Telephone: Office 685-2914
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R. H. SERAPHIM ENGINEERING LIMITED
GEOLOGICAL ENGINEERING

316 - 470 GRANVILLE STREET
VANCOUVER, B.C. V6C 1V5

GEOLOGICAL AND GEOCHEMICAL REPORT

ON THE

I.R.A. 1 TO 6 MINERAL CLAIMS

ATLIN MINING DIVISION

N.T.S. 104N-14E; 104N-14W

Lat. 59°47.5' Long. 133°15'

OWNER: MALABAR MINES LTD.

OPERATOR: R.H. SERAPHIM ENGINEERING LTD.

BY

T.E. LISLE, P.ENG.

October 2, 1978

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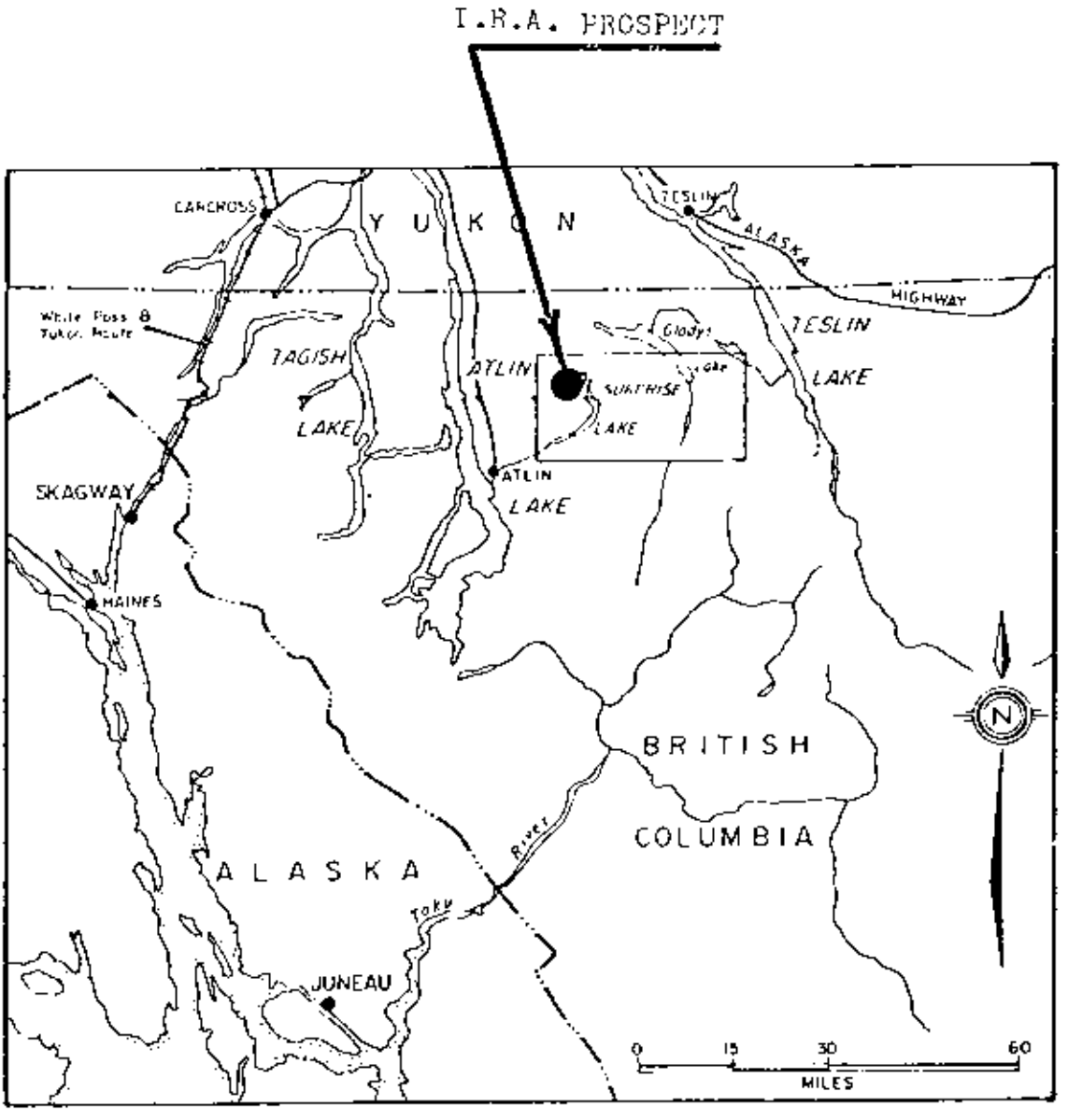


R.H. SERAPHIM ENGINEERING LTD.

LOCATION MAP, I.R.A. PROSPECT

ATLIN MINING DIVISION, NTS 104N

September, 1978. Map 1

SUMMARY AND CONCLUSIONS

The Uranium Reconnaissance Program sponsored by the federal and provincial governments released multi element geochemical data on Map Sheet NTS 104N on June 15, 1978. This data showed, among other things, that the creeks draining the Mt. Edmund area towards the north end of Surprise Lake carried anomalous values for uranium and fluorine in water and uranium in silt.

In response to these values, R.H. Seraphim Engineering Ltd. undertook a reconnaissance geological and geochemical program in the Mt. Edmund area. The company also optioned the I.R.A. prospect, as radioactivity had been noted on the claims by previous operators. Follow-up work consisted of detailed grids for geochemical and geological surveys.

The I.R.A. prospect is situated near the western margins of the Surprise Lake alaskite batholith. The claims are underlain mainly by alaskite although remnants of Cache Creek volcanic and sedimentary rocks occur near the western margins. Some late quartz porphyry, quartz-feldspar porphyry, and green andesitic dikes are also evident.

The geology is marked by prominent north-easterly sheeting, widespread northwesterly fracturing and shearing, and by narrow lineaments commonly aligned a few degrees east of north.

The geochemical results showed a wide range of uranium values. Some of the higher values on the eastern grid lines coincide with the above lineaments and it is of interest that previous operators had noted

radioactivity along some of these lineaments. Other areas on both the eastern and western grid lines showed locally anomalous areas that will require follow-up prospecting and mapping to evaluate their significance.

INTRODUCTION

Between the period June 25 to September 6, 1978, Seraphim Engineering Limited carried out geological and geochemical studies for uranium on sections of the I.R.A. claims and the immediately surrounding area. This program involved prospecting with geiger counters, air photo mapping, collection of silt and soil samples, and more latterly detailed geologic and geochemical surveys over about 21.5 line kilometers of grid.

The results of this work are shown on the attached geological and geochemical plans at scales of 1:12,000 and 1:5,000 and are discussed under the appropriate headings of the report.

LOCATION AND ACCESS

The I.R.A. prospect is situated to the west of the north end of Surprise Lake some 34 Km northeast of Atlin. The claims are centered roughly on Lat. 59° 47.5'; Long. 133° 15' and are in NTS 104N,14E and 14W. Access is presently by helicopter from Atlin, B.C.

Elevations range from approximately 1,000 to greater than 1,800 meters above sea level. The terrain is generally subdued however the eastern slopes of Mt. Edmund are steep and precipitous.

CLAIMS

The prospect is comprised of six I.R.A. claims in the Atlin Mining Division. Pertinent data is as follows:

Name	Record	No. Units	Group	Anniversary
IRA	110 [9]	9	IRA East	Sept. 7, 1978
IRA 2	135 [9]	6	"	Sept. 17, 1978
IRA 3	136 [9]	12	"	Sept. 17, 1978
IRA 4	137 [9]	12	"	Sept. 17, 1978
IRA 5	138 [9]	20	IRA West	Sept. 17, 1978
IRA 6	158 [10]	8	"	Oct. 8, 1978

HISTORY

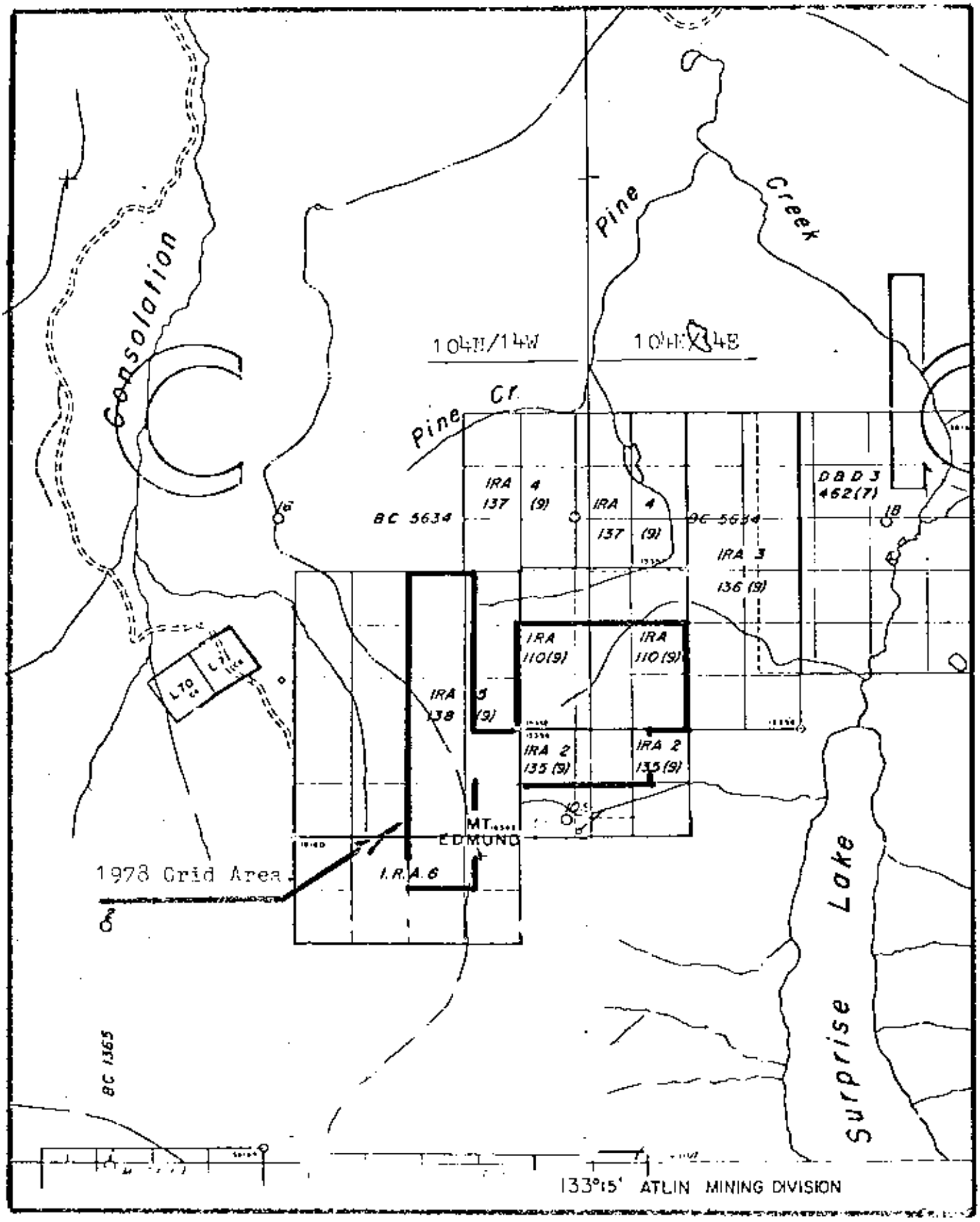
Claim post evidence indicates that the claim area was staked in the 1954-55 and 1967-69 periods. The ground was possibly investigated respectively for uranium and molybdenum as those periods coincide with exploration activity for those metals in the area.

In 1976 Malabar Mines Ltd. acquired the current property on the strength of geochemistry and investigated it for silver, lead and uranium by radiometrics, limited trenching, and further geochemical surveys.

Seraphim Engineering optioned the property in the summer of 1978 and undertook current investigations.

WORK PROGRAM

The work program was carried out from the four camp sites shown on Map 3. The regional part of the program involved the collection of 66 silt samples from



MAP 2

I.R.A. PROSPECT- INDEX MAP.

B.N.SERAPHIM ENGINEERING LTD.

SCALE, 1:50,000 Sept. 1978

the major drainage of the claim area and to a lesser extent the area to the south and west. This work also involved geological mapping on air photos and generally prospecting the area with geiger counters or G.I.S. 4 spectrometers.

More detailed follow-up work was carried out mainly on the I.R.A., I.R.A. 2 and 5 claims. This involved approximately 21.5 line Km of picket line established with compass and hip chain or nylon chain. Geological surveys were undertaken on a large area of the grid and a total of 339 soil samples were collected and analyzed for uranium.

GENERAL GEOLOGY

The I.R.A. prospect is situated near the western margins of the Surprise Lake alaskite batholith. This intrusion is Cretaceous ? in age, is elongate east-west and is locally disjointed by northeasterly trending faults.

The alaskite is 'phasey' with textures varying from fine to coarse grain in porphyritic and non-porphyritic rocks. It contains a low mafic content, mainly biotite; has abundant smoky quartz, minor amounts of muscovite, fluorite, apatite, beryl, and rare topaz and allanite. Narrow zones of simple pegmatite and quartz veining are also evident. The intrusion is locally limonitic due, in part, to the weathering of minor pyrite, chalcopyrite, arseno-pyrite and magnetite, and also to the mafic breakdown.

The intrusion is of interest in that it contains

anomalous values in zinc, lead, fluorite, tungsten, molybdenum and uranium [Open File 517]. Because of this it has been intensively explored in the past. The large Adanac porphyry molybdenum deposit was recently outlined in a younger ? Tertiary aged alaskite stock a few kilometers southwest of the I.R.A. prospect.

GEOLOGY, I.R.A. GRID

The I.R.A. prospect is underlain almost entirely by alaskite, and by a few late porphyry and basaltic dikes. The claims cover Mt. Edmund and adjacent areas which are locally marked by weak to strong gossans.

Fine grained alaskite usually has a recognizable groundmass of quartz, feldspar and biotite. It may contain 5 to 10% quartz phenocrysts to 1 cm., or feldspar phenocrysts to 2 cm., or a combination of both. The coarse alaskite on the other hand commonly forms a crowded mosaic of quartz, feldspar [to 3 cm.] and up to 5%, but commonly less biotite. Textures may be porphyritic or non-porphyritic and the quartz is often smoky. Contacts between the fine and coarser alaskite may be gradational over narrow wicths or relatively sharp. In the latter case the fine grained alaskite is intrusive into the coarser material.

Quartz porphyry, quartz feldspar porphyry and basaltic dikes up to a few meters wide have been mapped within the grid. The porphyry dikes are recognizable by the prominent quartz or quartz and feldspar phenocrysts set in a fine grain aphanitic groundmass. Contacts are not often exposed but field evidence suggests an east-northeasterly strike.

Most outcrops show evidence of strong north-easterly sheeting. Fractures are commonly 0.1 to 0.5 meters apart and strike in the 50 to 70 degree range with moderate to steep dips to the southeast. These structures appear to be superimposed on a widely developed northwesterly trending [±N25W] shear and fracture system, although in one or two instances the north-easterly fractures are apparently offset by the latter.

A number of N10 to 25E fractures, local shears, and topographic lineaments are also evident in the eastern section of the grid. These structures may be later than the stronger sets noted above, however direct evidence supporting this is lacking.

Large limonitic areas found in the cirque and to a lesser extent on the lower eastern slopes remain to be further evaluated. Some magnetite-quartz vein material has been noted in both areas and is likely responsible in part for the gossans.

Uranium mineralization has been noted in three locations during the investigation. Zeunerite was found in the general vicinity of the I.R.A. 6 claim associated with fine grained alaskite. Kasolite was noted in the cirque area with fluorite and quartz veins, and an unidentified uranium mineral associated with fluorite occurs in a trench on the I.R.A. claim excavated by previous operators. The significance of any of these showings remains to be determined.

GEOCHEMICAL SURVEY

Silt and soil samples were collected from the areas indicated on Maps 3 and 5. The silt samples included

a variety of material ranging from fine active silts; silts from reworked till; and organic rich samples, the latter mainly from areas on the low swampy ground on the I.R.A. 3 and 4 and in the lower Consolation Creek valley. Grid samples were collected by use of a grub hoe. Holes were dug generally 15 to 20 cm and samples taken near the bottom of the hole.

Distinct soil horizons are not well developed on the upland glaciated terrain. A typical profile might consist of 1 to 2 cm of organic surface material underlain by brown fine to coarse grained sandy [alaskitic] soil containing abundant large fragments. In some places large areas are strewn with rounded boulders [felsenmeer], and in other areas large outcrops preclude soil sampling.

All samples were packed in standard kraft soil envelopes and shipped to Chemex laboratory in North Vancouver. At Chemex the samples are dried and screened. The -80 mesh fraction is weighed, ashed and digested in hot nitric acid, and evaporated to dryness. The residue is leached with a known volume of dilute nitric acid. It is then mixed, and a small aliquot pipetted into a platinum dish for evaporation and fusion with a carbonate-fluoride flux for measurement of uranium fluorescence. The detection limit is 0.5 ppm. In some instances, as shown on the certificate of analysis, the detection limit varied due to fluorescence quenching caused by high concentration of interfering metals.

GEOCHEMICAL RESULTS

The geochemical data shown on Maps 3 and 5 has not been treated statistically, and has had very little follow-up study. In spite of this, a few observations are worthy of note.

The general tenor of the reconnaissance sample values is higher than for samples taken from the grid. The exceptions to this are the generally low values in the lower Consolation Creek valley, and the more normal values shown on southern sections of the western grid lines.

The organic content of the samples appears in part, responsible for higher uranium values noted in certain areas. Included in these are the swamp zone to the northeast and scattered areas within the grid.

A number of seemingly isolated high values occur on the eastern grid lines. Some of these values occur in narrow lineaments and are produced from dark, organic rich soils. These soils are locally radioactive although flanking alaskite outcrops are not. Other areas within the grid show slightly to moderately higher than background values and warrant further investigation.

REFERENCES

- Open File 517, 1978. Uranium Reconnaissance Program 104N, Atlin Map Area
- Report on I.R.A. Prospect 1977 with maps [radiometric and geochemical] D.G. Leighton and Associates
- Field data - R.H. Seraphim and Associates Ltd., 1978
- Atlin Map Area - J.D. Aitken, G.S.C. Memoir 307

APPENDIX I

STATEMENT OF EXPENDITURES

Appendix 1

Exploration Costs - I.R.A. Prospect, 1978

Wages:		I.R.A(E).	I.R.A.(W)
D.Fennings,	Soil sampler, Prospector Linecutter, $950.00/mo. July 19-29;Sept. 1-6,	½mo.	475.00
	Aug. 16-31.	½mo. 475.00	
D. Kronig,	Geologist $1925.00/mo. July 19-29, one third mo.	642.00	
	June 25-July 1st.	¼mo.	481.00
D.Gaard,	Geologist $2200.00/mo. June 25-July7	½mo	1100.00
C Kowall,	August 16-31 (Geologist- 2000.00/mo.)	½mo 500.00	500.00
J. Taylor,	Soil sampler,Linecutter 850.00/mo. Sept.1-6	¼mo 212.00	
T.Lisle,	Geologist. 2500.00/mo July 27, August 19-31, Sept. 1-2.	½mo. 1250.00	
	Aug.2-5. Sept.3-6	1/3mo	833.00
Camp Costs:			
	55 man days @ $13.00	715.00	
	45 man days @ $13.00		585.00
Geochemical Analyses. Chemex Laboratory			
	200 Grid samples (soil) 28 Reconnaissance silt samples		
	228 samples @ $2.85/sample less 10% discount	584.00	
	139 soil samples, grid, 38 silt samples		
	177 samples @ above costs		454.00
Hellicopter Support, (See following list)			
	June 25-Sept. 6,1978	1428.80	
	June 25-Sept.6, "		1327.20
		5807.60	5755.20

T.E.LISLE. P. ENG.

T E Lisle

Appendix 1 Con't.

Hellicopter Support:

Hiller 12E, Bell G3B1; Hughes 500.

Date.		Invoice	Applicable to I.R.A.	I.R.A.(E)	I.R.A.(W)
June 25/78		346.80 ✓	75%		260.10
July 1/78		265.20 ✓	100%		265.20
July 7/78	A	346.80 ✓	50%(A)		173.40
	B	244.80			
July 19		774.20 ✓	33%	258.00	
July24&29		662.40 ✓	75%	496.80	
August 2&5		621.00 *	50%		310.50
Aug. 16		360.00 *	50%	180.00	
Aug. 19		560.00 *	25%	140.00	
Aug. 25		400.00 *	50%	200.00	
Aug. 29		308.00 *	50%	154.00	
Sept.1		336.00 *	50%		168.00
Sept.6		300.00 *	50%		150.00
				1428.80	1327.20

* Cost Estimates

M. Leslie

APPENDIX 2

GEOCHEMICAL RESULTS

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1
TELEPHONE: 985-0648
AREA CODE: 604
TELEX: 043-52597

CHEMEX LABS LTD.

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 45626
INVOICE NO. 22116
RECEIVED September 5, 19
ANALYSED September 13, 1

TO: R.H. Seraphim Engineering Ltd.,
316 - 470 Granville Street
Vancouver, B.C.
V6C 1V5
cc. Atlin, B.C.

ATTN:

SAMPLE NO. :	PPM Uranium	Sample Depth	Soil Horizon	Description.
1N 0E	4.0	13 cm	C	Brown limonitic sandy soil
0+50	2.5	16 "	C	Brown coarse " "
1+00	2.0	15 "	B? / C	Dk brown clayey soil
1+50	2.0	15 "	B	Grey-brown fine sandy soil.
2+00	3.0	15 "	C	Slightly limonitic coarse "
2+50	0.5	13 "	C	Medium brown fine sandy soil
3+00	4.0	18 "	B	Coarse grey sandy soil.
3+50	2.0	20 "	C	Slightly limonitic sandy soil
4+00	4.0	18 "	B	Grey-brown sandy soil.
4+50	1.5	15 "	C	Limonitic brown sandy soil.
5+00	1.5	18 "	B/C	Light & dark brown fine sandy soil
5+50	2.0	23 "	C	Brown soil.
6+00	1.5	20 "	B	Brown fine soil - some organics
6+50	8.5	15 "	C	Brown sandy soil.
7+00	7.0	15 "	C	Limonitic clayey soil.
7+50	4.0	18 "	B/C	Lt-limonitic sandy soil.
8+00	2.5	28 "	C	Medium to dark brown silt org.
8+50	26	18 "	C	Brown fine sandy soil
9+00	3.0	13 "	B?	Grey clay + dark brown soil
9+50	3.0	15 "	C	Brown sandy soil.
1N10+00 E	3.0	18 "	C	Limonitic dk brown soil
1N11+00 E	1.0	20 "	C	Brown sandy soil.
1S 0 E	11	13 "	C	Dark brown coarse sandy soil
0+50	3.0	18 "	C	Brown sandy soil
1+00	4.5	15 "	C	" soil
1+50	80	15 "	B	Dry silt
2+00	5.5	15 "	C	Dark brown sandy soil
2+50	3.0	15 "	C	Brown sandy soil
3+00	<0.5	15 "	C	Brown-slightly organic soil
3+50	2.5	13 "	C	Brown sandy soil
4+00	2.5	18 "	C	Limonitic sandy soil.
4+50	195	20 "	C	Dark brown organic soil
5+00	31	7 "	A/B	Grey fine sand + black organic
5+50	2.0	15 "	C	Limonitic sandy soil
6+00	2.0	13 "	A/C	Dark brown soil - rocky
6+50	1.5	10 "	C	" grey-brown soil - poor sample
7+00	1.0	18 "	C	Weakly limonitic sandy soil.
7+50	0.5	10 "	B?	Dark brown - black organics
8+00	2.0	13 "	C	Coarse brown soil " "
8+50	1.0	15 "	B	Dark brown sandy soil
1S 9+00 E	1.5	13 "	C	Brown clayey soil
STD.	20			

CTA MEMBER CANADIAN TESTING ASSOCIATION

CERTIFIED BY:

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1
TELEPHONE: 985-0648
AREA CODE: 604
TELEX: 043-52597

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 45627

TO: R.H. Seraphim Engineering Ltd.,
9316 - 470 Granville Street,
VANCOUVER, B.C. V6C 1V5

INVOICE NO. 20030

RECEIVED Sept. 5, 1978

ATTN: cc: T. Lisle, Atlin, B.C.

ANALYSED Sept. 15, 1978

SAMPLE NO. :	PPM U	DEPTH OF SAMPLE	SOIL HORIZON	
1S 0+50E	1.0	9 cm	C	Brown sandy soil - Rocky
10+00	< 0.5	10 "	A+C	Dark Brown Sandy (organic)? soil
10+50	18	15 "	A+C	" " " " Rocky - Rz
1S 11+00E	1.0	13 "	C	" " soil
3N 0E	6.0	18 "	C	Brown - weakly limonitic sandy soil
0+50	34	20 "	C	" Sandy soil
1+00	3.5	13 "	C	limonitic coarse sandy soil
1+50	1.0	13 "	B?	Dark grey-Brown coarse sandy soil
2+00	1.5	18 "	C	Dark to medium brown sandy soil
2+50	1.0	13 "	C	Brown sandy soil - weakly limonitic
3+00	50	20 "	C	Dark brown fine sandy soil
3+50	< 0.5	20 "	B?	Clayey - limonitic soil
4+00	< 0.5	15 "	C	limonitic brown fine sandy soil Rocky
4+50	1.0	15 "	B+C	Grey (lt) sandy soil & limonitic soil & rock
5+00	< 0.5	18 "	C	Brown limonitic sandy soil
5+50	0.5	15 "	C	" " " "
6+00	< 0.5	20 "	C	Brown sandy soil by alaskite outcrop
6+50	0.5	15 "	B?	Dark organic soil & light brown sandy soil
7+00	4.5	18 "	B+C	Grey sandy soil and limonitic sandy soil
7+50	4.5	10 "	C	Coarse sandy soil - Brown
8+00	0.5	13 "	B	Dk brown sandy soil in draw - + Clay
8+50	< 0.5	10 "	B+C	limonitic sandy soil + Rocky fine - coarse soil
9+00	< 0.5	20 "	B+C	Grey-white coarse sandy soil
9+50	4.5	15 "	C	Coarse sandy soil - brown
10+00	0.5	13 "	C	Limonitic sandy soil - some organic
10+50	< 0.5	25 "	B+C	Black & Brown - some organics
3N 11+00E	9.5	10 "	B+C	Black organic soil
3S 0E	2.0	15 "	C	Medium to dark brown soil - some org
0+50	3.0	15 "	C	Dark brown soil - slightly organic
1+00	26	18 "	B+C	Brown sandy soil - Slightly organic
1+50	2.0	20 "	C	Limonitic sandy soil
2+00	1.5	13 "	B?	Dark brown weakly organic soil over fine sandy
2+50	1.5	20 "	C	Light brown fine sandy soil
3+00	0.4	18 "	C	Brown sandy soil with rocks.
3+50	0.3	20 "	A+C	Dk Brown with organic + limonitic sandy soil
4+00	1.2	18 "	C	Lt Brown coarse sandy soil - rocky - poor sample
4+50	1.2	20 "	C	Brown fine sandy soil.
5+00	1.2	13 "	C	Dk Brown fine sandy soil
5+50	1.0	18 "	C	Brown fine sandy soil.
3S 6+00E	1.0	15 "	C	Dark brown fine sandy soil
Std. No.	13			

Note: Less than 4 detection limit due to fluorescence quenching caused by high concentration of the interfering metals.

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212 BROOKSBANK AVE.
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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 45628

TO: R.H. Seraphim Engineering Ltd.,
#316 - 470 Granville Street,
Vancouver, B.C. V6C 1V5.

INVOICE NO. 28081

RECEIVED September 5, 1978

ATTN: cc: T. Lisle, Atlin.

ANALYSED September 14, 1978

SAMPLE NO. :	PPM U	Sample Depth	Soil Horizon	Description.
3S 6+50E	1.5	15cm	C	Light brown fine sandy soil
7+00	3.0	20 cm	C	" " " " "
7+50	1.5	15 "	C	" " " " "
8+00	1.0	23 "	C	Medium " " " "
8+50	1.5	18 "	C	Brown sandy soil
9+00	1.0	18 "	C	Light brown sandy soil.
9+50	1.0	20 "	C	Dark limonitic brown sandy soil
3S 10+00E	1.5	20 "	C	Light Brown soil.
5S 0E	5.0	18 "	B+C	Dark brown soil.
0+50	5.0	15 "	C	" " "
1+00	42	18 "	B?	Black organic soil.
1+50	3.0	?	(humic)?	Dk brown sandy soil-some organic
2+00	3.5	15 "	C	Grey and Brown soil
3+00	4.5	15 "	C	Brown sandy soil.
3+50	3.5	18 "	C	Limonitic brown sandy soil
4+00	1.5	15 "	C	Limonitic fine sandy soil
4+50	1.5	15 "	B+C	Dark brown - slightly organic
5+00	2.0	18 "	B	Medium brown to grey
5+50	9.5	15 "	?	Brown sandy soil.
6+00	4.5	18 "	A+C	Dark Brown sandy soil.
6+50	16	15 "	C	Coarse brown soil - Crest of drumlin.
7+00	9.0	18 "	?	Silt ? Brown coarse material
7+50	13	13 "	?	Open slope on creek - Silt?
8+00	2.0	20 "	B+C	Grey clay + dk brown-limonitic.
8+50	2.5	18 "	B+C	" " " " "
9+00	1.5	20 "	C	Limonitic soil.
9+50	1.5	20 "	B	Light & dark brown fine soil.
5S 10+00E	1.5	23 "	C	Brown limonitic sandy soil
7N 0+50E	9.5	18 "	C	" Sandy soil - Some organics
1+00	4.0	18 "	C	Weakly limonitic sandy soil.
1+50	2.5	15 "	C	" " brown sandy soil
2+00	2.5	13 "	C	Medium to dark brown sandy soil
2+50	3.5	15 "	C	Brown fine sandy soil.
3+00	1.5	15 "	C	" limonitic sandy soil
3+50	3.5	13 "	C	Limonitic fine sandy soil
4+00	25	25 "	B	Lt brown clay & dark brown soil
4+50	4.5	18 "	C	Brown sandy soil
5+00	1.5	18 "	B+C	Lt & dark brown sandy soil
5+50	3.0	20 "	C	Limonitic fine sandy soil
7N 6+00E	1.5	15cm	C	Grey clay & Coarse sand & limonitic silt
STD. NO.	21			

NOTE:
U-Less than 4 detection limit due to fluorescence quenching caused by high concentration of the interfering metals.

CTA MEMBER CANADIAN TESTING ASSOCIATION

CERTIFIED BY: Hunt Biller

212 BROOKSBANK AVE.
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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 45629

TO: R.S. Seraphim Engineering Ltd.,
316 - 470 Granville St
Vancouver, B.C.
V6C 1V5

INVOICE NO. 28116

RECEIVED Sept. [illegible], 19[illegible]

ATTN: cc. Atlin, B.C.

ANALYSED September 15, 19[illegible]

SAMPLE NO. :	PPM Uranium	Sample Depth	Soil Horizon	Description
7N 6+50 E	2.5	15cm	B?+C	Coarse grey - limonitic sandy soil. Rocky
7+00	1.0	20 "	"	As above. - Rocky.
7+50	2.0	23 "	B	Dark brown - limonitic soil
8+00	2.0	18 "	C	Brown slightly limonitic "
9+00	38	15"	B	DK brown soil
9+50	6.0	15"	B?+C	" " with light brown clay.
7N 10+00 E	1.5	13"	B+C.	Coarse grey sand + fine limonitic soil
IRA 5N 30 E	16	20 cm	C	DK brown sandy soil.
60	2.5	20 "	"	Brown with glacial pebbles
90	2.0	10 "	C	Brown sandy soil - limonitic silt
120	24	10 "	?	Dry silt.
150	5.0	15 "	C	DK brown limonitic
180	32	20 "	B+C.	DK brown soil.
210	31	20 "	"	" " "
240	60	25 "	B+C.	" " " " - boulders.
270	4.0	25 "	C	Brown sandy soil.
IRA 5N 300 E	3.5	20 "	C	Grey glacial soil - pebbles limonitic
IRA 3+30 E	6.0	20 "	C	Fine brown sandy soil
IRA 5N 3+60 E	3.5	20 "	C	" " " "
3+90 E	2.5	25 "	C	" " limonitic sandy soil
420 E	2.5	15"	C	Brown sandy soil.
4+50 E	95	15"	?	DK brown - in gully (basement)
9+90 E	1.5	15-20 "	C	Brown sandy soil
IRA 5N 100 E	220	--	--	Black organic soil from Bog
STD.	20			

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V6C 1V5

ATTN:

CERTIFICATE NO. 45734
INVOICE NO. 28104
RECEIVED Sept. 11/78
ANALYSED Sept. 15/78

SAMPLE NO. :	PPM Uranium	Sample Depth	Horizon	Soil Description.
7W 0+50N	8.0	13 cm.	C.	Brown sandy soil - coarse
1	5.0	31 "	A+C.	Dark brown sandy soil.
1+50	5.0	20 "	C	Brown sandy soil - fine
2	4.5	20 "	A+C	Dk brown sandy soil.
2+50	5.0	15 "	C	Brown sandy soil - coarse
3	8.0	15 "	(A+C)?	Brown muddy soil
3+50	1.5	15 "	C	Dark brown coarse soil.
4	5.0	15 "	?	Brown muddy soil
4+50	33	15 "	A+C.	Black organic soil.
5	3.0	15 "	A+C.	Brown sandy soil.
5+50	3.0	13 "	C	Brown sand - coarse.
6	18	15 "	C	" " soil.
6+50	28	15 "	A+C.	Dark brown coarse soil.
7	7.0	10 "	C	Brown soil with pebbles.
7+50	14	15 "	C	Brown coarse sandy soil
8	13	10 "	.-	Silt - grey to brown
8+50	7.5	15 "	C	Medium brown coarse "
9	5.0	15 "	C	Brown soil
9+50	3.5	15 "	A+C.	Dark brown coarse soil.
10	2.5	15 "	C	Brown soil.
10+50	1.5	20 "	?	Medium brown soil.
11	18	15 "	A+B+C	Dark brown soil
11+50	2.5	15 "	A+C.	Medium brown coarse soil.
12	30	13 "	Silt ?	Clay stream bed.
12+50	4.0	18 "	A+C.	Lt tan sandy soil.
13	6.5	15 "	A+C.	Brown soil.
13+50	21	18 "	A+C	Coarse brown-black soil.
14	21	13 "	A+B+C.	Lt brown soil.
14+50	6.5	15 "	A+C.	Lt. brown fine sandy soil
15N	4.5	15 "	A+C	Brown sandy soil.
0E	16	15 cm	C.	Brown sandy soil - pebbles
0+50	19	13 "	A+C.	Medium brown mud.
1	18	15 cm	A+C	Brown sandy soil
1+50	6.0	13 "	C	Takes shape - rocky - brown soil
2	18	13 "	C	Lt brown coarse sandy soil.
2+50	14	15 "	C	Light brown coarse soil
3	23	15 "	A+C.	Med brown coarse soil.
7+50	8.0	13 "	A+C	Coarse brown muddy soil
8	6.0	15 "	A+C	Dark brown coarse soil.
8+50S	24	15 "	C	Med. brown - grey coarse

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 45735

INVOICE NO. 28104

RECEIVED Sept. 11/78

ANALYSED Sept. 15/78

TO: R. H. Seraphim Engineering Ltd.
316 - 470 Granville Street
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ATTN:

SAMPLE NO. :	PPM Uranium	Sampling Depth	Horizon	Soil Description
7W 8+50S	< 0.5	15 cm	C	Med brown - f coarse soil
9	5.0	15 cm	A+C	Dk brown v coarse soil.
9+50	5.0	15 cm	A+C	L coarse brown soil
10	9.0	13 "	C	Med. brown coarse soil.
10+50	8.5	15 "	C	L coarse brown sandy soil
11	5.0	15 "	A+C	Brown muddy soil
11+50	16	15 "	A+C	Med brown coarse soil.
12	7.0	15 "	A+C	Dark brown coarse soil.
12+50	7.0	15 "	A+C	Med brown sandy soil.
13	7.5	13 "	A+C	Black brown sandy soil.
13+50	17	13 "	C	Lt brown sandy soil
14	18	10 "	C	Med. brown - very coarse.
14+50	46	15 "	A+C	Coarse muddy soil.
7W 15S	6.5	15 "	C	Lt. brown sandy soil
7+50W 3S	13	15 "	A+C	Med brown coarse soil.
3+50	8.5	13 "	C	Lt brown muddy soil
4	4.5	15 "	A+C	Med. brown coarse soil.
4+50	9.0	18 "	C	Med. brown sandy soil.
5	7.0	13 "	A+C	Medium brown - coarse.
5+50	4.0	15 "	A+C	Med. brown - coarse sandy.
6	4.5	15 "	A+C	Med brown - coarse.
6+50	4.5	15 "	A+C	Brown coarse muddy soil
7	9.0	13 "	A+C	Brown coarse muddy soil.
7+50	22	13 "	A+C	Brown - coarse muddy soil
7+50W 8S	9.5	15 "	A+C	Med brown coarse muddy
9W 0N	6.0	8 "	C	Brown soil. boulder strewn
1	4.0	18 "	A+C	brown soil
2	5.0	15 "	C	fine brown soil.
3	5.0	13 "	C	" " "
4	2.5	13 "	A+C	Dark brown sandy soil
5	20	10 "	A+B	" " soil
6	9.0	10 "	A+C	" " sandy soil.
7	8.0	13 "	C	light brown sandy soil. boulders.
8	7.5	15 "	silt+C	Talus slope - light brown soil.
9	6.0	15 "	C	" " " " coarse.
10	9.5	15 "	A+C	Dark brown coarse soil.
11	7.0	15 "	A+C	Coarse dark brown soil
12	4.5	15 "	A+B+C	Brown soil.
13	21	13 "	C	Brown sandy soil + med.
9W 14N	22	13 "	C	" soil.
STD.	19			

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CERTIFICATE NO. 45736
INVOICE NO. 28104
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ANALYSED Sept. 15/78

TO: R. H. Seraphim Engineering Ltd.
316 - 470 Granville Street
Vancouver, B.C.
V6C 1V5

ATTN:

SAMPLE NO. :	PPM Uranium	Sample Depth	Horizon	Soil Description
9W 15N	2.5	15 cm	C	Brown sandy soil
0+50S	7.0	13 "	C	Med brown coarse sand (boul
1	8.5	13 cm	A+C	Dark brown coarse soil
1+50	5.0	10 "	A+C	Black-brown coarse "
2	7.5	15 "	C	Med brown coarse soil
2+50	6.5	15 "	A+C	Lt brown sandy soil
3	4.5	15 "	A+C	Dark brown coarse "
3+50	5.0	13 "	C	Brown coarse soil
4	8.5	15 "	C	Brown mud
4+50	18	13	C	" coarse sandy soil
5	27	13 "	A+C	Med brown sandy soil
5+50S	6.0	10 "	"	Brown - very coarse
6S	7.5	13 "	A+C	Dark brown coarse soil
6+50S	9.5	13 "	C	Brown coarse sandy soil
7	16	10 "	A+C	Grey-brown sandy soil
7+50	68	15 "	A+C	Dark brown mud
8	24	15 "	C	Lt tan sandy soil
8+50	31	15 "	C	Med brown coarse sand
9	15	15 "	A+C	Medium brown coarse soil
9+50	12	13 "	A+C	Brown muddy soil
10	9.0	13 "	C	Medium brown coarse "
10+50	10	15 "	A+C	Black brown muddy soil
11	15	15 cm	A+C	Brown mud
11+50	35	15 "	A+C	Medium brown muddy soil
12	37	10 "	C	Lt Brown sandy soil
12+50	4.5	15 "	A+C	Coarse brown sandy "
13	4.0	10 cm	C	Dk brown coarse soil
13+50	3.5	15 "	C	Very coarse brown soil
14	6.0	20 cm	A+C	Dk brown very coarse soil
14+50	5.0	13 "	A+C	Brown coarse soil
9W 15S	2.5	15 cm	A+C	Medium brown coarse soil
11W 0N	3.5	10 "	A+C	Brown sandy soil
1	3.5	13 "	A+C	Brown " "
2	5.0	15 "	A+C	Coarse brown "
3	2.5	15 "	A+C	" " "
4	7.5	10 "	A+C	Light brown fine sand
5	18	13 "	C	Coarse brown soil
6	5.0	15 "	A+C	Brown coarse sandy soil
7	5.0	15 "	C	Lt brown sandy soil
11W 8N	4.0	15 "	C	Light tan muddy soil
STD.	18			

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 45737

TO: R. H. Seraphim Engineering Ltd.
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Vancouver, B.C.
V6C 1V5

INVOICE NO. 28104

RECEIVED Sept.

ATTN:

ANALYSED Sept.

SAMPLE NO.	PPM Uranium	Sample Depth	Soil Horizon	Soil Description
11W 9S	3.5	15 cm.	A1C	Brown sandy soil.
10	10	13 "	A1C	" " "
11	8.5	13 "	?	
12	4.5	10	C	Brown coarse soil.
13	3.5	15	A+C	" " "
14	4.5	15	C	Light brown mod.
15N	3.5	15	A+C	Brown sandy soil.
1S	38	15 cm.	A+C	Dark brown coarse soil
2	8.0	15 "	"	Coarse brown soil.
3	52	15 "	"	Brown organic soil.
4	88	15 "	"	Brown muddy soil
5	32	13 "	"	" organic soil.
6	17	13 "	"	" sandy soil
7	21	15 "	"	" coarse soil.
8	5.5	15 "	"	" " "
9	2.5	13 "	"	" " "
10	23	15 "	"	" " "
11	30	15 "	"	" " "
12	18	10 "	"	" " "
13	27	10 "	C	" sandy soil
14	4.5	13 "	A+C	" " "
11W 15S	5.0	13 "	C	" coarse sandy soil

	Sample Depth	Soil Horizon	PPM Uranium	Soil Description
9S 6+00E	15 cm.	B+C	1.5	Grey and brown - mod. organic
8+50	25 "	B	23	Medium brown soil.
9+00	18 "	C	2.0	limonitic soil - peg. sample - rock
9+50	31 "	B+C	0.5	Clayey - dark brown soil.
10+00	15 "	B+C	0.5	Grey & dark brown clayey soil.
10+50	25 "	B+C	9.5	Grey-brown clayey soil-rotted org
11+00	18 "	C	1.5	Coarse grey sandy soil.
11+50	25 "	C	1.5	Limonitic sandy soil.
12+00	15 "	C	1.5	Coarse grey sandy "
12+50	15 "	C	0.5	" brown " "
13+00	13 "	B+C	4.0	Dark brown to red soil - boulders
14+00	20 "	C	0.5	Grey sandy soil - some clay
14+50	20 "	C	0.5	limonitic to dark brown soil
9S 15+00E	13 "	B+C	2.0	Dark brown sandy soil.

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 45615
INVOICE NO. 28055
RECEIVED Sept. 4/78
ANALYSED Sept.13/78

TO: R.E. Seraphim Engineering Ltd.,
316 - 470 Granville St.,
Vancouver, B.C.

ATTN: cc:Atlin, B.C.

SAMPLE NO :	Sample Depth	Soil Horizon	PPM Uranium	Soil Description.
IRA 5N-00E			8.5	Brown Sandy Soil.
4+80	20 "	C	2.0	" " "
510	20 "	C	2.0	" " " (limonite)
540	20 "	?	155	Clayey material - limonite
5+70	15 "	C	1.5	Brown Sandy Soil.
600	15 "	A+C	2.0	Dark brown soil.
6+30	15 "	C	1.5	Brown sandy soil
6+60	20 "	C	3.0	" " " - platy rock boulders
6+90	10 "	A+C	15	Rocky - Poor sample.
7+20	10 "	C	1.0	Grey-brown sandy soil
7+50	15 "	C	1.5	" " sandy soil - N-S. limonite
7+80	10 "	C	1.0	Grey - coarse sandy soil
8+10	15 "	C	4.5	Brown sandy soil.
8+60	20 "	A	130	Brown-Black organic soil
8+70	20 "	C	1.5	Grey sandy soil
9+00	20 "	C	1.5	Brown sandy soil - ridge.
9+30	20 "	C	0.5	Limonitic sandy soil.
9+60	20 "	C	0.5	Grey-brown - coarse sandy soil.
1020	15 "	C	1.5	Sandy soil between boulders.
IRA 5N 10+60E	13 "	C	1.0	Brown sandy soil.
7N 0E	?	?	3.0	
10+50	20 "	B	18	Dark brown to grey - Sandy - local clay
13+00	20 "	C	1.0	Slightly limonitic sandy soil.
13+50	15 "	A+B	6.5	Grey-black organic soil.
7N 14+00E	10 "	C	2.5	Dark brown soil.
9N 0E	20 cm	A+C	20	Brown sandy soil.
0+50	15 "	C	2.0	" Coarse sandy soil.
1+00	15 "	C	6.5	" Sandy soil. "
1+50	15 "	C	7.5	" (Light) Sandy "
2+00	18 "	C	13	Grey-Brown " "
2+50	13 "	C	1.5	Dark brown " "
3+00	20 "	C	6.5	Limonitic fine Sandy "
3+50	13 "	C	5.5	Dark brown - very coarse & sandy.
4+00	23 "	C	3.5	" " soil
4+50	25 "	C	3.5	Brown fine sand (many boulders)
5+50	18 "	C	1.0	Dark brown soil.
6+00	25 "	C	<0.5	" " "
6+50	25 "	B	5.5	Grey-brown silty organic soil
7+00	18 "	B+C	1.5	Brown soil.
9N 7+50E	30 cm	?	180	Grey black clayey soil.
Std.			20	

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 44714
INVOICE NO. 27374
RECEIVED August 1/78
ANALYSED August 2/78

TO: R. H. Seraphim Engineering Ltd.
316 - 470 Granville Street
Vancouver, B.C.

ATTN: cc: Box 48, Atlin

SAMPLE NO. :	PPM Uranium		
DF #1	76	Pit	Dark brown soil.
22	46	Sm creek	Grey Clayey Silt
23	> 400	Soil - 25cm	Red-brown - radioactive soil.
24	86	Soil - 15cm	Dark brown sandy soil swamp area
25	58	" - 15cm	" " " " " "
DF 26	200	Soil - 15cm	Clayey soil Swamp area
DG 87	80	Sm Ck	Fine sandy silts
88	42	Sm Ck.	" " "
89	96	Creek	Silt sample.
90	3.5	Silt	Silt - (Dry) ?
DG 91	6.5	Soil	Near hematized joint @ N 50° E - 57° SE
DK 66	45	Creek	Moderate gradient - High organic
67	110	Creek 1km	Steep gradient - Medium organics.
68	95	" 1m.	Medium " - High organics.
69	25	" 2m	Moderately organic.
70	93	Soil	Crushed rock and chips - strong gossan.
71	> 400	St Creek	- Below gossan - high organics.
72	> 400	Pit - Increment	High organic content.
73	11	Silt - Creek	Creek 1/2m - high organic material
74	14	Creek 1km	Moderately organic
75	15	Swamp.	Soil - 23cm - high organic.
76	145	"	Soil - 23 " " " - Red brown.
77	155	Dry AREA.	Red brown soil - Mud cracks - high organic
78	40	Swampy Ck.	Red " " - high organics.
DK 79	13	Creek.	Organic Mud.
WGB 33 —	3.0	Silt - Fine	grey silt - Frost heave area.
UCB 33 —	2.0	— " —	Organic silt.
STD.	18		

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 44076

TO: R.R. Seraphim Engineering Ltd.,
316 - 470 Granville St.,
Vancouver, B.C.
V6C 1V5

INVOICE NO. 26512

RECEIVED July 7, 1978

ATTN: c.c. Atlin, B.C.

ANALYSED July 13, 1978

SAMPLE NO. :	PPM Uranium	Sample location	Description
DF 4	10	Creek	Light brown sandy silt.
5	1.5	Sm Creek	Dark brown silt - 20 to 30% organic material.
7	0.5	Sm CK	Brown sandy silt
DF 11	8.0	Creek	limonitic sandy silt
DG 64	6.0		
65	13	Main Creek	Brown sandy silt
66	2.5	Creek.	Fine brown silt - ~30% organic material.
67	3.5	"	Brown silt.
68	25	"	Brown sandy silt.
69	2.5	"	Brown " " with ~ 2% organic material.
70	2.0	"	" " " " ~ 15% organic "
71	6.0	Small CK	" " " (limonitic)
72	2.0	" "	" silt.
73	70	CK.	Brown silt high organics.
74	1.0	"	" " moderately organic.
75	1.0	"	" " weakly organic.
76	1.0	"	" clayey silt weakly organic
77L	5.0		
78	52		
DG 79	8.0	"	limonitic silt.
DF 29	15	creek	Organic silt
30	4.5	creek	?
31	10	Small CK.	?
32	8.0	" "	?
33	7.0	Creek.	?
DF 14	17	Sm Creek	Brown limonitic silt - slightly organic.
15	8.5	Creek	Brown sandy silt
16 -	84	Main CK.	Brown limonitic silt with moderately organic.
17 -	44	Sm Creek.	Sandy silt weakly limonitic - pebbles
18 -	40	" "	fine brown silt, some clay.
19 -	20	" "	Brown limonitic sandy silt.
20 -	6.0	Sm CK.	Brown limonitic sandy silt. minor organic
DF 21S -	84	soil	limonitic soil - some fresh alaskite
DG 80 -	72	Creek	Dark brown (limonitic) silt - weakly organic
81 -	1.0	Creek.	Grey-brown sandy silt.
82 -	43	"	" " "
83 -	20	"	Brown silt, abundant mica.
84 -	26	"	Coarse, brown sandy silt.
85 -	14	"	Brown fine sandy silt
DG 86 -	43		" sandy silt.
Std.	25		

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APPENDIX 3

STATEMENT OF QUALIFICATIONS

CERTIFICATE OF QUALIFICATION

I, T.E. Lisle of 145 West Rockland Road, North Vancouver, B.C. declare that:

1. The work described in this report was carried out by me and by the personnel listed in Appendix I under my supervision between June 25 and September 6, 1978.

2. I am a graduate of the University of British Columbia with a B.Sc. 1964.

3. I have worked intermittently in exploration geology for several years prior to 1964, and have worked continuously in the same field since that date.

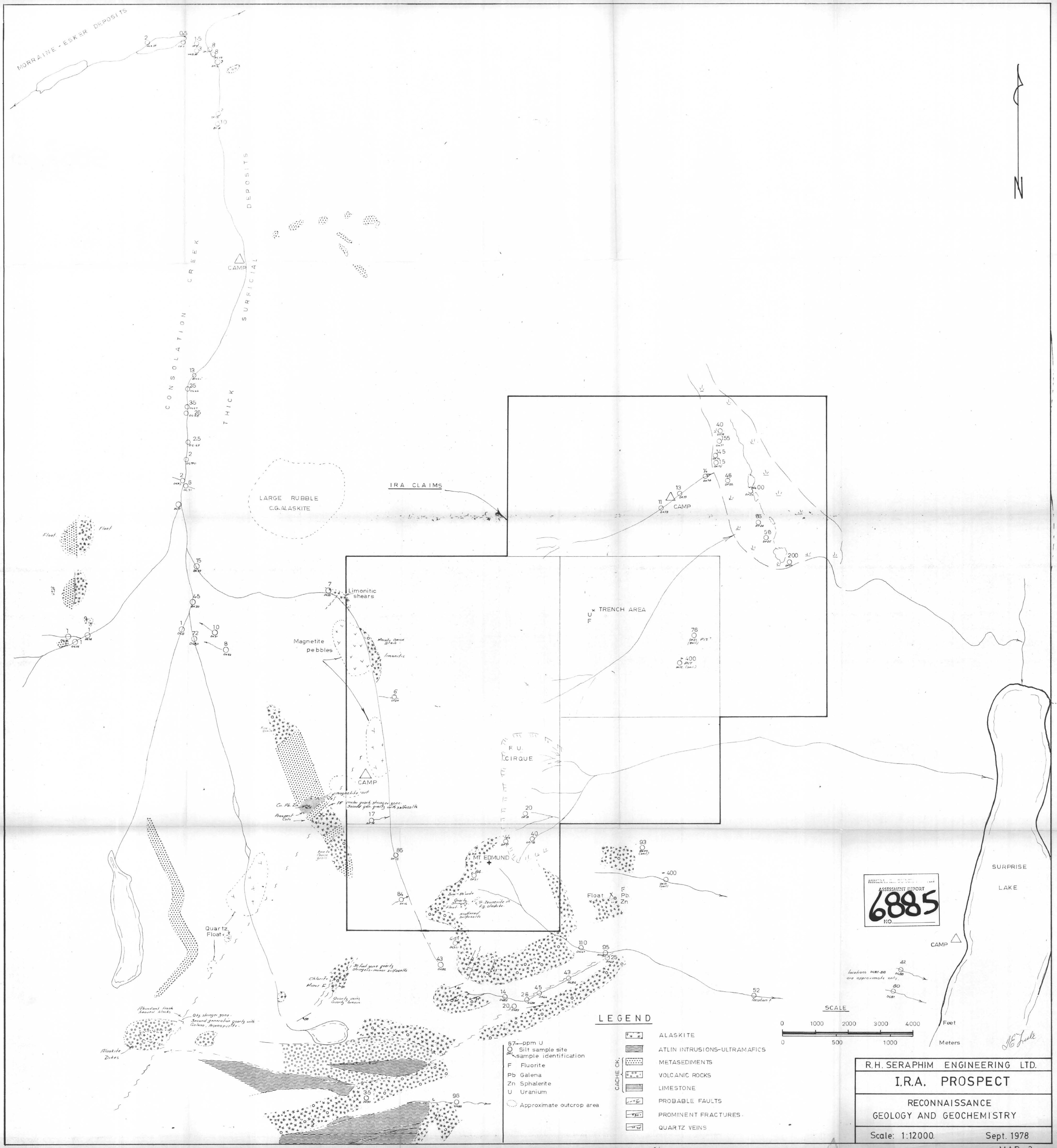
4. I am a member of the following organizations:

   [a] Canadian Institute of Mining & Metallurgy

   [b] Geological Association of Canada

   [c] Association of Professional Engineers of B.C.

T.E. Lisle, P.Eng.
October 2, 1978


MORRAINE - ESKER DEPOSITS
CONSOLATION CREEK
THICK SURFICIAL DEPOSITS
CAMP
N
LARGE RUBBLE
C.G. ALASKITE
IRA CLAIMS
Float
Limonitic shears
Magnetite pebbles
Mainly Coarse Grain
limonitic
TRENCH AREA
U
F
PIT
(soil)
F. U.
CIRQUE
magnetite cut
Cu. Pb. Zn.
15 meter quartz stringer zone. Second gen. quartz with sulfosalts
Prospect Cuts
Fine Grain
Fine to Coarse grain
MT EDMUND
Zone ~ 50' wide
Quartz Stringers
Float
Tr. Zeunerite in F.g. alaskite
scattered sulfosalts
Quartz Float
30 foot zone quartz stringers - minor sulfosalts
Chlorite
Minor F
Quartz veins
Quartz breccia
Abundant frost heaved blocks
Qtz. stringer zone. Second generation quartz with Galena, Arsenopyrite.
Alaskite Dikes
Float
F
Pb.
Zn
location ?
locations DG81-88 are approximate only.
SURPRISE LAKE
MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
6885
NO.
LEGEND
67 ← ppm U
Silt sample site
sample identification
F Fluorite
Pb Galena
Zn Sphalerite
U Uranium
Approximate outcrop area
ALASKITE
ATLIN INTRUSIONS-ULTRAMAFICS
CACHE CK.
METASEDIMENTS
VOLCANIC ROCKS
LIMESTONE
PROBABLE FAULTS
PROMINENT FRACTURES
QUARTZ VEINS
SCALE
0 1000 2000 3000 4000 Feet
0 500 1000 Meters
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Sept. 1978
MAP 3


IR.A 4
N
1500
1300 N
1100 N
900 N
700 N
500 N
300 N
100 N
00
100S
300S
500S
700S
900S
1100S
1300S
1500S
1977 'B' GRID
F
U
Trench.
oc?
Mossive
3+4 Phasey
sheared direction?
Weak N-S foliation
Phasey
quartz vein 1/3m
Pits
Phasey contact.
Mainly Float
fine to med grain
baseline
outcrop?
local quartz Veinlets
I.R.A.
I.R.A3
Limonitic
minor quartz magnetite veinlets
quartz Veinlets
local quartz Veinlets
6" quartz vein
F
Mn
Cirque Area
Mixed 3+4.
Some Quartz Veining
Fluorite+Manganese.
Limonitic
ROCK GLACIER
quartz magnetite vein + hematite.
Limonitic
Limonitic
chloritized.
Creek.
minor quartz stringers
Scattered quartz veinlets
gossan area.
8" qtz vein
I.R.A. 5
I.R.A. 6
I.R.A. 2
Bright Gosson
Bi rich zone
1100W 1000W 900W 800W 700W 600W 500W 400W 300W 200W 100W
100E 200E 300E 400E 500E 600E 700E 800E 900E 1000E 1100E 1200E 1300E 1400E 1500E
LEGEND
1 Quartz porphyry - Quartz-Feldspar porphyry.
2 Basalt dikes.
3 Alaskite - fine grained
4 Alaskite medium & coarse grained
Prominent fractures
Shear zone
Fault
Topographic lineament
x x Float
Outcrop area
U Uranium F Fluorite
Mn Manganese
MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
6885
NO.
SCALE.
50 100 150 200 250 300 350 meters.
R.H. SERAPHIM ENGINEERING LTD.
I.R.A. PROSPECT.
GEOLOGY
Scale: 1cm = 50 meters Sept./78
MAP 4

IR.A 4

1977 B GRID

baseline

IRA

IRA3

IRA 5

IRA 6

IRA.2

Pit in lineament

Creek

ROCK GLACIER

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
6885
NO.

SCALE
50 100 150 200 250 300 350

R.H. SERAPHIM ENGINEERING LTD.

I.R.A. PROSPECT.

URANIUM GEOCHEMISTRY

Scale: 1cm - 50meters Sept./78

MAP 5