1998 OPAP REPORT
FOR THE
O'SULLIVAN LAKE PROJECT
for
Mike Atkins and Todd Maitland

NTS 42L6NE and 42L7NW

November, 1998

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Clark-Eveleigh Consulting

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SUMMARY

Clark-Eveleigh Consulting of Thunder Bay, Ontario was contracted to supervise and complete an OPAP assisted mineral exploration program for Mike Atkins and Todd Maitland on their O'Sullivan Lake property. An integrated exploration program including linecuting, humus sampling, prospecting and geological mapping was carried out on the property.

A grid totalling 13.6 km was cut over the area where the Hurd Lake Fault intersects a granitoid plug just east of the Kowkash Gold Showings. The grid consists of 10 km of 200m spaced section lines, a 1.8 km baseline and a 1.8km tieline. All lines are picketed every 25 metres.

A total of 163 humus samples were collected and assayed to determine their gold content. The sampling interval was 25 metres and covered the four most south-easterly grid lines (Lines 10E, 12E, 14E and 16E.

The grid, the Copper Jim Showing and the Peninsula Showing were mapped, prospected and sampled. A total of 30 grab samples were collected and assayed to determine their gold content (sample # 33551-33580). Fifteen grab samples were collected on the O'Sullivan Lake grid, 5 from the Copper Jim, 1 from the Copper Jim - northwest and 9 from the Peninsula Showing.

The O'Sullivan Lake Property underlain predominantly by massive to pillowed mafic volcanic flows intruded by numerous quartz porphyry and quartz feldspar porphry dykes. A granitoid stock occupies the south-western third of the property grid. Late north-westerly trending diorite and diabase dykes can be found in the north-central and northern portion of the grid. The geology of the Copper Jim Showing and the Peninsula Showing is very similar consisting of quartz porphyry dykes intruding massive to pillowed mafic volcanic flows.

The general fabric of all the volcanic rocks within the O'Sullivan Lake Property is expressed by a northeast, vertically dipping foliation. Locally, at the contacts the felsic intrusives and focused within the intermediate tuffs, strong shearing is evident. The principle structure in the area is the Hurd Lake Fault which crosscuts all rock types.

The intermediate to mafic volcanic rocks overlying the O'Sullivan Lake Property exhibit weak to moderate incipient chlorite alteration and locally are weakly pyritized. The granite plug is locally weakly hematized. Alteration associated with the quartz porphyry dykes consists of weak to locally strong iron carbonate, moderate to strong silicification as veins, veinlets and stringers, +/- moderate sericite and +/- weak hematite. The mineralized rocks adjacent to the quartz porphyries contain minor to semi-massive sulphides. Most commonly they contain minor to 1% pyrite, minor pyrrhotite, and locally minor chalcopyrite.

The vast majority of the humus sample gold assay results were at background levels. A few anomalous samples outlined a gold trend within the western corner of the grid. This trend was subsequently replicated by litho-geochemical sampling of altered and mineralized rocks associated with quartz porphyry dyking.

The best assay (sample-33556) obtained within the confines of the grid returned an assay value of 2.77 grams Au /tonne from a quartz vein containing 5% chalcopyrite and minor pyrite. A sample of quartz porphyry dyke (sample-33558) containing 1% pyrite and local minor chalcopyrite assayed 0.52 grams Au/tonne. The best assay obtained from the property was obtained at the Copper Jim Showing. This sample (33570) of quartz porphyry dyke exhibiting moderate iron carbonate alteration, minor disseminated pyrite and trace chalcopyrite returned an assay value of 5.63 grams Au/tonne. Sample 33573, from the Peninsula Showing, a 3 to 5 cm wide quartz vein exhibiting iron staining, minor pyrite and minor chalcopyrite returned an assay value of 2.26 grams Au/tonne.

The geology observed in the O'Sullivan Area is in good agreement with a previous interpretation by Moorehouse, 1947, 1948. There is a positive correlation between the humus anomaly and bedrock gold assay results. The best gold assay results obtained from the property grid came from quartz porphyritic intrusive rocks and associated quartz veining proximal to the western flank of the granitic intrusion. The best gold assay results obtained from the Copper Jim and Peninsula Showing again came from quartz porphyry dykes and associated quartz veining. The 1998 program reproduced similar gold assay results to those obtained historically. The gold values are intimately associated with the quartz porphyritic intrusive rocks.

Detailed prospecting, litho-sampling, humus sampling and mapping along the northwestern flank of the granite plug is recommended in an attempt to locate and sample the numerous quartz porphyritic intrusions outlined on Moorehouse's 1947-48 map. Possible additional cut lines should be completed, intermediate to the 200 metre lines, to allow for the additional humus sampling, prospecting and litho-sampling. Expansion of the grid to cover the are of the Copper Jim would provide control for further work in this area. Follow up mechanical stripping, washing and channel sampling should also be considered.

Work on the Peninsula Area should include further prospecting to determine the extent of the quartz porphyry intrusives and associated gold mineralization.

The O'Sullivan Lake Area is presently dormant in regard to claims and exploration activity which would provide an opportunity for reconnaissance prospecting and sampling of known and unexplored quartz porphyritic rocks. This work could lead to acquisition of additional claims in the O'Sullivan Lake Area.

1.0 INTRODUCTION

Clark-Eveleigh Consulting was contracted to carry out an OPAP assisted exploration property on the O'Sullivan Lake Property located approximately 300 km northeast of Thunder Bay, Ontario and 35 km northwest of Nakina, Ontario. The property was recently returned after being optioned to Crowbush Minerals of Toronto. The only work completed during the option period was an airborne magnetic and electromagnetic survey. Past exploration and OPAP grants had outlined several areas of interesting gold, gold - copper mineralization. The high and widespread gold numbers suggest that this area is a very favourable site for hosting a gold deposit.

An integrated exploration program including linecuting, humus sampling, prospecting and geological mapping was carried out on the property.

This report presents the results of this exploration program and provides recommendations for further work.

1.1 LOCATION AND ACCESS

The O'Sullivan Lake property areas lie approximately 300 km northeast of Thunder Bay, Ontario and 35 km northwest of Nakina (Figure 1). The property is within the Beardmore-Geraldton area of the Thunder Bay Mining Division. The claim map sheets are O'Sullivan Lake, G-362 and Maun Lake, G-319 with latitude 50 27'20" and longitude 87 00'00" in the NTS 42L6NE and 42L7NW.

Access is via logging road 643 from Nakina north to O'Sullivan Lake and branching off on the road to the Consolidated Louanna Mine (Figure 2). From here, a boat will be needed to access the other side of the lake where the claims covering Hurd Lake Fault Zone have been staked.

1.2 CLAIMS

The O'Sullivan Lake Property consists of 7 claims totalling 92 units (1472 hectares) recorded in good standing in the Thunder Bay Mining Division and illustrated on the Maun Lake (G-319) and O'Sullivan Lake (G-362) claim maps (Figure 3I). The claims are:

Claim Number	Units / Hectares	Claim Map
TB 1205320	16 / 256	O'Sullivan Lake
TB 1210284	16 / 256	O'Sullivan Lake
TB 1215787	15 / 240	O'Sullivan Lake

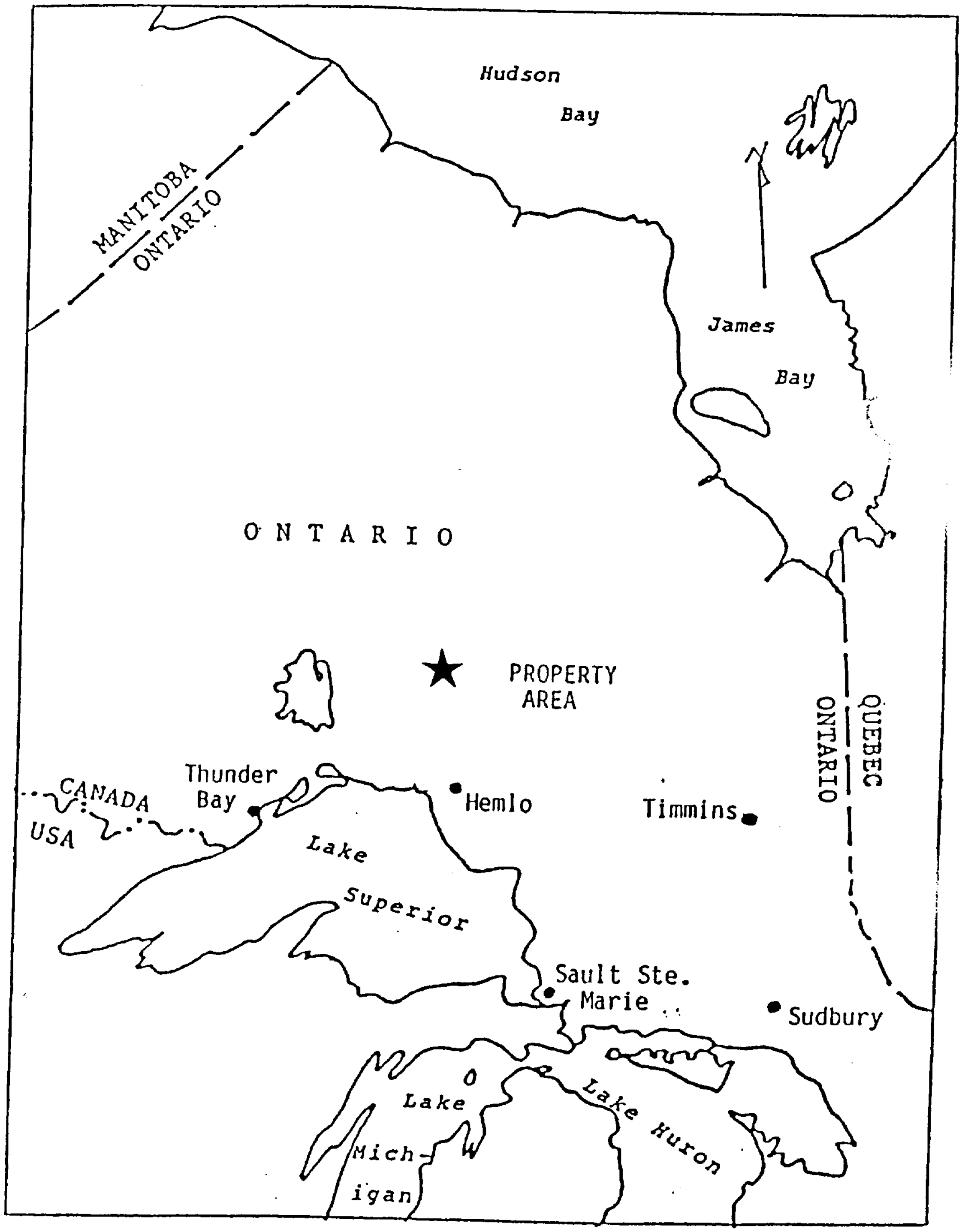
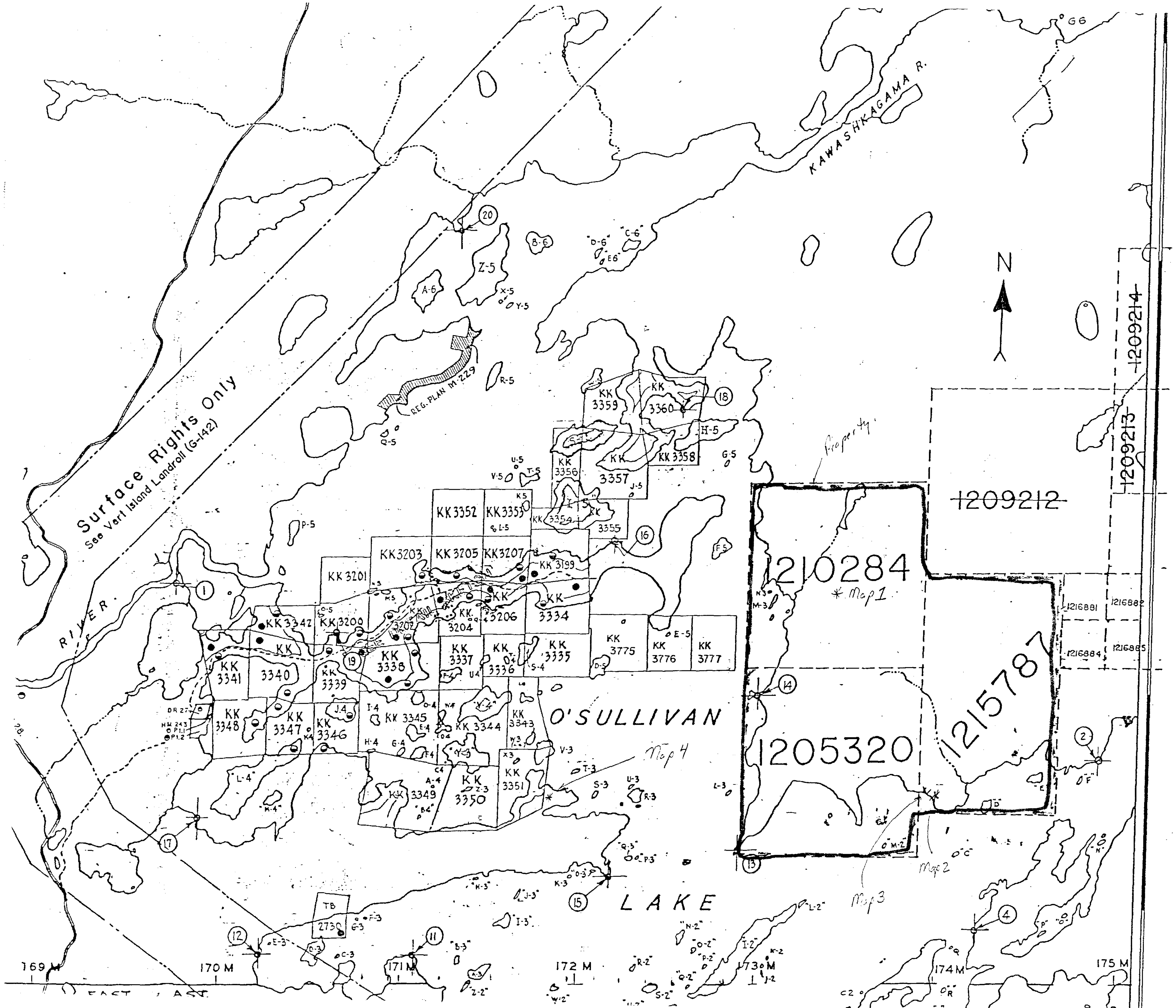


Figure 1: Location of the Property Area in Northwestern Ontario

FIG.1. LOCATION MAP



0 — 1600 metres.

O'Sullivan Lake Area
Map. G-362
Location Map of Work.

Figure 2

1.3 PREVIOUS WORK AND RESULTS

Gold mineralization in the O'Sullivan Lake areas was first reported in Kindle (1931) to occur associated to quartz stringers within carbonate altered porphyry on the Cryderman claims.

The gold mineralization at the Consolidated Louanna Gold Mine is reported in 1935. Further work led to the beginning of underground development in 1947.

The area of the O'Sullivan Lake property has been prospected since the 1940's. Work is recorded in the Government Assessment Files in 1950. The area has been mapped in detail by the Government in 1955 by Moorehouse(1955), who documented the numerous gold occurrences known at the time. A Government sponsored Airborne (Electromagnetic and Magnetic) Geophysical Survey was completed in 1989. Recent 1997 mapping by Stott and Parker (1997)of the OGS identified the Hurd Lake Fault.

The summary of the previous exploration is presented is presented in the Mineral Exploration Inventory maps 42L 7NW and 42L 6NW (Appendix II). A map of the showings and some of the better assays covered by the claim block are presented Appendix III.

The specific work, area and results are:

Year	Company / Individual	Type of Work / Where Related to Claims	Results
1950 - 51	Kogold Prospecting Syndicate	Diamond Drilling / East, Southeast Portion	Early work on New Athona Cu-Au Showing
1955	New Athona Mines	Geology, Diamond Drilling, Assays / East, Southeast Portion	up to 0.43% copper over 51 feet with 0.02 - 0.05 OPT gold
1955	Peterson Occurrence	Assay data from stripping / northeast portion	0.59% copper and 0.07 OPT gold over 2 feet
1955	Copper Jim Mines	Trenching, diamond drilling / south boundary portion	1.92% copper and 0.02 OPT gold over 7.0 feet, grabs of up to 6.5 % copper
1956	Ovansull Lake Gold	Diamond drilling / south boundary portion	0.06 OPT gold over 2.5 feet, Visible gold
1959 - 60	Jonsmith Mines Ltd.	Diamond drilling and geophysics / northeast portion	duplicated Peterson Work
1971-72	R. J. Kasner	Diamond drilling / south boundary portion	drill results not presented
1980-83	E. Bazinet	Diamond drilling, geophysics / south boundary	no results presented

Year	Company / Individual	Type of Work / Where Related to Claims	Results
1981-82	Amax	Diamond drilling, geophysics / south boundary	no results presented
1986-87	Kowkash Gold Corp.	Report of diamond drilling / west central portion	1 - 10% copper, 0.03 - 7.99 OPT gold
1991-92	M. D. Smith	OPAP, sampling, geophysics, mapping / East, Southeast Portion	Confirmed New Athona assays
1992	Rick Roy	OPAP, sampling / most showings within claim block	Confirmed all previous sampling
1993	Crowbush Mines	Airborne magnetics and electromagnetics over present claims	Located mag trends and EM conductors (Appendix IV)

1.4 PAST GOLD PRODUCTION

The O'Sullivan Lake Belt is host of the Lake OSU Gold Mine (Consolidated Louanna Gold Mine). The mine property was first explored in detail in 1935. This work lead to the sinking of a shaft to the 150 foot level in 1947. Extensive but sporadic work has been carried out from 1947 until 1984 with the production of 15,400 ounces of gold. The ore zones of the mine occur within a strongly sheared and altered mafic to intermediate tuffaceous horizon. The tuff horizon is hosted by massive to pillowed mafic flows. The tuffaceous band has been the focus of shearing, porphyry intrusion and alteration. The intrusives, irregular in shape and size, are frequently sheared and consist of quartz and quartz-feldspar porphyries. The alteration of the tuffaceous horizon consists of pervasive carbonate and weak sericite with intense silicification and sericite mineralization near the intrusive contacts.

The mineralization at the mine site is associated to brecciated bluish quartz veins hosted by the quartz feldspar porphyries and the sheared tuff. The veins contain up to 15% sulphides (pyrite, pyrrhotite, arsenopyrite, sphalerite, and chalcopyrite) and native gold.

1.5 REGIONAL GEOLOGY

The area is underlain by Archean metavolcanics and metasediments belonging to the Wabigoon Belt (Appendix III). Locally interbedded massive and pillowed mafic flows are overlain by a narrow belt of felsic to intermediate tuffs and metasediments. The volcanics are locally intruded by sills, dykes and small stocks of gabbroic to granitic composition. Metamorphic grade varies from greenschist in the central belt to upper amphibolite adjacent to the granite bodies. All the rocks are sheared in an easterly direction bearing 065-045. A number of strong, northerly trending faults 020-040 have been identified.

1.6 STRUCTURE

The general fabric of all the volcanic rocks within the O'Sullivan Lake Property is expressed by a northeast, vertically dipping foliation. Locally, at the contacts the felsic intrusives and focused within the intermediate tuffs, strong shearing is evident. The principle structure in the area is the Hurd Lake Fault which crosscuts all rock types.

The Hurd Lake Fault is a strong northeast striking, vertically dipping structure traceable for over 8 kilometres (4.8 miles).

1.7 PROPERTY GEOLOGY AND MINERALIZATION

The O'Sullivan Lake Property hosts the Hurd Lake Fault Zone which occurs within the Northeastern end of the Kowkash Greenstone Belt where the belt appears to start pinching out at O'Sullivan Lake. The fault is a northeast trending (040-045) structure with numerous parallel copper-gold showings associated with it.

The area is underlain by mafic to intermediate volcanics intruded by a number of feldspar and quartz feldspar porphyries. The main showing at the Lake OSU mine occurs in a porphyry similar to these. Numerous copper-gold showings occur in the Hurd Lake area. The showings are either associated with large breccia zones or quartz veins in shear zones at the margins of felsic intrusions.

The New Athona Mines Prospect is an example of a breccia zone which is believed to have 300,000 tons of 1% Cu and low grade Au. Another prospect near this fault zone would be the Copper Jim which has mineralization in a breccia zone in the form of pyrite, pyrrhotite and chalcopyrite. This zone was traced for a strike length of 600 ft and found to occur across horizontal widths of up to 35 ft. Assays from this property usually range from 2.78 to 7.43% Cu and from 0.03 to 0.07 oz/ton Au.

Exploration diamond drilling and sampling by Kowkash Gold Corp. on the west central portion of the claim block returned impressive copper, gold and silver numbers from both quartz veins adjacent porphyries and sheared mafic volcanics. The assays include 1 - 15% copper, 0.01 - 7.99 ounces gold per ton and up to 8.14 ounces silver per ton.

There are several significant showings in this area which display similarities to a large tonnage, low grade copper-gold deposit. The area needs a thorough exploration program to determine the actual extent of mineralization that exists near the Hurd Lake Fault Zone.

2.0 1998 EXPLORATION PROGRAM

2.1 INTRODUCTION

An OPAP assisted exploration program of linecutting, prospecting, humus sampling, rock sampling, and geological mapping was carried out to assess the potential of the O'Sullivan Lake Property as a host for economic quantities of gold mineralization. The property covers numerous gold and gold-copper showings. The exploration work was concentrated on three key areas:

a) the grid which covers: 1) the south-western portion of the Hurd Lake Fault, 2) the contact between the metavolcanic rocks and a small granitoid plug, and 3) numerous narrow quartz porphyry dyke / volcanic contacts with associated quartz vein type gold mineralization.

b) the Copper Jim showing - copper and gold mineralization associated with a quartz porphyry dyke intruding pillowed mafic volcanics.

c) the Peninsula Showing - gold mineralization hosted in quartz veins associated with a quartz porphyry dyke intruding mafic volcanic flows.

Sunset Minerals of Thunder Bay, Ontario was contracted to cut a grid totaling 13.6 km over the area where the Hurd Lake Fault intersects a granitoid plug just east of the Kowkash Gold Showings. The grid consists of 10 km of 200m spaced section lines and 1.8 km baseline and a 1.8 km tieline. All lines are picketed every 25 metres.

The work was conducted between September 3 and October 5, 1998. The humus samples were collected by Todd Maitland, R.Varrin and J. Pinksen. Geological mapping, prospecting and sampling was conducted by B. Nelson, Todd Maitland and J. Pinksen. The work was hampered by rain that caused the project to go take longer then expected and go over budget.

A total of 163 humus samples were collected and assayed to determine their gold content. The sampling interval was 25 metres and covered the four most south-easterly grid lines (Lines 10E, 12E, 14E and 16E).

The grid (Map 1), the Copper Jim Showing(Map 2), Copper Jim-northwest (Map 3) and the Peninsula Showing (Map 4) were mapped, prospected and sampled. A total of 30 grab samples were collected and assayed to determine their gold content (Sample # 33551-33580). Fifteen grab samples were collected on the O'Sullivan Lake grid(Map 1), 5 from the Copper Jim (Map 2), 1 from the Copper Jim - northwest (Map 3) and 9 from the Peninsula Showing (Map 4).

2.2 GEOLOGY AND STRUCTURE

The O'Sullivan Lake Property underlain predominantly by massive to pillowed mafic volcanic flows intruded by numerous quartz porphyry and quartz feldspar porphyry dykes. A granitoid stock occupies the south-western third of the property grid. Late north-westerly trending diorite and diabase dykes can be found in the north-central and northern portion of the grid (Map 1). The geology of the Copper Jim Showing (Map 2), Copper Jim- northwest (Map 3) and the Peninsula Showing (Map 4) is very similar and consists of quartz porphyry dykes intruding massive to pillowed mafic volcanic flows.

The general fabric of all the volcanic rocks within the O'Sullivan Lake Property is expressed by a northeast, vertically dipping foliation. Locally, at the contacts the felsic intrusives and focused within the intermediate tuffs, strong shearing is evident. The principle structure in the area is the Hurd Lake Fault which crosscuts all rock types (Map 1).

2.3 ALTERATION AND MINERALIZATION

The intermediate to mafic volcanic rocks overlying the O'Sullivan Lake Property exhibit weak to moderate incipient chlorite alteration and locally are weakly pyritized. The granite plug is locally weakly hematized. Alteration associated with the quartz porphyry dykes consists of weak to locally strong iron carbonate, moderate to strong silicification as veins, veinlets and stringers, +/- moderate sericite and +/- weak hematite. The mineralized rocks adjacent to the quartz porphyries contain minor to semi-massive sulphides. Most commonly they contain minor to 1% pyrite, minor pyrrhotite, and locally minor chalcopyrite.

3.0 RESULTS

All grab samples collected on the property during the 1998 program are listed in table (O'Sullivan Grab Samples). The best assay (sample-33556) obtained within the confines of the grid returned an assay value of 2.77 grams Au /tonne from a quartz vein containing 5% chalcopyrite and minor pyrite (Map 1). A sample of quartz porphyry dyke (sample-33558) containing 1% pyrite and local minor chalcopyrite assayed 0.52 grams Au/tonne (Map 1). The best assay result returned from the property was obtained at the Copper Jim Showing (Map 2). This sample (33570) of quartz porphyry dyke exhibiting moderate iron carbonate alteration, minor disseminated pyrite and trace chalcopyrite returned an assay value of 5.63 grams Au/tonne. Sample 33573, from the Peninsula Showing (Map 4), a 3 to 5 cm wide quartz vein exhibiting iron staining, minor pyrite and minor chalcopyrite returned an assay value of 2.26 grams Au/tonne (Map 4).

The humus sampling was completed in an attempt to assess the response of the gold mineralization through the glacial cover. The sampling proved the viability of using humus to trace the covered gold mineralization (Map 5). The sampling produced 4 anomalies:

Humus Anomalies
Map 5

From	To	Assay, PPB GOLD	Comment
1200E, 2050N	1400E, 2075N	8 and 17 respectively	Overburden cover, possible edge of granite
1000E, 2725N	1200E, 2625N	24 and 20 respectively	Overburden cover, parallels dikes and pits at 1200E, 2800N
1000E, 2875N		9 one station	Overburden cover on strike to dikes and pits 1200E, 2800N
1400E, 2825N	1400E, 2850N	156 and 22 respectively	Edge of outcrop with pits and grabs of up to 2.769 grams gold per ton

O'Sullivan Grab Samples

SAMPLE NO.	LOCATION	ROCK TYPEk	ALTERATION/MINERALIZATION	COMMENTS	ASSAY Au (ppb)
33551	11+45E, 20+00N	Granite + Quartz Veins	60% erratic stockwock quartz veinlets, no pyrite		<5
33552	12+25E, 28+25N	Intermediate volcanic + semi-massive sulphides	10% chalcopyrite, 10-15% pyrrhotite, and 5-10% pyrite, possible arsenopyrite	70% host intermediate volcanic and 30% sulphides as sulphide veining with moderate quartz	57
33553	12+30E, 28+10N	Quartz Porphyry Dyke	local minor hematite on fractures, trace disseminated pyrite	siliceous and very hard, <1% tiny blue quartz eyes	<5
33554	11+60E, 28+75N	Intermediate volcanic	local quartz - iron carbonate stringers, 1% chalcopyrite, 1% pyrite plus pyrrhotite	intense rusty fractures	17
33555	11+88E, 29+30N	Intermediate volcanic	minor to locally 1% disseminated to bleby silvery pyrite, local minor pyrrthotite	hard - siliceous, local hint of hyaloclastite texture	<5
33556	14+05E, 28+35N	Quartz Vein	5% chalcopyrite splashes up to 1 cm, minor pyrite	sample from rubble pile - west side of trench, two generations of quartz veining - white with minor chalcopyrite and grey with 5% chalcopyrite	2769
33557	14+05E, 28+35N	Intermediate volcanic / Quartz Porphyry?	moderate sericite, moderate quartz stringers, weak chlorite, 1% chalcopyrite, minor pyrite, minor pyrrhotite	sheared intermediate volcanic or quartz porphyry - hint of grey quartz eyes (amygdules?)	51
33558	16+40E, 29+15N	Quartz Porphyry Sill / Dyke?	siliceous, local quartz veinlets, 1% disseminated pyrite, local minor chalcopyrite	minor tiny <1mm scale glassy quartz eyes, local sub-parallel one cm scale quartz veinlets	515
33559	16+12E, 29+02N	Mafic volcanic	strong sericite, moderate chlorite, minor pyrite associated with quartz stringers	intensely foliated to crenulated, rusty on fractures, tending to a quartz-chlorite-sericite schist	9
33560	25+30E, 30+00N	Intermediate volcanic	minor disseminated silvery pyrite	massive and hard	5
33561	20+65E, 28+25N	Intermediate - felsic dyke	1% disseminated silvery pyrite	rusty	22
33562	20+35E, 28+25N	Mafic volcanic	minor disseminated pyrite + pyrrhotite	rusty on fractures	<5
33563	17+75E, 26+25N	Mafic volcanic	1-2% chalcopyrite, 3-5% pyrrhotite, 5% pyrite, possible sphalerite?	rubble from most easterly pit, quartz-sulphide vein in mafic volcanics, sulphide estimates are questionable	22
33564	17+90E, 26+25N	Quartz Porphyry	minor disseminated pyrite, trace chalcopyrite	frost slump from trench, 5% tiny quartz eyes	10
33565	17+70E, 27+75N	Mafic volcanic	quartz and carbonate stringers	2/3 metre wide sheared zone thru massive volcanic	18
33566	Copper Jim	Quartz Porphyry	siliceous, trace disseminated pyrite	sample from trench #1 - west end, tiny quartz eyes	102

O'Sullivan Grab Samples

SAMPLE NO.	LOCATION	ROCK TYPEk	ALTERATION/MINERALIZATION	COMMENTS	ASSAY Au (ppb)
33567	Copper Jim	Quartz Porphyry	moderate to strong iron carbonate, local quartz veinlets, trace disseminated pyrite	sample from trench #2 - east end	13
33568	Copper Jim	Quartz Porphyry	moderate iron carbonate, minor disseminated pyrite, minor quartz stringers	sample from outcrop at east side of trench #3	783
33569	Copper Jim	Quartz Porphyry	weak iron carbonate, trace pyrite, trace chalcopyrite?	sample from west end of trench #3	7
33570	Copper Jim	Quartz Porphyry	local iron carbonate, minor disseminated pyrite, trace chalcopyrite	sample from east end of trench #3, 5% 1-3mm glassy clear quartz eyes, no quartz veins	5626
33571	Copper Jim (northwest)	Intermediate volcanic	minor grey quartz stringers, trace disseminated pyrite	sample from most southerly trench	25
33572	Penninsula Showing	Quartz Porphyry	moderate iron carbonate, moderate sericite, minor to locally 1% pyrite, trace chalcopyrite	moderately foliated, local iron staining	250
33573	Penninsula Showing	Quartz Vein	local intense yellow to red iron staining (hematite + iron carbonate), minor pyrite, local minor chalcopyrite?	3 to 5 cm wide quartz vein, fractured grey-white quartz containing minor mafic inclusions	2256
33574	Penninsula Showing	Quartz Porphyry	weak hematite, weak iron carbonate, and weak sericite, minor to locally 1% disseminated pyrite	sampled rock not in place, 3-5% 2 to 3mm scale quartz eyes	15
33575	Penninsula Showing	Quartz Vein	trace disseminated pyrite	bullish glassy white to grey quartz, sulphides in quartz porphyry host - not in quartz vein	33
33576	Penninsula Showing	Quartz Porphyry	strong iron carbonate, moderate sericite, trace disseminated pyrite	well foliated	28
33577	Penninsula Showing	Quartz Porphyry	strong iron carbonate, strong sericite, minor disseminated pyrite	weakly foliated	75
33578	Penninsula Showing	Quartz Vein + Quartz Porphyry	strong iron carbonate, strong sericite, trace disseminated pyrite	50% white - bullish quartz veinlets and 50% altered quartz porphyry	<5
33579	Penninsula Showing	Quartz Porphyry	moderate iron carbonate, minor sericite, minor bleby pyrite	north side of penninsula	221
33580	Penninsula Showing	Quartz Porphyry	strong iron carbonate, strong sericite, minor bleby pyrite	north side of penninsula, well foliated @ 225 / 75 NW	55

4.0 CONCLUSIONS

The geology observed in the O'Sullivan Area is in good agreement with a previous interpretation by Moorehouse, 1947, 1948. There is a positive correlation between the humus anomaly and bedrock gold assay results. The best gold assay results obtained from the property grid came from quartz porphyritic intrusive rocks and associated quartz veining proximal to the western flank of the granitic intrusion. The best gold assay results obtained from the Copper Jim and Peninsula Showing again came from quartz porphyry dykes and associated quartz veining. The 1998 program reproduced similar gold assay results to those obtained historically. The gold values are intimately associated with the quartz porphyritic intrusive rocks.

5.0 RECOMMENDATIONS

Detailed prospecting, litho-sampling, humus sampling and mapping along the northwestern flank of the granite plug is recommended in an attempt to locate and sample the numerous quartz porphyritic intrusions outlined on Moorehouse's 1947-48 map. Possible additional cut lines should be completed, intermediate to the 200 metre lines, to allow for the additional humus sampling, prospecting and litho-sampling. Expansion of the grid to cover the are of the Copper Jim would provide control for further work in this area. Follow up mechanical stripping, washing and channel sampling should also be considered.

Work on the Peninsula Area should include further prospecting to determine the extent of the quartz porphyry intrusives and associated gold mineralization.

The O'Sullivan Lake Area is presently dormant in regard to claims and exploration activity which would provide an opportunity for reconnaissance prospecting and sampling of known and unexplored quartz porphyritic rocks. This work could lead to acquisition of additional claims in the O'Sullivan Lake Area.

REFERENCES

Assessment Files: Ministry of Northern Development and Mines, Thunder Bay.

Kindle, L.F., 1931: Kowkash-Ogoki Gold Area, District of Thunder Bay, Ontario, Department of Mines, A.R. 40, Part 5.

Moore house, 1966: Geology of the O'Sullivan Lake Area, Ontario Department of Mines, A.R. 64, Part 4.

Mason J. and White G., 1986: Gold Occurrences, Prospect and Deposits of the Beardmore-Geraldton Area, Districts of Thunder Bay and Cochrane, Ontario Geological Survey, Open File Report 5630.

Stott, G.M. and Parker, J.R., 1997: Geology and Mineralization of the O'Sullivan Lake area, Onaman-Tashota greenstone belt, east Wabigoon subprovince, in summary of Field Work and Other Activities, OGS, MP 168

Statement of Qualifications

I, J. Garry Clark do hereby certify:

- I am a resident of Thunder Bay, Ontario, Canada with address 120 Robinson Drive, P7A 6G5
- I have been engaged in base and precious metal exploration as a geologist since 1983
- I am a graduate of Lakehead University, Thunder Bay, Ontario (H.B.Sc., Geology, 1983)

Signature: ____________

Name: J. Garry Clark

Date: Dec 9/98

APPENDIX I
ROCK SAMPLE
Assay Certificates

ACCURASSAY LABORATORIES
A DIVISION OF ASSAY LABORATORY SERVICES INC.

1070 LITHIUM DRIVE, UNIT 2
THUNDER BAY, ONTARIO P7B 6G3
PHONE (807) 623-6448
FAX (807) 623-6820

CLARK-EVELEIGH CONSULTING
1000 ALLOY DRIVE
THUNDER BAY, ONTARIO
P7B 6A5
Fax (807) 625-9293

Oct 14, 1998

Job# 9840748

Pro: O'Sullivan

SAMPLE # Accurassay	Customer	Gold ppb	Gold Oz/t
1	33551	<5	<0.001
2	33552	57	0.002
3	33553	<5	<0.001
4	33554	17	<0.001
5	33555	<5	<0.001
6	33556	2769	0.081
7	33557	51	0.001
8	33558	515	0.015
9	33559	9	<0.001
10	33560	6	<0.001
11 Check	33560	<5	<0.001
12	33561	22	<0.001
13	33562	<5	<0.001
14	33563	22	<0.001
15	33564	10	<0.001
16	33565	18	<0.001
17	33566	102	0.003
18	33567	13	<0.001
19	33568	783	0.023
20	33569	9	<0.001
21 Check	33569	<5	<0.001
22	33570	5626	0.164
23	33571	25	<0.001
24	33572	250	0.007
25	33573	2256	0.066
26	33574	15	<0.001
27	33575	33	<0.001
28	33576	28	<0.001
29	33577	75	0.002

Certified By: ____________

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CLARK-EVELEIGH CONSULTING
1000 ALLOY DRIVE
THUNDER BAY, ONTARIO
P7B 6A5
Fax (807) 625-9293

Oct 14, 1998

Job# 9840748

Pro: O'Sullivan

SAMPLE #		Gold	Gold
Accurassay	Customer	ppb	Oz/t
30	33578	<5	<0.001
31 Check	33578	<5	<0.001
32	33579	221	0.006
33	33580	55	0.002

Certified By:

APPENDIX II
Humus Sample
Assay Certificates

O'Sullivan

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Sep 28, 1998

Job# 9840725

Pro: O'Sullivan Lake

SAMPLE # Accurassay	Customer	Gold ppb	Gold Oz/t
1	L12E-20+00N	<5	<0.001
2	L12E-20+25N	<5	<0.001
3	L12E-20+50N	8	<0.001
4	L12E-20+75N	<5	<0.001
5	L12E-21+00N	<5	<0.001
6	L12E-21+25N	<5	<0.001
7	L12E-21+50N	<5	<0.001
8	L12E-21+75N	<5	<0.001
9	L12E-22+00N	<5	<0.001
10	L12E-22+25N	<5	<0.001
11 Check	L12E-22+25N	<5	<0.001
12	L12E-22+50N	<5	<0.001
13	L12E-22+75N	<5	<0.001
14	L12E-23+00N	<5	<0.001
15	L12E-23+25N	<5	<0.001
16	L12E-23+50N	<5	<0.001
17	L12E-23+75N	<5	<0.001
18	L12E-24+00N	<5	<0.001
19	L12E-24+25N	8	<0.001
20	L12E-24+50N	<5	<0.001
21 Check	L12E-24+50N	<5	<0.001
22	L12E-24+75N	<5	<0.001
23	L12E-25+00N	<5	<0.001
24	L12E-25+25N	<5	<0.001
25	L12E-25+50N	<5	<0.001
26	L12E-25+75N	<5	<0.001
27	L12E-26+00N	<5	<0.001
28	L12E-26+25N	20	<0.001
29	L12E-26+50N	<5	<0.001

Certified By: [signature]

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Sep 28, 1998

Job# 9840725

Pro: O'Sullivan Lake

SAMPLE # Accurassay	Customer	Gold ppb	Gold Oz/t
30	L12E-26+75N	<5	<0.001
31	Check L12E-26+75N	<5	<0.001
32	L12E-27+00N	<5	<0.001
33	L12E-27+25N	<5	<0.001
34	L12E-27+50N	<5	<0.001
35	L12E-27+75N	<5	<0.001
36	L12E-28+00N	<5	<0.001
37	L12E-28+25N	<5	<0.001
38	L12E-28+50N	<5	<0.001
39	L12E-28+75N	<5	<0.001
40	L12E-29+00N	<5	<0.001
41	Check L12E-29+00N	<5	<0.001
42	L12E-29+25N	<5	<0.001
43	L12E-29+50N	<5	<0.001
44	L12E-29+75N	<5	<0.001
45	L12E-30+00N	<5	<0.001
46	L14E-20+00N	<5	<0.001
47	L14E-20+25N	<5	<0.001
48	L14E-20+50N	<5	<0.001
49	L14E-20+75N	17	<0.001
50	L14E-21+00N	<5	<0.001
51	Check L14E-21+00N	5	<0.001
52	L14E-21+25N	9	<0.001
53	L14E-21+50N	6	<0.001
54	L14E-21+75N	<5	<0.001
55	L14E-22+00N	<5	<0.001
56	L14E-22+25N	<5	<0.001
57	L14E-22+50N	<5	<0.001
58	L14E-22+75N	<5	<0.001
59	L14E-23+00N	<5	<0.001

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Sep 28, 1998

Job# 9840725

Pro: O'Sullivan Lake

SAMPLE # Accurassay	Customer	Gold ppb	Gold Oz/t
60	L14E-23+25N	<5	<0.001
61 Check	L14E-23+25N	<5	<0.001
62	L14E-23+50N	<5	<0.001
63	L14E-23+75N	<5	<0.001
64	L14E-24+00N	<5	<0.001
65	L14E-24+25N	<5	<0.001
66	L14E-24+50N	<5	<0.001
67	L14E-24+75N	<5	<0.001
68	L14E-25+00N	<5	<0.001
69	L14E-25+25N	<5	<0.001
70	L14E-25+50N	<5	<0.001
71 Check	L14E-25+50N	<5	<0.001
72	L14E-25+75N	<5	<0.001
73	L14E-26+00N	<5	<0.001
74	L14E-26+25N	<5	<0.001
75	L14E-26+50N	<5	<0.001
76	L14E-26+75N	<5	<0.001
77	L14E-27+00N	<5	<0.001
78	L14E-27+25N	<5	<0.001
79	L14E-27+50N	<5	<0.001
80	L14E-27+75N	<5	<0.001
81 Check	L14E-27+75N	<5	<0.001
82	L14E-28+00N	<5	<0.001
83	L14E-28+25N	156	0.005
84	L14E-28+50N	22	<0.001
85	L14E-28+75N	<5	<0.001
86	L14E-29+00N	<5	<0.001
87	L14E-29+25N	<5	<0.001
88	L14E-29+50N	<5	<0.001
89	L14E-29+75N	<5	<0.001

Certified By: [signature]

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Sep 28, 1998

Job# 9840725

Pro: O'Sullivan Lake

SAMPLE # Accurassay	Customer	Gold ppb	Gold Oz/t
90	L14E-30+00N	<5	<0.001
91 Check	L14E-30+00N	<5	<0.001
92	10+00E-20+00N	<5	<0.001
93	10+00E-20+25N	<5	<0.001
94	10+00E-20+50N	<5	<0.001
95	10+00E-20+75N	<5	<0.001
96	10+00E-21+00N	<5	<0.001
97	10+00E-21+25N	<5	<0.001
98	10+00E-21+50N	<5	<0.001
99	10+00E-21+75N	<5	<0.001
100	10+00E-22+00N	<5	<0.001
101 Check	10+00E-22+00N	<5	<0.001
102	10+00E-22+25N	<5	<0.001
103	10+00E-22+50N	<5	<0.001
104	10+00E-22+75N	<5	<0.001
105	10+00E-23+00N	<5	<0.001
106	10+00E-23+25N	<5	<0.001
107	10+00E-23+50N	<5	<0.001
108	10+00E-23+75N	<5	<0.001
109	10+00E-24+00N	<5	<0.001
110	10+00E-24+25N	<5	<0.001
111 Check	10+00E-24+25N	<5	<0.001
112	10+00E-24+50N	<5	<0.001
113	10+00E-24+75N	<5	<0.001
114	10+00E-25+00N	<5	<0.001
115	10+00E-25+25N	<5	<0.001
116	10+00E-25+50N	<5	<0.001
117	10+00E-25+75N	<5	<0.001
118	10+00E-26+00N	<5	<0.001
119	10+00E-26+25N	<5	<0.001

Certified By: [signature]

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Sep 28, 1998

Job# 9840725

Pro: O'Sullivan Lake

SAMPLE # Accurassay	Customer	Gold ppb	Gold Oz/t
120	10+00E-26+50N	<5	<0.001
121 Check	10+00E-26+50N	<5	<0.001
122	10+00E-26+75N	<5	<0.001
123	10+00E-27+00N	<5	<0.001
124	10+00E-27+25N	24	<0.001
125	10+00E-27+50N	<5	<0.001
126	10+00E-27+75N	<5	<0.001
127	10+00E-28+00N	<5	<0.001
128	10+00E-28+25N	<5	<0.001
129	10+00E-28+50N	<5	<0.001
130	10+00E-28+75N	9	<0.001
131 Check	10+00E-28+75N	<5	<0.001
132	10+00E-29+00N	<5	<0.001
133	10+00E-29+25N	<5	<0.001
134	10+00E-29+50N	<5	<0.001
135	10+00E-29+75N	<5	<0.001
136	16+00E-20+00N	<5	<0.001
137	16+00E-20+25N	<5	<0.001
138	16+00E-20+50N	<5	<0.001
139	16+00E-20+75N	<5	<0.001
140	16+00E-21+00N	<5	<0.001
141 Check	16+00E-21+00N	<5	<0.001
142	16+00E-21+25N	<5	<0.001
143	16+00E-21+50N	<5	<0.001
144	16+00E-21+75N	<5	<0.001
145	16+00E-22+00N	<5	<0.001
146	16+00E-22+25N	<5	<0.001
147	16+00E-22+50N	<5	<0.001
148	16+00E-22+75N	<5	<0.001
149	16+00E-23+00N	<5	<0.001

Certified By:

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P7B 6A5
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Sep 28, 1998

Job# 9840725

Pro: O'Sullivan Lake

SAMPLE # Accurassay		Customer	Gold ppb	Gold Oz/t
150		16+00E-23+25N	<5	<0.001
151	Check	16+00E-23+25N	<5	<0.001
152		16+00E-23+50N	<5	<0.001
153		16+00E-23+75N	<5	<0.001
154		16+00E-23+75Na	<5	<0.001
155		16+00E-24+25N	<5	<0.001
156		16+00E-24+50N	<5	<0.001
157		16+00E-24+75N	<5	<0.001
158		16+00E-25+00N	<5	<0.001
159		16+00E-25+25N	<5	<0.001
160		16+00E-25+50N	<5	<0.001
161	Check	16+00E-25+50N	<5	<0.001
162		16+00E-25+75N	<5	<0.001
163		16+00E-26+00N	<5	<0.001
164		16+00E-26+25N	<5	<0.001
165		16+00E-26+50N	<5	<0.001
166		16+00E-26+75N	<5	<0.001
167		16+00E-27+00N	<5	<0.001
168		16+00E-27+25N	<5	<0.001
169		16+00E-27+50N	<5	<0.001
170		16+00E-27+75N	<5	<0.001
171	Check	16+00E-27+75N	<5	<0.001
172		16+00E-28+00N	<5	<0.001
173		16+00E-28+25N	<5	<0.001
174		16+00E-28+50N	<5	<0.001
175		16+00E-28+75N	<5	<0.001
176		16+00E-29+00N	<5	<0.001
177		16+00E-29+25N	<5	<0.001
178		16+00E-29+50N	<5	<0.001
179		16+00E-29+75N	<5	<0.001

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Job# 9840725

Pro: O'Sullivan Lake

SAMPLE #		Gold	Gold
Accurassay	Customer	ppb	Oz/t
180	16+00E-30+00N	<5	<0.001
181 Check	16+00E-30+00N	<5	<0.001

Certified By: ____________

Appendix III
Table of Rock Types and Descriptions

PROVINCE OF ONTARIO

DEPARTMENT OF MINES

HON. PHILIP T. KELLY, *Minister of Mines* H. C. RICKABY, *Deputy Minister*

M. E. HURST, *Provincial Geologist*

SIXTY-FOURTH ANNUAL REPORT

OF THE

ONTARIO DEPARTMENT OF MINES

BEING

VOL. LXIV, PART 4, 1955

Geology of the O'Sullivan Lake Area

By

W. W. MOORHOUSE

PRINTED BY ORDER OF

THE LEGISLATIVE ASSEMBLY OF ONTARIO

TORONTO

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1956

Natural Resources

Forest

Much of the area consists of second-growth spruce, jackpine, balsam, poplar, and birch. A fine stand of original timber remains on the east end of Osulake Peninsula.

Fish and Game

O'Sullivan lake provides good fishing for lake trout and pickerel, and pike are abundant. Brook trout fishing on the Kawashkagama River and the Little Current River flowing northeast from Superb Lake is said to be good. Game is not especially abundant, but the Indians occasionally shoot moose, and one or two were seen by members of the party. Deer seem to be relatively scarce. Traces of bear were frequently seen.

Water Power

A number of small falls and rapids occur on the Kawashkagama and Little Current rivers, but none appear to offer important sources of power.

Inhabitants

A few Indian families live more or less permanently on the lake, but otherwise there are no permanent inhabitants.

GENERAL GEOLOGY

The consolidated rocks of the area are all Precambrian in age. The oldest rocks are a series of basic lavas, with which are associated basic, intermediate, and acid tuffs, the last being relatively rare. A series of metamorphosed sediments along the north boundary of the area mapped is considered here to be younger than the volcanics, but available evidence regarding its stratigraphic position is scanty and somewhat contradictory. These rocks have been intruded by gabbro, granites of various types, abundant dikes and irregular bodies of porphyry, and diabase dikes. The bed rock is overlain by Pleistocene glacial and glacial-fluvial deposits, and Recent swamp deposits.

Table of Formations

CENOZOIC	
RECENT:	Peat; river and beach deposits.
PLEISTOCENE:	Boulder clay, sand and gravel.
	Great Unconformity
PRECAMBRIAN	
KEWEENAWAN (?):	Diabase dikes.
POST-ALGOMAN (?):	Lamprophyre; diorite and metadiabase dikes.
	Intrusive Contact
ALGOMAN (?):	Quartz porphyry, feldspar porphyry, quartz-feldspar porphyry, aplite, dioritic aplite. Alaskite, hybrid granite. Granodiorite, quartz diorite.
	Intrusive Contact
PRE-ALGOMAN (?):	Gabbro, feldspathic gabbro, pyroxenite, peridotite; sheared gabbro.
	Intrusive Contact
SEDIMENTS:	Thin-bedded mica schists.
KEEWATIN (?):	Pillow lavas, metadiabase, amphibolite; rhyolite and quartz porphyry; tuff and agglomerate; iron formation.

Keewatin

The rocks classified here as Keewatin are predominantly of volcanic origin. Most abundant and most typical are the pillow lavas, which are found throughout the area except along the north edge of the Keewatin belt and in the south-eastern part of the area, between the Northeast Arm and Wander Arm.

The pillow lavas appear, for the most part, to be basic or basaltic lavas, and in structure and microscopic features they resemble the Keewatin lavas throughout other parts of northern Ontario. The pillow structure is very well exposed on the shores of islands in the lake and on outcrops that have been recently burned over. Unfortunately, these lavas are not reliable for structural interpretation because, as a result of the intense compression that has been so general throughout the area, the pillow forms are invariably somewhat deformed. As far as can be determined they rarely appear to be elongated in the direction of strike of the flows as a result of this shearing. Consequently, top determinations that have been made and are recorded on the accompanying geological map (in back pocket) are unreliable and few in number.

On one or two islands and points exposed to strong wave action, pillows have, in places, become weathered out from the outcrop and can be lifted out bodily as football-shaped masses. In one or two outcrops at the east end of the Cryderman Peninsula very dense, flinty-looking material is found associated with pillows. In thin section it appears to be tuffaceous in character.

In addition to the pillow lavas, massive and structureless lavas also occur. Variolitic and vesicular flows seem to be relatively rare. Some slightly porphyritic flows are exposed in various parts of the area.

In the belt of metamorphosed, sheared amphibolitic Keewatin rocks between Merle Lake and Superb Lake, all primary structures of the original lavas have been completely destroyed. The same is true of the finer-grained schists in the granite-metadiabase complex of the peninsula south of Northeast Arm.

In the vicinity of porphyry dikes and certain quartz veins as in claim K.K.3357 and in the vicinity of the mineralized shear zone in claim K.K.3334 on the Lake-Osu Mines, Limited, property, the greenstone has been considerably altered. It becomes pale, greenish-white in colour on the weathered surface and develops a chalky texture. The altered rock, in thin section, proves to be made up of chlorite, carbonate, white mica, epidote and clinozoisite, albite, and quartz in place of the typical hornblende, chlorite, epidote, and albite of the normal greenstone. From the field occurrence and microscopic evidence it is not always certain that some of these altered phases are not tuffaceous in origin. The alteration evidently involves chloritization, albitization, carbonatization, and possibly silicification.

Metadiabase[1]

A very characteristic rock type in the Keewatin sequence is metadiabase. These coarse-grained, generally massive and structureless rocks are encountered in many areas of Keewatin lavas and are popularly known as "diorites." They form prominent outcrops some of which are over ¼ mile in width. The relation of the metadiabase to the lavas is generally obscure. In one or two places it has been possible to recognize a gradation in texture from the coarse-grained

[1] The heavy, broken black lines shown on the geological map (back pocket) to be near the Hogan-Newman property, south of Northeast Arm, represent inclusions of metadiabase and not iron formation as might be inferred from the map legend.

metadiabase to the fine-grained lava, as in an outcrop on the north side of Osulake Peninsula. Nowhere have definite intrusive contacts been observed between the two rock types, although in one or two places inclusions of finer-grained lava were observed in the metadiabase. Drill cores from the Lake-Osu mine indicated that the metadiabase and lava are usually intimately mixed. In most cases, it is probable that these massive rocks represent simply the coarser parts of flows; their structureless, resistant character results in their standing up as prominent outcrops.

The petrography and relationships of the metadiabases have been fully described by H. W. Pfeffer.[1] Throughout most of the area the metadiabase preserves perfectly the original ophitic or diabasic texture of the rock, although in most cases the pyroxene and calcic plagioclase initially present have been altered to fibrous uralitic hornblende and albite, often impregnated with saussurite. Only one or two samples were found that showed a little original pyroxene or plagioclase. This, in itself, is evidence to show that these rocks should not properly be called diorites. Chemical analyses of the metadiabase indicate its similarity to typical diabases and basalts and to the greenstones with which it is associated.

ANALYSES OF METADIABASES AND RELATED ROCKS

	1[2]	2[2]	3[2]	4	5	6
SiO_2	48.49	48.32	49.39	48.19	49.43	48.80
Al_2O_3	15.04	13.70	13.59	17.05	16.68	13.98
Fe_2O_3	3.41	4.45	3.78	4.06	3.24	3.59
FeO	8.36	8.52	8.97	9.29	10.23	9.78
MnO	0.11	0.16	0.21	....	....	0.17
MgO	8.06	7.82	7.03	3.64	4.54	6.70
CaO	9.72	11.09	10.12	8.99	8.49	9.38
Na_2O	1.59	1.00	1.78	2.24	2.56	2.59
K_2O	0.58	0.70	0.28	0.87	0.72	0.69
TiO_2	0.75	0.70	1.04	....	....	2.19
P_2O_5	0.12	0.12	0.26	....	....	0.33
H_2O	3.52	3.68	3.91	2.78	2.23	1.80
CO_2				2.43	1.21	....
	99.75	100.26	100.36	99.55	99.36	100.00

1. Pillow lava (specimen No.K-59), Osulake Peninsula. Specific gravity, 2.95.
2. Medium-grained metadiabase (specimen No.K-62), Osulake Peninsula, taken about 20 feet from No.1 above; the two rock types grade into each other. Specific gravity, 3.04.
3. *Coarse-grained metadiabase.* Specific gravity, 2.98.
4. The average of 9 analyses of Keewatin basalts according to J. Satterly.[3]
5. The average of 7 analyses of pillowed Keewatin basalts according to J. Satterly.[4]
6. The average of 43 analyses of Plateau basalts according to R. A. Daly.[5]

The metadiabase occurs in an unusual manner on the peninsula north of Wander Arm. Here it is found in narrow bands from a few feet up to 400 feet wide, the bands being separated by granite that is more or less sheared. The origin of this very complex mixture of metadiabase and granite is obscure. The

[1] H. W. Pfeffer, by permission from his thesis for Doctor of Philosophy degree, *Petrogenesis of the Dioritic Rocks (Metadiabases) of the O'Sullivan Lake Area, Ontario,* University of Toronto, 1951.

[2] Analyses by D. A. Moddle, Provincial Assayer, Ontario Department of Mines.

[3] J. Satterly, "Pillow Lavas from the Dryden-Wabigoon Area, Kenora District, Ontario," University of Toronto Studies, Geol. Ser., No. 46, *Contributions to Canadian Mineralogy,* 1941, p. 133.

[4] *Ibid.,* p. 134.

[5] R. A. Daly, *Igneous Rocks and the Depths of the Earth,* McGraw-Hill Book Co., Inc., New York, 1933.

metadiabase appears to be normal in texture and mineralogy. It is possible that the finer-grained phases of the greenstone sequence have developed into shear zones along which the granite was intruded. The injection of granite is fairly consistently parallel to the northeast strike in this area. South and east of the area, especially on the islands and the southeast shore of Wander Arm, the distribution of granite, recrystallized metadiabase, and greenstone is much more irregular. The Keewatin occurs as roughly angular blocks enclosed in granite. The metadiabase and greenstone in this area are metamorphosed to a somewhat higher degree than in the belt to the north. A number of metadiabase outcrops are characterized by the presence of metacrysts of plagioclase, some attaining a diameter of several inches. Some of these are highly altered and are therefore probably phenocrysts, although similar textures have not been observed in other parts of the O'Sullivan Lake area. Some of the finer-grained amphibolitic greenstones, particularly along the south shore of Wander Arm, show irregular streaks and patches of coarser-grained feldspathic material, indicative of increasing injection and granitization.

In addition to the metadiabase and related rocks, which appear to be older than the granites, a number of dikes up to 80 feet wide, which appear to cut granite and pre-granite rocks, have been mapped. Texturally and mineralogically they resemble the metadiabase, except for the occurrence, in one dike, of patches of micropegmatite up to a couple of feet long. They have not been found in contact with the Keweenawan diabase, so their relative age is not definitely known; but their high degree of alteration, in areas where the later diabase is relatively fresh, has led to the conclusion that they are of an early period of diabase intrusion. Whether they are younger than all the granites in the O'Sullivan Lake area is not known since they have not been recognized beyond the southeast corner of the map area.

In the northern part of the map area, south of the arm leading to Superb Lake and along the northwest shore of O'Sullivan Lake, the metadiabases have been metamorphosed to an even higher degree. They have apparently been sheared and recrystallized intensely, because all trace of the original texture has been destroyed, and no pillow structures or other primary features are recognizable. The amphibolites derived from lavas are relatively fine-grained, but those developed from the metadiabase have become very coarse. Some amphibolites, as on the island and point immediately west of Pfeffer Point, contain an intensely blue (alkaline) amphibole, but this is not a general characteristic of the amphibolites described.

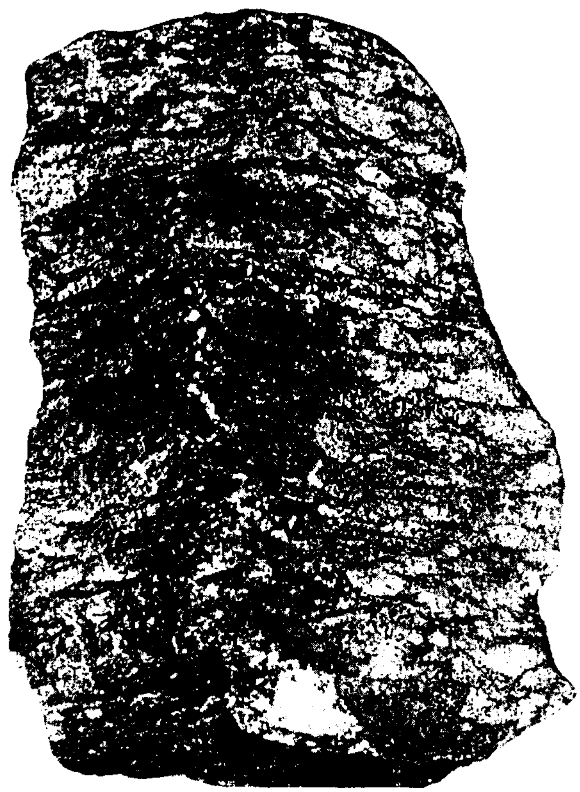
Amphibolites of obscure origin occupy a small irregular area at the contact of granite and sediments north of Odman Lake. Considerable outcrops of amphibolite and recrystallized greenstone also occur west and southwest of Elka Lake and in the vicinity of Prop Lake. Strongly banded or sheared amphibolites in the Elka Lake Odman Lake area and on Peter Island and adjoining islands are of doubtful origin and are described more fully below, in the section on tuff and agglomerate.

Rhyolite

There are few rhyolites and related acid rocks in the O'Sullivan Lake area. A number of narrow bands of rhyolite and quartz porphyry outcrop on Cryderman Peninsula, Springpole Island, Harlow Island, and east of Conlon Bay. A few other minor occurrences are indicated on the map. In thin section these rocks appear to be very siliceous, sericitized, and otherwise altered. They are usually highly sheared but otherwise structureless.

Tuff and Agglomerate

Tuff and agglomerate are relatively subordinate except along the north edge of the area, in a belt extending from south of Superb Lake to Prop Lake. Elsewhere they occur as relatively narrow bands of 30-300 feet interbedded with lavas. The largest of these is on the north side of Cryderman Peninsula. This band is composed mostly of intermediate to basic agglomeratic rocks, with which are associated two narrow bands of rhyolitic tuff or arkose. The intermediate agglomerates continue eastward to outcrop on Farley Island. The distribution and strong shearing of this band indicates that it is rather complexly folded, particularly towards the east.

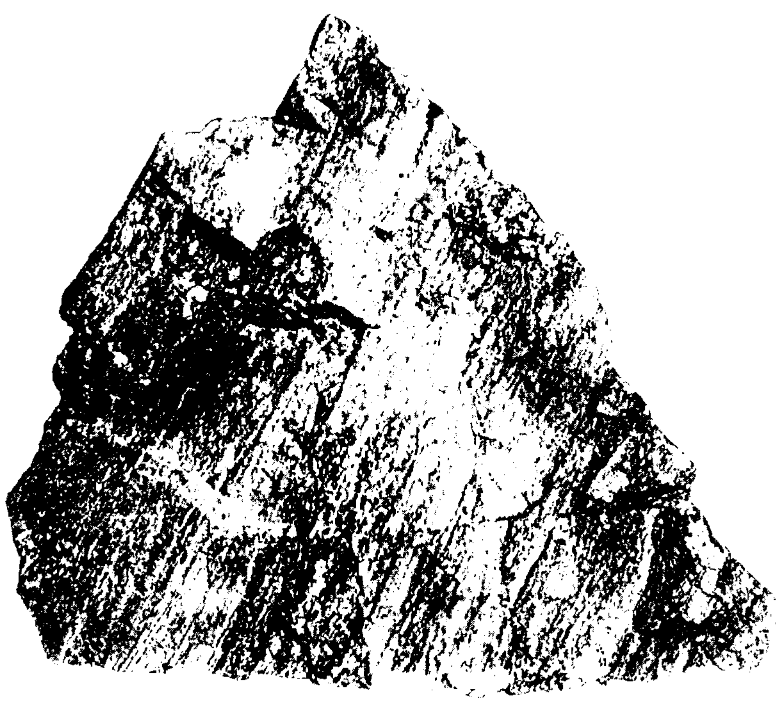


Amphibolitic agglomerate east of Prop Lake. The specimen is 7 inches long.

Two narrow bands of thinly bedded tuff are exposed on Osulake Peninsula. The south band is mineralized in places, as on the east shore of the bay in claim K.K.3334, and has been traced a few hundred feet west of the bay by trenching. It may possibly represent the zone in which the Lake-Osu mineralized zone has been developed. A similar narrow mineralized zone of tuff has been trenched on the island southeast of Pfeffer Point in the northeast corner of the Lake-Osu group of claims. Another tuff belt, possibly a continuation of the preceding one, has been exposed by workings on the Trans-American Mining Corporation, Limited, group on the east shore of the lake.

A rather extensive area of similar intermediate tuffs and agglomerates lies south and east of Conlon Bay. Owing to considerable shearing and faulting in this area, the distribution of the fragmentals is not too clear, but a rather complicated fold structure seems apparent.

The belt of tuffs in the northern part of the map area is rather varied and, to the west, highly metamorphosed, so that identification of the original nature of the rocks is not always easy. Two main types are presented, one is a series of white to brown-weathering tuffs and agglomerates, particularly characteristic of the eastern part of the belt; the other is in the western part of the area, north of Kowkash Bay, a series of amphibolites and gneissic-appearing, banded garnetiferous amphibole-feldspar rocks. Many of the latter appear to be definitely tuffaceous and agglomeratic, but others may represent interbedded lavas, metadiabase, or possibly metamorphosed phases of the gabbro complex that



Thinly bedded hornblendic tuff from the south side of the Superb Lake arm. The specimen is 8 inches long.

lies west and south of the belt. All these rocks have been grouped together in the tuffaceous series, but it is probable that further detailed field and microscopic investigations would reveal a much more intricate mixture of several rock types. A thin section from the contact between an amphibolite and an agglomerate on a small island half a mile east of Peter Island shows essentially the same mineralogy in both rocks, except that the deep blue (alkaline) amphibole is much more abundant in the amphibolite than in its neighbour. A questionable "amphibolite" from an outcrop just west of the southwest end of Elka Lake proved, in thin section, to be a peculiar association of chlorite, epidote, and garnet. The sheared fragmental volcanics outcropping south of the gabbro-peridotite intrusive at the west boundary of the area are probably a part of this series.

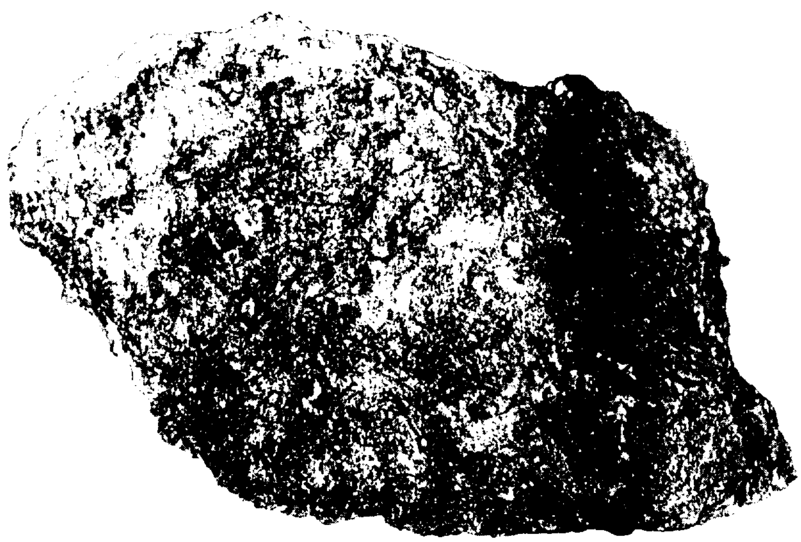
South of Elka Lake, near the south boundary of this predominantly fragmental belt, a number of outcrops of quartz porphyry and rhyolite, some of which may be tuffaceous, have been mapped.

Iron Formation[1]

A little magnetic iron formation was encountered in the area southeast of Conlon Bay. It is exposed on the side of an outcrop, so that its size is not determinable; but it does not seem to be of any consequence.

Sediments

A belt of sediments, ½-¾ mile wide, lies along the north edge of the area, separating the tuff-amphibolite zone from pegmatitic granite to the north. These sediments are for the most part light-grey to brown-weathering, sandy-



Knotted biotite schist from a reef in Superb Lake. The specimen is 9 inches long.

looking biotite schists and gneisses, in some cases with nodules of metamorphic minerals that tend to stand out on the weathered surface. The sediments appear to be otherwise structureless, except for one or two occurrences of grain-gradation. They show very little variation in grain, and neither conglomeratic nor slaty beds are recognizable as such. In some places tuffs appear to be interbedded with the more normal sediments.

In thin section, the sedimentary schists appear to be made up of quartz, biotite, and plagioclase; in places, andalusite, staurolite, and garnet occur. The occurrence of the andalusite and staurolite suggests that these schists were originally more argillaceous than they now appear.

The relation of the sediments to the Keewatin is obscure. Kindle,[2] following Hopkins,[3] has grouped these rocks with the Marshall Lake series, which he

[1] See footnote re Metadiabase on page 5.

[2] L. F. Kindle, *Kowkash-Ogoki Gold Area, District of Thunder Bay*, Ont. Dept. Mines, Vol. XL, 1931, pt. 4.

[3] P. E. Hopkins, *The Kowkash Gold Area (Second Report)*, Ont. Bur. Mines, Vol. XXVI, 1917, p. 207.

considers pre-Keewatin in age. Very meagre evidence from top determinations would seem to support this interpretation, but other evidence points to the younger age of the sediments:

1) A differentiated gabbro sill (described below) in the western part of the area, which has been intruded into the Keewatin and appears to have been folded with it, faces north, that is, towards the sediments.

2) The greenstones are separated from the sediments by the tuff and agglomerate zone described above. Since in most areas thick accumulations of fragmental rocks appear to overlie the main mass of basic pillow lavas, this relationship suggests a younger age for the sediments.

3) The distribution of metadiabase bodies in the Keewatin complex suggests a rather complicated fold pattern, but the sediments do not appear to be involved in this folding; this suggests that the volcanics were folded and eroded before deposition of the sediments.

It is recognized that the above evidence is not conclusive. If it is accepted, it also implies that the gabbro sill is older than the sediments, and it should therefore be placed below them in the table of formations. The sill and the sediments are nowhere known to be in contact, so direct evidence of their relationship is not available.

Pre-Algoman Intrusives

The pre-Algoman intrusives are best exposed on the north side of the Kawashkagama River, just west of Kowkash Bay. They are here exposed continuously from the river to the south side of Prop Lake, the maximum width being about half a mile. The gabbro, which is characteristic of these intrusives, is highly altered, and differentiated with the development of peridotitic and pyroxenite facies. The most persistent and easily recognized phase of the sill is the peridotite. This forms a continuous belt, 300 to nearly 1,000 feet wide, along the south side of the intrusive. It is invariably altered, but in thin section, the serpentine, of which it is mainly composed, clearly indicates by its structure that it has been derived from primary olivine. Associated with the serpentine is a small amount of carbonate, in places talc, and scattered grains of magnetite. No chromite has been noted in any of the sections examined. A pyroxenite from within the serpentine zone was found to contain serpentine and remnants of a colourless hypersthene. Hopkins[1] gives an analysis of this serpentine in which only a trace of chromium is recorded. In a few outcrops the serpentine is seamed with small, irregular cracks containing asbestos. No fibres longer than 1/10 inch were encountered in mapping the serpentine.

To the north of the serpentine, the gabbro sill consists largely of medium to coarse-grained gabbro, with some isolated occurrences of pyroxenite. The gabbro is much altered in that no pyroxene is preserved, its place being taken by almost colourless, fibrous amphibole. Surprisingly enough, the plagioclase is very little altered, consisting for the most part of labradorite. Sphene is usually present. Thin sections of altered pyroxenite from within the gabbro phase are in every case composed of the same minerals as the gabbro, except that the amphibole is in larger amounts.

The north contact of the gabbro mass is not well defined. It is in contact with a series of coarse amphibolites, and appears, itself, to have been metamorphosed to coarse hornblendic rocks along this contact.

[1] P. E. Hopkins, *op. cit.*, p. 206.

To the west, the gabbro extends beyond the limits of the area mapped. To the east it terminates against a fault trending roughly north. As noted previously, it is possible that it continues east of this fault, in the amphibolite-fragmental complex between Elka and Odman lakes. If this is the case, it must have changed considerably in character.

The original form of the gabbro intrusive is not definitely known, but it is believed to be a sill in view of the type of differentiation that it has undergone. Actually, the intrusive appears to cut across the strike of the Keewatin at a small angle, since fragmentals occur south of it at the west end of the area, but are only known north of the gabbro to the east. Thus the intrusive might better be described as a sheet than a sill.

Gabbro also occurs in the eastern part of the area, two or three distinct bands, 100–700 feet wide, lying just south of Superb Lake. This gabbro is throughout intensely sheared, and most outcrops are characterized by a marked fluxion structure. Thin-section examination of this rock confirms the profound shearing it has suffered. The plagioclase, though still labradorite in composition, is completely granulated and no longer retains its original crystal form. The sphene and amphibole of the rock are also strongly streaked out parallel to the direction of shearing. Since this gabbro appears to be parallel in strike to the volcanics with which it is associated, it is believed to be sill-like in form.

Algoman

A great variety of siliceous intrusives are included in the Algoman described here. There is some evidence that among these rocks there are granites and related rocks of more than one age, but in the absence of well-defined intrusive relationships it has been considered advisable to discuss them as a group.

Granites

The oldest granites in the area appear to be those that are associated with the metadiabases on the peninsula north of Wander Arm and on the islands and south shore of Wander Arm. This "granite" is properly a quartz diorite, being composed exclusively of quartz and plagioclase, generally andesine-oligoclase in composition, together with biotite or chlorite and abundant alteration products such as sericite and saussurite. Microcline or orthoclase are either completely absent or present in accessory amounts only. The "granite" is fairly massive and not deformed in the southern part of the area, but on the peninsula itself it is generally sheared. Along the shear zone that bounds the metadiabase-granite complex on the north, the "granite" has been intensely deformed, so that it is now a chlorite schist with large quartz eyes.

The quartz diorite is distinguished from later granitic intrusives by its being cut not only by Keweenawan diabase dikes but also by dikes of felsitic porphyry, pegmatite, and metadiabase (see page 6). These features are the basis for believing that it is somewhat older than other granites in the area. There is no doubt that it is intrusive into the metadiabases and associated volcanics, so that it is certainly post-Keewatin. Whether it represents an early period of granite intrusion (Laurentian) or is simply an early phase of Algoman vulcanism is not known, but the latter is considered more likely by the author.

In the broad area of Keewatin between the Northeast Arm and Superb Lake, there are a number of stocks, a sill-like intrusion, and a variety of smaller, irregular bodies of a light-coloured, generally rather siliceous granite, which, in some cases at least, has fine-grained, porphyritic border facies. In view of the latter characteristic, this granite is considered to be very closely related to the porphyries that occur widely throughout the O'Sullivan Lake area, but are particularly abundant in the section in which the stocks and bodies of granite occur. In a few places, as in the small stock about a mile northeast of Hurd Lake, syenitic and dioritic hybrid facies have been developed. The large stock northeast of Pelangio Point is noteworthy for the contact effects associated with it. The lavas in contact with it appear hornfelsic and recrystallized. In places, rather broad zones of carbonatization have been observed in the greenstones. Around the stock the greenstones have been rather generally impregnated with scattered pockets and grains of iron sulphide and, rarely, chalcopyrite.

In thin section, these granites, like the quartz diorite just described, are characteristic plagioclase granites, in which the principal feldspar is albite. A little microcline was noted in one or two places, and it may be more abundant in the sill-like intrusion south of Superb Lake. However, the intimate association found between this granite and the porphyries confirms the general prevalence of albite mentioned, since all the porphyries are themselves sodic.

The third type of granite is exposed along the north boundary of the map area, where it occurs almost invariably in contact with the sediments. It is a distinctly pegmatitic granite, in which the principal constituents are almost equal quantities of microcline and albite, quartz, a little biotite and muscovite, and, in places, garnet. In one case the microcline was found to be replaced by secondary albite. North of Odman Lake the pegmatitic granite is separated in places from the sedimentary schists by an irregular mass of coarse amphibolite. In this area also, hybrid syenitic or dioritic rocks have been developed. Along the contact between the granite and the sediments, the sediments are much injected by dikes of pegmatite, so that the contact between the two rock types is difficult to determine.

The relations between the pegmatitic granite and the stocks and sills to the south of it in the greenstones, are not known, since the two types have not been observed in contact. The presence of pegmatites cutting the quartz diorite south of Wander Arm may indicate that the pegmatitic granite is the younger.

Porphyries

The porphyries constitute one of the most interesting rock types studied in the area. They are very widespread, and range in size from narrow dikes, a few inches wide, to large dikes and irregular bodies up to 300 feet wide. They vary somewhat in composition, including quartz porphyries, which are probably most common, quartz-feldspar porphyries, feldspar porphyry, aplite, and dioritic aplite. The porphyries vary somewhat in their structure. Some, such as the porphyry in the Lake-Osu mineralized zone and on the old Cryderman claim, are rather highly sheared. Others, which are more massive, may have chilled margins against the adjacent country rock. All the porphyries examined appear to be intrusive in character. Some of the dikes are cut by quartz and carbonate stringers and mineralized with pyrite. A little gold has been discovered in the quartz of some of these porphyries, as in the large dike on the Camdeck property, in the dike on the point three-quarters of a mile east of Pelangio Point, and in the dike on a small island southeast of the Lake-Osu mine. Most of the dikes and bodies of porphyry shown on the map, however, are unmineralized.

Most of the porphyries, in thin section, are found to contain abundant quartz and albite, both in phenocrysts and matrix, together with variable amounts of sericite, carbonate, chlorite, and occasionally hornblende. In the more sheared and altered porphyries, little if any albite is recognizable, and sericite is correspondingly more abundant. In some apparently related dikes, quartz no longer appears as phenocrysts, the plagioclase is more calcic, and the ferromagnesian minerals are more abundant. This type of dike has been named "dioritic porphyry" on the map.

Reference has already been made to the interesting occurrence of quartz

An esker, Pelangio Point.

porphyry as a local border phase of granite stocks and sills in the east-central part of the area. With these intrusives there are associated more or less irregularly distributed swarms of dikes and bodies of porphyry. They are quite variable in strike. Dike swarms are found west and southwest of Bigfault Lake, south and west of Hurd Lake, north of Bayhead Island, and north of Conlon Bay. Two large sill-like bodies and quite a number of dikes occur east of Pfeffer Point.

Lamprophyre and Metadiabase Dikes

A few narrow lamprophyre dikes were mapped in various parts of the area. They are not, however, particularly abundant, and in most cases are hardly large enough to show on the map. The metadiabase dikes in the Wander Arm area have been described. As already noted, the age relationships of these dikes has not been definitely determined. They are younger than the quartz diorite, but their relation to other granites and the later diabases is unknown.

Keweenawan

Diabase dikes are abundant, particularly in the eastern part of the area. Several were examined in thin section, and all proved to be quartz diabases. In the southeast quarter of the area, diabase occurs in bodies up to 300 feet wide. The form of these bodies is not known. The dikes in general strike northwest, but two north-striking dikes also occur, and one northeast-striking dike was mapped south and east of Conlon Bay.

Pleistocene

Glacial till is distributed rather thinly over most of the area, except in the main valleys. However, southwest and west of the area, south of the Kawashkagama River, the bed rock is deeply covered with sand and gravel, which rises to a considerable height above the lake to form the prominent hill southwest of Discovery Bay. Another thick accumulation of drift is formed by the esker that extends northeast from Pelangio Point, where it terminates in the lake, almost to Bigfault Lake. This broad ridge of sand and gravel is dotted here and there with small pot-holes and pot-hole lakes. Southwest of Esker Lake, the esker is flanked on both sides by large areas of low, more or less open swamp, except in the vicinity of the large granite stock, which is fairly well exposed. Another extensive area of swamp and low sandy drift lies east and north of Prop Lake. North of Peter Island and the channel east of it, the mainland is flat and swampy, with very scanty outcrop. The north shore of Superb Lake is also buried in deep, sandy drift. The lake is crossed near the boundary of the map area by a shoal of fine sand and gravel, which is barely passable by canoe late in the summer.

Observations on glacial striae indicate a southwesterly movement of ice in this area. This direction is fairly general for the region, except where locally modified by structure.

STRUCTURAL GEOLOGY

Folding

All volcanic and sedimentary formations mapped in the area dip at steep angles, so that it can be concluded that these rocks have been strongly folded. Unfortunately there are no persistent flows or other recognizable horizons that can be traced for long distances. It is therefore impossible, on the basis of available information, to unravel the complexities of the fold structure. Various observations, such as the distribution of the metadiabase outcrops and the strike of some of the tuff horizons (in the area south of Conlon Bay, the point on Cryderman Peninsula west of Farley Island, and elsewhere) imply that folding is not simple. A peculiar feature, which appears to be very general, is the easterly to southeasterly strike of narrow tuff bands in the lavas. This suggests

Ontario Ministry of Northern Development and Mines

Declaration of Assessment Work Performed on Mining Land

Mining Act. Subsection 65(2) and 66(3), R.S.O. 1990

Transaction Number (office use): W9840.00676

Assessment Files Research Imaging

42L06NE2001 2.19085 OSULLIVAN LAKE 900

...bsections 65(2) and 66(3) of the Mining Act. Under section 8 of the Mining Act, ...essment work and correspond with the mining land holder. Questions about this ...hern Development and Mines, 3rd Floor, 933 Ramsey Lake Road, Sudbury,

2.19085

Thunder Bay Mining Division
DEC - 9 1998 2:45 pm
RECEIVED

Instructions: - For work performed on Crown Lands before **recording** a claim, use form 0240.
- Please type or print in ink.

1. Recorded holder(s) (Attach a list if necessary)

Name: Audrey Traverse	Client Number: 222905
Address: c/o 1000 Alloy Dr.	Telephone Number: 807-625-9291
Thunder Bay, ON P7B 6A5	Fax Number: 807-625-9293
Name	Client Number
Address	Telephone Number
	Fax Number

2. Type of work performed: Check (✓) and report on only ONE of the following groups for this declaration.

Geotechnical: prospecting, surveys, assays and work under section 18 (regs) ✓

Physical: drilling stripping, trenching and associated assays

Rehabilitation

		Office Use	
Work Type: Humus Sampling, Geology + Sampling		Commodity	
		Total $ Value of Work Claimed	16,310
Dates Work Performed From 03 09 98 (Day/Month/Year) To 09 12 98 (Day/Month/Year)		NTS Reference	
Global Positioning System Data (if available)	Township/Area: O'Sullivan Lake.	Mining Division	Thunder Bay
	M or G-Plan Number: G-362	Resident Geologist District	Thunder Bay

Please remember to: - obtain a work permit from the Ministry of Natural Resources as required;
- provide proper notice to surface rights holders before starting work;
- complete and attach a Statement of Costs, form 0212;
- provide a map showing contiguous mining lands that are linked for assigning work;
- include two copies of your technical report.

3. Person or companies who prepared the technical report (Attach a list if necessary)

Name: Garry Clark.	Telephone Number: 807-625-9291
Address: Same as Above	Fax Number: 807-625-9293
Name	Telephone Number
Address	Fax Number
Name	Telephone Number
Address	Fax Number

RECEIVED
[illegible] 11 [illegible]
2:55 [illegible]
GEOSCIENCE ASSESSMENT OFFICE

4. Certification by Recorded Holder or Agent

I, Agent J.G. Clark (Print Name), do hereby certify that I have personal knowledge of the facts set forth in this Declaration of Assessment Work having caused the work to be performed or witnessed the same during or after its completion and, to the best of my knowledge, the annexed report is true.

Signature of Recorded Holder or Agent: [signature]		Date: Dec 9/98
Agent's Address: 1000 Alloy Dr. Thunder Bay ON P7B 6G5	Telephone Number: 807-625-9291	Fax Number: 807-625-9293

0241 (03/97)

Deemed MARCH 11/99

5. Work to be recorded and distributed. Work can only be assigned to claims that are contiguous (adjoining) to the mining land where work was performed, at the time work was performed. A map showing the contiguous link must accompany this form.

W9840.00676

1 . 0 0 8 5

	Mining Claim Number. Or if work was done on other eligible mining land, show in this column the location number indicated on the claim map.	Number of Claim Units. For other mining land, list hectares.	Value of work performed on this claim or other mining land.	Value of work applied to this claim.	Value of work assigned to other mining claims.	Bank. Value of work to be distributed at a future date
eg	TB 7827	16 ha	$26,825	N/A	$24,000	$2,825
eg	1234567	12	0	$24,000	0	0
eg	1234568	2	$ 8,892	$ 4,000	0	$4,892
1	TB 1210284	16	14704	6400	4394	3910
2	TB 1205320	16	442		442	
3	TB 1215787	15	1164	6000		
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
	Column Totals		16310	12400	4836	3910

I, J. G. Clark. (Print Full Name), do hereby certify that the above work credits are eligible under subsection 7 (1) of the Assessment Work Regulation 6/96 for assignment to contiguous claims or for application to the claim where the work was done.

Signature of Recorded Holder or Agent Authorized in Writing

Date Dec 9, 1998

6. Instructions for cutting back credits that are not approved.

Some of the credits claimed in this declaration may be cut back. Please check (✓) in the boxes below to show how you wish to prioritize the deletion of credits:

- ☐ 1. Credits are to be cut back from the Bank first, followed by option 2 or 3 or 4 as indicated.
- ☐ 2. Credits are to be cut back starting with the claims listed last, working backwards; or
- ☐ 3. Credits are to be cut back equally over all claims listed in this declaration; or
- ☐ 4. Credits are to be cut back as prioritized on the attached appendix or as follows (describe):

× Please call.

Note: If you have not indicated how your credits are to be deleted, credits will be cut back from the Bank first, followed by option number 2 if necessary.

For Office Use Only

Received Stamp	Deemed Approved Date	Date Notification Sent
RECEIVED ... 1998 ... 2:55 PM GEOSCIENCE ASSESSMENT OFFICE	Date Approved	Total Value of Credit Approved
	Approved for Recording by Mining Recorder (Signature)	

0241 (03/97)

Ontario Ministry of Northern Development and Mines

Statement of Costs for Assessment Credit

Transaction Number (office use): W9640.00676.

Personal information collected on this form is obtained under the authority of subsection 8 (1) of the Assessment Work Regulation 6/96. Under section 8 of the Mining Act, this information is a public record. This information will be used to review the assessment work and correspond with the mining land holder. Questions about this collection should be directed to a Provincial Mining Recorder, Ministry of Northern Development and Mines, 3rd Floor, 933 Ramsey Lake Road, Sudbury, Ontario, P3E 6B5.

085

Work Type	Units of work Depending on the type of work, list the number of hours/days worked, metres of drilling, kilometres of grid line, number of samples, etc.	Cost Per Unit of work	Total Cost
Line cutting	10.2 km	342/km	3469
Humus Sampling	11 days	250/day + 7%	2943
Geology Mapping	7.2 days	300/day + 7%	2167
Assitant	6.4 days	250/day + 7%	1605
Supervision	1.12 days	321/day	360
Report + Maps			2000
Associated Costs (e.g. supplies, mobilization and demobilization).			
Assays - Humus	163		1573
- Rock	20		221
Supplies			148
Gas			91
Transportation Costs			
Truck			388
Boat			270
Food and Lodging Costs			
Food			370
Cabin			685
		Total Value of Assessment Work	16,310

RECEIVED
DEC 11 1998
2.5566
GEOSCIENCE ASSESSMENT OFFICE

Calculations of Filing Discounts:

1. Work filed within two years of performance is claimed at 100% of the above Total Value of Assessment Work.
2. If work is filed after two years and up to five years after performance, it can only be claimed at 50% of the Total Value of Assessment Work. *If this situation applies to your claims, use the calculation below:*

TOTAL VALUE OF ASSESSMENT WORK x 0.50 = Total $ value of worked claimed.

Note:

- Work older than 5 years is not eligible for credit.
- A recorded holder may be required to verify expenditures claimed in this statement of costs within 45 days of a request for verification and/or correction/clarification. If verification and/or correction/clarification is not made, the Minister may reject all or part of the assessment work submitted.

Certification verifying costs:

I, J.G. Clark (please print full name), do hereby certify, that the amounts shown are as accurate as may reasonably be determined and the costs were incurred while conducting assessment work on the lands indicated on the accompanying Declaration of Work form as ______ (recorded holder, agent, or state company position with signing authority) I am authorized to make this certification.

Signature: [signature] Date: Dec 9/98

0212 (03/97)

Ministry of Northern Development and Mines

Ministère du Développement du Nord et des Mines

Ontario

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

Telephone: (888) 415-9846
Fax: (877) 670-1555

Visit our website at:
www.gov.on.ca/MNDM/MINES/LANDS/mlsmnpge.htm

February 9, 1999

AUDREY ELIZABETH TRAVERSE
C/O 1000 ALLOY DRIVE
THUNDER BAY, ONTARIO
P7B 6A5

Submission Number: 2.19085

Dear Sir or Madam:

Subject: Transaction Number(s):		**Status**
	W9840.00676	Deemed Approval

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. Allowable changes to your credit distribution can be made by contacting the Geoscience Assessment Office within this 45 Day period, otherwise assessment credit will be cut back and distributed as outlined in Section #6 of the Declaration of Assessment work form.

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

If you have any questions regarding this correspondence, please contact Steve Beneteau by e-mail at steve.beneteau@ndm.gov.on.ca or by telephone at (705) 670-5855.

Yours sincerely,

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

Correspondence ID: 13371

Copy for: Assessment Library

Work Report Assessment Results

Submission Number: 2.19085

Date Correspondence Sent: February 09, 1999 **Assessor:** Steve Beneteau

Transaction Number	First Claim Number	Township(s) / Area(s)	Status	Approval Date
W9840.00676	1210284	O'SULLIVAN LAKE	Deemed Approval	February 08, 1999

Section:
17 Assays ASSAY
12 Geological GEOL

Correspondence to:
Resident Geologist
Thunder Bay, ON

Assessment Files Library
Sudbury, ON

Recorded Holder(s) and/or Agent(s):
J.Garry Clark
THUNDER BAY, ONTARIO

AUDREY ELIZABETH TRAVERSE
THUNDER BAY, ONTARIO

Correspondence ID: 13371

[redacted]

REFERENCES

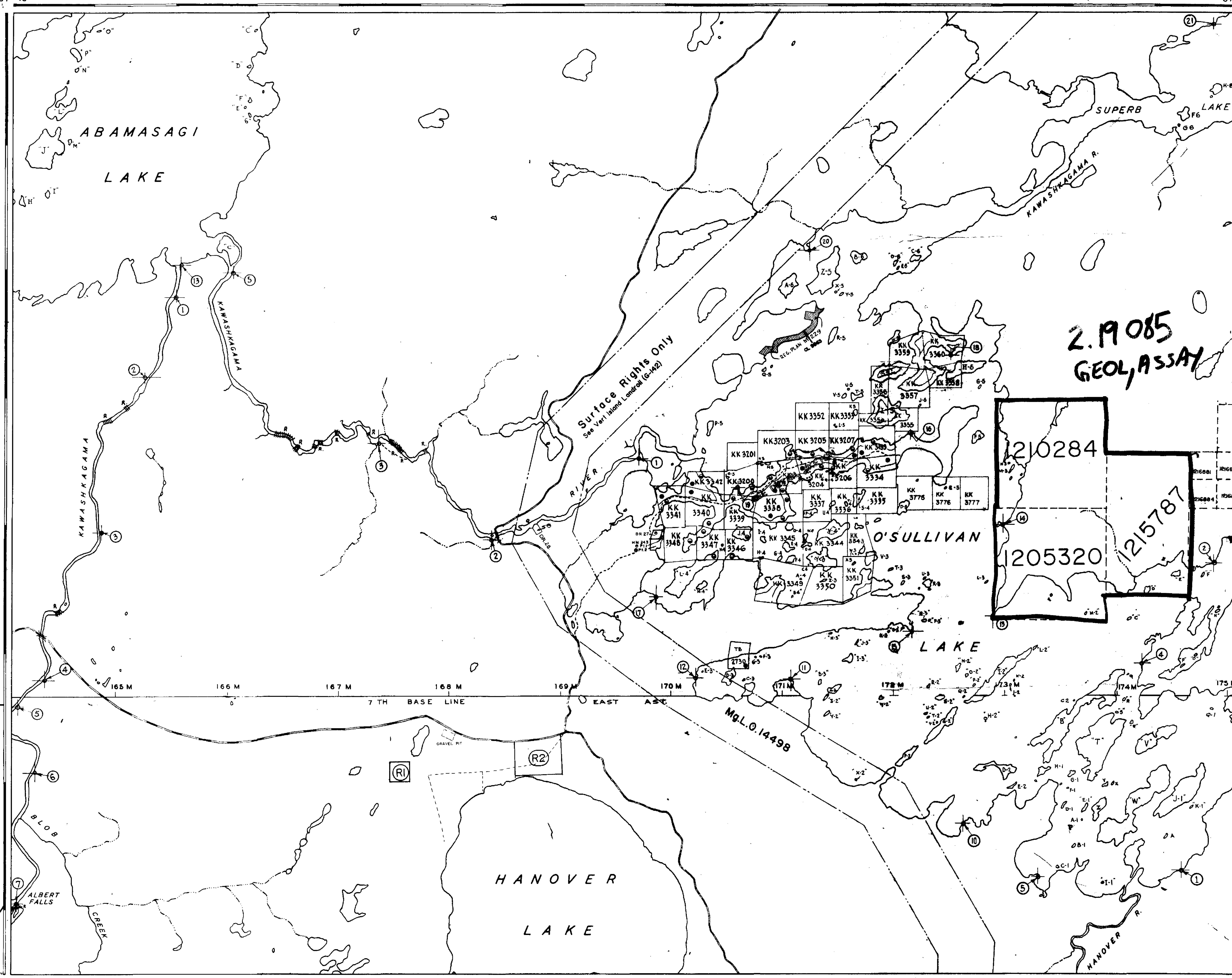
AREAS WITHDRAWN FROM DISPOSITION

M.R.O. - MINING RIGHTS ONLY
S.R.O. - SURFACE RIGHTS ONLY
M.+S. - MINING AND SURFACE RIGHTS

(R1) SURFACE RIGHTS ONLY WITHDRAWN FROM STAKING ORDER W27/83 LAND SITES FOR INDIAN RESERVE FOR WHITESAND BAND. SEC. 36/80. DATED 18/10/83. FILE 160704.

(R2) SURFACE RIGHTS ONLY WITHDRAWN FROM STAKING ORDER W33/83 RED FLAGGING LEACHEATE ATTENUATION ZONE AROUND WASTE DISPOSAL SITE. DATED 28/11/83 FILE 188516.

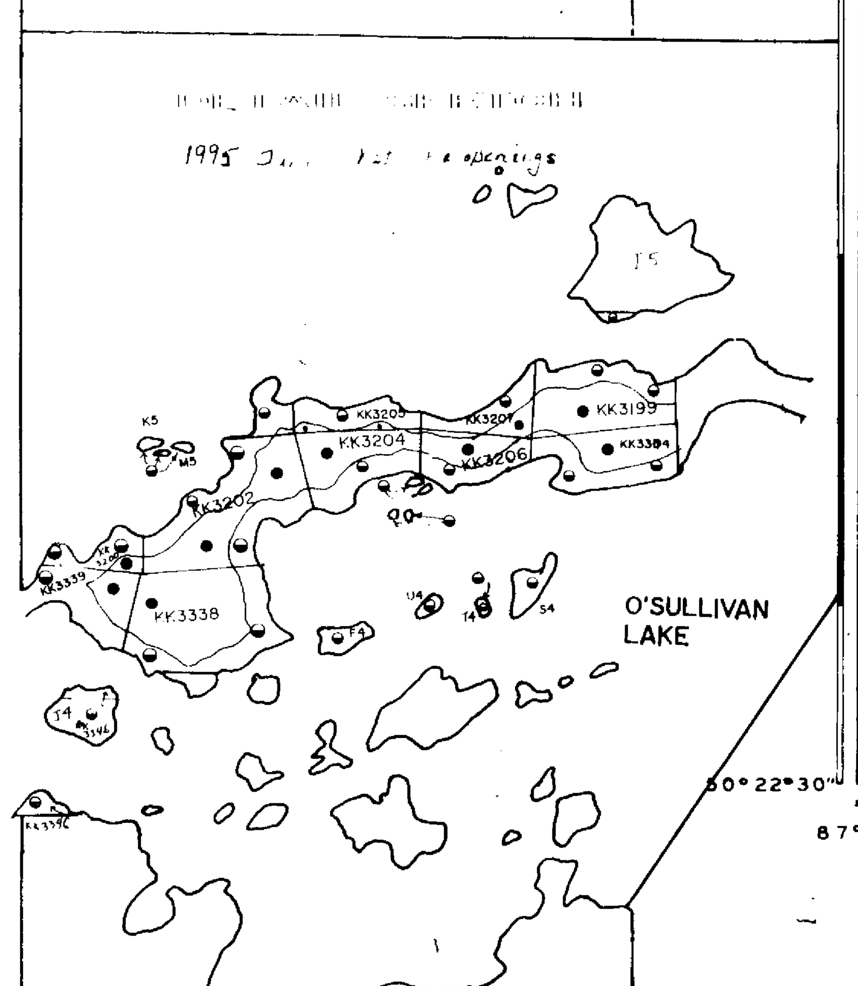
BOSTON LAKE G-208



SOLLAS LAKE G-403

MAUN LAKE G-319

HANOVER LAKE G-266



REFERENCES

DATE OF ISSUE
DEC 09 1998
PROVINCIAL RECORDING OFFICE - SUDBURY

NOTICE-
The information that appears on this map has been compiled from various sources and accuracy is not guaranteed. Those wishing to stake MINING CLAIMS should consult with the MINING RECORDER, Ministry of Northern Development and Mines, for additional information on the status of the lands shown hereon.

LEGEND

HIGHWAY AND ROUTE No
OTHER ROADS
TRAILS
SURVEYED LINES:
TOWNSHIPS, BASE LINES, ETC.
LOTS, MINING CLAIMS, PARCELS, ETC
UNSURVEYED LINES
LOT LINES
PARCEL BOUNDARY
MINING CLAIMS ETC
RAILWAY AND RIGHT OF WAY
UTILITY LINES
NON-PERENNIAL STREAM
FLOODING OR FLOODING RIGHTS
SUBDIVISION OR COMPOSITE PLAN
RESERVATIONS
ORIGINAL SHORELINE
MARSH OR MUSKEG
MINES
TRAVERSE MONUMENT
LAND USE PERMITS FOR COMMERCIAL TOURISM, OUTPOST CAMPS

DISPOSITION OF CROWN LANDS

TYPE OF DOCUMENT	SYMBOL
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	OC
RESERVATION	®
CANCELLED	⊗
SAND & GRAVEL	ⓢ

NOTE: MINING RIGHTS IN PARCELS PATENTED PRIOR TO MAY 6, 1913, VESTED IN ORIGINAL PATENTEE BY THE PUBLIC LANDS ACT, R.S.O. 1970, CHAP. 380, SEC. 63, SUBSEC. 1

SCALE: 1 INCH = 40 CHAINS

FEET 0 1000 2000 4000 6000 8000
METRES 0 200 1000 (1 KM) 2000 (2 KM)

AREA

O'SULLIVAN LAKE

M.N.R. ADMINISTRATIVE DISTRICT
GERALDTON
MINING DIVISION
THUNDER BAY
LAND TITLES / REGISTRY DIVISION
THUNDER BAY

Ministry of Natural Resources
Ontario
Land Management Branch

Date JULY, 1981
Number **G-362**

In Service Jun. 05/95

O'Sullivan Lake Property Grid Geology Map

Geological Legend — Map 1

Rock Types

Mv - Mafic Volcanic
Mm - Massiv Mafic Volcanic
Mp - Pillowed Mafic Volcanic
Mp-Bx - Mafic Pillow Breccia

Iv - Intermediate Volcanic
Ip - Pillowed Intermediate Volcanic

QP - Quartz Porphyry
QFP - Quartz Feldspar Porphyry

Dior - Diorite
Qtz Dior - Quartz Diorite

Gn - Granite

Dia - Diabase.

Abbreviations

Py - pyrite
po - pyrrhotite
cpy - chalcopyrite
Arsno - arsenopyrite
mgt - magnetite
hem - hematite
Ep - epidote
Qtz - quartz
sil - silicified

QV - quartz vein
QVs - quartz veins
Qtz stringers - quartz stringers

loc - local
min - minor
tr - trace
fracts - fractures
stg - strong

Xeno - Xenolith

OB - Overburden
sp - spruce
cd - cedar
pop - poplar
Jp - jackpine
bal - balsam
tam - tamarack
ald - alder
bi - birch

mixed - Mixed Bush

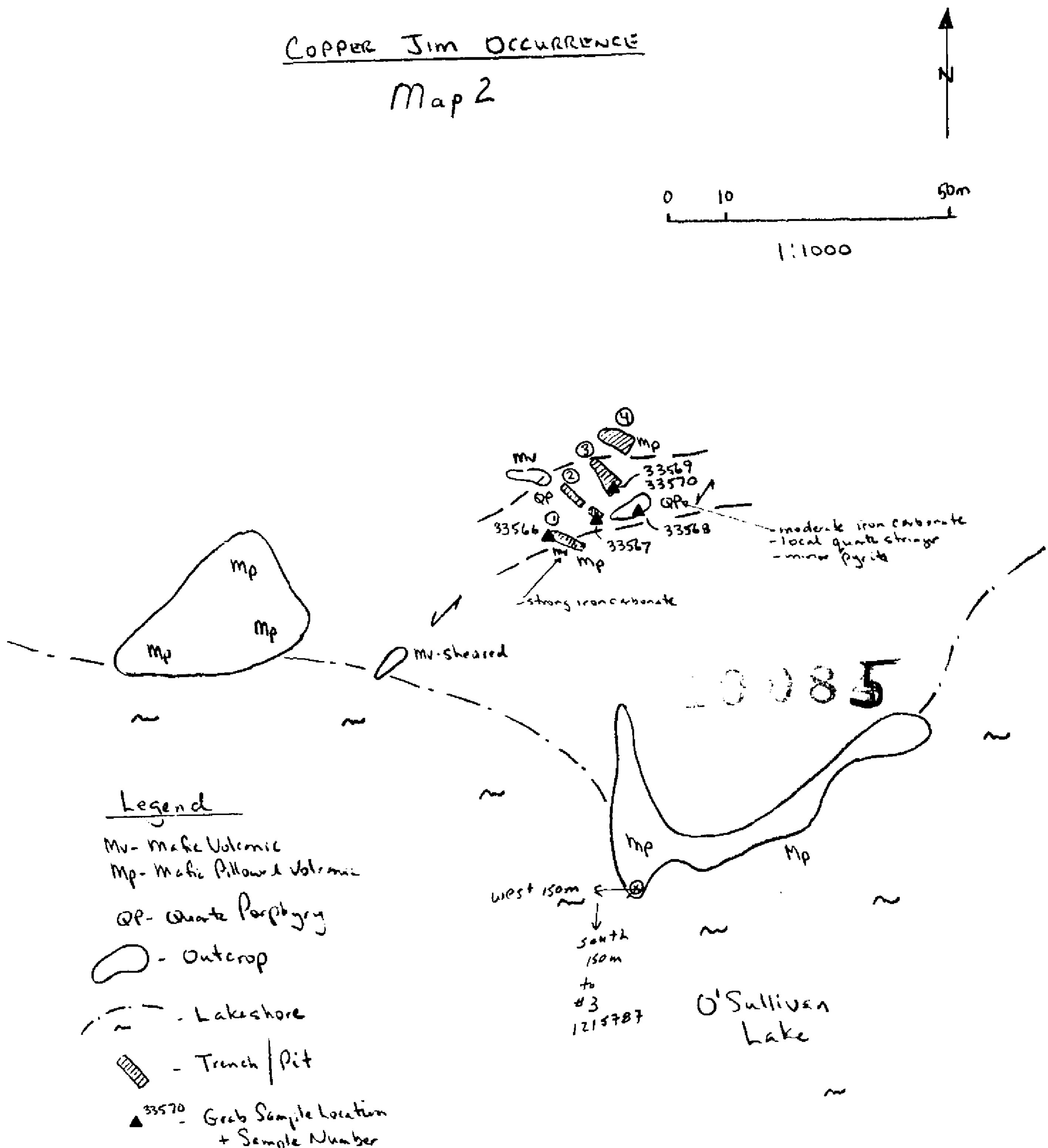
Symbols

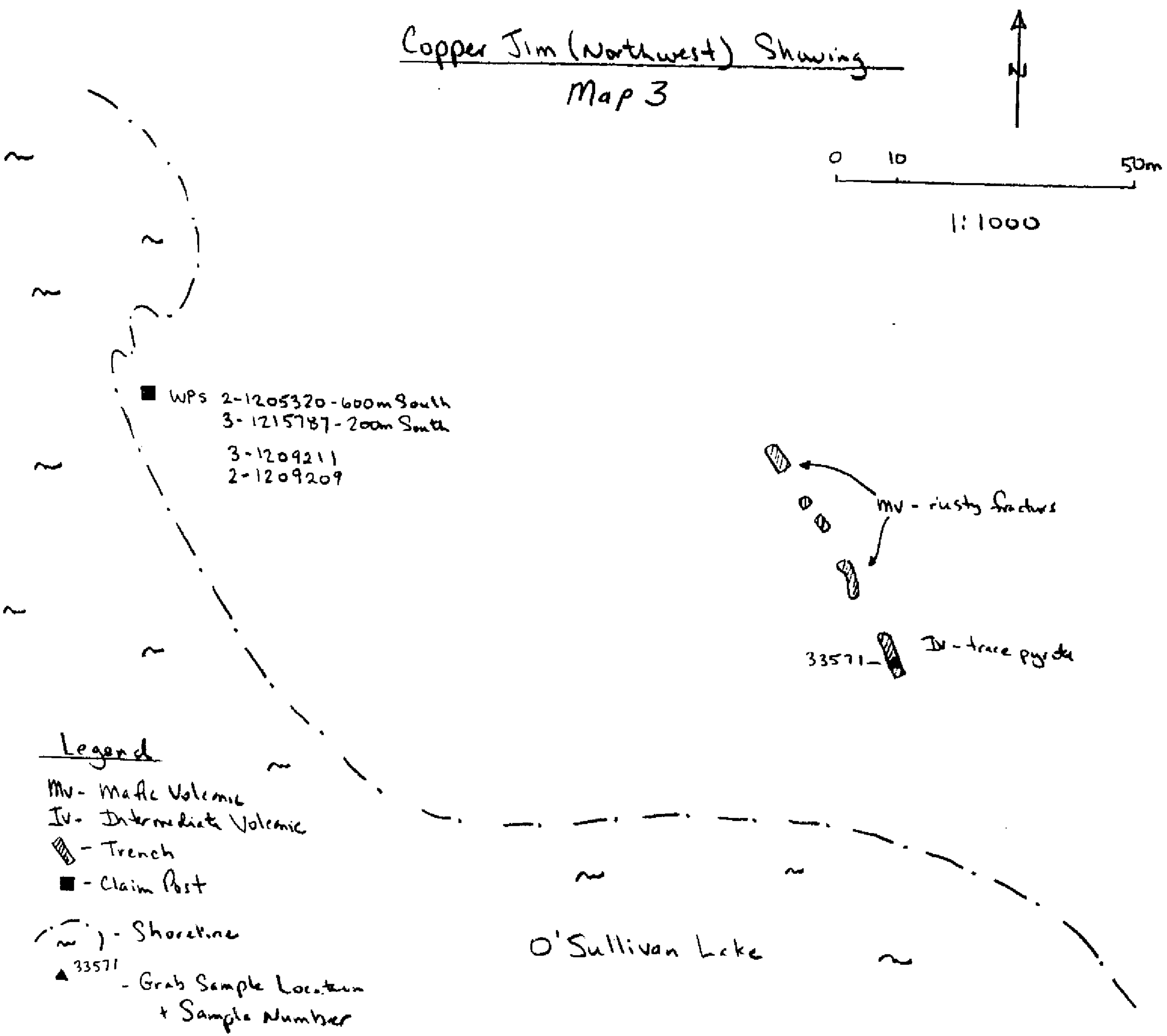
- outcrop
- bottom of gentle slope
- Lake
- Creek
- Crest of Esker.
- Geological Contact
- Trench
- Small Pit
- Diamond Drill Hole (Vericl)
- Diamond Drill Hole (direction of hole)
- Claim post
- Line post
- Sample location and number
- Swamp
- Foliation - strike + dip

Map 1

Copper Jim Occurrence

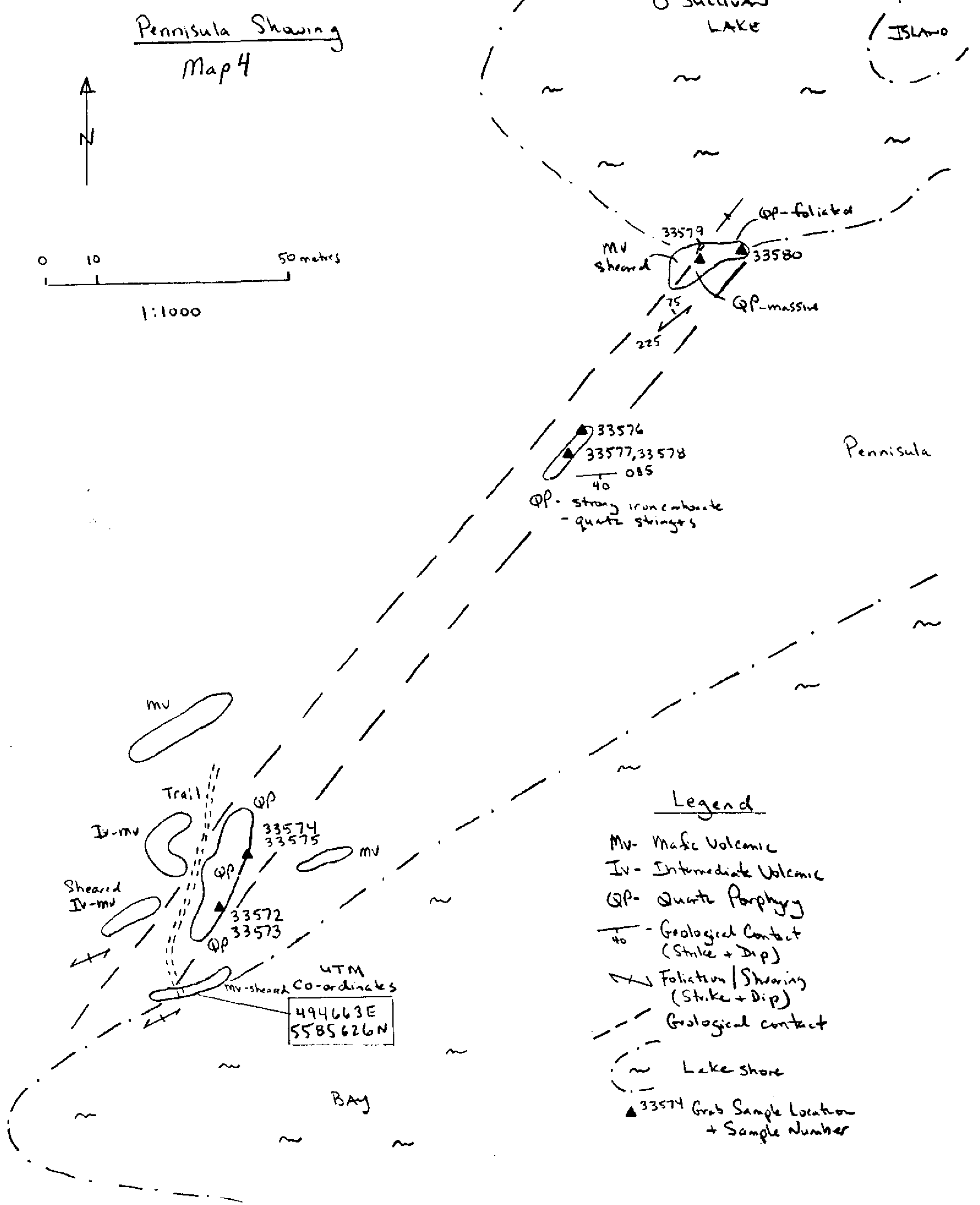
Map 2

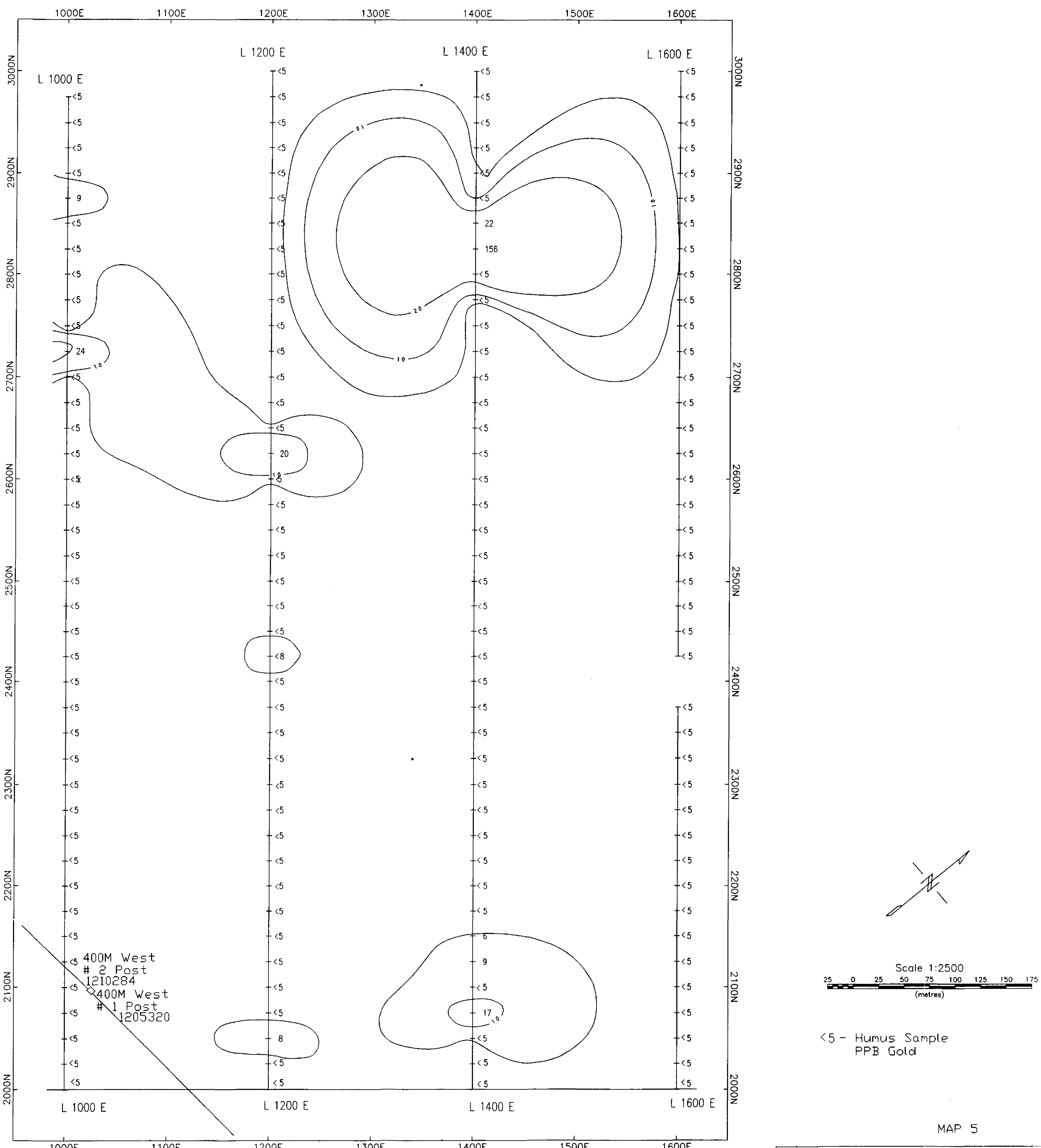




Copper Jim (Northwest) Showing
Map 3
N
0
10
50m
1:1000
WPS 2-1205320-600m South
3-1215787-200m South
3-1209211
2-1209209
MV - rusty fractures
33571
IV - trace pyrite
Legend
MV - Mafic Volcanic
IV - Intermediate Volcanic
- Trench
- Claim Post
- Shoreline
33571
- Grab Sample Location + Sample Number
O'Sullivan Lake

42L06NE2001 2.19085 OSULLIVAN LAKE 240





MAP 5

Maitland + Atkins

Humus Sample Map
Assays PPB Au

Clark-Eveleigh Consulting

10095