

433

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Location Map

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VD-40-C-57-5a VD-40-C-57-5b VD-40C-57-6 (in 3 sheets)	Vertical Magnetic Intensity Map, Artlish Group, Zeballos Area, Vancouver Island, British Columbia	in pocket 3

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO. **433** MAP

SUMMARY

The Artlish group of six claims is located on a 4000-foot ridge approximately seven miles due north of Zeballos, B.C., a small town on the west coast of Vancouver Island approximately 175 air miles northwest of Vancouver, B.C.

These claims were optioned from Mr. O.L. Skogland of Zeballos, in September, 1961 and an exploration program was then undertaken. A permanent camp was built on the property and geologic mapping and magnetometer surveying was started. Using a crew of up to seven men, the magnetic work over the three known iron zones and the geologic mapping over two of these zones was completed before camp closure. Winter conditions forced this closure on December 5 at which time the ground was covered by four feet of snow.

Two of the magnetite zones lie within the claims' area and one is centered a few hundred feet west of the claim group on ground held by Ventures Limited.

These mineralized zones are of the contact metamorphic type, one occurring along a major limestone-volcanic contact in a bedded sedimentary-volcanic sequence.

A conservative tonnage estimate for the two zones on the Artlish claims is 1.2 million long tons grading between 40 and 45% iron, 0.16% sulphur, 0.10% phosphorus and 0.03% copper.

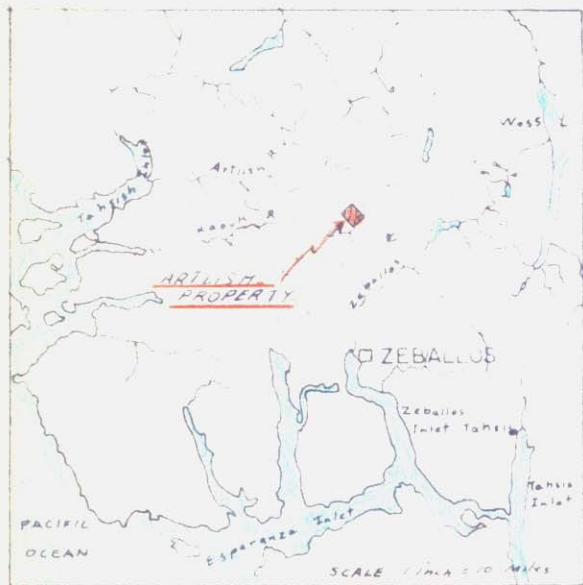
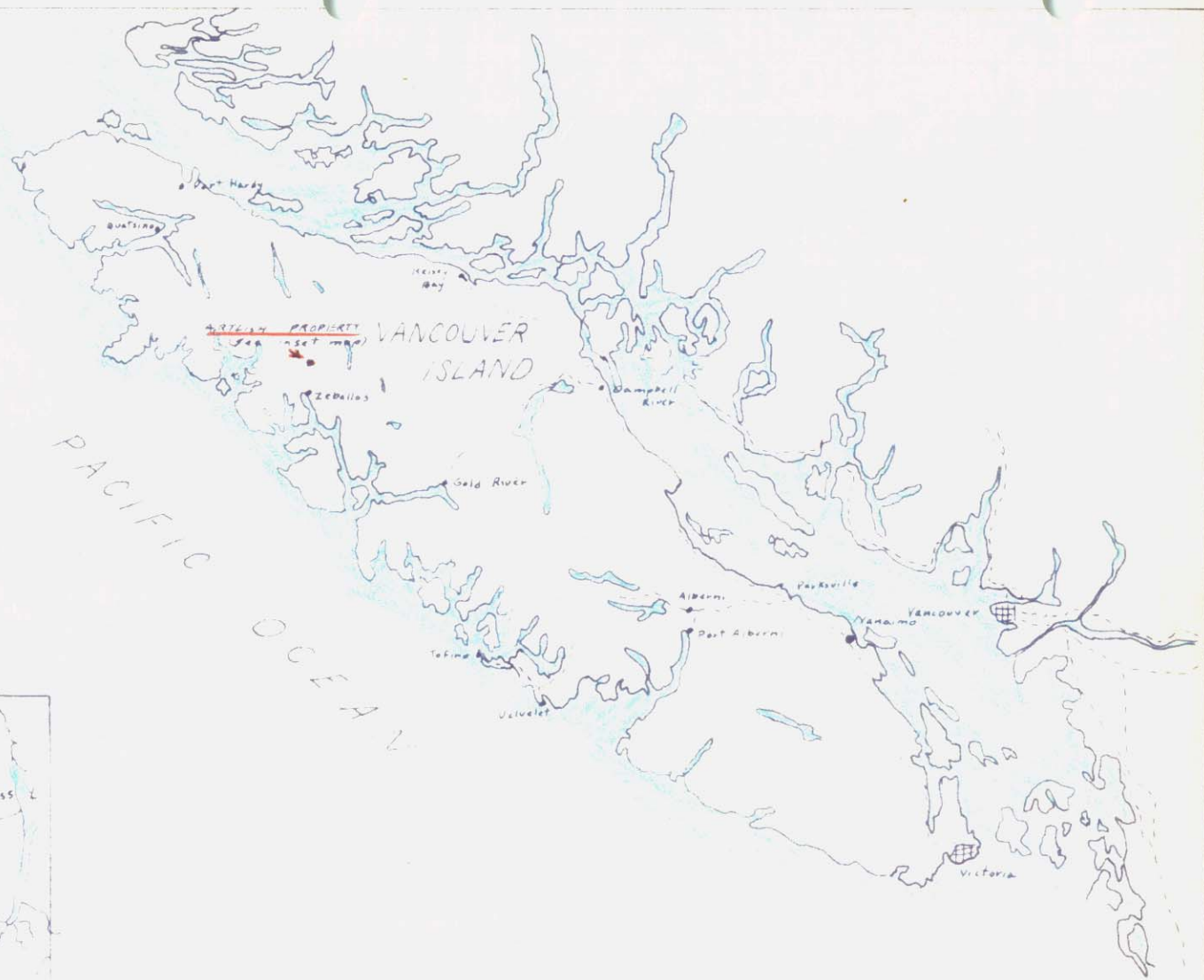
The third mineralized zone, held by Ventures Limited and just outside the Artlish claims, may contain approximately one million long tons of magnetite.

The Artlish property, by itself, is not of economic interest because of its adverse topographic location and low estimated reserves. However, if the Artlish mineralized zones were combined with those on Ventures' Hiller group sufficient

tonnage may be present to make an economic mining operation.

It is recommended that negotiations be carried out with Ventures to see if a favorable option can be obtained on their Hiller Group or if a joint development program could be worked out.

H.M. JONES



UTAH CONSTRUCTION & MINING CO
 M D & G DEPT VANCOUVER, B.C.

LOCATION MAP
 ARTLISH PROPERTY
 VANCOUVER ISLAND, B.C.

DRAWN H.M.J. | DATE JAN 1962

S.A.E. 0 10 20 30 40 50 Miles

GEOLOGICAL - GEOPHYSICAL REPORT
ARTLISH GROUP
50° 126° S.W.
H.M. JONES
MR. O.L. SKOGLAND
UTAH CONSTRUCTION & MINING CO.
SEPTEMBER 26 THROUGH DECEMBER 5, 1961

I. INTRODUCTION:

During the field season of 1961 Mt. Andrew Mining Company, later succeeded by Utah Construction and Mining Company, continued a program of geological reconnaissance on Vancouver Island. The object of this program was to examine interesting aeromagnetic anomalies which were recorded on two separate aeromagnetic surveys flown over various parts of Vancouver Island. One survey was flown for the British Columbia Department of Mines in 1956 and the second for Mt. Andrew Mining Company in 1960.

One of the areas flown for the B.C. Department of Mines was near Zeballos. The results of this survey, shown on map number A.M. 57-11 and titled "Lime Creek", indicate an anomaly over what was later found to be the Artlish Group. A field party examined this anomalous area in late June, and, although the ground was mostly snow covered, several impressive magnetite zones were observed (1)

Claims were immediately staked to cover the mineralized showings but before they were recorded it was found that the ground was already covered by claims in good standing. These claims are held by Mr. O.L. Skogland of Zeballos, B.C.

(1) H.M. Jones, M.J. Young -Aeromagnetic Anomaly Investigation, Vancouver Island, B.C., Lime Creek Area.

Negotiations were started with Mr. Skogland and on September 1, 1961 an option agreement was signed. A detailed examination of the property was then undertaken.

A. Mining History of the Zeballos Area:

The Zeballos area has been actively prospected since the late 1890's. Gold and iron discoveries were made but the area remained relatively inactive until 1934, when the first rich gold-quartz veins were discovered. Within a very short time, the Zeballos mining camp was an important gold producer. The Privateer Mine, which operated from 1936 to 1942 and from 1945 to 1948 was the principal producer, yielding 154,381 ounces of gold during its periods of operation. All gold mines in the area are now inactive.

Two iron prospects were known but they received very little attention until the early 1950's. The Ford deposit, about three miles north of Zeballos, is now being prepared for production by International Iron Mines Ltd. This deposit is estimated to contain two to three million tons of magnetite ore grading better than 50 percent iron.

The Churchill iron deposit, located about six miles north of Zeballos at the head of Fault Creek, is now under option to International Iron Mines Ltd. The Argonaut Mine Division, Utah Co. of the Americas, drilled this deposit in 1951 and estimated the tonnage to be 700,000 tons of magnetite ore grading 55.69% iron, 1.8% sulphur, 0.25% copper.

The Artlish Group and its possible extension to the northwest, held by Ventures Limited, are new discoveries. The Artlish Group was first staked by Mr. Skogland in 1956, allowed to lapse because of unfavorable Government legislation on iron ores and then restaked in 1958.

Ventures Limited discovered magnetite to the northwest and to the southwest of the Artlish Group. They have these mineralized zones staked and their claim adjoin the Artlish Group on the northwest, southeast and southwest.

B. LOCATION AND ACCESSIBILITY:

The Artlish Group is situated at $50^{\circ} 05'$ north latitude, $126^{\circ} 51'$ west longitude and lies between 2700 feet and 4200 feet above sea level. The claim group, which is three claims long by two claims wide, lies along a northwesterly trending ridge which separates the Artlish River drainage from the Kaouk River drainage. The property is about 7 miles due north of Zeballos, which is at the head of Zeballos Inlet, on the west coast of Vancouver Island, about 175 air miles west northwest of Vancouver, B.C.

Four miles of gravel road follow the Zeballos River north from Zeballos. From the end of the road, a packhorse trail winds its way up Lime Creek and terminates at the Churchill property. A rough foot path leads from here to the Artlish property.

Regular B.C. Airline flights service Zeballos from Vancouver. Also, the "Tahsis Chief", a coastal freight boat operated out of Vancouver by Northland Navigation Company, stops at Zeballos once a week. Supplies to the Artlish Camp must be flown in from Zeballos by helicopter, and these may be chartered from Vancouver or Victoria.

C. TOPOGRAPHY:

The Zeballos area is characterized by northwesterly trending mountain ranges which rise abruptly from sea level to elevations between 4000 feet and 6000 feet. The slopes are very steep, often cliff-forming, and the vegetation is usually dense on the lower slopes.

Timber generally thins out above the 3500-foot elevation and open,

C. TOPOGRAPHY: Cont.

heather-covered or rocky areas are not uncommon.

The Artlish Group lies on top of a rounded, sparsely timbered, north-westerly trending ridge which attains a maximum elevation of 4200 feet above sea level. Cirque-like features, which form the headwaters of the Artlish and Kaouk Rivers, lie respectively to the northeast and southwest of the ridge. Slopes on these two sides are very steep and cliffs, several hundred feet high are common. Timber is relatively sparse on the ridge top but becomes dense on the side-hills.

D. CLIMATE:

The climate of the Zeballos area is typical of the north coast of British Columbia and of the southern part of the Alaska Panhandle. Rainfall averages 150 inches per year with most of the precipitation falling during the fall and winter months. Sea level temperatures seldom drop below freezing during the winter and summer temperatures in the low 70° to 75° F. range are common. Snowfall is light at sea level but can be very heavy along the mountain tops.

At the Artlish property, the relatively high elevation produces severe winter conditions. Snow may be expected from late October to early June. Total snowfall is estimated at 20 feet, and 5 feet of snow on the ground, at any time, is not uncommon.

E. PREVIOUS WORK:

There are no signs of any work having ever been performed on the property. Rio Canadian Exploration Company made a brief dip needle reconnaissance of the property in the spring of 1961 when the ground was snow covered; and Ventures Limited examined it in 1960 when they unintentionally overstaked this ground.

F. PRESENT WORK BY UTAH CONSTRUCTION & MINING CO.

The Utah Construction & Mining Co. moved onto the property September 31, 1961 after waiting out a week of bad weather. All camp equipment, food and personnel were flown in from Zeballos via helicopter. A camp, consisting of a cookhouse, two bunkhouses and an office was constructed. All buildings are covered with plywood and built to withstand heavy winter snows.

The crew consisted of one surveyor, two survey helpers, one geophysicist, one geologist, and one prospector and a cook. The field program consisted of detailed magnetometer surveying over three known mineralized areas. Geologic mapping, on a scale of one inch equals 50 feet was completed over part of the area covered by the magnetometer survey.

A transit and chain controlled baseline and stadia controlled magnetometer lines were used for field magnetics and geologic mapping. It was found that the stadia lines could be run in almost as fast as the progress of the magnetometer operator along them.

Work was stopped December 5, 1961 because snow conditions combined with steep slopes made it unsafe to work further down slope.

II GEOLOGY

A. General Geology:

The area north of Zeballos was mapped by Gunning for the Geological Survey of Canada during the period 1927-1932. The results of his work are combined with that of Hoadley's and appear in G.S.C. Memoir 272. The geological map, which includes the area covered by the Artlish Group, is the Woss Lake sheet-map number 1028-A.

Gunning mapped four rock units in the area.

- (1) Karmutsen Group-Upper Triassic or earlier-a thick series of medium to basic,

highly amygdaloidal volcanic flows, with very little sedimentary material.

- (2) Quatsino Formation - Upper Triassic - a relatively thin band of white to light blue crystalline limestone.
- (3) Bonanza Group - Upper Triassic and Jurassic - a mixture of tuffs, breccias, agglomerates, lavas of intermediate composition and sedimentary rocks. The latter include argillite, calcareous argillite, dark coloured mainly impure limestone, tuffs, and limestone-cemented agglomerate. The sedimentary rocks, apart from minor intercalation of limestone, are almost entirely confined to lower 500 to 1000 feet of the group.
- (4) Coast Intrusives-Upper Jurassic and/or lower Cretaceous-Granodiorite, granite, diorite, quartz diorite, minor syenite, related minor intrusions.

Gunning's map indicates that the ridge on which the Artlish Group is located is composed of volcanics and sediments of the Bonanza Group. This northwesterly trending rock unit is about 2500 feet wide in the claims area and is in contact with the Quatsino limestone on the northeast and coast intrusions on the southwest.

B. LOCAL GEOLOGY:

1. Rock types:

A sequence of bedded sedimentary and banded volcanic rocks form the main part of the ridge. This rock unit is in contact with white to grey crystalline limestone on the northeast side of the ridge. (See map No. VD-40C-57-1)

(1) Bonanza volcanics and sediments:

In the volcanic-sedimentary sequence no distinct marker bed was found. However, numerous outcrops were found which show distinct garnet banding. These bands vary from one inch to six inches wide. Numerous attitudes were

taken on the bands and these varied from N. 55° W/ 55° SW to N 5° W/ 32° W. It should be noted that the attitudes along the southwest edge of the map area are relatively uniform, averaging N 48° W/ 45° SW, while on the northeast edge of the map area the attitudes vary from N 55° W/ 55° SW to N 5° W/ 32° W. On this latter side the beds show a definite swing toward the north.

The rocks which comprise the volcanic-sedimentary sequence include: dark grey, finely banded mudstones, argillite, light grey quartzite; and volcanics, which vary from light grey to white, fine grained, dense, feldspathic tuffs(?) to medium grained, grey to green andesites and porphyritic andesites. The garnet bands, consisting of fine grained, massive garnet, are commonly one inch to six inches wide and are seldom over one foot in width. Garnet bands are irregular spaced but separations of less than one foot are common.

Numerous outcrops of the volcanic-sedimentary sequence are coated with a heavy iron stain. Disseminated pyrite was noted in some of the volcanics and this, together with the breakdown of the rock-forming minerals probably accounts for this discolouration.

Between the southwest and northeast extremities of the mapped area the banded sequence appears to be less abundant and andesite, andesite porphyry and feldspathized volcanics are the dominant rocks. They vary from light grey to dark grey, vaguely porphyritic to distinctly porphyritic; and from light grey to black, fine grained to medium grained, dense to porphyritic.

These volcanics show little or no evidence of banding.

(ii) Quatsino Limestone:

The only exposures of limestone seen were white to grey and coarsely crystalline. No evidence of bedding was seen.

Gunning states that the Quatsino Limestone can be traced almost continuously across the Woss Lake map-area, a distance of 15 miles. The Artlish

property is approximately mid-way along this zone. The limestone is also known to extend northwest and beyond the Empire Development Company's iron mine at Benson Lake, approximately 35 miles northwest of the Artlish property. It has also been traced approximately 40 miles southeast to and beyond the head of Muchalat Inlet.

The limestone varies in thickness from 200 feet to 3500 feet in the Zeballos area and in the vicinity of the Artlish Group it is approximately 2000 feet thick.

(iii) Intrusive rocks:

Numerous dykes were intruded into the volcanic-sedimentary sequence.

These include:

(a) Aplite Dykes:

Aplite outcrops were found in great abundance along the ridge top. J.J. MacDougall (Ventures Limited, personal communication) classifies these dyke rocks as leucocratic granite or Alaskite. Because of snow or ice cover, many of these exposures could not be traced to develop the trend of the dyke. However, at the southeast end of the map area, two 20 to 30-foot wide dykes are well exposed. These strike slightly west of north and dip steeply. Their contacts are irregular; i.e., the dip is variable and the aplite fills many fractures, etc., in the host rock thus locally forming a very ragged contact surface.

Aplite outcrops are numerous on the northwest end of the map area. Exposures up to 50 feet wide were noted. The abundance of aplitic material in this area suggests that it was intruded by a swarm of dykes. One dyke, averaging 25 feet in width, was traced for 600 feet. Its attitude is similar to those mapped at the southeast end of the map area.

(b) Diorite dyke:

Only one diorite dyke was mapped. It was dark grey, medium grained, holocrystalline, and composed of about 60% feldspar and 40% black mafics.

(c) Basic dykes:

Basic dykes are fairly common. They are the latest intrusives and cut the volcanic-sedimentary sequence, limestone and the aplite dykes.

They vary in texture and composition but are generally dark grey to brown-grey, fine to medium grained, dense to porphyritic. Some of these dykes closely resemble andesite.

2. Faults:

Numerous gulleys and draws cut the ridge top and sidehills. In most cases one or more of the following features could be found in the rock adjacent to the gulleys---dense fracturing parallelling the gully, shearing parallelling the gully, slickensides or mullion structure. For these reasons, the depressions were inferred as the topographic expression of fault zones. These show a predominant northeasterly trend with lesser faults feathering off in a northerly direction.

Very little evidence was found of displacement along any of the fault zones. At the southeast end of the map area, two large aplite dykes appear to be displaced by as much as 15 feet. Also, about 100 feet north from here, there is an apparent warping and slight displacement of two aplite dykes.

3. Structure:

The volcanic and sedimentary rocks of northern Vancouver Island are folded into broad, regional, northwesterly striking anticlines and synclines. These structures were intruded by batholiths, stocks, sills and dykes which locally produced folding and warping.

The limestone belt, which lies on the northeast side of the Artlish Group, has a regional northwesterly trend but locally it is warped by the intrusives to a north or northeasterly strike. This same limestone belt, in the vicinity of both the Empire Development Company's and the International Iron Mines' magnetite deposits, has a northeasterly strike, resulting from the intrusion of the Coast Copper stock in the first instance and the Zeballos batholith in the second. Also, the Artlish Group lies near the south end of a localized north warping of the limestone.

Within the Artlish claims, all bedding dips moderately to the southwest or west. These dips may indicate the area to be underlain by the westerly limb of an anticline. (Gunning indicates an anticlinal axis approximately 1.5 miles southeast of the property). The bedded structures show a warping from the regional north-westerly trend to one of northerly. This is probably the result of the Zeballos batholith which lies several thousand feet to the southwest. Also, numerous north-easterly trending faults, which locally warp the beds, are probably the result of stresses set up by the intruding mass.

Detail of the local structure is included in the descriptions of the mineralized zones.

To the northwest, beyond the map area, the banded volcanic-sedimentary sequence was observed to be dragged along a northeasterly trending fault zone. This occurs in the deep draw at 51,150 N, 48,350 E.

Elsewhere on the property, snow covered most gulleys to the extent that it was difficult to trace formations across the fault zones.

III Mineralization

Three mineralized zones were observed on the property. For convenience,

the zones were named as follows:-

(A) Footwall Zone

The footwall zone lies between the following approximate co-ordinates: 50,450N, 49,750E and 50,800N, 49,400E. Magnetite may be traced for about 500 feet along strike and widths up to 50 feet are indicated. (assuming dip near 32° true thickness is about 25 feet).

The zone shows a strong curvature and slight flattening toward the northwest. The southeast end trends N 55° W/ 45° SW while the northwest end trends N. 15° W/ 32° W. This change in attitude is probably due to a northeasterly striking fault which cuts through the centre of the zone.

The mineralization is on or very near the Bonanza-Quatsino contact. The contact area was under heavy snow cover but sufficient limestone outcrops were present to indicate the proximity of the magnetite to the contact.

The upper contact is exposed along the previously mentioned fault zone. Here, the magnetite is in contact with a black amphibolite which contains an appreciable amount of spotty magnetite, the grade of which is estimated to be 25-30% iron. This rock unit is approximately ten feet wide, strikes N 25° W and dips 32° southwest. It, in turn, is in contact with the garnet banded volcanic-sedimentary sequence which is barren of mineralization. The magnetite and overlying volcanics are heavily iron stained.

(B) Middle zone

The middle zone was traced by geologic mapping for 1800 feet. Magnetics indicate the zone continues for approximately 600 feet further to the southeast for a total length of 2400 feet.

The mineralized zone, within the area mapped, shows a slight curvature

towards the north. At the southeast end, the zone trends N. 55° W. while at the northwest end it trends N. 35° W. This curvature is in the same direction as that of the "footwall zone" but does not swing as far north as the latter. Beyond the map area, to the southeast, magnetics indicate that the zone swings to the south. This is probably local northeasterly warping of the regional northwest striking structure as further indicated by the numerous northeast-trending faults.

There are three mineralized sections within the middle zone, two of which are shown on the geology map. The third mineralized section, which lies about 600 feet southeast of the map area, was covered by the magnetometer survey but because of snow cover the geology was not mapped. For convenience the middle zone was subdivided as follows, from northwest to southeast.

1. Section A - This mineralized section lies between the following approximate coordinates: 50,350N, 49,300 E and 51,000N, 48,750E. Mapping indicates the section to be approximately 900 feet long and up to 90 feet wide (assuming a dip of 40°, the maximum true width is near 60 feet).

2. Section B - It lies between the following approximate coordinates: 49,700N, 50,150E, and 50,150N, 49,550E. This section is estimated to be approximately 850 feet long and up to 50 feet wide. Scattered outcrops of massive magnetite were observed over the length of the Section B, indicating that an appreciable amount of relatively high grade magnetite may be present.

3. Section C - Magnetics define this section between the following approximate coordinates: 49,600N, 50,550E and 49,050N, 50,500E. Three small magnetic anomalies of intermediate intensity were recorded in this area, indicating spotty, lower grade mineralization. No geology was mapped in this area because of snow cover.

Although no contacts were seen, all the rocks mapped adjacent to section A and B, on the southwest or hanging wall side, were of the garnet banded volcanic-sedimentary sequence. The same rocks were noted near the centre

of the map-area on the footwall side. However, towards the north and south extremities of these zones, black andesite and andesite porphyries appear to form the footwall rocks.

(C) Hanging wall zone

This zone occurs to the west of the Artlish Group and all but the eastern most 100 feet of it lies outside the O.L.S. #7 claim boundary. Two small anomalous areas were recorded and they lie between the following approximate coordinates: Section A-50,150N, 46750E to 50,050N, 46,960E; and Sections B-49,950N, 47,630E to 49,950N, 47820E. These areas are respectively approximately 220 feet long by 50 feet wide and 250 feet long by 100 feet wide.

These anomalies occur along the top north side of an east-west trending ridge. The north side of the ridge is very steep and for the most part, cliff-forming. This cliff edge represents a fault, the continuation of which forms a gully on the southwest slope of the Artlish property.

At the time of examination this area was under a three-foot snow cover and work had to be restricted to the ridge top. Magnetometer lines could be run only to the cliff edge, thus leaving the anomalies open on the north side. A brief reconnaissance made beneath the cliffs, and before the snow came found appreciable magnetite outcrop down slope from the second mentioned anomaly.

IV Alteration

Garnet bands, varying in thickness from a fraction of an inch to several feet wide, are widespread over the Artlish property. These bands parallel the regional structure and occur in the lower sedimentary-volcanic members of the Bonanza group. This alteration can be traced over the length of the property and is probably a regional feature resulting from the intrusion of the Zeballos batholith into the Bonanza group.

The garnet appears to be selective and is confined to well defined beds which originally were probably impure limestone, limy argillite and limy tuffs.

Adjacent to the footwall magnetite zone is a band of black amphibolite. Associated with this is an appreciable amount of irregularly disseminated magnetite and minor pyrite and garnet. This rock unit was probably formed as a result of hydrothermal alteration of a gabbro or basic volcanic.

Many of the rock mapped as members of the sedimentary-volcanic sequence are light to dark grey, and very feldspathic. This feldspathization is also probably a regional metamorphic feature.

V. Results

A. Assay Results

Heavy iron stain was noted on most magnetite exposures in all zones. In some instances pyrite was noted as fracture coatings and fine disseminations. The following is a table of assay results of samples taken partly or entirely from some of these rusty zones. These samples were taken by G.A. Noel during his initial examination of the property in August, 1961. The approximate sample locations are shown on Map No. VD-40C-57-1.

SAMPLE	TYPE	LENGTH	% FE	% S	% P	% Cu
1	Chip	12.0	57.65	0.11	0.31)
2	"	29.0	48.11	0.18	0.09)
3	"	30.0	48.85	0.17	0.12) Composite
4	"	30.0	43.40	0.21	0.11) 0.03
5	"	90.0	40.60	0.15	0.07)

Combined assay values are: 44.5% Fe, 0.16% S., 0.10% P.

B. Possible tonnage

1. The following calculations are based on the mapped geology, assuming continuity between magnetite exposures, and using a tonnage factor of 10 cu. ft. per long ton.

ZONE	LENGTH (ft)	WIDTH (ft)	Down-Dip Extent (ft)	Tonnage (Long tons)
Footwall	500	25	100	125,000
Middle Zone A	900	60	200	1,080,000
Middle Zone B	850	32	200	544,000
Middle Zone C				<u>50,000</u>
			Total	<u>1,800,000</u> long tons

The above calculations should be considered as the most optimistic view since it is known that there are barren sections within the mineralized zones.

2. The following calculations are partially based on the magnetics. The widths and depths are the same as used in the first calculations but the lengths of the zones are measured from the magnetic anomalies, assuming the 10,000 gamma contour as the limits of each zone. In the middle zone, sections A, B & C contain several areas which are less than 10,000 gammas. These areas are considered as being low in grade and are omitted from the calculations. The lengths used in the middle zone calculations are the summation of the length of each anomalous area enclosed by a 10,000 gamma contour in each section of this zone.

ZONE	LENGTH (ft)	WIDTH (ft)	Down-Dip Extent (ft)	TONNAGE (Long tons)
Footwall	340	25	100	85,000
Middle A	600	60	200	720,000
Middle B	500	40	200	400,000
Middle C	220	20	50	<u>22,000</u>
				<u>1,227,000</u> long tons

These calculations are considered to be more representative since they omit areas which magnetics indicate are either unmineralized or low in grade.

Assuming the grab samples to be representative, a conservative estimate indicates that 1,230,000 long tons of magnetite grading 44.5% Fe are present on the Artlish group of claims.

(3) Not included in the calculations is that magnetite which lies outside of the claims area in what has been referred to as the "hanging wall" zone. Since less than half of section B is on the Artlish group, it was considered as being off the claims. The possible tonnage in the zone, as based on magnetic data only, is as follows:

SECTION	LENGTH (ft)	WIDTH (ft)	Down-dip Extent (ft)	TONNAGE(long tons)
A	220	50	200	220,000
B	250	100	300	<u>750,000</u>
		Total		<u>970,000</u> long tons

The estimated tonnage in this zone is probably very conservative. Because of snow conditions, no geologic mapping or magnetometer surveying was carried out on or below the cliff. Below the cliff edge, there is a good possibility that there is continuity between the two anomalies, which at present are separated by 500 feet of low magnetics.

In total, the Artlish property and the neighbouring "hanging wall" zone contain an estimated 2,230,000 long tons of magnetite which probably grade between 40% and 45% iron.

4. Possible Additional Tonnage

A reconnaissance aeromagnetic survey, using a Jalander magnetometer in a Bell G-2 helicopter, was made over the southwestern slopes on and beneath the Artlish Group. (See Appendix 1-G.D. DeLane-Report on the Jalander Airborne Magnetometer survey over the Southwestern slope of the Artlish Group) One anomalous area, previously unknown to the company, was recorded near the northwest corner of O.L.S. No. 7 Claim. This anomaly follows a creek gully from an elevation of 3500 feet down to 2300 feet. Observations from the air noted abundant iron stain along the creek. Due to difficulties in navigation the exact location of the anomaly is now known but its approximate location is shown on map number VC-400-57-4.

This zone is indicated as approximately 2400 feet long. Assuming an average width of 25 feet and depth of 200 feet, there may be 1,000,000 tons of magnetite in this zone. It should be noted that approximately one-half of this anomalous area lies on the Artlish Group, the remainder being probably on ground held by Ventures Limited.

No other anomalous areas are known at the present time. Prospecting northwesterly along the limestone-volcanics contact could possibly result in finding other mineralized zones.

VI CONCLUSIONS

The two magnetite zones which occur within the claims area are of the contact metamorphic type. Garnet alteration is common and amphibolite borders one of the zones.

The "footwall zone" occurs along the Bonanza-Quatsino contact whereas the "middle zone" occurs approximately 400 feet southwest of the contact. Both deposits parallel the regional structure and replace favourable beds in the sedimentary-volcanic sequence of the Bonanza group.

Faulting is also a probable control of these deposits. Along the "footwall zone", a cliff exposes magnetite over the length of the zone. This may be a fault scarp. Also, a northeasterly trending fault crosses the centre of this zone. Several prominent northeasterly faults also cross the "middle zone." These faults may have provided the channels for the hydrothermal solutions.

The "hanging wall" zone, the most of which lies just outside the western boundary of the Artlish claims area, is exposed along a steep cliff edge. This cliff is probably a fault scarp since its strike, projected to the east, follows a gully which crosses the Artlish property. This deposit must be fault controlled since it does not coincide with the regional structure but instead parallels the fault.

A conservative estimate indicates that this property may yield 1,230,000 long tons of magnetite, grading between 40% and 45% iron. Four chip samples averaged 0.16% sulphur and 0.10% phosphorous, indicating that these impurities may be present in sufficient amounts to be detrimental.

The "hanging wall" zone, which lies on ground held by Ventures Limited could yield 1,000,000 long tons of magnetite.

Although the Artlish property does not at present appear to be of economic importance because of its limited tonnage and remote location, several additional neighboring magnetite deposits, including the "hanging wall" zone, are located on the adjoining Hiller claims owned by Ventures Limited. If a favorable agreement can be made with Ventures Limited for an option on their claims or for a joint development program, then between the two properties the total tonnage might be increased sufficiently to make a mining operation feasible.

VII RECOMMENDATIONS

1. Geologic mapping and magnetometer surveying should be continued to completely cover the Artlish claim group, especially on the lower southwest slope to find out if the middle zone mineralization comes to surface.
2. A minimum of 2000 feet of diamond drilling should be done to test the depth and grade of the mineralized zones. Since these deposits are of the contact metamorphic type, their shapes could be very irregular and they even may widen at depth.
3. An agreement should be made with Ventures Limited regarding their Hiller claims, to permit either our leasing their ground or a joint development of both properties.
4. If some favorable agreement is reached with Ventures Limited then airborne magnetometer surveying, using a helicopter, should be done over the entire area.

A. A. Noel, P. ENG.

A P P E N D I X

UTAH CONSTRUCTION & MINING CO.
MINERAL DEVELOPMENT AND GEOLOGY DIVISION

ROOM 204 - 510 WEST HASTINGS STREET - VANCOUVER 2, B.C.

August 28, 1962

Mr. F.R. Carmichael,
Deputy Mining Recorder,
205 Elizabeth Street,
ALBERNI, B.C.

Dear Sir:

RE: YOUR FILE 8-7

This will acknowledge your letter of August 13 requesting additional information relative to the Geological and Geophysical Report which we submitted to cover the assessment requirements on the Artlish group of claims in the Zeballos area on Vancouver Island.

We are pleased to supply the following information:

a) dates between which each man worked:

<u>NAME</u>	<u>PERIOD OF WORK(1961)</u>
Harold M. Jones	September 26 to December 7
George A. Jameson	October 28 to December 7
William C. Sevrens	September 26 to November 6
Gerald D. Delane	November 1 to December 7
Terrace S. Samoil	September 26 to November 4
Raymond A. Rivers	September 26 to December 7
Gerard Venne	September 26 to December 7
Knud A. Godtfredsen	September 26 to November 2
Ralph E. Boulton	September 26 to December 7

b) Costs for--geological mapping, magnetic survey, other operations:

Geological mapping	\$ 2,533.32
Magnetic surveying	2,179.16
Other operations	<u>3,099.18</u>
Total	<u>\$ 7,811.66</u>

I trust that the above data may permit you to process our affidavit on application for a certificate of work on the above claims.

Yours very truly,

G.A. NOEL,
District Geologist

DOMINION OF CANADA:
PROVINCE OF BRITISH COLUMBIA.
To Wit:

In the Matter of

SUB-MINING RECORDER
RECEIVED
JUN 15 1962
M.R. #54888 2 \$190.00
VANCOUVER, B.C.

I, GERALD A. NOEL

of 510 West Hastings St., Room, 204,

in the Province of British Columbia, do solemnly declare that I am District Geologist in charge of operations of Utah Construction & Mining Co. in the Province of British Columbia.

Further that during the months of September, October, November, and December 1961, Utah Construction & Mining Co. paid salaries for work actually done on and for the Artlish group of four claims located in the Alberni Mining Division. These claims have Record Nos. 4793 through 4796, and were recorded on June 25, 1959.

Harold M. Jones was paid atotal of \$1533.33 for 2 2/3 month's work at the rate of \$575.00/month.

George A. Jameson was paid a total of \$787.50 for 1 1/2 month's work at the rate of \$525.00/ month.

William C. Sevrens was paid atotal of \$833.33 for 1 2/3 month's work at the rate of \$500./month

Gerald D. Delane was paid a total of \$712.50 for 1 1/2 months work at the rate of \$475./month

Terrace S. Samoil was paid a totaloof \$536.67 for 1 1/6 month's work at the rate of \$460./month

Raymond A. Rivers was paid a total of \$1,200. for 2 2/3 month's work at the rate of \$450./month

Gerard Venne was paid atotal of \$933.33for 2 2/3 month's work at the rate of \$350./month

Knud A. Godtfredsen was paid a total of \$408.33 for 1 1/6 month's work at the rate of \$350./month

Ralph E. Boulton was paid atotal of \$866.67 for 2 2/3 month's work at the rate of \$325./month

Thus a total of \$7811.66 was spent for wages for work on and for the Artlish group of claims

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City
of Vancouver, in the
Province of British Columbia, this 8th
day of June 1962, A.D.

Gerald A. Noel

[Signature]
A Commissioner for taking Affidavits within British Columbia or
A Notary Public in and for the Province of British Columbia.

UTAH CONSTRUCTION & MINING COMPANY
MINERAL DEVELOPMENT AND GEOLOGY DIVISION



ROOM 204 - 510 WEST HASTINGS STREET - VANCOUVER 2, B. C.

July 13, 1962

Mr. T.G. O'Neill,
205 Elizabeth Street,
ALBERNI, B.C.

Dear Sir:

RE: ARTLISH GROUP OF MINERAL CLAIMS--GEOLOGICAL
AND GEOPHYSICAL REPORT

This letter is in reply to your letter of July 6 requesting further information relating to the report submitted by Mr. Harold M. Jones to cover the assessment requirements on the Artlish claims in the Zeballos area, Alberni Mining Division. The following explanatory statements are numbered in the same order as in your letter.

1) Geological Mapping

The geological mapping was done by Harold M. Jones with some assistance from Gerald D. Delane and William C. Sevrens. This geological mapping of the property was conducted throughout 2½ months of fieldwork from October 1 until December 7.

The procedure followed consisted of first laying in a closed transit and tape control survey; then transit and stadia control points for geologic mapping. In addition a transit and stadia magnetometer grid was laid out and this was used as control for geologic mapping. The topographic coordinate grid and control points were marked on 8½" x 11" sheets of mylar film for geologic mapping. This mapping was done on a scale of one inch to fifty feet with complete coverage of all outcrops. Geologic mapping of the mineralized sections was attended to initially and this detailed (1" to 50 Feet) mapping was only about 60% completed on the Artlish claims when adverse weather forced a halt in this work on December 7.

A base map for regional mapping at 200 feet to one inch was constructed by Hunting Surveys from aerial photographs, but no regional mapping was undertaken during the 1961 field season due to time limitations. Harold M. Jones spent eight weeks on the geological fieldwork and an additional two to three weeks in the office completing this map. He was assisted for two weeks by William Sevrens and for one week by Gerald Delane.

2) Magnetic mapping

The magnetic mapping was done by Gerald D. Delane who was assisted by

Mr. T.G. O'Neill,

July 13, 1962

2. Magnetic mapping, Cont.

either Ralph E. Boulton or Gerard Venne for most of the time. The magnetic work was done from October 25 to December 7 and consisted of readings taken at 10 to 20-foot intervals on lines about 50 feet apart. These lines were run in by transit and stadia in a northeast-southwest direction across the ridge line which trends northwest-southeast. These lines extended about 300 feet northeast of and about 300 feet southwest of this ridge line. A plot of the vertical magnetic intensity for each station was made and then a contour map was compiled from these data. The instrument used was a Jalander Electronic magnetometer, model 1957, serial number 5779, manufactured by H. Jalander, TukholmanKatu, Helsinki Finland. This instrument operates on the "flux-gate" principle and is a self orienting instrument capable of reading from 0 to 250,000 gammas, positive or negative field, in five ranges. It reads the vertical magnetic field directly in gammas, and has a precision of ± 10 gammas on the first scale. Gerald D. Delane spent six weeks on this geophysical work. Ralph E. Boulton assisted on the geophysical work for two weeks. Gerard Venne assisted on the magnetic work for two weeks.

3. Qualifications of the geophysicist

Gerald D. Delane graduated from University of B.C. in 1961 with a Bachelor of Science degree, majoring in geology and geophysics. He worked for Kennco Explorations (Western) Limited under Charles Nay, John Anderson and Dr. J.J. Brummer during May to September in both 1958 and 1959 in the Princeton and Merritt areas of B.C. His duties included geological mapping and geochemical and geophysical surveys. The geophysical work included magnetics and induced polarization work. The magnetic work involved some interpretative work on magnetic profiles--instrument used was a Sharpe A-2 magnetometer.

From May to September 1960 Gerald Delane was employed by Hudson Bay Mining and Smelting Co. under Mr. A.A. Koffman on geophysical surveys in the Lynn Lake area of Manitoba. He worked largely with electromagnetic equipment at this time; i.e. Ronka equipment mainly.

From May 10, 1961 until the present, Gerald Delane has been employed by Utah Construction & Mining Co. as a geophysicst-geologist. From May to July 1961 he conducted a detailed ground magnetometer survey on our Poorman magnetite property on Prince of Wales Island for this company under the supervision of G.I. Mac Innis, geologist, and myself. This work was done with a Sharpe D-1M magnetometer of the "super-dip" type, and later with the Jalander electronic magnetometer (previously described).

Mr. T.G. O'Neill

July 13, 1962

During August and September 1961, Gerald Delane conducted detailed ground magnetic surveys on the Ptarmigan property on the North Bradfield River in Southeastern Alaska. In addition he did an air borne magnetometer reconnaissance survey over these latter claims using the Jalander magnetometer in a helicopter. Following this work, Delane was moved to the Artlish property.

He has plotted all of his results and done some interpretive work from these results for Utah Construction & Mining Co.

4. Time Not covered in (1) and (2)

Topographic surveying was conducted on the Artlish claims from October 1 until December 7. This work involved construction of a one-inch to fifty feet topographic base map from a closed transit and tape traverse with transit and stadia side shots and open traverses. In addition, control points for geologic mapping were set by the transit and stadia method, and a grid was laid out for the magnetometer survey. The final survey work, which was interrupted in December by adverse weather, was laid out with the intention of picking up all Artlish and immediately adjoining claims as a means of constructing a regional claim and topographic map. This map was to be at a scale of 200 feet to one inch. Very little of this work was completed by December 7. Following this field work at least two weeks were required to complete the compilation and plotting of the work and to prepare topographic map. George Jameson was employed on this survey work from November 1 to December 15. Terrace S. Samoil was employed on this survey work from September 26 to November 1. Gerard Venne was employed on survey work from September 26 to December 7. Ralph E. Boulton was employed on survey work from September 26 to December 7.

*Affected by
50% 1/2 ms*

Two men were used in camp construction work and in prospecting the claims area--William Sevrens and Knud Godfredsen. The camp was built in about three weeks and consisted of four plywood frame buildings constructed on the Artlish claims. About three weeks was spent by these two men prospecting the Artlish claims.

Raymond Rivers was camp cook and was employed at the camp from September 26 to December 7. An airborne magnetometer reconnaissance was carried out over the southwest slope of the claims area and over the adjoining Hiller claims during December 1961. This work was done in one or two days by helicopter by G.D. Delane. Considerably more time was spent in the plotting and analysis of the results between December 7 and 31 in Vancouver.

The camp was entirely serviced by helicopter from Zeballos and was equipped with radio telephone. Both of these facilities entailed considerable expense but were not shown in the statement of expenditures.

Mr. T.G. O'Neill

July 13, 1962

5. Time on geological and geophysical work outside the boundaries of the Artlish Claims.

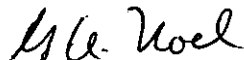
The actual time spent on geological and geophysical work outside the boundaries of the Artlish claims would amount to about one week with the distribution as follows:

- a) Magnetic survey ---- G.D. Delane - 4 days
- b) Prospecting ----- W.C. Sevrens)
 K.A. Godtfredsen) one week
- c) Topographic Surveying G.A. Jameson)
 R.E. Boulton) one week
 G. Venne)

This work was done on the boundaries of the Artlish claims to cover all extensions of the known mineralization. In addition, we were uncertain as to the actual boundaries until the work was almost completed and about 90% of the work shown above as outside the boundaries of the Artlish claims, was at the time thought to be within the claim boundaries; i.e. all of the work except the two days on airborne magnetometer reconnaissance by G.D. Delane.

I trust that the above explanation has covered your enquiry quite adequately.

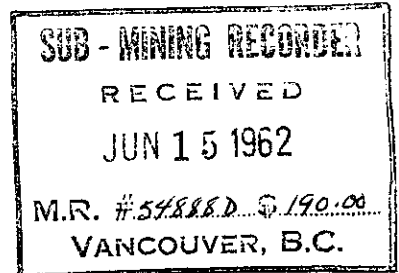
Yours very truly,



G.A. NOEL,
District Geologist

GAN/do

STATEMENT OF QUALIFICATIONS



THIS IS TO CERTIFY THAT I, Harold Mervin Jones, am a Canadian Citizen, born in Trail, British Columbia, April 25, 1930, attended public, junior and senior high schools in Trail, British Columbia and completed grade XIII in June, 1948. received my University education from the University of British Columbia situated at Vancouver, British Columbia, and graduated from there in May, 1956 with the degree of B.A. Sc. in Geological Engineering.

worked as a Junior Geologist for Bethlehem Copper Corp. and American Smelting & Refining Co., under the supervision of C.J. Coveney, from May 1956 through September, 1956. Duties involved surveying diamond drill holes, core logging, and assisting onground layout and performing of magnetometer and electromagnetic surveys.

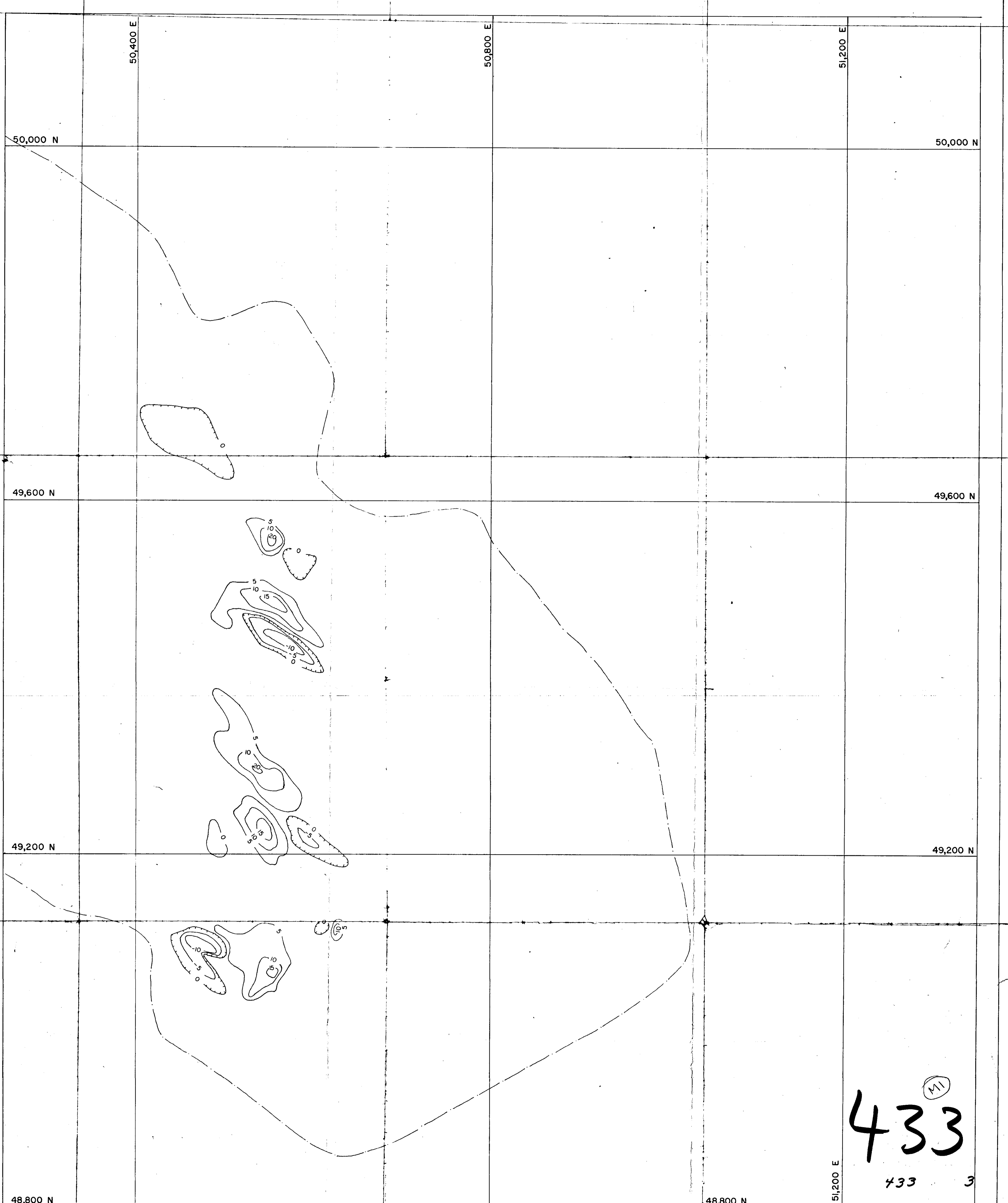
worked as a Geologist, under the direct supervision of G.A. Noel, P. Eng., for Utah Construction & Mining Co. since October, 1957. Duties have involved property examinations, investigation of aeromagnetic anomalies, layout and supervision of diamond drill programs, detailed geologic mapping, magnetic surveys and geologic reconnaissance in British Columbia and Alaska.

Harold M. Jones

Harold M. Jones, B.A. Sc.
Geologist
Utah Construction & Mining Co.

VANCOUVER, B.C.

May 15, 1962



50,000 N

50,000 N

49,600 N

49,600 N

49,200 N

49,200 N

48,800 N

48,800 N

50,400 E

50,800 E

51,200 E

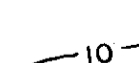


50,400 E

50,800 E

51,200 E

MI
433
433 3

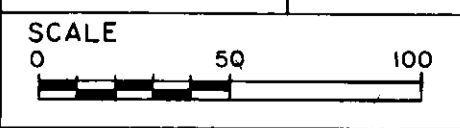
LEGEND

-  MAGNETIC CONTOUR — defined, inferred — contour interval as shown
-  MAGNETIC DEPRESSION
-  LIMIT OF 1961 MAGNETOMETER SURVEY
(gamma readings x 1000)

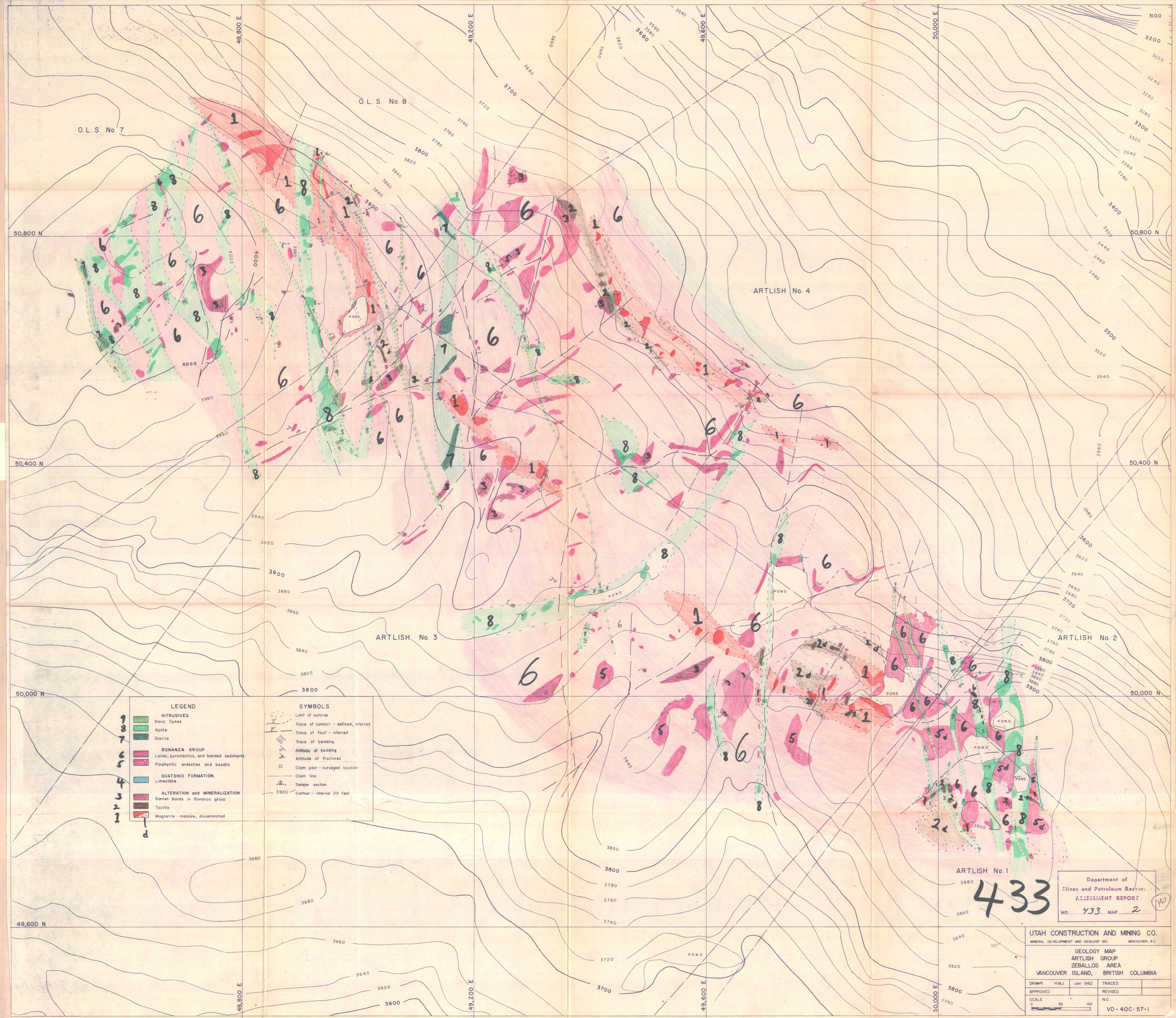
UTAH CONSTRUCTION & MINING CO.
MINERAL DEVELOPMENT & GEOLOGY DIV. VANCOUVER, B.C.

VERTICAL MAGNETIC INTENSITY MAP
ARTLISH GROUP
ZEBALLOS AREA
VANCOUVER ISLAND, BRITISH COLUMBIA

DRAWN	G.D.D.	Dec 1961	TRACED	H.M.J.	Feb 1962
APPROVED			REVISED		



No. VD-40C-57-5b



LEGEND

1	INTRUSIVES
2	Basic Dykes
3	Apilite
4	Diorite
5	BONANZA GROUP
6	Lavas, pyroclastics, and banded sediments
7	Porphyritic andesites and basalts
8	QUATSINO FORMATION
9	Limestone
10	ALTERATION and MINERALIZATION
11	Garnet bands in Bonanza group
12	Tactite
13	Magnetite - massive, disseminated

SYMBOLS

(Symbol)	Limit of outcrop
(Symbol)	Trace of contact - defined, inferred
(Symbol)	Trace of fault - inferred
(Symbol)	Trace of bedding
(Symbol)	Attitude of bedding
(Symbol)	Attitude of fractures
(Symbol)	Claim post - surveyed location
(Symbol)	Claim line
(Symbol)	Sample section
(Symbol)	3920 Contour - interval 20 feet

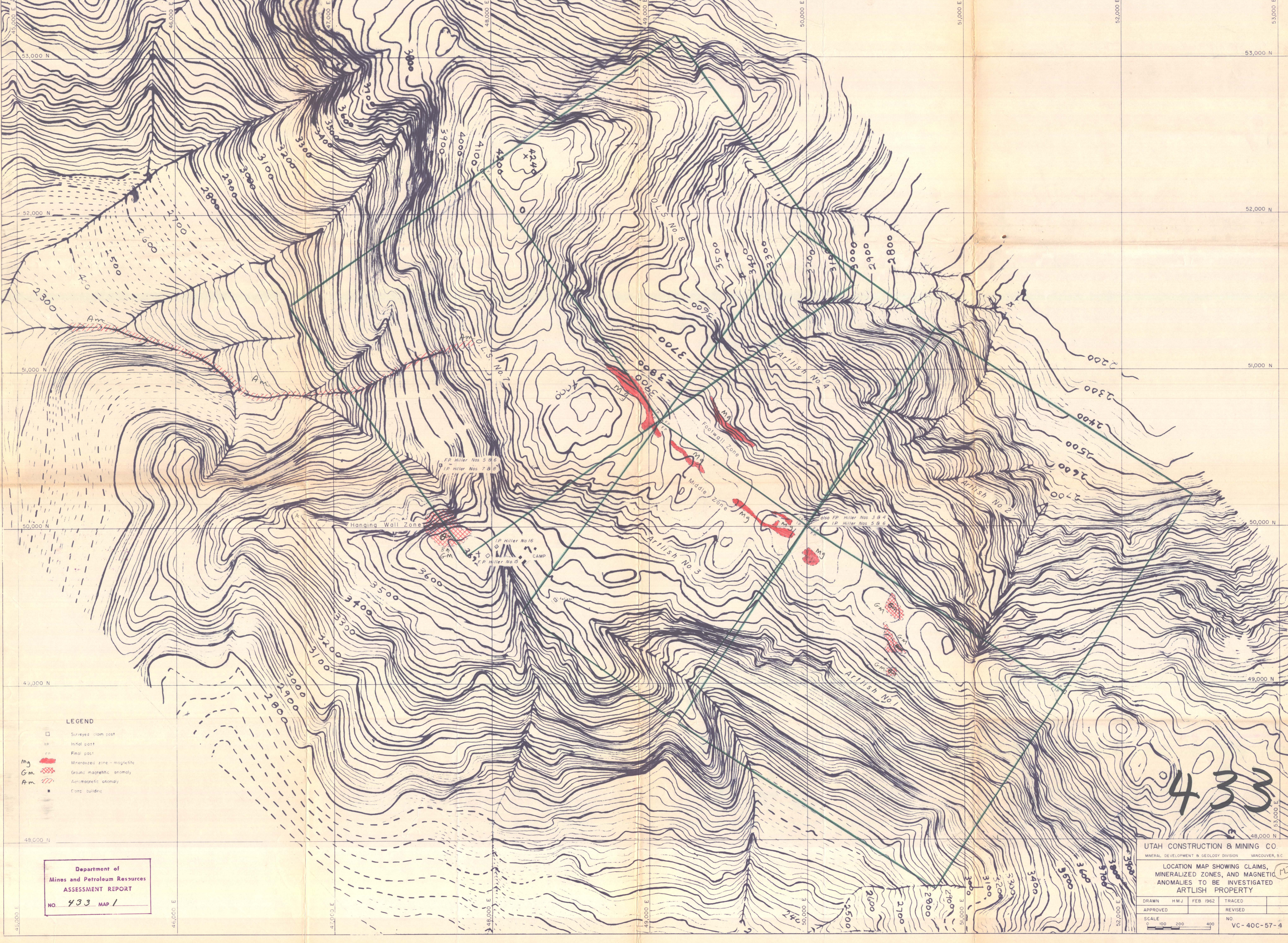
ARTLISH No. 1
433

Department of
 Mines and Petroleum Resources
ASSESSMENT REPORT
 NO. 433 MAP 2

UTAH CONSTRUCTION AND MINING CO.
 MINERAL DEVELOPMENT AND GEOLOGY DIV. VANCOUVER, B.C.

GEOLOGY MAP
 ARTLISH GROUP
 ZEBALLOS AREA
 VANCOUVER ISLAND, BRITISH COLUMBIA

DRAWN	H.M.J.	Jan. 1962	TRACED
APPROVED			REVISED
SCALE	0	50	100
			NO.
			VD-40C-57-1



LEGEND

- Surveyed claim post
- ip Initial post
- fm Final post
- Mg Mineralized zone - magnetite
- Gm Ground magnetic anomaly
- Am Aeromagnetic anomaly
- Camp building

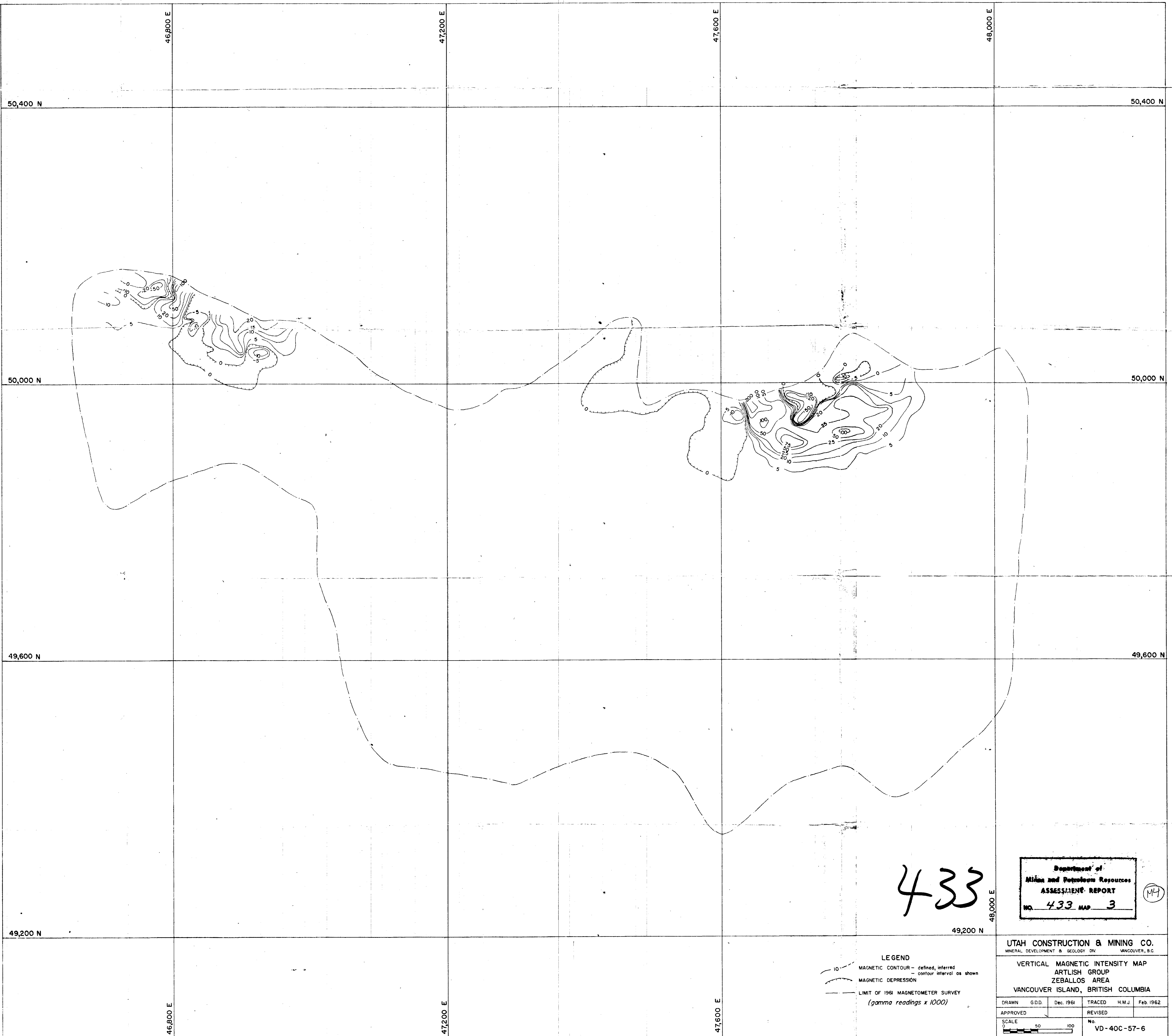
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 433 MAP 1

433

UTAH CONSTRUCTION & MINING CO.
MINERAL DEVELOPMENT & GEOLOGY DIVISION VANCOUVER, B.C.

LOCATION MAP SHOWING CLAIMS,
MINERALIZED ZONES, AND MAGNETIC
ANOMALIES TO BE INVESTIGATED
ARTLISH PROPERTY

DRAWN	HMJ	FEB 1962	TRACED
APPROVED			REVISED
SCALE	0 100 200 400		NO
			VC-40C-57-4



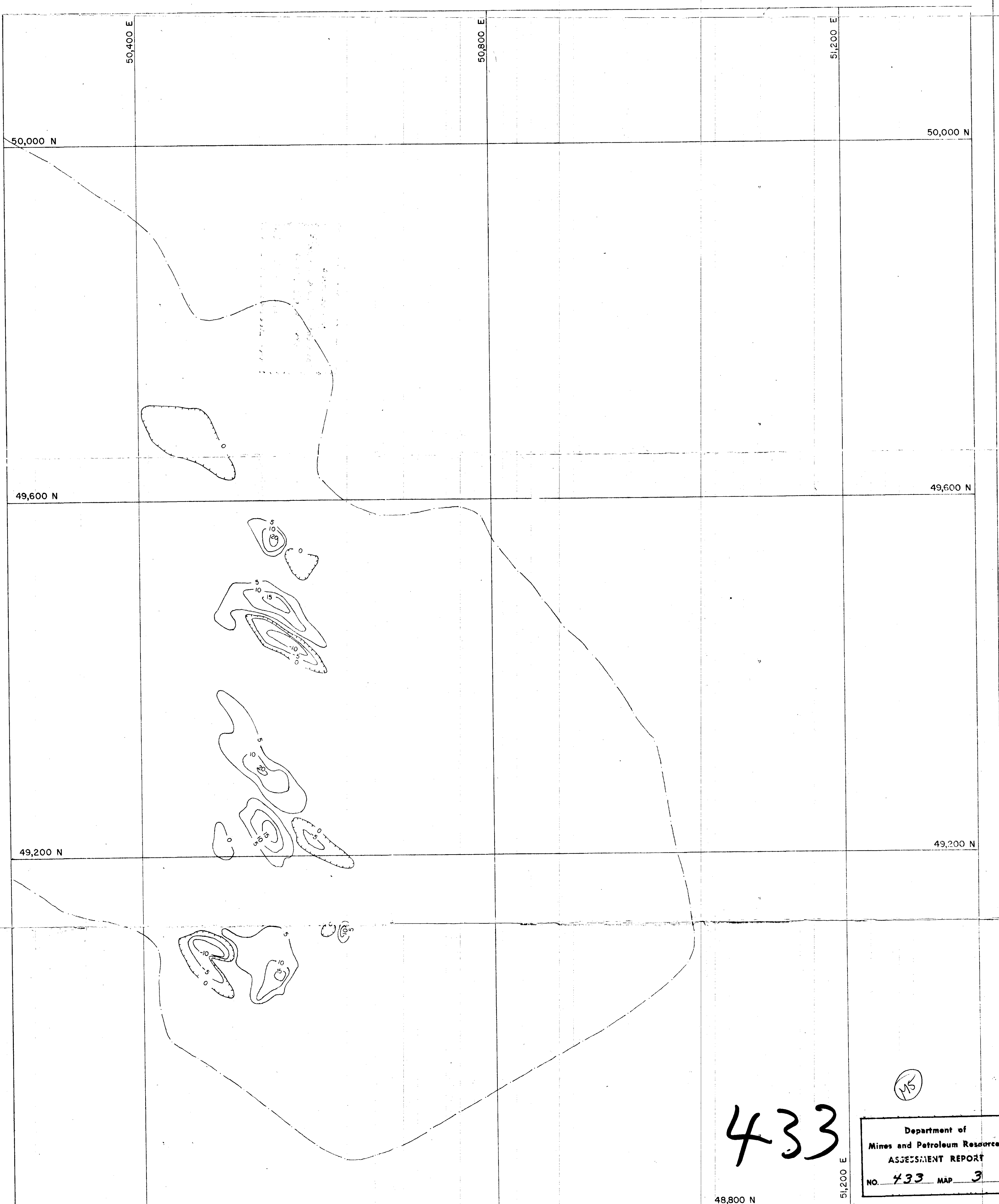
433

Department of
 Mines and Petroleum Resources
ASSESSMENT REPORT
 No. 433 MAP 3

(M)

LEGEND
 --- MAGNETIC CONTOUR - defined, inferred
 --- contour interval as shown
 --- MAGNETIC DEPRESSION
 --- LIMIT OF 1961 MAGNETOMETER SURVEY
 (gamma readings x 1000)

UTAH CONSTRUCTION & MINING CO. MINERAL DEVELOPMENT & GEOLOGY DIV. VANCOUVER, B.C.					
VERTICAL MAGNETIC INTENSITY MAP ARTLISH GROUP ZEBALLOS AREA VANCOUVER ISLAND, BRITISH COLUMBIA					
DRAWN	G.D.D.	Dec. 1961	TRACED	H.M.J.	Feb. 1962
APPROVED			REVISED		
SCALE 0 50 100			No. VD-40C-57-6		



433

MS

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 433 MAP 3

LEGEND
 - - - - - MAGNETIC CONTOUR — defined, inferred
 — contour interval is shown
 - - - - - MAGNETIC DEPRESSION
 - - - - - LIMIT OF 1961 MAGNETOMETER SURVEY
 (gamma readings x 1000)

UTAH CONSTRUCTION & MINING CO.
 MINERAL DEVELOPMENT & GEOLOGY DIV. VANCOUVER, B.C.
 VERTICAL MAGNETIC INTENSITY MAP
 ARTLISH GROUP
 ZEBALLOS AREA
 VANCOUVER ISLAND, BRITISH COLUMBIA

DRAWN	GDD	Dec 1961	TRACED	H.M.J.	Feb 1962
APPROVED			REVISED		
SCALE			No.		
0 50 100			VD-40C-57-5b		

