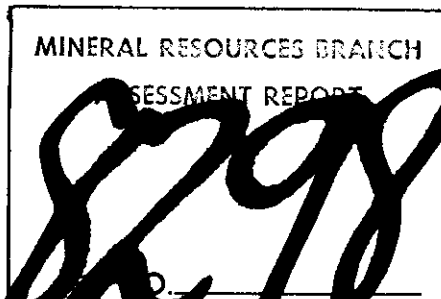


NORCEN ENERGY RESOURCES LIMITED  
ASSESSMENT REPORT  
GEOCHEMICAL PROGRAM  
GROUP XXIII  
GOLDEN MINING DISTRICT  
BRITISH COLUMBIA

CLAIMS: WCL, WC3  
LOCATION: 45 km south of Golden, British Columbia  
LATITUDE: 50° 55' N  
LONGITUDE: 116° 44' W



L. Smith, P. Geol.  
A. Slingsby

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*[Handwritten signature]*

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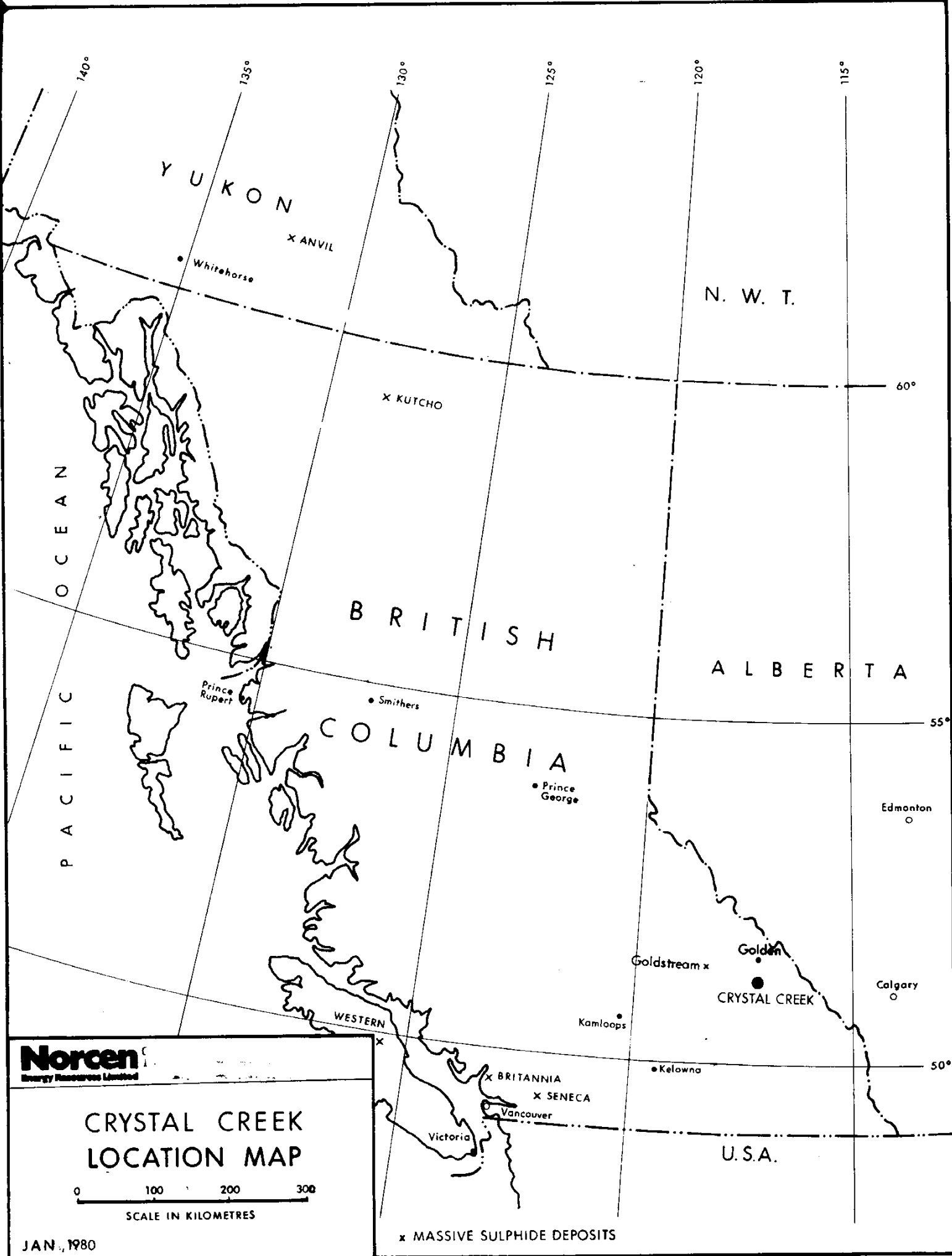
## SUMMARY

A total of 958 soil samples, 96 stream sediment samples and 26 rock samples were collected during a reconnaissance geochemical survey of the Crystal Creek property. The soil and stream sediments were analyzed for their content of iron, manganese, lead, zinc, copper and silver. Rock samples were analyzed by induction coupled argon plasma spectrometry for nine major oxides and 15 minor and trace elements. Of these samples 52 soil, 4 stream sediment and 2 rock samples were taken within the boundaries of Group XXIII. An 1:20,000 orthophoto produced from 1976 Energy, Mines and Resources aerial photograph by North West Survey Corporation International Ltd. of Edmonton, Alberta, was used for control of sampling points. The samples were taken on May 18, 24, June 10 and 11.

Soil samples were taken from B horizon where available. Notes as to topograph, vegetation, drainage, soil types, etc. were taken. Stream samples were taken where available. Rock samples were taken where soil was not available or where the rock appeared to have an anomalous metal content. The samples are generally of shale.

## LOCATION AND ACCESS

The claims are located in the Purcell Mountains approximately 45 kilometres south of Golden, British Columbia. Access to the property is by paved highway 95 to Parson, British Columbia and hence by 52 kilometres of logging road along Bobby Burns and Vowell Creeks.



**Norcen**  
Energy Resources Limited


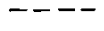
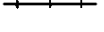


# CRYSTAL CREEK LOCATION MAP

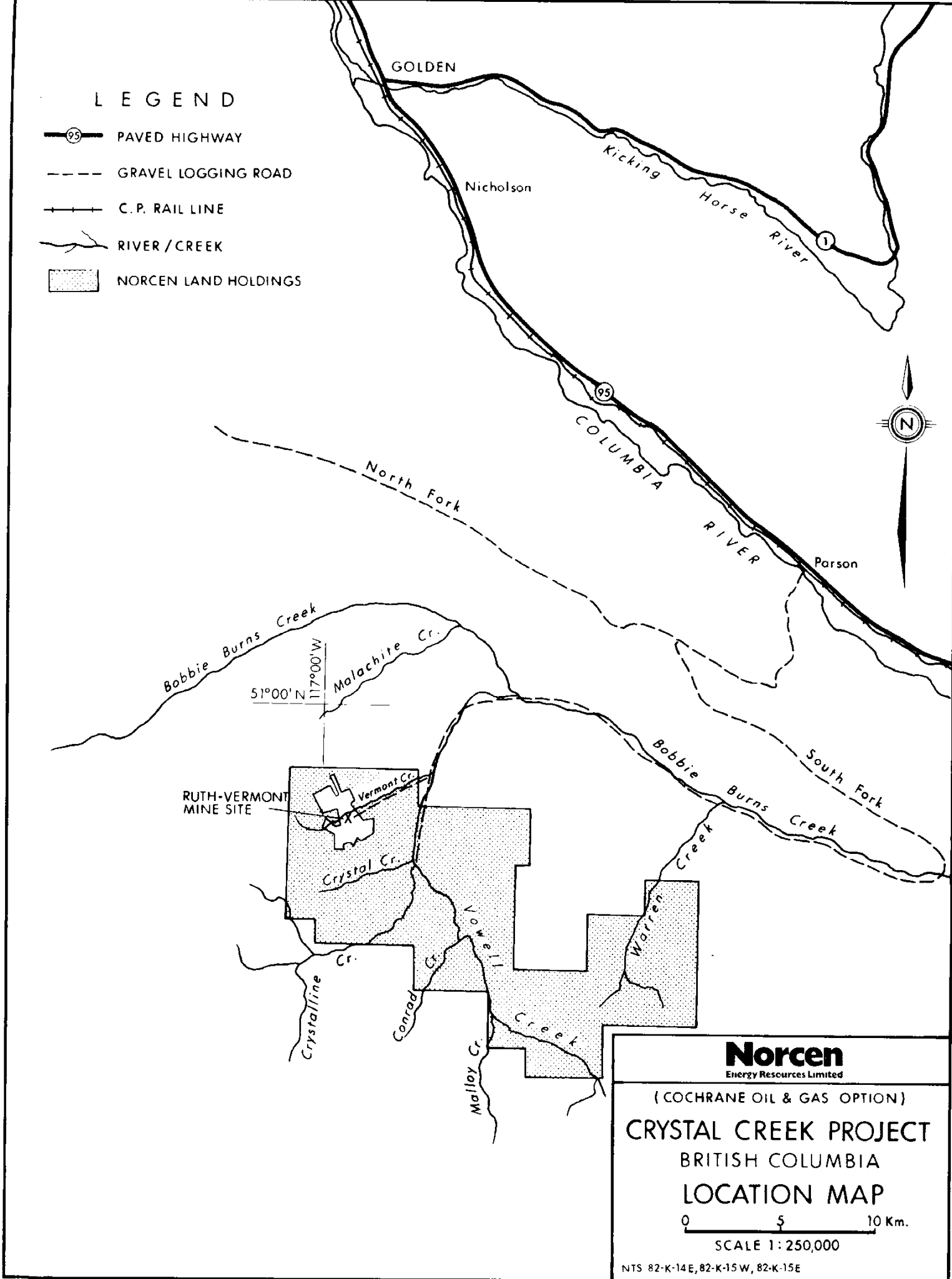


JAN., 1980

x MASSIVE SULPHIDE DEPOSITS

LEGEND

-  PAVED HIGHWAY
-  GRAVEL LOGGING ROAD
-  C. P. RAIL LINE
-  RIVER / CREEK
-  NORCEN LAND HOLDINGS



**Norcen**  
Energy Resources Limited

(COCHRANE OIL & GAS OPTION)  
**CRYSTAL CREEK PROJECT**  
BRITISH COLUMBIA  
**LOCATION MAP**

0 5 10 Km.

SCALE 1:250,000

NTS 82-K-14E, 82-K-15W, 82-K-15E

## CLAIMS STATUS

The WC1 and WC3 claims form part of the Crystal Creek property. They have been grouped together to form Group XXIII.

Claim Name	Record Number	Recorded Date	# of Units
WC1	306	June 18, 1979	20
WC3	308	June 18, 1979	20



## GEOCHEMICAL SAMPLING

A total of 52 soil samples, 4 stream sediment and 2 rock samples were collected on Group XXIII. All samples were sent to Barringer Magenta Limited of No. 105 3750 19th Street, N.E., Calgary, Alberta. The soil and sediment samples were analyzed for lead, zinc, silver, copper, iron and manganese by atomic absorption. The rock samples were analyzed by induction coupled argon plasma spectrometry for nine oxides;  $TiO_2$ ,  $Al_2O_3$ ,  $MnO$ ,  $CaO$ ,  $Na_2O$ ,  $K_2O$ ,  $P_2O_5$ ,  $MgO$  and  $Fe_2O_3$  and fifteen minor and trace elements.

Statistical analysis of the data for the entire property produced the following means and standard deviations:

### Soils

	Mean	Standard Deviation
Ag (ppm)	.319	.25
Cu (ppm)	27.1	24.4
Pb (ppm)	22.4	54.3
Zn (ppm)	65.0	43.4
Mn (ppm)	344	478
Fe (%)	3.41	1.19

## Stream Sediments

	Mean	Standard Deviation
Ag (ppm)	.206	.132
Cu (ppm)	33.0	22.8
Pb (ppm)	13.5	8.7
Zn (ppm)	52.0	31.3
Mn (ppm)	372	192
Fe (ppm)	4.15	1.28

Analysis of the soil samples from Group XXIII showed that the area was somewhat low in metal content excepting manganese. Copper content was low in most samples but there were a number with moderately or highly anomalous copper contents. The stream sediment samples reflected similar results excepting one very high lead value (2026S).

ITEMIZED STATEMENT OF EXPENDITURES

A. SALARIES

A. Slingsby - Supervision - May 31	\$ 125 00
Geochemical Sampling May 18, 24, June 10, 11	500 00
J. Gillian - Project Preparation - March 14	175 00
P. Collender - Geochemical Sampling - May 24	125 00
B. Hettinga - Geochemical Sampling - May 18	90 00
R. Pryde - Geochemical Sampling - May 24, June 10	180 00
D. Meyer - Geochemical Sampling - May 24	90 00
B. Wasylyshyn - Geochemical Sampling - June 11	90 00

B. ACCOMMODATION AND MEALS

11 man days @ \$41/day	451 00
------------------------	--------

C. TRANSPORTATION

Truck rental 3 days @ \$23.50/day	70 50
Helicopter 1.8 hrs. @ \$408/hr.	734 40

D. ASSAYING AND ORTHOPHOTO

52 soils @ \$6/sample	312 00
4 streams @ \$5/sample	20 00
2 rocks @ \$20/sample	40 00
40 units (photo) @ \$10/unit	<u>400 00</u>

TOTAL EXPENDITURES	<u>\$3 402 90</u>
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STATEMENT OF QUALIFICATIONS

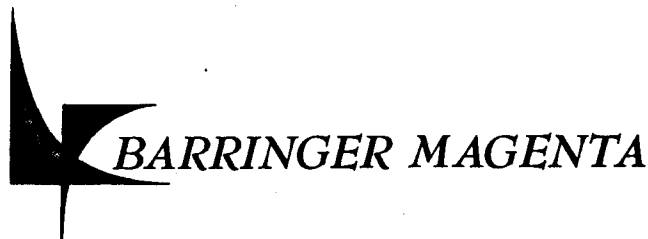
I, Laurie James Smith, of the City of Calgary in the Province of Alberta, do hereby state:

1. I am a graduate of the University of Calgary with a B Sc degree in Geology.
2. I have been involved in all phases of geological exploration in many areas of Canada (British Columbia, Alberta, Saskatchewan, Northwest Territories, Ontario, Quebec, Nova Scotia and New Brunswick) since graduation.
3. I supervised the geochemical soil sampling on Group XXIII.
4. I am a member of the Association of Professional Engineers, Geologists, and Geophysicists of Alberta.
5. I am the holder of valid Free Miners License Number 197331.

Laurie J. Smith

APPENDIX I

ASSAY CERTIFICATES



BARRINGER MAGENTA LIMITED  
 OFFICES & MINERALS  
 LABORATORY:  
 3750 - 19th ST., N.E., SUITE 105  
 CALGARY, ALBERTA T2E 6V2  
 PHONE (403) 276-9701  
 TELEX 03-827584

AUTHORITY: ART SLINGSBY

02/SEP/80  
 PAGE 1 OF 6  
 WORK ORDER # NORCEN

NORCEN ENERGY RESOURCES  
 715-5TH AVE.S.W.  
 CALGARY, ALBERTA  
 T2F 2X7

SAMPLE GROUP #23

\*\*\*FINAL REPORT\*\*\*

G E O C H E M I C A L L A B O R A T O R Y R E P O R T

SAMPLE TYPE:  
 SOIL

SAMPLE NUMBER	AG PPM	CU PPM	FE %	MN PPM	PB PPM
2001	.3	23.	3.1	370.	16.
2002	.1	22.	2.9	780.	20.
2003	.1	32.	3.	2000.	25.
2004	.6	25.	3.5	220.	9.
2005	.1	27.	2.7	1500.	30.
2006	.2	16.	3.1	150.	8.
2007	N D	26.	3.1	400.	22.
2008	N D	49.	2.	2300.	23.
2009	.3	48.	2.3	600.	15.
2010	.2	40.	3.2	1700.	14.
2016	N D	19.	3.5	210.	8.
2017	.1	10.	3.5	120.	3.
2018	.2	14.	2.9	250.	21.
2019	N D	8.	2.7	90.	8.
2020	N D	42.	3.4	210.	7.
2021	.2	17.	3.	540.	15.
2022	N D	9.	3.7	150.	5.
2023	N D	13.	1.7	80.	4.
2024	N D	10.	3.9	200.	3.
2025	N D	28.	3.4	270.	4.
2026	.1	40.	3.5	310.	15.
2099	.2	125.	4.75	945.	72.
2100	.2	36.	4.29	1140.	79.
2101	.1	94.	4.15	670.	31.
2102	.7	225.	4.25	625.	45.
2103	N D	38.	4.25	495.	22.
2104	N D	11.	4.05	455.	6.
2105	.1	28.	4.15	715.	28.
2106	.2	17.	3.99	295.	6.
2111	.8	160.	4.35	940.	84.

\*P=QUESTIONABLE PRECISION; \*I=INTERFERENCE; IS=INSUFFICIENT SAMPLE  
 NA=NOT ANALYZED; ND=NOT DETECTED; NS=MISSING SAMPLE; T-TRACE



BARRINGER MAGENTA LIMITED  
 OFFICES & MINERALS  
 LABORATORY:  
 3750 - 19th ST., N.E., SUITE 105  
 CALGARY, ALBERTA T2E 6V2  
 PHONE (403) 276-9701  
 TELEX 03-827584

AUTHORITY: ART SLINGSBY

02/SEP/80  
 PAGE 2 OF 6  
 WORK ORDER # NORCEN

NORCEN ENERGY RESOURCES  
 715-5TH AVE.S.W.  
 CALGARY, ALBERTA  
 T2P 2X7

SAMPLE GROUP #23

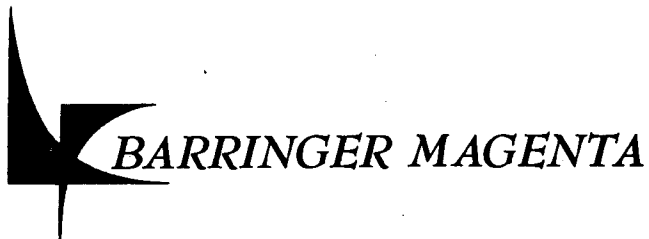
\*\*\*FINAL REPORT\*\*\*

G E O C H E M I C A L L A B O R A T O R Y R E P O R T

SAMPLE TYPE:  
 SOIL

SAMPLE NUMBER	AG PPM	CU PPM	FE %	MN PPM	PB PPM
2112	.4	38.	4.25	725.	34.
2113	.6	22.	.79	39.	8.
2114	.5	12.	2.95	207.	13.
2115	.3	13.	1.24	52.	12.
2116	.3	25.	3.85	753.	17.
2117	.4	33.	4.4	354.	11.
2118	.3	40.	3.88	451.	14.
3080	.2	110.	3.2	460.	31.
3081	N D	5.	1.5	120.	8.
3082	N D	15.	2.5	390.	13.
3083	.1	13.	2.5	140.	19.
5074	.5	13.	2.24	185.	7.
5075	.1	42.	4.3	420.	20.
5076	N D	66.	4.5	515.	20.
5077	.1	26.	2.52	350.	13.
5078	.2	11.	2.07	60.	13.
5079	.3	13.	1.92	65.	9.
5080	.2	9.	.75	135.	4.
5081	.5	12.	1.2	360.	6.
5082	.3	30.	.99	105.	2.
5083	.3	9.	2.42	90.	9.
5084	.3	19.	1.53	75.	7.

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AUTHORITY: ART SLINGSBY

02/SEP/80  
 PAGE 3 OF 6  
 WORK ORDER # NORCEN

NORCEN ENERGY RESOURCES  
 715-5TH AVE, S.W.  
 CALGARY, ALBERTA  
 T2E 2X7

SAMPLE GROUP #23

\*\*\*FINAL REPORT\*\*\*

G E O C H E M I C A L L A B O R A T O R Y R E P O R T

SAMPLE TYPE:  
 SOIL

SAMPLE NUMBER	ZN PPM
2001	60.
2002	62.
2003	68.
2004	64.
2005	61.
2006	51.
2007	59.
2008	80.
2009	46.
2010	67.
2016	54.
2017	48.
2018	44.
2019	15.
2020	62.
2021	61.
2022	59.
2023	26.
2024	60.
2025	74.
2026	71.
2099	91.
2100	65.
2101	80.
2102	84.
2103	80.
2104	74.
2105	83.
2106	78.
2111	78.





BARRINGER MAGENTA LIMITED  
OFFICES & MINERALS  
LABORATORY:  
3750 - 19th ST., N.E., SUITE 105  
CALGARY, ALBERTA T2E 6V2  
PHONE (403) 276-9701  
TELEX 03-827584

AUTHORITY: ART SLINGSBY

02/SEP/80  
PAGE 4 OF 6  
WORK ORDER # NORCEN

NORCEN ENERGY RESOURCES  
715-5TH AVE. S.W.  
CALGARY, ALBERTA  
T2P 2X7

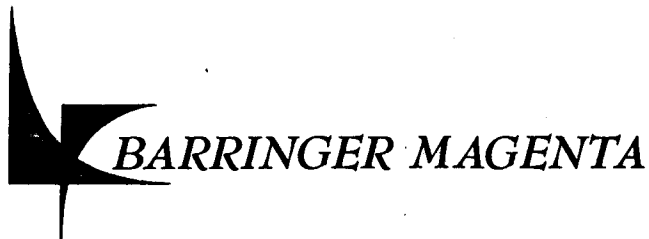
SAMPLE GROUP #23

\*\*\*FINAL REPORT\*\*\*

G E O C H E M I C A L L A B O R A T O R Y R E P O R T

SAMPLE TYPE:  
SOIL

SAMPLE NUMBER	ZN PPM
2112	75.
2113	14.
2114	40.
2115	13.
2116	72.
2117	75.
2118	67.
3080	65.
3081	26.
3082	69.
3083	44.
5074	28.
5075	70.
5076	75.
5077	54.
5078	20.
5079	16.
5080	6.
5081	8.
5082	7.
5083	24.
5084	11.



BARRINGER MAGENTA LIMITED  
 OFFICES & MINERALS  
 LABORATORY:  
 3750 - 19th ST., N.E., SUITE 105  
 CALGARY, ALBERTA T2E 6V2  
 PHONE: (403) 276-9701  
 TELEX: 03-827584

AUTHORITY: ART SLINGSBY

02/SEP/80  
 PAGE 5 OF 6  
 WORK ORDER # NORCEN

NORCEN ENERGY RESOURCES  
 715-5TH AVE. S.W.  
 CALGARY, ALBERTA  
 T2P 2X7

SAMPLE GROUP #23

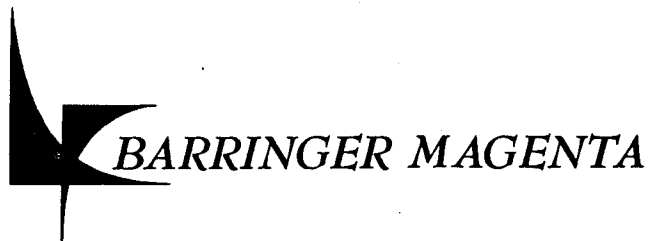
\*\*\*FINAL REPORT\*\*\*

G E O C H E M I C A L L A B O R A T O R Y R E P O R T

SAMPLE TYPE:  
 STREAM SEDIMENT

SAMPLE NUMBER	AG PPM	CU PPM	FE %	MN PPM	PE PPM
S 1000	N D	54.	3.38	450.	15.
1001	N D	34.	3.72	450.	15.
1002	N D	34.	4.4	340.	12.
2026	.3	100.	4.59	355.	59.

\*P=QUESTIONABLE PRECISION; \*I=INTERFERENCE; IS=INSUFFICIENT SAMPLE  
 NA=NOT ANALYZED; ND=NOT DETECTED; MS=MISSING SAMPLE; T=TRACE



BARRINGER MAGENTA LIMITED  
 OFFICES & MINERALS  
 LABORATORY:  
 3750 - 19th ST., N.E., SUITE 105  
 CALGARY, ALBERTA T2E 6V2  
 PHONE: (403) 276-9701  
 TELEX: 03-827584

AUTHORITY: ART SLINGSBY

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 PAGE 6 OF 6  
 WORK ORDER # NORCEN

NORCEN ENERGY RESOURCES  
 715-5TH AVE.S.W.  
 CALGARY, ALBERTA  
 T2P 2X7

SAMPLE GROUP #23

\*\*\*FINAL REPORT\*\*\*

G E O C H E M I C A L L A B O R A T O R Y R E P O R T

SAMPLE TYPE:  
 STREAM SEDIMENT

SAMPLE NUMBER	ZN PPM
S	
1000	64.
1001	70.
1002	68.
2026	75.

WO NO:80-0457 ANALYSIS DATE: 09/07/80 MATRIX: HF

FILE:T0-0457

SAMPLE ID	AL2O3 %	FE2O3 %	CaO %	SiO2 %	TiO2 %	MnO2 %	Na2O %	K2O %	P2O5 %
1146-R	22.8	8.76	.277	2.87	.402	.0821	.771	4.13	.13
2001-R	10.9	7.35	.124	.989	.282	.0243	.315	2.93	.14
2002-R	5.73	5.09	.512	.570	.0590	.110	.623	.932	.03
2003-R	11.3	7.19	1.05	2.14	.243	.229	.064	1.41	.06
2004-R	22.3	10.6	1.45	3.63	.533	.374	1.25	3.23	.11
5001-R	24.8	11.1	.213	3.34	.598	.119	1.06	3.58	.15
5002-R	21.8	9.24	.114	2.81	.571	.0673	.900	4.07	.09
5003-R	23.6	10.3	.084	2.19	.460	.118	1.05	3.17	.13
5004-R	7.84	4.76	1.37	.407	.103	.0871	1.40	.722	.02
1187-R	14.1	5.13	.119	2.97	.385	.0313	1.97	2.14	.05
1189-R	10.6	7.40	.090	2.48	.394	.0522	1.85	1.23	.05
1194-R	13.1	4.79	.078	1.58	.693	.0385	1.19	2.04	.03
2005-R	14.3	13.3	3.29	3.19	.422	.695	.755	1.63	.02
2006-R	15.6	10.7	3.19	3.18	.420	.761	.750	2.33	.06
2007-R	9.16	8.74	20.4	9.52	.166	2.12	.336	2.40	.18
2008-R	26.1	6.31	.169	1.98	.547	.0514	1.24	4.53	<.01
2009-R	24.1	8.77	.061	3.14	.565	.0513	1.12	3.58	.05
2010-R	24.5	12.8	.584	2.46	.313	2.28	1.02	3.83	.20
3001-R	8.61	4.03	.081	1.34	.126	.0574	2.82	.647	.03
3002-R	.625	1.12	.022	.0355	.0034	.0188	<.003	.102	<.01
3003-R	.592	2.82	.865	.0804	.0029	.0150	<.003	.118	.52
3004-R	.464	3.98	.048	.0277	.0033	.0536	<.003	.075	<.01
3005-R	1.95	38.5	.003	.0325	.0232	.0091	.019	.465	<.01
3006-R	4.60	6.28	2.15	1.07	.0545	.124	.185	.903	.07
5005-R	4.71	1.96	.774	.216	.0435	.0813	1.72	.405	.01
5006-R	19.3	8.64	.102	2.42	.416	.142	1.30	3.11	.09
5007-R	9.56	4.65	.470	1.24	.356	.0610	2.09	1.05	.04
5008-R	22.7	8.03	.168	2.38	.423	.105	1.21	3.66	.15

WO NO:80-0457 ANALYSTS DATE: 09/07/80 MATRIX: HF

FILE:T0-0457

SAMPLE ID	HF PPM	CD PPM	CR PPM	CO PPM	CU PPM	PH PPM	NI PPM	AG PPM
1146-R	2.0	<7	385	31	14.9	<5	68	<5
2001-R	1.2	<7	2240	40	27.4	35	26	<5
2002-R	.7	<7	1890	57	27.7	30	44	<5
2003-R	.9	<7	1180	46	68.1	<5	57	<5
2004-R	2.1	<7	322	46	45.5	15	95	<5
5001-R	2.4	<7	178	30	35.7	<5	78	<5
5002-R	2.0	<7	414	25	30.1	500	71	<5
5003-R	2.4	<7	341	24	33.9	<5	73	<5
5004-R	.7	7	1090	26	23.2	<5	36	<5
1187-R	1.3	<7	1120	28	7.1	<5	53	<5
1189-R	.6	<7	1700	36	23.1	15	60	<5
1194-R	1.5	<7	1130	29	9.1	<5	41	<5
2005-R	1.2	<7	502	38	47.6	10	88	<5
2006-R	1.6	<7	576	33	82.0	20	77	<5
2007-R	.9	10	84.9	17	5.1	70	32	<5
2008-R	3.5	<7	369	<4	8.1	10	40	<5
2009-R	2.5	<7	189	18	25.1	<5	58	<5
2010-R	2.9	<7	82.7	67	57.9	5	118	<5
3001-R	.8	<7	1120	23	9.5	25	37	<5
3002-R	.1	36	1480	23	833	41000	13	462
3003-R	.1	442	887	17	2000	10000	15	493
3004-R	.2	43	4560	64	9560	17200	47	263
3005-R	.4	<7	1100	152	94.3	1450	152	12
3006-R	.7	<7	1250	25	37.6	430	39	<5
5005-R	.2	<7	1580	24	8.9	165	17	<5
5006-R	2.1	<7	455	31	25.8	40	60	<5
5007-R	.6	<7	1240	31	2.9	75	39	<5
5008-R	2.5	<7	224	22	32.2	115	58	<5

WO NO:80-0457 ANALYSIS DATE: 09/07/80 MATRIX: HF

FILE:T0-0457

SAMPLE ID	SR PPM	TH PPM	7R PPM	V PPM	7N PPM	MO PPM
1146-R	68.3	23	80	100	93	<30
2001-R	41.8	20	56	124	27	40
2002-R	28.4	14	15	99.7	28	30
2003-R	48.9	18	49	103	72	40
2004-R	123	28	94	114	116	30
5001-R	110	22	97	118	112	<30
5002-R	43.3	19	119	120	114	<30
5003-R	115	25	94	113	102	<30
5004-R	44.2	12	22	73.9	33	<30
1187-R	67.8	8	45	104	39	<30
1189-R	43.3	9	33	113	52	<30
1194-R	43.3	28	42	153	36	<30
2005-R	43.0	13	46	111	132	<30
2006-R	121	15	90	106	87	<30
2007-R	274	11	37	45.4	41	<30
2008-R	149	14	99	122	77	<30
2009-R	114	18	93	118	95	<30
2010-R	137	15	81	100	184	30
3001-R	56.7	9	23	75.5	34	<30
3002-R	17.8	<6	<3	72.9	5090	<30
3003-R	64.0	<6	<3	36.3	86800	<30
3004-R	6.2	<6	<3	205	3990	<30
3005-R	13.8	<6	10	48.2	217	<30
3006-R	97.5	<6	10	77.9	86	<30
5005-R	19.2	<6	14	69.1	33	<30
5006-R	80.9	17	75	106	87	<30
5007-R	38.2	12	21	99.9	53	<30
5008-R	139	17	91	97.6	113	<30