015090

SUMMARY OF EXPLORATION ACTIVITIES

TO JULY 20, 1972

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Work of the Exploration group at Anvil during the first half of 1972 includes a study of E-M effectiveness over the Faro #3 ore zone; gravity surveys on the TED, RAM, DEA-DY claims; soil sampling; geological mapping; exploring for a second coal seam at the Tantalus Butte coal mine; and drilling of hole 71-213.

The geophysical surveys and the coal mine surveys have been completed and all other projects are in progress.

GEOLOGIC INVESTIGATIONS

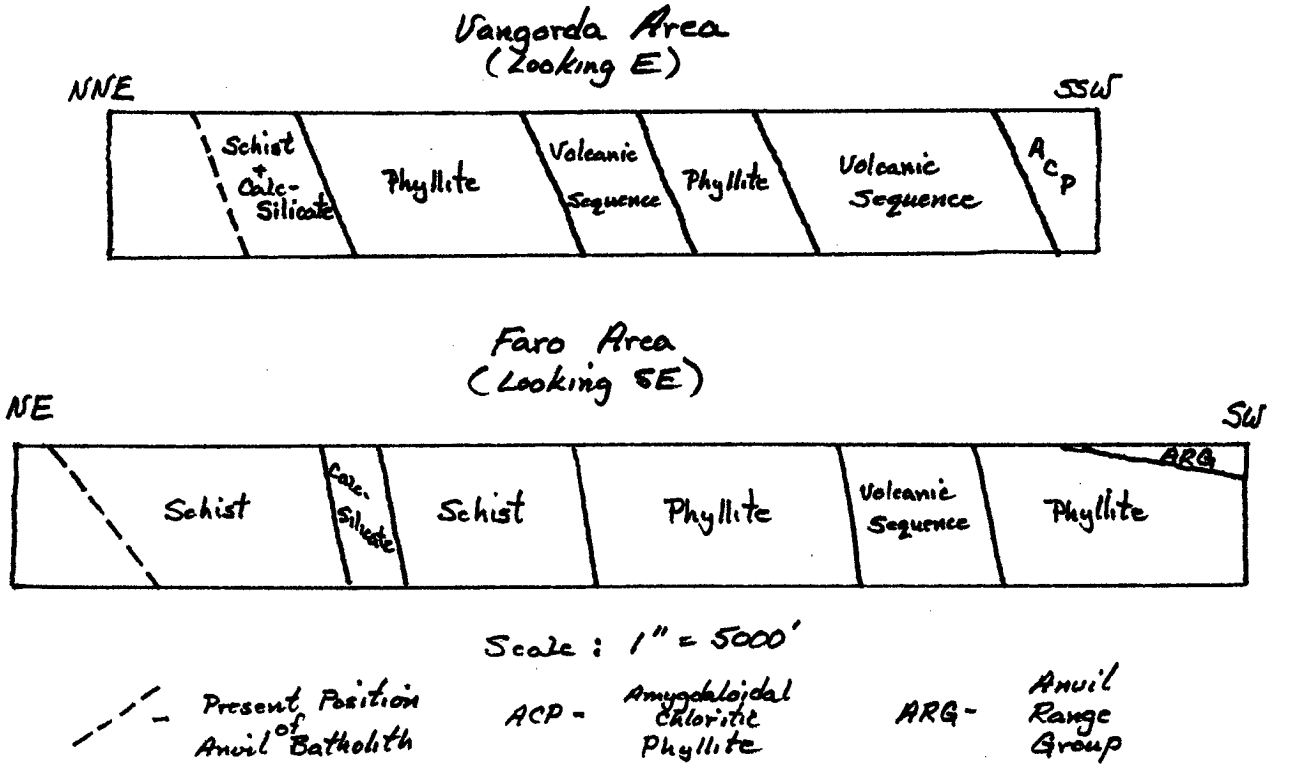
GEOLOGIC INVESTIGATIONS

General

Geologic mapping has been completed at 1000 scale from the Faro grid to Blind Creek. The area mapped covers all Anvil claims in this interval and is bounded on the northeast by the Anvil Batholith and on the southwest by rocks of the Anvil Range Group. Structural and stratigraphic relations recognized on the Faro grid can be successfully extended to cover this area. The deformational model proposed for the Anvil metamorphic belt in the 1971 Anvil Exploration Report (Figure 19) has been confirmed. Both the biotite-muscovite schist and the phyllite unit host sulfide deposits. Pertinent details on stratigraphy structure and metamorphism in the Faro - Vangorda area are discussed in the following sections.

Stratigraphy

A post-D_1, pre-D_2 stratigraphic sequence can now be recognized in the Faro - Vangorda area. This sequence is given diagramatically below:



Structure

The oldest metamorphic foliation, S_1, is axial planar to folds (F_1) in compositional banding. This fold generation is found in the low grade, metamorphic terrain around Vangorda and is progressively destroyed by D_2 metamorphism toward the Faro area. Presence of this fold generation demonstrates that $S_0 \neq S_1$ and that S_1 is a transposition foliation i.e. S_1 transposes S_0 into parallelism with itself on F_1 fold limbs. It is this D_1 transposition that generates the post-D_1, pre-D_2 stratigraphic sequence discussed above. This stratigraphic sequence is progressively transposed into the S_2 plane during D_2 deformation going from the Vangorda area to the Faro area. D_2 transposition in the Faro area has produced a megascopic, F_2 nappe structure here termed the Anvil nappe which is synformal with respect to the axis of the Anvil Arch. Post-D_2 folds (probably F_4) are found in various scales throughout the belt. The largest of these is a doubly plunging anticline northeast of the Vangorda deposit called the Vangorda anticline. A left lateral, oblique slip fault of pre-Permo-Pennsylvanian age occurs in the valley south of the Vangorda turn-off parallel to the main tote road to town.

Metamorphism

Petrographic examination of thin sections from the Faro and Vangorda areas shows the D_1 and D_2 events of equivalent metamorphic grade in the Faro area. Progressing southeasterly through the Vangorda area D_2 metamorphism diminishes while effects of the D_1 event persist. In many rock types in the Vangorda area S_2 is seen to be an incipient crenulation foliation with little or no D_2 recrystallization. D_2

recrystallization is prevalent in the phyllite units in this area. Toward the Faro area increasing amounts of D_2 recrystallization occur until S_2 is the predominant fabric element. This picture compliments the structural and stratigraphic interpretations given above.

Grades of regional metamorphism vary from upper greenschist facies in the Vangorda area to middle amphibolite facies in the Faro area for both the D_1 and D_2 events but isogradic surfaces for each event are not coincident. Phase assemblages for these events suggest them to be low pressure-intermediate types of regional metamorphism.

Mineralization Occurrences

Sphalerite and galena are found as disseminated grains in a thin calc-silicate schist unit above the RICH camp. While mineralization occurs in patchy fashion throughout this unit, it warrants no further investigation.

Relatively "clean" marbles occur south of Rose Creek near the Vangorda turn-off. There is a possibility that some of the marble bands are pure enough for production of $Ca(OH)_2$ for the zinc circuit.

Chalcopyrite, malachite and azurite are found in quartz veins occurring within amygdaloidal chloritic phyllite on the old road to town. Selected hand samples contain coarse grained chalcopyrite, however, the quartz veins, which mainly parallel the S_1 metamorphic foliation, are weak and discontinuous. No further work is warranted.

Unit contacts are parallel to the subvertical S_1 foliation after the D_1 event. These contacts are variably transposed parallel to the S_2 foliation during D_2 depending on their position within the metamorphic sequence and the ductility contrasts of the units involved. Thus, in the Vangorda area, rock unit contacts are subvertical and parallel to S_1. Toward the Faro area, these contacts are progressively transposed into the plane of S_2 generating shallow, southwesterly dipping stratigraphic packages. The post-D_2 stratigraphic sequence is essentially as documented for the Faro grid area.

Rocks of the Anvil metamorphic belt represent a metamorphosed complex of interbanded pelitic rocks, marbles, and volcanic units of Eocambrian age. The schistose and phyllitic rocks of intermediate bulk composition are metamorphosed shaley rocks and the marbles, metamorphosed limestones. Most of the metabasites are metamorphosed basaltic flow rocks associated with strongly banded, calcareous meta-tuffaceous units which accumulated as interlobate, aquagene tuffs and derivative hyaloclastic sediments. Rocks mapped as amydaloidal chloritic phyllites are metamorphosed basic tuffs, pillow lavas and and coarse pyroclastic debris. The Eocambrian sequence in the map area is unconformably overlain by rocks of the Permo-Pennsylvanian Anvil Range Group and is intruded by granitic rocks of the Lower Cretaceous Anvil Batholith.

GEOPHYSICAL INVESTIGATIONS

E-M Investigations

The Turam, large vertical loop, galvanic, and CEM electromagnetic systems were tested over the Faro #3 ore body to determine their effectiveness in detecting massive sulfides of the Anvil type at depths of 400-500 feet. The work was performed for Anvil by Peter E. Walcott & Associates, Geophysical Contractors, of Coquitlam, B. C.

The Turam and large vertical loop methods were examined in detail. The galvanic method was also checked and yielded results similar to Turam except for possibly more "noise" in the background readings. The CEM method was not investigated in detail because preliminary work by the contractor indicated "broad null-widths" in the order of 40°.

The Turam system was tried at 200, 400, and 800 cps. The results when plotted in profile form show "anomalous" readings of field strength and phase difference over the known sulfides.

A relatively strong anomaly is located north of the center base line with broad low intensity "anomalous" values extending mainly to the northwest from the main zone of anomalous readings.

The results of the field strength at 400 cps when plotted in plan appear to outline the eastern edge of the ore body. This method appears to be effective in detecting Anvil type conductors in Anvil type rocks at depths of more than 400'.

The large vertical loop method did not effectively identify the deep conductors in a manner that could be readily extracted from the 390 Hz and 1830 Hz field data. Cross overs can be seen on the profiles but these are not well defined and may be seen for only one frequency and not the others.

Ski-Hill Anomaly

A Turam survey was conducted over a coinciding airborne magnetic and electro-magnetic anomaly on the west slope of the ridge to the west of the ski hill and is referred to as the "Ski-Hill" anomaly.

The Turam survey was carried out on lines 5000 feet long and spaced 800 feet apart.

Three parallel zones of conductors were located. Relative conductivities were determined by ratios of field strengths at two frequencies. The northernmost conductor can be related directly to amphibolite. The middle band is a relatively poor conductor and the southernmost is a medium (moderate) conductor.

Depths to the conductor axes were calculated from half-widths of profiles. The northern conductor axis is at depths from 200 to 300 feet. The conductor axis of the central conductor is about 300 feet with the good conductor between 360 - 450 feet.


WATER
STORAGE DAM
BILL
RAE
JOE
3040
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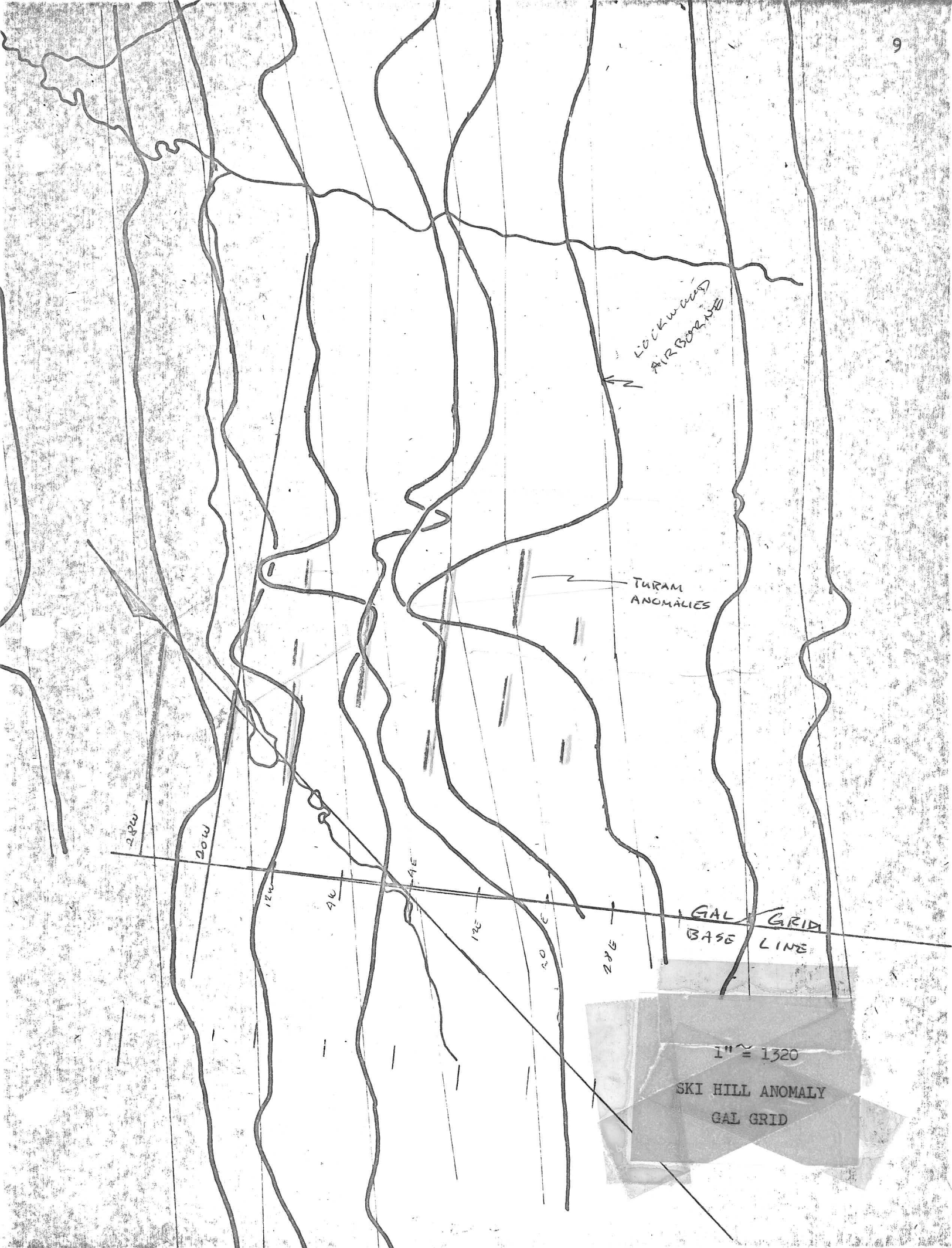
3100
3080


LOCKWOOD AIRBORNE
TURAM ANOMALIES
24W
20W
12W
4W
4E
12E
20E
24E
GAL GRID
BASE LINE
1" ≅ 1320
SKI HILL ANOMALY
GAL GRID

Gravity Surveys

Gravity surveys were conducted on the TED, RAM, and DEA-DY claims. The field work was by G. Schentowski of Roving Exploration Ltd. of Calgary, Alberta, and these results were interpreted by R. B. Galeski of Airborne Gravity and Seismic Services of Calgary, Alberta. Gravity surveys on the RAM and TED claims were conducted as a final evaluation of these groups in order to determine if any drilling should be done in these areas or whether the claims should be allowed to lapse. The gravity work on the DEA-DY claims was designed to check the extension of a gravity anomaly from the SWIM claim group of Kerr-Addison Mines on to claims held by Anvil Mining Corp. Ltd. Significant gravity anomalies were located on the RAM and DEA-DY claims but no anomalies of significance were detected on the TED claims.

The following descriptions and notes on what are believed to be significant residual anomalies are excerpted from reports on gravity interpretation by R. B. Galeski:

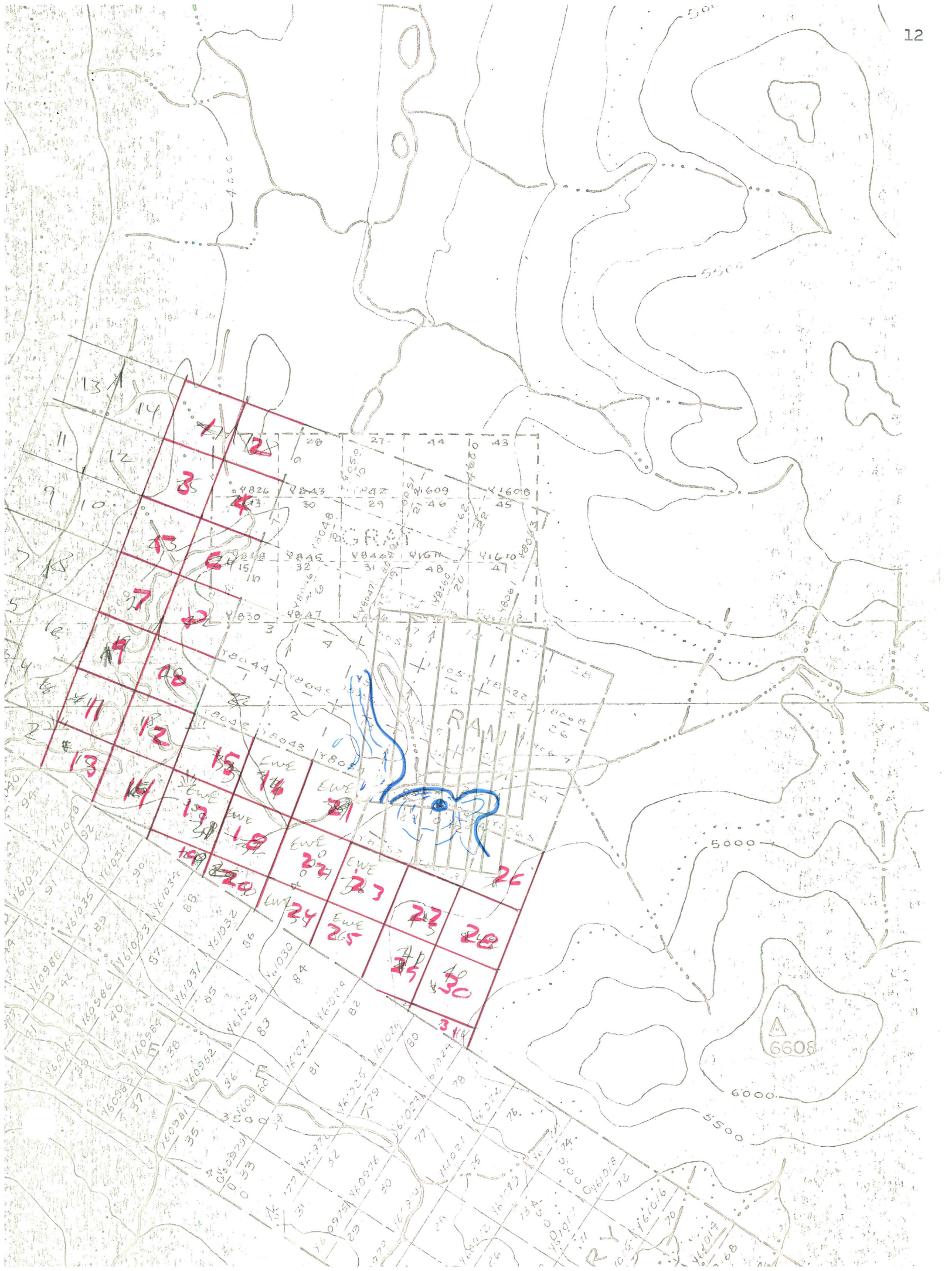
RAM: Two large residual features labled "A" and "B" were identified. Both are high quality, valid positive anomalies. Each is described below.

> "A" Anomaly - Amplitude 1.42 mgals., maximum slope gradient 0.4 mgal./100'. This is the most attractive anomaly seen in this region by the writer since the Faro "A" anomaly, now the Anvil Mine. Causative mass is thought to be a slab-shaped ore body 125' thick with top at 150'. Dimensions are about 800' x 1200', tonnage 12 million. Thickness and tonnage values are thought to be conservative, as they are based on country rock density of 2.7 and ore density of 3.6. With heavier country rock it would require a greater tonnage (and thickness) to produce this anomaly.

"B" Anomaly - Amplitude of 1.5 mgals., maximum slope gradient = 0.4 mgal./100. This is also an excellent anomaly, possibly with greater aerial extent than "A". It is downgraded somewhat because the bulk of it lies along line 20W which is under poor regional control. Computations indicate a maximum possible depth to top of 270' and thickness of 125' at the apex on line 12W. However, causative mass may be a little shallower and somewhat thicker on line 20W.

The surface area of the above anomalies has been investigated in the field. No outcrop was found in the main zone of the "A" anomaly, but "graphitic" biotite phyllite and greenstone were float was found on slopes of the hillsides. A chlorite greenstone was found to the south of the main anomaly and an amphibolite ridge to the east of the main part of the anomaly.

The "B" anomaly is located on and defines a ridge underlain by mafic rock of approximately "amphibolite" composition. This anomaly may well be due to topographic effects and associated variations in rock type. Rock densities of samples in the RAM area will be determined and a geologic map will be submitted to R. B. Galeski for re-evaluation of these anomalies.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DEA-DY Gravity Anomaly

"The regional map accompanying this report indicates that the central part of the area is underlain by a thick mass (1000 ±) of rocks of heavier density than the country rock of the area. These rocks could be part of an intrusive. The top of the intrusive (?) mass is relatively shallow (0-2000').

"Two shaded areas, one crossing lines 24W and 32W and the other on lines 40E and 48E represent local negatives beneath local high topography. These are considered to be piles of loose rock debris - perhaps left by alpine glaciers.

"The residual map represents a contoured plat of the smoothed difference values between Bouguer and regional. Contour interval is 0.2 mgal. The residual map should be used with care at the edges of data acquisition, as regional values (and hence residual values) are under poor control in these areas.

"Four separate positive closures have been isolated on the residual map. Each is described below:

"A": A large anomaly of intermediate magnitude (1.22 mgals.). If causative mass is an ore body, maximum possible depth to top is 750 - 800', thickness 100' ± dimensions approximately 2000' x 4000'. Apex is within 400' of line 64W between stations 12S and 16S. Note that because of the large station spacing residual gradients (on which the above calculations are made) are somewhat inaccurate. Nevertheless, this is a very good anomaly.

"B": Small amplitude anomaly with an apex of 0.7 mgal. at 68E on the base line. Causative mass appears to be slab-like at a depth of 600'±. Because of the proximity to the edge of the work area, regional control on this and calculations are very questionable.

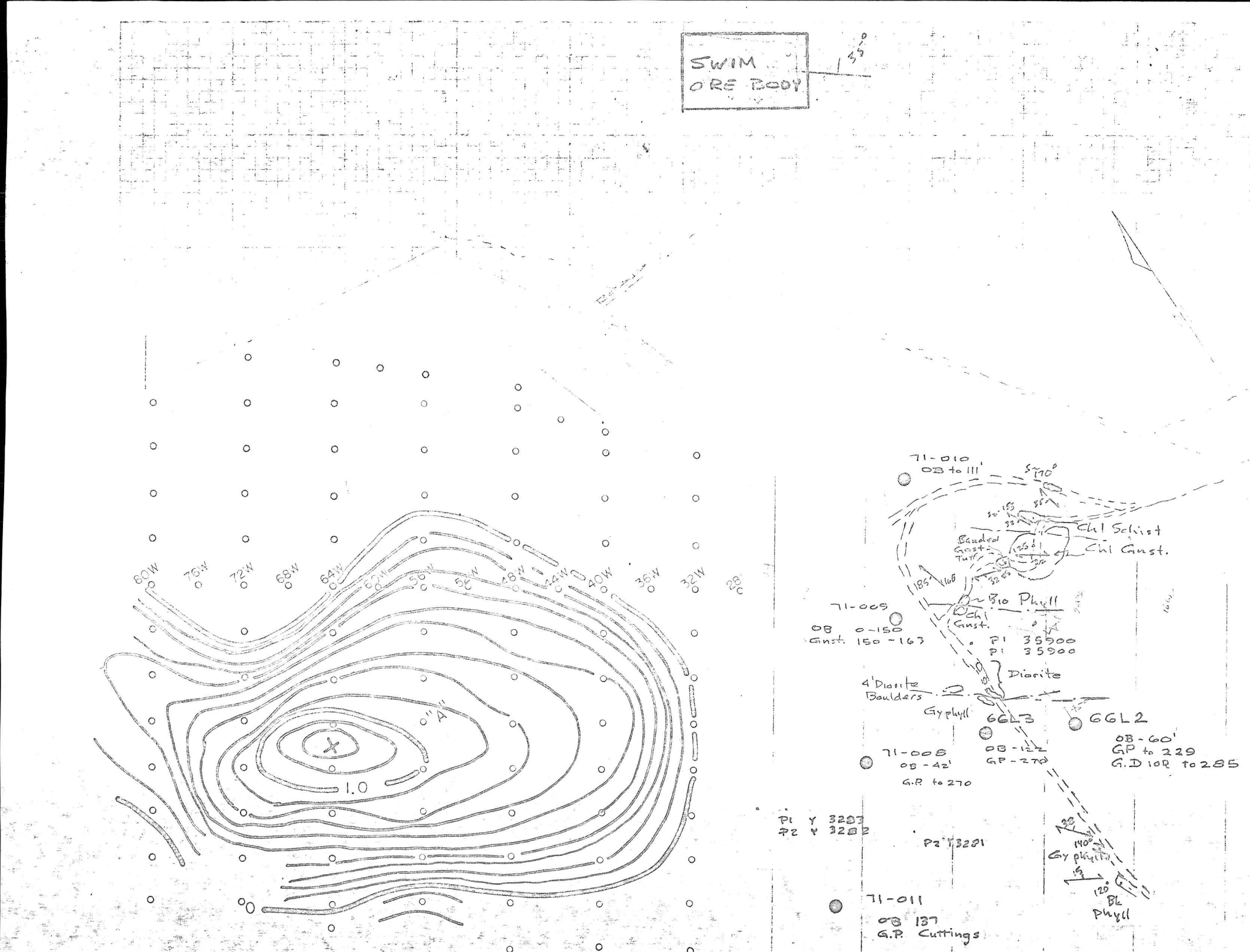
"C": Like B above, the C anomaly is questionable because of its position at the edge of the work. Amplitude is 0.63 mgal. maximum depth to top is 335' (?).

"D": Very small (0.4 mgal.) positive which appears on only one line. Probably an overburden effect.

"The "A" gravity anomaly will be investigated first. It is located to the southwest of the anomaly located on the SWIM claim group of Kerr-Addison Mines. The ground E-M work by Kerr-Addison traced a conductive unit in which the SWIM ore body occurs into this same general area.

"Further, more massive pyrite in quartzite float was found by soil samplers on the flank of the ridge near the top of the hill. The texture of this pyrite appeared similar to some pyrite at the Faro pit and found in core left at the Vangorda camp core racks. Outcropping rock near where this pyrite float was found is graphitic-biotite phyllite. All cut lines and several zones between the cut lines were traversed in search for outcrop over the "A" gravity anomaly. Outcrop was not found in this entire area."

SOIL GEOCHEMISTRY


SWIM
ORE BODY
80W
76W
72W
68W
64W
60W
55W
52
48W
44W
40W
36W
32W
28
"A"
1.0
71-010
OB to 111'
S 70°
Chl Schist
Banded Gnst-Tuff
Chl Gnst.
185°
160
Blo Phyll
Chl Gnst.
71-009
OB 0-150
Gnst. 150-163
Pl 35900
Pl 35900
Diorite
4' Diorite Boulders
Gy phyll
GGL3
GGL2
OB-60'
GP to 229
G.D IOR to 285
71-008
OB-42'
G.P. to 270
OB-122
GP-270
Pl Y 3287
P2 Y 3282
P2 Y 3281
38
140°
Gy phyll
19
120°
Bk Phyll
71-011
OB 137
G.P. Cuttings

Samples of the "B" soil horizon, here defined as material occurring below the organic and volcanic ash layer, are being collected and their total Cu, Pb, and Zn content determined. To date more than half of the proposed traverses have been completed and 462 analyses have been plotted.

The 1972 soil geochemical program is an extension of the 1971 program starting from Blind Creek and extending to the southeast to cover all Anvil Claims. An approximate 1200 foot by 200 foot grid is used to cover the entire claimed area. Samples making a 1200 by 400 foot grid are being analyzed. The intermediate 200 foot station samples are being saved for analyses for zones where anomalous metals in soil are detected.

To date 462 analyses are available. The values have been plotted on a base map at a scale of 1" = 1000 feet. The average metal content determined in these samples is 22 ppm Cu, 13 ppm Pb, and 111 ppm Zn. Samples with more than twice the average value are defined as anomalous.

Continuous areas of anomalous metal content in soil are seen only when the plot of values greater than twice the average metal content are grouped. If values of greater than 3 and 4 times the average metal content are grouped, no samples contained more than twice the average value of Cu, Pb, and Zn.

Six areas of anomalous (more than 2 times average) copper content are identified. These may be in part related to volcanic rocks or shallow mafic intrusives.

The anomalies are located on the slopes of the main ridge to the southwest of the SWIM claim group. The largest copper in soil anomaly is a 14 station northwest - southeast trending zone. Five of the six anomalies have a northwest - southeast trend which is parallel to the strike of the rock units in this area.

Three zones of anomalous zinc content in soil are defined. One major zone (10 station), one 4 station zone, and a 3 station zone of anomalies were located. The source of the Zn in the largest anomaly is not known. The 4 station zone area was drilled to bedrock in 1971 with overburden samples yielding anomalous Cd, Cu, Pb, Zn values up to 113 ppm Cu, 76 ppm Pb, and 2300 ppm Zn.

DIAMOND DRILLING

Diamond drill hole 71-213, proposed for drilling in 1971, is being drilled now. The target was the cause of a 0.6 mgal. residual gravity anomaly. The depth to date is 243 feet with banded sericite-chlorite phyllite and quartzite encountered at about 50 feet.

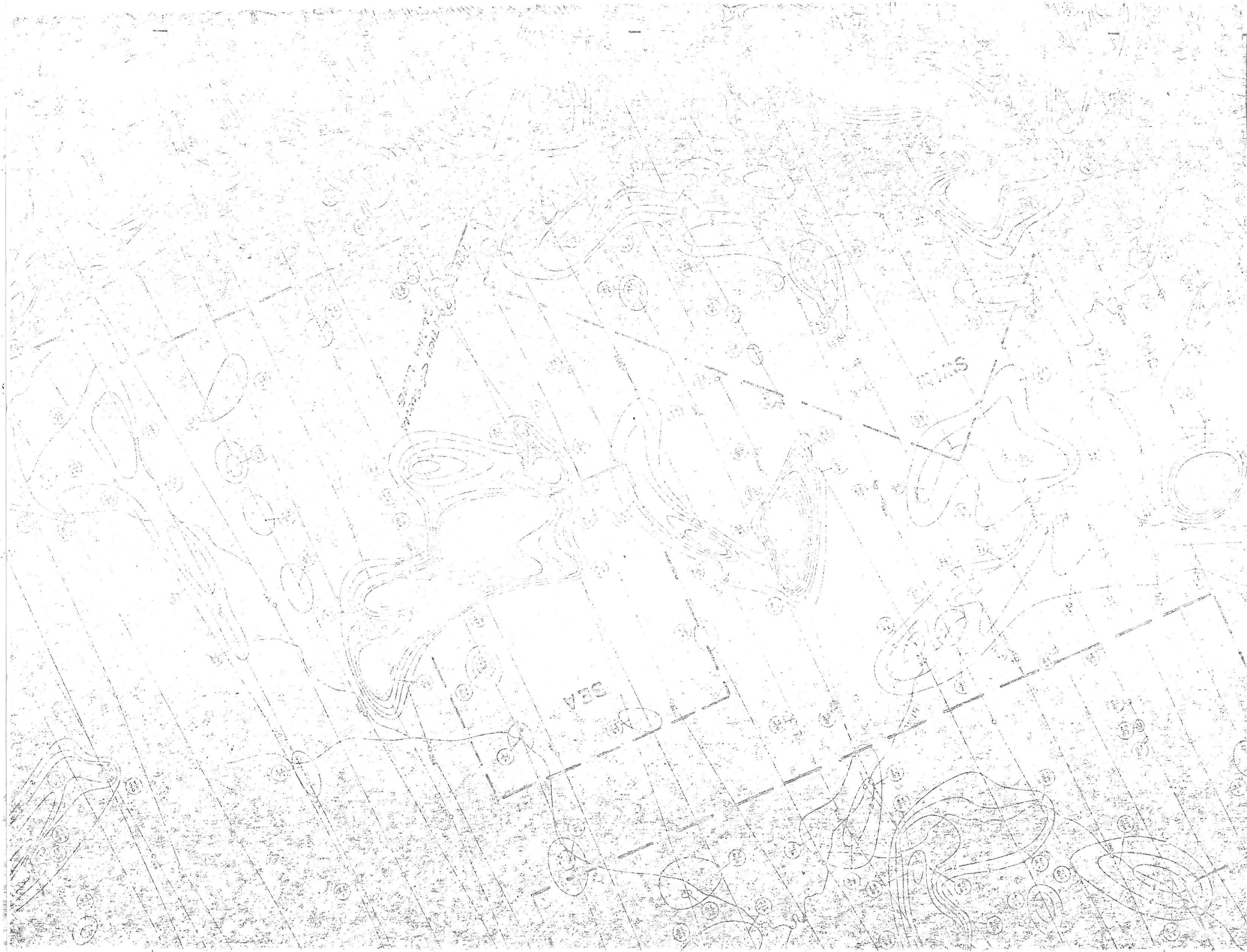
The cause of the anomaly was probably a bedrock ridge, since the depth to bedrock in surrounding holes was greater than 100 feet.

This hole will be extended to 400 feet to determine if the minor mineralization encountered in rotary drill hole 71-198 at a depth of 250 feet extends into this area.

CLAIM STAKING

Two groups totalling 57 claims - 10 BP and 47 SINK - were staked in early 1972. Both groups are in the Swim Lake area. The BP claims were staked to cover open ground in the middle of Anvil's PEA claims.

SINK claims were staked to cover ground to the northeast of the SWIM claim group. From published reports and descriptions of surface investigations by previous Anvil personnel the rock units hosting the SWIM ore body can be projected into this area. The staked areas cover ground over which airborne electromagnetic anomalies were found by the 1965 Lockwood Survey.

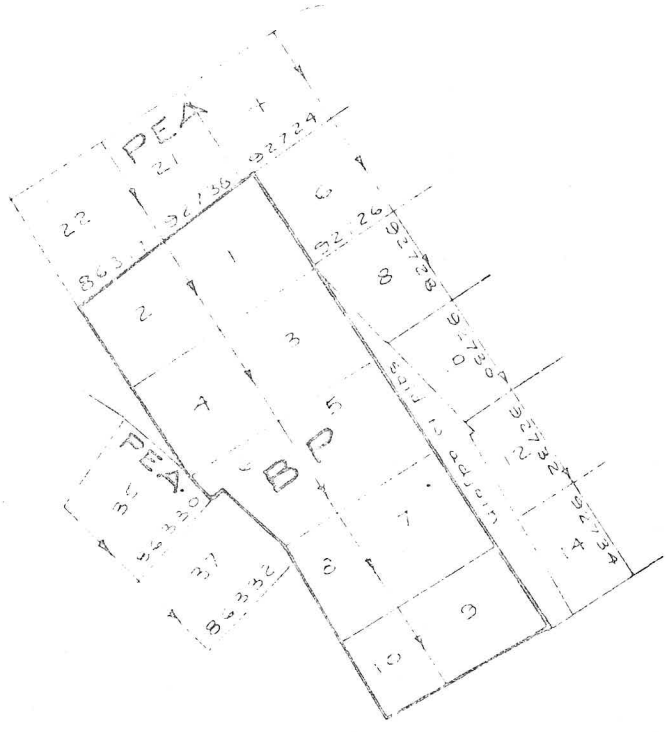


LOCATION SKETCH SHOWING

BP 1-10 M.C.'s

CLAIM SHEET 105-K-2, WHITEHORSE MINING DISTRICT

Scale: ½" = 1 Mile



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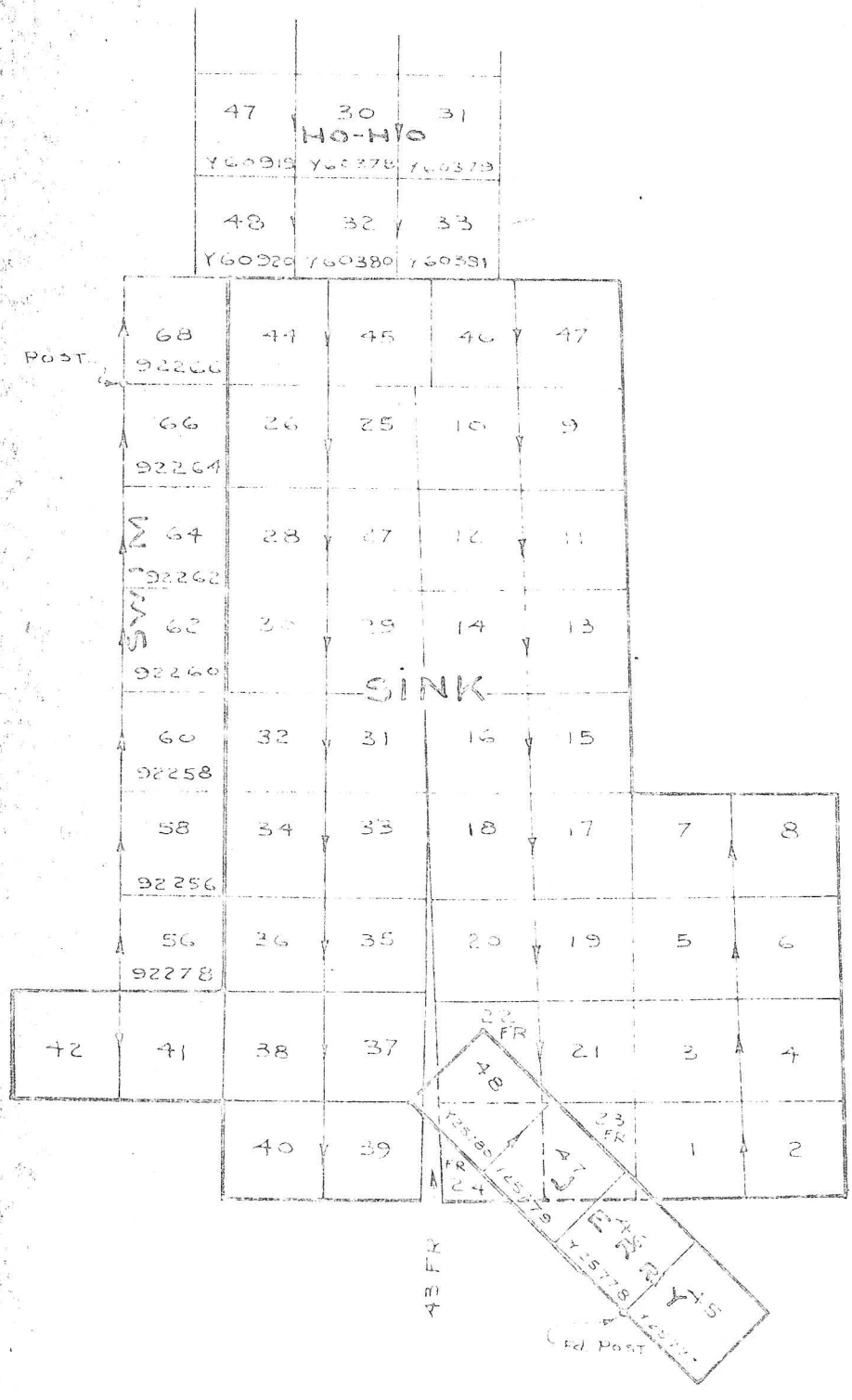
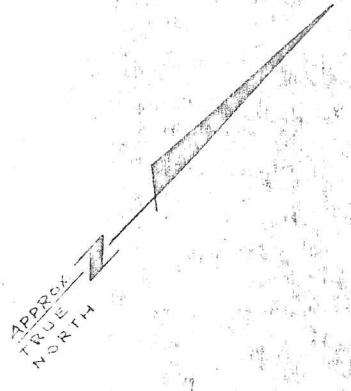
WHITEHORSE, Y.T.

LOCATION SKETCH SHOWING
SINK 1-47 M.C.'s
CLAIM SHEET 105-K-2, WHITEHORSE MINING DISTRICT
Scale: ½" = 1 Mile





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COAL MINE

Underground drilling and surface trenching located a second coal seam about 180 feet to the west of the #1 coal seam at the Tantalus Butte Coal Mine. A minimum strike length of 1300 feet, dip length of 500 feet, and thickness of 6 feet of clean coal, were indicated by the drilling and surface trenching. The minability of this coal will be examined by underground work.

B U D G E T

An estimated $115,582 has been spent to July 20, 1972 on the exploration program. The breakdown of the expenditures is shown on the following table.

ANVIL MINING CORPORATION LIMITED

EXPLORATION COSTS

ACCUMULATED TO JULY 15TH, 1972

1972 PROGRAMME

Airborne Survey		$ -
Gravity Survey - Contract	$ 10,837	
- Linecutting	14,986	
- Transportation	9,761	35,584
Drilling - Contract	-	
- Supplies	250	
- Analysis	28	278
Consulting		7,000
Outside Services		39
Soil Sampling - Labour	2,858	
- Supplies	162	
- Analysis	120	3,140
Equipment Costs - Operating Labour	-	
- Repair Labour	-	
- Operating Supplies	7,675	
- Repair Supplies	1,889	
- Fuel	103	9,667
Camp Costs - Labour	1,068	
- Supplies	4,601	5,669
Geology - Labour		25,980
Claim Staking		3,707
Supervision - Labour	6,807	
- Supplies	11,205	18,012
Payments in lieu of assessment work		6,506
		$ 115,582

CONTINUING 1972 PROGRAM

The following items will be completed in the second half of the 1972 exploration phase.

1. Field check RAM gravity anomalies, and re-evaluate gravity results. Cost $1,000.00.

2. Proposed to stake 30 claims to the south and west of the RAM claims. This will include the areas of possible extensions of the gravity anomalies. Cost $2,500.00.

3. Continue and complete the soil sampling program. Cost $7,500.00.

4. Continue geological mapping to the southeast from Blind Creek to cover the Swim Lake area claims.

5. Diamond and rotary drilling mainly in Swim Lake area.

   A diamond drill hole will be placed on the "A" gravity anomaly on the DEA-DY claims. The minimum depth of this hole will be 400 feet and maximum depth 800 feet. Rotary drill holes will cover mainly the PEA and BP claims, which is an area with very little previous exploration information. Cost $50,000.

6. Salaries for 6 months @ $5000 = $30,000

Pending the status of the financial position, the following programs will be completed:

1. Drill RAM "A" gravity anomaly to 400 feet. Cost $10,000.00.

2. Gravity on Ski Hill to test for any mass concentrations related to conductor anomalies. Cost $2,000.00.