80-826#8534

1980 Geological and Geochemical Assessment Report

TITLE	TOOTSEE RIVER PROPERTY
CLAIMS	Heap 1 and 2
COMMODITY	Tungsten
LOCATED	18 miles southeast of Rancheria, Y.T. Latitude 59°59'N Longitude 130°07'W Liard Mining Division 104 O/16E
BY	A.C. Hitchins & G.W. Booth
FOR	AMAX OF CANADA LIMITED
WORK PERIOD	Field work carried out between June 8 - June 15,1980. Office work September 1-2, 1980.

AMAX Vancouver Office

TABLE OF CONTENTS

ILLUSTRATIONS

SUMMARY

This report summarizes work completed in 1980 on the Tootsee River property consisting of the HOT claims 1-80 located in the Yukon and the HEAP 1 and 2 claims in British Columbia staked in 1979. The claims cover Lower Cambrian calc-silicate units thought to be the source of stream sediment tungsten anomalies.

Previous property work in 1979 consisted of preliminary geological mapping and cutting of 40 km of grid over the most intensely skarned portions of the sequence.

During the 1980 field season, a program involving geological mapping, soil sampling and panning was initiated to further evaluate the area.

Results from mapping and soil geochemistry confirmed the presence of a rather broad zone of low grade tungsten mineralization in fractures which also contain pyrrhotite, pyrite, chalcopyrite, bornite and minor sphalerite.

INTODUCTION

General Statement

This report presents the results of geological and geochemical evaluation of the Tootsee River property carried out between June 8 and June 15, 1980. Work was conducted under Project #1068 by G.W. Booth, and G.O. Skok of AMAX.

Previous property work is described in a brief summary report by A.C. Hitchins.

Location, Access and Topography

The Tootsee River property lies on the Yukon-British Columbia border 18 miles southeast of Rancheria on the Alaska Highway, within the Watson Lake Mining District and Liard Mining Division.

Access to the property is by helicopter from Watson Lake, 85 km to the east or Swift River 50 km to the west. Heavy equipment can be transported to within 12 km of the property by means of a bush road which extends south from the highway along the west side of Tootsee River.

The property is characterized by low to moderate relief with elevations ranging from 1200-1600 m. The main tungsten showings outcrop in the Yukon above tree line near the 1500 m mark. The area is well drained by local valleys, in which bedrock is covered largely by alluvium and ground moraine.

Claims Data

The Tootsee River property consists of Hot #1-80 claims in the Yukon and Heap #1-2 claims of 16 units each in British Columbia (Figure 2). All claim posts are located on

the property base map and the appropriate tags affixed to the Yukon posts in accordance with the Quartz Mining Act.

List of Claims in B.C.

Heap 1 (16 units) Tag #07318 Recorded June 7, 1979

Heap 2 (16 units) Tag #49251 Recorded June 7, 1979

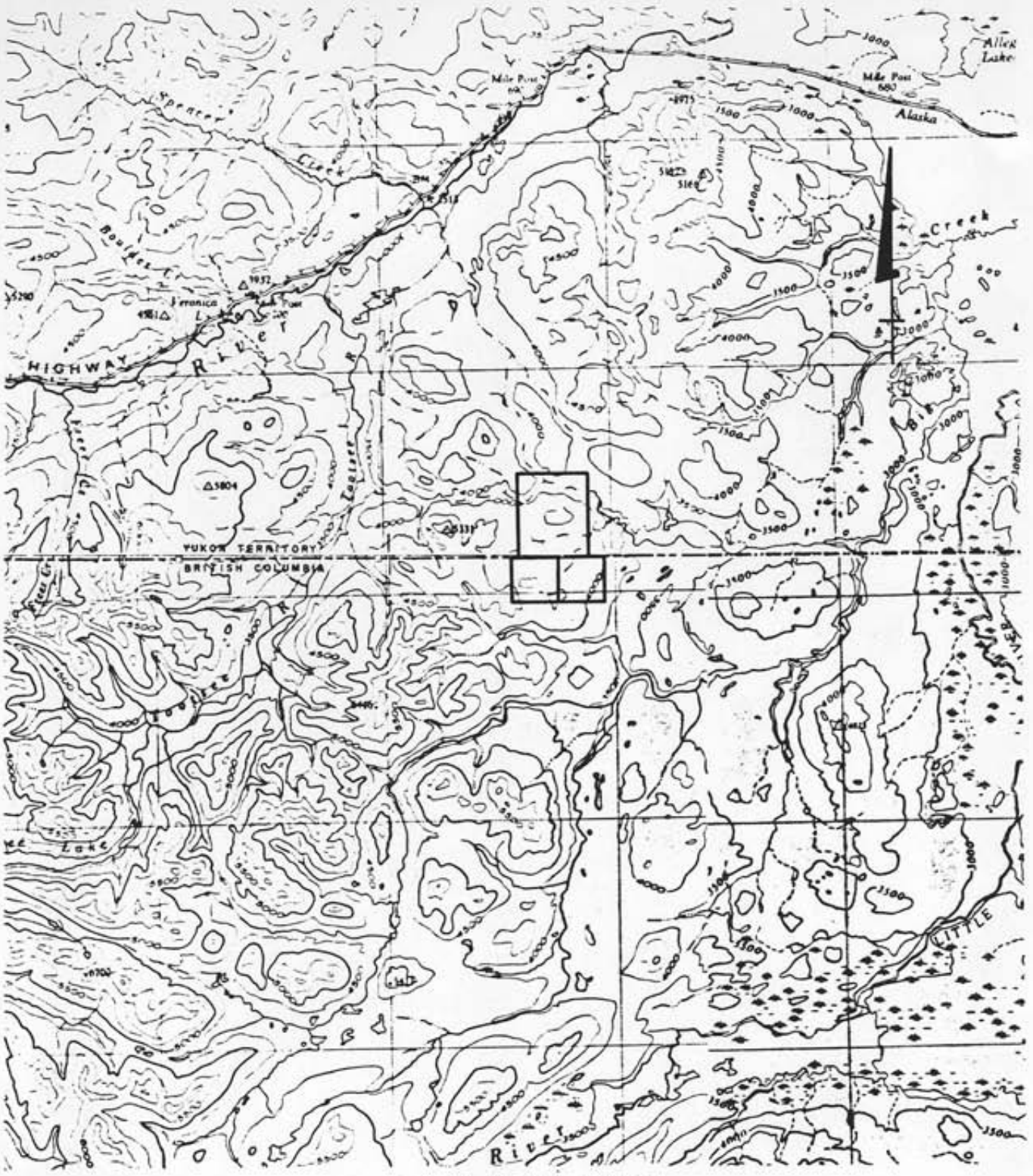
Previous Work

AMAX crews panned major creeks east of the property in 1978. Anomalous concentrations of scheelite were traced to a steeply dipping weakly mineralized calc-silicate sequence.

Claims were staked in 1979 and preliminary geological mapping, rock chip and panning surveys were carried out. Assays of up to 150 ppm WO_3 and 320 ppm Zn were obtained. A 17 line (40 km mainly in the Yukon) grid was added in September of 1979 in preparation for the 1980 field program.

1980 Exploration Program

Soil sampling was conducted over the grid at 50 m intervals on lines 240 m apart. A metric contoured 1:10,000 scale orthophoto provided ground control for detailed geological mapping; UV lamp prospecting was carried out concomitantly. All local creeks draining the property were panned at regular intervals and the concentrates lamped for scheelite.



AMAX OF CANADA LIMITED

TOOTSEE RIVER PROPERTY

WATSON LAKE M.D. — YUKON
ATLIN M.D. — B.C.

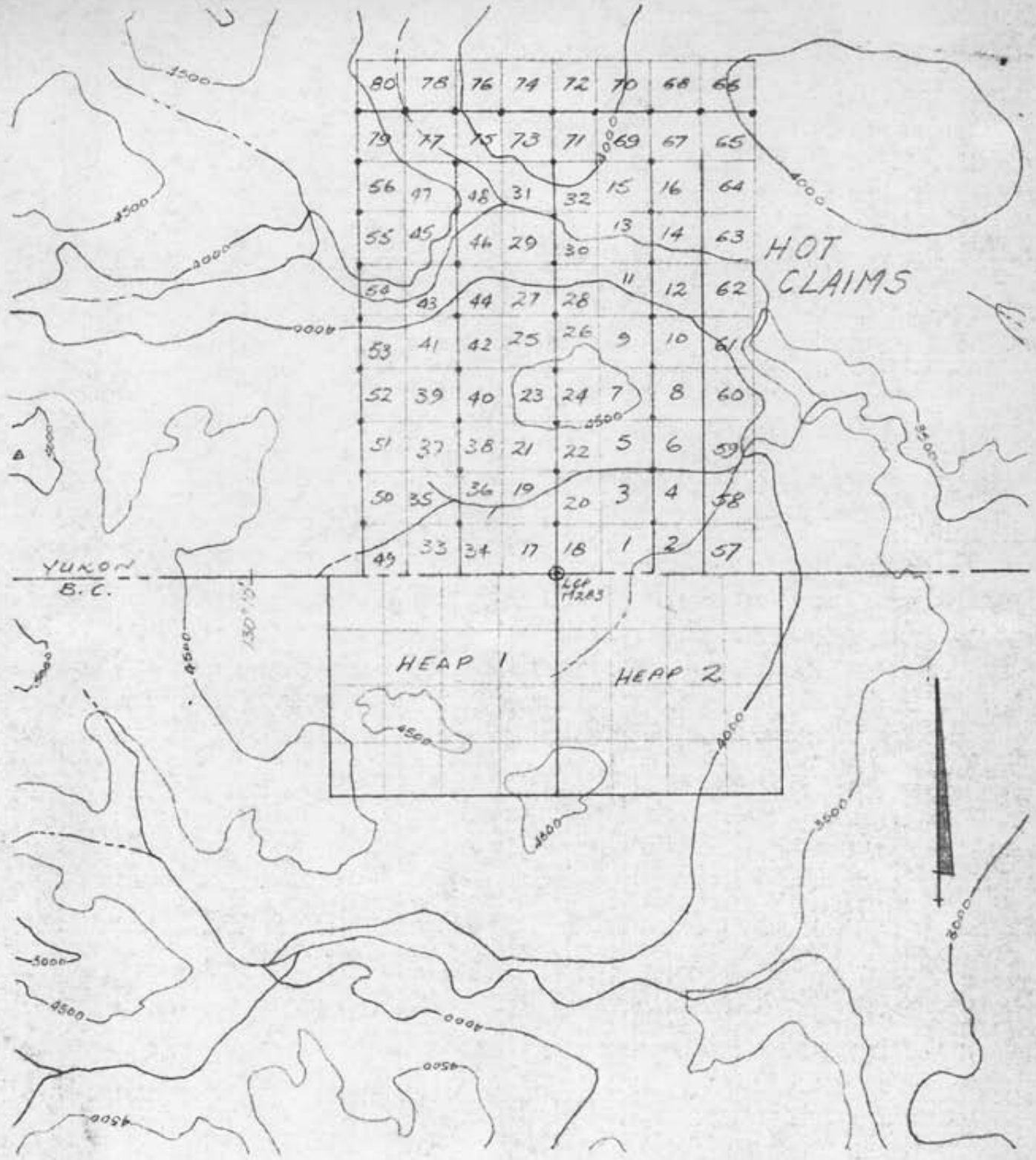
LOCATION MAP

SCALE 8 0 8 KILOMETRES
4 0 4 MILES

1 : 250,000

N.T.S. Ref. 104 O 16, 105 B 1

Fig. 1



AMAX OF CANADA LIMITED

TOOTSEE RIVER PROPERTY

WATSON LAKE M.D. - YUKON
ATLIN M.D. - B.C.

1:50,000

FIG. 2

NTS Ref. 104 O 16, 105 B 1

REGIONAL GEOLOGY

The area is underlain by north-northwest striking Cambrian to Devonian metasediments intruded by small apophyses of the Cretaceous Cassiar Batholith. Northeast and northwest striking faults are common within this area and may be conjugate to the Liard and Tintina breaks which bound the area to the north and northwest respectively. Scattered base metal, tin, and tungsten showings have been found to the northwest, particularly along the margins of the Cassiar Batholith, but no ore zone of major proportions has as yet been discovered within the immediate area.

PROPERTY GEOLOGY

General Statement

Heap 1-2 claims were mapped at 1:50,000 scale (Figure 2, in pocket) during the period June 8 - June 15, 1980.

Rock Units

The Tootsee River property is underlain by a north-northwest striking, now variably skarned and hornfelsed sequence of middle Cambrian-middle Silurian limestone and argillite (Unit 4). The zone of most intense calc-silicate/hornfels development represented by Units 4d, 4e, 4f on the accompanying map covers an ellipse approximately 2500 m x 1500 m in the centre of the claim group.

Middle Silurian-middle Devonian quartzites, limestones and minor quartz breccia overlie the calc-silicate/hornfels to the southwest and are in fault contact with Upper Devonian and Mississippian greywacke and arkosic grits.

Only two small monzonite and diabase dykes were found in the northern and central sections of the Hot claim group.

MINERALIZATION

Tungsten occurs mainly in the northern half of the property as scheelite in the form of fine grained disseminations in Units 4c - 4f. No spatial association with either quartz veining or fracturing was observed. Up to 15% pyrrhotite and minor pyrite mainly on fresh joint surfaces accompanies scheelite. Minor chalcopyrite, covellite, bornite, galena and occasionally sphalerite also occur in some fractures.

GEOCHEMISTRY

General Statement

During the 1980 field season a total of 632 soil samples were collected at 50 m spacings on the grid; the eastern halves of lines 1680N, 1920N and 2160W were sampled at 25 m intervals. An additional 32 soil samples were obtained from the area bordering the west side of the Hal claims in order to establish background metal concentrations for this particular area.

Thirty-three rock chip samples were taken from the various lithologies on the property mainly from those bearing visible scheelite.

Twenty-seven pan and silt samples were obtained from local streams draining the property. Each pan sample was lamped to determine its relative scheelite component.

A total of 27 geochemical samples were collected in B.C.

Samples were analyzed for W,Mo,Cu,Pb,Zn,Fe,Mn,Ag, and Au. Results are plotted on Figure 4; complete analytical results are found in the Appendix.

Soil Type and Provenance

Wooded soils frequently covered by thick layers of sphagnum moss, and with weakly developed red brown B horizons occur in the valleys on the property. These soils appear to have formed from a heterogeneous combination of talus, glacial drift and alluvium.

Along ridges and hill sides the B horizon is better developed in the soil profile and an increase in the percentage of rock fragments with depth of the sample was observed. Although a glacial component is present, tungsten values in soils correspond closely with scheelite concentrations in nearby outcrops suggesting that soil anomalies are a good reflection of bedrock concentrations.

Results

a) Soils Eight separate anomalous zones are evident in the contoured soil sample data. The zones are discontinuous, trend northwest, parallel to regional strike and coincide with most intense calc-silicate development (e.g. lines 1440-2160N). The average value for the lines is approximately 100 ppm tungsten with a maximum recorded concentration of .16% tungsten.

b) Rock Chips Like the soil analyses, strongly anomalous rock chip results appear confined to the calc-silicate zone located in the south central portion of the Hot claims, in particular on L1920N. Individual assays of up to 600 ppm tungsten were recorded while the combined average of all rock chip samples was 70 ppm tungsten.

c) Pan and Silt In spite of the fact that it was this mode of sampling that stimulated interest in the area, the results of the pan and silt survey were generally unimpressive. One average sample was found to contain a mere nine grains of scheelite and only 1 of the 27 concentrates attained the 100 grain mark.

INTERPRETATION AND ECONOMIC POTENTIAL

Although only one or two dykes and small amounts of quartz-feldspar porphyry float were observed on the property, the combined evidence of calc-silicate/hornfels alteration and sulphide distribution as well as the presence of anomalous tungsten, lead, zinc and molybdenum in both soils and rock chips suggest that a shallowly buried intrusive underlies the property.

The data collected to date does not rule out the possible presence of high-grade tungsten skarn or a tungsten stockwork deposit.

Extensive development of hornfels and calc-silicate, fracture-controlled pyrrhotite, pyrite and scheelite and the presence of porphyry dykes tend to suggest a stockwork-type deposit, but the absence of quartz veining down grades the probability that it exists at surface.

No coarse grained high-sulphide skarns have been found on the property but the setting is similarly favourable for high grade tungsten skarn if a suitably reactive limy unit were to occur near the intrusive contact.

G.W. Booth

A.C. Hitchins

Nov 12 1980

APPENDIX I

TOOTSEE RIVER PROPERTY

APPENDIX I

TOOTSEE RIVER PROPERTY

Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.
BURNABY, B.C.
CANADA
TELEPHONE: 299-6910
AREA CODE: 604

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 80171-1

INVOICE NO.

DATE ANALYSED JUNE 1980

PROJECT 1068, TOOTSEE RIVER

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Pb	Ag	Zn	Ni	V	Fe	Mn	Sn		No.
01	80JLS 1		5	22	3.1	0.4	250	24	0	580	20			01
02	2		6	16	2.1	0.2	112	16	0	630	20			02
03	3		8	24	1.8	0.2	158	40	0	400	20			03
04	4		5	30	2.0	0.4	256	46	0	730	20			04
05	5		5	24	2.0	0.2	154	18	0	500	20			05
06	6		6	48	2.9	0.4	232	20	0	560	30			06
07	7		4	32	2.0	0.4	234	16	12	600	20			07
08	8		5	42	2.9	0.4	134	12	10	730	20			08
09	9		9	22	2.7	0.6	134	14	12	530	20			09
10	10		9	18	3.1	0.4	186	12	20	600	20	6		10
11	11		5	12	2.0	0.4	112	14	12	430	20			11
12	12		7	24	2.6	0.8	228	20	15	610	10			12
13	13		11	176	4.0	0.8	208	22	120	1200	10			13
14	14		8	22	2.6	0.4	184	14	12	690	10			14
15	15		5	24	2.3	0.2	166	14	80	680	20			15
16	16		6	38	3.3	0.2	326	8	25	890	20			16
17	17		3	38	2.7	0.6	190	8	30	730	10			17
18	18		7	24	2.7	1.0	222	14	70	530	30			18
19	19		12	156	5.4	0.6	286	16	325	1100	20			19
20	STD C		18	182	1.2	12.6	112	74	2	340	10			20
21	20		13	256	5.7	1.0	360	12	195	1200	20	10		21
22	21		5	104	5.6	0.6	404	16	210	620	10			22
23	22		5	118	3.4	0.6	396	14	90	700	20			23
24	23		5	110	4.8	0.6	220	18	120	660	20			24
25	24		5	106	4.5	0.6	252	14	180	600	10			25
26	25		4	100	4.1	1.0	236	14	250	820	10			26
27	26		9	148	5.5	0.8	220	12	150	1300	20			27
28	27		10	346	6.5	0.6	290	20	195	2000	50			28
29	28		6	278	5.6	0.4	214	20	210	1650	20			29
30	29		15	318	9.1	1.0	312	18	240	1250	10			30
31	30		11	104	4.2	1.4	398	20	30	800	20	0		31
32	31		4	116	4.9	0.4	180	18	105	1150	20			32
33	32		3	152	5.3	0.2	182	16	210	1150	20			33
34	33		3	42	3.5	0.4	184	12	20	770	10			34
35	34		2	24	3.7	0.2	156	8	15	600	20			35
36	35		3	34	4.4	0.2	210	6	10	800	20			36
37	36		5	42	3.0	0.2	130	12	15	900	20			37
38	37		3	20	1.9	0.2	140	10	0	520	20			38
39	38		2	16	2.6	0.2	102	14	0	540	20			39
40	STD G		17	130	1.2	6.1	102	66	20	760				40

Certified by J. Rossbacher

Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
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AREA CODE: 604

CERTIFICATE NO. 80171-2

INVOICE NO.

DATE ANALYSED JUNE 1980

PROJECT 1068, TOOTSIE RV.

CERTIFICATE OF ANALYSIS

TO: AMAX MINERALS EXPLORATION
801 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Pb	Ag	Zn	Ni	W	F	Au PPB	Sn		No.
01	80JLS39		1	18	2.1	04	110	14	0	540	30	-		01
02	40		2	20	2.4	0.2	190	16	0	640	20	0		02
03	41		1	86	3.3	0.6	174	14	0	900	40	-		03
04	42		2	84	3.7	04	202	26	0	1000	50	-		04
05	43		2	166	0.9	2.0	76	10	0	750	40	-		05
06	44		1	68	3.4	1.6	400	24	15	900	40	-		06
07	45		3	68	4.1	0.6	420	28	80	900	40	-		07
08	46		2	124	4.8	0.4	392	42	35	1200	50	-		08
09	47		1	84	2.7	0.8	870	30	0	300	40	-		09
10	48		4	282	4.1	0.8	760	20	85	640	40	-		10
11	49		3	100	3.2	04	212	16	30	900	50	-		11
12	50		3	64	3.4	0.2	196	24	120	810	30	0		12
13	51		4	170	4.7	2.0	96	82	210	950	50	-		13
14	52		3	62	2.8	04	112	22	80	670	40	-		14
15	53		1	60	2.3	0.2	118	24	80	660	30	-		15
16	54		3	44	3.6	0.2	290	28	180	860	30	-		16
17	55		5	124	4.4	0.8	364	38	190	1000	20	-		17
18	56		4	100	3.2	0.2	304	30	50	980	20	-		18
19	57		3	102	4.8	0.2	300	32	180	800	20			19
20	STD B		2	114	0.9	3.6	584	98	30	460	-	-		20
21	58		5	298	5.8	1.0	346	20	195	1450	30	-		21
22	59		3	84	3.5	04	384	16	90	720	20	-		22
23	60		1	66	4.1	0.6	414	16	310	610	20	0		23
24	61		2	126	6.0	0.8	960	18	240	850	30			24
25	62		8	194	7.4	1.0	750	60	105	1200	40	-		25
26	63		4	198	6.6	0.6	326	14	60	1350	30	-		26
27	64		2	80	4.2	0.4	320	22	65	740	60	-		27
28	65		4	116	5.6	0.6	302	16	210	750	30	-		28
29	66		2	160	5.2	0.6	236	26	50	1400	40	-		29
30	67		1	28	2.8	0.6	302	20	30	660	50	-		30
31	68		3	62	5.0	0.6	288	22	150	900	30	-		31
32	69		3	128	5.4	0.6	270	20	75	1150	30	-		32
33	70		4	160	6.4	0.6	332	42	40	950	30	30		33
34	71		4	320	4.2	3.2	234	58	21	1250	40			34
35	72		2	286	3.7	2.4	240	26	15	1450	30			35
36	73		2	96	3.6	2.0	192	16	40	900	30			36
37	STD C		2	120	0.8	38	500	102	20	430	-			37
38														38
39														39
40														40

Certified by L. Rossbacher

Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

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CERTIFICATE NO. 80208-1

INVOICE NO.

DATE ANALYSED JUNE 1980

PROJECT 1068

CERTIFICATE OF ANALYSIS

TO: AMAX MINERALS EXPLORATION
801 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Pb	Ag	Zn	Ni	W	Au				No.
01	80JKS152	BROKEN			BAG		—	—	—	—				01
02	153		8	116	4.4	0.6	226	26	70	10				02
03	154		8	122	4.8	0.4	220	22	100	10				03
04	155		10	78	3.2	0.4	186	16	80	10				04
05	156		5	74	3.8	0.6	366	18	50	10				05
06	157		11	132	4.3	0.4	250	26	60	10				06
07	158		5	160	4.0	0.4	190	26	160	10				07
08	159		6	112	6.2	0.4	284	16	240	10				08
09	160	BROKEN			BAG		—	—	—	—				09
10	80JKS161		5	106	3.5	0.2	158	16	180	10				10
11	162		6	180	5.7	0.4	214	32	320	10				11
12	163		3	46	4.1	0.6	406	20	90	10				12
13	164		1	64	2.0	0.4	348	14	8	10				13
14	165		5	144	6.0	0.6	840	54	100	10				14
15	166		5	150	5.8	0.8	780	52	120	10				15
16	167		5	116	6.3	0.4	880	36	320	10				16
17	168		3	92	4.0	0.8	442	36	120	10				17
18	169		4	124	5.1	0.4	458	72	90	10				18
19	170		3	68	4.0	0.4	470	64	70	10				19
20	STD A		6	22	2.4	0.2	34	18	20	10				20
21	80JKS171		4	56	3.7	0.4	490	44	60	10				21
22	172		2	38	3.8	0.6	438	36	50	10				22
23	173		2	40	4.3	0.2	398	74	50	10				23
24	174		2	36	4.0	0.4	318	44	25	10				24
25	175		2	82	4.1	0.2	288	54	70	10				25
26	176		2	30	2.1	0.2	216	20	50	10				26
27	177		3	56	3.8	0.2	214	30	50	10				27
28	178		3	62	3.5	0.2	228	36	5	10				28
29	179		3	82	3.8	0.2	398	40	70	10				29
30	180	BROKEN			BAG		—	—	—	—				30
31	80JKS181		2	56	2.9	0.2	260	36	30	10				31
32	182		3	58	5.1	0.2	810	48	70	10				32
33	183		6	186	5.7	0.6	450	58	240	10				33
34	184		6	120	5.4	0.6	1020	50	240	10				34
35	185		2	54	2.9	0.8	458	34	30	10				35
36	186		3	56	4.2	0.8	540	42	120	10				36
37	187		2	62	3.6	0.8	820	28	100	10				37
38	188		7	200	6.0	0.4	302	46	240	10				38
39	189		4	118	4.7	0.6	610	44	200	10				39
40	STD A		8	28	3.0	0.2	46	24	60	-				40

Certified by L. Rossbacher

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TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	Bi	PPB Au				No.
01	80JKS190		3	500	5.7	0.2	286	76	140	10				01
02	191		7	238	3.3	0.2	228	26	120	10				02
03	192		32	264	700	0.2	336	18	480	10				03
04	193		10	200	4.1	0.8	970	52	80	10				04
05	194		6	136	4.1	0.2	130	20	60	10				05
06	195		2	62	4.6	0.2	152	24	100	10				06
07	196		3	156	5.4	0.2	114	22	130	10				07
08	197		2	102	5.7	0.4	80	26	240	10				08
09	198		4	188	3.6	0.4	306	22	90	10				09
10	80JKS199		12	200	4.0	1.7	256	24	70	10				10
11	200		9	184	4.8	0.2	206	68	1200	40				11
12	201		2	26	2.3	0.2	94	26	50	10				12
13	202		9	192	4.0	0.2	200	98	400	30				13
14	203		11	88	3.3	0.2	212	50	840	80				14
15	204		6	78	3.0	0.6	186	40	100	20				15
16	205	BROKEN		BAG	-	-	-	-	-	-				16
17	206		2	84	3.0	0.2	158	48	40	10				17
18	207		13	320	6.0	0.4	640	58	150	20				18
19	208		5	468	4.0	0.2	364	86	30	60				19
20	STD A		4	26	2.5	0.2	30	22	80	-				20
21	80JKS209		7	374	4.8	0.4	426	48	100	80				21
22	210		5	316	8.9	1.2	368	56	30	40				22
23	211		3	230	6.4	0.6	436	54	50	80				23
24	212		3	272	4.4	1.8	790	114	160	10				24
25	213		4	538	4.8	0.8	334	86	50	20				25
26	214		3	242	3.4	0.4	196	60	70	10				26
27	215		4	272	4.7	0.2	194	48	100	80				27
28	216A 216		2	276	3.6	0.2	132	26	60	30				28
29	217		4	304	5.2	0.4	320	46	80	80				29
30	218		3	344	6.5	0.6	180	34	10	80				30
31	80JKS 219		4	52	2.0	0.6	170	32	5	20				31
32	220		6	144	1.9	1.6	180	38	5	30				32
33	221	BROKEN		BAG	-	-	-	-	-	-				33
34	222	BROKEN		BAG	-	-	-	-	-	-				34
35	223		10	504	5.2	1.0	246	132	300	10				35
36	224		16	3.0	0.2	182	128	0	20					36
37	225		1	22	2.8	0.4	224	42	0	10				37
38	226		2	22	2.6	0.4	214	66	0	20				38
39	227		2	22	2.9	0.2	180	58	0	20				39
40	STD B		6	24	2.6	0.2	36	32	20	-				40

TWO SAMPLES WERE MARKED AS JKS 217

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Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B.C.
CANADA
TELEPHONE: 299-6910
AREA CODE: 604

CERTIFICATE NO. 80208-3

INVOICE NO.

DATE ANALYSED JUNE 1980

PROJECT 1068

CERTIFICATE OF ANALYSIS

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	W	PPB Au				No.
01	80JKS228		3	22	2.9	0.8	1000	76	0	10				01
02	229		4	24	2.5	0.6	180	52	0	10				02
03	230		4	22	2.7	0.6	172	50	0	10				03
04	231		3	20	2.4	0.6	168	50	0	10				04
05	232		2	14	2.7	0.4	78	26	0	10				05
06	233		2	12	2.1	0.4	88	42	0	10				06
07	234		2	16	2.8	0.6	138	52	0	10				07
08	235		2	12	2.1	0.4	136	20	0	10				08
09	236		4	12	1.7	0.4	168	38	0	10				09
10	80JKS237		1	8	2.6	0.4	108	30	0	10				10
11	238		3	10	3.0	0.4	190	44	0	10				11
12	239		4	12	2.4	0.4	170	56	0	10				12
13	240		3	14	3.2	0.6	218	60	0	10				13
14	241		4	10	2.6	0.4	194	38	0	10				14
15	242		2	10	3.4	0.4	90	32	0	10				15
16	243		2	22	3.1	0.6	116	26	0	10				16
17	244		2	18	3.3	0.4	352	26	0	10				17
18	245		2	10	3.5	0.4	128	26	0	10				18
19	246		1	8	2.0	0.4	78	16	0	10				19
20	STD D		12	122	0.7	4.2	530	186	-	-				20
21	80JKS247		2	10	3.6	0.4	80	20	0	80				21
22	248		2	12	2.8	0.4	102	18	0	30				22
23	249		2	12	3.5	0.4	126	26	0	30				23
24	250		1	10	3.2	0.4	126	18	0	80				24
25	251		3	16	3.4	0.4	104	18	0	30				25
26	252		2	18	2.5	0.6	120	22	0	80				26
27	253		2	20	2.8	0.6	156	34	0	20				27
28	254		2	32	2.3	0.6	152	54	0	20				28
29	255		2	30	3.2	0.4	160	34	0	20				29
30	256		1	14	1.8	0.6	220	68	0	10				30
31	80JKS257		2	12	2.6	0.4	140	38	0	10				31
32	258		3	12	2.6	0.4	156	46	0	10				32
33	259		2	16	2.4	0.6	218	70	0	10				33
34	260		2	14	2.4	0.8	184	54	0	10				34
35	261		2	12	2.8	0.4	186	64	0	10				35
36	262		2	12	2.4	0.6	154	68	6	10				36
37	263		2	18	2.9	0.4	156	44	0	10				37
38	264		1	16	2.6	0.4	168	32	0	10				38
39	265		2	22	2.4	0.6	180	52	0	10				39
40	STD B		2	126	0.6	4.6	536	78	-	-				40

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Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B.C.
CANADA
TELEPHONE: 299-6910
AREA CODE: 604
CERTIFICATE NO. 80208-4
INVOICE NO.
DATE ANALYSED June 1980
PROJECT 1068

CERTIFICATE OF ANALYSIS

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	W	Au (PPB)				No.
01	80 IKS 266		3	20	2.8	0.4	182	60	0	10				01
02	267		3	22	2.8	0.4	184	50	0	10				02
03	268		3	16	2.5	0.4	118	40	0	10				03
04	269		2	14	3.1	0.4	122	32	0	10				04
05	270		1	20	2.4	0.4	98	32	10	10				05
06	271		2	16	2.7	0.4	106	36	0	10				06
07	272		2	16	2.2	0.4	102	28	0	10				07
08	273		2	24	2.6	0.4	96	28	15	10				08
09	274		2	26	2.4	0.4	96	24	0	10				09
10	80 IKS 275		2	22	2.4	0.2	100	32	0	10				10
11	276		2	28	2.8	0.2	102	28	2	10				11
12	277		1	18	2.6	0.4	96	24	0	10				12
13	278		2	26	2.9	0.4	120	28	0	10				13
14	279		1	28	2.6	0.4	112	30	0	10				14
15	280		1	92	3.2	0.4	104	30	90	10				15
16	281		2	16	2.7	0.4	70	16	0	10				16
17	282		1	20	2.6	0.4	82	24	0	10				17
18	283		1	20	3.0	0.4	120	26	0	10				18
19	284		2	14	2.6	0.6	128	18	0	10				19
20	STD E		3	80	3.0	0.6	164	20	35	10				20
21	80 IKS 285		2	12	3.1	0.2	182	24	0	10				21
22	286		2	14	3.8	0.6	232	26	0	10				22
23	287		2	20	2.8	0.6	96	22	0	10				23
24	288		2	22	3.1	0.6	166	28	0	10				24
25	289		1	16	2.7	0.4	122	18	0	10				25
26	290		2	30	2.8	0.4	98	22	0	10				26
27	291		1	22	2.4	0.4	86	16	0	10				27
28	292		2	16	1.6	0.4	144	32	0	10				28
29	293		2	36	2.9	0.6	170	26	10	10				29
30	294		2	30	3.0	0.4	120	24	0	10				30
31	80 IKS 295		2	22	3.0	0.2	76	10	0	10				31
32	296		2	68	1.6	0.6	34	6	0	10				32
33	297		2	58	2.3	0.6	78	28	0	10				33
34	298		2	22	4.2	0.2	76	10	0	10				34
35	STD E		3	68	2.7	0.6	134	18	40	10				35
36														36
37														37
38														38
39														39
40														40

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GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B.C.
CANADA
TELEPHONE: 299-6910
AREA CODE: 604
CERTIFICATE NO. 80208-5
INVOICE NO.
DATE ANALYSED June 1980
PROJECT 1068

CERTIFICATE OF ANALYSIS

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	W	Au (PPB)				No.
01	80 IJS 168		3	58	2.3	0.6	138	26	2	10				01
02	169		3	66	3.0	0.4	172	30	2	10				02
03	170		2	50	3.4	0.8	160	32	2	10				03
04	171		2	36	3.4	0.4	174	30	0	10				04
05	172		3	32	3.5	0.6	142	28	0	10				05
06	173		2	12	2.4	0.4	94	20	0	10				06
07	174		2	12	3.0	0.8	182	18	0	10				07
08	175		2	10	1.4	0.6	106	24	0	10				08
09	176		1	10	1.1	0.4	48	30	0	10				09
10	80 IJS 177		3	52	1.8	0.6	82	26	0	10				10
11	178		7	76	4.0	0.6	84	20	0	10				11
12	179		3	30	3.4	0.8	134	18	0	10				12
13	180		7	78	4.4	0.6	112	20	30	10				13
14	181		3	36	2.5	0.4	110	16	10	10				14
15	182		6	64	4.3	0.8	174	14	10	10				15
16	183		3	38	3.6	0.8	182	20	10	10				16
17	184		3	44	1.4	2.2	94	24	10	10				17
18	185		1	18	1.6	0.6	106	18	15	10				18
19	186		3	36	2.8	0.6	238	20	10	10				19
20	80 IJS 187A		4	52	2.9	0.8	112	30	10	10				20
21	80 IJS 187B		2	40	3.0	0.4	214	22	25	10				21
22	188		7	146	3.7	1.0	96	24	10	10				22
23	189		2	30	1.6	0.4	70	18	10	10				23
24	190		5	89	3.1	1.2	144	44	80	10				24
25	191		2	82	3.7	0.4	158	38	35	10				25
26	192		-	-	-	-	-	-	-	-				26
27	193		2	114	3.0	1.0	192	30	35	10				27
28	194		3	80	3.3	0.6	214	46	15	10				28
29	195		2	18	2.2	0.4	98	20	5	10				29
30	196		1	54	2.4	0.6	208	38	2	10				30
31	80 IJS 197		1	36	2.9	0.6	184	40	20	10				31
32	198		1	26	3.0	2.4	440	58	20	10				32
33	199		1	20	2.4	1.0	478	58	15	10				33
34	200		1	16	2.6	0.6	468	62	10	10				34
35	201		1	28	2.6	0.8	660	54	10	10				35
36	202		3	29	2.6	0.4	234	36	10	10				36
37	203		4	26	2.2	0.4	123	42	5	10				37
38	204		3	29	2.3	0.4	98	36	0	10				38
39	205		2	15	2.3	0.2	100	26	0	10				39
40	STD E		3	73	3.0	0.6	160	20		-				40

② TWO SAMPLES MARKED 187.

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Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S SPRINGER AVE.,
BURNABY, B. C.
CANADA
TELEPHONE 299-6910
AREA CODE. 604
CERTIFICATE NO. 80208-6
INVOICE NO.
DATE ANALYSED JUNE 1980
PROJECT 1068

CERTIFICATE OF ANALYSIS

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	W	PPB Au				No.
01	80 JLS 206		2	16	2.4	0.2	164	22	0	10				01
02	207		2	28	2.0	0.2	94	22	0	10				02
03	208		2	34	1.8	0.4	272	20	0	10				03
04	209		2	98	2.2	0.6	258	30	0	10				04
05	210		3	34	2.7	0.4	174	26	25	10				05
06	211		3	28	2.2	0.6	102	30	10	10				06
07	212		1	14	3.0	0.4	50	22	10	10				07
08	213		2	20	2.1	0.4	124	34	10	10				08
09	214		2	62	2.8	0.6	218	26	30	10				09
10	80 JLS 215		4	62	3.4	0.4	146	34	15	10				10
11	216		1	34	1.6	2.8	66	40	0	20				11
12	217		1	11	1.7	0.4	110	44	5	10				12
13	218		6	52	3.1	0.4	376	16	100	20				13
14	219		8	120	5.0	0.8	274	24	80	20				14
15	220		6	40	4.5	1.0	428	20	45	20				15
16	221		5	120	5.6	0.6	340	22	130	20				16
17	222		6	100	4.3	0.8	820	22	130	20				17
18	223		3	12	2.7	0.6	144	18	0	20				18
19	224		2	18	2.6	0.4	100	16	0	20				19
20	STD B		30	134	0.8	1.6	134	90	15	—				20
21	80 JLS 225		2	10	2.5	0.2	100	18	0	20				21
22	226		3	52	3.1	0.6	204	26	0	10				22
23	227		1	16	2.2	0.4	140	18	0	20				23
24	228		1	10	1.0	0.4	60	14	0	20				24
25	229		2	18	1.8	0.4	92	20	0	20				25
26	230		2	92	2.7	0.8	168	26	20	10				26
27	231		2	110	2.6	0.6	130	20	20	20				27
28	232		2	84	2.7	0.6	240	34	20	10				28
29	233		3	132	2.4	1.0	154	20	15	10				29
30	234		6	84	3.0	0.4	178	28	30	10				30
31	80 JLS 235		17	364	2.8	1.0	230	34	20	10				31
32	236		38	64	2.5	0.6	168	82	45	10				32
33	237		23	496	4.4	1.8	1900	80	160	10				33
34	238		5	76	1.5	1.0	210	36	20	10				34
35	239		8	340	5.4	0.4	156	80	135	20				35
36	240		7	458	4.5	0.6	320	76	95	10				36
37	241		8	160	4.7	0.4	146	36	70	10				37
38	242		14	340	4.4	1.2	204	120	15	20				38
39	243		5	220	3.9	0.6	120	76	20	10				39
40	STD G		30	134	0.8	1.6	136	96	15	—				40

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GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S SPRINGER AVE.,
BURNABY, B. C.
CANADA
TELEPHONE 299-6910
AREA CODE. 604
CERTIFICATE NO. 80208-7
INVOICE NO.
DATE ANALYSED JUNE 1980
PROJECT 1068

CERTIFICATE OF ANALYSIS

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	W	PPB Au				No.
01	80 JLS 244		8	306	5.1	0.6	350	86	35	10				01
02	245		4	432	5.3	0.6	570	98	55	10				02
03	246		4	268	5.1	1.0	430	114	45	10				03
04	247		3	140	2.8	0.4	100	38	40	10				04
05	248		3	80	2.7	0.2	94	26	50	10				05
06	249		2	46	3.3	0.2	74	24	35	10				06
07	250		2	780	5.9	0.4	104	30	10	10				07
08	251		1	30	3.2	0.2	70	18	10	10				08
09	252		2	34	3.9	0.2	68	14	25	10				09
10	80 JLS 253		1	44	2.6	0.2	60	20	5	10				10
11	254		1	76	2.5	0.2	56	20	10	10				11
12	255		1	36	3.0	0.2	108	18	10	10				12
13	256		2	52	2.7	0.4	90	20	15	10				13
14	257		1	94	3.1	0.4	146	32	10	10				14
15	258		2	28	2.8	0.2	90	20	10	10				15
16	259		2	18	2.7	0.2	68	16	15	10				16
17	260		1	20	2.6	0.2	82	14	5	10				17
18	261		2	20	3.2	0.2	76	16	5	10				18
19	262		3	16	2.9	0.2	76	16	10	10				19
20	STD C		18	184	1.4	0.8	124	88	20	10				20
21	80 JLS 263		11	136	3.9	0.6	302	42	55	10				21
22	264		12	280	3.8	1.0	1140	68	90	10				22
23	265		4	192	4.5	1.0	360	60	45	10				23
24	266		34	242	1.3	3.2	124	34	2	10				24
25	267		13	166	5.4	0.6	396	52	280	10				25
26	268		8	86	2.6	0.3	110	32	110	10				26
27	269		3	20	3.5	0.4	162	28	15	10				27
28	270		3	26	4.3	0.6	124	28	15	10				28
29	271		2	26	3.0	0.4	120	30	10	10				29
30	272		9	456	8.6	0.8	360	54	130	10				30
31	80 JLS 273		6	158	5.2	1.8	366	80	90	10				31
32	274		6	248	5.1	0.8	438	36	45	10				32
33	275		3	158	4.4	0.8	302	66	25	10				33
34	276		—	—	—	—	—	—	—	—				34
35	277		3	52	3.2	0.4	118	18	25	10				35
36	278		3	100	3.3	0.6	252	42	15	40				36
37	279		6	328	6.8	0.8	288	64	5	10				37
38	280		4	274	3.7	0.8	152	46	15	10				38
39	281		2	90	2.4	0.2	100	20	15	10				39
40	STD C		18	190	1.4	0.8	124	88	15	10				40

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Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B.C.
CANADA
TELEPHONE 299-6910
AREA CODE 604

CERTIFICATE NO. 80208-8

INVOICE NO.

DATE ANALYSED JUNE 1980

PROJECT 1068

CERTIFICATE OF ANALYSIS

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	W	PPB Au					No.
01	80 IL S 282		3	144	4.8	0.6	216	48	15	10					01
02	283		3	300	3.6	1.6	448	122	20	10					02
03	284		3	146	3.6	0.6	128	40	35	10					03
04	285		2	108	3.6	0.4	98	28	85	10					04
05	286		3	174	4.0	0.6	182	46	75	10					05
06	287		1	108	3.1	0.4	126	32	20	10					06
07	288		1	42	1.8	0.4	68	20	80	10					07
08	289		1	78	2.5	0.6	84	24	10	10					08
09	290		2	68	2.7	0.6	88	24	5	10					09
10	80 IL S 291		2	80	3.1	0.6	178	30	15	10					10
11	292		2	126	3.7	0.6	236	50	80	10					11
12	293		2	110	2.9	0.6	232	32	0	10					12
13	294		1	90	2.6	0.8	240	32	15	10					13
14	295		1	64	4.9	0.4	188	20	15	10					14
15	296		1	112	3.0	1.2	208	52	80	10					15
16	297		1	90	3.5	0.8	320	64	25	10					16
17	298		1	22	3.0	0.8	208	26	35	10					17
18	299		1	140	2.5	1.6	216	26	30	10					18
19	300		5	478	4.6	1.6	700	46	60	10					19
20	STD E		4	76	2.8	0.6	156	20	15	-					20
21	80 IL S 301		4	108	6.7	0.6	294	36	100	20					21
22	302		6	114	6.0	1.0	358	60	80	20					22
23	303		2	48	3.8	0.8	570	36	65	10					23
24	304		1	58	3.0	0.6	376	32	45	10					24
25	305		4	80	4.2	0.6	442	46	90	10					25
26	306		4	70	3.7	0.6	258	36	45	10					26
27	307		9	244	5.1	0.8	318	52	200	10					27
28	308		6	142	2.9	0.8	660	36	35	10					28
29	309		2	68	2.8	0.6	412	24	35	10					29
30	310		4	54	3.3	1.8	640	46	55	10					30
31	80 IL S 311		5	76	3.4	1.2	394	34	40	10					31
32	312		8	68	4.8	0.8	464	42	55	10					32
33	313		5	42	3.4	1.2	900	28	50	10					33
34	314		6	484	4.0	1.0	380	26	80	10					34
35	STD E		3	78	2.2	0.6	140	18	15	-					35
36															36
37															37
38															38
39															39
40															40

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GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B.C.
CANADA
TELEPHONE: 299-6910
AREA CODE 604

CERTIFICATE NO. 80250-1

INVOICE NO.

DATE ANALYSED JULY 1980

PROJECT 1068

CERTIFICATE OF ANALYSIS

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	W	Au					No.
01	80 IL S 315		3	178	4.2	0.2	448	74							01
02	16		2	42	2.9	0.3	240	26							02
03	17		2	28	2.3	0.2	124	36							03
04	18		1	16	1.7	0.2	260	26							04
05	19		3	24	2.0	0.2	472	48							05
06	20		1	28	0.3	0.4	126	24							06
07	21		2	16	1.9	0.2	222	32							07
08	22		4	26	1.4	0.4	110	52							08
09	23		3	116	0.8	1.0	105	12							09
10	24		7	84	2.2	0.2	230	30							10
11	80 IL S 325		6	116	1.1	0.6	182	28							11
12	26		27	52	2.2	0.2	230	24							12
13	27		6	220	2.9	0.4	186	30							13
14	28		2	140	0.9	0.2	148	38							14
15	29		4	100	2.6	0.2	88	34							15
16	30		3	36	1.4	0.2	60	20							16
17	31		4	48	2.2	0.2	76	22							17
18	32		5	116	2.3	0.2	96	38							18
19	33		5	230	2.7	0.2	124	48							19
20	6		30	168	0.8	0.6	146	76							20
21	80 IL S 334		4	34	2.8	0.2	124	38							21
22	35		4	44	2.8	0.2	178	56							22
23	36		4	32	2.2	0.1	180	46							23
24	37		5	40	2.3	0.2	220	46							24
25	38		6	24	2.3	0.2	210	56							25
26	39		4	20	2.9	0.2	266	52							26
27	40		3	15	2.8	0.2	270	24							27
28	41		4	12	3.2	0.2	216	72							28
29	42		3	9	3.1	0.2	212	34							29
30	80 IL S 343		3	12	3.2	0.2	194	58							30
31	44		1	8	2.8	0.2	202	64							31
32	45		1	12	2.9	0.2	104	24							32
33	46		1	16	2.8	0.2	118	44							33
34	47		1	16	2.9	0.3	182	106							34
35	48		1	42	3.4	0.2	96	20							35
36	49		1	44	3.1	0.6	76	22							36
37	50		1	32	2.3	0.2	82	22							37
38	51		1	12	2.7	0.2	52	10							38
39	80 IL S 352		1	62	2.3	0.2	105	36							39
40	5		28	156	0.7	0.8	136	98							40

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GEOCHEMICAL ANALYSTS & ASSAYERS

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VANCOUVER OFFICE

2225 S. SPRINGER AVE.,
BURNABY, B.C.
CANADA
TELEPHONE: 299-6910
AREA CODE: 604

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 80254-1
INVOICE NO.
DATE ANALYSED July 1980
PROJECT 1068

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Zn	W	Sn							No.
01	80 JBT 1			22	52	40	0							01
02	2			22	68	25	0							02
03	3			38	192	15	40							03
04	4			54	150	10	0							04
05	5			16	92	0	0							05
06	6			22	88	0	0							06
07	7			16	352	0	0							07
08	8			40	136	0	0							08
09	9			36	154	0	0							09
10	80 JBT 10			28	114	0	0							10
11	11			42	230	0	0							11
12	12			32	108	15	0							12
13	13			46	246	15	0							13
14	14			28	190	10	0							14
15	15			36	204	0	0							15
16	16			38	196	0	0							16
17	80 JBT 17			40	112	25	0							17
18	STD C			190	118		-							18
19														19
20														20
21														21
22														22
23														23
24														24
25														25
26														26
27														27
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29														29
30														30
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GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B.C.
CANADA
TELEPHONE: 299-6910
AREA CODE: 604

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 80254-2
INVOICE NO. 282
DATE ANALYSED July 1980
PROJECT 1068

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	W	Pb	PPB Au				No.
01	80 TLS 381		4	136	4.2	1.2	640	120	16	10				01
02	382		3	150	3.3	1.6	460	60	28	10				02
03	383		2	260	5.9	0.6	484	140	60	10				03
04	384		5	140	5.2	0.6	410	200	30	10				04
05	385		3	66	3.4	1.2	660	120	42	10				05
06	386		6	92	3.9	0.8	410	200	82	10				06
07	387		6	56	2.7	0.6	390	250	14	10				07
08	388		7	84	1.9	0.6	196	75	26	10				08
09	389		6	228	5.4	1.0	352	20	28	10				09
10	390		4	86	3.4	0.4	170	140	32	10				10
11	80 TLS 391		2	110	4.2	0.2	376	120	28	10				11
12	392		2	48	3.5	0.6	344	90	28	10				12
13	393		1	56	5.4	0.6	960	75	24	10				13
14	394		3	176	6.8	0.4	386	150	34	10				14
15	395		3	650	5.9	1.0	750	140	30	10				15
16	396		3	400	3.4	1.4	320	130	38	10				16
17	397		3	102	5.5	0.8	396	50	62	10				17
18	398		1	76	3.0	0.4	88	240	12	10				18
19	399		1	160	3.0	1.0	840	75	56	10				19
20	STD C		16	176	1.0	0.2	104	10	74	~~60~~				20
21	80 TLS 400		1	128	3.8	0.8	152	60	14	10				21
22	401		1	130	3.0	0.8	272	0	50	10				22
23	402		1	92	3.3	0.2	128	20	12	10				23
24	403		1	118	3.0	0.4	204	20	22	10				24
25	80 TLS 404		1	74	2.6	0.2	132	0	20	10				25
26	STD C		16	82	1.1	0.6	102	20	88					26
27														27
28														28
29														29
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GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S SPRINGER AVE.
BURNABY, B.C.
CANADA
TELEPHONE 299-6910
AREA CODE 604

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 80254-3
INVOICE NO. 80 282
DATE ANALYSED JULY, 1980
PROJECT 1068

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	W	PPB Au				No.
01	80JKS341		2	42	2.8	0.2	94	28	30	10				01
02	342		3	28	2.7	0.2	96	24	25	10				02
03	343		2	26	2.7	0.2	112	20	10	10				03
04	344		3	20	2.8	0.2	100	24	15	10				04
05	345		3	16	2.7	0.2	92	18	0	10				05
06	346		4	26	2.4	0.2	82	30	0	10				06
07	347		4	14	2.7	0.2	126	30	10	10				07
08	348		4	12	2.2	0.2	92	36	0	10				08
09	349		2	12	2.6	0.2	110	32	0	10				09
10	350		2	18	2.4	0.4	132	36	20	10				10
11	80JKS351		2	12	2.3	0.2	90	12	20	10				11
12	352		3	30	1.8	0.4	104	10	0	10				12
13	353		2	20	1.4	0.2	78	10	0	10				13
14	354		3	20	2.0	0.2	90	10	0	10				14
15	355													15
16	356		3	80	2.5	0.2	126	10	0	10				16
17	357		3	28	2.3	0.2	106	30	10	10				17
18	358		3	34	3.0	0.2	76	88	0	10				18
19	359		4	18	2.7	0.2	98	84	10	10				19
20	STD B		29	164	1.0	0.8	130	98	60	40				20
21	80JKS360		2	32	3.5	0.4	208	42	10	10				21
22	361		1	24	3.3	0.2	98	14	20	10				22
23	362		3	42	2.7	0.4	180	26	0	10				23
24	363		3	14	2.2	0.2	108	26	0	10				24
25	364		6	20	3.0	0.2	108	16	0	10				25
26	365		1	18	2.8	0.2	122	22	0	10				26
27	366		2	46	2.2	0.4	150	12	0	10				27
28	367		3	26	2.2	0.6	202	24	0	10				28
29	368		2	24	3.0	0.2	100	12	0	10				29
30	369		2	66	3.0	0.4	110	10	0	10				30
31	80JKS370		5	28	2.6	1.2	800	134	0	10				31
32	371		4	18	2.2	0.8	490	76	0	10				32
33	372		5	28	2.2	0.8	580	104	0	10				33
34	373		5	24	1.2	1.2	4960	106	0	10				34
35	374		9	24	2.2	1.2	600	102	0	10				35
36	375		4	8	0.8	2.2	88	22	15	10				36
37	376		7	6	0.8	0.2	96	36	10	10				37
38	377		6	8	2.2	0.8	580	148	0	10				38
39	80JKS378		4	8	1.5	0.2	137	40	0	10				39
40	STD B		28	164	1.0	0.8	148	96	45	-				40

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GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S SPRINGER AVE.
BURNABY, B.C.
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TELEPHONE 299-6910
AREA CODE 604

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 80254-4
INVOICE NO. 282
DATE ANALYSED JULY, 1980
PROJECT 1068

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	W	PPB Au				No.
01	80JKS379		3	10	0.7	0.2	68	28	0	10				01
02	380		3	14	2.3	0.8	640	108	0	10				02
03	381		2	10	1.8	0.2	328	30	0	10				03
04	382		2	10	0.2	0.2	106	46	10	10				04
05	383		1	6	1.2	0.2	56	20	10	10				05
06	384		1	10	1.6	0.2	64	18	2	10				06
07	385		1	10	1.8	0.2	72	24	0	10				07
08	386		1	12	1.2	1.0	64	18	0	10				08
09	387		1	6	0.2	0.2	52	8	2	10				09
10	388		1	12	1.7	0.2	352	14	2	10				10
11	80JKS389		1	12	1.7	0.2	400	10	10	10				11
12	390		1	16	1.4	0.2	780	42	10	10				12
13	391		1	16	2.1	0.2	990	46	2	10				13
14	392		1	32	3.0	1.0	1260	14	0	10				14
15	393		1	12	1.8	0.2	474	16	0	10				15
16	394		4	16	2.0	0.2	206	30	0	10				16
17	395		2	10	0.9	0.2	316	22	15	10				17
18	396		2	14	2.0	0.2	1090	70	10	10				18
19	397		1	18	2.0	0.2	780	54	0	10				19
20	STD E		4	86	3.0	0.2	168	14	0	60				20
21	80JKS398		1	32	2.2	0.8	730	34	5	10				21
22	399		1	20	2.1	1.0	274	30	0	10				22
23	400		1	28	1.1	0.6	204	14	0	10				23
24	401		1	14	1.4	0.4	126	24	10	10				24
25	402		3	30	1.8	0.6	226	48	0	10				25
26	403		6	24	2.3	0.4	276	42	0	10				26
27	404		5	28	1.5	0.2	90	20	0	10				27
28	405		7	30	1.7	0.2	126	44	0	10				28
29	406		7	34	1.7	0.2	88	22	2	10				29
30	80JKS407		6	30	1.5	0.2	90	18	2	10				30
31	408		4	32	1.7	0.4	104	18	0	10				31
32	409		1	16	2.2	0.2	70	18	0	10				32
33	410		1	16	3.2	0.2	72	2	0	10				33
34	411		1	14	3.0	0.2	62	8	2	10				34
35	412		2	16	1.9	0.2	322	36	2	10				35
36	413		3	16	1.3	0.2	216	20	2	10				36
37	414		2	14	1.5	0.2	172	34	2	10				37
38	415		4	14	1.5	0.2	206	22	5	10				38
39	80JKS416		5	164	4.3	0.6	262	56	400	10				39
40			4	86	3.1	0.2	150	14	-	-				40

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GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B. C.
CANADA
TELEPHONE: 299-6910
AREA CODE: 604

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 80254-5
INVOICE NO. 282
DATE ANALYSED JULY 1980
PROJECT 1068

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	W	PPB Au				No.
01	80JKS417		16	288	6.6	1.0	280	42	1000	10				01
02	418		7	162	4.3	1.0	212	20	500	10				02
03	419		4	70	4.4	0.8	178	22	100	10				03
04	420		1	28	2.2	0.6	80	12	5	10				04
05	421		2	26	2.6	0.8	88	10	20	10				05
06	422		4	160	4.2	0.8	336	40	250	10				06
07	423		3	40	2.0	0.8	60	24	20	10				07
08	424		2	110	2.9	1.2	276	24	30	10				08
09	425		4	224	3.6	1.0	206	40	35	10				09
10	426		2	46	3.0	0.6	156	32	50	10				10
11	80JKS427		3	540	5.0	0.8	188	50	100	10				11
12	428		4	218	3.8	1.0	230	50	120	10				12
13	429		3	166	8.4	0.8	92	22	120	10				13
14	430		3	296	5.1	1.0	276	38	30	10				14
15	431		3	340	4.4	0.6	312	30	20	10				15
16	432		3	312	60	10.6	3600	1990	40	10				16
17	433		3	220	4.6	0.6	134	48	220	30				17
18	434		5	222	3.7	0.6	176	46	100	10				18
19	435		4	345	4.3	0.6	184	64	20	10				19
20	436		5	78	3.0	0.2	134	10	20	10				20
21	80JKS436		1	212	4.1	0.6	240	36	60	10				21
22	437		1	70	3.1	0.2	110	14	20	10				22
23	438		1	26	3.6	0.2	100	20	20	10				23
24	439		1	72	3.1	0.4	86	20	10	10				24
25	440		1	50	3.5	0.2	98	18	15	10				25
26	441		2	48	3.0	0.2	98	14	10	10				26
27	442		2	58	3.1	0.2	94	18	10	10				27
28	443		2	62	3.7	0.2	108	18	15	10				28
29	444		2	80	3.0	0.4	88	16	10	10				29
30	80JKS445		2	128	3.6	0.4	102	24	40	20				30
31	446		2	46	4.3	0.2	66	4	5	10				31
32	447		1	198	1.3	0.6	26	6	5	10				32
33	448		2	320	5.1	1.0	236	40	20	10				33
34	449		1	110	4.2	0.4	88	16	50	10				34
35	450		2	214	4.3	0.4	168	28	30	10				35
36	451		1	218	3.9	0.2	146	26	10	10				36
37	452		1	300	4.6	1.0	310	28	10	10				37
38	453		4	580	6.4	0.6	396	48	60	10				38
39	80JKS454		3	372	2.7	0.6	120	18	20	10				39
40	455		4	86	3.6	0.2	148	10						40

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GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B. C.
CANADA
TELEPHONE: 299-6910
AREA CODE: 604

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 80254-6
INVOICE NO. 282
DATE ANALYSED Aug, 1980
PROJECT 1068

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	W	PPB Au				No.
01	80JKS455		2	318	4.9	0.8	307	180	150	10				01
02	456		1	256	5.2	1.2	590	105	40	10				02
03	457		1	183	2.6	1.0	292	56	8	10				03
04	458		4	381	5.1	1.0	426	76	70	10				04
05	459		4	496	3.4	0.8	318	52	30	10				05
06	460		5	428	4.1	0.8	370	42	5	10				06
07	461		13	318	3.0	2.0	286	38	18	10				07
08	80JKS462		12	250	2.5	2.0	210	34	20	10				08
09	80JKS463		6	164	3.4	0.6	384	40	120	10				09
10														10
11														11
12														12
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14														14
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GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B.C.
CANADA
TELEPHONE: 299-6910
AREA CODE: 604

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 80256-1
INVOICE NO.
DATE ANALYSED JULY 1980
PROJECT 1068

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Ni	Mn	Fe	Ag	Zn	W	Au			No.
01	80JLT 1		8	264	30	420	3.7	.6 2	80	10				01
02	2		4	148	42	1960	3.4	0.2	66	280				02
03	3		4	84	38	220	1.7	0.2	66	0				03
04	4		5	120	44	360	2.5	0.2	48	55				04
05	5		2	8	22	440	2.2	0.2	70	280				05
06	6		6	12	24	420	1.6	0.2	62	0				06
07	7		6	16	48	320	2.3	0.2	78	0				07
08	8		5	10	34	220	2.8	0.2	72	0				08
09	9		5	12	46	200	1.6	0.2	16	0				09
10	10		5	14	38	460	3.2	0.2	48	0				10
11	80JLT 11		5	12	34	160	1.4	0.2	10	0				11
12	610		15	566	14	320	2.6	0.2	60	—				12
13														13

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2225 S. SPRINGER AVE.,
BURNABY, B.C.
CANADA
TELEPHONE: 299-6910
AREA CODE: 604

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 80256-4
INVOICE NO.
DATE ANALYSED JULY 1980
PROJECT 1068

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	Ti	Au			No.
01	80JKS 337		3	14	7.9	8.2	476	52					01
02	38		2	16	3.3	0.2	238	118					02
03	39		3	20	3.4	0.4	5440	42					03
04	80JKS 340		3	16	0.7	0.2	232	32					04
05	340 B		29	152	1.0	0.4	132	98					05
06													06
07													07
08													08
09													09
10													10
11													11
12													12
13													13
14													14
15													15
16													16
17													17
18													18
19													19

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GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B.C.
CANADA
TELEPHONE: 299-6910
AREA CODE: 604

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 80256-2
INVOICE NO.
DATE ANALYSED JUNE 1980
PROJECT 1068

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Ni	Mn	Fe	Ag	Zn	W	Au			No.
01	80JBT 4		2	520	28	430	>10	.4 2	80					01
02	5		2	20	26	2230	2.7	0.2	32					02
03	5A		2	148	20	1080	6.6	0.2	30					03
04	11		1	4	12	70	0.5	0.2	4					04
05	31		3	4	16	190	0.6	0.2	16					05
06	43		2	28	32	150	1.7	0.2	30					06
07	45		1	372	16	70	4.2	0.2	14					07
08	45A		3	18	24	330	0.9	0.2	366					08
09	46		3	60	34	120	2.1	0.2	26					09
10	41		2	30	38	190	1.1	0.2	40					10
11	80JBT 41A		1	12	28	240	0.9	0.2	30					11
12	47		1	6	26	310	1.2	0.2	48					12
13	47A		2	4	40	180	2.7	0.2	36					13
14	48		1	32	20	140	1.3	0.2	36					14
15	52		1	5	34	280	3.2	0.2	64					15
16	57		2	132	36	490	1.5	0.2	58					16
17	59		4	12	34	160	1.9	0.2	32					17
18	59A		3	16	28	130	1.8	0.2	26					18
19	66		3	2	14	830	3.6	0.2	80					19
20	6		30	166	14	170	0.9	1.2	142					20
21	80JBT 67		3	10	18	1830	1.9	0.2	46					21
22	64		2	8	18	1620	4.3	0.2	80					22
23	71		4	92	94	1830	6.7	0.2	124					23
24	72		5	480	20	3140	>10	0.2	96					24
25	74		2	16	16	1480	0.9	0.2	54					25
26	74A		4	16	18	1270	2.6	0.2	216					26
27	74B		5	12	36	2 70	1.3	0.2	56					27
28	76		1	4	8	30	0.2	0.2	14					28
29	85		3	28	38	160	2.2	0.2	34					29
30	80JBT 83		5	16	46	310	3.6	0.2	32					30
31	95		4	12	28	670	1.5	0.2	46					31
32	112		4	8	30	460	2.3	0.2	22					32
33	113		4	46	22	420	1.2	0.2	16					33
34	121		5	216	22	1140	3.5	0.2	123					34
35	122		3	44	24	370	2.8	0.2	56					35
36	123		3	64	32	140	1.7	0.2	10					36
37	124		3	68	22	380	2.3	0.2	54					37
38	125		3	36	32	270	1.6	0.2	36					38
39	80JBT 126		5	22	24	1290	4.0	0.2	78					39
40	6		31	164	14	190	1.0	0.2	152					40

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GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S SPRINGER AVE.
BURNABY, B.C.
CANADA
TELEPHONE 299-6910
AREA CODE 604
CERTIFICATE NO. 80235-3
INVOICE NO.
DATE ANALYSED JULY 1980
PROJECT 1068

CERTIFICATE OF ANALYSIS

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Pb	Zn	Fe	Ag	Ba	W	Au			No.
01	80JBIL31		6	14	22	540	3.7	0.2	80	5				01
02	132		6	16	20	460	2.4	0.2	50	20				02
03	133		33	78	22	760	2.6	0.2	38	280				03
04	135		8	26	34	1100	3.1	0.2	64	75				04
05	136		9	34	60	2340	3.4	0.2	48	15				05
06	137		8	2	10	540	1.4	0.2	44	35				06
07	140		7	72	40	640	2.1	0.2	392	0				07
08	141		7	18	34	100	1.6	0.2	84	0				08
09	80JBIL54		7	8	22	50	1.1	0.2	17	0				09
10	142		16	480	10	320	2.6	0.2	68	—				10
11														11
12														12
13														13
14														14
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GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S SPRINGER AVE.
BURNABY, B.C.
CANADA
TELEPHONE 299-6910
AREA CODE 604
CERTIFICATE NO. 80205-1
INVOICE NO.
DATE ANALYSED JUNE 1980
PROJECT 1068

CERTIFICATE OF ANALYSIS

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Pb	Ag	Zn	Fe	W	Ba				No.
01	80IL574		4	14	28	0.4	108	16	0	10				01
02	75		2	6	0.8	0.2	30	24	20	10				02
03	76		5	22	1.7	0.2	116	48	5	10				03
04	77		5	26	2.3	0.4	124	50	10	10				04
05	78		1	20	1.3	0.2	52	10	5	10				05
06	79		2	18	1.2	0.2	78	14	10	30				06
07	80		3	44	1.2	0.2	82	22	5	10				07
08	81		6	92	3.4	0.2	262	34	20	10				08
09	82		4	24	2.4	0.2	180	34	10	10				09
10	80IL583		4	20	2.1	0.2	152	38	2	10				10
11	84		4	28	2.6	0.2	202	42	10	10				11
12	85		5	20	2.5	0.2	194	40	10	10				12
13	86		5	22	2.3	0.2	198	36	5	10				13
14	87		4	90	4.0	0.2	136	30	35	10				14
15	88		4	46	2.9	0.2	120	37	45	30				15
16	89		3	60	3.0	0.4	164	36	25	10				16
17	90		6	26	1.9	0.2	158	30	35	10				17
18	91		5	62	2.9	0.2	190	34	40	10				18
19	92		6	62	3.0	0.6	148	34	35	10				19
20	STD A		7	22	2.6	0.2	38	18	20	10				20
21	80IL593		10	18	2.4	0.4	186	14	15	20				21
22	94		8	20	2.4	0.2	106	18	40	30				22
23	95		6	36	3.0	0.6	206	22	15	10				23
24	96		2	34	4.4	0.4	480	26	15	10				24
25	97		2	42	3.6	0.6	358	24	15	10				25
26	98		2	64	3.0	0.4	198	40	5	30				26
27	99		2	80	3.0	0.8	340	24	20	80				27
28	100		3	26	3.8	0.4	430	16	80	20				28
29	101		2	24	3.3	0.6	308	18	15	20				29
30	102		6	140	4.6	1.2	388	28	140	30				30
31	80IL5103		3	20	7.2	0.6	282	22	25	10				31
32	104		8	194	4.4	0.4	438	44	160	10				32
33	105		7	72	4.0	0.4	268	28	240	10				33
34	106		5	104	4.2	0.4	172	30	100	10				34
35	107		4	40	3.9	0.4	312	26	55	10				35
36	108		6	54	3.3	0.6	280	22	180	10				36
37	109		4	74	4.9	0.6	240	46	140	10				37
38	110		4	38	3.7	0.4	210	22	25	10				38
39	111		8	318	7.4	0.6	278	32	160	30				39
40	STD A		7	24	2.5	0.2	28	20	20	—				40

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GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B.C.
CANADA
TELEPHONE: 299-6910
AREA CODE 604

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 80205-2
INVOICE NO.
DATE ANALYSED JUNE 1980
PROJECT 1068

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	W	Au				No.
01	80JLS112		3	26	2.8	0.4	334	22	80	10				01
02	113		5	16	2.6	0.2	242	16	15	10				02
03	114		7	22	2.6	0.6	320	16	10	10				03
04	115		5	180	2.2	0.6	146	20	20	10				04
05	116		6	18	1.9	0.2	92	20	15	20				05
06	117		3	56	2.3	0.4	114	16	80	10				06
07	118		2	10	1.8	0.2	102	18	5	20				07
08	119		2	16	1.7	0.4	136	18	2	30				08
09	120		2	16	1.2	0.2	58	24	0	20				09
10	80JLS121		3	22	1.6	0.2	68	22	5	20				10
11	122		1	14	2.0	0.2	102	30	10	10				11
12	123		2	48	2.8	0.4	294	42	10	10				12
13	124		2	56	2.6	0.2	162	46	35	140				13
14	125		1	14	2.2	0.2	86	20	15	20				14
15	126		2	36	2.0	0.2	218	74	5	20				15
16	127		2	22	1.7	0.2	114	40	10	40				16
17	128		2	26	1.8	0.2	146	54	15	10				17
18	129		1	18	0.9	0.2	62	22	10	10				18
19	130		1	28	1.6	0.4	128	58	5	10				19
20	Soil A		5	22	2.0	0.2	12	18	15	/				20
21	80JLS131		2	26	1.9	0.4	144	34	0	10				21
22	132		4	48	2.2	0.2	170	50	25	10				22
23	133		3	42	1.7	0.4	120	38	80	10				23
24	134		12	30	2.4	0.2	168	76	45	10				24
25	135		4	36	2.0	0.4	148	32	20	10				25
26	136		7	50	2.1	0.2	164	26	25	10				26
27	137		8	18	2.2	0.2	352	76	90	10				27
28	138		7	34	2.0	0.2	168	18	80	10				28
29	139		4	46	2.2	0.2	232	20	90	10				29
30	140		5	104	4.0	0.4	128	28	260	10				30
31	80JLS141		1	18	4.2	0.2	388	76	9	10				31
32	142		3	106	3.4	0.6	412	36	55	10				32
33	143		2	30	3.9	0.2	290	20	35	10				33
34	144		2	90	2.8	0.2	148	36	25	40				34
35	145		2	38	1.4	0.4	70	26	10	10				35
36	146		2	24	2.1	0.2	270	54	15	10				36
37	147		3	42	2.5	0.2	114	20	90	10				37
38	148		3	54	2.9	0.2	124	32	25	10				38
39	149		5	52	3.8	0.2	274	24	15	10				39
40			6	22	2.1	0.2	8	18	80	/				40

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GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B.C.
CANADA
TELEPHONE: 299-6910
AREA CODE: 604

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 80205-3
INVOICE NO.
DATE ANALYSED JUNE 1980
PROJECT 1068

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	W	Au ppb				No.
01	80JLS150		3	32	2.9	0.2	136	24	40	10				01
02	151		2	30	2.6	0.2	148	32	65	10				02
03	152		2	30	2.3	0.2	162	32	45	10				03
04	153		2	44	2.8	0.2	156	32	35	10				04
05	154		4	28	2.6	0.2	134	34	25	10				05
06	155		1	8	1.0	0.4	60	20	15	10				06
07	156		2	10	2.2	0.4	276	28	15	10				07
08	157		2	30	2.7	0.4	148	32	20	10				08
09	158		2	90	3.3	0.2	204	30	20	10				09
10	80JLS159		2	44	3.3	0.4	162	26	50	10				10
11	160		2	16	3.1	0.2	194	18	15	10				11
12	161		2	20	3.7	0.2	376	28	30	10				12
13	162		2	36	4.2	0.2	290	30	40	10				13
14	163		4	92	4.5	0.2	160	60	35	10				14
15	164		4	74	4.7	0.2	326	40	30	10				15
16	165		3	24	2.6	0.4	760	70	25	10				16
17	166		4	20	2.2	0.2	92	30	10	10				17
18	167		7	28	2.5	0.2	108	60	0	10				18
19	Soil A		7	24	2.4	0.2	38	20	40	/				19
20														20
21														21
22														22
23														23
24														24
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GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B.C.
CANADA
TELEPHONE: 299-6910
AREA CODE: 604

CERTIFICATE NO. 80205-4

INVOICE NO.

DATE ANALYSED JUNE 1980

PROJECT 1068

CERTIFICATE OF ANALYSIS

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	W	Au				No.
01	80JK81		1	10	3.0	0.2	84	40	0	10				01
02	2		1	10	3.0	0.2	90	28	0	10				02
03	3		1	14	2.8	0.2	158	70	0	10				03
04	4		1	16	3.0	0.2	134	46	0	10				04
05	5		2	14	3.5	0.2	166	36	0	10				05
06	6		2	30	3.6	0.2	100	46	0	10				06
07	7		1	14	2.9	0.2	116	42	0	10				07
08	8		1	10	2.8	0.4	190	52	0	10				08
09	9		2	12	2.7	0.4	236	38	0	10				09
10	80JK810		2	16	2.8	0.2	158	44	2	10				10
11	11		2	36	2.8	0.4	150	58	0	10				11
12	12A		3	30	2.8	0.2	130	50	0	10				12
13	12B		1	30	3.4	0.2	122	30	0	10				13
14	13		2	16	2.7	0.2	132	54	0	10				14
15	14		2	50	3.0	0.2	168	70	0	10				15
16	15		1	58	3.8	0.4	72	44	10	10				16
17	16		2	58	3.7	0.6	180	66	2	10				17
18	17		2	20	2.7	0.4	96	42	0	10				18
19	18		1	40	2.8	0.4	104	40	8	10				19
20	STD A		6	24	2.7	0.6	14	20	25	-				20
21	80JK819		2	48	3.5	0.2	100	36	20	10				21
22	20		1	16	3.5	0.2	108	28	12	10				22
23	21		1	22	3.1	0.2	98	38	10	10				23
24	22		1	22	3.3	0.2	88	34	15	10				24
25	23		1	20	3.2	0.2	88	24	25	10				25
26	24		2	44	3.8	0.2	142	60	20	10				26
27	25		2	20	9.1	0.4	262	44	20	10				27
28	26		1	22	3.0	0.2	416	36	15	10				28
29	27		2	28	3.6	0.2	106	42	15	10				29
30	28		2	34	3.2	0.2	154	46	5	10				30
31	80JK829		1	12	3.8	0.2	108	18	5	10				31
32	30		3	38	3.5	0.2	110	52	10	10				32
33	31		1	62	3.0	0.2	172	50	0	10				33
34	32		1	20	2.7	0.2	156	46	5	10				34
35	33		1	14	3.3	0.4	118	36	2	10				35
36	34		1	16	3.0	0.4	138	42	0	10				36
37	35		2	30	3.1	2.0	600	440	2	60				37
38	36		2	32	3.2	2.2	620	438	5	10				38
39	37		1	42	3.1	3.0	820	560	0	10				39
40	STD B		28	148	0.9	4.0	136	1000	35	-				40

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Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S SPRINGER AVE.
BURNABY, B.C.
CANADA
TELEPHONE: 299-6910

CERTIFICATE NO. 80205-5

INVOICE NO.

DATE ANALYSED JUNE 1980

PROJECT 1068

CERTIFICATE OF ANALYSIS

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C. V6E 3L6

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	W	PPB Au				No.
01	80JK838		1	30	2.8	0.2	136	20	10	10				01
02	39		1	42	4.7	0.2	126	20	10	10				02
03	40		2	46	3.3	0.2	160	26	10	10				03
04	41A		1	26	2.9	0.2	64	22	0	10				04
05	41B		1	38	4.0	0.2	104	20	5	10				05
06	42		2	38	4.3	0.2	92	16	5	10				06
07	43		2	48	4.4	0.2	224	30	20	30				07
08	44		2	60	6.4	0.2	390	34	15	10				08
09	45		2	26	3.3	0.2	110	30	0	10				09
10	80JK846		2	38	3.0	0.2	70	22	0	10				10
11	47		3	16	3.2	0.2	76	28	0	10				11
12	48		4	12	4.0	0.2	66	46	2	10				12
13	49	Missing	-	-	-	-	-	-	-	-	-			13
14	50		2	38	2.0	0.2	56	14	0	10				14
15	51		1	44	2.4	0.4	204	22	0	10				15
16	52		1	34	2.5	0.4	48	10	0	10				16
17	53		2	14	3.7	0.2	106	18	0	10				17
18	54		3	14	3.1	0.2	54	16	0	10				18
19	55		3	62	2.6	0.2	54	14	0	10				19
20	STD C		15	182	1.4	1.0	108	86	15	-				20
21	80JK856		1	8	3.0	0.2	60	20	0	10				21
22	57		1	10	3.4	0.2	68	16	0	10				22
23	58		1	16	3.4	0.2	62	12	0	10				23
24	59		2	14	2.5	0.2	54	14	0	10				24
25	60		2	16	3.7	0.2	62	14	0	10				25
26	61		1	12	3.4	0.2	54	14	10	10				26
27	62		2	14	3.3	0.2	68	14	0	10				27
28	63		2	20	3.1	0.2	62	16	0	10				28
29	64		2	20	3.4	0.2	74	14	0	10				29
30	65		2	18	3.3	0.2	74	24	0	10				30
31	80JK866		4	14	3.5	0.2	66	10	0	10				31
32	67		3	10	2.7	0.2	196	26	0	10				32
33	68		4	14	3.0	0.2	168	62	15	10				33
34	69		3	10	4.1	0.2	42	6	0	10				34
35	70		3	20	3.9	0.2	74	8	0	10				35
36	71		4	44	3.3	0.4	230	22	15	10				36
37	72		3	44	3.7	0.2	264	18	25	10				37
38	73		2	28	2.9	0.2	164	16	10	10				38
39	74		3	26	2.9	0.2	238	28	20	10				39
40	STD D		3	118	1.3	4.0	498	72	15	-				40

Certified by J. Rossbacher

Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B. C.
CANADA
TELEPHONE: 299-6910
AREA CODE 604

CERTIFICATE NO. 80205-6

INVOICE NO.

DATE ANALYSED JUNE 1980

PROJECT 1068

CERTIFICATE OF ANALYSIS

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	W	Au ppb				No.
01	80IK5175		2	18	2.8	0.4	304	28	15	10				01
02	76		2	22	3.3	1.0	740	120	15	10				02
03	77		2	16	3.2	0.6	820	64	10	10				03
04	78		3	20	3.6	0.2	940	64	15	10				04
05	79		2	20	2.8	0.4	428	40	10	10				05
06	80		2	24	3.0	0.6	366	40	0	10				06
07	81		1	22	3.6	0.4	250	32	5	10				07
08	82		1	19	2.8	0.8	268	46	10	10				08
09	83		2	30	4.2	0.4	334	38	15	10				09
10	80IK584		2	22	3.0	0.4	290	46	5	10				10
11	85		3	20	3.5	0.2	94	14	5	10				11
12	86		2	14	3.1	0.2	234	24	0	10				12
13	87		3	18	3.2	0.4	208	28	5	10				13
14	88		2	18	2.8	0.4	182	38	10	10				14
15	89		2	14	2.7	0.6	156	40	5	10				15
16	90		1	48	2.9	0.4	660	76	10	10				16
17	91		2	20	2.7	0.4	194	68	10	10				17
18	92		2	18	3.0	0.4	224	68	15	10				18
19	93		1	22	3.2	2.2	800	248	5	10				19
20	STD D		2	124	0.8	4.0	526	106	15	-				20
21	80IK594		1	34	3.6	0.6	660	92	15	10				21
22	95		1	44	1.3	0.6	120	80	15	10				22
23	96		2	28	2.5	0.2	272	78	15	10				23
24	97		2	58	5.2	0.6	540	86	20	10				24
25	98		2	30	3.7	0.4	214	36	10	10				25
26	99		2	28	4.0	0.2	202	22	85	10				26
27	100		2	58	3.2	0.4	220	22	15	10				27
28	101		1	16	2.6	0.4	130	16	10	10				28
29	102		3	58	4.4	0.8	360	86	15	10				29
30	103		5	62	4.1	0.4	232	24	10	10				30
31	80IK5104		4	40	3.8	0.8	196	78	5	10				31
32	105		3	22	3.5	0.4	208	32	10	10				32
33	106		3	14	3.0	0.4	216	28	10	10				33
34	107		3	98	3.0	0.6	232	56	10	10				34
35	108		3	32	3.1	0.4	118	30	10	10				35
36	109		3	28	3.4	0.2	148	28	5	10				36
37	110		3	36	2.4	0.2	152	28	5	10				37
38	111		5	34	3.3	0.2	172	48	2	10				38
39	112		3	38	2.9	1.0	320	88	2	10				39
40	STD D		2	126	1.5	4.0	526	104	35	-				40

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Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

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AREA CODE: 604

CERTIFICATE NO. 80205-7

INVOICE NO.

DATE ANALYSED JUNE 1980

PROJECT 1068

CERTIFICATE OF ANALYSIS

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	Fe	Ag	Zn	Pb	W	Au ppb				No.
01	80IK5113		3	38	2.3	0.6	166	70	C	10				01
02	114		2	62	2.1	0.8	98	26	C	10				02
03	115		2	32	3.0	0.2	188	32	15	20				03
04	116		1	30	2.4	0.2	162	20	C	20				04
05	117		3	34	2.3	0.2	110	36	10	20				05
06	118		3	28	3.1	0.2	176	38	40	10				06
07	119		3	30	3.3	0.2	190	36	C	20				07
08	120		6	34	3.7	0.2	146	30	25	10				08
09														09
10	80IK5122		3	26	3.8	0.2	100	20	10	10				10
11	123		3	28	3.7	0.2	110	22	10	10				11
12	124		3	18	3.1	0.2	88	20	15	10				12
13	125		2	16	3.3	0.2	84	16	20	10				13
14	126		4	20	3.6	0.2	106	20	12	20				14
15	127		2	22	3.4	0.2	114	16	5	20				15
16	128		2	30	3.0	0.2	70	22	8	10				16
17	129		1	14	2.8	0.2	76	16	10	10				17
18	130		3	26	3.6	0.2	390	140	5	20				18
19	131		1	32	4.1	0.2	128	24	5	20				19
20	STD A		5	22	2.7	0.2	32	26	25	-				20
21	80IK5133		1	42	2.5	0.2	164	46	5	10				21
22	134		2	64	2.8	1.2	260	88	10	10				22
23	135		5	54	2.5	0.2	178	40	35	10				23
24	136		2	24	2.8	0.2	174	20	20	10				24
25	137		2	28	3.2	0.2	192	28	20	10				25
26	138		2	54	2.3	0.2	186	76	5	10				26
27	139		3	54	4.3	0.2	158	20	8	10				27
28	140		3	52	2.8	0.4	242	94	15	10				28
29	141		2	58	2.6	0.2	194	66	15	10				29
30	142		2	66	2.6	0.2	148	44	15	10				30
31	80IK5143		2	58	4.0	0.2	434	58	15	10				31
32	144		1	40	5.9	0.2	174	14	15	10				32
33	145		2	34	3.3	0.2	370	32	60	10				33
34	146		2	26	3.0	1.2	408	34	35	10				34
35	147		2	70	2.8	1.0	440	48	35	10				35
36	148		5	42	3.1	0.2	170	18	15	10				36
37	149		4	64	3.6	0.2	178	22	30	10				37
38	150		1	22	3.3	0.2	226	20	15	10				38
39	151		3	42	3.7	0.8	302	36	15	10				39
40	STD G		6	22	2.7	0.2	34	22						40

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Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

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CERTIFICATE NO. 80207-7A

INVOICE NO.

DATE ANALYSED JULY 1980

PROJECT 1060

CERTIFICATE OF ANALYSIS

TO: AMAX MINERALS EXPLORATION
601 - 535 THURLOW ST.
VANCOUVER, B.C.

No.	Sample	pH	Mo	Cu	% Fe	Ag	Zn	Pb	W	PPB Au				No.
01	80JK5131		3	20	2.8	0.2	196	34	12	10				01
02														02
03														03
04														04
05														05
06														06
07														07
08														08
09														09
10														10
11														11
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39														39
40														40

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APPENDIX II

Procedures for Collection and Processing of Geochemical Samples

Analytical Methods for Ag, Mo, Cu, Pb, Zn, Fe, Mn, Ni, Co and U in sediments and soils; Mo, Cu, Zn, Ni and SO_4^{--} in waters.

Amax Exploration, Inc.
Vancouver Office.

September 1970

SAMPLE COLLECTION

Soils

B horizon material is sampled and thus organic rich topsoil and leached upper subsoil are avoided. Occasionally organic rich samples have to be taken in swampy depressions.

Samples are taken by hand from a small excavation made with a cast iron mattock. Approximately 200 gms of finer grained material is taken and placed in a numbered, high wet-strength, Kraft paper bag. The bags are closed by folding and do not have metal tabs.

Observations as to the nature of the sample and the environment of the sample site are made in the field.

Drainage Sediments

Active sediments are taken by hand from tributary drainages which are generally of five square miles catchment or less. Composite samples are taken of the finest material available from as near as possible to the centre of the drainage channel thus avoiding collapsed banks. More than one sample is taken if marked mineralogical or textural segregation of the sediments is evident.

Some 200 gm of finer material is collected unless the sediment is unusually coarse in which case the weight is increased to 1 kg. Samples are placed in the same type of Kraft paper bag as are employed in soil sampling. Water samples are taken at all appropriate sites. Approximately 100 mls are sampled and placed in a clean, screw sealed, polythene bottle. Observations are made at each site recording the environment and nature of the sample.

Kossbacher Laboratory
GEOCHEMICAL ANALYSTS & ASSAYERS

BURNABY, B.C.
CANADA
TELEPHONE 299 6910
AREA CODE 604

April 30, 1974

SUMMARY OF SOME ANALYTICAL TECHNIQUES CURRENTLY IN USE AT ROSSBACHER LABORATORY

A ANALYTICAL TECHNIQUES FOR GEOCHEMICAL SAMPLES

SAMPLE PREPARATION

Packages of samples are opened as soon as they arrive at the laboratory and the bags placed in numerical sequence in an electrically heated sample drier (maximum temperature 70°C).

After drying soil and sediment samples they are lightly pounded with a wooden block to break up aggregates of fine particles and are then passed through a 35 mesh stainless steel sieve. The coarse material is discarded and the minus 35 mesh fraction replaced in the original bag providing that this is undamaged and not excessively dirty.

Rock samples are exposed to the air until the outside surfaces are dry; only if abnormally wet are rocks placed in the sample drier. Rock samples are processed in such manner that a fully representative 1/2 g. sample can be obtained for analysis. The entire amount of each sample is passed through a jaw crusher and thus reduced to fragments of 2 mm. size or less. A minimum of 1 kg. is then passed through a pulverizer with plates set such that 95% of the product will pass through a 100 mesh

Rock Chips

Composite rock chip samples generally consist of some ten small fragments broken from unweathered outcrop with a steel hammer. Each fragment weighs some 50 gms. Samples are placed in strong polythene bags and sealed with non-contaminating wire tabs. Samples are restricted to a single rock type and obvious mineralization is avoided.

Soil, sediment and rock samples are packed securely in cardboard boxes or canvas sacks and dispatched by road or air.

Calibration

1. Set 1 gamma/ml to read 40 equivalent to 20 gamma/gm

   Factor $\frac{1}{2}$ x meter reading

   Check standards

   4, 10, 20, 40 ppm Ag in sample

2. Set 15 gamma/ml to 100 equivalent to 100 ppm

   Check standards

   40, 100 ppm

   Factor directly in ppm Ag

3. Rotate burner to maximum angle

   Set 10.0 gamma/ml Ag to read 100

   Check standards

   100, 200, 400, 1000 ppm Ag

   Factor 10x scale reading

4. Samples higher than 1000 ppm should be re-analyzed by assay procedure

5. Background correction for sample reading between 1 to 5 ppm

   Calibrate AA in step 1

   Dial wavelength to 300 (peak)

   Read the samples again

   Subtract the background reading from the first reading

Standards

1. 1000 gamma/ml Ag - 0.720 gm Ag_2SO_4 dissolved in 20 mls $Hx10_3$ and dilute to 500 mls

2. 100 gamma/ml Ag - 10 mls of above + 20 mls $HClO_4$, dilute to 100 mls

3. Recovery spiked standard

   5 gamma/ml Ag - 5 mls 100 gamma/ml dilute to 100 mls with "mixed" acid

Working AA Standards

Pipette .2, .5, 1, 2, 5, 10 mls of 100 gamma/ml and 2, 5 mls 1000 gamma/ml dilute to 100 mls with 20% $HClO_4$. This equivalent to 4, 10, 20, 40, 100, 200, 400, and 1000 ppm Ag in the sample .50 g diluted to 10 mls.

Recovery Standard

Pipette 2 mls of 5 gamma/ml Ag in mix acids into a sample and carry through the digestion. This should give a reading of 20 ppm Ag + original sample content.

Follow the general geochemical procedure for sample preparation and digestion.

For low assay Ag, the same procedure is used. Ag is then calculated in oz/ton.

1 ppm = .0292 oz/ton

conversion factor

oz/ton = .0292 x ppm Ag

person. Where samples are appreciably heavier than 2 kg the material is split after jaw crushing by means of a Jones splitter. After pulverizing the sample is mixed by rolling on paper and is then placed in a Kraft paper bag.

SAMPLE DIGESTION

Digestion tubes (100 x 16 mm) are marked at the 5 ml level with a diamond pencil. Tubes are cleaned with hot water and concentrated HCl. 0.5 g samples are weighed accurately, using a Fisher Dial-O-Gram balance, and placed in the appropriate tubes.

To each of the samples thus prepared are added 2 ml of an acid mixture comprising 15% nitric and 5% perchloric acids. Racks of tubes are then placed on an electrical hot plate, brought to a gentle boil (½ hour) and digested for 2½ hours. Samples unusually rich in organic material are first burned in a porcelain crucible heated by a bunsen burner before the acid mixture is added. Digestion is performed in a stainless steel fume hood.

After digestion tubes are removed from the hot plate and the volume is brought up to 5 ml with deionized water. The tubes are shaken to mix the solution and then centrifuged for one minute. The resulting clear upper layer is used for Cu, Mo, Pb, Zn, Ag, Fe, Mn, Ni and Co determination by a Perkin-Elmer 290 atomic absorption spectrophotometer. Analytical procedures are given on the following pages.

ANALYTICAL PROCEDURES

Silver

1. Scope - This procedure covers a range of silver in the sample from less than .5 to 1000 ppm
2. Summary of Method - The sample is treated with nitric and perchloric acid mixture to oxidize organics and sulphides. The silver then is present as perchlorate in aqueous solution. The concentration is determined by atomic absorption spectrophotometer
3. Interferences - Silver below 1 gamma/ml is not very stable in solution. Maintaining the solution in 20% perchloric prevents silver being absorbed on the glass container. Determination must be completed on the same day as the digestion.

   Samples high in dissolved solids, especially calcium, cause high background absorbance. This background absorbance must be corrected using an adjacent Ag line.

Silver AA Settings P.E. 290

Lamp - Ag

Current 4 ma position 3

Slit 7 A

Wavelength 3231A Dial 287.4

Fuel - acetylene - flow - 14

Oxidant - air - flow - 14

Burner - techtron AB 51 in line

Maximum Conc. 3 to 4x

Mn Geochemical AA Setting

Lamp Multi element Ca, Ni, Co, Mn Cr

Current 10 #4 Slit 7A

Wave length 4030.8 Dial 425.2

Fuel - Acetylene Flow 14.0

Oxidant - Air Flow 14.0

Burner - P.E. short path (or AB 50)

Range

0 - 100 gamma/ml Factor 20x - 0 to 2000 ppm

0 - 200 gamma/ml Factor 40x - 0 to 4000 ppm

Burner 90°

0 - 1000 gamma/ml Factor 200x - 0 to 20,000 ppm

0 - 2000 gamma/ml Factor 400x - 0 to 40,000 ppm

EDTA Extraction - use AB 51 in line

0 - 20 gamma/ml Factor 4x - 0 to 400 ppm

Standards

Fisner 10,000 gamma/ml (ml)

10x Dilution 1000 gamma/ml

Pippette

.5, 1, 2, 3, 5, 8, 10, ml of 1000 gamma/ml

2, 3, 5, 8, 10, 15, 20 ml of 10,000 gamma/ml dilute to 100 mls with 20% $HClO_4$. This gives

5, 10, 20, 30, 50, 80, 100, 200, 300, 500, 800, 1000, 1500, 2000 gamma/ml

Mo Geochemical AA Setting

Lamp ASL H/C Mo

Current 5 #5 Slit 7A

Wavelength 3133 Dial 260.2

Fuel - Acetylene Flow 12.0 to give 1" red feather

Oxidant - Nitrous oxide Flow 14.0

Burner - AB 50 in line

Caution read the operation using N_2O and acetylene flame at end of general AA procedure

Range

0 - 10 gamma/ml Factor 2x - 0 to 200 ppm

Rotate burner to max. angle

0 - 50 gamma/ml Factor 10 x 0 to 1000 ppm

0 - 100 gamma/ml Factor 20 x 0 to 2000 ppm

Standards 1000 gamma/ml

Dissolve .750 gms MoO_3 (acid molybdic) with 20 mls H_2O, 6 lumps NaCH, when all dissolved, add 20 mls HCl, dilute to 500 mls

100 gamma/ml - 10 x dilution

Pipette

.2, .5, 1, 2, 3, 5, 8, 10 mls of 100 gamma/ml

2, 3, 5, 8, 10 mls of 1000 gamma/ml add 5 mls 10% $AlCl_3$ and dilute to 100 mls with 20% $HClO_4$

This gives

.2, .5, 1, 2, 3, 5, 8, 10, 20, 30, 50, 80, 100 gamma/ml Mo

Zn Geochemical AA Setting

Lamp Zn

Current 8 #3 Slit 20A

Wave length 2133 Dial 84.9

Fuel - Acetylene Flow 14

Oxidant - Air Flow 14

Burner - P.E. short path 90°

Range

0 - 20 gamma/ml Factor 4x - 0 to 400 ppm

0 - 50 gamma/ml Factor 10x -0 to 1000 ppm

For Waters - Burner AB- 51 in line 1 gamma/ml read 100 to give 0 to 1000 ppb

High Zn Burner Boling in line. Wavelength 3075. Dial 250 Slit 7A

Fuel 14 Air 14.5

0 to 1000 gamma/ml read 0 to 20 Factor 400 x

Pure Standard 10,000 gamma/ml

1 gm Zn dissolved, H_2O, HCl, HNO_3, $HClO_4$, fumed to $HClO_4$ - make up to 100 mls H_2O

1000, 100 gamma/ml and 100 ml by dilution in 20 % $HClO_4$

0 to 200 gamma/ml Zn use combined Cu, Ni, Co, Pb, Zn standards

Pipette

1, 2, 3, 5, 8, 10 mls of 10,000 gamma/ml - dilute to 100 mls with 20% $HClO_4$ to give

100, 200, 300, 500, 800, 1000 gamma/ml Zn for high standards

Co Geochemical AA Setting

Lamp - 5 multi element

Current 10 #4 Slit 2A

Wavelength 2407 Dial 133.1

Fuel - Acetylene Flow 14

Oxidant - Air Flow 14

Burner - AB 51 in line

Range

0 - 10 gamma/ml read 100 Factor 2 x reading to 200 ppm

0 - 20 gamma ml read 100 Factor 4 x reading to 400 ppm

Burner at maximum angle

0 - 100 gamma/ml read 100 Factor 20 x reading to 2000 ppm

0 - 200 gamma/ml read 100 Factor 40 x reading to 4000 ppm

Standards - 1000 gamma/ml

1.000 gm cobalt metal dissolved in HCl, HNO, and fumed into $HClO_4$, dilute to 1 liter

Pipette

1, 2, 10, 20 mls into 100 ml vol flasks diluted to mark with 20% $HClO_4$

This gives

10, 20, 100, 200 gamma/ml Co

Mixed - combination standards of Cu, Ni, Co, Pb, Zn

of

1, 2, 5, 10, 20, 30, 50, 80, 100, 150, 200 gamma/ml are used for calibration

Cu Geochemical AA Setting

Lamp Single Cu or

5 multi element

Current 10 for multi element #4 Slit 7A

4 for single #3 Slit 7A

Wavelength 3247 Dial 280

Burner Techtron AB 51 (For Cu in natural waters)

P.E. Short Path (For geochem)

Fuel Acetylene Flow 14

Oxidant Air Flow 14

Range

0 - 5 gamma/ml Factor 1x to 100 ppm (for low Cu)

0 - 20 gamma/ml Factor 4x to 400 ppm

Burner 90°

0 - 200 gamma/ml Factor 40x to 4000 ppm

Wavelength 2492 Dial 147

Burner in line

Range

0 - 1000 gamma/ml Factor 200x to 20,000 ppm

0 - 2000 gamma/ml Factor 400x to 40,000 ppm

Higher range than 40,000 ppm requires 10x dilution

Standards

10,000 gamma/ml

1.000 gm metal powder, H_2O, HCl, HNO_3 until dissolved, add $HClO_4$, fume dilute to 100 mls

1000 gamma/ml 10x dilution above in 20% $HClO_4$

2000 gamma/ml 20 mls 10,000 gamma/ml - dilute to 100 mls in 20% $HClO_4$

100 gamma/ml 10x dilution 1000 gamma/ml dilute to 100 mls in 20% $HClO_4$

200 gamma/ml 10x dilution 2000 gamma/ml dilute to 100 mls in 20% $HClO_4$

Pipette

1, 2, 3, 5, 8, 10 mls 100 gamma/ml - dilute to 100 mls with 20% $HClO_4$ to give 1, 2, 3, 5, 8, 10 gamma/ml

Combined standards Cu, Ni, Co, Pb, Zn

1, 2, 5, 10, 20, 30, 50, 80, 100, 150, 200 gamma/ml

Fe Geochemical AA Setting

Lamp - Fe

- Do not use multi element Fe

Current 10 #4 Slit 2A

Wavelength 3440.6 Dial 317.5

Fuel - Acetylene Flow 14.0

Oxidant - Air Flow 14.0

Burner - PE Short Path 90°

Range

0 - 5000 gamma/ml 0.1 x % - 0 to 10.0%

0 - 10,000 gamma/ml 0.2 x % - 0 to 20.0%

Higher Fe - 10 x dilution

Standards 10,000 gamma/ml

Weigh 5.000 gms iron wires, into beaker, add H_2O, HCl, HNO_3, $HClO_4$, heat to $HClO_4$ fumes. Add $HClO_4$ to 100 mls + 100 mls H_2O, warm, dilute to 500 mls

Pipette

1, 5, 10, 20, 30, 50, 80 mls 10,000 gamma/ml dilute to 100 mls with 20% $HClO_4$ to give

100, 500, 1000, 2000, 3000, 5000, 8000 gamma/ml to be equivalent to .2, 1.0, 2.0, 4.0, 6.0, 10.0%, 16.0% Fe in geochem sample

Ni Geochemical AA Setting

Lamp P.E. H/C. Ni or multi element Cu, Ni, Co, Mn, Cr

Current 10 #4, Slit 2A

Wave length 3415 Dial 312.5

Fule - Acetylene Flow 14.0

Oxidant - Air Flow 14.0

Burner AB 51 in line

Range

0 - 20 gamma/ml Factor 4x - 0 - 400 ppm

0 - 100 gamma/ml Factor 20x - 0 - 2000 gamma

45° 0 - 200 gamma/ml Factor 40x - 0 - 4000 ppm

0 - 500 gamma/ml Factor 100x - 0 - 10,000 ppm

Ni in waters and very low ranges

Wave length 2320 Dial 113

Range 0 - 5 gamma/ml Factor 1x - 0 - 100 ppm

Standards 10,000 gamma/ml

1.000 gm pure Ni metal dissolved in HCl, HNO_3, $HClO_4$ to perchloric fumes, dilute to 100 ml H_2O

1000 gamma/ml and 100 gamma/ml Successive 10x dilutions in 20% $HClO_4$

1, 2, 5, 8, 10 mls of 100 gamma/ml

2, 5, 8, 10 mls 1000 gamma/ml

2, 5, 8, 10 mls 10,000 gamma/ml - dilute to 100 mls in 20% HClO4. This gives

1, 2, 5, 8, 10, 20, 50, 80, 100, 200, 500, 800, 1000 gamma/ml S

Combined Standards - Cu, Ni, Co, Pb, Zn is used as a working standard

2. Sinter in rotary for 2 to 3 minutes (Flux dull read for one minute)
3. Cool, add 10 mls H_2O, heat in sand bath to boiling, cool, let sit overnight
4. Stir, crush, and mix. Let settle
5. Take 2 ml aliquot into screw cap test tube
6. Add 7 mls $SnCl_2$, heat in hot water bath for 5 minutes (80°C)
7. Cool to less than 15°C
8. Add 1 ml 20% KSCN, mix (if lemmon yellow; compare color standard 10x)
9. Add ½ ml extractant, cap, shake vigorously 1 minute
10. Compare color

Molybdenum in Water Samples

1. Transfer 50 mls to 125 separatory funnel
2. Add 5 ml .2% ferric chloride in conc HCl
3. Add 5 mls of mixed KSCN and $SnCl_2$
4. Add 1.2 mls isopropyl ether, shake for 1 minute, and allow phases to separate
5. Drain off water
6. Compare the color of extractant

Standardization

Pipette 0, .2, .5, 1, 2, 3, 4, 5, mls of 1 gamma/ml and 1, 1.5, 2, mls of 10 gamma/ml dilute to 50 mls with demineralized H_2O, a continue step #2.

This is equivalent to -

1, 4, 10, 20, 40, 60, 80, 100, 200, 300, 400 ppb Mo

Artificial color - Nabob orange extract dilute with 1:1 H_2O to methanol to match. Seal tightly

$SnCl_2$ - 15% in 15% HCl

300 gm $SnCl_2 \cdot 2H_2O$ + 300 mls HCl, until $SnCl_2$ dissolved dilute to 2 liters

KSCN - 5% in H_2O

Mixed $SnCl_2$ - KSCN

3 parts $SnCl_2$ to 2 parts KSCN

Pb Geochemical AA Setting

Lamp ASL H/c Pb

Current 5 ma Slit 7A

Wave length 2833 Dial 208

Fuel - acetylene Flow 14

Oxidant - air Flow 14

Burner AB 51 in line

Range

0 - 20 gamma/ml to read 0 to 30. Factor 5x 0 to 500 ppm

0 - 200 gamma/ml to read 0 to 80. Factor 50x 0 to 5000 ppm

Standards - 10,000 gamma/ml

1.000 pure metal, dissolved in HNO_3, fumed to $HClO_4$ make up to 100 mls in 20% $HClO_4$

1000 gamma/ml and 100 gamma/ml Successive 10x dilutions in 20% $HClO_4$

Pipette

1, 2, 5, 8, 10 mls 100 gamma/ml

2, 5, 8, 10, 20 mls 1000 gamma/ml dilute to 100 mls in 20% $HClO_4$ this gives

1, 2, 5, 8, 10, 20, 50, 80, 100, 200 gamma/ml

Combined Standards Cu, Ni, Co, Pb, Zn, are used as working standards

W in Soils and Silts

Reagents and apparatus

Test tubes - pyrex disposable

Test tubes - screw cap

Bunsen Burner

Flux - 5 parts Na_2CO_3

4 parts NaCl

1 part KNO_3 pulverized to -80 mesh

7% $SnCl_2$ in 70% HCl

20% KSCN in H_2O

Extractant - 1 part tri-n-butyl phosphate

9 parts carbon tetrachloride

Standards

1000 gamma/ml W

.18 gms Na_2WO_4 $2H_2O$ dissolved in H_2O, make up to 100 mls

100 gamma/ml, 10 gamma/ml by dilution

Standardization

Pipette .5, 1, 2, 3, 5, 8, 10 ml of 10 gamma/ml and 1.5, 2 mls of 100 gamma/ml - dilute to 10 mls

continue from step #4

Artificial colors - Nabob pure Lemon Extract, dilute with 1:1 ethanol and water to match. Tightly seal these for permanent standards

Procedure

1. Weigh 1.0 gram sample, add 2 gm flux, mix

Water Samples Run for AA

1. Cu - 2 gamma/ml reads 80 scale therefore 1 unit = 25 ppb
2. Zn - 1 gamma/ml reads full scale therefore 1 unit = 10 ppb
3. Ni - 2.5 gamma/ml reads 50 scale therefore 1 unit = 50 ppb

Burner: long slot techtron burner in line

Sulphate in Natural Waters

1. Pipette 0.5 ml sulphate reagent mix into a colorimetric tube
2. Add 5 ml water sample and mix
3. Read at 343 mμ against a demineralized water blank
4. Read again at 400 mμ and subtract from sulphate reading
5. Calculate ppm sulphate from the graph

Reagent

Dissolve 54 grams red mercuric oxide (J.T. Baker 2620- Can Lab) in 185 ml 70% perchloric acid and 20 ml H_2O, shake for one hour. Add 46.3 grams ferric perchlorate [$Fe(ClO_4)_3 \cdot 6H_2O$] (GFS 39) and 47 grams aluminum perchlorate [$Al(ClO_4)_3 \cdot 3H_2O$] (GFS 2) Add 400 ml water to dissolve, let settle overnight, decant into bottle and make to 1 liter

pH MEASUREMENTS

Soil and drainage sediment samples are dampened with water in a glass beaker to a pasty consistency. Demineralized water is used for this purpose as it has a low buffer capacity and thus does not influence the pH of the sample. Measurement is made with a Fisher Acument pH meter. Electrodes are stored in buffer overnight. A 30 minute warm up time is allowed for the instrument each morning. A 10 ml aliquot is taken from water samples for pH measurement.

ROSSBACHER LABORATORY

P. Rossbacher

APPENDIX III

STATEMENT OF QUALIFICATIONS

APPENDIX III

A.C. Hitchins

601-535 Thurlow Street, Vancouver, B.C. V6E 3L6

Education - University of Toronto - B.A. Sc. 1970
University of Toronto - M.Sc. 1973

Experience- AMAX of Canada Limited - Staff Geologist - 1972 to present

G.O. Skok

2279 Berkley Road, North Vancouver, B.C. V7H 1Z6

Education - Windsor Secondary - Grade 12

Experience- AMAX of Canada Limited - Junior Assistant - 1980 Field Season

G.W. Booth

509-30 Charles Street West, Toronto, Ontario M4Y 1R5

Education - Secondary - University of Toronto Schools 1969-1973
Tertiary - Western Australian Institute of Technology, 1973-1974 University of Toronto, 1974-1980; B.Sc. Geology 1978, M.Sc. Geology 1981.
Scholarships - Rotary International Student Exchange Scholarship to Perth, Western Australia, to attend the Western Institute of Technology.
M.Sc. Thesis Topic - The Pamiutuq Lake Batholith; a large (700 sq. km.) hypabyssal porphyritic acidic intrusion of Paleohelikan age located in the Baker Lake Basin of the N.W.T. A petrological, geochemical and geophysical evaluation of the body has been undertaken as part of a 1:250,000 scale regional mapping project of the Basin itself, initiated by the Geological survey of Canada in 1976.

Experience - 1973 - Undergroundand surface labourer, Agnico Eagle Gold Mines Ltd.
1975 - Junior Geologist, Camflo Mines Ltd.
1976 - Junior Geologist, Hollinger Mines Ltd. Labrador Mining Ltd.
1977 - Junior Geologist, United Siscoe Mines Ltd.
1978 - Senior Geologist, Geological Survey of Canada, Precambrian Division

(cont'd)

1979 - Senior Geologist, Geological Survey of Canada, Precambrian Division
1980 - Senior Geologist - AMAX of Canada Limited - 1980 Field Season

APPENDIX IV

STATEMENT OF COSTS

APPENDIX IV

Field work on the Heap 1 and Heap 2 claims was conducted between June 8th and June 15th, 1980. Report preparation required two days in early September, 1980.

Personnel Employed

G.W. Booth	- 509-30 Charles Street West, Toronto, Ontario Senior Geologist; 10 days @ 74.96/day	749.60
G.O. Skok	- 2279 Berkley Road, North Vancouver, B.C. Junior Assistant; 10 days @ 33.51/day	355.10

Board and Camp Supplies

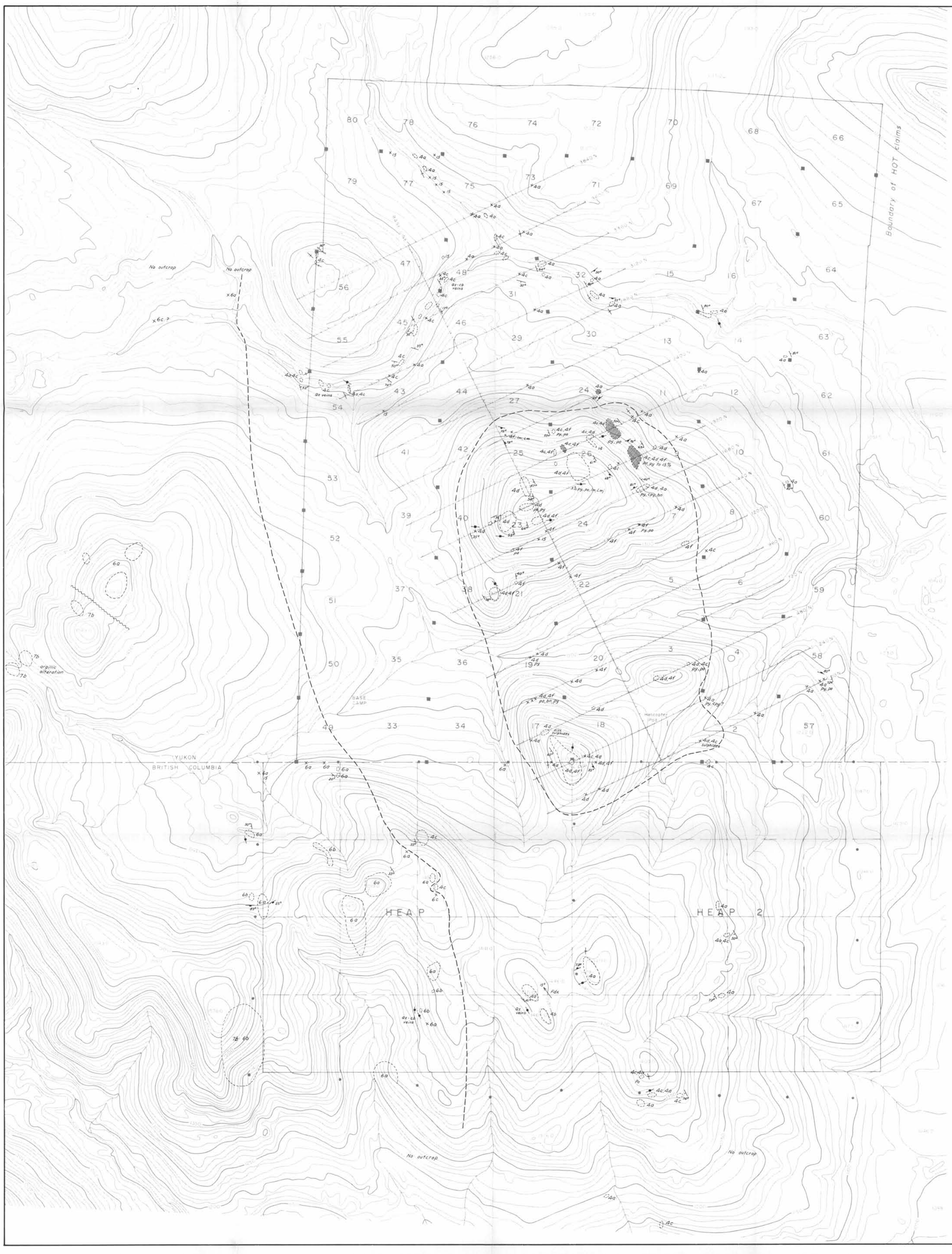
20 man days @ 25/day	250.00

Helicopter

Frontier Helicopters Ltd.	- Invoice #6367	593.96
Frontier Helicopters Ltd.	- Invoice #6378	412.50

Geochemistry - Rossbacher Laboratory Ltd. Invoice #0203 & #0282
27 samples analysed for Mo, Cu, Fe, Ag, Pb, Zn, Au and W at 8.55/sample 230.85

$2,592.01



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LEGEND

CRETACEOUS

- 15 Quartz - feldspar porphyry
- 14 Diabase, syenodiorite ?

UPPER DEVONIAN AND LOWER MISSISSIPPIAN

- 7b Greywacke, arkosic grit, chert pebble conglomerate, argillite

MIDDLE SILURIAN AND MIDDLE DEVONIAN

- 6a Quartzite, dolomitic quartzite
- 6b Limestone, siliceous limestone
- 6c Quartz breccia

MIDDLE CAMBRIAN TO MIDDLE SILURIAN

- 4a Brown argillite, limey siltstone, calcilutite, cherty siltstone
- 4b Limestone, marble, siliceous limestone
- 4c Intercalated maroon argillite and carbonate or calc silicate bands
- 4d Banded calc silicate skarn
- 4e Calc silicate skarn and hornfelsed argillite
- 4f Dark green diopsidic, tremolitic calc silicate, skarn

SYMBOLS

- Outcrop, subcrop, boulders
- Geological contact (defined)
- Geological contact (interpreted)
- Bedding, or banding, inclined, vertical
- Jointing, inclined, vertical
- Fold axis
- Shear zone, inclined, vertical
- Fault
- Iron stain, gossan
- Grid picket line
- Legal corner post, claim boundary
- Claim unit boundary
- Claim unit identification post
- Claim post
- Property boundary
- Stream
- 1250 Topographic contour (contour interval 10 metres)

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
8534
NO.

AMAX OF CANADA LIMITED

TOOTSEE RIVER PROPERTY

HOT CLAIMS

WATSON LAKE MINING DISTRICT - YUKON TERRITORY

HEAP CLAIMS

ATLIN MINING DIVISION BRITISH COLUMBIA

Anthony Hitchins
Nov 12, 1980

GEOLOGICAL MAP

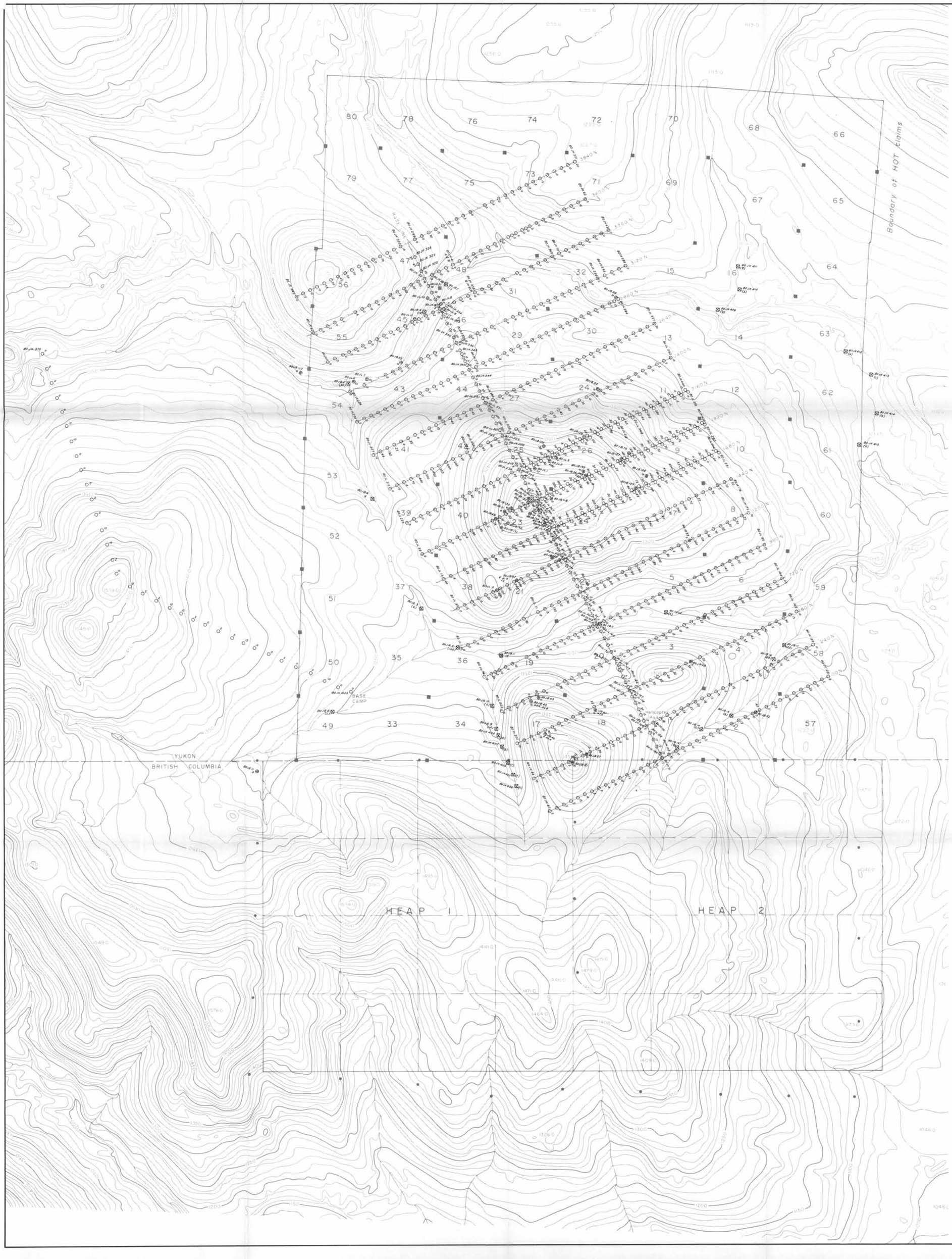
400 0 400 METRES
1200 0 1200 FEET
1:10,000

To accompany 1980 Assessment Report by: A.C. Hitchins and G.W. Booth.

Vancouver

N.T.S. Ref. 104 O 16, 105 B 1

FIG. 3



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SYMBOLS

- Soil, Rock chip } Sample site, sample number, p.p.m. W
- Pan sample-number of grains of scheelite in concentrate
- Grid picket line
- Legal corner post, claim boundary
- Claim unit boundary
- Claim unit identification post
- Claim post
- Property boundary
- Stream
- 1250 Topographic contour (contour interval 10 metres)

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FIG. 4