

Los Angeles, California
December 16, 1974

Gravity Interpretation
Cove Fort Prospect, Southwestern Utah

DATA SOURCE

The reconnaissance gravity coverage (shown in Figure 1) includes 150 stations metered by the author using 1:24,000 U.S.G.S. topographic maps for vertical and horizontal control. Other stations are from published surveys available from the Department of Defense. Data reduction and integration of the various surveys were done by Union Oil Research Center.

GRAVITY INTERPRETATION

The most prominent gravity features (Figure 1) are the north-south trending maximum east of Cove Fort (T25S-R6W) and the southwest trending maximum in the northeast quadrant of the map. The gravity maxima are marked with red anticlinal symbols. These features appear to be associated with uplifts which have placed high density Paleozoic sediments in lateral contact with relatively lower density Cenozoic sediments and volcanics. The individual

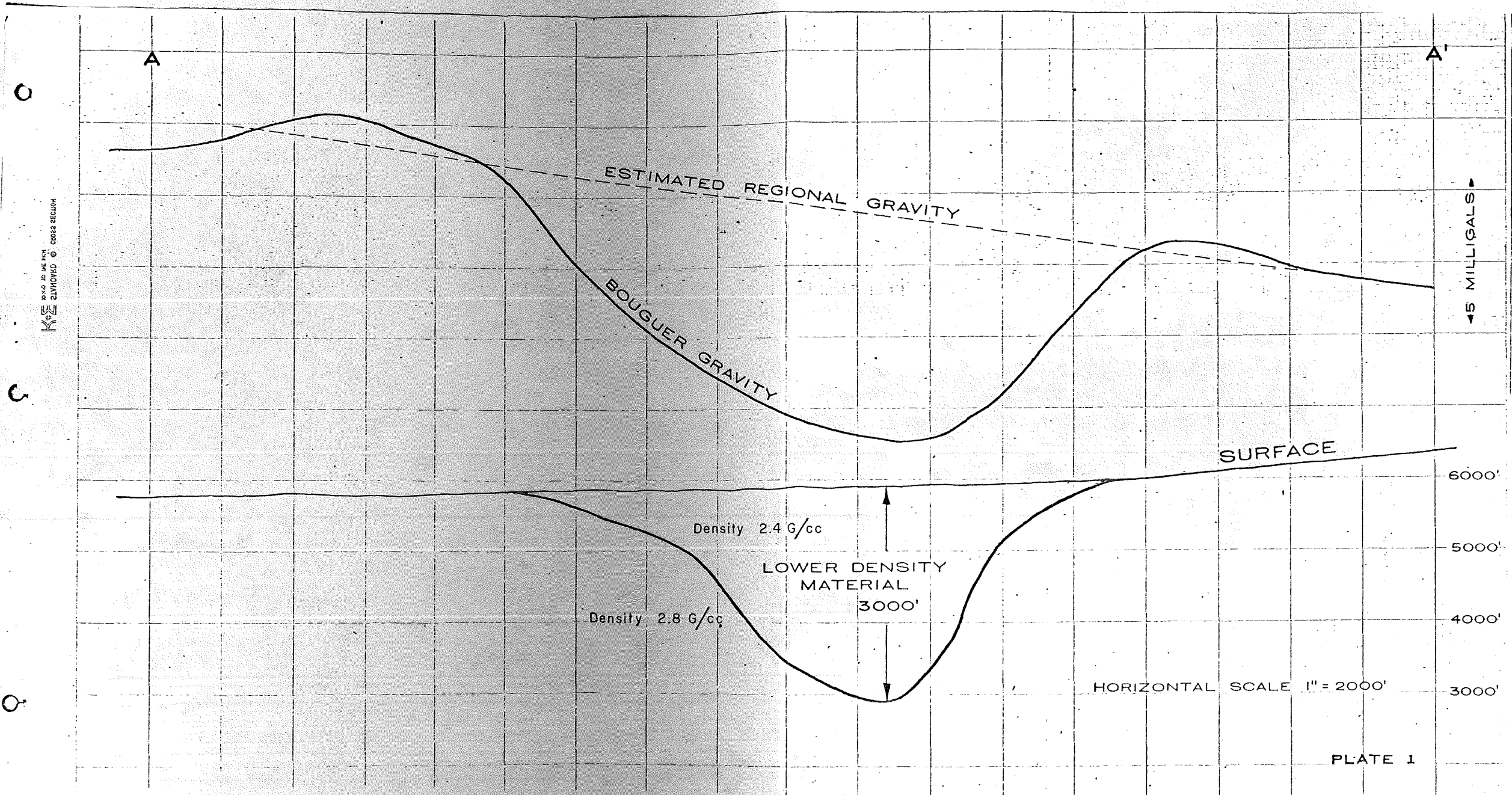
Cenozoic sediments, volcanics and interpreted intrusives apparently do not cause discrete gravity anomalies with this coverage. This indicates that generally, their densities are fairly uniform. Therefore, the gravity should reveal primarily the configuration at the base of Cenozoic sediments and volcanics. The thickest accumulations of these rocks should occur in the interpreted structural trough as revealed by the regional gravity minimum trending north-south through Cove Fort. The gravity minimum is marked with a blue synclinal symbol.

A structure profile (Plate 1) was calculated from the gravity anomaly along A-A' (encl. 1) across the regional minimum. A density contrast of 0.4 g/cc was assumed.

Skeels method.(1963) yielded a thickness of 3600' which is considered as good agreement.

Only general characteristics of the interpreted trough can be inferred from gravity with such^a wide station spacing. Gradual shallowing is indicated north from A-A' with the low density body ending at Sec.6, T25S-R6W. South of A-A' contours indicate the trough deepens and has a lower angle east from Sulphurdale south while the west flank becomes very low angle and extends over T26S-R7W.

A north-south trending gravity minimum is present at the west edge of the survey. Cenozoic rocks along this trend are most likely the thinnest at the northeast quarter of T25S-R8W, with thickening to the north and south.



U.S. GEOLOGICAL SURVEY
DIVISION OF GEOPHYSICS
WASHINGTON, D.C. 20508

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PLATE 1

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CONCLUSIONS

Gravity features appear correlative with Paleozoic and Mesozoic structure in outcrop and should provide reliable indications to subsurface structure. Cenozoic sedimentary, volcanic and intrusive rocks may have nearly the same densities which precludes distinguishing between them using our present gravity. Precision detailed coverage might disprove this observation which is based only on reconnaissance data.

Respectfully submitted,

Joe W. Shiner

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JWS:jml

Attachments

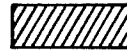
BIBLIOGRAPHY

- K. P. Fournier and S. F. Krupicka, April, 1974. "A new Approximate Method For Directly Interpreting Gravity Anomaly Profiles Caused By Surface Geologic Structures". Company Files.
- D. C. Skeels, April, 1963. "An Approximate Solution of the Problem of Maximum Depth in Gravity Interpretation". Geophysics, Vol. XXVIII, No. 5, Part I, pp. 724-735.

UTAH

IDAHO

GRAVITY SURVEY
LOCATION MAP

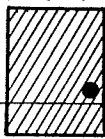


WYOMING

NEVADA

COLORADO

COVE FORT
SURVEY AREA



COVE FORT

ARIZONA

SCALE IN MILES

0 5 10 20 30 40

(1) C. .4) Gravity Measurements

Enclosed is a printout of the basic gravity data compiled for the Cove Fort area. This data includes: station number, latitude, longitude, elevation, observed gravity and Bouguer gravity anomaly values. Also listed are the latitude, curvature of the earth, free air and Bouguer corrections. The station and map numbers in the last two columns of the tabulations refer to the stations located on the original report survey map. The map numbers correspond with an author-index printout of references of non-Union gravity data recorded in the Cove Fort area. This gravity report, therefore, is a composite of Union Oil Company measurements (indicated as map #1) and other agency's data.

Types of elevation control for specific stations may be found in the original sources used for non-Union data. Union's elevation control was based on elevations obtained from a U.S. Geological Survey 1:24,000 scale, 7" topographic quadrangle map with 40' contour intervals. Measurements were read to 1 foot values, however, it is estimated that the gravity value accuracy is less than 5 feet.

Drift corrections are internal in the computer software, and therefore, are not listed in the printout. This value is incorporated into the "observed gravity" values.

Terrain corrections were calculated for Union's survey and are available through zone H, however, because most stations had less than 1 milligal of terrain correction, no overall terrain correction was applied at all to the entire composite.

Item (1)C. .4)

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Union's gravity measurements were taken with a WORDEN 808 gravimeter, supplied by United Geophysical Company, during August and October, 1974.