UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Principal Facts for 125 Gravity Stations in and around the Goshute Mountains-Toano Range, Elko County, Nevada

by

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Abstract

This report contains complete descriptions of 125 gravity stations located to the west of Wendover, Utah in the Goshute-Toano Range, Elko County, Nevada. The stations were established in June, 1985, as part of a USGS/BLM wilderness appraisal study. Included in this report are procedures and equipment used, base station descriptions, accuracy estimates, and listings of reduced Bouguer anomaly and Airy isostatic residual anomaly values.

Introduction

The 125 stations described in this report were established by the authors in and around the Goshute Mountains-Toano Range, Nevada (see figure 1). These data were collected for a mineral survey report on two BLM wilderness study areas: Blue Bells and Goshute Peak, Nevada. These data will also become part of the "Complete Bouguer Gravity Map of Nevada - Elko Sheet" to be published by the Nevada Bureau of Mines and Geology.

The Gravity Survey

The gravity stations described in this report were established between June 6 and June 20, 1985. The areal extent of the survey is shown in figure 1. The stations are located in the Toano Range and the Goshute Mountains as well as the adjoining Steptoe, Antelope, and Goshute valleys.

The primary base for this survey was to have been ACIC base number 4646-1 (Jablonsky, 1974) in Wendover, Utah. However, the original base has been destroyed. A new location was established near the old base (see base station descriptions). This base was checked relative to the ACIC Ely base number 0390-2. In addition, five secondary bases were established and tied to the Wendover base.

The gravity stations were located mainly at bench marks or on labeled elevations on USGS 1:24,000 scale maps. Elevations for a few stations were estimated using two altimeters. The station accuracy code indicates the method of elevation control (table 2).

The stations were established on single day traverses involving driving and hiking. Each traverse began and ended at a primary or secondary base station.

LaCoste and Romberg gravity meters G17 and G614 were used for this survey.

Reduction Procedures

Observed gravity was obtained from the gravity meter readings using the calibration constants provided by the manufacturer as well as secondary factors established by the USGS. The secondary calibration factors used were 1.0025 for G17 and 1.00038 for G614. These values were then adjusted to the base station value assuming a linear drift between the first and last reading of each day.

The base datum is the International Gravity Standardization Network of 1971 (Morelli, 1974). Bouguer gravity anomalies were computed using the 1967 Geodetic Reference System formula for theoretical gravity at sea level (International Association of Geodesy, 1971) as implemented on a computer (Cordell and others, 1982). A Bouguer reduction density of 2.67 g/cm^3 was used. Terrain corrections were calculated for the region extending radially to 167 km from each station using a digital elevation model based on a 15 second geographic grid (Plouff, 1977). Inner zone terrain corrections from the station to a distance of 63 meters (Hayford-Bowie zones A and B of Swick, 1942) were estimated in the field using tables based on slope, cone, and broken-slope elevation models. Terrain corrections for the radial area between 63 m and 590 m (Hayford-Bowie zones C and D) were calculated using templates and 1:24,000 scale topographic maps for stations in areas of high local relief. A curvature correction for the deviation of the spheroidal earth from the Bouguer approximation has also been added.

As the final step to the reduction process, a broad regional based on the gravitational effect of Airy isostatic roots (Simpson and others, 1983) was removed from the data. The resultant isostatic residual anomaly emphasizes the gravity effects of density distribution in the upper crust (Simpson and others, 1986). For the Airy isostatic model we assumed a sea level crustal thickness of 25 km, a surface load density of 2.67 g/cm^3, and a density contrast at depth of 0.4 g/cm^3

Accuracy Estimation

There are three potential sources of error for the reduced gravity values reported here:

1. Error in observed gravity
2. Elevation inaccuracy
3. Error in terrain correction

Imprecision in the observed gravity values may be due to operator error (mis-reading, meter not level), or mechanical problems with the meter itself, either continuous (drift), or catastrophic (tare, thermostat failure, electrical malfunction). Systematic error in the observed gravity values is dependent on the accuracy of the primary base station, WEND, relative to IGSN 71. This station is located near the old ACIC base Wendover (#4646-1), which had a reported accuracy of ±0.1 mGal. The observed gravity for WEND is based on two ties to ACIC station #0390-2 in Ely, Nevada (IGSN 71 observed gravity value 979480.08). The new base is assumed accurate to within ±0.3 mGal.

Imprecision due to operator error or catastrophic mechanical failure is taken to be negligible for this survey. Imprecision due to mechanical drift can be estimated from the base station closures made each day. The maximum daily drift for this survey was 0.07 mGal. This corresponds to a linear drift of approximately 0.01 mGal/hour. The imprecision is the difference between the true drift and the linear drift model. We estimate this to be at most equal to the value of the drift itself. If the worst deviation occurs at the midpoint in time between the two base readings, we estimate a maximum imprecision for observed gravity values to be 0.04 mGal.

Elevation inaccuracies effect the reduction of observed gravity to simple Bouguer gravity. An elevation factor equal to approximately .06 mGal/foot (.19 mGal/m) is applied by the combination of the free air and Bouguer corrections. Benchmark elevations are assumed accurate to within 1 ft, topographic spot elevations are assumed to be accurate to within 5 ft, and altimetry estimates made for this survey are assumed accurate to within 20 ft, or 50% of the difference between control elevations, whichever is less. This elevation imprecision causes from less than ±0.06 to ±1.2 mGal of uncertainty, depending on the station elevation control.

The effect of latitude inaccuracy on the precision of results is assumed to be negligible.

The error in terrain correction is potentially the biggest source of error in the final results. These errors may be systematic to the survey due to a regional deviation of the topographic model from actual topography. This systematic error is difficult to estimate, but is probably less than 10% of the outer zone corrections. Inner zone terrain corrections for stations in areas of high relief can be very imprecise. We assume that the inner zone terrain corrections estimated for this survey are accurate to within 30%.

The survey is assumed to have a systemmatic error in observed gravity of less than ±1 mGal relative to IGSN 71. The overall precision of the complete Bouguer anomalies is less than ±2 mGal. However, the imprecision of individual stations with large inner zone terrain corrections may be as large as ±5 mGal.

Acknowledgements

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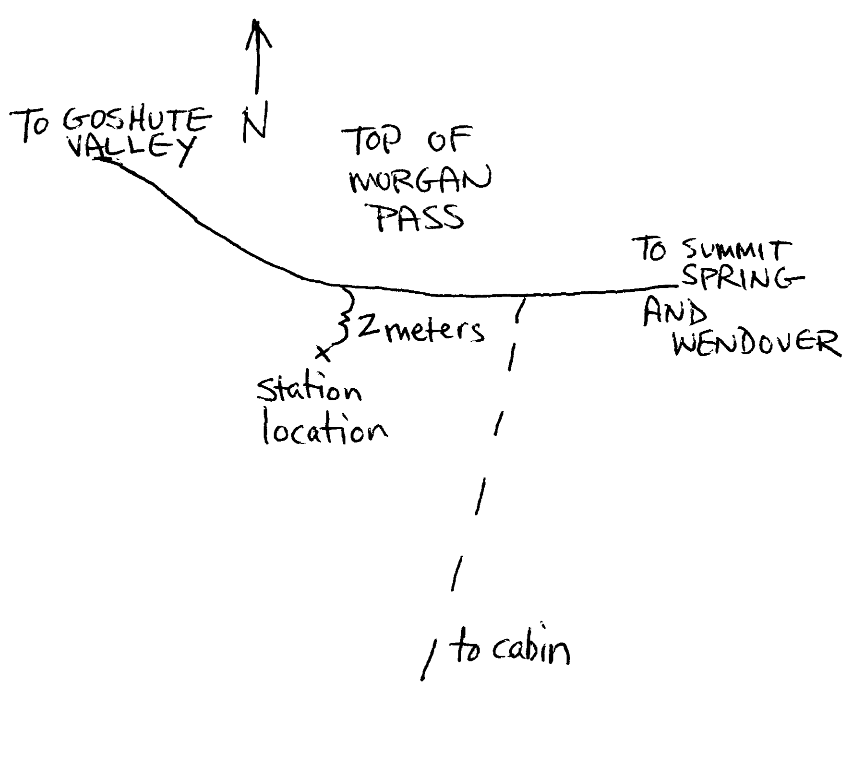
Local **GRAVITY BASE STATION**
U.S. GEOLOGICAL SURVEY

STATE/COUNTRY	STATION DESIGNATION	OBSERVED GRAVITY
Nevada	GP01	979610.11 (IGSN 71)
NEAREST TOWN	**LONGITUDE**	**LATITUDE**
Wendover, Utah	114°16.91'W.	40°37.85'N.
ELEVATION	**TOPOGRAPHIC MAP(S)**	
2228.1 m (7310 ft)	Elko 1° x 2°, Morgan Pass 1:24,000	

DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
6/85	Saltus	G17&G614	Wendover	979824.91 ±.3

DESCRIPTION/SKETCH

This station is located at the top of Morgan Pass on the road separating the Toano Range from the Goshute Mountains. The station was read to the south of the road at its highest point, about 2 meters from the roadway. This station will be impossible to relocate exactly.



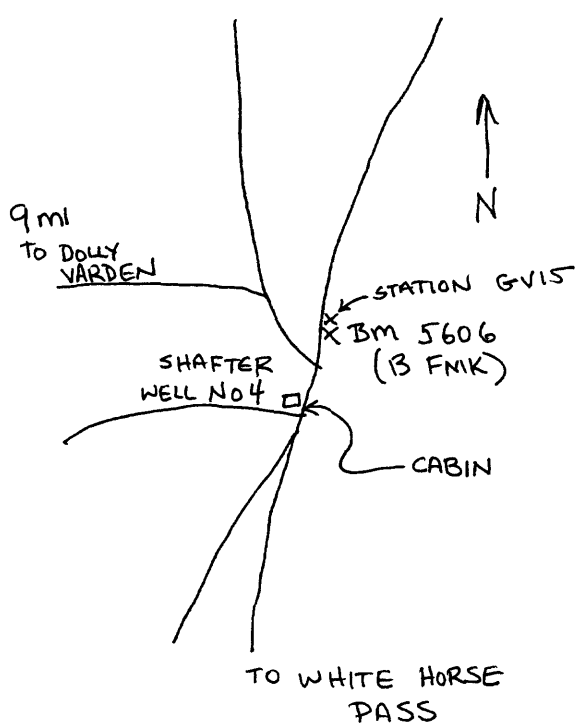
GRAVITY BASE STATION
U.S. GEOLOGICAL SURVEY

STATE/COUNTRY	STATION DESIGNATION	OBSERVED GRAVITY
Nevada	GV15	979686.47 (IGSN 71)
NEAREST TOWN	LONGITUDE	LATITUDE
Wendover, Utah	114°22.29'W.	40°31.00'N.
ELEVATION	TOPOGRAPHIC MAP(S)	
1708.7 m (5606 ft)	Elko 1° x 2°, Lion Spring 1:24,000	

DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
6/85	Saltus	G17&G614	Wendover	979824.91 ± .3

DESCRIPTION/SKETCH

Located at benchmark labeled 13 FMK near Shafter well number 4. The meter was read on the ground directly to the north of the benchmark, with the baseplate touching the benchmark.



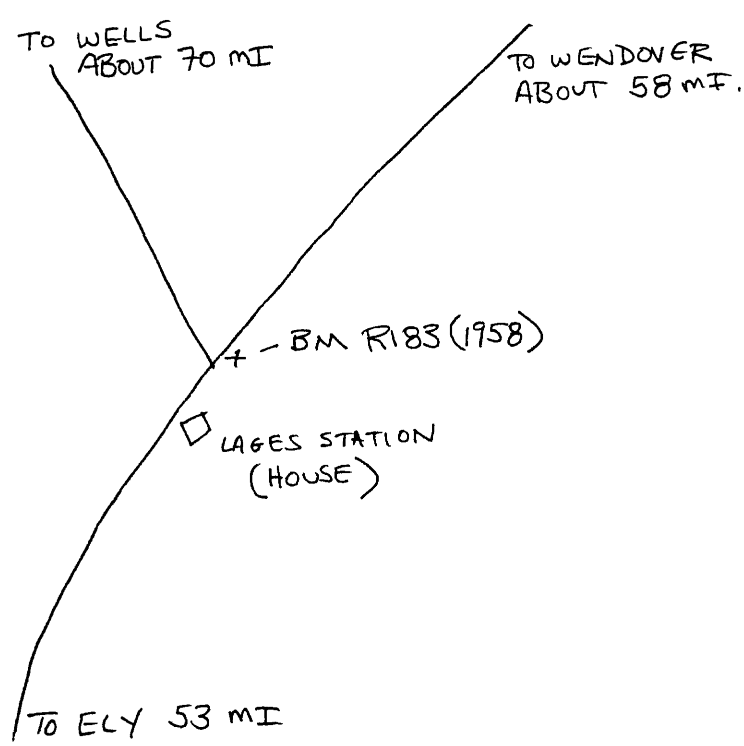
GRAVITY BASE STATION
U.S. GEOLOGICAL SURVEY

STATE/COUNTRY	STATION DESIGNATION	OBSERVED GRAVITY
Nevada	LAGE	979606.63 (IGSN 71)
NEAREST TOWN	**LONGITUDE**	**LATITUDE**
Wendover, UT; Ely, NV	114°37.05'W.	40°03.46'N.
ELEVATION	**TOPOGRAPHIC MAP(S)**	
1820.0 m (5971.0 ft)	Elko 1° x 2°, Lages Station 1:24,000	

DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
6/7/85	Saltus	G17	Wendover	979824.91

DESCRIPTION/SKETCH

The station is located on top of USC and GS benchmark R183 (1958) at southeast side of the Y-intersection of state highways ALT 50 and 93 halfway between Wendover, Utah and Ely, Nevada. The base plate is placed directly on the benchmark, about 5 inches above the ground.



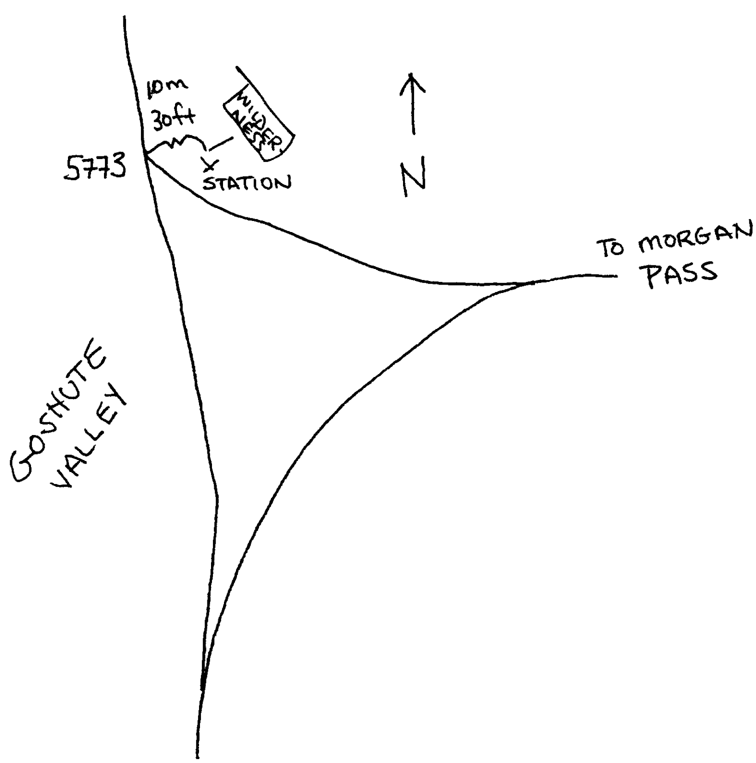
GRAVITY BASE STATION
U.S. GEOLOGICAL SURVEY

STATE/COUNTRY	STATION DESIGNATION	OBSERVED GRAVITY
Nevada	MORG	979701.16 (IGSN 71)
NEAREST TOWN	LONGITUDE	LATITUDE
Wendover, Utah	114°20.65'W.	40°38.25'N.
ELEVATION	TOPOGRAPHIC MAP(S)	
1760.2 m (5775.0 ft)	Elko 1° x 2°, Morgan Pass 1:24,000	

DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
6/7/85	Saltus	G17	Wendover	979824.91
6/7/85	Saltus	G614	Wendover	979824.91

DESCRIPTION/SKETCH

The station is located to the northeast of the northernmost intersection of the Morgan Pass road with the highest road skirting the eastern edge of Goshute Valley. In June, 1985, the location was 1 ft south of a BLM "Wilderness Study Area" sign. The station is approximately 30 ft E of and 2 ft above the center of the road intersection marked 5773



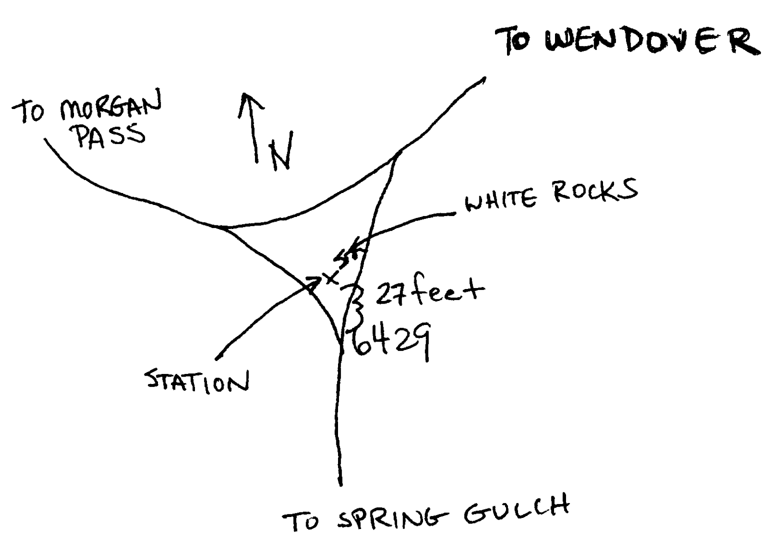
GRAVITY BASE STATION
U.S. GEOLOGICAL SURVEY

STATE/COUNTRY	STATION DESIGNATION	OBSERVED GRAVITY
Nevada	MUDS (MP08)	979662.13 (IGSN 71)
NEAREST TOWN	LONGITUDE	LATITUDE
Wendover, Utah	$114^{o}14.78$'W.	$40^{o}37.72$'N.
ELEVATION	TOPOGRAPHIC MAP(S)	
1959.6 m (6429 ft)	Elko 1^{o} x 2^{o}, Ola 1:24,000	

DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
6/85	Saltus	G17&G614	Wendover	979824.91

DESCRIPTION/SKETCH

The station is located at the southeast corner of the second triangle intersection to the east of Morgan Pass. This intersection is about 3/4 mile south of Mud Spring. The station is 1 ft SW of some whitewashed boulders in the center of the triangular intersection island. The station is about 27 feet north of the center of the intersection marked 6429.



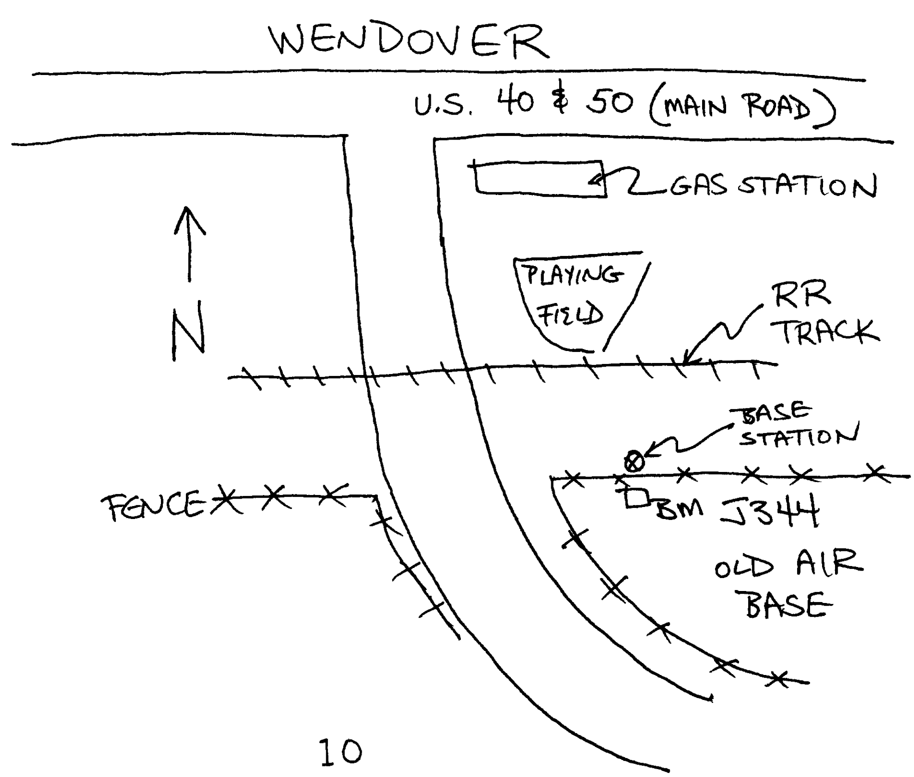
GRAVITY BASE STATION
U.S. GEOLOGICAL SURVEY

STATE/COUNTRY	STATION DESIGNATION	OBSERVED GRAVITY
Utah	Wend	979824.91 (IGSN 71)
NEAREST TOWN	LONGITUDE	LATITUDE
Wendover, Utah	114°01.8'W.	40°44.1'N.
ELEVATION	TOPOGRAPHIC MAP(S)	
1296.1 m (4252.25 ft)	Elko 1° x 2°, Wendover 1:24,000	

DATE	OBSERVER	METER	REFERENCE STATION	REFERENCE VALUE
6/14/85	Saltus	G17	Elya ACIC 0390-2	979480.08

DESCRIPTION/SKETCH

This station was established on 6/7/85 when it was discovered that original ACIC station 4646-1 had been destroyed.
The station is located near USC and GS benchmark "J334 1945", which is set in a low concrete post near the entrance to old Wendover Air Force Base (abandoned) in the southern part of Wendover, Utah. The benchmark itself is located just inside the perimeter fence of the air base. The station is located on the ground directly outside the fence from the benchmark (about 2 ft from the benchmark). In June, 1985, the exact location of the station was marked by a piece of flat steel held in place by old railroad spikes.



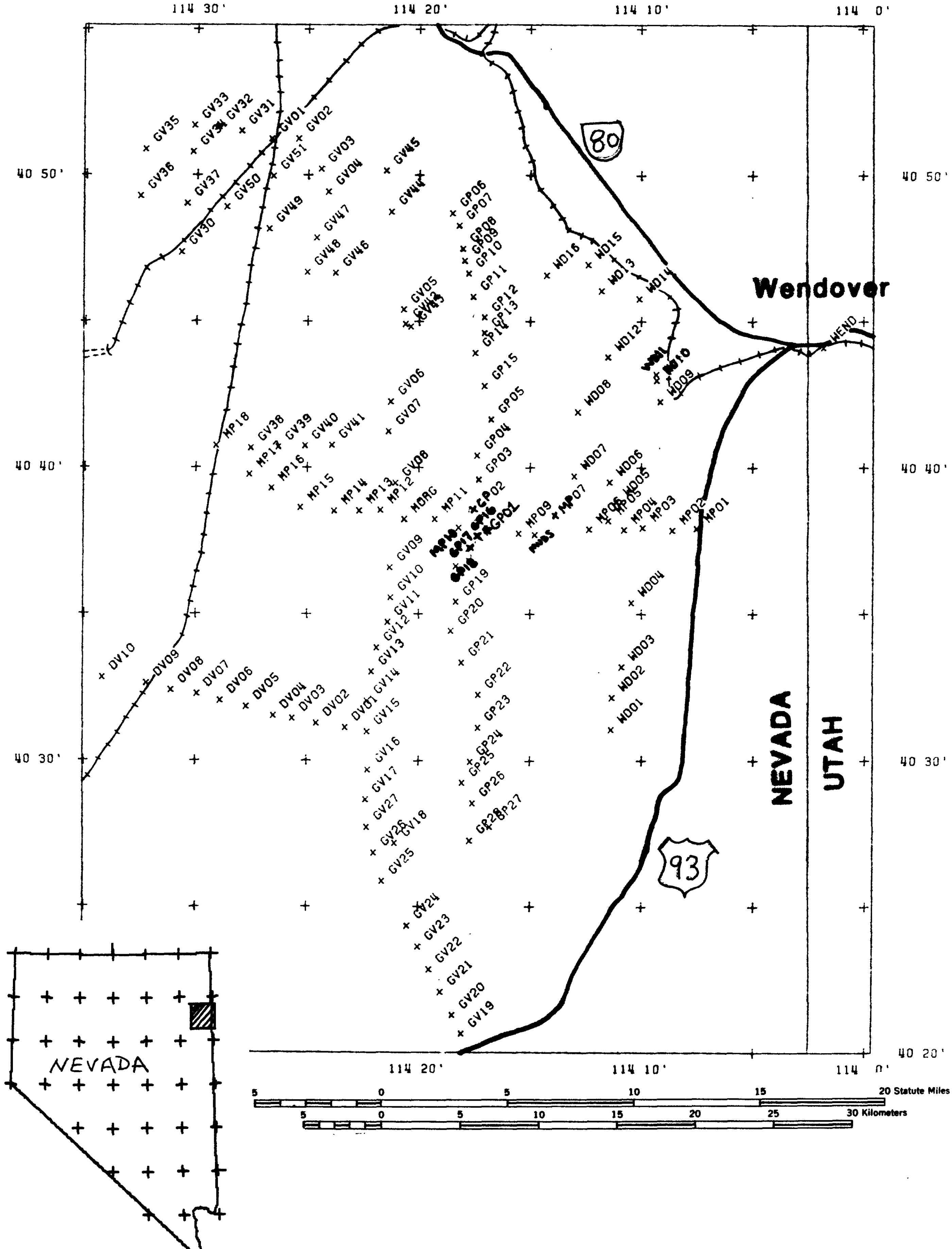


Figure 1.--Index Map of Gravity Station Locations

Table 1.--Data Format

Explanation of Columns in the Principal Facts Table

Sta	Station Identification GP = Goshute Peak north-south profile MP = Morgan Pass east-west profile DV = Dolly Varden line in Steptoe Valley GV = Goshute Valley stations WD = Stations on the Wendover side of the range
Latitude and Longitude	In degrees and decimal minutes, digitized by computer from 1:24,000 scale maps.
Elevation	In feet, accuracy code indicates source.
ACC	One letter and three digits indicating elevation, location, and observed gravity accuracy (see table 2 for explanation).

The remaining columns contain gravity values in milligals (mGal) to the nearest hundredth.

Observed gravity	Relative to the IGSN-71 datum.
FA	Free air anomaly.
Near	Inner zone terrain correction calculated to a distance of 590 m using cylindrical ring templates (when followed by an "H") or estimated using 15 second digital data.
TC	Near plus digital terrain correction out to 166.7 km calculated using a 15 second digital terrain model.
CBA	Complete Bouguer anomaly for crustal density of 2.67 g/cm^3.
ISO	Isostatic residual anomaly. Based on an Airy compensation model with a 25 km depth to Moho at sea level, a density contrast of 0.4 g/cm^3 at depth, and a topographic load density of 2.67 g/cm^3.

Table 2.--Accuracy Codes used in this Report

GENERAL LOCATION CODE (1st digit)
(vertical and horizontal)

Code	Station Location Method (vertical and horizontal)
	A) Survey Marks (vertical) - Topographic Maps (horizontal)
	1) Base plate directly on bench mark.
B	a) USGS or USC&GS level-line bench mark.
M	b) Level line bench marks other than a) such as USCE, BPR, CDH, private companies, etc.
V	c) VABM (Vertical angle bench marks).
	2) Base plate near bench mark.
N	a) USGS or USC&GS level-line bench mark.
E	b) Level-line bench marks other than a) such as USCE, BPR.
H	c) VABM (Vertical angle bench marks).
P	3) Base plate on or near other reference marks (such as stakes, paint, etc.) that have been surveyed by the group doing the gravity survey or other known people.
X	4) On or near Section Corners, 1/4 section marks, 1/8 section markers, and other property boundary markers.
D	5) Destroyed or not found bench or reference marks.
	B) Topographic Map Locations (vertical and horizontal)
F	1) Black spot elevations - field checked.
G	2) Brown spot elevations and elevations taken off original manuscripts - not field checked.
W	3) Blue lake elevations.
R	4) Lake or reservoir elevations determined from leveling to bench marks, and water level is determined from gauging stations.
S	5) Sea level elevations.
C	6) Contour line interpolation.
Q	7) River gradient interpolation.
	C) Air Photographs (vertical and horizontal)
T	1) Elevations determined by U.S. Geological Survey Topographic Division by Kelsh plotter or least squares computer system.
K	2) Elevations determined by other groups by Kelsh plotter or least squares computer system.
L	3) Elevations determined by Laser methods.
J	4) Elevations determined by other methods.
	D) Altimetry (vertical) - Topographic Maps (horizontal)
A	1) Good control (Leap frog, double loop, two or more altimeters, etc.).
Y	2) Poor control.
	E) Special Sources
Z	1) Elevations determined by methods such as mobile elevation recorders - horizontal control from Topo Maps.
I	2) Other special sources.
	F) Unknown Elevation Sources
U	1) Elevation data sources unknown (this would include reference marks with unknown ties).

Table 2.--(cont.) ELEVATION ACCURACY CODE (2nd digit)
(relative to 1929 USC & GS mean sea level datum)

Code	Elevation Accuracy	Typical Types of Elevation Data	Approx. Gravity Effect
	(ft)		(mGal)
1	0.2	On leveled bench marks	0.01
2	1/3	Beside bench marks	0.02
3	1	Transit and good alidade surveys	0.05
4	2	VABM's and most black map elevations	0.1
5	4	Black elevations on old maps, good photogrammetry	0.2
6	10	Brown elevations and normal photogrammetry on 20 ft contour interval maps	0.5
7	20	Brown elevations on 80 ft contour interval maps, good altimetry	1.0
8	40	Contour interpolation data from 50 ft contour-interval map	2.0
9	80	Poor altimetry; data from 200 ft contour-interval maps	5.0
0	>80	Altimetry in very bad weather or equipment failures	>5.0

LATITUDE ACCURACY CODE (3rd digit)
(Lat gravity effect based on mean value of 1.45 mGal/min at Lat 37°)

Code	Lat Accuracy	Equivalent Distance Accuracy	Typical Map Measurement Requirements in inches	Lat Gravity Effect
	(min)	(ft)		(mGal)
1	.0075	42	Triangulation or special survey data	0.01
2	.02	84	0.04 (1:24,000) map with special location care	0.02
3	.04	210	0.10 (1:24,000) normal survey; 0.04 (1:62,500) map	0.05
4	.07	420	0.21 (1:24,000) map; 0.08 (1:62,500) normal survey	0.1
5	.14	840	0.42 (1:24,000) map; 0.16 (1:62,500) map	0.2
6	.35	2,100	0.4 (1:62,500) map; 0.1 (1:250,000) map	0.5
7	.70	4,200	0.8 (1:62,500) map; 0.2 (1:250,000) map	1.0
8	1.4	8,400	1.6 (1:62,500) map; 0.4 (1:250,000) map	2.0
9	3.40			5.0
0	>3.40			>5.0

OBSERVED GRAVITY ACCURACY (4th digit)
(relative to local base)

Code	Observed Gravity Accuracy	Suggested Types of Gravity Measurements
	mGal	
1	0.01	Local surveys with special meters
2	0.02	Multiple readings with LaCoste and Romberg meters
3	0.05	Average LaCoste and Romberg, and Multiple Worden gravity data
4	0.1	LaCoste and Romberg gravity data with small vibrations. Most USGS Worden gravity meter data
5	0.2	Gravity data from loops with closure errors this large
6	0.5	" " " " " " " " "
7	1.0	" " " " " " " " "
8	2.0	" " " " " " " " "
9	5.0	" " " " " " " " "
0	>5.0	" " " " " " " " "

Table 3.--Principal facts for 125 gravity stations in the Goshute-Toano Range, Nevada

Base datum IGSN-71
GRS 1967 formula for theoretical gravity
Bouguer reduction density 2.67 g/cc

Sta	Latitude deg min	Longitude deg min	Elev. feet	Observed gravity	ACC	FA	Near	TC	CBA	Iso
GP01	40 37.85	114 16.91	7310.0	979610.11	A732	72.05	0.58H	5.51	-173.28	12.13
GP02	40 38.44	114 17.61	7574.0	979590.03	F433	75.89	3.34H	10.62	-173.32	12.39
GP03	40 39.59	114 17.30	8698.0	979505.15	V433	94.89	6.16H	28.78	-174.39	10.95
GP04	40 40.41	114 17.38	8107.0	979555.01	F433	88.01	3.21H	15.61	-174.34	10.97
GP05	40 41.65	114 16.75	7875.0	979575.10	F433	84.45	3.47H	13.60	-172.02	12.82
GP06	40 48.71	114 18.50	7003.0	979648.34	F433	65.24	2.32H	6.74	-168.39	17.06
GP07	40 48.28	114 18.20	7196.0	979636.65	F433	72.32	1.62H	6.74	-167.88	17.41
GP08	40 47.49	114 18.03	7618.0	979606.44	F433	82.95	2.33H	10.82	-167.56	17.63
GP09	40 47.08	114 17.95	7744.0	979595.89	F433	84.84	2.64H	12.78	-167.99	17.16
GP10	40 46.64	114 17.77	7717.0	979595.20	F433	82.27	3.41H	13.31	-169.11	15.96
GP11	40 45.85	114 17.55	7674.0	979598.43	F433	82.64	4.46H	13.46	-167.13	17.86
GP12	40 45.14	114 17.06	7822.0	979585.87	F433	85.04	3.81H	14.41	-168.82	15.93
GP13	40 44.60	114 17.05	7801.0	979588.64	F433	86.64	3.15H	12.12	-168.79	15.99
GP14	40 43.91	114 17.47	7790.0	979588.68	F433	86.68	1.83H	9.99	-170.51	14.54
GP15	40 42.78	114 17.05	7672.0	979593.12	F433	81.72	2.60H	10.01	-171.44	13.48
GP16	40 37.67	114 17.37	8018.0	979555.08	F433	83.80	4.61	17.74	-173.40	12.26
GP17	40 37.27	114 17.71	8158.0	979544.92	F433	87.40	4.37H	19.40	-172.91	12.99
GP18	40 36.63	114 18.33	8316.0	979529.65	F433	87.92	5.68H	23.44	-173.71	12.63
GP19	40 35.42	114 18.32	8693.0	979500.53	F433	96.02	6.74H	28.73	-173.15	13.35
GP20	40 34.42	114 18.55	8842.0	979489.54	F433	100.51	3.18H	27.01	-175.43	11.37
GP21	40 33.34	114 18.06	7990.0	979555.92	F433	88.46	1.23H	10.58	-174.94	11.83
GP22	40 32.24	114 17.31	8144.0	979543.70	F433	92.35	2.86H	13.30	-173.57	12.99
GP23	40 31.13	114 17.33	8976.0	979479.42	F433	107.88	3.80H	24.98	-174.65	12.11
GP24	40 29.96	114 17.68	9609.0	979431.18	V433	120.84	5.58H	34.97	-173.18	13.99
GP25	40 29.24	114 18.03	9016.0	979476.39	F433	111.42	5.28H	24.79	-172.65	14.92
GP26	40 28.54	114 17.56	8241.0	979532.45	F433	95.73	4.03H	14.99	-171.81	15.72
GP27	40 27.73	114 16.78	8281.0	979528.00	F433	96.24	3.81H	15.21	-172.44	14.86
GP28	40 27.27	114 17.69	7956.0	979546.22	F433	84.61	4.18H	14.37	-173.85	14.09
MP01	40 37.93	114 7.51	4640.0	979765.89	N233	-23.21	0.01H	0.55	-182.28	-2.71
MP02	40 37.87	114 8.60	4735.0	979762.22	A733	-17.86	1.16H	1.89	-178.85	1.45
MP03	40 37.96	114 9.93	4932.0	979752.24	A733	-9.46	0.05H	1.06	-178.02	3.13
MP04	40 37.89	114 10.78	5172.0	979741.89	F433	2.85	0.06H	1.34	-173.64	8.06
MP05	40 38.20	114 11.48	5352.0	979728.06	F433	5.48	0.07H	1.51	-177.00	5.10
MP06	40 37.91	114 12.33	5615.0	979713.32	F433	15.89	0.12H	1.90	-175.19	7.49
MP07	40 38.33	114 13.93	6038.0	979686.05	F433	27.74	0.39H	2.97	-176.73	6.87
MP09	40 37.75	114 15.51	6608.0	979653.86	F433	49.98	0.12H	2.89	-174.02	10.61
MP10	40 37.96	114 18.20	6548.0	979656.10	A733	46.27	1.11H	4.99	-173.59	12.58
MP11	40 38.26	114 19.28	6086.0	979684.12	A733	30.43	0.31H	3.20	-175.45	11.32
MP12	40 38.56	114 21.72	5617.0	979704.65	N233	6.44	0.01H	1.00	-185.61	2.46
MP13	40 38.54	114 22.66	5595.0	979695.42	A733	-4.83	0.01H	0.68	-196.45	-7.88
MP14	40 38.52	114 23.79	5590.0	979687.72	F433	-12.97	0.01H	0.49	-204.61	-15.46
MP15	40 38.65	114 25.30	5587.0	979679.10	A733	-22.07	0.01H	0.37	-213.72	-23.87
MP16	40 39.30	114 26.61	5586.0	979677.11	A733	-25.12	0.01H	0.33	-216.78	-26.40
MP17	40 39.77	114 27.60	5585.0	979677.09	A733	-25.93	0.01H	0.33	-217.56	-26.80
MP18	40 40.75	114 29.10	5583.0	979685.91	N233	-18.76	0.01H	0.40	-210.25	-18.99
DV01	40 31.14	114 23.27	5593.0	979672.26	N233	-17.16	0.00	0.99	-208.40	-18.24
DV02	40 31.29	114 24.56	5595.0	979666.43	N233	-23.02	0.01	0.59	-214.73	-23.97
DV03	40 31.45	114 25.63	5596.0	979665.23	N233	-24.37	0.02	0.43	-216.27	-25.04
DV04	40 31.54	114 26.49	5596.0	979665.70	N233	-24.03	0.01	0.35	-216.01	-24.40
DV05	40 31.84	114 27.70	5596.0	979668.02	N233	-22.15	0.01	0.31	-214.18	-22.07

Table 3.--Principal facts for 125 gravity stations in the Goshute-Toano Range, Nevada (cont.)

Base datum IGSN-71
GRS 1967 formula for theoretical gravity
Bouguer reduction density 2.67 g/cc

Sta	Latitude deg min	Longitude deg min	Elev. feet	Observed gravity	ACC	FA	Near	TC	CBA	Iso
DV06	40 32.05	114 28.88	5596.0	979671.51	N233	-18.98	0.02	0.30	-211.01	-18.45
DV07	40 32.27	114 29.92	5600.0	979673.83	N233	-16.61	0.02	0.31	-208.77	-15.81
DV08	40 32.39	114 31.08	5599.0	979677.36	N233	-13.35	0.03	0.37	-205.42	-12.00
DV09	40 32.62	114 32.18	5597.0	979682.68	N233	-8.56	0.00	0.43	-200.50	-6.70
DV10	40 32.82	114 34.16	5768.0	979684.00	N233	8.53	0.01	0.70	-188.98	5.52
GV01	40 51.25	114 26.65	5591.0	979718.12	F433	-1.46	0.01	0.31	-193.31	-3.77
GV02	40 51.26	114 25.44	5595.0	979719.15	F433	-0.07	0.00	0.33	-192.04	-3.05
GV03	40 50.21	114 24.42	5598.0	979717.45	F433	0.08	0.00	0.37	-191.95	-3.42
GV04	40 49.44	114 24.08	5597.0	979715.96	F433	-0.36	0.00	0.38	-192.34	-3.96
GV05	40 45.41	114 20.69	5772.0	979718.13	F433	24.28	0.03	1.30	-172.77	14.07
GV06	40 42.26	114 21.25	5696.0	979712.83	F433	16.53	0.01	1.13	-178.09	9.30
GV07	40 41.24	114 21.35	5715.0	979708.74	F433	15.74	0.02	1.07	-179.59	7.95
GV08	40 39.48	114 21.05	5698.0	979708.78	F433	16.81	0.09	1.61	-177.40	10.20
GV09	40 36.59	114 21.29	5609.0	979701.16	N233	5.13	0.01	1.47	-186.18	1.96
GV10	40 35.57	114 21.25	5615.0	979700.76	N233	6.82	0.01	1.78	-184.39	3.88
GV11	40 34.73	114 21.39	5614.0	979700.06	N233	7.27	0.01	1.80	-183.88	4.62
GV12	40 33.85	114 21.87	5614.0	979696.30	N233	4.83	0.01	1.41	-186.71	2.19
GV13	40 33.03	114 22.10	5612.0	979692.36	N233	1.92	0.01	1.36	-189.60	-0.43
GV13	40 33.03	114 22.10	5612.0	979692.44	N233	2.00	0.01	1.36	-189.52	-0.35
GV14	40 32.04	114 22.30	5609.0	979689.61	N233	0.36	0.01	1.46	-190.96	-1.49
GV15	40 31.00	114 22.29	5606.0	979686.47	N232	-1.51	0.01	1.88	-192.31	-2.63
GV16	40 29.70	114 22.26	5665.0	979686.88	N233	6.38	0.15	2.46	-185.85	4.09
GV17	40 28.67	114 22.35	5640.0	979687.89	N233	6.57	0.23	2.12	-185.15	5.08
GV18	40 27.18	114 21.04	5741.0	979681.21	C733	11.60	0.03	1.82	-183.87	6.05
GV19	40 20.66	114 18.02	5630.0	979675.91	N233	5.57	0.01	0.75	-187.17	3.10
GV20	40 21.29	114 18.43	5610.0	979674.06	N233	0.91	0.01	0.73	-191.17	-0.90
GV21	40 22.09	114 18.97	5605.0	979671.98	N233	-2.84	0.01	0.78	-194.70	-4.41
GV22	40 22.86	114 19.48	5602.0	979671.20	N233	-5.04	0.01	0.85	-196.73	-6.41
GV23	40 23.63	114 19.99	5601.0	979673.97	N233	-3.52	0.01	0.90	-195.12	-4.75
GV24	40 24.36	114 20.48	5601.0	979675.19	N233	-3.38	0.01	0.94	-194.94	-4.53
GV25	40 25.88	114 21.60	5610.0	979678.63	N233	-1.35	0.01	0.95	-193.21	-2.66
GV26	40 26.85	114 21.97	5605.0	979681.92	N233	0.02	0.00	1.09	-191.53	-1.04
GV27	40 27.73	114 22.30	5610.0	979683.18	N233	0.44	0.02	1.33	-191.04	-0.62
GV30	40 47.38	114 30.69	5582.0	979703.09	F433	-11.56	0.00	0.36	-203.05	-11.74
GV31	40 51.52	114 28.02	5584.0	979715.63	F433	-5.01	0.00	0.33	-196.61	-6.51
GV32	40 51.66	114 29.04	5584.0	979713.23	F433	-7.62	0.00	0.40	-199.15	-8.63
GV33	40 51.70	114 30.13	5582.0	979713.64	F433	-7.46	0.00	0.52	-198.79	-7.83
GV34	40 50.79	114 30.19	5582.0	979709.51	F433	-10.23	0.00	0.46	-201.62	-10.62
GV35	40 50.88	114 32.33	5640.0	979724.02	F433	9.59	0.03	1.15	-183.09	8.68
GV36	40 49.28	114 32.55	5601.0	979725.18	F433	9.48	0.01	0.89	-182.13	9.76
GV37	40 49.04	114 30.45	5581.0	979704.01	F433	-13.21	0.00	0.38	-204.65	-13.51
GV38	40 40.67	114 27.53	5585.0	979681.67	N233	-22.70	0.00	0.31	-214.34	-23.72
GV39	40 40.70	114 26.30	5587.0	979683.24	N233	-20.98	0.00	0.31	-212.70	-22.65
GV40	40 40.74	114 25.11	5587.0	979689.14	N233	-15.14	0.00	0.35	-206.81	-17.32
GV41	40 40.77	114 23.90	5590.0	979699.75	N233	-4.30	0.00	0.44	-195.98	-7.06
GV42	40 44.91	114 20.60	5604.0	979714.37	N233	5.47	1.87	3.91	-183.23	3.61
GV43	40 44.82	114 20.36	5810.0	979714.22	F433	24.81	0.27	1.94	-172.90	13.81
GV44	40 48.76	114 21.25	5822.0	979719.23	F433	25.07	0.03	0.94	-174.04	12.94
GV45	40 50.15	114 21.49	5836.0	979712.28	F433	17.37	0.03	0.82	-182.35	4.73
GV46	40 46.65	114 23.76	5602.0	979714.64	F433	2.96	0.00	0.39	-189.19	-0.85

Table 3.--Principal facts for 125 gravity stations in the Goshute-Toano Range, Nevada (cont.)

Base datum IGSN-71
GRS 1967 formula for theoretical gravity
Bouguer reduction density 2.67 g/cc

Sta	Latitude deg min	Longitude deg min	Elev. feet	Observed gravity	ACC	FA	Near	TC	CBA	Iso
GV47	40 47.86	114 24.61	5591.0	979713.32	F433	-1.20	0.00	0.33	-193.03	-4.35
GV48	40 46.68	114 25.03	5590.0	979724.31	F433	11.45	0.06	0.39	-180.29	8.63
GV49	40 48.16	114 26.75	5586.0	979705.83	F433	-9.61	0.00	0.26	-201.34	-11.68
GV50	40 48.91	114 28.66	5584.0	979704.18	F433	-12.56	0.00	0.28	-204.21	-13.79
GV51	40 49.97	114 26.56	5588.0	979713.42	F433	-4.53	0.00	0.28	-196.31	-6.79
WD01	40 31.07	114 11.35	5590.0	979702.82	F433	13.23	0.04	1.47	-177.43	5.87
WD02	40 32.15	114 11.31	5342.0	979719.33	F433	4.82	0.05	1.36	-177.46	5.58
WD03	40 33.20	114 10.87	5175.0	979733.03	F433	1.26	0.03	1.17	-175.50	7.04
WD04	40 35.39	114 10.44	5089.0	979741.44	F433	-1.67	0.11	1.27	-175.40	6.46
WD05	40 38.84	114 11.11	5171.0	979734.36	F433	-6.19	0.03	1.28	-182.71	-0.92
WD06	40 39.51	114 11.42	5177.0	979735.40	F433	-5.58	0.04	1.36	-182.23	-0.31
WD07	40 39.71	114 13.01	5618.0	979712.86	F433	13.03	0.04	1.93	-178.13	4.76
WD08	40 41.91	114 12.85	5590.0	979721.23	F433	15.48	0.21	2.17	-174.48	8.09
WD09	40 42.25	114 9.14	4686.0	979772.22	F433	-18.99	0.03	0.80	-179.39	0.83
WD10	40 42.97	114 9.31	4700.0	979775.62	C833	-15.36	0.09	0.89	-176.14	4.13
WD11	40 43.18	114 9.34	4711.0	979778.59	F433	-11.66	0.10	0.90	-172.82	7.45
WD12	40 43.78	114 11.50	5195.0	979749.99	F433	4.34	0.08	1.63	-172.65	8.94
WD13	40 46.05	114 11.79	5198.0	979758.99	F433	10.23	0.05	1.21	-167.28	14.39
WD14	40 45.77	114 10.08	4961.0	979770.60	F433	-0.02	0.06	0.75	-169.88	10.75
WD15	40 46.94	114 12.38	5164.0	979759.99	F433	6.71	0.06	1.24	-169.61	12.41
WD16	40 46.58	114 14.27	5581.0	979739.26	F433	25.70	0.03	2.02	-164.10	19.05
LAGE	40 3.46	114 37.05	5963.0	979606.63	B232	-6.84	0.11	1.08	-210.64	-7.44
MORG	40 38.25	114 20.65	5775.0	979701.16	F432	18.26	0.03H	1.67	-178.52	9.02
MUDS	40 37.72	114 14.78	6429.0	979662.14	F432	41.49	0.11H	2.56	-176.74	7.45
WEND	40 44.10	114 1.80	4252.0	979824.91	N232	-9.86	0.20	0.72	-155.46	20.01