

# Principal Facts for Gravity Stations in The Humboldt House Geothermal Area, Pershing County, Nevada

By Brian G. Duffrin, David L. Berger, and Donald H. Schaefer

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CONTENTS

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	<i>Page</i>
Abstract -----	1
Introduction -----	1
Principal facts for gravity stations -----	5
References cited -----	11

---

ILLUSTRATION

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Figure 1. Map showing location of gravity stations -----	3
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## CONVERSION FACTORS AND ABBREVIATIONS

"Inch-pound" units of measure used in this report may be converted to International System (metric) units by using the following factors:

<i>Multiply</i>	<i>By</i>	<i>To obtain</i>
Feet (ft)	0.3048	Meters (m)
Miles (mi)	1.609	Kilometers (km)

## ALTITUDE DATUM

The term "National Geodetic Vertical Datum of 1929" replaces the formerly used term "mean sea level" to describe the datum for altitude measurements. The datum is derived from a general adjustment of the first-order leveling network of both the United States and Canada. For convenience in this report, the datum is referred to as "sea level."

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THE HUMBOLDT HOUSE GEOTHERMAL AREA,  
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ABSTRACT

Principal facts for 172 gravity stations in and near Humboldt House, Nev., are tabulated; they consist of latitude, longitude, altitude, observed gravity, free-air anomaly, terrain correction, and Bouguer anomaly values at a bedrock density of 2.67 grams per cubic centimeter.

INTRODUCTION

The Humboldt House study area, about 50 miles southwest of Winnemucca and 100 miles northeast of Reno, is one of Nevada's many promising geothermal areas. The area of study, about 500 square miles, lies in the Humboldt River valley between Lovelock and Imlay. The purpose of the geophysical study for which data are reported herein, which was made in cooperation with the U.S. Bureau of Land Management, was to determine aspects of the geology that may control, affect, or delineate the geothermal system in the area.

During June and July 1981, gravity measurements were made at 172 stations in and near Humboldt House.

The latitude and longitude for most stations in the study area were obtained using the Loran navigation system. Peripheral bedrock stations were surveyed with an electronic transit for position and altitude. Additionally, bench marks, section corners, and road intersections were used to locate stations.

Most altitudes were determined using altimeters or topographic maps.

The gravity observations were made with a Worden<sup>1</sup> temperature-controlled gravimeter with a scale factor of 0.1907 milliGal per scale division.

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<sup>1</sup> Use of brand names in this report is for descriptive purposes only and does not constitute endorsement by the U.S. Geological Survey.

Two base stations in the study area were established; gravity remeasurements were made at one or the other at the beginning, middle, and end of each working day in order to correct for any gravimeter drift. The base stations were related to a U.S. Department of Defense gravity station in Winnemucca by numerous repeat measurements. This gravity station has a standard absolute value of 979,810.48 milliGals (Gravity Services Branch, 1970).

Principal facts for each of the 172 stations are listed in the following table. Figure 1 shows the location of the stations. In addition, Schaefer (in press) discusses details regarding the collection, correction, reduction, interpretation, and limitations of the data. A map showing Bouguer gravity anomalies in the Humboldt House area is also given in Schaefer's report.

The data listed in the following table are available on magnetic tape from the U.S. Geological Survey, 705 N. Plaza St., Room 224, Carson City, Nev. 89701.

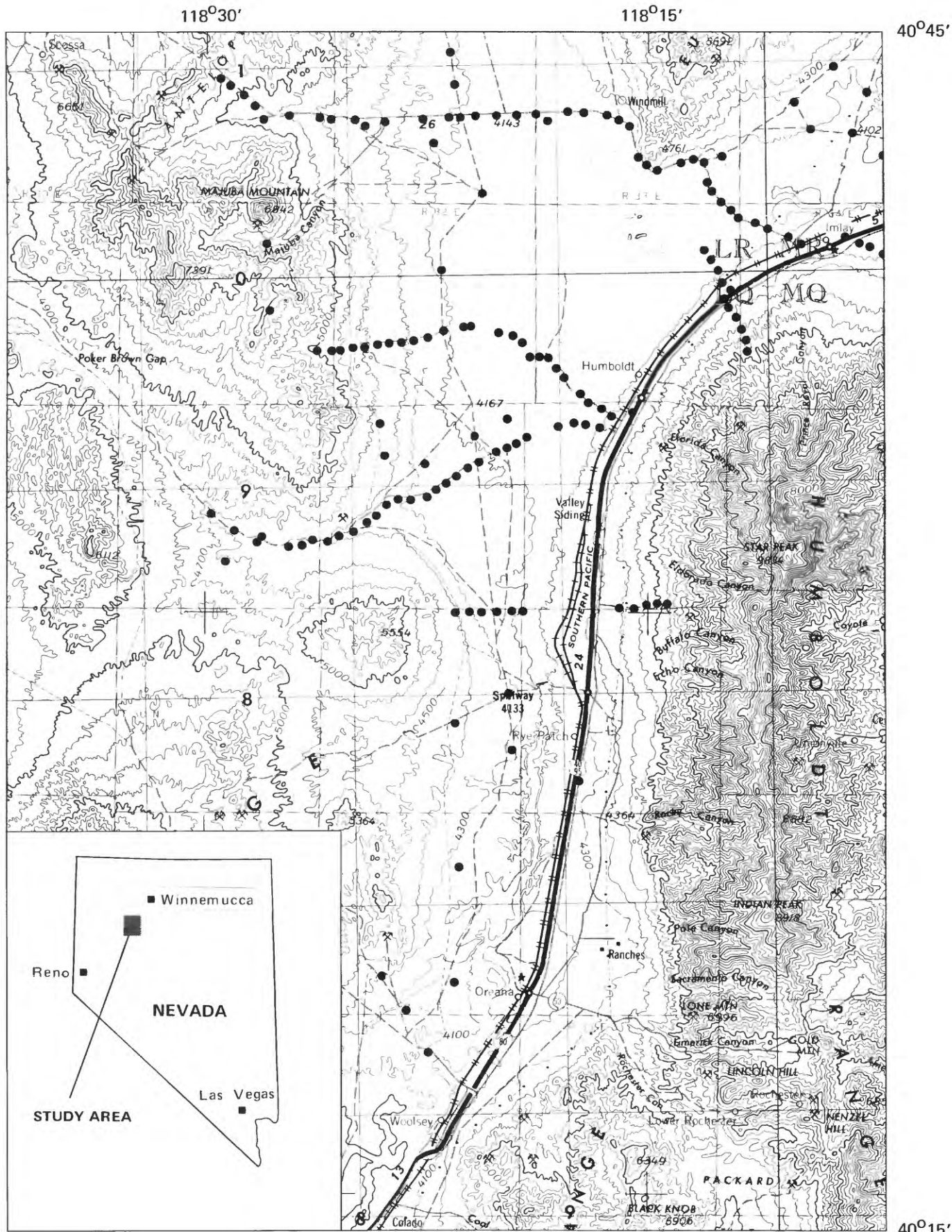


FIGURE 1.--Location of gravity stations.

PRINCIPAL FACTS FOR  
GRAVITY STATIONS



Site: Data are listed by valley, in order of increasing latitude (that is, from north to south).

Terrain corrections: "Hand" indicates manual correction within a radius of 1.42 miles, at a bedrock density of 2.67 g/cm<sup>3</sup> (grams per cubic centimeter).

"Comp" indicates computer correction between radii of 1.42 and 103.6 miles, at a bedrock density of 2.67 g/cm<sup>3</sup>. (See Schaefer, 1983, page 8).

Bouguer anomaly: Complete Bouguer anomaly at a bedrock density of 2.67 g/cm<sup>3</sup>.

Site	Latitude (deg min)	Longitude (deg min)	Altitude (feet above sea level)	Observed gravity (mGal)	Free- air anomaly (mGal)	Terrain corrections		Bouguer anomaly (mGal)
						Hand (mGal)	Comp (mGal)	
HH158	40 17.90	118 21.00	4127	979812.49	5.09	0.02	0.49	-136.51
HH159	40 18.67	118 20.70	4156	979808.20	2.39	0.02	0.41	-140.28
HH157	40 18.70	118 22.92	4148	979808.35	1.73	0.00	0.29	-140.81
HH156	40 18.71	118 23.03	4116	979812.16	2.53	0.00	0.31	-138.90
HH170	40 19.59	118 10.29	6542	979672.87	89.94	7.13	3.71	-124.06
HH155	40 19.80	118 23.60	4197	979815.43	11.78	0.00	0.33	-132.40
HH153	40 20.55	118 22.10	4165	979808.92	1.15	0.01	0.36	-141.89
HH154	40 20.78	118 24.45	4331	979807.53	15.03	0.11	0.40	-133.58
HH152	40 23.49	118 21.91	4280	979806.10	4.77	0.02	0.40	-142.17
HH63	40 25.70	118 17.83	4145	979817.73	0.42	0.00	1.23	-141.08
HH151	40 26.50	118 19.99	4277	979802.76	-3.34	0.00	0.53	-150.07
HH150	40 27.13	118 21.90	4402	979804.86	9.58	0.00	0.38	-141.60
HH149	40 27.88	118 19.92	4256	979807.16	-2.96	0.00	0.56	-148.94
HH81	40 30.04	118 21.94	4510	979814.53	25.07	0.50	0.39	-129.30
HH80	40 30.04	118 21.54	4413	979818.02	19.44	0.32	0.41	-131.76
HH79	40 30.04	118 21.11	4355	979819.12	15.09	0.36	0.44	-134.06
HH24	40 30.04	118 20.45	4212	979818.83	1.36	0.00	0.55	-143.12
HH83	40 30.04	118 19.70	4270	979811.61	-0.41	0.48	0.56	-146.39
HH78	40 30.05	118 20.64	4301	979817.67	8.55	0.10	0.47	-138.97
HH82	40 30.06	118 20.04	4294	979813.59	3.79	1.30	0.51	-142.24
HH76	40 30.13	118 16.32	4644	979796.68	19.68	1.54	1.62	-137.02
HH75	40 30.14	118 15.84	4751	979792.68	25.72	2.02	1.92	-133.86
HH74	40 30.15	118 15.40	4844	979787.27	29.04	2.04	2.28	-133.35
HH73	40 30.20	118 14.98	4998	979779.32	35.49	2.58	2.62	-131.32
HH77	40 30.22	118 17.24	4476	979799.94	7.02	0.44	1.16	-145.48
HH72	40 30.22	118 14.76	5094	979773.52	38.69	1.86	2.80	-131.95
HH144	40 31.43	118 29.64	4594	979797.68	14.04	0.02	0.31	-143.77
HH139	40 31.79	118 27.44	4480	979807.31	12.42	0.14	0.36	-141.31
HH138	40 31.82	118 27.03	4459	979810.41	13.50	0.06	0.38	-139.57
HH136	40 31.89	118 26.24	4438	979817.57	18.58	0.09	0.39	-133.72

Site	Latitude		Longitude		Altitude (feet above sea level)	Observed gravity (mGal)	Free- air anomaly (mGal)	Terrain corrections		Bouguer anomaly (mGal)
	(deg)	(min)	(deg)	(min)				Hand (mGal)	Comp (mGal)	
HH141	40	31.94	118	28.54	4531	979802.25	11.93	0.02	0.33	-143.70
HH137	40	31.94	118	26.65	4475	979812.73	17.15	0.07	0.36	-136.47
HH135	40	31.98	118	25.85	4430	979820.08	20.21	0.09	0.39	-131.82
HH142	40	32.05	118	28.38	4534	979801.11	10.91	0.07	0.33	-144.77
HH134	40	32.10	118	25.31	4394	979825.54	22.11	0.12	0.42	-128.63
HH143	40	32.22	118	29.33	4563	979798.98	11.26	0.06	0.34	-145.42
HH133	40	32.40	118	24.86	4389	979826.38	22.03	0.08	0.41	-128.59
HH132	40	32.59	118	24.49	4377	979826.38	20.62	0.05	0.39	-129.63
HH145	40	32.68	118	30.05	4624	979795.23	12.55	0.02	0.34	-146.26
HH131	40	32.82	118	24.19	4346	979828.77	19.75	0.11	0.41	-129.36
HH130	40	32.95	118	23.79	4349	979826.61	17.68	0.01	0.38	-131.67
HH129	40	32.96	118	23.37	4324	979825.40	14.11	0.00	0.36	-134.41
HH128	40	33.03	118	22.80	4309	979823.79	10.98	0.00	0.34	-137.04
HH127	40	33.20	118	22.47	4288	979822.99	7.96	0.00	0.33	-139.35
HH126	40	33.37	118	22.09	4270	979822.34	5.36	0.00	0.32	-141.34
HH125	40	33.55	118	21.74	4251	979821.77	2.74	0.00	0.33	-143.31
HH124	40	33.74	118	21.37	4235	979821.67	0.85	0.00	0.33	-144.64
HH23	40	33.89	118	21.03	4177	979822.10	-4.40	0.00	0.36	-147.87
HH146	40	33.91	118	22.79	4287	979824.32	8.13	0.00	0.37	-139.10
HH147	40	34.12	118	24.21	4519	979819.85	25.16	0.19	0.43	-129.79
HH123	40	34.12	118	20.44	4202	979821.97	-2.52	0.00	0.35	-146.85
HH122	40	34.25	118	20.07	4188	979822.16	-3.84	0.00	0.38	-147.66
HH121	40	34.36	118	19.77	4181	979821.91	-4.91	0.00	0.40	-148.47
HH120	40	34.51	118	19.39	4143	979822.69	-7.93	0.00	0.46	-150.13
HH119	40	34.57	118	21.08	4209	979823.22	-1.28	0.00	0.33	-145.88
HH25	40	34.76	118	18.28	4209	979816.28	-8.50	0.00	0.55	-152.88
HH116	40	34.76	118	16.94	4194	979822.48	-3.71	0.01	0.95	-147.16
HH117	40	34.81	118	17.37	4160	979822.65	-6.82	0.00	0.82	-149.24
HH118	40	34.82	118	17.78	4157	979821.61	-8.16	0.00	0.69	-150.60
HH148	40	34.96	118	24.36	4546	979820.77	27.36	0.39	0.51	-128.23
HH26	40	35.00	118	20.00	4153	979817.47	-12.94	0.00	0.37	-155.57
HH22	40	35.00	118	20.00	4237	979830.20	7.68	0.00	0.33	-137.87
HH59	40	35.07	118	16.49	4209	979819.83	-5.42	0.05	1.05	-149.24
HH58	40	35.14	118	15.89	4258	979825.03	4.29	0.12	1.30	-140.90
HH60	40	35.23	118	16.83	4171	979820.02	-9.04	0.01	0.90	-151.75

Site	Latitude (deg min)	Longitude (deg min)	Altitude (feet above sea level)	Observed gravity (mGal)	Free- air anomaly (mGal)	Terrain corrections		Bouguer anomaly (mGal)
						Hand (mGal)	Comp (mGal)	
HH61	40 35.42	118 17.28	4151	979818.96	-12.27	0.00	0.73	-154.47
HH62	40 35.61	118 17.55	4149	979819.79	-11.90	0.00	0.62	-154.15
HH57	40 35.70	118 15.56	4257	979825.50	3.83	0.10	1.23	-141.41
HH64	40 36.05	118 18.11	4146	979816.92	-15.71	0.00	0.47	-158.01
HH65	40 36.30	118 18.40	4152	979816.41	-16.03	0.00	0.40	-158.61
HH66	40 36.57	118 18.66	4160	979816.67	-15.42	0.01	0.34	-158.31
HH68	40 36.59	118 19.20	4147	979817.32	-16.02	0.00	0.32	-158.49
HH67	40 36.59	118 18.90	4149	979817.04	-16.11	0.00	0.34	-158.64
HH111	40 36.71	118 11.95	4896	979808.71	45.60	1.19	1.87	-119.85
HH46	40 36.83	118 25.95	4922	979800.96	40.11	0.50	0.77	-128.01
HH47	40 36.83	118 25.65	4845	979805.49	37.40	0.48	0.75	-128.12
HH45	40 36.85	118 26.40	5023	979793.82	42.43	0.65	0.79	-128.98
HH48	40 36.89	118 25.20	4768	979810.65	35.24	0.25	0.70	-127.92
HH49	40 36.89	118 24.80	4677	979816.20	32.23	0.18	0.65	-127.92
HH69	40 36.92	118 19.47	4137	979818.38	-16.39	0.00	0.30	-158.54
HH50	40 36.94	118 24.40	4596	979820.83	29.18	0.12	0.59	-128.32
HH51	40 36.94	118 24.00	4507	979824.14	24.11	0.08	0.54	-130.42
HH110	40 36.95	118 11.99	4796	979814.53	41.66	0.00	1.65	-121.77
HH52	40 36.98	118 23.56	4434	979826.42	19.48	0.13	0.48	-132.56
HH53	40 37.03	118 23.15	4355	979829.83	15.38	0.17	0.45	-133.94
HH54	40 37.09	118 22.71	4300	979830.93	11.23	0.13	0.41	-136.29
HH70	40 37.10	118 19.75	4153	979819.00	-14.54	0.00	0.28	-157.27
HH71	40 37.20	118 20.35	4155	979821.02	-12.48	0.00	0.27	-155.28
HH21	40 37.23	118 22.18	4214	979832.32	4.32	0.01	0.38	-140.39
HH112	40 37.25	118 12.18	4630	979824.52	35.60	1.54	1.39	-120.85
HH55	40 37.37	118 21.42	4151	979827.28	-6.85	0.09	0.34	-149.36
HH56	40 37.40	118 21.28	4134	979827.16	-8.61	0.00	0.34	-150.63
HH113	40 37.53	118 12.37	4508	979831.36	30.55	0.96	1.18	-122.50
HH114	40 37.83	118 12.53	4386	979837.48	24.76	0.81	1.02	-124.41
HH140	40 37.87	118 28.08	4503	979802.61	0.83	0.04	2.08	-152.07
HH115	40 38.07	118 12.64	4307	979839.60	19.09	0.10	0.91	-128.18
HH94	40 38.17	118 5.00	4637	979822.71	33.07	0.48	0.63	-125.44
HH104	40 38.22	118 12.54	4290	979839.87	17.54	0.08	0.87	-129.22
HH95	40 38.31	118 5.30	4463	979831.54	25.34	0.44	0.68	-127.18
HH105	40 38.43	118 12.73	4246	979841.40	14.62	0.03	0.76	-130.78

Site	Latitude		Longitude		Altitude (feet above sea level)	Observed gravity (mGal)	Free- air anomaly (mGal)	Terrain corrections		Bouguer anomaly (mGal)
	(deg min)	(deg min)	(deg min)	(deg min)				Hand (mGal)	Comp (mGal)	
HH96	40	38.49	118	5.77	4395	979830.44	17.58	0.20	0.74	-132.79
HH97	40	38.60	118	6.18	4350	979828.97	11.72	0.08	0.79	-137.18
HH106	40	38.77	118	12.85	4189	979842.21	9.57	0.03	0.65	-133.98
HH98	40	38.81	118	6.58	4321	979827.56	7.27	0.04	0.76	-140.71
HH20	40	38.86	118	22.24	4207	979832.32	1.23	0.00	0.37	-143.25
HH99	40	38.95	118	6.95	4314	979826.71	5.55	0.03	0.72	-142.24
HH107	40	39.01	118	13.11	4162	979842.48	6.94	0.00	0.56	-135.81
HH100	40	39.11	118	7.37	4293	979826.20	2.83	0.03	0.68	-144.28
HH108	40	39.24	118	13.36	4157	979842.21	5.86	0.00	0.47	-136.81
HH109	40	39.25	118	13.33	4154	979842.97	6.32	0.00	0.48	-136.24
HH101	40	39.26	118	7.77	4274	979826.32	0.94	0.02	0.65	-145.55
HH166	40	39.28	118	9.46	4235	979838.72	9.65	0.04	0.68	-135.46
HH84	40	39.38	118	10.08	4253	979840.84	13.31	0.19	0.60	-132.34
HH102	40	39.41	118	8.18	4243	979829.22	0.70	0.04	0.62	-144.74
HH103	40	39.56	118	8.57	4218	979832.22	1.12	0.04	0.59	-143.48
HH169	40	39.58	118	28.05	5453	979771.42	56.38	1.47	1.19	-128.55
HH85	40	39.60	118	10.45	4241	979844.21	15.22	0.22	0.52	-130.06
HH171	40	39.72	118	3.78	4687	979822.65	35.40	1.41	0.43	-124.09
HH1	40	39.83	118	11.20	4172	979844.82	9.00	0.00	0.48	-134.17
HH44	40	39.83	118	11.20	4176	979853.27	17.83	0.35	0.48	-125.14
HH9	40	39.83	118	11.20	4176	979844.37	8.93	0.34	0.48	-134.05
HH86	40	39.97	118	11.57	4211	979847.01	14.64	0.08	0.40	-129.87
HH27	40	40.08	118	12.17	4172	979843.80	7.61	0.00	0.38	-135.66
HH87	40	40.30	118	12.44	4215	979847.31	14.83	0.18	0.32	-129.80
HH88	40	40.52	118	12.75	4211	979849.13	15.95	0.12	0.29	-128.64
HH19	40	40.78	118	20.83	4159	979833.19	-5.26	0.00	0.19	-148.28
HH89	40	40.81	118	13.07	4200	979852.02	17.38	0.08	0.27	-126.90
HH90	40	40.99	118	13.15	4194	979854.94	19.46	0.06	0.26	-124.63
HH93	40	41.32	118	14.90	4172	979853.43	15.39	0.20	0.23	-127.84
HH29	40	41.48	118	15.27	4224	979847.25	13.86	0.46	0.20	-130.93
HH28	40	41.52	118	13.32	4149	979857.08	16.58	0.10	0.31	-125.88
HH92	40	41.54	118	14.12	4211	979856.00	21.30	0.17	0.24	-123.28
HH167	40	41.60	118	7.15	4205	979832.42	-2.94	0.01	0.25	-147.47
HH91	40	41.62	118	13.69	4212	979855.92	21.19	0.14	0.26	-123.44
HH30	40	41.68	118	15.47	4162	979848.13	8.61	0.57	0.22	-133.91

Site	Latitude (deg min)	Longitude (deg min)	Altitude (feet above sea level)	Observed gravity (mGal)	Free- air anomaly (mGal)	Terrain corrections		Bouguer anomaly (mGal)
						Hand (mGal)	Comp (mGal)	
HH160	40 41.71	118 12.68	4168	979860.49	21.49	0.07	0.31	-121.65
HH37	40 42.14	118 22.44	4314	979832.97	7.06	0.36	0.22	-140.90
HH164	40 42.26	118 8.17	4184	979842.37	4.06	0.00	0.25	-139.76
HH163	40 42.38	118 9.63	4194	979854.96	17.41	0.00	0.28	-126.72
HH31	40 42.50	118 15.81	4211	979842.35	6.22	0.28	0.24	-138.25
HH38	40 42.61	118 24.80	4551	979833.28	28.94	0.28	0.42	-127.03
HH4	40 42.64	118 18.63	4163	979837.11	-3.74	0.00	0.13	-146.96
HH11	40 42.68	118 25.17	4547	979832.58	27.76	0.00	0.48	-128.29
HH2	40 42.68	118 16.16	4168	979841.95	1.50	0.12	0.27	-141.63
HH10	40 42.70	118 24.07	4426	979833.79	17.57	0.00	0.35	-134.46
HH8	40 42.73	118 22.83	4239	979832.30	-1.55	0.56	0.29	-146.65
HH36	40 42.75	118 21.91	4280	979832.87	2.85	0.00	0.18	-144.34
HH39	40 42.76	118 25.93	4647	979827.77	32.23	0.19	0.55	-126.99
HH7	40 42.76	118 21.55	4242	979833.62	0.02	0.00	0.17	-145.88
HH32	40 42.77	118 16.54	4168	979839.36	-1.22	0.00	0.24	-144.50
HH6	40 42.79	118 21.00	4217	979834.13	-1.87	0.00	0.15	-146.92
HH35	40 42.80	118 20.31	4181	979835.72	-3.68	0.00	0.13	-147.51
HH41	40 42.81	118 28.19	4828	979816.61	38.01	0.32	0.82	-127.02
HH12	40 42.81	118 26.04	4639	979826.95	30.59	0.06	0.57	-128.46
HH40	40 42.82	118 26.29	4656	979827.56	32.78	0.32	0.61	-126.56
HH13	40 42.83	118 27.31	4753	979820.06	34.38	0.44	0.73	-128.05
HH5	40 42.83	118 19.64	4168	979837.46	-3.21	0.00	0.13	-146.60
HH34	40 42.84	118 18.91	4159	979837.46	-4.07	0.00	0.13	-147.15
HH3	40 42.87	118 17.36	4167	979836.54	-4.28	0.00	0.18	-147.58
HH33	40 42.88	118 17.91	4158	979836.32	-5.37	0.00	0.16	-148.38
HH168	40 42.92	118 13.87	5156	979803.27	55.33	4.23	1.56	-116.29
HH14	40 43.12	118 28.41	4927	979811.86	42.10	0.16	0.73	-126.57
HH161	40 43.12	118 10.12	4274	979858.06	26.93	0.00	0.34	-119.89
HH165	40 43.24	118 7.77	4200	979850.80	12.53	0.00	0.28	-131.81
HH42	40 43.28	118 29.04	4984	979808.96	44.32	0.42	0.74	-126.03
HH18	40 43.61	118 21.74	4251	979832.75	-1.28	0.00	0.17	-147.48
HH15	40 43.67	118 29.35	5143	979799.41	49.14	0.41	0.65	-126.78
HH43	40 43.84	118 29.64	5239	979795.13	53.62	0.28	0.63	-125.72
HH162	40 43.96	118 8.88	4290	979859.31	28.42	0.02	0.43	-118.84
HH16	40 44.26	118 30.01	5491	979780.77	62.32	0.88	0.81	-124.88
HH17	40 44.44	118 21.88	4253	979833.48	-1.60	0.00	0.18	-147.85
WINN	40 54.23	117 48.21	4298	979839.03	-6.42	0.00	0.33	-154.07
BASE								

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