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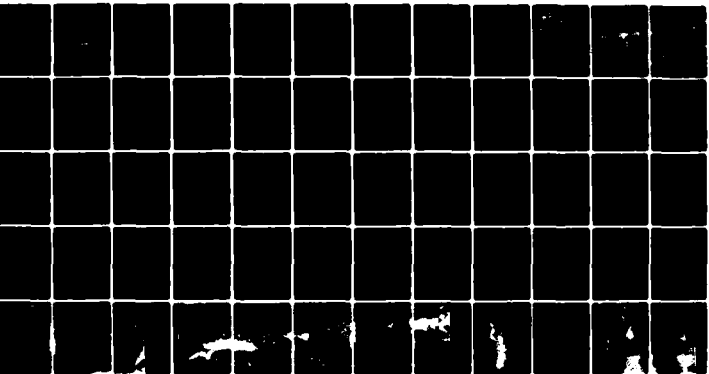
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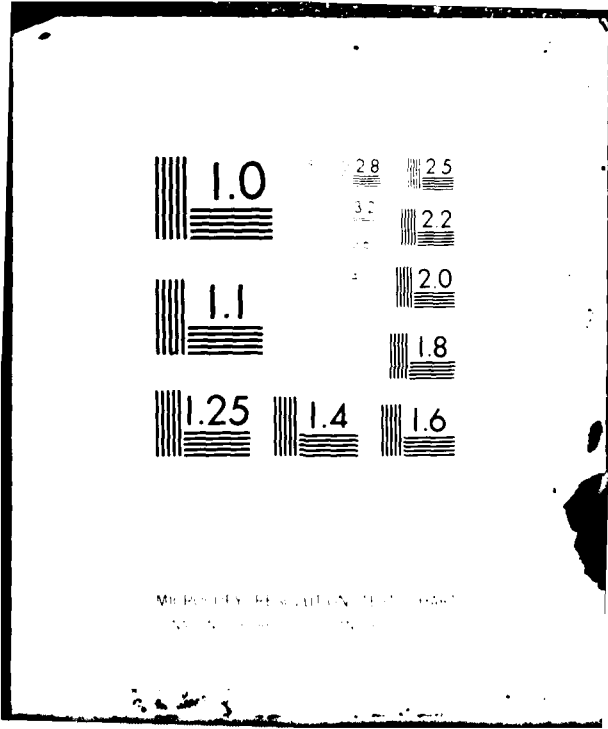
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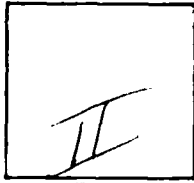


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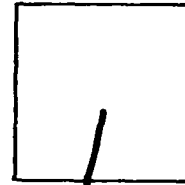
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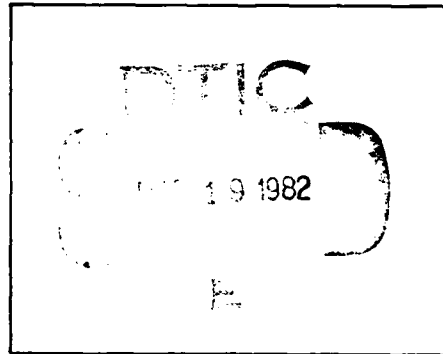
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FN-TR-33-LV

MX SITING INVESTIGATION
GRAVITY SURVEY - LAKE VALLEY
NEVADA

Prepared for:

U.S Department of the Air Force
Ballistic Missile Office (BMO)
Norton Air Force Base, California 92409

Prepared by:

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20 May 1981

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FOREWORD

Methodology and Characterization studies during Fiscal Years 1977 and 1978 (FY 77 and 78) included gravity surveys in ten valleys in Arizona (five), Nevada (two), New Mexico (two), and California (one). The gravity data were obtained for the purpose of estimating the gross structure and shape of the basins and the thickness of the valley fill. There was also the possibility of detecting shallow rock in areas between boring locations. Generalized interpretations from these surveys were included in Ertec Western's (formerly Fugro National) Characterization Reports (FN-TR-26a through e).

During the FY 77 surveys, measurements were made to form an approximate 1-mile grid over the study areas, and contour maps showing interpreted depth to bedrock were made. In FY 79, the decision was made to concentrate on verifying and refining suitable area boundaries. This decision resulted in a reduction in the gravity program. Instead of obtaining gravity data on a grid, the reduced program consisted of obtaining gravity measurements along profiles across the valleys where Verification studies were also performed.

The Defense Mapping Agency (DMA), St. Louis, Missouri, was requested to provide gravity data from their library to supplement the gravity profiles. For Big Smoky, Hot Creek, and Big Sand Springs valleys, a sufficient density of library data is available to permit construction of interpreted contour maps instead of just two-dimensional cross sections.

In late summer of FY 79, supplementary funds became available to begin data reduction. At that time, inner zone terrain corrections were begun on the library data and the profiles from Big Smoky Valley, Nevada, and Butler and La Posa valleys, Arizona. The profile data from Whirlwind, Hamlin, Snake East, White River, Garden, and Coal valleys, Nevada, became available from the field in early October 1979.

A continuation of gravity interpretations has been incorporated into the FY 80-81 program, and the results are being summarized in a series of valley reports. Reports covering Nevada-Utah gravity studies are numbered "E-TR-33-" followed by the abbreviation for the subject valley. In addition, more detailed reports of the results of FY 77 surveys in Dry Lake and Ralston valleys, Nevada, were prepared. Verification studies were continued in FY 80 and 81, and gravity studies were included in the program. DMA continued to obtain the field measurements, and there was a return to the grid pattern. The interpretation of the grid data allows the production of contour maps which are valuable in the deep basin structural analysis needed for computer modeling in the water resources program. The

gravity interpretations will also be useful in Nuclear Hardness and Survivability (NH&S) evaluations.

The basic decisions governing the gravity program are made by BMO following consultation with TRW, Inc., Ertec Western, and the DMA. Conduct of the gravity studies is a joint effort between DMA and Ertec Western. The field work, including planning, logistics, surveying, and meter operation is done by the Defense Mapping Agency Hydrographic/Topographic Center (DMAHTC), headquartered in Cheyenne, Wyoming. DMAHTC reduces the data to Simple Bouguer Anomaly (see Section A1.4, Appendix A1.0). The Defense Mapping Agency Aerospace Center (DMAAC), St. Louis, Missouri, calculates outer zone terrain corrections.

Ertec Western provides DMA with schedules showing the valleys with the highest priorities. Ertec Western also recommended locations for the profiles in the FY 79 studies with the provision that they should follow existing roads or trails. Any required inner zone terrain corrections are calculated by Ertec Western prior to making geologic interpretations.

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1.0 INTRODUCTION

1.1 OBJECTIVE

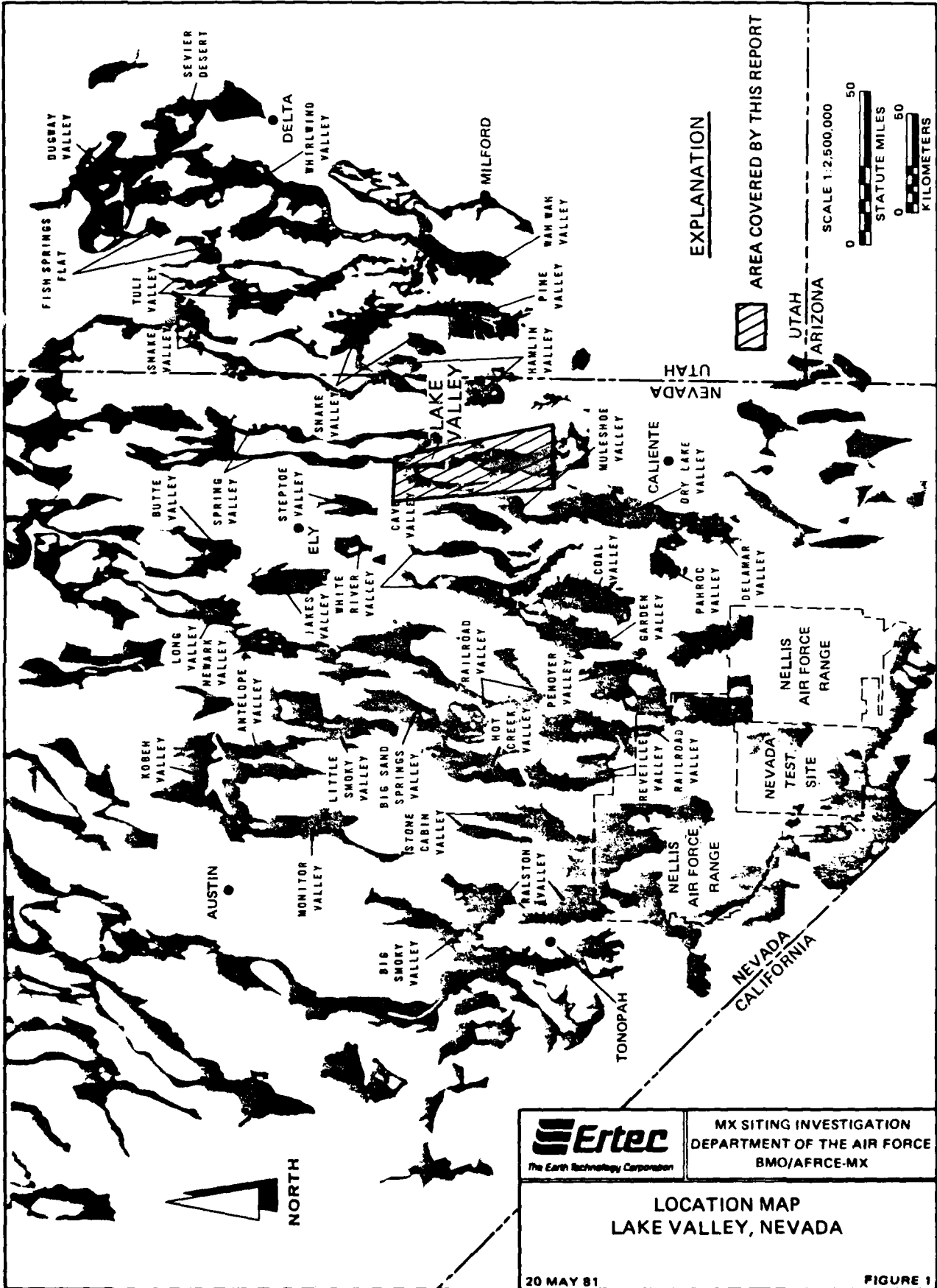
Gravity data from Lake Valley were studied for the purpose of making a geological interpretation which includes estimates of the overall shape of the structural basin, the thickness of alluvial fill, and the location of concealed faults. The estimates will be useful in modeling the dynamic response of ground motion in the basin and in evaluating ground-water resources.

1.2 LOCATION

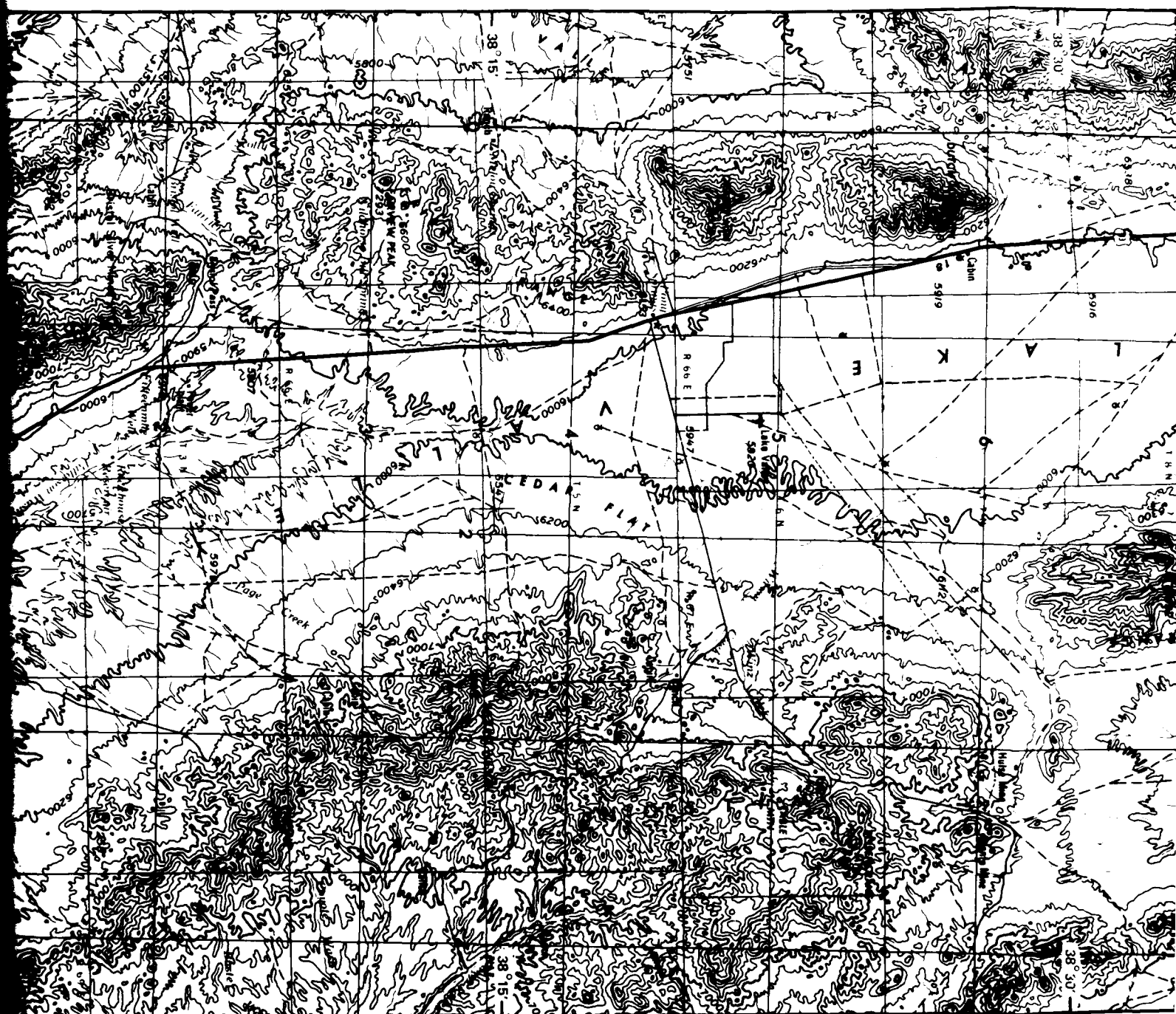
Lake Valley is located in east-central Nevada about 30 miles (48 km) west of the Utah border and 50 miles (80 km) north of the town of Caliente (Figure 1).

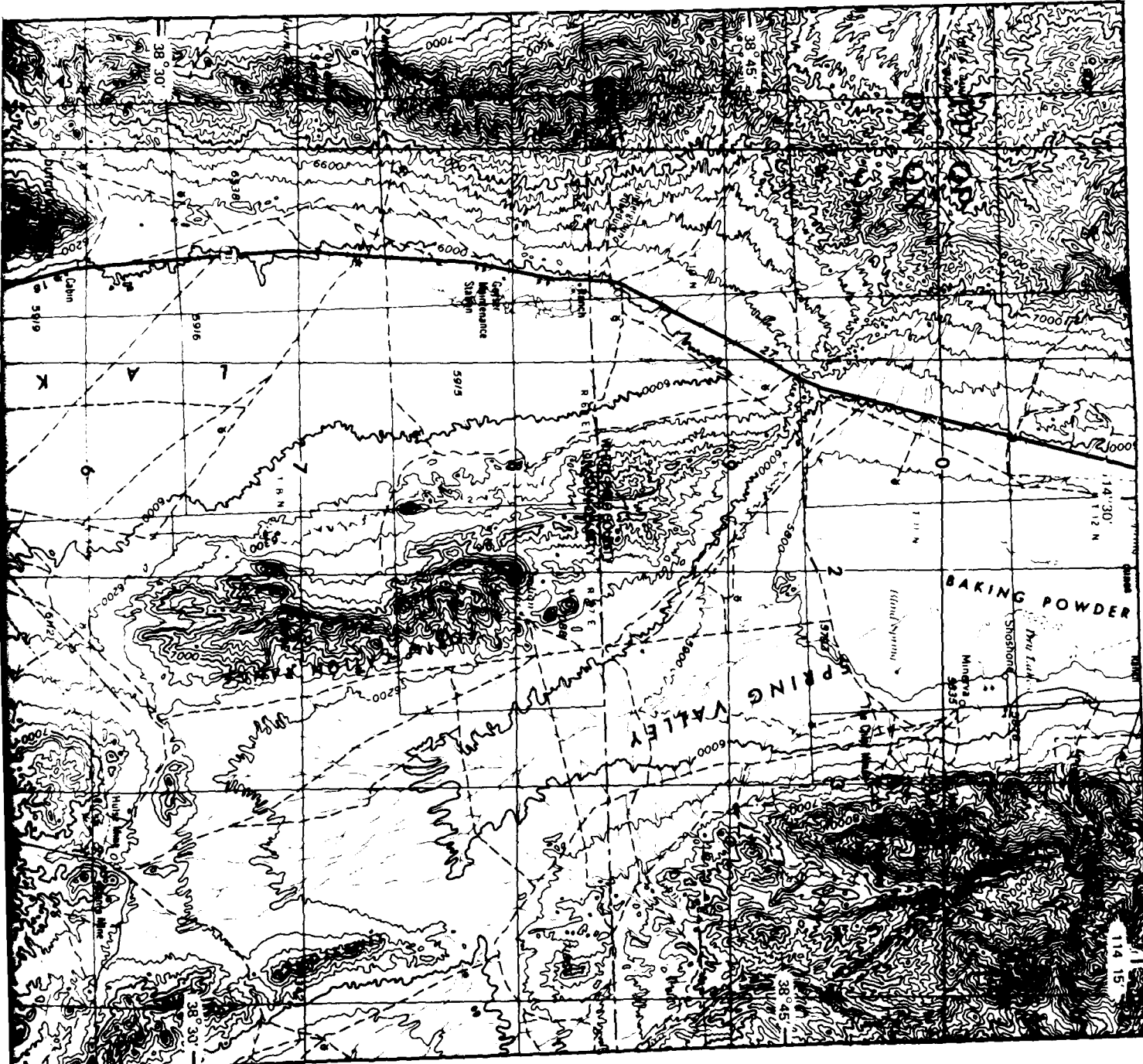
Lake Valley is bounded on the east by the Fortification and Wilson Creek ranges. It is bounded on the west by Schell Creek Range, Dutch John Mountain, Grassy Mountain, Fairview Range, Bristol Range, and Pioche Hills (Figure 2). The valley is approximately 12 miles (19 km) wide and 60 miles (97 km) long. It is principally used for rangeland. U.S. Highway 93 and an extensive network of well-maintained unpaved roads provide access throughout the valley.

The area covered by this report lies between latitudes 38°00' and 38°48' N. and longitudes 114°20' and 114°45' W.



FISH SPRINGS FLAT
DUGWAY VALLEY
TULI VALLEY
SNAKE VALLEY
SEVIER DESERT
DELTA WHIRLWIND VALLEY
MILFORD
WAM WAK VALLEY
PINE VALLEY
SHAMLIN VALLEY
LAKE VALLEY
MULESHOE VALLEY
CALIENTE
DRY LAKE VALLEY
COAL VALLEY
DELMAR VALLEY
PARROC VALLEY
RAILROAD VALLEY
GARDEN VALLEY
HOT CREEK VALLEY
PENOVER VALLEY
RAILROAD VALLEY
REVELLE VALLEY
NELLIS AIR FORCE RANGE
NEVADA TEST SITE
NELLIS AIR FORCE RANGE
TONOPAH
BIG SMOKY VALLEY
CABIN VALLEY
STONE SPRINGS VALLEY
BIG SAND VALLEY
SMOKY VALLEY
LITTLE VALLEY
HOT VALLEY
WHITE RIVER VALLEY
JAKES VALLEY
ELY
STEPHENS VALLEY
CAVERN VALLEY
CANYON VALLEY
ANIELOPE VALLEY
NEWARK VALLEY
LONG VALLEY
KOBEN VALLEY
MONITOR VALLEY
AUSTIN
BIG SMOKY VALLEY





1.3 SCOPE OF WORK

Five primary work elements were completed during this study.

They are:

1. Computation and merging of terrain corrections;
2. Synthesis of regional and valley specific geological data;
3. Evaluation of the regional field and residual separation;
4. Inverse modeling to estimate depth to bedrock; and
5. Interpretation of structural relationships.

The gravitational field within Lake Valley was defined by measurements from 529 stations. The principal facts for these stations are listed in Appendix A2.0, and their distribution is shown in Drawing 1.0. These data were made of 403 new measurements by the Defense Mapping Agency Hydrographic-Topographic Center/Geodetic Survey Squadron (DMAHTC/GSS) and 126 measurements which were obtained from the Defense Mapping Agency Aerospace Center (DMAAC) library.

Many additional stations were used in the calculation of a regional trend surface over a larger area containing Lake and Spring valleys and the surrounding mountain ranges.

2.0 GRAVITY DATA REDUCTION

DMAHTC/GSS obtained the basic observations for the new stations and reduced them to Simple Bouguer Anomalies (SBA) as described in Appendix A1.0. Up to three levels of terrain corrections were applied to the new stations to convert the SBA to the Complete Bouguer Anomaly (CBA). Only the first two levels of terrain corrections described below were applied to the library stations.

First, the DMAAC, St. Louis, Missouri, used its library of digitized terrain data and a computer program to calculate corrections out to 104 miles (167 km) from each station. When the program could not calculate the terrain effects near a station, a ring template was used to estimate the effect of terrain within approximately 3000 feet (914 m) of the station. The third level of terrain corrections was applied to those stations where 10 feet (3 m) or more of relief were observed within 130 feet (40 m). In these cases, the elevation differences were measured in the field at a distance of 130 feet (40 m) along six directions from the stations. These data were used to calculate the effect of the very near relief.

The principal facts and CBA values for the Lake Valley stations are listed in Appendix A2.0.

3.0 LAKE VALLEY GEOLOGIC SUMMARY

Lake Valley is located in east-central Nevada within the eastern portion of the Great Basin region of the Basin and Range Physiographic province. The valley and adjacent mountains generally trend north-south except for the northern Fortification Range and the Pioche Hills which trend northwest-southeast (Figure 2).

The southern Schell Creek Range, on the west side of the valley, is composed of faulted Paleozoic limestone, dolomite, shale, and minor Tertiary quartz diorite and rhyolite rocks. Dutch John Mountain and Grassy Mountain are composed of Paleozoic limestones, siltstones, and shales. The Fairview Range is predominantly low-relief hills of Tertiary volcanics with only isolated outcrops of Upper Paleozoic clastic and carbonate rocks. The Highland and Bristol ranges form a gently eastward tilted fault block composed of limestone, dolomite, and shale. The western portion of the Pioche Hills is composed of Cambrian carbonates and quartzites which are overlain in the eastern portion by Tertiary volcanic rocks.

On the east side of the valley, the Fortification Range is composed of Paleozoic carbonates in the north and middle Tertiary volcanics in the south. The Wilson Creek Range is primarily composed of Tertiary volcanic rocks overlain in the north by younger volcanics. The basement rock in northern Lake Valley is thought to be carbonate on the west side of the valley and volcanic rock on the east side, whereas in the south, basement is predominantly volcanics over Paleozoic carbonates.

Lake Valley is divided into two parts by a low, gentle topographic divide between an enclosed basin in the north and a broad, dissected channel named Patterson Wash in the south. The northern basin contains a modern playa.

The valley fill in the northern basin is composed of fine-grained sediments first deposited in a Pliocene lake covering the entire valley and then reworked in a smaller late Pleistocene lake located north of the topographic divide (Tschanz, 1970). The valley margins are composed of sand and sandy gravel deposits of coalescing alluvial fans.

In central Patterson Wash, surface exposures include argillaceous tuffs, low-density silicic ash, medium-grained sandstones, and conglomerates (EWI, 1981). Subsurface valley-fill in this portion of Lake Valley probably includes water-laid tuffs, sands, silts, and clays, with the finer grained material concentrated toward the center of the valley. There also may be interbedded conglomerates, lacustrine limestones, and basalt flows (Tschanz, 1970).

Lake Valley is typical of the the intermontane valleys in the Basin and Range province in that it resulted from development of a tilted-fault-block, or graben structure. A major range-bounding normal fault occurs along the western margin of Lake Valley near the Schell Creek Range (Tschanz, 1970) and on Dutch John Mountain and Grassy Mountain (EWI, 1981). North trending surface faults and lineaments in the valley-fill about 6 miles (9.6 km) basinward from Schell Creek Range represent another

younger fault. A set of northeast trending lineaments in the alluvium between the Grassy Mountain-Fairview Range boundary and the southern end of the Fortification Range is of uncertain origin (EWI, 1981).

4.0 INTERPRETATION

The basis of interpretation is the Complete Bouguer Anomaly (CBA). Drawing 1 shows the location of the gravity stations and contours of the CBA gravity field. The contours were generated by a computer program. Since contouring and other mathematical treatment of irregularly spaced data are inefficient, the station CBA and elevation data were first reduced to sets of values at uniformly spaced points (nodes) in a geographic array, or grid. The value at a node was calculated from the station data within a circular area around the node. The algorithm which calculated the nodal value used a bell-shaped function to weight the station values. In this way, those station values nearest the node had the greatest influence on the calculated value. A node spacing of 1.2 miles (2 km) was chosen to match the average data spacing.

4.1 REGIONAL-RESIDUAL SEPARATION

A fundamental part of the gravity interpretation is the separation of regional effects from the local effects of the valley and its fill. The CBA contains long wavelength components from deep and broad geologic structures extending far beyond the valley. These long wavelength components, called the regional gravity, were approximated by upward continuation of the gravity field. Upward continuations were made to successively higher elevations until the negative anomaly over the valley was essentially smoothed out. The final continuation was calculated for an elevation of 90,000 feet (27,432 m). This regional

field was subtracted from the CBA and the resulting residual gravity anomaly was adjusted by a constant +5.0 milligals so that the zero residual would approximately fit the existing rock outcrops.

4.2 DENSITY SELECTION

The construction of a geologic model from the residual anomaly requires selection of density values representative of the alluvial fill and of the underlying rock. Because only very generalized density information is available, the geologic interpretation of the gravity data can be only a coarse approximation. Seven borings were drilled approximately 175 feet (53 m) into the alluvium during Verification studies. The average of the densities measured at the bottom of these borings was 2.0 g/cm³. To account for compaction with depth (Woollard, 1962; and Grant and West, 1965), a density of 2.3 g/cm³ was used in the modeling process.

The basement rocks underlying the alluvium of Lake Valley are assumed to be similar to the rocks comprising the adjacent mountain ranges. These ranges are predominantly comprised of Paleozoic carbonate rocks, but significant amounts of Paleozoic siliceous clastic rocks (quartzites and shales) and older siliceous-to-intermediate volcanic rocks are present. Published values for Paleozoic carbonate and clastic rocks typically range between 2.6 to 2.9 g/cm³. The carbonate rocks in Nevada and Utah are commonly reported to be relatively high in density, on the order of 2.8 g/cm³. This value was selected to represent

the density of the basement rock. The density of siliceous to intermediate volcanic rocks generally ranges between 2.0 to 2.5 g/cm³ depending on the degree of welding, compaction, and alteration. The older volcanics in the Lake Valley area are probably at the higher end of this density range, being approximately equivalent to dense alluvium or between the density of alluvium and the density of bedrock. The information available regarding the volume and characteristics of subsurface volcanic rocks in Lake Valley is insufficient to make an estimate of their effect on the geologic model. The density contrast used for modeling was -0.50 g/cm³.

4.3 MODELING

Modeling was done with the aid of a computer program which iteratively calculates a three-dimensional solution of gravity anomaly data (Cordell, 1970). The gravity anomaly is represented by discrete values on a two-dimensional grid. The source of the anomaly (the volume of low-density valley fill) is represented by a set of vertical prism elements. The tops of the prisms lie in a common horizontal plane. The bottoms of the prisms collectively represent the bottom of the valley fill. Each prism has a cross-sectional area equal to one grid square and a uniform density. A grid square of 1.2 miles by 1.2 miles (2 km by 2 km) was selected as representative of the gravity station distribution. Computations were made for eight iterations of mutually interactive prism adjustments. The root-mean-square error between the observed residual gravity field and the field calculated for the final model of the entire valley was less than 0.7 milligal.

The calculated thickness of the valley fill depends upon the accuracy of the -0.50 g/cm^3 density contrast (i.e., fill density minus rock density) used. Since neither density is perfectly known, nor even uniform, the calculated thickness should be expected to contain a corresponding degree of uncertainty. The calculated thickness of fill, or interpreted depth to rock, is contoured in Drawing 2.

4.4 DISCUSSION OF RESULTS

The depth-to-rock contours in Drawing 2 show uneven basement topography. It is deep in the north-central part of the valley, shallow in the central part, and of intermediate depth in the south. The surficial topographic differences between the northern and southern parts of the valley appear to be related to the basement structure. The deeper part of the valley shows a slightly different axial trend than the remainder of the valley.

The steep gravity gradient (Drawing 1) on the west side of the deepest part of the valley suggests the existence of a major fault system. The gravity gradient opposite it, on the east side, is not as steep nor as great in amplitude; it suggests a deeper fault with smaller vertical displacement. The north-trending surficial faults and lineaments in the valley fill described in Section 3.0 may be related to the large fault system on the west suggested by the gravity data. Also, a previously interpreted fault is shown near the western margin of the valley by a dotted line on the geologic base map in Drawing 2.

The second vertical derivative of the CBA field was calculated to aid in drawing the line of inflection, which theoretically marks the location of a normal fault. Placement of the interpreted fault lines in Drawing 2 was guided by the locations of the calculated lines of inflection.

The gravity results are interpreted as indicating that the Lake Valley basin is principally the result of the uneven subsidence of three blocks: a northern block, corresponding to the most pronounced gravity minimum; a central block; and a southern block, corresponding to the lesser gravity minimum.

The northern block is tilted downward to the west. This tilt may be the cause of an apparent shift in the axial alignment of the valley.

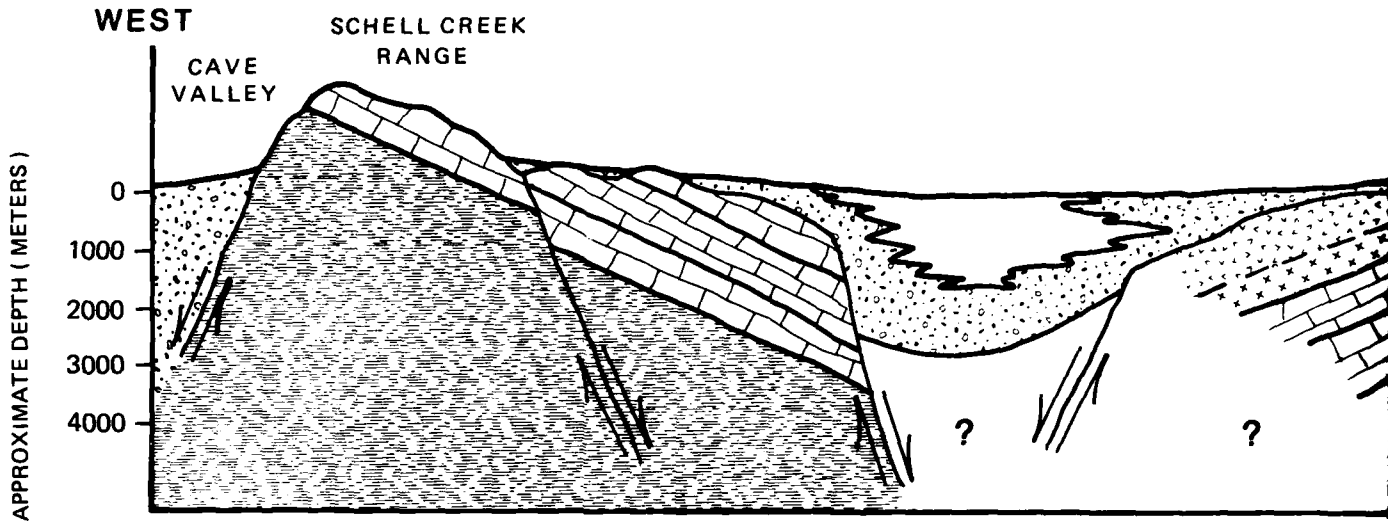
The previously described northeast-trending lineaments in the alluvium may indicate mark a zone of transverse faulting or differential compaction between the deep northern and central blocks.

The central block is in the narrowest and shallowest part of the valley, flanked on both sides by volcanic rocks. If there is a significant thickness of volcanic rocks with an intermediate density underlying the alluvium, the contours of depth to carbonate bedrock from our two-density model are too shallow.

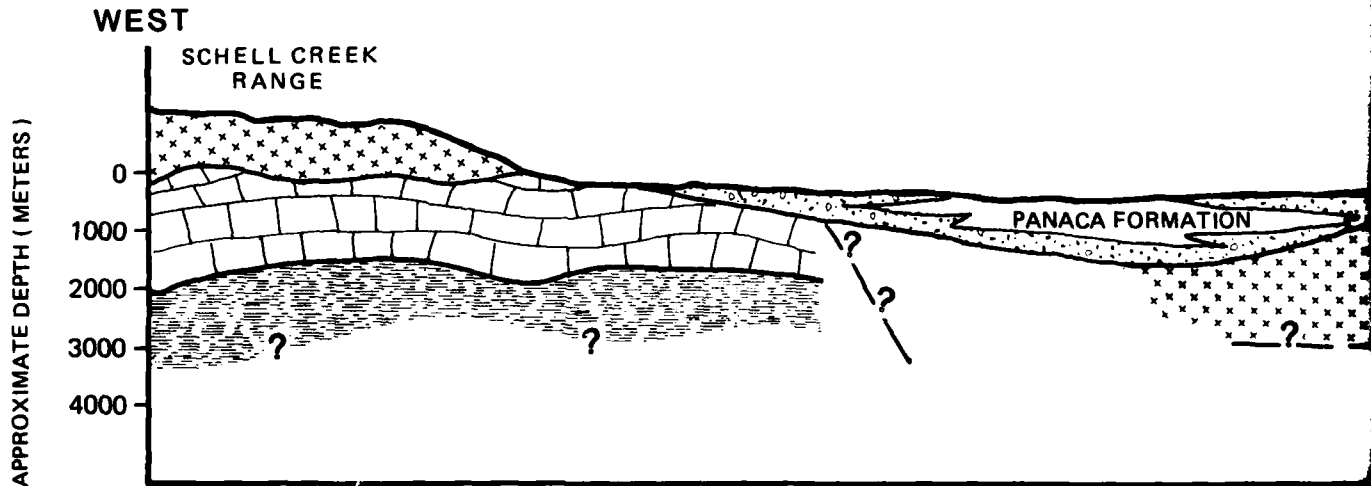
The southern block has apparently been stable during Quaternary time since major faulting has not occurred in the Pliocene or Miocene lake beds in the area.

Interpreted faults are shown in Drawing 2 only for the northern block where the gravity gradients are defined best. These interpretations were aided by regional geologic information from published reports, aerial photographs, and surface geologic mapping. Figure 3 shows interpreted geologic cross-sections which are consistent with gravity data and geologic information.

NORTH CENTRAL LAKE VALLEY

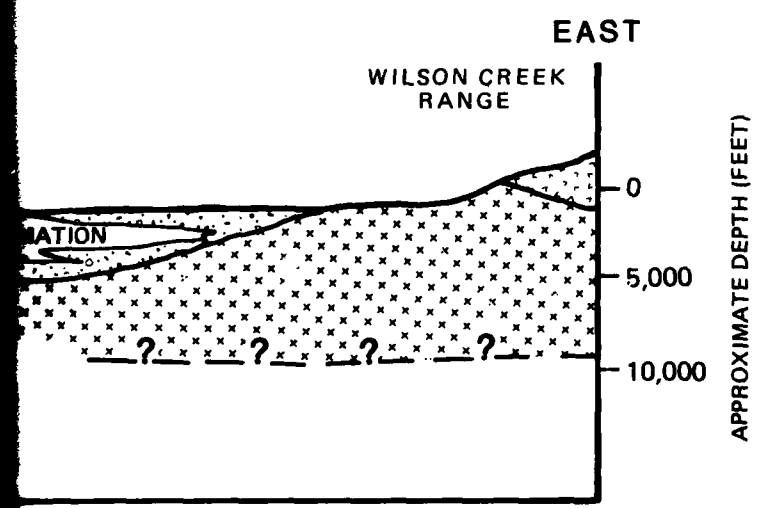
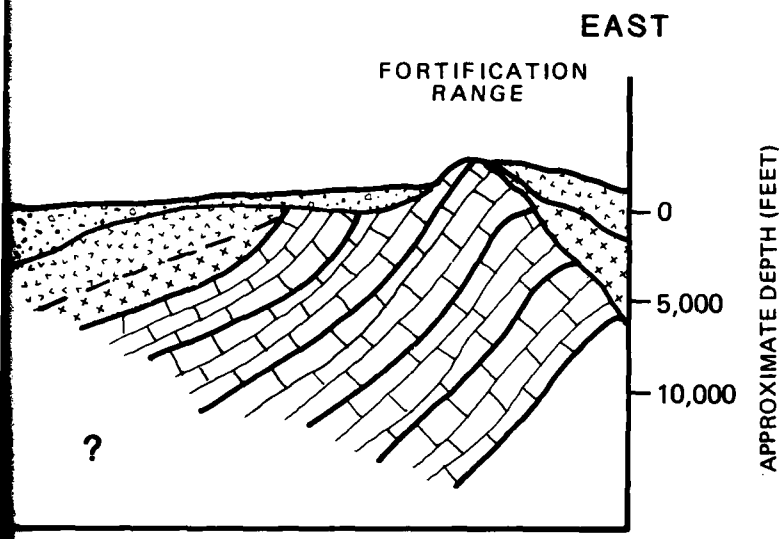


SOUTHERN LAKE VALLEY









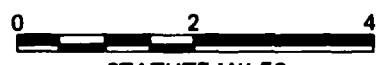
APPROXIMATE HORIZONTAL SCALE

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EXPLANATION

-  QUATERNARY PLAYA AND TERTIARY LACUSTRINE DEPOSITS
-  QUATERNARY AND TERTIARY BASIN-FILL DEPOSITS
-  UPPER TERTIARY VOLCANICS
-  MIDDLE TERTIARY VOLCANICS
-  PALEOZOIC CARBONATES
-  CAMBRIAN SILICEOUS AND CARBONATE ROCKS



SCALE



MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE
BMO/AFRCE-MX

**GENERALIZED CROSS-SECTIONS
LAKE VALLEY, NEVADA**

20 MAY 81

FIGURE 3

5.0 CONCLUSIONS

Lake Valley gravity data indicate that the valley is underlain by three subsidence blocks, or grabens. There is deep subsidence in the north-central valley between Schell Creek Range and Fortification Range. Shallow subsidence is found in the central valley between Grassy Mountain/Fairview Range and Wilson Creek Range. There is intermediate subsidence in the south valley between southern Fairview Range/northern Bristol Range and Wilson Creek Range. The range of depths to carbonate bedrock along the valley axis is interpreted to be 2000 to 8000 feet, except at the northern and southern ends where the depth is about 1000 feet. The northern subsidence block is tilted downward to the west. Faults and lineaments in the alluvium indicate Quaternary movement of the northern block.

The calculated depths to carbonate bedrock are necessarily approximate because the complex and imperfectly known density distribution has been represented by a simple two-density model. Also, the residual gravity anomaly is necessarily based on an interpreted regional field. An average density contrast of -0.50 g/cm^3 between the alluvium and bedrock was used to calculate the thickness of the valley-fill material. Future studies that acquire better density data or measure actual depths to bedrock in deep parts of the valley can be used to refine the gravity interpretation.

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APPENDIX A1.0

GENERAL PRINCIPLES OF THE
GRAVITY EXPLORATION METHOD

A1.0 GENERAL PRINCIPLES OF THE GRAVITY
EXPLORATION METHOD

A1.1 GENERAL

A gravity survey involves measurement of differences in the gravitational field between various points on the earth's surface. The gravitational field values being measured are the same as those influencing all objects on the surface of the earth. They are generally associated with the force which causes a 1-gm mass to be accelerated at 980 cm/sec^2 . This force is normally referred to as a 1-g force.

Even though in many applications the gravitational field at the earth's surface is assumed to be constant, small but distinguishable differences in gravity occur from point to point. In a gravity survey, the variations are measured in terms of milligals. A milligal is equal to 0.001 cm/sec^2 or 0.00000102 g . The differences in gravity are caused by geometrical effects, such as differences in elevation and latitude, and by lateral variations in density within the earth. The lateral density variations are a result of changes in geologic conditions. For measurements at the surface of the earth, the largest factor influencing the pull of gravity is the density of all materials between the center of the earth and the point of measurement.

To detect changes produced by differing geological conditions, it is necessary to detect differences in the gravitational field as small as a few milligals. To recognize changes due to

geological conditions, the measurements are "corrected" to account for changes due to differences in elevation and latitude.

Given this background, the basic concept of the gravitational exploration method, the anomaly, can be introduced. If, instead of being an oblate spheroid characterized by complex density variations, the earth were made up of concentric, homogeneous shells, the gravitational field would be the same at all points on the surface of the earth. The complexities in the earth's shape and material distribution are the reason that the pull of gravity is not the same from place to place. A difference in gravity between two points which is not caused by the effects of known geometrical differences, such as in elevation, latitude, and surrounding terrain, is referred to as an "anomaly."

An anomaly reflects lateral differences in material densities. The gravitational attraction is smaller at a place underlain by relatively low density material than it is at a place underlain by a relatively high density material. The term "negative gravity anomaly" describes a situation in which the pull of gravity within a prescribed area is small compared to the area surrounding it. Low-density alluvial deposits in basins such as those in the Nevada-Utah region produce negative gravity anomalies in relation to the gravity values in the surrounding mountains which are formed by more dense rocks.

The objective of gravity exploration is to deduce the variations in geologic conditions that produce the gravity anomalies identified during a gravity survey.

A1.2 INSTRUMENTS

The sensing element of a LaCoste and Romberg gravimeter is a mass suspended by a zero-length spring. Deflections of the mass from a null position are proportional to changes in gravitational attraction. These instruments are sealed and compensated for atmospheric pressure changes. They are maintained at a constant temperature by an internal heater element and thermostat. The absolute value of gravity is not measured directly by a gravimeter. It measures relative values of gravity between one point and the next. Gravitational differences as small as 0.01 milligal can be measured.

A1.3 FIELD PROCEDURES

The gravimeter readings were calibrated in terms of absolute gravity by taking readings twice daily at nearby USGS gravity base stations. Gravimeter readings fluctuate because of small time-related deviations due to the effect of earth tides and instrument drift. Field readings were corrected to account for these deviations. The magnitude of the tidal correction was calculated using an equation suggested by Goguel (1954):

$$C = P + N \cos \phi (\cos \phi + \sin \phi) + S \cos \phi (\cos \phi - \sin \phi)$$

where C is the tidal correction factor, P, N, and S are time-related variables, and ϕ is the latitude of the observation point. Tables giving the values of P, N, and S are published annually by the European Association of Exploration Geophysicists.

The meter drift correction was based on readings taken at a designated base station at the start and end of each day. Any difference between these two readings after they were corrected for tidal effects was considered to have been the result of instrumental drift. It was assumed that this drift occurred at a uniform rate between the two readings. Corrections for drift were typically only a few hundredths of a milligal. Readings corrected for tidal effects and instrumental drift represented the observed gravity at each station. The observed gravity values represent the total gravitational pull of the entire earth at the measurement stations.

A1.4 DATA REDUCTION

Several corrections or reductions are made to the observed gravity to isolate the portion of the gravitational pull which is due to the crustal and near-surface materials. The gravity remaining after these reductions is called the "Bouguer Anomaly." Bouguer Anomaly values are the basis for geologic interpretation. To obtain the Bouguer Anomaly, the observed gravity is adjusted to the value it would have had if it had been measured at the geoid, a theoretically defined surface which approximates the surface of mean sea level. The difference between the "adjusted" observed gravity and the gravity at the geoid calculated for a theoretically homogeneous earth is the Bouguer Anomaly.

Four separate reductions, to account for four geometrical effects, are made to the observed gravity at each station to arrive at its Bouguer Anomaly value.

a. Free-Air Effect: Gravitational attraction varies inversely as the square of the distance from the center of the earth. Thus, corrections must be applied for elevation. Observed gravity levels are corrected for elevation using the normal vertical gradient of:

$$FA = -0.09406 \text{ mg/ft } (-0.3086 \text{ milligals/meter})$$

where FA is the free-air effect (the rate of change of gravity with distance from the center of the earth). The free-air correction is positive in sign since the correction is opposite the effect.

b. Bouguer Effect: Like the free-air effect, the Bouguer effect is a function of the elevation of the station, but it considers the influence of a slab of earth materials between the observation point on the surface of the earth and the corresponding point on the geoid (sea level). Normal practice, which is to assume that the density of the slab is 2.67 grams per cubic centimeter was followed in these studies. The Bouguer correction (B_C), which is opposite in sign to the free-air correction, was defined according to the following formula.

$$B_C = 0.01276 (2.67) h_f \text{ (milligals per foot)}$$

$$B_C = 0.04185 (2.67) h_m \text{ (milligals per meter)}$$

where h_f is the height above sea level in feet and h_m is the height in meters.

c. Latitude Effect: Points at different latitudes will have different "gravities" for two reasons. The earth (and the geoid) is spheroidal, or flattened at the poles. Since points at higher latitudes are closer to the center of the earth than points near the equator, the gravity at the higher latitudes is larger. As the earth spins, the centrifugal acceleration causes a slight decrease in gravity. At the higher latitudes where the earth's radii are smaller, the centrifugal acceleration diminishes. The gravity formula for the Geodetic Reference System, 1967, gives the theoretical value of gravity at the geoid as a function of latitude. It is:

$$g = 978.0381 (1 + 0.0053204 \sin^2 \phi - 0.0000058 \sin^2 2\phi) \text{ gals}$$

where g is the theoretical acceleration of gravity and ϕ is the latitude in degrees. The positive term accounts for the spheroidal shape of the earth. The negative term adjusts for the centrifugal acceleration.

The previous two corrections (free air and Bouguer) have adjusted the observed gravity to the value it would have had at the geoid (sea level). The theoretical value at the geoid for the latitude of the station is then subtracted from the adjusted observed gravity. The remainder is called the Simple Bouguer Anomaly (SBA). Most of this gravity represents the effect of material beneath the station, but part of it may be due to irregularities in terrain (upper part of the Bouguer slab) away from the station.

d. Terrain Effect: Topographic relief around the station has a negative effect on the gravitational force at the station. A nearby hill has upward gravitational pull and a nearby valley contributes less downward attraction than a nearby material would have. Therefore, the corrections are always positive. Corrections are made to the SBA when the terrain effects were 0.1 milligal or larger. Terrain corrected Bouguer values are called the Complete Bouguer Anomaly (CBA). When the CBA is obtained, the reduction of gravity at individual measurement points (stations) is complete.

A1.5 INTERPRETATION

To interpret the gravity data, the portion of the CBA that might be caused by the light-weight, basin-fill material must be separated from that caused by the heavier bedrock material which forms the surrounding mountains and presumably the basin floor. The first step is to create a regional field. A regional field is an estimation of the values the CBA would have had if the light-weight sediments (the anomaly) had not been there. Since the valley-fill sediments are absent at the stations read in the mountains, one approach is to use the CBA values at bedrock stations as the basis for constructing a second order polynomial surface to represent a regional field over the valley.

Where there are insufficient bedrock stations to define a satisfactory regional trend, another approach is to estimate the regional by the process of upward continuation of the CBA field.

In Potential Theory, a field normal to a surface, regardless of its actual source, may be considered as originating in an areal distribution of mass on that surface. If the field strength is known the surface density of mass (grams per square centimeter) can be calculated. The observed gravity field at the surface of the earth approximately fulfills the requirements of this theory: thus the observed (Bouguer anomaly) field can be used to compute a surficial distribution of mass which would reproduce the field, and most importantly, account for the gravity field anywhere above the surface of observation. On this basis, the Bouguer anomaly field is readily "continued" to level surfaces above the ground.

An important property of such "upward continuation" is that the resultant field (which can be represented by a contour map), with increasing altitudes of continuation, changes more with respect to shallow sources than it does with respect to deeper sources. The anomalous parts of the field ascribed to shallow density distribution tend to vanish as the continuation is carried upward whereas the field produced by deeper sources changes only slightly, so that upward continuations produce "regional"-type fields.

The difference between the CBA and the regional field is called the "residual" field or residual anomaly. The residual field is the interpreter's estimation of the gravitational effect of the geologic anomaly. The zero value of the residual anomaly is not exactly at the rock outcrop line but at some distance on the

"rock" side of the contact. The reason for this is found in the explanation of the terrain effect. There is a component of gravitational attraction from material which is not directly beneath a point.

If the "regional" is well chosen, the magnitude of the residual anomaly is a function of the thickness of the anomalous (fill) material and the density contrast. The density contrast is the difference in density between the alluvial and bedrock material. If this contrast were known, an accurate calculation of the thickness could be made. In most cases, the densities are not well known and they also vary within the study area. In these cases, it is necessary to use typical densities for materials similar to those in the study area.

If the selected average density contrast is smaller than the actual density contrast, the computed depth to bedrock will be greater than the actual depth and vice-versa. The computed depth is inversely proportional to the density contrast. A ten percent error in density contrast produces a ten percent error in computed depth. An iterative computer program is used to calculate a subsurface model which will yield a gravitational field to match (approximately) the residual gravity anomaly.

The second vertical derivative (SVD) of gravitational field is used to aid the interpreter in evaluating the subsurface mass distribution. Once the CBA field has been projected onto a uniform grid system, its SVD at the grid nodes is readily computed.

In accordance with Laplace's Equation in Free Space, the negative of the second vertical derivative is equal to the sums of the second derivatives in the x-direction and in the y-direction. The second vertical derivative is an indication of the curvature of the Bouguer anomaly field. In particular the zero-value of the SVD indicates the inflection in the field as it changes from "concave-upward" (algebraically negative SVD) to "convex-upward" (algebraically positive SVD). In a general way the zero SVD falls on the tightest contours of the field and where contours are nearly parallel its location can be established by eye. However, where contours diverge, converge, or change direction this is not always so readily done. The zero SVD contour line may be an indicator of a line of faulting, the pinchout of a stratum, truncation of a stratum at an unconformity or merely a marked change in shape or in density of a geologic unit.

E-TR-33-LV

APPENDIX A2.0
LAKE VALLEY, NEVADA
GRAVITY DATA

LAKE VALLEY GRAVITY DATA

STATION IDENT.	LAT. DEG MIN	LONG. DEG MIN	ELEV. +CODE	TER-COR. IN/OUT	NORTH UTM	EAST UTM	OBSV GRAV	THEO GRAV	FAA	C3A +1000
0245	38 340	114395358261T	0	193421448	70541145908199707			1000	81333	
0239	38 351	114440350200T	0	131421452	69882149825199723			-2670	80341	
0246	38 366	114402357329T	0	159421494	70437146303199745			480	81099	
5028	38 371	114331560230T	0	231421530	71472144287199752			1180	80881	
0251	38 408	114396758530T	0	178421574	70517144980199807			220	80448	
1212	38 410	114336061135T	0	246421600	71405143619199809			1310	80726	
0248	38 420	114412355640T	0	142421590	70289147398199824			-80	81082	
0241	38 444	114441051010T	0	130421624	69868149758199859			-2110	80620	
0258	38 418	114390060499T	0	207421650	70613143940199865			980	80557	
0252	38 448	114406856280T	0	149421644	70368146564199865			-360	80599	
0257	38 465	114379064429T	0	305421686	70773142011199890			2720	81065	
0259	38 468	114397558550T	0	173421684	70503144920199894			100	80313	
0254	38 475	114415254649T	0	145421691	70244147813199905			-680	80825	
7081	38 480	114234060728T	0	135421770	72893142804199912			0	79445	
7083	38 485	114275058159T	0	107421763	72293143570199919			-1630	78637	
0260	38 515	114387561690T	0	216421775	70647143554199963			1610	80796	
0262	38 520	114407455889T	0	138421777	70356146709199970			-680	80388	
0263	38 531	114414254629T	0	132421795	70256147609199986			-990	80512	
0282	38 564	114427452881T	0	136421851	70061149557200035			-730	81366	
1584	38 570	114348060719T	0	231421892	71222143702200044			760	80301	
0266	38 575	114392958560T	0	187421884	70565145175200051			200	80427	
0275	38 593	114402556280T	0	145421914	70424146313200077			-820	80125	
0278	38 602	114417554062T	0	128421925	70204147913200090			-1320	80368	
5029	38 622	114413254511T	0	137421963	70266147426200120			-1410	80137	
0294	38 623	114449152500T	0	121421952	69741149611200121			-1120	81091	
0274	38 627	114406255600T	0	135421975	70368146706200127			-1120	80055	
0273	38 654	114399056660T	0	149422046	70472145711200181			-1170	79659	
0297	38 687	114423755000T	0	122422080	70110147246200215			-1230	80132	
0295	38 705	114443353930T	0	123422106	69822148584200241			-920	80803	
0296	38 710	114432055230T	0	129422119	69987147473200248			-820	80469	
7412	38 710	114441153930T	0	127422116	69854148611200248			-900	80837	
0276	38 711	114412156220T	0	121422128	70278146571200250			-790	80151	
0271	38 730	114391858281T	0	149422171	70574145057200278			-390	79879	
0270	38 740	114382459911T	0	183422193	70711144838200292			900	80653	
7411	38 750	114380061529T	0	150422212	70745143580200307			1140	80320	
0781	38 761	114430357749T	0	126422214	70010146652200323			650	81086	
0780	38 762	114438556181T	0	107422213	69890146994200325			-480	80467	
0782	38 771	114422556270T	0	124422236	70123146360200738			-1040	79884	
0790	38 774	114396857621T	0	145422288	70498145868200371			-300	80195	
0784	38 807	114442158560T	0	147422295	69835145467200390			160	80337	

LAKE VALLEY GRAVITY DATA

STATION IDENT.	LAT. DEG MIN	LONG. DEG MIN	ELEV. +CODE	TER-COR. IN/OUT	NORTH UTM	EAST UTM	OBSV GRAV	THEO GRAV	FAA	CBA +1000
0783	38 815	114427456870T	0	126422315	70050146386200402				-520	80216
0785	38 819	114449157021T	0	122422315	69733146525200408				-240	80432
1211	38 826	114349558789T	0	111422364	71187144335200418				-770	79291
0793	38 834	114387858471T	0	202422365	70627146123200430				690	80952
0786	38 873	114435257470T	0	122422420	69933146343200487				-80	80442
0800	38 892	114427660341T	0	149422458	70043144701200515				940	80519
0787	38 922	114444556850T	0	135422507	69795146689200559				-390	80355
7082	38 940	114254058071T	0	379422613	72577144555200585				-1400	79169
0811	38 957	114379361329T	0	123422596	70746144341200610				1410	80633
0804	38 963	114432361171T	0	163422587	69971144694200619				1610	80923
7036	38 965	114330563232T	0	406422629	71458141922200622				770	79626
0803	38 997	114440060732T	0	150422647	69857144782200669				1230	80680
7286	381005	114362160246T	0	117422691	70995143831200680				-170	79397
0805	381005	114426366581T	0	386422667	70057141111200680				3050	80736
7304	381025	114233565850T	0	320422779	72872139385200710				610	78490
7442	381055	114436860397T	0	140422756	69902145498200754				1550	81110
0819	381068	114442559531T	0	125422778	69818145722200773				940	80775
0820	381149	114443961680T	0	161422927	69794143784200891				910	80041
1582	381230	114353060961T	0	122423110	71117143702201010				30	79382
1210	381418	114353061821T	0	115423458	71108143516201285				380	79425
7049	381430	114355061837T	0	119423480	71078143601201303				460	79499
7296	381445	114236292959T	0	1979423554	72810121606201325				7710	78009
7050	381495	114280064777T	0	167423629	72169140864201398				390	78477
7441	381515	114422060843T	0	121423612	70097144428201427				220	79611
1581	381530	114354062359T	0	114423665	71088143242201449				440	79314
1580	381730	114359062139T	0	132424033	71005143802201742				500	79462
7303	381802	114240065781T	0	541424213	72736140749201848				770	78891
7424	381825	114419059551T	0	195424186	70126145228201882				-630	79255
7032	381916	114363061568T	0	141424375	70938144291202015				180	79341
1209	381932	114364261624T	0	140424405	70920144257202039				180	79320
7047	381960	114247065148T	0	176424539	72625141145202109				310	78286
7045	382000	114317059469T	0	100424548	71604144022202138				-2170	77650
7423	382020	114433557799T	0	273424542	69906146055202168				-1730	78823
1579	382060	114369060679T	0	127424640	70844144962202226				-190	79247
7031	382304	114373859760T	0	125425089	70762146083202584				-280	79455
7297	382356	114273561270T	0	135425224	72220144069202660				-950	78285
1578	382380	114381060259T	0	145425227	70654146302202696				280	79885
7298	382385	114208870827T	0	319425304	73160137810202703				1710	77899
7295	382518	114313559813T	0	91425508	71629144465202898				-2160	77531
7283	382535	114433862221T	0	169425494	69878144719202923				320	79289

LAKE VALLEY GRAVITY DATA

STATION IDENT.	LAT. DEG MIN	LONG. DEG MIN	ELEV. +CODE	TER-COR. IN/OUT	NORTH UTM	EAST UTM	OBSV GRAV	THEO GRAV	FAA	CBA +1000
1208	382590	114382259892T	0	230425615	70626146525203004				-140	79670
1577	382720	114386059419T	0	330425854	70565147072203195				-230	79840
7030	382782	114386259846T	0	204425969	70559146772203286				-210	79574
7294	382858	114280263068T	0	151426150	72097144154203397				70	78731
1589	382900	114387060141T	0	134426187	70542146652203459				-230	79394
7285	383050	114408062087T	0	162426456	70229145480203679				190	79192
1207	383099	114390059711T	0	128426553	70489146321203751				-1250	78508
7301	383114	114205562484T	0	112426654	73169144422203773				-570	78232
7029	383135	114388559738T	0	123426621	70509146176203804				-1430	78323
7293	383138	114334559262T	0	97426647	71293145344203808				-2710	77177
1576	383210	114391060079T	0	130426758	70469145722203914				-1670	77970
1575	383330	114390059692T	0	146427073	70475146022204164				-1980	77806
7302	383540	114239860978T	0	130427428	72648145901204399				-1130	78200
7027	383558	114386759642T	0	157427404	70515146906204425				-1410	78407
7219	383570	114435074003T	0	543427408	69813138963204443				4120	79443
7422	383530	114425569649T	0	472427430	69951141483204458				2530	79262
1206	383593	114387059613T	0	167427468	70509146909204477				-1480	78357
7017	383638	114322560719T	0	124427669	71440146001204616				-1490	77924
7021	383690	114245061148T	0	134427703	72565146226204619				-870	78414
1574	383700	114387059619T	0	193427666	70504147412204634				-1130	78733
7017	383784	114324260719T	0	120427846	71411146006204758				-1630	77780
7291	383805	114430089934T	0	1445427845	69875128318204788				8110	78905
1573	384060	114377059879T	0	178428336	70632147782205163				-1040	78708
1205	384067	114378559879T	0	188428348	70610147816205174				-1020	78748
7016	384079	114328561867T	0	153428390	71334146914205191				-80	78983
7020	384082	114258060220T	0	121428423	72356147617205196				-920	78661
7015	384157	114376060266T	0	170428516	70641147391205306				-1210	78400
7022	384174	114212960715T	0	142428612	73005147298205331				-910	78522
1572	384360	114360060449T	0	140428897	70864147652205605				-1080	78450
7019	384415	114292059117T	0	134429025	71846149053205685				-1010	78964
1204	384470	114355060971T	0	141429103	70931147310205766				-1090	78261
7013	384514	114340060538T	0	140429190	71146147548205831				-1330	78170
7011	384560	114373563117T	0	176429262	70658146116205899				-400	78246
5101	384595	114221659859T	0	330429387	72857148189205950				-1440	78470
4254	384595	114297957900T	0	130429356	71752149015205950				-2470	77920
4253	384611	114286257841T	0	128429390	71920149098205974				-2450	77948
4252	384636	114275657900T	0	132429441	72072149021206011				-2520	77862
4210	384650	114340060518T	0	157429441	71139147737206031				-1360	78157
4251	384653	114264557930T	0	144429477	72232149093206036				-2440	77944
5102	384654	114264257841T	0	145429479	72237149122206037				-2490	77925

LAKE VALLEY GRAVITY DATA

STATION IDENT.	LAT. DEG MIN	LONG. DEG MIN	ELEV. +CODE	TER-COR. IN/OUT	NORTH UTM	EAST UTM	OBSV GRAV	THEO GRAV	FAA	CBA +1000
1571	384670	114338060531T		0	150429479	71167147732206061			-1380	78120
4250	384675	114254157920T		0	164429522	72382149375206068			-2200	78204
4249	384716	114243257910T		0	213429602	72537149375206128			-2270	78183
7008	384765	114335560007T		0	157429656	71199147887206200			-1860	77837
4248	384789	114235458051T		0	285429740	72647149242206236			-2380	78105
4247	384818	114228558940T		0	364429797	72745148667206278			-2160	78094
SPR089	384125	114210960971T		0	134428522	73037146913205259			963	78376
LVO102	382703	1142500 6470S		0	166425876	72544144068203170			1794	79892
SPR095	383958	114225059229T		0	116428207	72841147281205013			-1988	77927
LVO124	382875	1143571 5915Y		0	97426152	70978144475203422			-3278	76645
LVO126	382875	1143153 5930Y		0	99426168	71585145388203422			-2223	77650
SPR135	383572	1142743 8268V		872527427473	72146130106204446			3489	77903	
SPR141	383366	1142685 8268C		322030427094	72241130803204143			4488	78350	
LVO162	382686	1144012 8860V		463635425785	70345127201203145			7461	80923	
LVO164	382468	1143811 5998C		0	180425390	70648145494202825			120	79843
LVO173	381791	1143794 7866V		561888424138	70705132802201832			5013	80128	
SPR148	383175	1142825 7612C		241109426736	72047135275203863			3062	78233	
LVO201	381690	1143564 6227Y		0	123423960	71045143519201684			443	79328
SPR164	383076	1142686 7482C		52	831426558	72254136462207717			3170	78534
LVO215	381937	1142769 6405C		0	160424448	72192142303202046			541	78856
LVO163	382590	1143815 6007C		0	408425615	70636146418203004			-49	79871
LVO262	381250	1143635 6538Y		7	260423143	70963141118201039			1615	79583
SPR166	383941	1142696 6941C		5	923428158	72195141108204988			1451	78705
CAV021	383599	1144473 8426C		592307427457	69633131241204486			6072	79699	
CAV023	383492	1144381 9145C		813513427263	69772125213204328			6973	79376	
CAV022	383558	114440672339T		0	585427384	69732139887204425			3551	79463
LVO001	384735	1143998 8072C		31	984429576	70269135397206156			5222	78706
LVO014	384250	1143307 6215S		0	147428705	71294147040205443			91	79041
LVO018	384140	1143375 6024S		0	136428499	71200148027205281			-558	79032
LVO041	384006	1144310 9695C		252229428216	69851123336205084			9522	78709	
LVO064	383142	1144376 8266C		241706426616	69795132536203814			6532	80069	
SPR026	384554	1142073 6815C		36	825429336	73065143348205905			1587	79204
SPR036	384878	1143730 7446S		6	473429850	70650139164206367			2883	77966
SPR068	383980	1142972 7102C		12	365428219	71793141462205046			3263	79417
SPR077	383787	1142920 7092C		18	374427864	71878141131204762			3122	79325
SPR152	382965	1142167 7135C		8	460426374	73014138619203554			2222	78355
SPR165	383148	1142516 6761C		8	290426698	72497141527203823			1340	78578
SPR042	384745	1143595 6749S		3	249429610	70852143424206171			775	78008
SPR050	384596	1143353 6162S		7	136429343	71210147157205952			-800	78326
CAV020	383849	1144466 8535S		251127427920	69632131765204853			7254	79296	

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CAV024	383212	1144424	8263C		441580426743	69722132481203917			6345	79786
LV0013	384230	1143054	6875S	18	273428678	71661142940205413			2235	79078
LV0035	384254	1144276	7695C	4	649428676	69889137093205449			4076	78483
LV0096	382834	1142356	6712S	5	169426216	72744142682203435			2421	79702
LV0103	382649	1142343	7777S	10	788425782	72775134327203090			4440	78713
LV0002	384537	1144108	7085C	5	271429206	70119141557205865			2378	78490
LV0012	384413	1143217	6825S	8	406429010	71416142945205682			1501	78637
LV0059	383377	1144300	7319C	14	403427053	69895139199204159			3930	79334
LV0114	382374	1142557	6733S	6	211425265	72478140549202687			1235	78487
LV0156	382876	1144382	7574C	16	591426160	69797137075203453			4914	79688
LV0165	382428	1144070	7048C	6	347425306	70273141407202766			4979	81293
LV0170	382070	1144031	8613C		122214424682	70345128958202270			7766	80615
LV0218	382018	1142300	7104C	21	320424617	72871137839202165			2540	78652
LV0219	381849	1142637	7230C	10	450424290	72388136838201917			2974	78774
LV0227	381495	1142944	6544C	11	236423623	71959140097201398			292	78219
LV0230	381384	1142450	7712C	16	519423438	72685133127201235			4484	78715
LV0236	381156	1142469	6899V	10	235423015	72669137852200901			1887	78601
LV0282	38 539	1143645	7907V		261624421828	70982131683199998			6114	80795
LV0293	383714	1144147	6897C	17	483427682	70101141784204655			2046	79022
LV0294	38 946	1142348	6970C	7	341422632	72857136576200594			1586	78161
LV0297	381632	1142459	8013C	11	718423896	72659130919201599			4747	78146
LV0292	382808	1142760	6462S	1	176426059	72160143257203324			753	78890
SPR007	384854	1142236	6030C	0	445429865	72814147893206331			-1686	78192
SPR008	384773	1142136	6259B	0	756429720	72963146685206212			-619	78790
SPR009	384512	1142201	6004S	0	283429234	72883148352205828			-969	78836
SPR010	384595	114221559878T		0	333429387	72858148165205950			-1429	78481
SPR011	384662	114223360020T		0	345429510	72828148105206049			-1455	78419
SPR012	384738	1142261	5921S	0	362429650	72784148602206161			-1833	78334
SPR013	384790	1142352	5805S	0	287429742	72649149278206237			-2326	78162
SPR014	384680	1142348	5816V	0	253429539	72661149075206075			-2263	78153
SPR015	384594	1142348	5831C	0	222429380	72666149031205949			-2040	78294
SPR016	384510	1142475	5819B	0	158429219	72486149421205825			-1638	78673
SPR017	384593	1142505	5800B	0	163429371	72438149592205947			-1769	78612
SPR018	384716	114244357910T		0	208429602	72522149399206128			-2228	78229
SPR019	384675	114254357920T		0	164429522	72379149394206068			-2163	78246
SPR020	384655	1142646	5793S	0	144429480	72231149111206039			-2407	77979
SPR021	384522	1142633	5809B	0	135429235	72256149399205843			-1773	78550
SPR022	384307	1142782	5803B	0	127429201	72041149476205821			-1730	78604
SPR023	384638	114275657900T		0	133429444	72072149041206014			-2481	77904
SPR024	384612	114286257841T		0	128429392	71920149110205975			-2429	77971

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SPR025	384596	11429795	7900T	0	130429358	71752149032205952			-2427	77955
SPR038	384891	1143243	5929Y	0	153429875	71355148314206371			-2256	77675
SPR040	384825	1143085	5771Y	0	141429777	71586149380206299			-2595	77863
SPR041	384839	1143495	6229B	0	195429787	70992146672206309			-1012	77939
SPR043	384766	1143357	5995Y	0	159429658	71196147898206202			-1881	77831
SPR044	384738	1143188	5820V	0	142429612	71442149417206161			-1969	78323
SPR045	384717	1143025	5762B	0	133429580	71679149238206130			-2663	77817
SPR046	384605	11430805	7930T	0	134429371	71605149190205965			-2254	78121
SPR047	384607	11431815	8199T	0	158429370	71458149237205968			-1956	78352
SPR048	384646	11433105	9160T	0	165429437	71270148595206025			-1752	78235
SPR049	384652	11434036	0531T	0	159429445	71135147735206034			-1330	78184
SPR051	384507	1143152	5949Y	0	166429186	71505148649205821			-1183	78693
SPR052	384456	1142982	5891S	0	136429099	71754149022205746			-1280	78763
SPR053	384373	1142868	5912S	0	141428950	71924149184205624			-798	79179
SPR054	384392	1142720	5834U	0	131428972	72138149765205637			-966	79267
SPR055	384398	1142619	5827C	0	132428988	72284149559205646			-1246	79011
SPR056	384392	1142467	5839B	0	141428983	72504149178205637			-1505	78720
SPR057	384428	1142354	5888B	0	165429072	72666148970205705			-1319	78763
SPR058	384299	1142340	5880V	0	144428834	72693148725205515			-1450	78639
SPR059	384291	1142547	5868C	0	127428811	72393149284205503			-992	79121
SPR060	384259	1142690	5959S	0	126428746	72187149154205456			-218	79584
SPR061	384240	1142865	6424C	0	196428704	71935146002205428			1036	79322
SPR062	384177	1142596	5965C	0	120428598	72328148627205335			-568	79207
SPR063	384236	1142437	5868B	0	128428714	72555148769205422			-1427	78697
SPR064	384179	1142280	5930S	0	130428615	72786147804205338			-1724	78181
SPR065	384147	1142376	5878S	0	125428552	72648148205205291			-1765	78312
SPR066	384130	1142499	5930S	0	118428515	72471148205205266			-1251	78641
SPR067	384060	1142723	6177S	0	135428377	72150147164205163			137	79204
SPR070	384018	1142580	6028C	0	129428305	72359147555205102			-813	78756
SPR071	384035	1142416	5934B	0	115428343	72596147715205127			-1563	78313
SPR072	384060	1142252	5948B	0	118428396	72833147218205163			-1965	77966
SPR073	383941	11423535	9360T	0	116428172	72693147563204988			-1558	78312
SPR074	383923	11424595	9869T	0	121428134	72540147471204962			-1143	78558
SPR075	383904	11425686	0781T	0	148428094	72383147068204934			-662	78756
SPR076	383895	1142685	6226C	0	248428054	72214146306204906			3	79010
SPR078	383801	1142498	6103S	0	146427907	72490146699204782			-644	78686
SPR079	383827	1142350	5986B	0	112427961	72703147111204821			-1372	78324
SPR080	384437	11421936	0951T	0	220429096	72898147821205718			-533	78899
SPR082	384324	1142040	6312S	0	218428893	73126146549205552			405	79095
SPR083	384338	11421856	0889T	0	180428913	72915147688205572			-577	78835

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SPR084	384234	114215160469T	0	155428722	72970147642205419	-865	78665			
SPR093	383977	114201061319T	0	123428290	73187147287205071	-71	79138			
SPR094	383978	114212960131T	0	119428249	73016147089205043	-1361	78249			
SPR096	383861	1142222 5927S	0	113428029	72887147252204871	-1836	78061			
SPR097	383889	1142041 6025S	0	113428088	73148147529204912	-678	78886			
SPR103	383784	1142089 5955S	0	106427892	73084147393204758	-1318	78477			
SPR104	383721	1142246 5967S	0	108427769	72860146786204665	-1720	78037			
SPR105	383662	1142095 5980S	0	100427666	73082146634204578	-1662	78042			
SPR110	383549	1142015 6046S	0	96427461	73204146171204412	-1339	78136			
SPR111	383541	1142221 6009S	0	104427437	72905146014204400	-1832	77777			
SPR112	383447	1142106 6050S	0	101427268	73077145662204262	-1659	77807			
SPR118	383323	114219461010T	0	106427035	72956145417204080	-1242	78055			
SPR119	383206	1142104 6202S	0	104426322	73093144930203908	-606	78345			
SPR120	383241	1142006 6179S	0	101426891	73234145021203960	-783	78243			
SPR126	383166	1142242 6157S	0	117426743	72895145062203849	-839	78278			
SPR127	383048	1142196 6265S	0	143426526	72968144572203676	-139	78636			
SPR128	383072	114204363241T	0	113426577	73189144244203711	54	78597			
SPR133	383697	114244161128T	0	130427717	72578146216204630	-879	78401			
SPR134	383675	1142570 6369C	0	200427671	72392145041204597	388	78865			
SPR137	383616	114239860859T	0	125427569	72644146103204511	-1128	78240			
SPR138	383629	1142262 5984S	0	108427598	72841146999204530	-1211	78487			
SPR139	383539	114235760649T	0	122427428	72708146002204397	-1314	78122			
SPR140	383489	1142526 6372C	0	206427328	72465144114204324	-237	78236			
SPR142	383388	1142489 6291C	0	213427143	72524144594204176	-372	78384			
SPR145	383304	1142464 6301C	0	172426989	72565144693204052	-55	78626			
SPR146	383253	1142334 6151C	0	125426900	72756145314203977	-772	78374			
SPR147	383163	1142443 6279S	0	173426729	72603144659203845	-89	78668			
SPR150	383075	1142491 6443C	0	221426564	72538143500203716	426	78672			
SPR151	383073	1142355 6242C	0	134426603	72734144508203742	-486	78359			
SPR153	382980	114200364101T	0	127426409	73252143900203576	655	78919			
SPR158	382813	114207167050T	0	156426097	73162142452203331	2230	79517			
LV0003	384566	1143839 6481C	0	198429269	70507145310205908	401	78494			
LV0004	384668	1143713 6467C	0	188429463	70685144990206058	-201	77930			
LV0005	384590	1143655 6308C	0	160429321	70773146033205943	-540	78105			
LV0006	384503	114351160971T	0	136429165	70986147172205815	-1260	78080			
LV0007	384596	1143465 6155V	0	146429339	71048147166205952	-856	78297			
LV0008	384502	1143417 6050C	0	143429167	71122147545205813	-1328	78180			
LV0009	384469	1143699 6173S	0	160429095	70715146548205765	-1118	77988			
LV0010	384415	1143548 6032S	0	141429001	70936147800205685	-1114	78453			
LV0011	384364	1143399 6037Y	0	136428912	71155147768205610	-1024	78521			

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LV0015	384255	1143499	5962B	0	136428707	71015148283205450			-1055	78746
LV0016	384317	1143650	6048C	0	145428816	70793147667205541			-952	78565
LV0017	384151	1143607	5955S	0	138428510	70864147943205297			-1308	78519
LV0019	384135	1143221	6475S	0	204428496	71424145580205274			1249	79369
LV0020	384063	1143495	59282	0	132428352	71030148023205168			-1353	78560
LV0021	384039	1143734	5927S	0	173428298	70685147757205132			-1593	78365
LV0022	383965	1143634	5924S	0	142428165	70833147481205024			-1788	78149
LV0023	383932	1143521	5925Y	0	126428109	70999147314204975			-1897	78020
LV0024	383971	1143376	5951B	0	131428186	71207147340205032			-1683	78150
LV0025	383961	1143213	6210S	0	146428174	71444146965205018			395	79360
LV0026	383859	1143238	6104S	0	126428003	71413146342204882			-1092	78215
LV0027	383856	1143464	5925B	0	120427970	71085146906204863			-2194	77718
LV0028	383835	1143634	5921B	0	137428017	70837146973204906			-2207	77735
LV0029	383801	1143607	5922Y	0	127427863	70881146336204782			-2712	77217
LV0030	383761	1143353	5978S	0	113427799	71251146559204724			-1902	77622
LV0031	384440	1143933	6432B	0	203429033	70377145023205722			-162	78104
LV0032	384361	1143800	6217C	0	169428892	70574146386205606			-707	78257
LV0033	384262	1143792	6135B	0	171428709	70590146820205460			-900	78347
LV0034	384310	1143999	6471B	0	242428790	70288144436205531			-191	77981
LV0036	384216	1144090	68292	0	358428613	70160142370205393			1253	78320
LV0037	384195	1143904	6276C	0	217428581	70431145537205362			-756	78055
LV0038	384172	1143758	6033C	0	170428544	70644147325205328			-1222	78371
LV0039	384120	1143852	6129C	0	207428444	70510146547205252			-1020	78283
LV0040	384062	1143984	6495C	0	297428332	70321143342205166			-694	77451
LV0042	383968	1144069	6950C	0	461428155	70202141580205028			1967	78724
LV0043	383974	1143940	6396B	0	282428170	70389145146205037			308	78775
LV0044	383947	1143792	5949C	0	200428126	70605147989204997			-1018	78891
LV0045	383822	1143814	5935C	0	193427894	70579147633204813			-1322	78628
LV0046	383845	1143977	6457	0	282427931	70342144980204847			906	79165
LV0048	383726	1143994	6262B	0	268427710	70323145741204672			6	78916
LV0049	383649	1143861	5950B	0	176427572	70519147142204559			-1418	78464
LV0050	383614	1144082	6414C	0	277427499	70200144689204508			550	78951
LV0051	383558	114427369649T		0	538427407	69925141468204440			2584	79367
LV0052	383494	1144102	6330C	0	244427277	70177144640204331			-114	78540
LV0053	383456	1144010	6121C	0	184427210	70312145695204275			-971	78336
LV0054	383541	114396260941T		0	181427369	70378146106204400			-939	78457
LV0055	383563	114375859199T		0	137427417	70673145627204433			-3089	76856
LV0056	383405	1143752	5918C	0	125427125	70689144654204201			-3848	76092
LV0057	383401	114389659691T		0	145427112	70480146030204195			-1987	77800
LV0058	383362	1144041	6185C	0	181427035	70271144907204137			-1018	78067

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LV0060	383238	1144078	6246C	0	175426804	70223145365203955			196	79068
LV0061	383244	1143904	6012C	0	129426822	70476145672203964			-1709	77915
LV0062	383127	1143895	5967C	0	128426605	70495146161203792			-1472	78304
LV0063	383136	1143990	6075B	0	154426619	70356146193203805			-436	78998
LV0065	383043	1144073	6204C	0	156426444	70240145462203669			184	79180
LV0066	383734	1143738	5928Y	0	148427734	70694146292204684			-2600	77329
LV0067	383552	114363559219T		0	115427420	70851144900204431			-3796	76121
LV0068	383590	114352959340T		0	107427476	71004145241204472			-3383	76485
LV0069	383614	114342159521T		0	106427524	71160145810204508			-2680	77125
LV0070	383634	114331459780T		0	112427565	71314146056204537			-2218	77504
LV0071	383537	1143051	6298S	0	142427396	71701145515204395			396	79057
LV0072	383533	1143205	6085B	0	115427383	71477145850204389			-1269	78092
LV0073	383526	114334159829T		0	103427364	71280145868204378			-2200	77497
LV0074	383448	1143607	5919S	0	108427210	70898144468204264			-4088	75832
LV0075	383418	1143433	5932S	0	103427161	71152145658204220			-2732	77139
LV0076	383414	1143270	6022Y	0	104427160	71389145939204214			-1598	77967
LV0077	383411	1143162	6124S	0	112427159	71546145710204209			-862	78363
LV0078	383293	1143244	5997B	0	103426937	71432145945204036			-1649	78000
LV0079	383322	114337959350T		0	102426986	71235145885204079			-2336	77523
LV0080	383337	1143637	5915Y	0	105427004	70859144090204101			-4341	75590
LV0081	383247	1143737	5819Y	0	148426833	70718144480203968			-4723	75578
LV0082	383270	1143526	5915Y	0	99426884	71024144626204002			-3707	76218
LV0083	383228	114339559229T		0	99426811	71216145361203941			-2835	77062
LV0084	383238	1143098	6069S	0	123426841	71647145841203955			-994	78429
LV0085	383197	1143253	5935Y	0	106426759	71424145730203895			-2307	77556
LV0086	383146	114340559190T		0	96426659	71206145102203820			-3011	76897
LV0087	383123	1143715	5917Y	0	106426605	70756144777203786			-3321	76604
LV0088	383056	114341859170T		0	94426492	71191144885203688			-3115	76798
LV0089	383098	1143259	5931Y	0	101426576	71420145174203750			-2755	77117
LV0090	383102	1143091	5979B	0	124426590	71664145824203755			-1660	78072
LV0091	383452	1142928	6427C	0	151427244	71883144790204270			1011	79242
LV0092	383329	1142927	6298B	0	192427016	71891144724204089			-89	78622
LV0093	382948	1142985	6082S	0	124426309	71826145258203529			-1029	78351
LV0095	382947	1142418	6382S	0	138426330	72650144106203528			645	79016
LV0097	382825	1142448	6514S	0	147426103	72613143660203349			1621	79550
LV0098	382788	1142582	6288E	0	135426029	72420145061203294			949	79637
LV0099	382829	1142789	6218B	0	130426097	72117144677203355			-155	78768
LV0100	382698	1142895	6037S	0	105425832	71970145412203148			-917	78598
LV0101	382714	1142681	6178S	0	122425889	72280145477203186			437	79487
LV0104	382637	1142621	6296S	0	137425749	72371144960203073			1144	79807

LAKE VALLEY GRAVITY DATA

STATION IDENT.	LAT. DEG MIN	LONG. DEG MIN	ELEV. +CODE	TER-COR. IN/OUT	NORTH UTM	EAST UTM	OBSV GRAV	THEO GRAV	FAA	C3A +1000
LV0105	382636	1142801	6296S	0	162425739	72109144983203071			1169	79857
LV0106	382576	1142896	6036B	0	103425625	71974145097202983			-1077	78439
LV0107	382570	11427466	1601T	0	118425620	72193145045202974			48	79156
LV0108	382520	11428416	0909T	0	108425523	72057144847202901			-727	78606
LV0109	382502	1142711	6228S	0	124425495	72247144336202875			78	78960
LV0110	382502	1142600	6377S	0	146425500	72409143654202875			799	79195
LV0111	382465	11429416	0371T	0	102425418	71914144683202820			-1319	78192
LV0112	382372	1142841	6100B	0	111425287	72064144585202713			-716	78590
LV0113	382415	1142711	6254S	0	129425334	72252143682202747			-204	78595
LV0115	382278	1142419	6690S	0	170425093	72684140840202546			1261	78614
LV0116	382253	1142615	6377B	0	139425039	72400142853202509			363	78752
LV0117	382270	1142767	6189B	0	119425064	72178143682202534			-602	78408
LV0118	382273	1142880	61212	0	108425102	72012144100202568			-858	78373
LV0119	382340	1142962	6070S	0	101425186	71890144357202637			-1151	78247
LV0120	382779	11423696	7510T	0	201426022	72730142592203281			2852	80028
LV0121	382967	1143251	5925Y	0	102426334	71438145100203557			-2694	77200
LV0122	382965	1143428	5915U	0	95426323	71181144712203554			-3173	76748
LV0123	382970	1143694	5921Y	0	103426323	70794144749203562			-3087	76821
LV0125	382872	1143426	5917U	0	94426152	71189144494203418			-3235	76678
LV0127	382813	1143297	5926Y	0	96426047	71379144615203331			-2943	76941
LV0128	382782	1143425	5915U	0	94425985	71194144517203286			-3099	76821
LV0129	382727	1143677	5919Y	0	114425874	70831145236203205			-2261	77665
LV0130	382695	1143423	5925U	0	93425824	71202144453203158			-2941	76944
LV0131	382784	1143012	5976Y	0	102426005	71795145624203289			-1420	78299
LV0132	382698	1143117	5955Y	0	95425823	71647144902203148			-2199	77585
LV0133	382592	1143021	5981Y	0	95425649	71792144902203007			-1813	77892
LV0134	382597	1143233	5950Y	0	91425650	71483144363203014			-2651	77146
LV0135	382608	1143422	5929U	0	92425663	71207144539203030			-2690	77180
LV0136	382618	1143631	5921Y	0	109425674	70903145414203045			-1905	78010
LV0137	382501	1143597	5927Y	0	104425459	70958145454202873			-1636	78252
LV0138	382522	1143425	5932U	0	92425504	71207144725202904			-2349	77510
LV0139	382492	1143235	5966Y	0	91425456	71485144234202860			-2476	77267
LV0140	382493	1143133	5983U	0	92425462	71633144371202861			-2180	77505
LV0141	382412	11430416	0249T	0	96425316	71771144579202743			-1458	78089
LV0142	382414	1143264	5956Y	0	91425311	71447144424202746			-2266	77511
LV0143	382436	1143389	5933U	0	95425346	71264144685202778			-2253	77606
LV0144	382421	1143575	5929Y	0	103425312	70994145313202756			-1641	78240
LV0146	382324	1143584	5936Y	0	104425132	70985145389202613			-1357	78501
LV0147	382346	1143470	5934Y	0	93425177	71150144889202646			-1908	77946
LV0148	382346	1143352	5945Y	0	91425181	71322144727202646			-1966	77848

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LV0149	382362	114313760069T	0	92425219	71634144603202669	-1530	78074			
LV0150	382328	1143044 6057Y	0	99425160	71771144729202619	-883	78557			
LV0151	382313	114322859869T	0	91425125	71504144361202597	-1889	77782			
LV0152	382262	1143319 5963U	0	91425027	71374144446202523	-1954	77798			
LV0153	382979	1143884 5998B	0	122426332	70518146686203575	-438	79227			
LV0154	382927	1144004 6097C	0	153426231	70346146165203499	50	79408			
LV0155	382930	1144103 6220C	0	164426233	70202145257203503	296	79245			
LV0157	382794	1144171 6316C	0	212425979	70109144777203303	919	79589			
LV0158	382846	1144046 6246B	0	209426080	70288145570203380	977	79683			
LV0159	382855	1143932 6056C	0	185426101	70454146520203393	124	79654			
LV0160	382849	1143766 5937Y	0	120426096	70695145896203384	-1611	78259			
LV0161	382734	1143843 5938C	0	240425880	70589146831203215	-498	79489			
LV0166	382377	1143898 6146C	0	183425218	70526146614202691	1768	80989			
LV0167	382326	1144027 6445Y	0	206425119	70340144953202616	2997	81221			
LV0168	382278	1143787 6048C	0	138425039	70692145970202546	346	79856			
LV0169	382172	1143877 6375B	0	235424840	70566144535202391	2145	80637			
LV0171	382041	1143836 6407B	0	218424599	70632143833202198	1937	80302			
LV0172	381951	114377162441T	0	171424435	70731144516202066	1218	80092			
LV0174	382240	114364859550T	0	111424974	70896145699202490	-744	79056			
LV0175	382240	114354159531T	0	100424978	71052145135202490	-1327	78469			
LV0176	382240	114343259501T	0	93424982	71211144756202490	-1735	78064			
LV0177	382237	1143182 6000S	0	92424986	71575144225202486	-1790	77837			
LV0178	382241	1143043 6070S	0	102424999	71777144353202492	-1009	78390			
LV0179	382148	1143309 5962Y	0	93424817	71394144217202355	-2026	77733			
LV0180	382129	1143541 5960Y	0	103424773	71057145148202327	-1086	78689			
LV0181	382131	1143697 6023Y	0	126424771	70830145488202330	-156	79427			
LV0182	382046	1143676 6075Y	0	122424614	70865144673202206	-355	79046			
LV0183	382066	1143431 5957Y	0	94424660	71221144499202235	-1671	78105			
LV0184	382103	1143134 6011S	0	96424740	71651143861202289	-1854	77740			
LV0185	382030	1143010 6070Y	0	108424610	71836143788202182	-1264	78140			
LV0186	382038	114312160200T	0	100424565	71675143830202150	-1661	77906			
LV0187	382016	1143266 5969Y	0	93424574	71463144072202162	-1911	77823			
LV0188	381979	1143526 5997S	0	105424533	71085144303202137	-1392	78259			
LV0189	381910	114363761621T	0	142424364	70928144232202006	221	79346			
LV0190	381958	1143398 5965Y	0	96424462	71274144345202077	-1590	78161			
LV0191	381929	1143164 6000S	0	100424417	71616144127202034	-1437	78199			
LV0192	381895	1143314 5966Y	0	98424349	71399144248201984	-1586	78164			
LV0193	381834	1143494 6040S	0	106424229	71140144437201895	-611	78894			
LV0194	381851	1143237 5979S	0	99424289	71513143930201935	-1732	77974			
LV0195	381820	1143095 6072S	0	109424218	71722143306201874	-1420	77979			

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LV0196	381797	1143370	5890S	0	119424165	71323144117201841	-2289	77741		
LV0197	381761	1143277	5978Y	0	100424102	71460143959201788	-1566	78143		
LV0198	381715	1143132	6056Y	0	106424023	71674143367201720	-1356	78094		
LV0199	381666	1143315	6012S	0	100423925	71409143705201649	-1361	78234		
LV0200	381721	1143426	6059S	0	102424023	71245143666201729	-1037	78399		
LV0202	381574	1143557	62359T	0	116423746	71061143241201514	420	79266		
LV0203	381596	1143431	6100S	0	104423791	71243143320201546	-814	78485		
LV0204	381547	1143314	5998S	0	101423705	71416143750201474	-1272	78371		
LV0205	381595	1143179	6015S	0	105423799	71611143540201545	-1393	78196		
LV0206	381597	1143013	6162S	0	119423909	71853142697201548	-855	78247		
LV0207	382130	1142989	6094B	0	109424796	71861143725202329	-1248	78076		
LV0208	382190	1142883	6153B	0	113424911	72013143301202417	-1205	77922		
LV0209	382187	1142513	6448C	0	149424921	72552141888202413	165	78321		
LV0210	382187	1142328	66571T	0	183424928	72821141182202413	1426	78904		
LV0211	382110	1142579	6341C	0	139424775	72460142596202300	-23	78489		
LV0212	382144	1142717	6264B	0	124424833	72257142955202350	-438	78321		
LV0213	382063	1142830	6197C	0	121424678	72096143461202231	-445	78540		
LV0214	381907	1142989	6110C	0	121424384	71872143629202002	-867	78414		
LV0216	382005	1142634	6460B	0	146424579	72385142007202146	663	78776		
LV0217	382016	1142481	6516S	0	165424606	72607141536202162	703	78644		
LV0220	381848	1142828	6369B	0	161424281	72110142416201915	445	78883		
LV0221	381761	1142826	6370C	0	156424120	72117142391201788	558	78987		
LV0222	381734	1142989	6179S	0	126424064	71881142706201748	-887	78164		
LV0223	381595	1142826	64242	0	159423813	72126141871201545	789	79038		
LV0225	381529	1142664	6746C	0	228423697	72365139767201448	1814	79034		
LV0226	381472	1142789	6456D	0	168423587	72186140770201364	170	78319		
LV0228	381364	1142944	6200C	0	137423381	71965142007201206	-846	78145		
LV0229	381350	1142785	63681T	0	168423361	72198140951201186	-299	78150		
LV0231	381257	1142631	6614B	0	226423196	72427139724201049	926	78594		
LV0232	381267	1142782	63310T	0	162423208	72207140975201064	-502	78067		
LV0233	381246	1142898	6158B	0	139423165	72038141562201033	-1513	77623		
LV0234	381161	1142968	6034C	0	123423005	71940141868200909	-2250	77293		
LV0235	381179	1142779	62529T	0	155423045	72215140903200935	-1180	77648		
LV0237	381102	1142601	6478B	0	178422910	72479139872200822	21	78105		
LV0238	381092	1142775	61870T	0	144422885	72226141107200808	-1470	77572		
LV0239	381045	1142876	6054B	0	128422794	72081141520200739	-2240	77239		
LV0240	381004	1142772	61640T	0	134422722	72235141044200679	-1620	77490		
LV0241	38 973	1142593	6316B	0	163422709	72496140578200663	639	77982		
LV0243	38 939	1142459	6382C	0	190422614	72695140507200584	-9	78413		
LV0244	38 926	1142768	61119T	0	127422578	72244141440200565	-1599	77681		

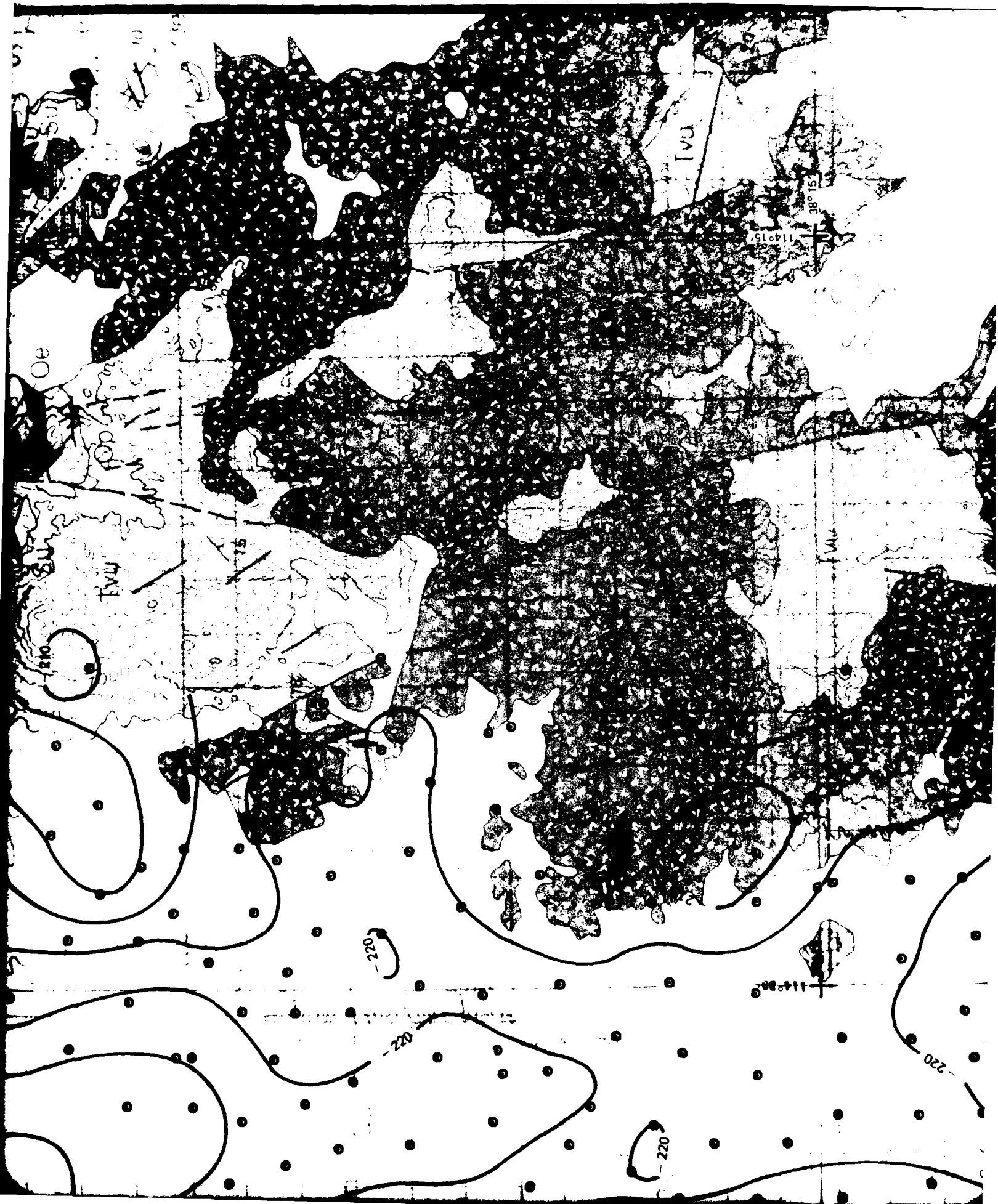
LAKE VALLEY GRAVITY DATA

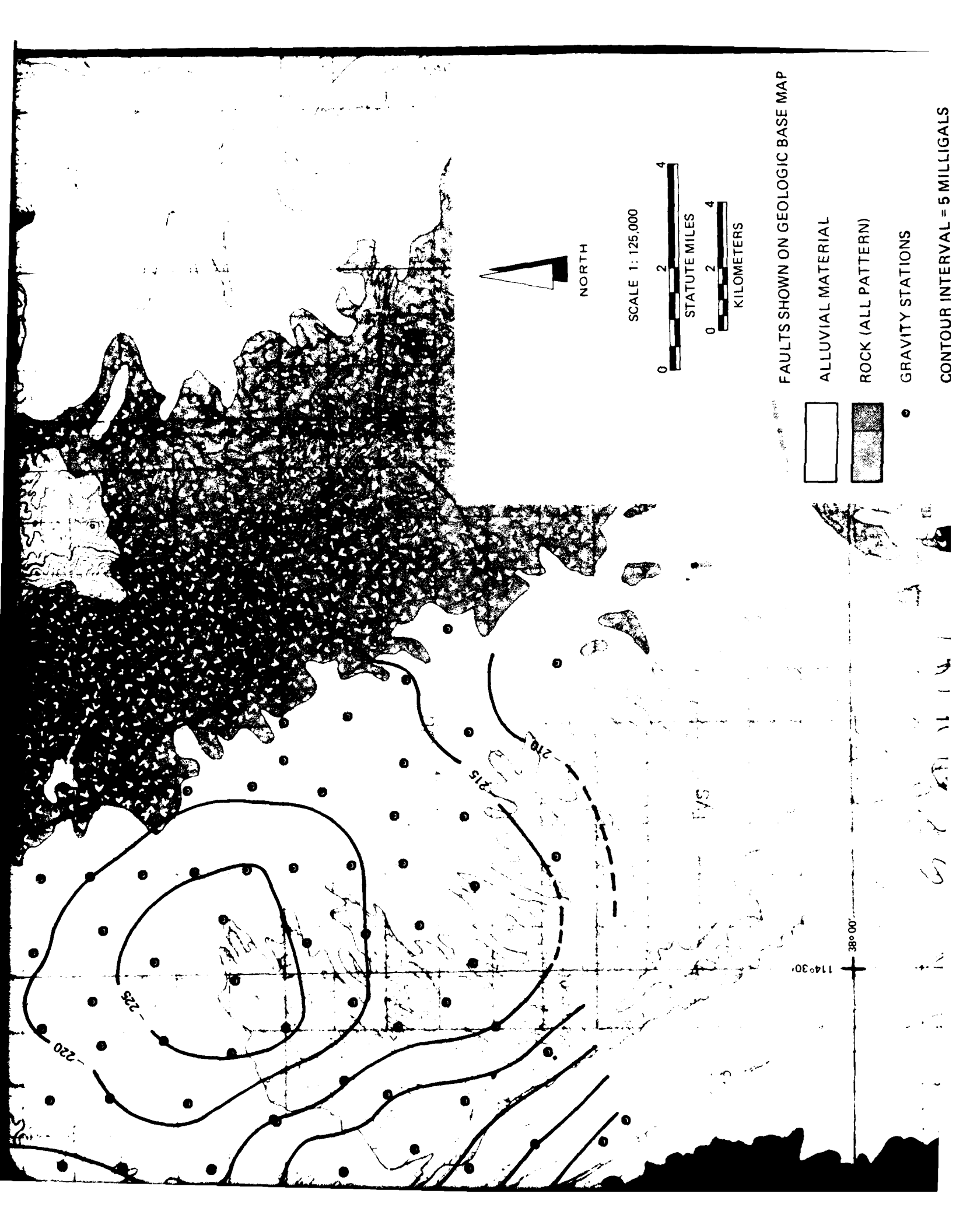
STATION IDENT.	LAT. DEG MIN	LONG. DEG MIN	ELEV. +CODE	TER-COR. IN/OUT	NORTH UTM	EAST UTM	OBSV GRAV	THEO GRAV	FAA	CBA +1000
LV0245	38 905	1142930	5974Y	0	113422533	72009142171200534			-2137	77600
LV0246	38 826	1142911	5929B	0	110422350	72041142826200389			-1761	78127
LV0247	38 829	114276560380T		0	121422399	72254141977200423			-1617	77910
LV0248	38 876	1142607	6181C	0	140422492	72482141314200491			-1003	78056
LV0249	38 832	1142447	6251C	0	176422417	72718141106200427			-487	78369
LV0250	38 756	1142660	6029S	0	124422268	72411142073200316			-1499	78061
LV0252	381457	1143257	5934Y	0	112423559	71504143850201357			-1658	78215
LV0253	381460	1143425	6070S	0	108423540	71259143551201347			-667	78738
LV0254	381460	1143550	6190S	0	117423535	71076143556201347			468	79473
LV0255	381319	1143399	6005Y	0	106423280	71304143578201140			-1044	78590
LV0256	381339	1143259	5980S	0	103423322	71507143678201169			-1210	78497
LV0257	381350	1143106	6046Y	0	112423349	71730142684201186			-1598	77892
LV0258	381265	1143050	6044Y	0	116423194	71816142378201061			-1799	77703
LV0259	381251	1143144	5970S	0	110423164	71679142916201041			-1936	77812
LV0260	381238	1143256	5868Y	0	118423136	71516143708201022			-2086	78018
LV0261	381219	1143405	5925Y	0	111423095	71300143660200994			-1570	78333
LV0263	381070	1143410	5890S	0	105422819	71300143423200775			-1918	78098
LV0264	381108	1143269	5810S	0	112422895	71504143638200831			-2512	77784
LV0265	381147	1143135	5910S	0	111422972	71697142779200888			-2486	77468
LV0266	381026	1143009	5933S	0	115422753	71887142063200711			-2809	77071
LV0267	381034	1143163	5871S	0	104422762	71662142631200723			-2836	77244
LV0268	38 960	1143309	5808Y	0	110422619	71452143662200614			-2290	78011
LV0269	38 942	1143111	5855S	0	108422594	71743142692200588			-2791	77347
LV0270	38 849	1143418	5856C	0	107422410	71299144619200452			-718	79416
LV0271	38 846	1143224	5725B	0	112422412	71582144208200448			-2359	78227
LV0272	38 829	1143059	5868S	0	110422387	71824143002200423			-2193	77903
LV0273	38 773	1143255	5710S	0	118422276	71541144936200341			-1664	78979
LV0274	38 754	1143112	5800S	0	107422246	71750143549200313			-2176	78149
LV0275	38 729	1143372	5821C	0	116422190	71372144321200276			-1170	79092
LV0276	38 638	1143414	5806C	0	152422020	71315144767200143			-732	79617
LV0277	38 644	1143271	5683C	0	126422036	71523145289200152			-1377	79366
LV0278	38 673	1143061	5777C	0	108422098	71829143621200194			-2203	78202
LV0279	38 590	1143114	5738C	0	113421943	71756143916200073			-2153	78390
LV0280	38 503	1143169	5651S	0	133421780	71679144808199946			-1953	78906
LV0281	38 527	1143364	5869C	0	184421816	71393144502199981			-242	79925
LV0283	38 716	1142895	5902S	0	107422184	72069142904200257			-1805	78172
LV0284	38 742	114276259741T		0	115422238	72262142343200295			-1726	78013
LV0285	38 739	114254860761T		0	136422241	72575141915200291			-1190	78223
LV0286	38 733	114237263140T		0	171422237	72833140653200282			-202	78434
LV0287	38 662	1142265	6350S	0	179422110	72993140525200178			113	78634

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LVO288	38 629	1142484	6025B	0	135422040	72674142663200130			-761	78825
LVO289	38 639	1142664	5950S	0	116422051	72411142448200145			-1697	78125
LVO290	38 622	1142812	5855S	0	109422014	72195143114200120			-1901	78239
LVO291	38 627	1142979	5829S	0	104422016	71951143370200127			-1897	78326
LVO295	381460	1143103	6064Y	0	113423552	71729142992201347			-1282	78149
LVO296	382327	1143716	5957Y	0	120425132	70793146043202618			-510	79293
SPR136	383356	1142536	6283B	0	188427526	72445145002204481			-345	78414
SPR144	383369	1142334	6104S	0	123427114	72750145591204148			-1107	78197
SPR167	383467	114231460679T		0	117427296	72774145817204292			-1365	78056

END OF LIST



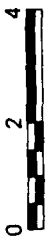


NORTH

SCALE 1:125,000



STATUTE MILES



KILOMETERS

FAULTS SHOWN ON GEOLOGIC BASE MAP



ALLUVIAL MATERIAL



ROCK (ALL PATTERNS)



GRAVITY STATIONS

CONTOUR INTERVAL = 5 MILLIGALS

STATUTE MILES



KILOMETERS

FAULTS SHOWN ON GEOLOGIC BASE MAP

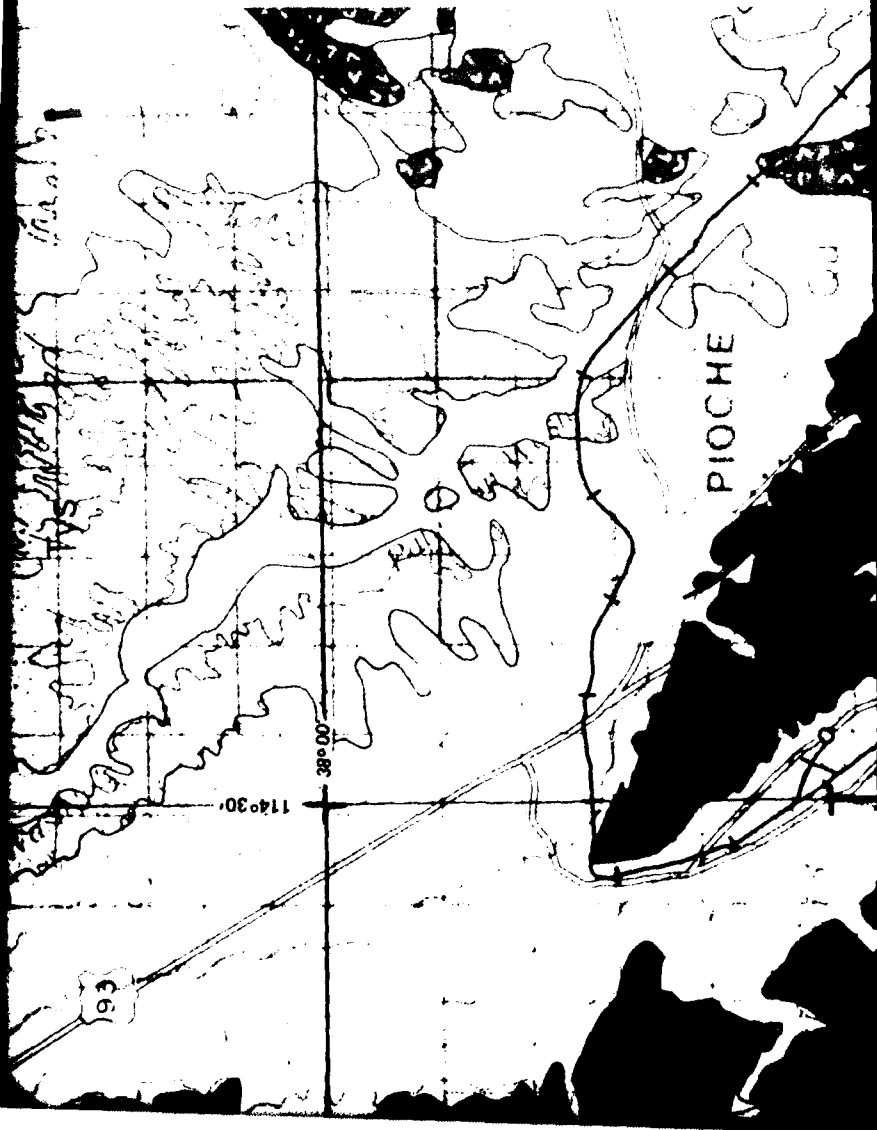
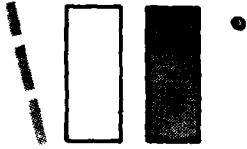
ALLUVIAL MATERIAL

ROCK (ALL PATTERN)

GRAVITY STATIONS

CONTOUR INTERVAL = 5 MILLIGALS

GEOLOGIC BASE MAP: Howard (1978)



MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE
BMO/AFRC-MX

COMPLETE BOUGUER
ANOMALY CONTOURS
LAKE VALLEY, NEVADA

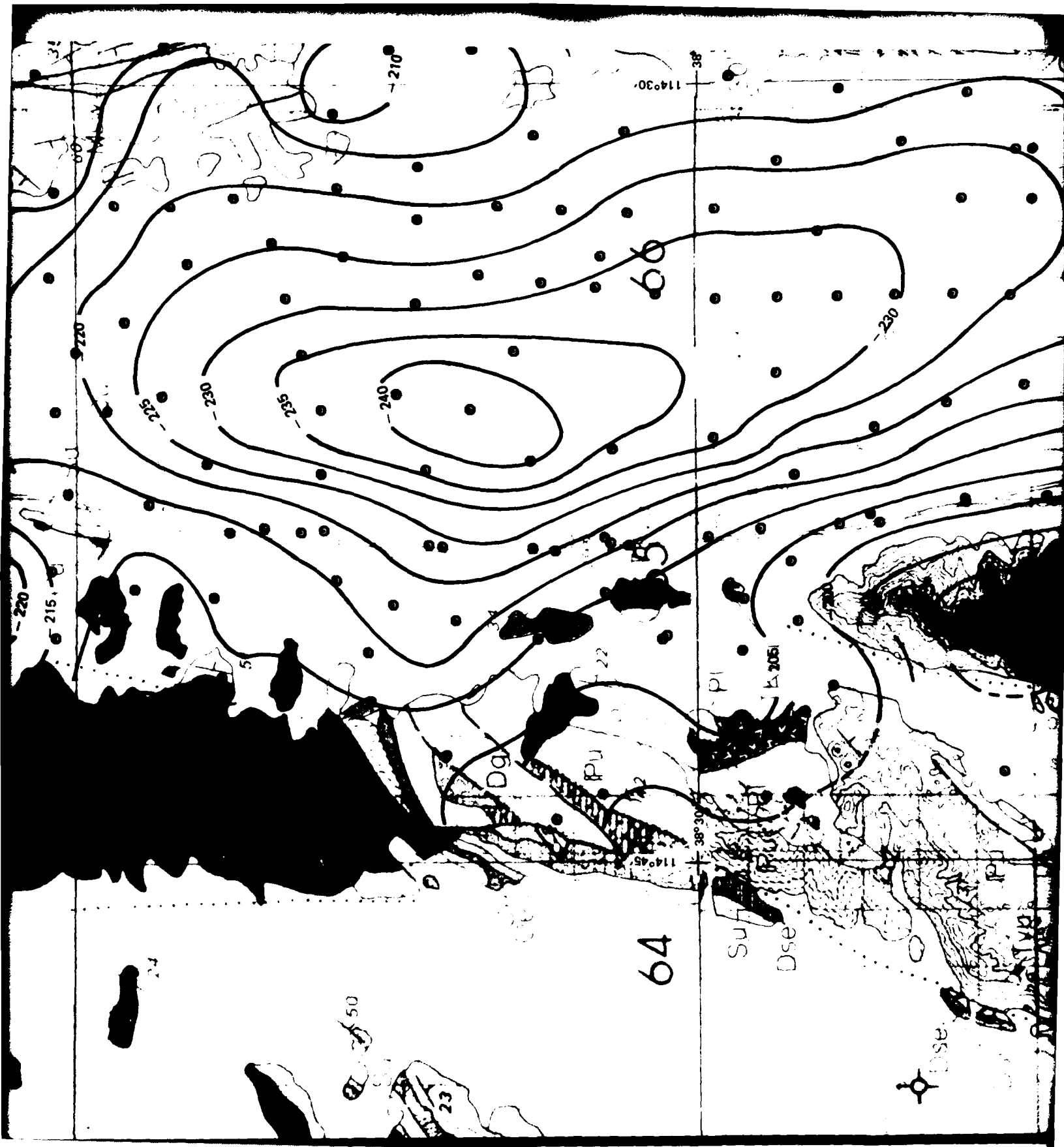
20 MAY 81

DRAWING 1

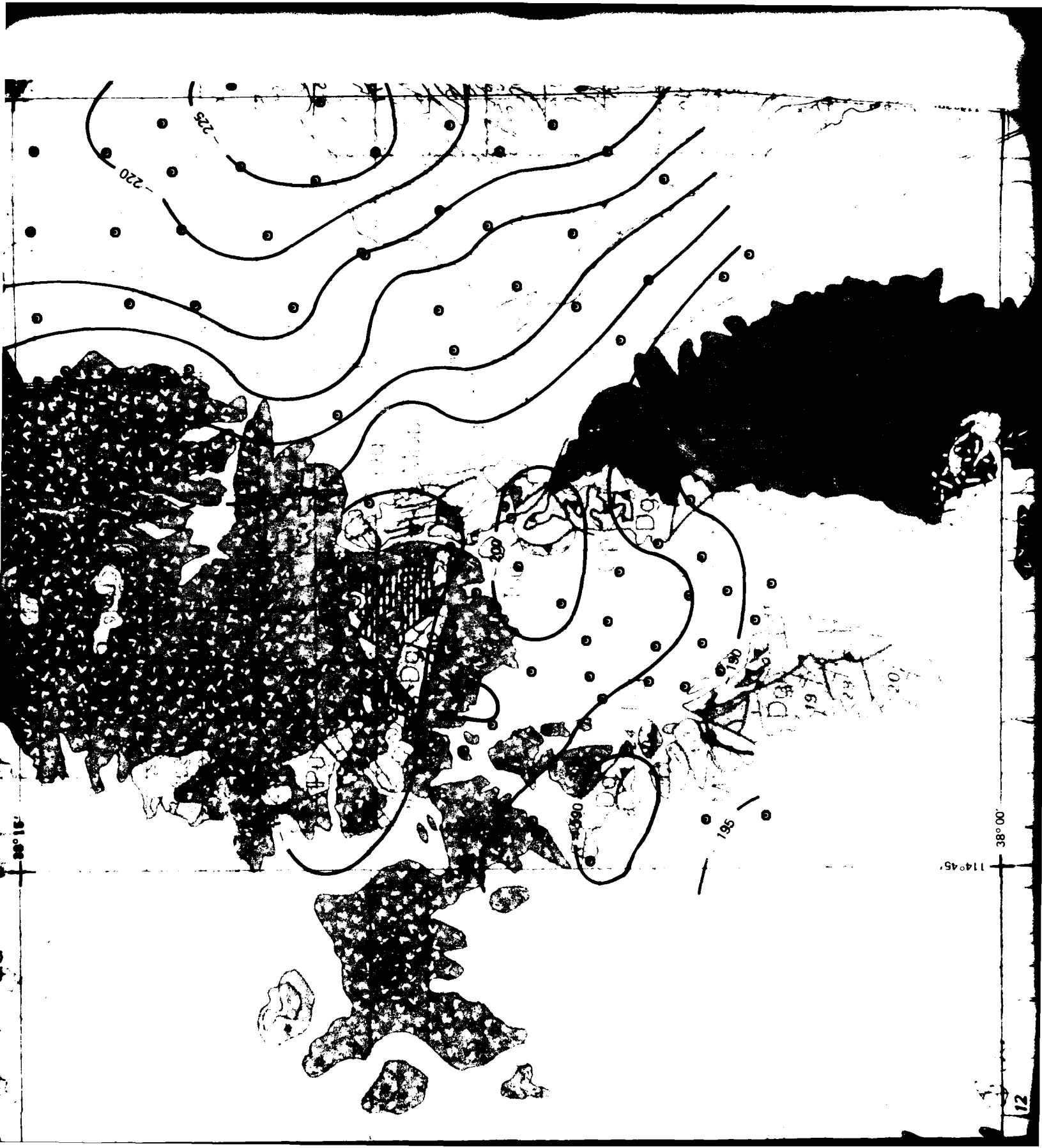
ETR-33-LV



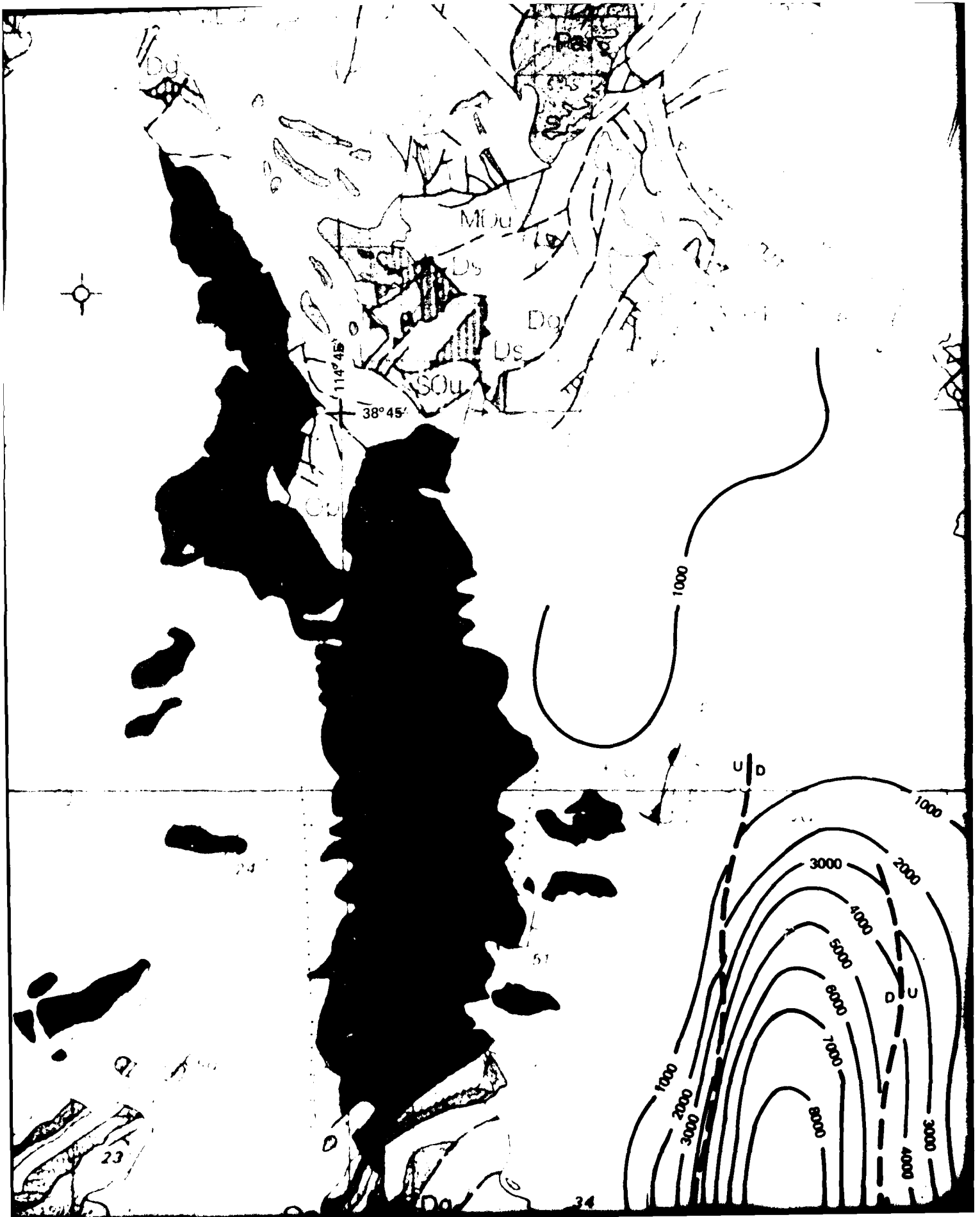
6

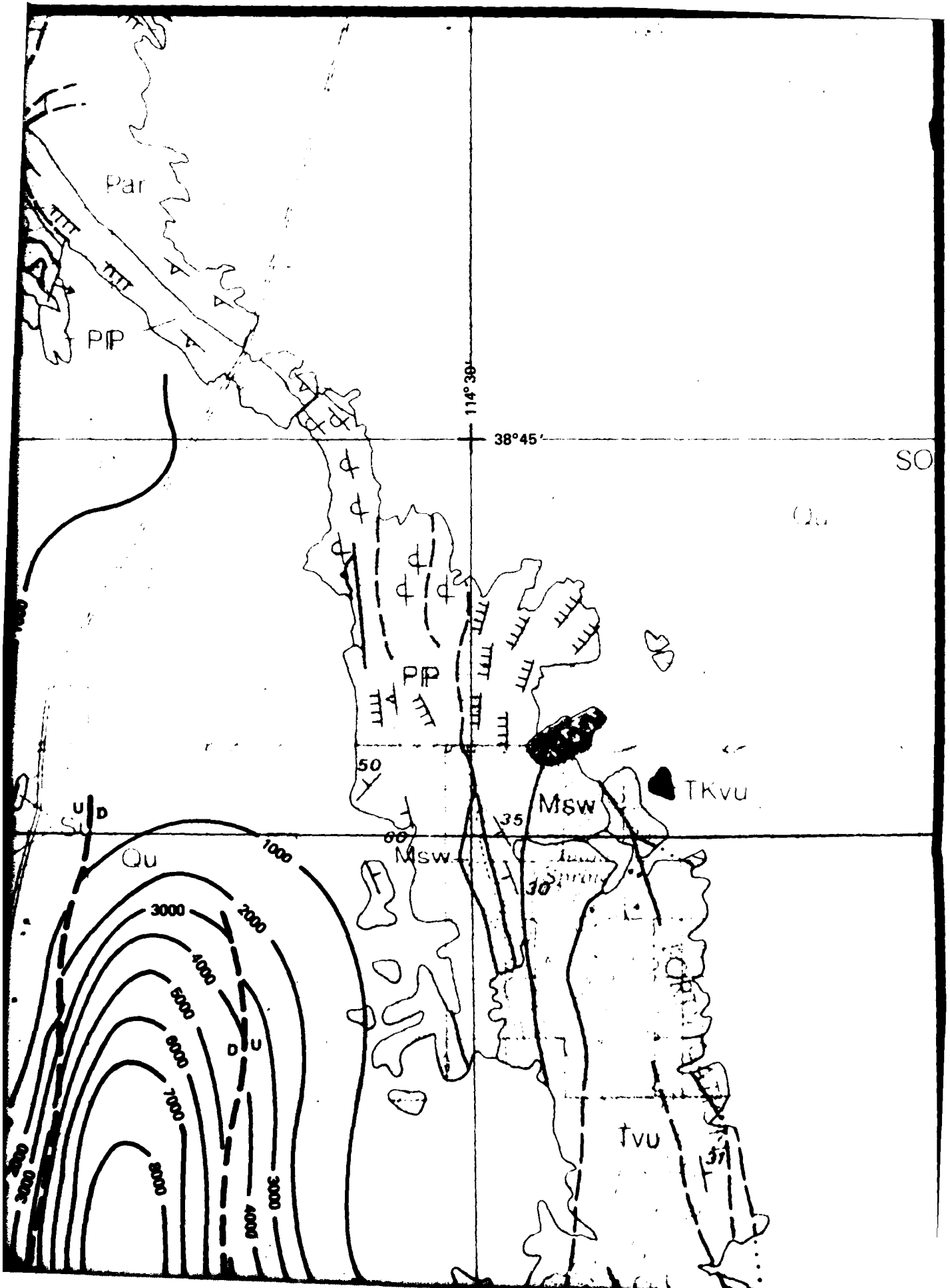


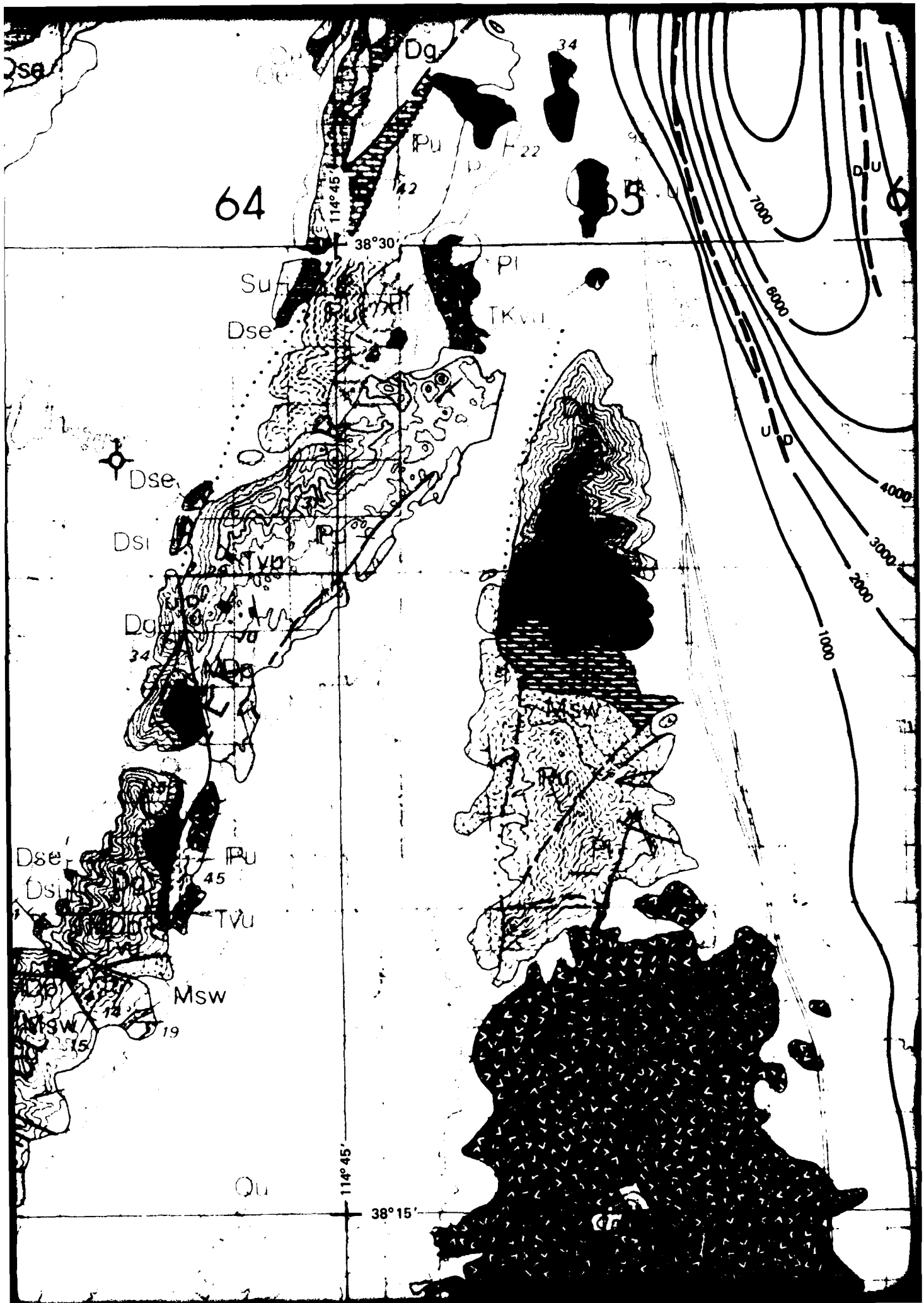


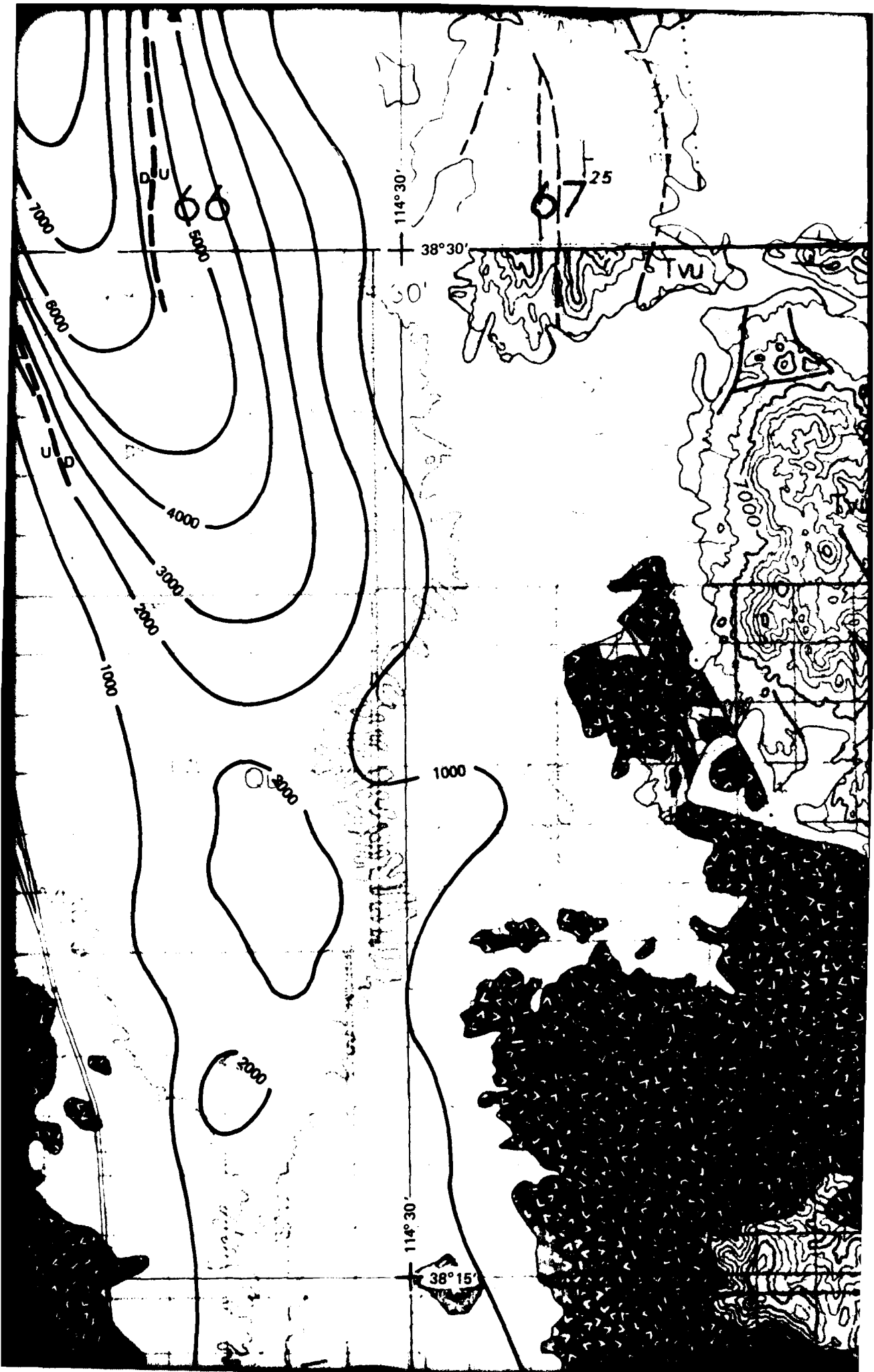


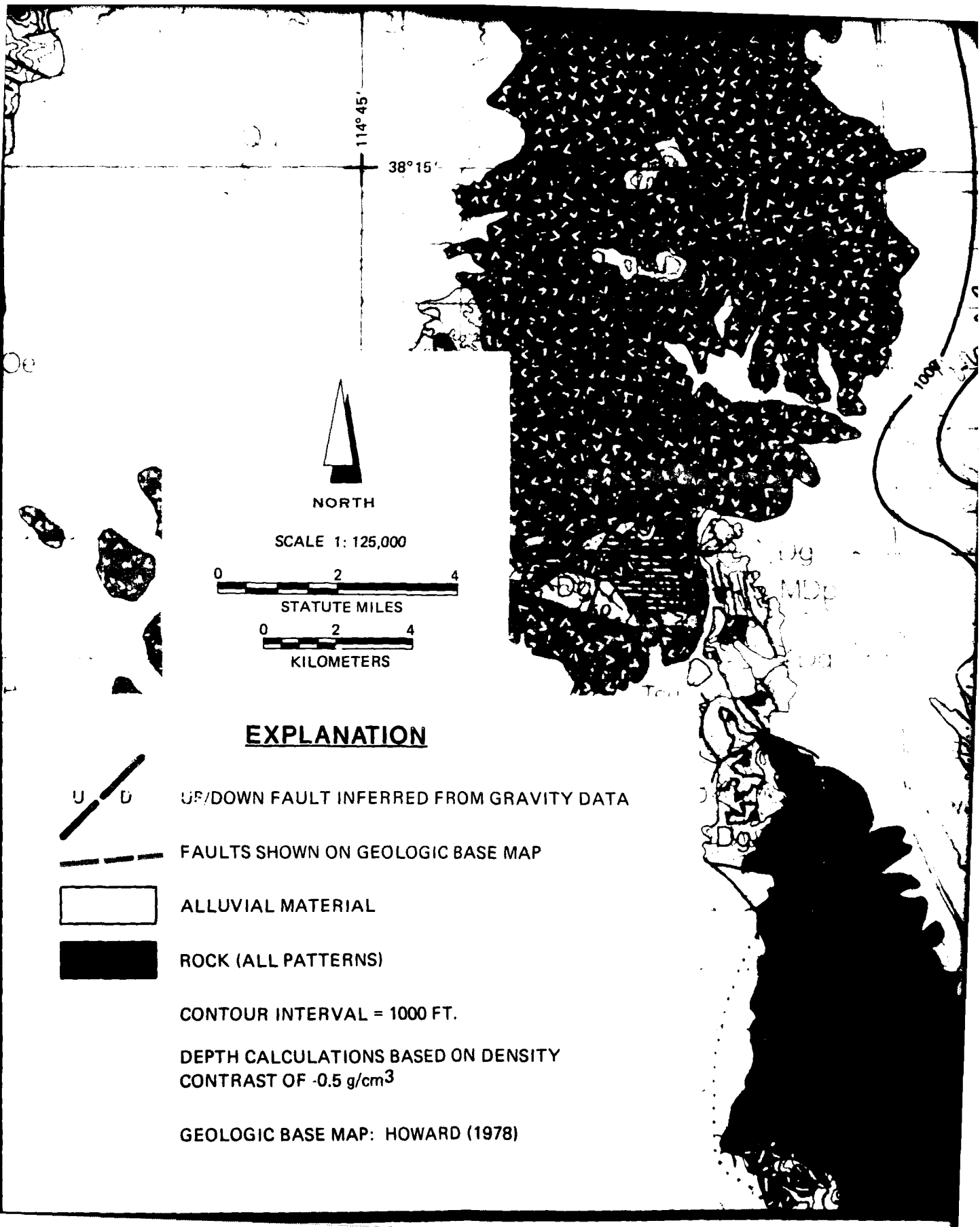












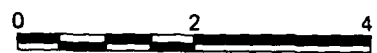
114° 45'

38° 15'

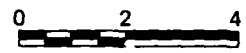


NORTH

SCALE 1: 125,000



STATUTE MILES



KILOMETERS

EXPLANATION



UP/DOWN FAULT INFERRED FROM GRAVITY DATA



FAULTS SHOWN ON GEOLOGIC BASE MAP



ALLUVIAL MATERIAL

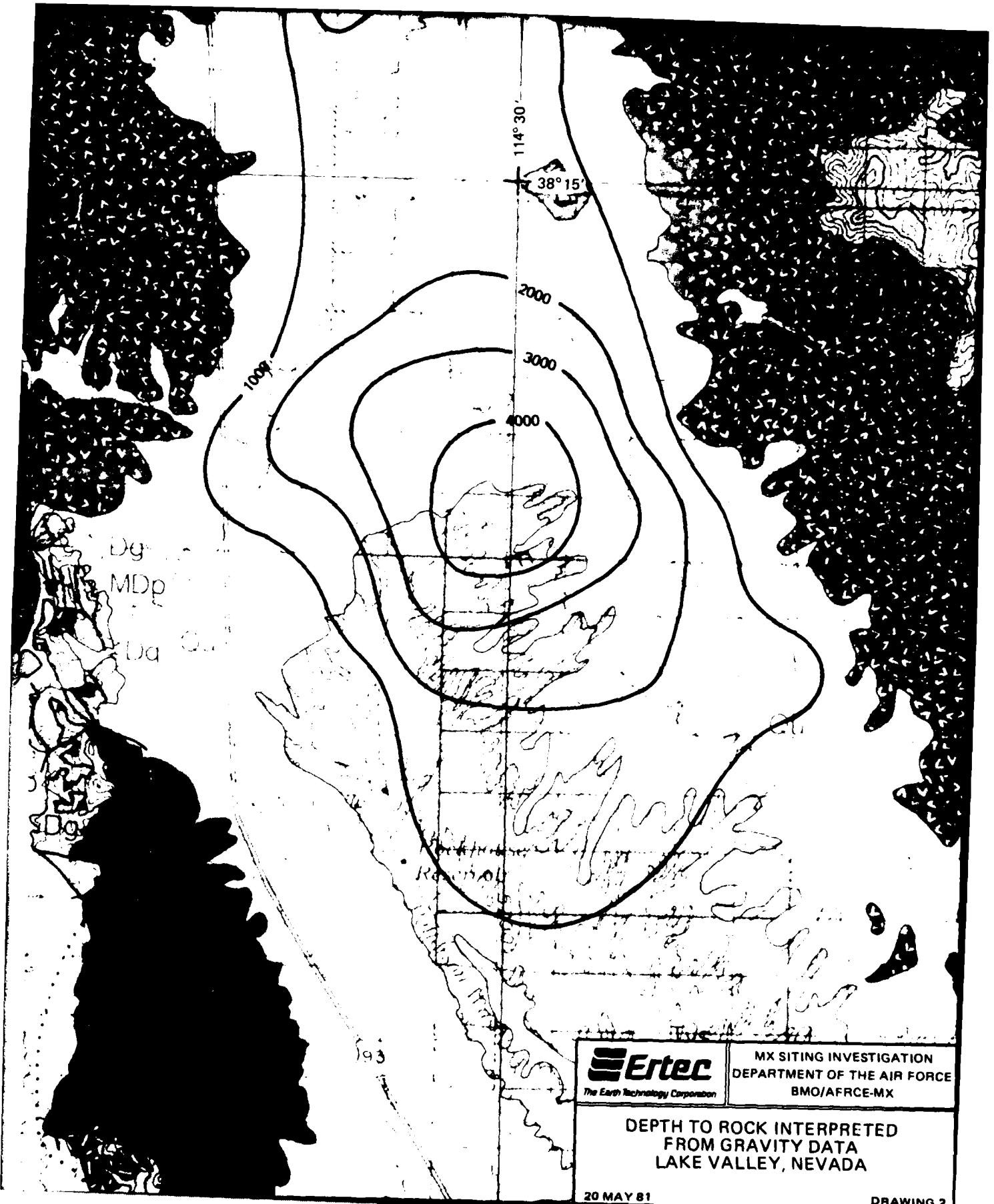


ROCK (ALL PATTERNS)

CONTOUR INTERVAL = 1000 FT.

DEPTH CALCULATIONS BASED ON DENSITY
CONTRAST OF -0.5 g/cm^3

GEOLOGIC BASE MAP: HOWARD (1978)



Ertec
The Earth Technology Corporation

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE
BMO/AFRCE-MX

**DEPTH TO ROCK INTERPRETED
FROM GRAVITY DATA
LAKE VALLEY, NEVADA**

20 MAY 81

DRAWING 2

ATE
LMED
-8