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GEOLOGICAL - GEOCHEMICAL REPORT

HOWELL CREEK PROSPECT 82 G /2E

BRITISH COLUMBIA

for

CANARCTIC RESOURCES LTD.

by

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June 30, 1971

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ENCLOSURES

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INTRODUCTION

At the request of Canarctic Resources Ltd., a detailed geologic mapping and geochemical program was carried out on fifty-nine (59) claims in the Howell Creek area thirty (30) miles south of Fernie B.C. A party of five, consisting of geologists H.H. Williams and E.W. James, assistants J. Koning, K. Hopkins, and cook F.G. Williams were retained in the field for the period June 12, to June 24, 1971.

The geochemical program consisted of detailed stream sediment sampling, stream water analyses, and limited soil sampling. Extractable total heavy metals analyses were carried out in the field on stream sediments and soils; plus total heavy metal analyses on stream waters. Stream sediments, soils, and rock samples were analysed by Core Laboratories Inc. for Cu, Pb, Zn, Ni, Mo, F, and Au.

Detailed geologic mapping was carried out at a scale of 1" = 1/4 mile.

The following report is a result of the above outlined field program.

LOCATION AND ACCESS

The Howell Creek property lies within the Canadian Rocky Mountains in Southeastern British Columbia at approximately latitude 49° 15' and longitude 114° 30' (see Map 1).

The area is accessible via a British Columbia Forest Service road from the Morrissey Bridge ten miles southwest of Fernie. Numerous logging roads provide access to most of the claims.

Fifty-nine (59) claims comprising the Howell Creek property are located near the headwaters of and between Howell and Twentynine Mile Creeks (Map 2). Although most of the claim posts have been destroyed by recent forest fires, the following claim posts were located:

Initial Post Cat #1 (tag # 839367)

" " Cat #2 (tag # 839368)

Final Post Cat #1 (tag # 839367)

" " Cat #2 (tag # 839368)

Initial Post ROK 46 (tag # 213663M)

" " ROK 47 (tag # 21365M)

PHYSIOGRAPHY

The property is characterized by two rugged east-west trending ridges with elevations of approximately 7500 feet. Maximum relief is in the order of 3000 feet. Numerous intermittent tributary streams of Howell and Twentynine Mile Creeks drain the area.

A thick growth of evergreens formerly covering the property has been largely destroyed by a forest fire. As a result, considerable outcrop has been exposed greatly facilitating geologic mapping. However, accelerated erosion has disturbed the soil profile on the steep slopes, hindering geochemical soil sampling.

PREVIOUS WORK

The Geological Survey of Canada (Price, 1965) mapped the area on a scale of 1" = 1 mile and outlined the alkali syenite complex in the Howell Creek area. Jones (1966) carried out further structural studies on the Howell Creek structure.

The property was first staked by Mr. N.C. Lenard in 1969. Minor ground prospecting and reconnaissance field geochemical stream sampling were carried out in 1969 and 1970. Possible geochemical stream sediment anomalies were indicated by this preliminary work.

GEOLOGY

General Geology

The major geologic feature in the area is the Howell Creek fenster exposing Upper Cretaceous Wapiabi and Belly River strata within an envelope of older rocks. An alkali syenite intrusive complex is exposed along the southwestern margin of the fenster. The Lewis Thrust and Howell Fault cut the syenite intrusive.

The Howell Creek mineral prospect encompasses the syenite complex and parts of the complexly faulted sedimentary sequence of Precambrian through Cenozoic strata.

Stratigraphic relationships and potassium-argon age determinations suggest a late Lower Cretaceous or early Upper Cretaceous emplacement of the syenite complex (Gordy and Edwards, 1962; Price, 1965). Price (1965) has shown that the intrusives cut Precambrian Purcell, Cambrian, Devonian, Rundle Group, Rocky Mountain formation, Jurassic Fernie Group, and the basal Lower Cretaceous strata. In the Howell Creek area the intrusives are not seen cutting the Lower Cretaceous strata but are shown to be in fault contact with these younger strata.

Price (1965) describes the syenite complex at the headwaters of Harvey Creek as, "a small stock of trachyte, consisting of subhedral lath-shaped orthoclase phenocrysts up to 5mm long, sericitized and kaolinized, in a groundmass of minute subparallel orthoclase laths with disseminated granules of iron oxides".

GEOLOGY

General Geology (Con't)

The groundmass is reportedly highly altered and the trachytic texture and composition appears uniform throughout most of the mass. The Howell Creek stock is composed of similar trachyte and syenite.

Geology of the Howell Creek Intrusive Complex

Geological mapping on a scale of 1" = 1/4 mile was carried out in the Howell Creek area in conjunction with a detailed geochemical program. Time limitations prevented detailed mapping of the entire property, however, considerable detail was obtained in the more geologically prospective areas. Heavy snow cover on the west end of the property limited geological mapping in that sector.

Mapping by the G.S.C. (Price, 1965) formed the basis of the mapping program and has been used extensely to complete mapping in areas unmapped by the present program. A photogeologic study was not carried out, necessitating extensive reliance upon previous fault interpretations. The composite geologic map on a scale of 1" = 1/4 mile is presented as Map 3.

Semi-detailed mapping of the Howell Creek intrusive complex has outlined a more complex intrusive than previous mapping indicated (Map 3). Field relationships indicate that the main mass of syenite consists of a zoned stock exhibiting intrusive brecciation and alteration halos.

GEOLOGY

Geology of the Howell Creek Intrusive Complex (Con't)

There is a pronounced textural change in an easterly direction from a fine-grained grey trachyte/trachyte porphyry through progressively more porphyritic trachyte into a very coarse-grained grey syenite (Syenite A). Syenite characterized by a very coarse-grained texture, subparallel feldspar laths up to 3/4" long, a pinkish color on fresh surface and distinctive rusty red weathering has been included in syenite A. This syenite occurs as small dykes within Precambrian Rooseville argillites and as a sill-like mass between the Cambrian quartzites of the Flathead formation and Cambrian carbonates of the Elko formation. Part of this sill-like mass either cuts through the Cambrian and Devonian carbonates on the east end of the property or is an erosional remnant of a large dyke cutting the carbonates. A thin breccia zone of variable thickness (2 - 10 feet) occurs at the syenite-carbonate contact. Hornfels are developed in narrow zones near the borders of the dykes cutting the argillites. The contact of syenite and Precambrian quartzites (Phillips Formation) forms a brecciated zone several tens of feet wide (Syenite B). This brecciated zone grades into a highly chloritized syenite with a pronounced green color, the chloritized zone being several hundred feet wide (Syenite C).

Relationships between the syenite and quartzite on the southern margin of the intrusive complex could not be resolved due to paucity of outcrop.

GEOLOGY

Geology of the Howell Creek Intrusive Complex (Con't)

However, the presence of unfossiliferous, cherty, limy dolomite (possibly Cambrian) resting on Precambrian Phillips quartzites may indicate complex faulting through this zone.

Geologic strata within the map area have a general NW strike and dip steeply to the NE. Several major thrust faults cut the map area (see Map 3).

GEOCHEMISTRY

The geochemical program consisted of detailed stream sediment sampling, Total Heavy Metal (THM) analyses of water and extractable THM in sediments, spot check extractable THM analyses of soils, limited soil sampling, and sampling of country rock. All station locations are plotted on Map 4, and all analytical data are enclosed in Appendix 1.

Comments on the hydrologic gradients and soil profiles are presented, followed by a discussion of results of geochemical analyses.

Hydrologic Gradients

The two major streams, Howell and Twentynine Mile Creeks, have relatively steep hydrologic gradients of about 200 feet per mile. All tributary streams have much steeper gradients, often exceeding 1000 feet per mile. These steep gradients result in removal of most sediment fines and make stream sediment sampling difficult. Heavy runoff from snow melt complicates sampling.

Soil Profiles

The soil profile developed in the area belongs to the azonal soil class, characterized by little or no differentiation of the parent material. The profile exhibits highly developed skeletal features, shallowness, weakly expressed horizon differentiation, and strongly eroded soil cover. On the steep upper slopes the soil forms a thin strongly eroded residual mantle, 6 inches to 18 inches thick, with a very thin A_1 horizon and no well defined B horizon;

GEOCHEMISTRY

Soil Profiles (Con't)

the B and C horizons form an intimately mixed zone of rocky unweathered to poorly weathered parent material. The lower slopes near the valley floor consist of glacial material of varying thickness, thinning upslope.

Soil profile development varies with relief; the better defined soil horizons developed where relief is low. Parent rock material affects the characteristics of the soil profile, reflecting differential weathering characteristics. Soils derived from underlying Cretaceous shales show relatively good horizon development and a characteristic grey to light red brown C horizon. Soils derived from syenite are characteristically reddish to intense rusty brown in color and have no distinguishable C horizon.

High relief with subsequent high runoff rates result in poor leaching, lack of horizon development, and generally only subtle developments of geochemical gradients by hydromorphic processes.

In heavily vegetated areas, residual soil anomalies derived by mechanical weathering should be superjacent anomalies. However, removal of forest cover by recent forest fires has resulted in increased erosion which will affect geochemical soil anomaly dispersion patterns.

GEOCHEMISTRY

Total Heavy Metal (THM) Analyses

THM field analyses, using the method outlined by Smith (1964), were routinely carried out on stream waters and for extractable THM in the stream sediments at each sample station. Soil samples were periodically checked for extractable THM. All THM extractions were carried out on bulk samples rather than the -80 mesh fractions.

Stream Waters:

THM data for stream waters are shown on Map 5. The regional background THM value in the waters of the area has been established as less than 0.010 ppm. Anomalous THM values are present on Wutluk Creek, a tributary of Twenty-nine Mile Creek, and on an unnamed tributary of Howell Creek, immediately north of Wutluk Creek.

The magnitude of the anomalous values on Wutluk Creek varied from 0.06 to 0.08 ppm with a single high value of 0.20 ppm (Fig 1). The anomaly was traced up Wutluk Creek to its source on a tributary of Wutluk Creek. Ground water feeding the small tributary passes through trachyte rubble. Dilution from snow melt was at a minimum on the anomalous tributary, however, all other tributaries were swollen and diluted by snow melt runoff.

The "anomalous area" on the tributary of Howell Creek is relatively small and could not be traced to its source because of snow cover.

GEOCHEMISTRY

Stream Waters (con't):

Dilution from runoff and distance from a probable source greatly subdue this anomaly. The highest anomalous value is slightly greater than 0.013 ppm. This anomalous area should be further delineated late in the summer season to minimize the meltwater dilution and fine sediment loss experienced in spring.

Stream Sediments:

The extractable THM data for stream sediments are shown on Map 5. Regional background THM value has been established at 3 ppm. Anomalous THM values in the stream sediments coincide with the THM anomalies in stream water in Wutluk and Howell Creeks.

The stream sediment THM profile for Wutluk Creek is shown in Fig. 1. Magnitude of the anomalous values varies from 12 ppm to 44 ppm. The anomalous sediments have been derived from a trachyte intrusive, which is the source rock for other non-anomalous stream sediments in other tributaries in the same local area. This suggests that the source of the anomalous sediments is a mineralized zone within the trachyte. No mineralized zones were located, however, outcrop is sparce in the area.

The anomaly on the tributary of Howell Creek is not as pronounced and could not be traced to its source because of snow cover. Anomalous values overlie Cretaceous Wapiabi shales and have probably been diluted by addition of shale derived sediment.

GEOCHEMISTRY

Stream Sediments (Con't):

THM analyses of stream sediment derived from Wapiabi shale indicates low THM (0.5 ppm; see Map 5) suggesting an upstream source of the anomalous sediment, probably the trachyte intrusive. Considerable pyrite mineralization was found within the Cambrian quartzites, syenites, and Precambrian argillites at the headwaters of the anomalous tributary stream. Outcrop was limited due to snow cover and hindered further evaluation, however, further mineralization is indicated.

Soils:

Relatively few soil samples were analyzed for extractable THM contents and those soils analyzed yielded 0.0 to 0.5 ppm extractable THM. The rugged terrain, high runoff rate and poor leaching results in little hydromorphic migration of metals to the soil horizon. Extractable THM analyses of soils does not appear to be very useful in the area in view of the absence of a well developed C horizon.

Geochemistry of Stream Sediments, Soil and Source Rock

Stream sediments, soil and source rock samples were analyzed by atomic absorption spectrophotometry for total Cu, Pb, Zn, Ni, and Mo and for weak acid extractable Cu and Zn.

GEOCHEMISTRY

Geochemistry of Stream Sediments, Soil and Source Rock (Con't)

Several samples of Cretaceous Wapiabi shale and unmineralized syenite/trachyte were analyzed for total Cu, Pb, Zn, Ni, and Mo, to establish background levels for these two rock types and to evaluate the relative importance of these rock types as a source of anomalous metal values.

Zn, Cu, Pb, Ni and Mo in Shale Syenite and Soil:

The normal background for these elements in Wapiabi shale and syenite/trachyte may be considered to be:

Wapiabi Shale Zn - 105 ppm; Cu - 10 ppm; Pb - 10 ppm; Ni - 28 ppm; Mo - 30 ppm.

Syenite/trachyte Zn - 85 ppm; Cu - 10 ppm; Pb - 38 ppm; Ni - 20 ppm; Mo - 20 ppm.

Molybdenum is the only element showing abnormally high concentration in both the shale and syenite. Average Mo concentrations in syenites and shales reported by Turekian and Wedepohl (1961) are 0.6 ppm and 2.6 ppm respectively compared to 20 ppm and 30 ppm Mo in syenite and shale from the Howell Creek area.

Anomalous Mo concentrations in the stream sediments could be derived from either a syenite or shale source and would not necessarily reflect Mo mineralization.

Soils in the area have regional background concentrations of: Cu - 52 ppm; Pb - 91 ppm; Zn - 96 ppm; Ni - 14 ppm; Mo - 11 ppm.

GEOCHEMISTRY

Geochemical Dispersion Patterns of Cu, Pb, Zn, Ni and Mo in Stream Sediments and Soil

The average Ni and Mo concentrations in streams sediments in the Howell Creek area have been established at 24 ppm and 1.6 ppm respectively. No anomalous dispersion patterns are evident for Ni in either soil or stream sediment, however, two anomalous Mo values are present on Wutluk Creek (see Map 7). The relatively low regional Mo values in stream sediments in the area suggests that the anomalous Mo contents are derived from a mineralized zone, however, an unmineralized trachyte source cannot be discounted with the presently limited data.

Molybdenum contents of the soils are not anomalously high in view of the average Mo contents of the syenite and shale in the map area.

Cutoff values for Cu, Pb and Zn in stream sediments have been set at 60 ppm, 80 ppm, and 200 ppm respectively, using two standard deviations about the mean as a cutoff criterion. Using these cutoff values, strong Cu, Pb and Zn anomalies are evident on Wutluk Creek coincident with the THM anomalies. Zinc values are extremely high, being in excess of 1000 ppm. Soils in the area do not show strong geochemical anomalies for these three elements, however only relatively few soil samples were obtained.

The high ratios of ex-Cu/total Cu and ex-Zn/total Zn in the stream sediments indicates a hydromorphic origin of the anomalous Cu and Zn anomalies. This suggests leaching of a mineralized zone containing Cu and Zn sulfides.

MINERALIZATION

No evidence was found for gold or uranium mineralization in the Precambrian and Cambrian quartzites in association with major faults or intrusive contacts, although abundant pyrite mineralization was found in the Cambrian Flathead formation near the headwaters of Twentynine Mile Creek. Pyrite mineralization is fairly extensive in the quartzites and syenite in this area, the full extent of this mineralization not being determined due to limited outcrop and heavy snow cover. It is significant that the extensive pyrite mineralization is adjacent to the pronounced geochemical anomalies on Wutluk and Howell Creeks. The presence of the three element geochemical anomaly on Wutluk Creek indicates the presence of Cu-Pb-Zn sulfide mineralization in the trachyte. The numerous major thrust faults through the area may control mineralization.

Fluorite mineralization was found at the carbonate-syenite contact. The extent of this mineralization could not be accurately delineated due to very limited outcrop. Patchy mineralization occurs across a 10 foot wide contact zone of brecciated carbonate and syenite with the fluorite occurring in both the brecciated carbonate and syenite. A grab specimen assayed 4.6% fluorine or approximately 9.2% fluorite. Trenching will be required to determine the nature and extent of mineralization and establish a reliable grade.

Minor barite, as a secondary mineral, was found at the carbonate-syenite contact, however, the minor amount present is not of economic significance.

MINERALIZATION

Although the geologic setting of carbonate and quartzites in contact with the syenite intrusive is a favorable environment for Mo mineralization, no evidence of Mo was found.

CONCLUSIONS

The Howell Creek intrusive has been shown to be a complexly zoned trachyte, syenite, and altered syenite complex intruding Precambrian through Cretaceous strata, exposed by the Howell Creek fenster.

Extensive pyrite mineralization was found on the west end of the property associated with trachyte, syenite, and quartzites. Cu, Pb, and Zn geochemical anomalies indicate the possibility of adjacent extensive mineralization in this area. Mineralization may be fault controlled.

Fluorite mineralization is associated with the carbonate syenite contact at the east end of the property. Extent of this mineralization is presently unknown due to limited outcrop of the contact zone, however, the mineralization is secondary.

RECOMMENDATIONS

It is recommended that:

1. The geochemical anomalies outlined be further investigated by
   a) detailed stream sediment and water sampling program on the headwaters of Howell Creek, and
   b) a detailed soil sampling program between Howell and Twentynine Mile Creeks over the anomalous zones.

   The geochemical program should be carried out during late summer or early fall when snow cover and meltwater runoff are at a minimum.
2. An Induced Polarization survey be carried out over the anomalous zones to investigate the potential for a disseminated sulfide source of the geochemical anomalies.
3. Trenching be carried out along the carbonate-syenite contact to further evaluate the extent of the fluorite mineralization.
4. If further geochemical and geophysical work produces favorable results in the Wutluk Creek area, a small syenite intrusion three miles north of the property should be prospected.

Respectfully submitted,

Harold H Williams

Harold H. Williams, Ph.D., P.Geol.
Consulting Geologist

Eric W. James, B.Sc.
Consulting Geologist

Calgary, Alberta
June 30, 1971

CERTIFICATE

I, Harold H. Williams, hereby certify:

1. That I am a consulting geologist resident in the City of Calgary, in the Province of Alberta.

2. That I am a graduate of the University of Alberta at Calgary with a Batchelor degree in Geology (1965), the University of Calgary with a Masters degree in Geology (1967), and McMaster University with a Ph.D. degree in Geology (1969).

3. That I am a Member of the Alberta Association of Professional Engineers.

4. That I have no interest, nor do I expect to receive any interest, direct or indirect, in the subject property.

5. That the statements made in this report are based on personal examination of the claims June 12 to June 24, 1971 and on a study of published reports of the property area.

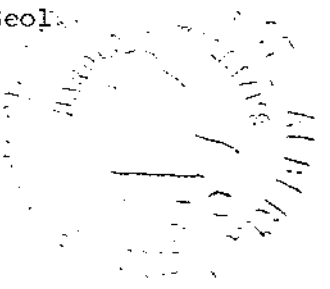
6. That no legal survey has been conducted over the subject mining properties and, therefore, in accordance with the mining laws of the appropriate jurisdiction in which such properties are situate, the existance of and the area of such properties could be in doubt.

DATED AT: The City of Calgary, in the Province of Alberta,

this 30th day of June, A.D. 1971.

Harold H. Williams

Harold H. Williams, Ph.D., P.Geol.



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Edwards, G.E., and Gordy, P.L.	1962	Age of the Howell Creek Intrusives. Journ. Alberta Soc. Pet. Geologists, v. 10, no. 7 pp. 69-372.
Jones, P.B.	1966	Geology of the Flathead Area of South Eastern British Columbia. Unpub. Ph.D. thesis, Colorado School of Mines.
Price, R.A.	1965	Flathead Map Area. Geol. Survey Can. Mem. 336.
Smith, A.Y.	1964	Cold extractable "Heavy Metal" in Soil and Alluviam. Geol. Survey Can. Paper 63-49.
Turekian, K.K., and Wedepohl, K.H.	1961	Distribution of the Elements in Some Major Units of the Earth's Crust. Geol. Soc. Am. Bull., v. 72, pp. 175-192.

APPENDIX 1

Geochemical Data

TOTAL HEAVY METAL DATA

Station No.	Ex-THM Sediment (ppm)	THM Water (ppm)	Ex-THM Soil (ppm)
1	44	0.2	
2	44	0.08	
3	44	0.08	
5	--	0.08	
6	--	0.08	
7	--	0.0	
8	3	0.04	
9	--	0.04	
10	--	0.04	
11	--	0.04	
12	3	0.0	
13	--	--	0.0
14	--	--	0.0
16	--	--	0.0
17	--	--	0.0
18	--	0.1	--
19	--	0.1	--
20	--	--	0.0
21	--	0.1	--
22	--	--	3.0
23	--	0.1	--
24	--	--	0.0
25	--	--	0.0
26	--	--	0.0
30	--	0.04	--
200	2.4	--	--
201	3.0	0.04	--
202	2.4	--	--
203	3.0	--	--

TOTAL HEAVY METAL DATA (CON'T)

Station No.	Ex-THM Sediment (ppm)	THM Water (ppm)	Ex-THM Soil (ppm)
204	3.0	--	--
206	--	--	0.0
209	0.0	--	--
211	3.0	--	--
212	--	--	0.0
213	--	0.04	--
215	--	--	0.0
218	--	--	0.0
221	--	--	0.0
32	--	0.04	--
33	15	0.04	--
34	12	0.04	--
35	12	0.02	--
36	15	0.02	--
37	15	0.02	--
38	3	0.02	--
39	--	0.02	--
40	12	0.02	--
42	12	0.02	--
43	12	0.02	--
44	--	0.02	--
45	--	0.02	--
46	--	0.02	--
225	3.3	0.013	--
226	1.8	0.012	--
227	3.0	0.013	--
228	2.4	0.013	--
229	2.4	0.013	--
230	2.4	0.013	--
231	3.0	0.013	--

TOTAL HEAVY METAL DATA (CON'T)

Station No.	Ex-THM Sediment (ppm)	THM Water (ppm)	Ex-THM Soil (ppm)
232	3.0	0.013	--
233	3.0	0.012	--
234	2.4	0.013	--
235	3.0	0.013	--
236	3.0	0.013	--
237	2.4	0.012	--
238	3.0	0.012	--
239	3.0	0.013	--
240	4.8	0.012	--
241	3.0	--	--
242	--	0.012	--
262	3.0	0.011	--
263	3.0	0.011	--
264	3.0	0.010	--
265	3.0	--	--
266	3.0	0.012	--
267	2.4	0.010	--
268	3.6	--	--
269	4.8	0.013	--
270	3.0	0.012	--
271	1.5	--	--
272	3.0	0.012	--
273	3.0	--	--
274	1.8	0.012	--
275	6.0	0.012	--
276	6.0	0.012	--
277	6.0	0.012	--
278	6.6	0.011	--
279	3.0	--	--

TOTAL HEAVY METAL DATA (CON'T)

Station No.	Ex-THM Sediment (ppm)	THM Water (ppm)	Ex-THM Soil (ppm)
280	3.0	0.011	--
281	1.8	0.011	--
282	1.2	--	--
283	1.2	0.011	--
67	3.0	0.010	--
68	3.0	0.010	--
69	3.0	0.010	--
70	3.0	0.010	--
71	3.0	0.010	--
73	--	0.010	--
74	3.0	0.010	--
75	10.0	0.010	--
77	3.0	0.010	--
79	3.0	0.010	--
81	3.0	0.010	--
82	3.0	0.010	--
83	10.0	0.010	--
85	10.0	0.010	--
88	3.0	0.010	--
89	3.0	0.010	--

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COMPANY Sunwapta Minerals
Assay Samples

PAGE 1 of 1
FILE 931-1253
DATE July 28/71

Analysis

Diabase:	Copper	0.010%
	Lead	0.003%
	Zinc	0.006%
	Nickel	0.008%
	Molybdenum	ND (Less than 0.001%)
No. 60:	Fluorine	4.60%
No. 250:	Fluorine	0.03%

CORE LABORATORIES CANADA, LTD.

Company: Harold Williams

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File: 931-1216
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File Number	Sample Number		TOTAL ACID DIGESTION Cu PPM	Pb PPM	Zn PPM	Ni PPM	Mo PPM	WEAK ACID DIGESTION Cu PPM	Zn PPM
1216-001	1	Sed	43	53	1000+	28	5	28	342
-002	2		61	83	1000+	36	2	40	585
-003	3		169	224	1000+	62	5	130	1000+
-004	5		71	68	209	31	6	38	129
-005	7		50	55	210	29	5	26	130
-006	8		47	51	176	27	2	29	173
-007	10		38	16	47	4	4	42	67
-008	11		177	95	220	32	24	124	181
-009	12		11	23	84	12	1	15	158
-010	13	Soil	16	44	83	15	1	8	57
1216-010	13	Check	17	44	88	14	1	11	87
-011	14	Soil	28	28	108	15	2	13	71
-012	16		31	34	100	16	2	11	70
-013	17		4	22	41	7	1	9	36
-014	20		191	270	83	9	64	66	83
-015	22		75	50	82	15	10	39	52
-016	24		64	62	142	17	13	42	103
-017	25		24	176	91	10	10	12	50
-018	26		65	111	181	13	10	39	136
-019	32	Sed	49	59	380	32	7	37	364
-020	34		47	71	407	31	9	38	431
1216-020	34	Check	54	83	457	36	10	31	415

Company: Harold Williams

Page: 2
File: 931-1216
Date: July 2/71

File Number	Sample Number	Cu PPM	TOTAL ACID DIGESTION Pb PPM	Zn PPM	Ni PPM	Mo PPM	WEAK ACID DIGESTION Cu PPM	Zn PPM
1216-021	35 Sed	53	79	440	36	1	16	426
-022	36	68	121	1000+	45	ND	47	902
-023	61	70	141	285	40	1	42	268
-024	67	11	30	70	14	3	5	61
-025	68	75	24	280	93	ND	47	261
-026	69	11	19	60	16	ND	2	37
-027	70	7	14	43	13	2	2	34
-028	71	8	14	49	14	ND	3	37
-029	74	9	28	70	14	ND	2	71
-030	75	19	43	165	36	ND	2	114
1216-030	75 Check	17	34	150	32	1	2	129
-031	76	12	32	100	19	ND	4	97
-032	79	7	15	138	21	1	3	154
-033	81	9	16	66	21	ND	ND	53
-034	83	22	64	242	49	ND	9	200
-035	85	12	31	130	23	ND	7	114
-036	88	9	18	112	20	ND	2	92
-037	89	10	29	90	16	2	5	87
-038	200 Stream Sed	6	29	66	20	3	3	76
-039	201	5	24	56	16	2	4	73
-040	202	11	29	101	18	3	7	144
1216-040	202 Check	13	39	115	23	3	9	

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Page: 3
File: 931-1216
Date: July 2/71

File Number	Sample Number		TOTAL ACID DIGESTION Cu PPM	Pb PPM	Zn PPM	Ni PPM	Mo PPM	WEAK ACID DIGESTION Cu PPM	Zn PPM
1216-041	203	Stream Sed	14	29	108	17	2	16	116
-042	204		12	32	102	16	ND	17	114
-043	206	Soil	63	189	86	15	2	33	41
-044	209	Sed	14	25	80	23	ND	14	71
-045	211	Sed	19	45	126	20	ND	13	102
-046	212	Soil	9	11	58	17	1	3	29
-047	225	Sed	10	25	85	14	1	18	117
-048	226		12	35	103	17	2	7	96
-049	227		20	44	126	19	ND	15	129
-050	228		23	50	150	21	3	13	108
1216-050	228	Check	16	40	103	17	3	12	109
-051	229		23	50	126	18	1	16	113
-052	230		20	30	80	20	ND	17	44
-053	231		20	40	112	18	ND	16	125
-054	232		19	45	100	16	3	12	84
-055	233		33	28	136	21	ND	21	127
-056	234		16	36	93	16	1	10	86
-057	235		28	56	150	22	ND	17	110
-058	236		12	25	51	20	1	5	29
-059	237		40	39	112	19	ND	21	109
-060	238		24	47	130	21	ND	21	128
1216-060	238	Check	22	44	125	25	ND	19	126

Company: Harold Williams

File Number	Sample Number		TOTAL ACID DIGESTION Cu PPM	Pb PPM	Zn PPM	Ni PPM	Mo PPM	WEAK ACID DIGESTION Cu PPM	Zn PPM
1216-061	239	Sed	23	46	135	24	2	12	206
-062	240		30	55	176	32	2	27	182
-063	241		20	43	119	19	1	16	114
-064	242		33	62	107	24	3	16	87
-065	262		14	31	89	15	ND	9	109
-066	263		18	39	113	21	1	10	106
-067	264		16	53	142	22	ND	9	101
-068	265		17	58	250	21	2	17	246
-069	266		17	55	145	22	ND	15	119
-070	267		10	31	61	12	ND	6	42
1216-070	267	Check	8	27	56	12	ND	5	41
-071	268		30	97	283	35	ND	22	206
-072	269		29	101	262	34	ND	18	189
-073	270		40	70	132	14	ND	45	130
-074	271		40	67	129	12	1	36	92
-075	272		19	76	150	25	ND	11	109
-076	273		17	71	140	21	1	9	112
-077	274		14	68	123	24	ND	5	100
-078	275		26	148	277	22	1	17	257
-079	276		29	170	245	26	1	24	207
-080	278		15	107	175	24	ND	15	160
1216-080	278	Check	16	113	186	24	ND	10	148

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Page: 5
File: 931-1216
Date: July 2/71

File Number	Sample Number		TOTAL ACID DIGESTION Cu PPM	Pb PPM	Zn PPM	Ni PPM	Mo PPM	WEAK ACID DIGESTION Cu PPM	Zn PPM
1216-081	279	Sed	15	73	111	25	ND	11	100
-082	280		14	76	130	27	ND	12	110
-083	281		8	17	59	19	ND	11	52
-084	282		9	20	54	14	ND	4	36
-085	283		9	19	79	21	ND	3	55

CORE LABORATORIES-CANADA, LTD.

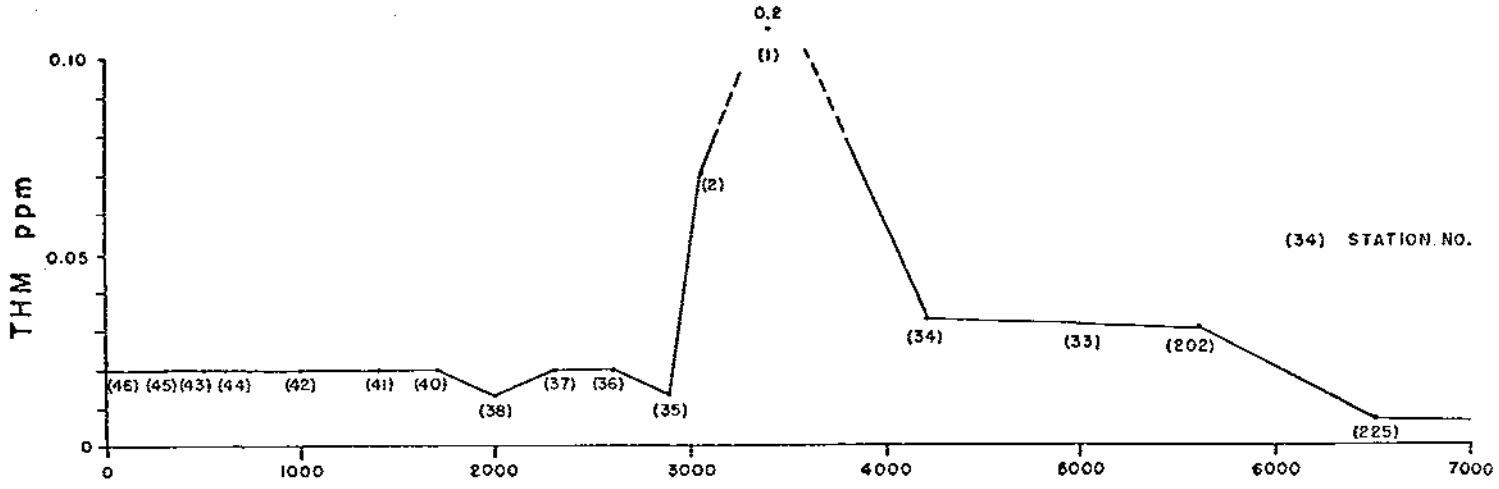
HAROLD WILLIAMS

Rock Samples

PAGE 6
FILE 931-1216
DATE July 15, 1971

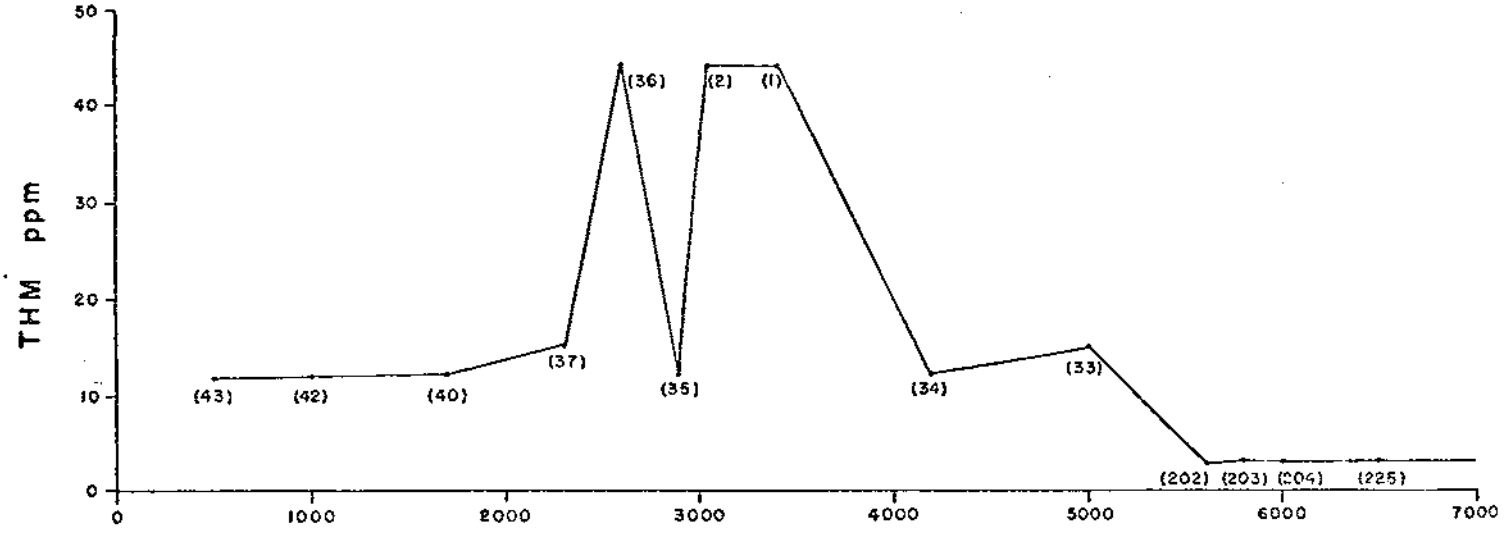
File Number	Sample Number	Zn %	Cu %	Pb %	Ni %	Mo %	Au
1216-01	90	-	ND	-	-	0.003	ND
-02	91	-	0.001	-	-	0.001	ND
-03	205	0.006	ND	0.004	0.002	0.001	-
-04	216	0.009	ND	0.002	ND	0.003	-
-05	218	0.007	ND	0.004	ND	0.003	-
-06	250	0.012	0.001	0.005	ND	0.001	-
-07	262	0.012	0.001	0.001	0.003	0.001	-
-08	279	0.010	0.001	0.001	0.002	0.004	-
-09	284	0.010	0.001	0.001	0.003	0.004	-
-10	285	0.010	0.001	0.001	0.003	0.003	-
1216-10	285 (check)	0.010	0.001	0.001	0.003	0.003	-

Sample No.	Rock Type
90	Syenite (pyritized)
91	Quartzite (pyritized)
205	Syenite
216	Syenite
218	Brecciated Syenite
250	Syenite
262	Wapiabi Shale
279	Wapiabi Shale
284	Wapiabi Shale
285	Wapiabi Shale



Approximate distance from A (feet) (see map 4)

Total Heavy Metals (THM) in water from Wutluk Creek area.



Approximate distance from A (feet) (see map 4)

Extractable Total Heavy Metals in sediments from Wutluk Creek area.

To accompany Geological-Geochemical Report--Howell Creek Prospect--
By H. H. Williams and E. W. Jones -- 30 June 1971

CANADA

Federal Capital ● Provincial Capital ●

Railways, Main

Railways in Kilometres

Air Routes, Canadian

Air Routes, Foreign

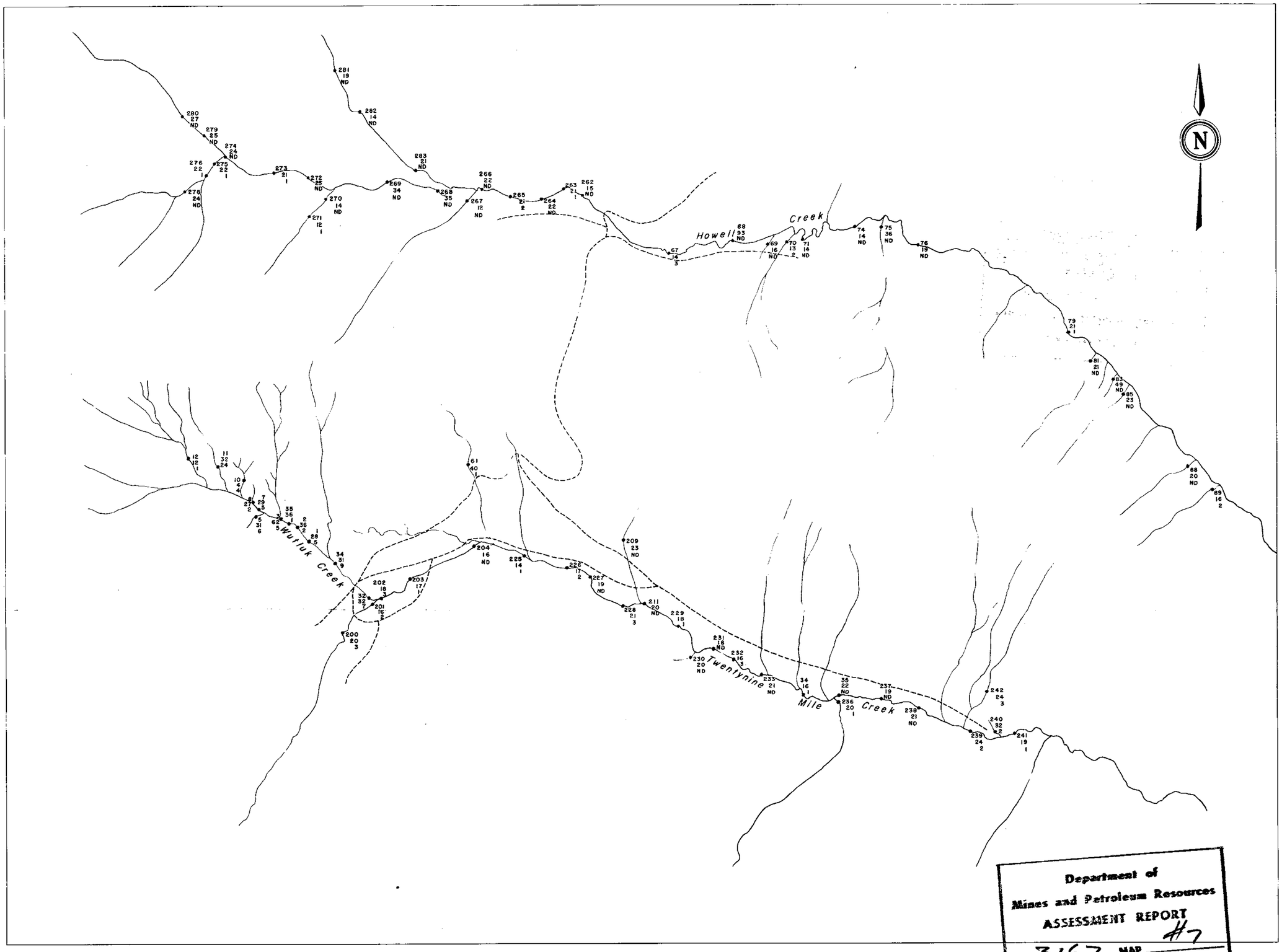
Steamship Routes

DEPARTMENT OF
ENERGY, MINES AND RESOURCES
SURVEYS AND MAPPING BRANCH

1968

HOWELL CREEK
PROSPECT

PRODUCED BY THE SURVEYS AND MAPPING BRANCH, OTTAWA, CANADA



LEGEND

● 1 STATION NUMBER

28 Ni } ppm
5 Mo }

1/4 0 1/4 1/2 Mile

To accompany Geological-Geochemical Report - Howell Creek Prospect -
By H. H. Williams and E. W. James - 30 June 1971

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MAP 7

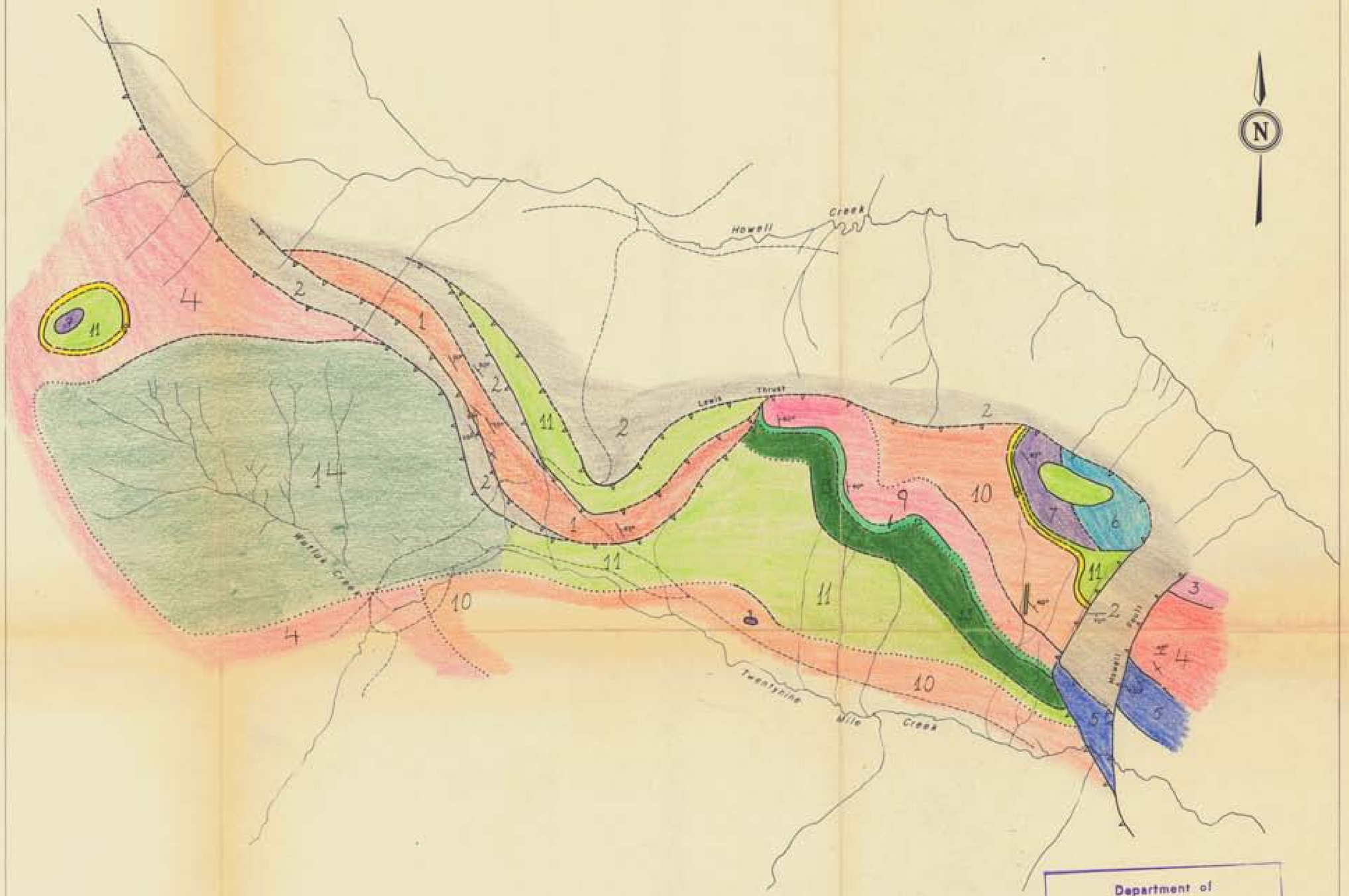
Geochemical Map — Ni, Mo in Stream Sediments

HOWELL CREEK AREA, B.C.

Geology by H. H. Williams

Date : 30 June 1971

REB



CRETACEOUS

1 BELLY RIVER FORMATION: Green and grey sandstone, mudstone and shale.

2 WAPIABI FORMATION: Dark grey shale, silty shale, sandstone.

TRIASSIC

3 SPRAY RIVER FORMATION: Grey dolomitic siltstone and sandstone; brown siltstone and silty shale.

PENNSYLVANIAN AND (?) PERMIAN

4 ROCKY MOUNTAIN FORMATION: Light grey quartzitic and dolomitic sandstone, dolomitic sandstone and dolomite; green shale.

MISSISSIPPIAN

ETHERINGTON FORMATION: Light grey crinoidal limestone; grey sandy and silty limestone; cherty dolomite.

DEVONIAN

FAIRHOLME GROUP: Dark grey, fine-crystalline limestone and argillaceous limestone.

CAMBRIAN

7 ELKO FORMATION: Light grey dolomite; mottled dolomitic limestone

6 FLATHEAD FORMATION: Light grey and yellowish brown quartzite and conglomeratic quartzite.

PRECAMBRIAN

5 ROOSVILLE FORMATION: Red, hematitic, fine and medium-grained quartzite and sandstone.

PHILLIPS FORMATION: Silty green and minor red argillites.

INTRUSIVES

11 Syenite A: Very course grained grey to reddish syenite characterized by sub-parallel orthoclase feldspar laths up to 3/4" long in a very course grained groundmass of feldspar crystals. High content of K-feldspar imparts the reddish color to the unit

Syenite B: Course grained reddish to grey syenite breccia containing abundant quartzite fragments and highly silicified

Syenite C: Relatively uniform course grained texture of random feldspar crystals with a characteristic light to dark green color. Highly chloritized.

Trachyte: Chloritized subhedral lath shaped orthoclase phenocrystals up to 5mm long in a very fine grained grey orthoclase groundmass with a uniform trachytic texture.

Geologic boundary

Assumed boundary

Approximate boundary

Thrust fault

Strike and dip

Road

To accompany Geological - Geochemical Report - Howell Creek Prospect - By H. H. Williams and E. W. James — 30 June 1971

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MAP 3

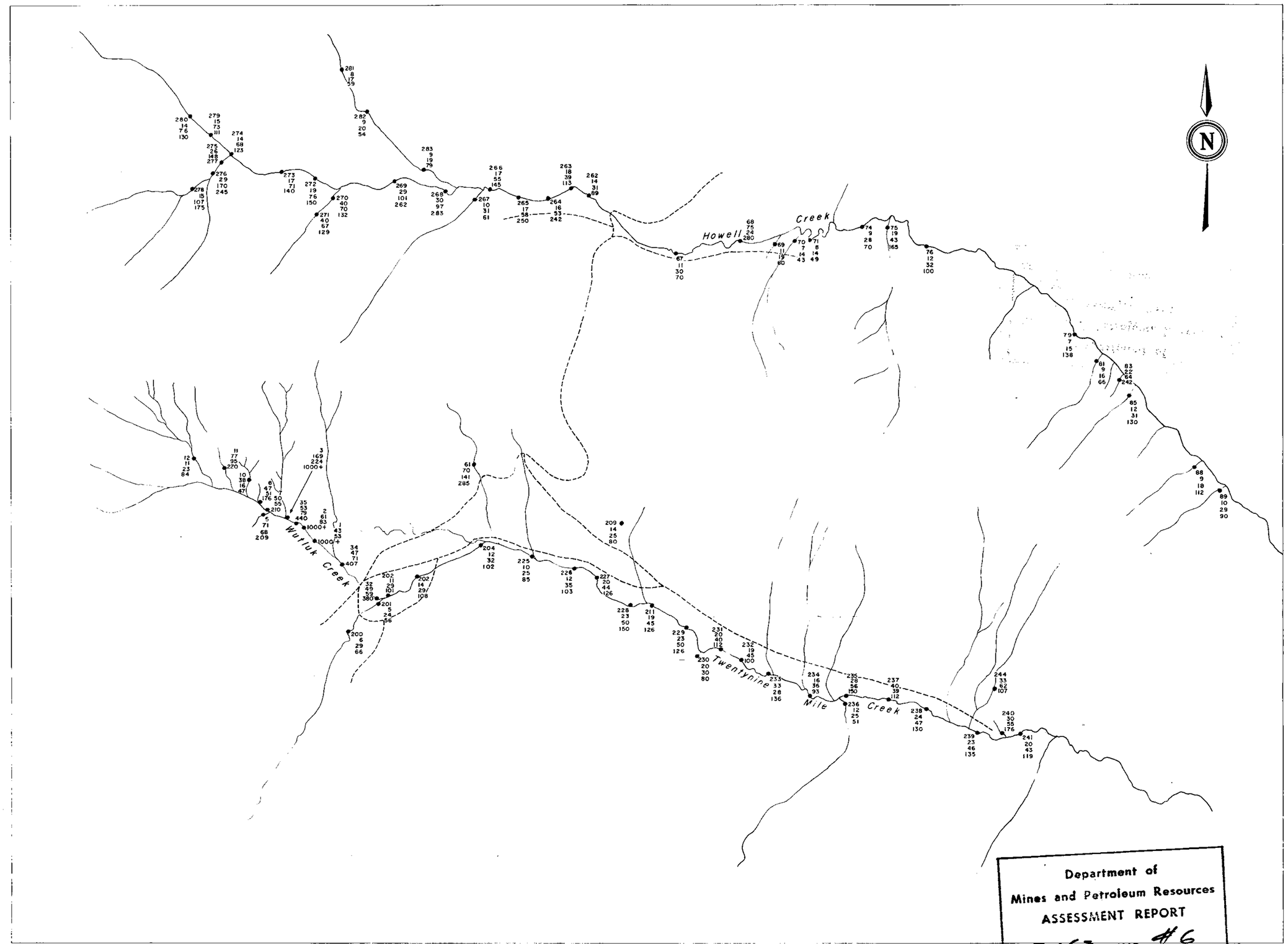
GEOLOGICAL MAP

HOWELL CREEK AREA, B.C.

Geology by H. H. Williams

Date: 30 June 1971

REB



LEGEND

- 1 Station Number
- 43 Cu
- 53 Pb
- 1000+ Zn

} ppm

1/4 0 1/4 1/2 MILE

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By H. H. Williams and E. W. James – 30 June 1971

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MAP 6

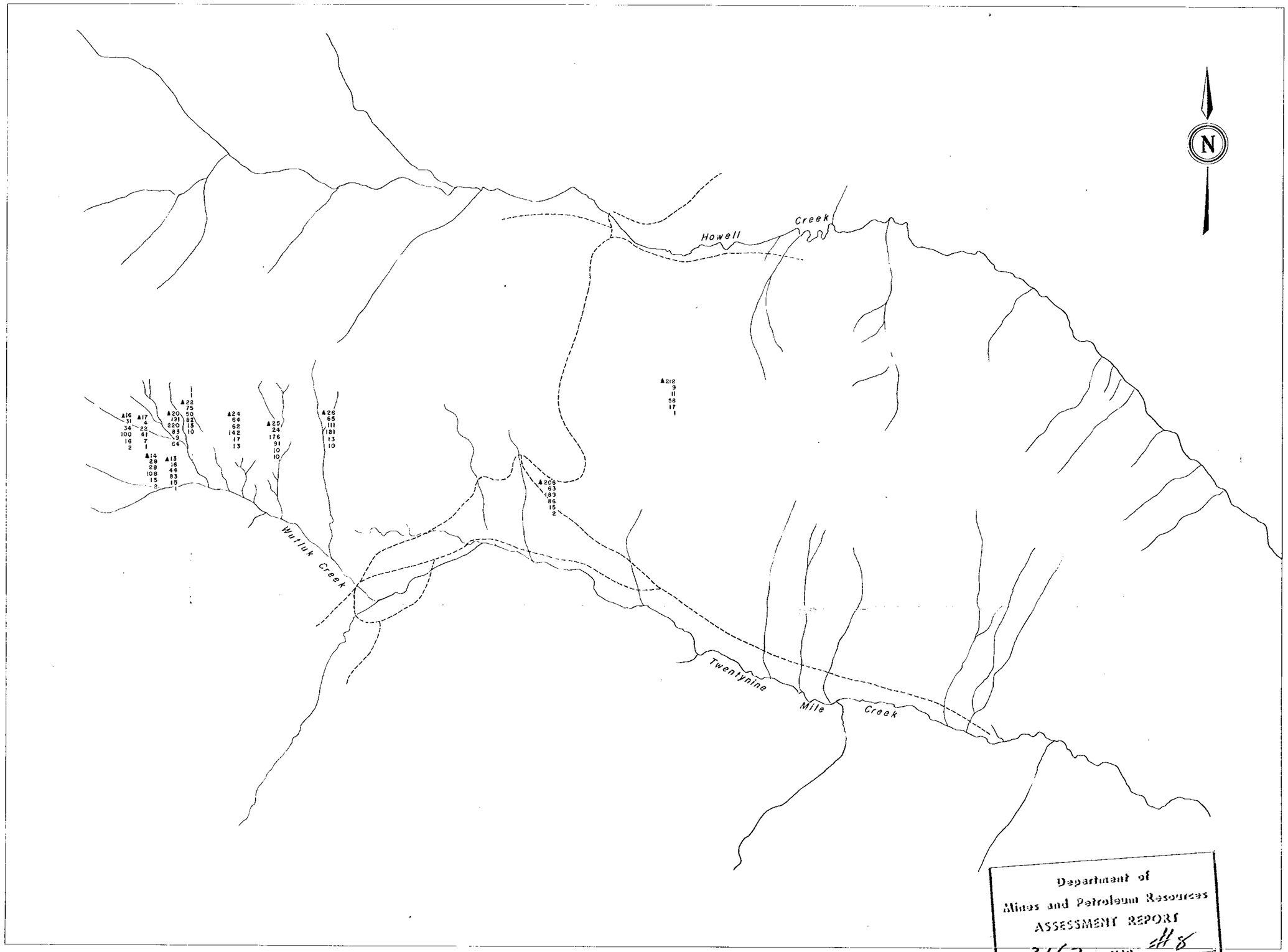
Geochemical Map — Cu, Pb, Zn in Stream Sediments

HOWELL CREEK AREA, B.C.

Geology by H. H. Williams

Date 30 June 1971

RE8



LEGEND

▲ 13 STATION NUMBER
16 Cu
44 Pb
83 Zn } ppm
15 Ni
1 Mo

1/4 0 1/4 1/2 Mi

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By H. H. Williams and E. W. James – 30 June 1971

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MAP 8

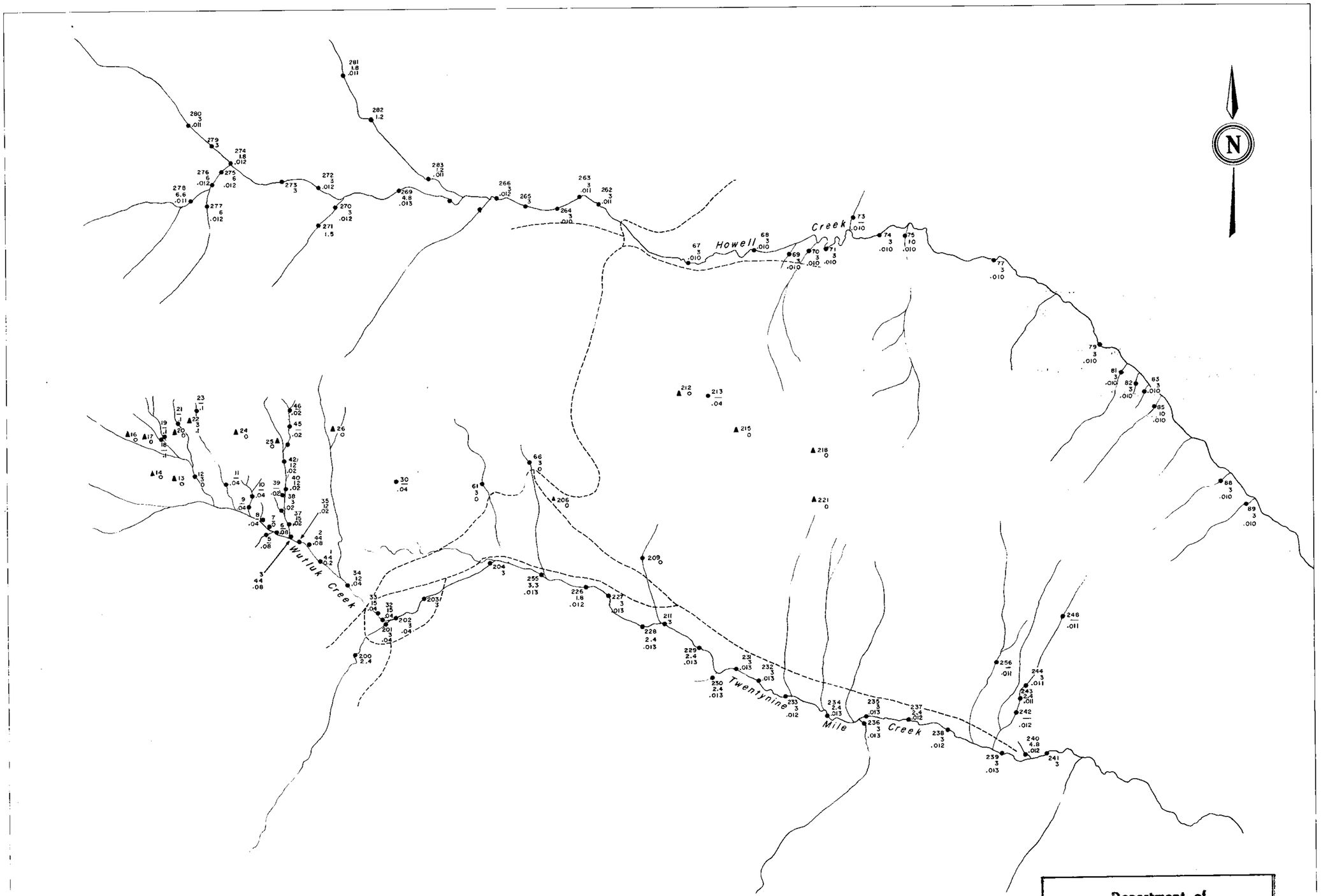
Geochemical Map – Cu, Pb, Zn, Ni and Mo in Soil

HOWELL CREEK AREA, B.C.

Geology by H. H. Williams

Date: 30 June 1971

REB



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3162 MAP #5

LEGEND

- ● 1 Station Number
  - 44 ex-THM ppm (stream sediment)
  - .2 THM ppm (stream water)
- ▲ 13 Station Number
  - 0 ex-THM ppm (soil)

1/4 0 1/4 1/2 Miles

To accompany Geological–Geochemical Report – Howell Creek Prospect
By H.H. Williams and E.W. James – 30 June 1971

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MAP 5

Extractable Total Heavy Metal (THM) in stream sediment, soil and (THM) in stream water.

HOWELL CREEK AREA, B.C.

Geology by H. H. Williams	Date 30 June 1971

REB

LEGEND

■ Claim Post Located

1/4 0 1/4 1/2 Miles

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MAP 2

APPROXIMATE CLAIM LOCATIONS

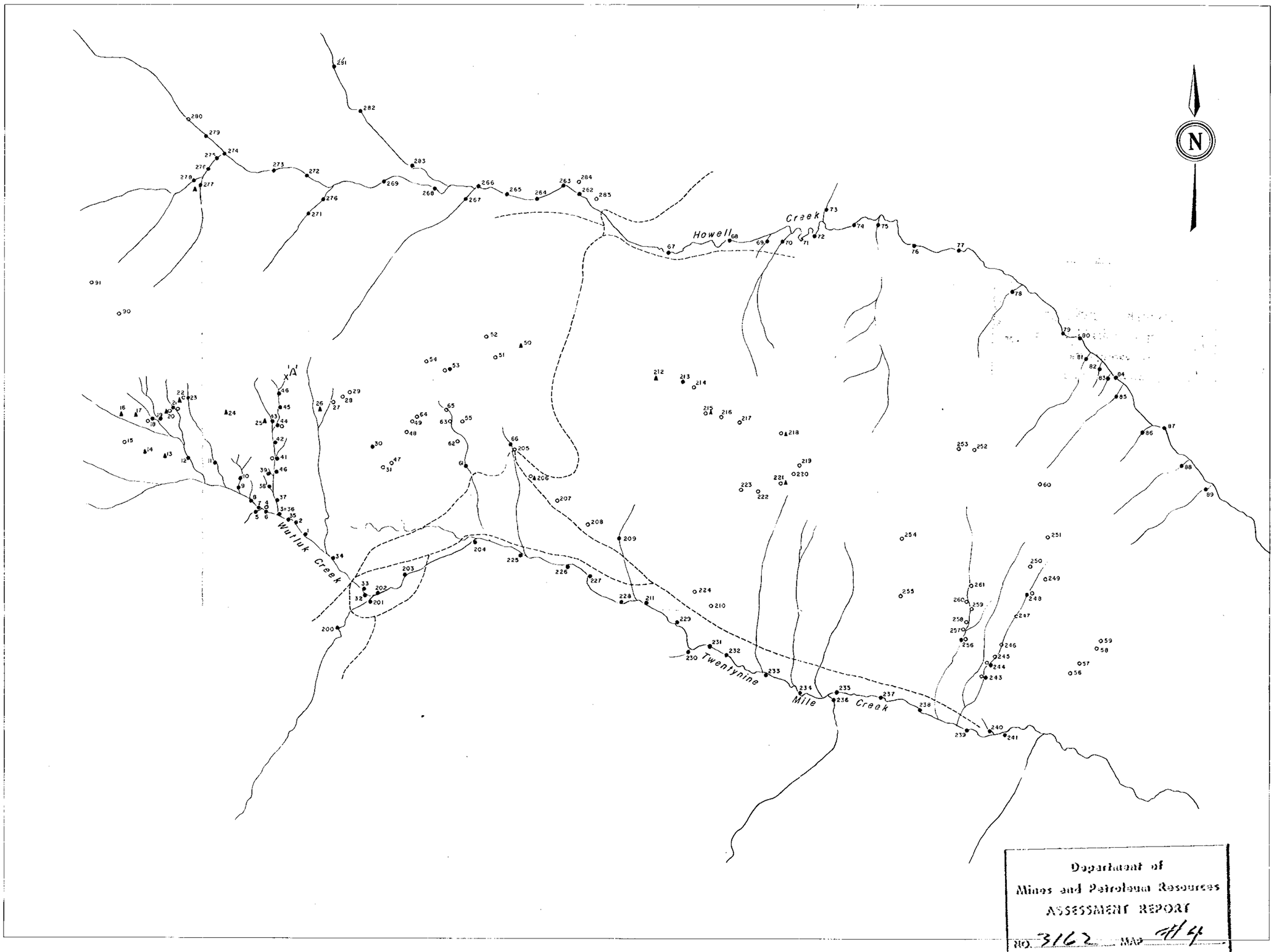
HOWELL CREEK AREA, B.C.

Geology by H. H. Williams | Date: 30 June 1971

3162

M-2

REB



LEGEND

- o Geological Station
- ▲ Soil sample or THM
- ● Stream sediment or water

1/4 0 1/4 1/2 Mile

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MAP 4

DATA INDEX MAP

HOWELL CREEK AREA, B.C.

Geology by H. H. Williams

Date: 30 June 1971

REB