MAP
UTAH
Sanpete Co.

GL01537

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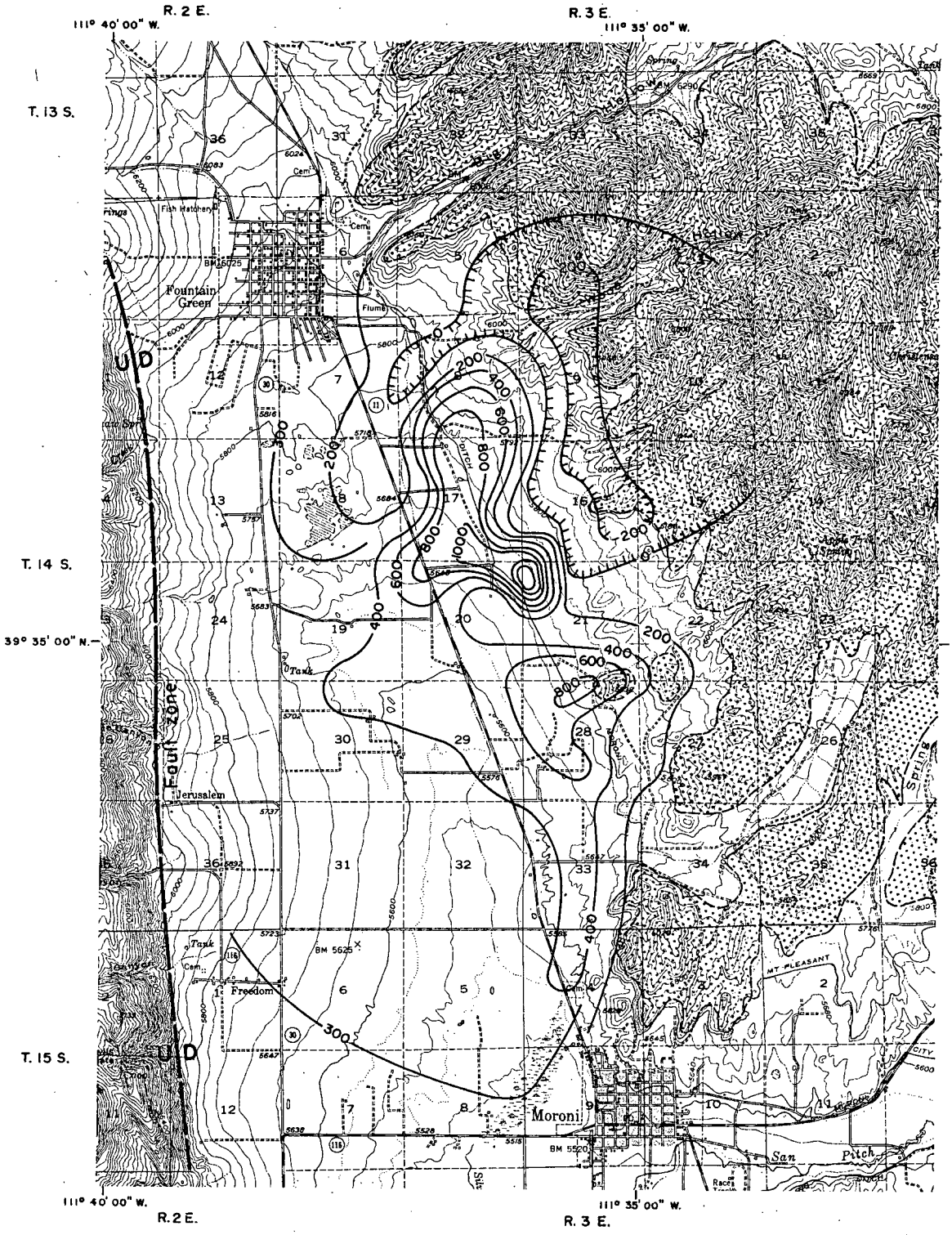
MAP 28



EXPLANATION

200 0 -200

MAGNETIC VERTICAL INTENSITY
Hachured contours indicate low magnetic intensity.

D
U

FAULT
Dashed where approximately located, U, upthrown side; D,downthrown side

VOLCANICS

0 1 2 3 Miles
SCALE

TOPOGRAPHIC CONTOUR INTERVAL 40 FEET.
MAGNETIC CONTOUR INTERVAL 200 GAMMAS.

Base map; USGS 15 minute quadrangle, Moroni, Utah. 1:62,500 1951.

Geology from Hintze, 1962

16°
TRUE NORTH
MAGNETIC NORTH

GROUND MAGNETIC SURVEY
FOUNTAIN GREEN – MORONI AREA
SANPETE COUNTY, UTAH
–1969–

UG & MS file no. 1165-A

GROUND MAGNETIC SURVEY OF THE FOUNTAIN GREEN-MORONI AREA, SANPETE COUNTY, UTAH, 1969

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Introduction

An aeromagnetic survey of north-central Utah by the U.S. Geological Survey (Mabey, 1964) shows two anomalies over alluvium in the upper Sanpete Valley near Fountain Green. Suggested causes are either a great thickness of volcanic material or an intrusive body. In May 1969 the magnetic exploration class of the University of Utah performed a ground magnetic survey to outline the southern anomaly in detail. The resulting map and interpretation are presented here.

Survey

Fifty-seven stations were occupied in an area of 30 square miles, with greater station density in regions of steeper magnetic gradient. All fieldwork and data reduction were performed by nine geophysics students as course work in magnetic exploration under R.T. Shuey. Three different vertical field balances were used. Repeated occupation of several base stations allowed correlation of readings from different instruments and correction for geomagnetic diurnal variation. Data were corrected for regional gradient of the geomagnetic main field, which at the survey locality is 12 gamma/mile N. 25° E., according to USC & GS Chart 3077.

The interpretation given below is the responsibility of R.T. Shuey but draws upon interpretations submitted by individual students.

Geologic Setting

To the west of the survey area the Gunnison Plateau rises precipitously 3,000 feet above the valley floor. The scarp presumably is the result of Cenozoic block faulting, and a displacement of 5,000 feet has been derived by correlation of the Jurassic-Cretaceous sedimentary sequence between the plateau top and a 10,000-ft dry well 1 mile south of Moroni (Hintze, 1962).

To the east the Cedar Hills consist of 2,000 ft of mildly folded and block-faulted volcanics, the lower part stream-deposited and the upper part welded tuff. These rest on Eocene sediments, although the contact is not exposed on the western face of the hills. Study of the surface exposures and the well log data do not indicate a major boundary fault on the east side of the valley.

About 12 miles west of the survey area, on the west face of the Gunnison Plateau near Levan, are several small monzonite porphyry intrusions considered to be Eocene-Miocene. At least one of these is in contact with a magnetite replacement body in limestone. The magnetic effect of these intrusions is marginally discernible on the regional aeromagnetic survey (Mabey, 1964).

Interpretation

The anomaly, an elongate row of magnetic highs, occupies the valley between State Highway 11 and Cedar Hills. Magnetic gradients are steeper on the northeast side than on the southwest side, but this may be more the effect of inclined magnetization than of body shape.

Depth-to-source analysis indicates that while the main body could be as deep as 2,300 ft, the source of the sharp central peak is within 1,300 ft of the surface. This latter estimate could be refined by a more detailed survey of the one square mile covered by this peak.

Estimates of magnetic susceptibility for the main anomaly and for the sharp peak gave .01-.03 (cgs). This corresponds to 2-8 percent magnetite and is significantly large. Measurements on a few hand samples from the Cedar Hills indicated the susceptibilities of the welded tuffs are .0005-.001 and those of the stream deposits less. A concentration of volcanics is thus unlikely to be the main cause of the magnetic anomaly. It should further be noted that the anomaly is not near the mouth of any of the principal washes draining the Cedar Hills.

The hypothesis of an elongate intrusive body is consistent with the geologic and magnetic data. Magnetic studies at East Tintic (Mabey and Morris, 1967) and Iron Springs (Blank and Mackin, 1967) were interpreted with an effective susceptibility of close to .004 for unaltered monzonite porphyry. Since this is somewhat less than the susceptibility estimate given above, some mineralization is possible here.

Blank, H.R. and J.H. Mackin, 1967, Geologic interpretation of an aeromagnetic survey of the Iron Springs district, Utah: U.S. Geol. Survey Prof. Paper 516-B.

Hintze, L.F., ed., 1962, Geology of the southern Wasatch Mountains and vicinity, Utah: BYU Geology Studies, v. 9)1), p. 78 and 101.

Mabey, D.R., et al, 1964, Aeromagnetic and generalized geologic map of part of north-central Utah: U.S. Geol. Survey Map GP-422.

_____ and H.T. Morris, 1967, Geologic interpretation of gravity and aeromagnetic maps of Tintic Valley and adjacent areas, Tooele and Juab Counties, Utah: U.S. Geol. Survey Prof. Paper 516-D.

SANPETE

TOTAL ALL WELLS — 8

" ANOMALOUS " — 1

See	T	R	d	BHT	GRAD.	AMB.
18	15S	6E	818m	38.9°	37	8.9°C

SANPETE Co

PI

No		
✓101	○	?
✓106	○	

UGMS

No		
✓1	△	
✓2	○	
✓3	△	36.6 °C/km
✓4	○	
✓5	○	
✓6	○	

47 0780

SANPETE COUNTY, UTAH

70° 80° 90° 100° 110° 120° 130° 140° 150°

47 0780

SANPETE COUNTY, UTAH

70° 80° 90° 100° 110° 120° 130° 140° 150°

47 0780

SANPETE COUNTY, UTAH

170° 180° 190° 200°

SANPETE COUNTY, UTAH