

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

**PRINCIPAL FACTS FOR GRAVITY STATIONS IN THE CLEARWATER AND
BLACKFOOT RIVER VALLEYS, MONTANA**

by

Dolores M. Wilson

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Introduction

A gravity survey was made in the Clearwater and Blackfoot River valleys to provide information on structural relationships and subsurface geology as part of the Big Fork-Avon environmental and land-use project undertaken by the U.S. Geological Survey and Missoula and Powell Counties, Montana.

Data Collection

During the summer of 1975, 138 gravity stations were established with LaCoste and Romberg^{1/} gravity meter G-159. The stations were referenced to base station ACIC 1200 of the International Gravity Standardization Net 1971 (Defense Mapping Agency Aerospace Center, 1974) at Lincoln, Montana. A secondary base was established at Seeley Lake, Montana, and tied to the Lincoln base station. The base at Seeley Lake is located at the southwest corner of the sidewalk in front of the Seeley Lake Post Office. The area covered by the survey is shown in Figure 1.

Station elevations were obtained from benchmarks and spot elevations on 1:24,000 scale topographic maps. Elevations are accurate to 1-2 m in areas of low relief, but may be in error by 5-7 m at a few stations in more rugged terrain. The resultant error in the Bouguer anomaly is less than 1.5 mgal.

1/ Use of brand names in this report is for descriptive purposes only and in no way constitutes endorsement of the U.S. Geological Survey.

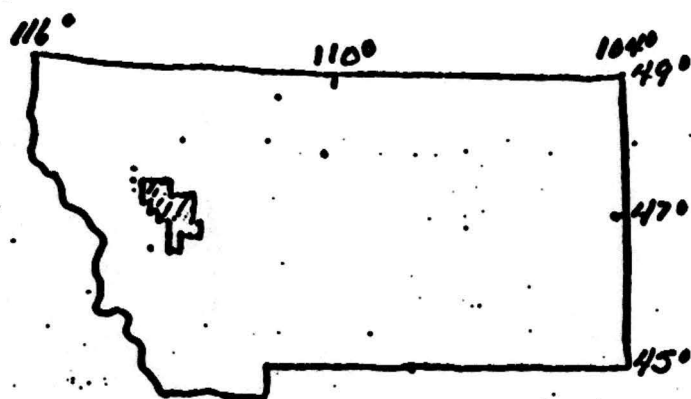
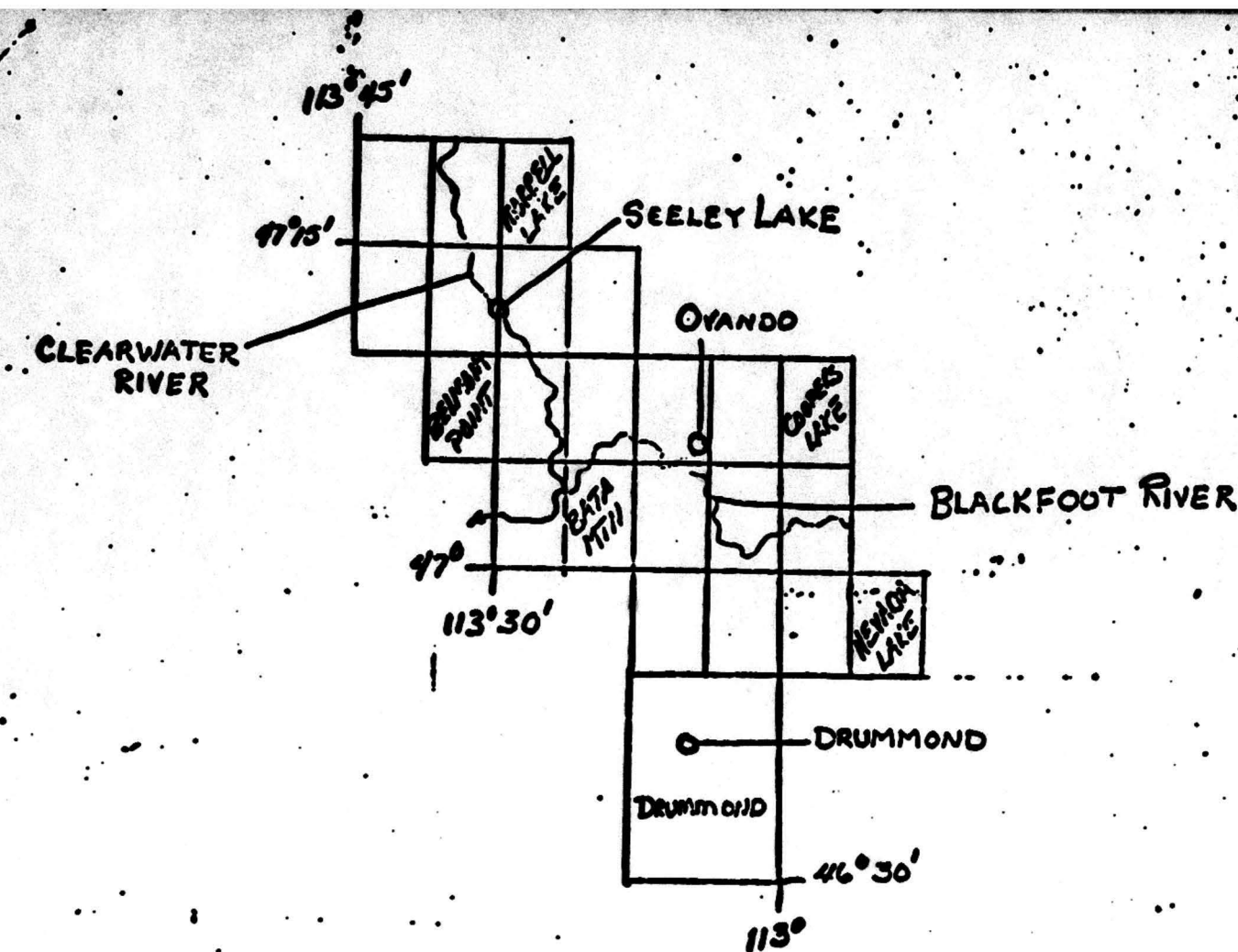


Figure 1. Area of gravity survey in the Clearwater and Blackfoot River valleys, Montana.

Data Reduction

The gravity data were reduced by means of a digital computer program by G. I. Evenden and R. R. Wahl (unpub.). Gravity meter readings were converted to observed gravity using the International Gravity Standardization Net 1971 base values. The Geodetic Reference System 1967 formula (International Association of Geodesy, 1967) was used to compute theoretical gravity. The data were reduced to Bouguer anomaly values using an assumed average rock density of 2.67 gm/cm^3 . Terrain corrections were made by hand template through Zone H of Hammer (1939) and to 167 km by digital computer (Wash, unpub.). The total computed corrections ranged from 0.26 mgal at Brown's Lake to 11.11 mgal north of Nevada Lake. Corrections were made for tidal effects and linear instrument drift.

The principal facts for the gravity stations are listed in Table 1.

Explanation of headings in Table 1:

STATION IDENTIFICATION	Gravity station number.
LATITUDE	North latitude in degrees, minutes, and hundredths of minutes.
LONGITUDE	West longitude in degrees, minutes, and hundredths of minutes.
ELEV	Elevation in feet (to convert to meters, multiply by 0.3048).
ST	State where station is located (Montana).
OBSERVED GRAVITY	Observed gravity in milligals.
STD. GRAVITY	Theoretical gravity.
TERRAIN	Terrain correction in milligals.

FREE-AIR

Free-air anomaly in milligals.

BOUGUER

**Elevation and curvature correction in
milligals**

BOUGUER ANOMALY

**Bouguer anomaly in milligals for assumed
average density of 2.67 gm/cm^3 .**

BOUGUER GRAVITY DATA

SWAN VALLEY
D. W. WILSON 1977
DENSITY: 2.67

STATION IDENTIFICATION	LATITUDE	LOCATION LONGITUDE	ELEV.	ST.	OBSERVED GRAVITY	STD. GRV.	TERRAIN	CORRECTIONS FREE-AIR	BOUGUER	SPECIAL	BOUGUER ANOMALY
GRAVITY, LAKEBASE				MT	980404.92		0.00				
GRAVITY. SV001	47 21.90	-113 42.21	4524.0	MT	980399.50	-980832.90	5.57	425.30	-155.65		-158.10
GRAVITY. SV002	47 19.83	-113 42.73	6103.0	MT	980304.26	-980829.79	6.30	573.68	-209.66		-155.21
GRAVITY. SV003	47 21.44	-113 35.37	4128.0	MT	980414.01	-980832.21	4.06	388.08	-142.08		-160.14
GRAVITY. SV004	47 21.35	-113 33.61	4622.0	MT	980382.63	-980832.07	4.19	434.51	-159.00		-169.74
GRAVITY. SV005	47 21.18	-113 31.48	5264.0	MT	980342.67	-980831.82	4.89	494.84	-180.98		-170.40
GRAVITY. SV006	47 20.54	-113 29.84	5870.0	MT	980304.82	-980830.85	7.00	551.79	-201.70		-168.94
GRAVITY, LAKEBASE				MT	980404.92		0.00				
GRAVITY, LAKEBASE				MT	980404.92		0.00				
GRAVITY. SV007	47 11.61	-113 27.20	4198.0	MT	980392.87	-980817.42	1.36	394.67	-144.48		-173.00
GRAVITY. SV008	47 11.36	-113 26.15	4275.0	MT	980385.32	-980817.05	1.48	401.90	-147.12		-175.47
GRAVITY. SV009	47 11.16	-113 25.19	4337.0	MT	980382.26	-980816.74	1.76	407.73	-149.24		-174.23
GRAVITY. SV010	47 11.10	-113 23.57	4450.0	MT	980377.52	-980816.65	6.30	418.35	-153.11		-167.59
GRAVITY. SV011	47 10.06	-113 21.15	4857.0	MT	980352.62	-980815.09	4.85	456.60	-167.05		-168.07
GRAVITY. SV012	47 11.38	-113 21.42	7796.0	MT	980161.32	-980817.08	9.65	732.74	-267.38		-177.75
GRAVITY. SV013	47 8.97	-113 18.85	4611.0	MT	980367.14	-980813.45	4.73	433.48	-158.63		-166.73
GRAVITY. SV014	47 6.39	-113 18.07	4238.0	MT	980389.63	-980809.57	1.25	398.43	-145.85		-166.11
GRAVITY. SV015	47 6.40	-113 16.28	4204.0	MT	980392.01	-980809.58	1.48	395.23	-144.68		-165.54
GRAVITY. SV016	47 5.28	-113 14.98	4211.0	MT	980384.61	-980807.90	0.98	395.89	-144.92		-171.34
GRAVITY. SV017	47 4.06	-113 13.10	4182.0	MT	980381.04	-980806.06	0.75	393.16	-143.93		-175.04
GRAVITY. SV018	47 6.13	-113 19.87	4235.0	MT	980397.07	-980809.18	1.11	398.14	-145.74		-163.60
GRAVITY. SV019	47 6.02	-113 22.13	4281.0	MT	980389.13	-980809.01	1.01	402.47	-147.32		-163.72
GRAVITY. SV020	47 6.28	-113 24.37	3920.0	MT	980408.80	-980809.40	1.50	368.54	-134.95		-165.51
GRAVITY. SV021	47 10.19	-113 28.63	4045.0	MT	980402.46	-980815.28	1.01	380.29	-139.23		-170.75
GRAVITY, LAKEBASE				MT	980404.92		0.00				
GRAVITY, LAKEBASE				MT	980404.92		0.00				
GRAVITY. SV022	47 20.13	-113 33.66	4748.0	MT	980372.51	-980830.24	3.63	446.35	-163.32		-171.07
GRAVITY. SV023	47 18.15	-113 34.35	4139.0	MT	980404.08	-980827.26	3.87	389.12	-142.45		-172.64
GRAVITY. SV024	47 21.54	-113 38.34	4607.0	MT	980390.16	-980832.36	5.48	433.10	-158.49		-162.11
GRAVITY. SV025	47 19.30	-113 36.91	4540.0	MT	980389.97	-980828.99	3.22	426.81	-156.20		-165.19
GRAVITY. SV026	47 20.26	-113 38.93	5365.0	MT	980345.76	-980830.43	5.47	504.33	-184.43		-159.30
GRAVITY. SV027	47 17.49	-113 38.15	4759.0	MT	980377.94	-980826.27	5.53	447.39	-163.70		-159.11
GRAVITY. SV028	47 17.02	-113 39.65	4809.0	MT	980370.88	-980825.56	6.50	452.09	-165.41		-161.50
GRAVITY. SV029	47 16.38	-113 36.54	4732.0	MT	980377.12	-980824.60	2.91	444.85	-162.77		-162.49
GRAVITY. SV030	47 13.70	-113 34.85	4296.0	MT	980395.28	-980820.57	2.06	403.88	-147.84		-167.19
GRAVITY. SV031	47 13.61	-113 37.56	4837.0	MT	980367.03	-980820.43	5.70	454.72	-166.37		-159.35
GRAVITY. SV032	47 12.92	-113 36.21	4712.0	MT	980374.40	-980819.39	1.90	442.97	-162.09		-162.21
GRAVITY. SV033	47 11.78	-113 37.13	4929.0	MT	980363.49	-980817.68	1.70	463.37	-169.52		-158.64
GRAVITY. SV034	47 11.24	-113 39.60	4858.0	MT	980367.36	-980816.86	5.44	456.69	-167.09		-154.46
GRAVITY. SV035	47 12.59	-113 40.13	5091.0	MT	980355.21	-980818.90	5.63	478.59	-175.06		-154.53

Table 1. Principal facts for gravity stations in the Clearwater and Blackfoot

BOUGUER GRAVITY DATA

SWAN VALLEY

STATION IDENTIFICATION		LATITUDE	LOCATION LONGITUDE	ELEV.	ST.	OBSERVED GRAVITY	STD. GRV.	TERRAIN CORRECTIONS	FREE-AIR	BOUGUER	SPECIAL	BOUGUER ANOMALY
GRAVITY.	SV036	47 11.52	-113 42.63	4897.0	MT	980362.52	-980817.29	6.33	460.36	-168.42		-156.50
GRAVITY.	SV037	47 11.23	-113 41.49	4855.0	MT	980365.50	-980816.85	6.14	456.41	-166.98		-155.78
GRAVITY.	SV038	47 10.15	-113 38.44	4535.0	MT	980383.88	-980815.23	5.40	426.34	-156.02		-155.63
GRAVITY.	SV039	47 9.05	-113 35.38	4325.0	MT	980393.27	-980813.57	1.36	406.60	-148.83		-161.17
GRAVITY.	SV040	47 7.93	-113 33.62	4154.0	MT	980403.15	-980811.88	1.31	390.53	-142.97		-159.86
GRAVITY.	SV041	47 8.31	-113 31.63	4143.0	MT	980403.13	-980812.46	1.19	389.50	-142.59		-161.23
GRAVITY.	SV042	47 9.50	-113 29.79	4019.0	MT	980409.40	-980814.25	1.33	377.84	-138.34		-164.02
GRAVITY.	LAKEBASE				MT	980404.92		0.00				
GRAVITY.	LAKEBASE				MT	980404.92		0.00				
GRAVITY.	SV043	47 12.06	-113 31.09	4042.0	MT	980400.76	-980819.30	1.57	380.00	-139.13		-176.10
GRAVITY.	SV044	47 12.54	-113 27.20	4404.0	MT	980383.13	-980818.82	1.84	414.03	-151.54		-171.36
GRAVITY.	SV045	47 14.18	-113 26.15	4555.0	MT	980375.71	-980821.29	3.65	426.22	-156.71		-170.42
GRAVITY.	SV046	47 15.66	-113 26.40	4794.0	MT	980363.93	-980823.51	7.57	450.77	-164.93		-166.17
GRAVITY.	SV047	47 15.92	-113 26.38	5000.0	MT	980352.01	-980823.91	7.32	470.04	-171.95		-166.49
GRAVITY.	SV348			5210.0	MT	980342.28		4.00				
GRAVITY.	SV049	47 18.56	-113 28.87	5780.0	MT	980310.99	-980827.08	6.17	543.33	-198.82		-166.01
GRAVITY.	SV050	47 14.35	-113 29.24	5340.0	MT	980333.17	-980821.54	3.01	501.99	-183.58		-166.95
GRAVITY.	SV051	47 15.53	-113 29.48	5690.0	MT	980312.39	-980823.32	5.85	534.87	-195.55		-165.76
GRAVITY.	SV052	47 15.29	-113 31.49	4746.0	MT	980367.39	-980822.96	2.74	446.17	-163.25		-169.91
GRAVITY.	SV053	47 17.63	-113 32.31	4900.0	MT	980368.83	-980826.48	3.19	460.64	-168.52		-162.34
GRAVITY.	LAKEBASE				MT	980404.92		0.00				
GRAVITY.	LINCBASE				MT	980347.35		0.00				
GRAVITY.	SV054	47 7.10	-113 27.18	3926.0	MT	980411.96	-980810.64	1.34	369.10	-135.18		-163.39
GRAVITY.	SV055	47 7.11	-113 29.10	4095.0	MT	980404.46	-980810.65	1.32	384.69	-140.95		-160.83
GRAVITY.	SV056	47 6.79	-113 30.50	4128.0	MT	980400.32	-980810.17	1.05	388.09	-142.08		-162.79
GRAVITY.	SV057	47 4.53	-113 31.55	4848.0	MT	980359.26	-980806.77	1.38	455.75	-166.74		-158.12
GRAVITY.	SV058	47 5.33	-113 28.91	4718.0	MT	980367.51	-980807.97	1.09	443.54	-162.29		-158.12
GRAVITY.	SV059	47 4.60	-113 27.11	4443.0	MT	980381.16	-980806.87	0.95	417.69	-152.87		-159.94
GRAVITY.	SV060	47 3.84	-113 24.67	4041.0	MT	980402.15	-980805.73	1.25	379.91	-139.09		-161.51
GRAVITY.	SV061	47 2.13	-113 24.99	4001.0	MT	980402.79	-980803.15	0.86	376.15	-137.72		-161.07
GRAVITY.	SV062	47 3.04	-113 28.07	4640.0	MT	980368.05	-980804.52	0.74	436.21	-159.62		-159.14
GRAVITY.	SV063	47 3.51	-113 29.86	4864.0	MT	980355.63	-980805.23	0.96	457.26	-167.29		-158.67
GRAVITY.	SV064	47 0.11	-113 23.72	3885.0	MT	980406.77	-980800.11	0.40	365.25	-133.74		-161.03
GRAVITY.	SV065	47 1.02	-113 27.28	4566.0	MT	980367.93	-980801.48	0.65	429.25	-157.09		-160.74
GRAVITY.	SV066	47 1.48	-113 29.89	4718.0	MT	980360.69	-980802.18	0.86	443.54	-162.29		-159.38
GRAVITY.	LINCBASE				MT	980347.35		0.00				
GRAVITY.	LINCBASE				MT	980347.35		0.00				
GRAVITY.	SV067	46 56.54	-112 56.77	4314.0	MT	980374.51	-980794.74	4.57	405.57	-148.45		-158.54
GRAVITY.	SV068	46 57.91	-112 58.13	4320.0	MT	980367.05	-980796.80	2.88	406.14	-148.66		-169.39
GRAVITY.	SV069	46 59.01	-112 59.88	4217.0	MT	980362.85	-980798.46	0.76	396.45	-145.13		-183.53
GRAVITY.	SV070	47 0.02	-113 2.13	4159.0	MT	980374.73	-980799.98	0.74	391.00	-143.14		-176.65

BOUGUER GRAVITY DATA

SWAN VALLEY

STATION IDENTIFICATION	LATITUDE	LOCATION LONGITUDE	ELEV.	ST.	OBSERVED GRAVITY	STD. GRV.	TERRAIN	CORRECTIONS FREE-AIR	BOUGUER	SPECIAL	BOUGUER ANOMALY	SPEC FIEL
GRAVITY. SV071	47 0.00	-113 4.10	4270.0	MT	980371.57	-980801.27	0.70	402.19	-147.22		-174.03	
GRAVITY. SV072	47 1.22	-113 6.43	4207.0	MT	980382.73	-980801.79	0.84	395.51	-144.78		-167.49	
GRAVITY. SV073	47 1.51	-113 8.00	4106.0	MT	980385.96	-980802.22	0.89	384.02	-141.32		-170.67	
GRAVITY. SV074	47 2.51	-113 10.50	4056.0	MT	980393.77	-980803.73	0.79	381.32	-139.61		-167.46	
GRAVITY. SV075	47 1.96	-113 13.49	3983.0	MT	980402.65	-980802.90	0.76	374.46	-137.11		-162.14	
GRAVITY. SV076	47 1.83	-113 16.31	3934.0	MT	980406.00	-980802.70	1.07	369.45	-135.42		-161.20	
GRAVITY. SV077	47 1.49	-113 18.24	3874.0	MT	980407.76	-980802.19	1.46	364.22	-133.37		-162.12	
GRAVITY. SV078	47 0.74	-113 19.53	3866.0	MT	980407.29	-980801.06	1.28	363.46	-133.09		-162.12	
GRAVITY. SV079	47 0.44	-113 21.29	3845.0	MT	980410.25	-980800.61	0.77	361.49	-132.37		-160.47	
GRAVITY. SV080	47 0.15	-113 22.24	3838.0	MT	980408.99	-980800.17	0.67	360.83	-132.13		-161.61	
GRAVITY. SV081	46 59.70	-113 23.33	3822.0	MT	980407.62	-980799.50	0.59	359.33	-131.58		-163.54	
GRAVITY. SV082	46 58.25	-113 24.49	3872.0	MT	980405.83	-980797.31	0.59	364.03	-133.30		-160.16	
GRAVITY. SV083	46 56.69	-113 25.85	3711.0	MT	980412.48	-980794.97	0.57	344.89	-127.78		-160.61	
GRAVITY. SV084	46 54.65	-113 26.23	3615.0	MT	980401.02	-980791.90	0.51	358.67	-131.34		-163.04	
GRAVITY. SV085	46 53.34	-113 27.60	4155.0	MT	980381.12	-980789.92	0.26	390.63	-143.00		-160.91	
GRAVITY. SV086	46 56.75	-113 29.58	3661.0	MT	980417.34	-980795.06	0.83	344.20	-126.06		-158.75	
GRAVITY. SV087	46 56.75	-113 27.98	3725.0	MT	980412.63	-980795.06	0.57	350.21	-128.26		-159.91	
GRAVITY. SV088	46 56.98	-113 22.63	3753.0	MT	980406.81	-980795.40	1.11	352.84	-129.22		-163.86	
GRAVITY. SV089	46 55.00	-113 24.45	3748.0	MT	980401.80	-980792.42	0.82	352.37	-129.04		-166.47	
GRAVITY. LINCHASE				MT	980347.35		0.00					
GRAVITY. LINBASE				MT	980347.35		0.00					
GRAVITY. SV090	46 55.19	-113 1.01	4287.0	MT	980355.53	-980792.71	0.41	403.03	-147.53		-181.27	
GRAVITY. SV091	46 55.12	-113 3.55	4316.0	MT	980351.83	-980792.60	0.43	405.76	-148.52		-183.10	
GRAVITY. SV092	46 55.99	-113 6.26	4311.0	MT	980366.51	-980793.91	0.46	405.29	-148.35		-149.80	
GRAVITY. SV093	46 57.27	-113 5.45	4343.0	MT	980365.56	-980795.84	0.52	408.30	-149.45		-170.91	
GRAVITY. SV094	46 58.65	-113 5.27	4135.0	MT	980377.95	-980797.92	0.82	388.78	-142.32		-172.72	
GRAVITY. SV095	46 55.12	-112 58.30	4309.0	MT	980352.20	-980792.60	0.56	405.10	-148.28		-183.02	
GRAVITY. SV096	46 53.17	-112 56.20	4344.0	MT	980341.82	-980789.67	0.75	408.39	-149.48		-188.19	
GRAVITY. SV097	46 51.67	-112 54.75	4365.0	MT	980347.44	-980787.41	1.26	410.36	-150.20		-183.55	
GRAVITY. SV098	46 50.17	-112 53.77	4410.0	MT	980354.90	-980785.15	1.76	414.59	-151.74		-165.64	
GRAVITY. SV099	47 49.66	-112 52.33	4441.0	MT	980357.98	-980784.62	11.11	417.50	-152.80		-240.63	
GRAVITY. SV100	46 48.40	-112 48.82	4554.0	MT	980344.16	-980782.48	2.92	426.13	-156.68		-163.95	
GRAVITY. SV101	46 50.88	-112 58.93	4378.0	MT	980348.10	-980786.22	0.66	411.59	-150.64		-176.51	
GRAVITY. SV102	46 49.61	-113 0.63	4459.0	MT	980351.28	-980784.31	0.82	419.20	-153.42		-166.43	
GRAVITY. SV103	46 48.16	-113 3.59	4561.0	MT	980341.82	-980782.12	0.79	428.78	-156.91		-167.64	
GRAVITY. SV104	46 45.60	-113 4.73	4742.0	MT	980326.08	-980776.27	0.91	445.80	-163.11		-168.59	
GRAVITY. SV105	46 42.81	-113 5.07	4990.0	MT	980308.75	-980774.06	0.83	469.10	-171.00		-166.98	
GRAVITY. SV106	46 38.97	-113 7.16	3992.0	MT	980359.76	-980768.28	1.09	375.31	-137.41		-169.53	
GRAVITY. LINCHASE				MT	980347.35		0.00					
GRAVITY. LINBASE				MT	980347.35		0.00					
GRAVITY. SV107	47 14.21	-113 33.38	4091.0	MT	980403.95	-980821.33	1.79	384.61	-140.81		-171.79	

SWAN VALLEY

BOUGUER GRAVITY DATA

STATION IDENTIFICATION		LATITUDE	LOCATION LONGITUDE	ELEV.	ST.	UNCORRECTED GRAVITY	STD. ENV.	TERRAIN	CORRECTIONS FREE-AIR	BOUGUER	SPECIAL	BOUGUER ANOMALY
GRAVITY.	SV108	47 11.51	-113 32.10	4039.0	MT	980404.64	-980017.27	1.22	379.72	-139.03		-170.72
GRAVITY.	SV109	47 12.03	-113 33.83	4185.0	MT	980400.94	-980018.05	1.65	393.44	-144.03		-166.01
GRAVITY.	SV110	47 11.43	-113 30.47	4685.0	MT	980374.32	-980017.13	1.45	440.44	-161.16		-162.10
GRAVITY.	SV111	47 10.16	-113 31.24	4190.0	MT	980399.81	-980015.24	1.21	393.91	-144.20		-164.51
GRAVITY.	SV112	47 10.11	-113 33.27	4390.0	MT	980390.83	-980015.16	1.33	412.71	-151.06		-161.35
GRAVITY.	SV113	47 6.38	-113 37.17	4879.0	MT	980360.97	-980009.55	2.13	454.57	-167.77		-155.65
GRAVITY.	SV114	47 6.88	-113 33.64	4217.0	MT	980396.64	-980010.30	1.67	396.45	-145.13		-160.67
GRAVITY.	SV115	47 9.58	-113 26.14	4189.0	MT	980394.71	-980014.37	1.26	393.82	-144.17		-168.75
GRAVITY.	SV116	47 2.91	-113 21.96	4581.0	MT	980384.22	-980004.33	0.55	430.46	-157.60		-146.50
GRAVITY.	SV117	47 3.71	-113 17.51	4082.0	MT	980397.43	-980005.53	0.90	383.76	-140.50		-163.94
GRAVITY.	SV118	47 3.42	-113 7.75	4197.0	MT	980382.21	-980005.10	1.07	394.57	-144.44		-171.69
GRAVITY.	SV119	47 5.00	-113 6.55	4584.0	MT	980363.02	-980007.48	1.80	430.94	-157.70		-169.42
GRAVITY.	SV120	47 1.21	-112 59.10	4259.0	MT	980367.72	-980001.77	1.10	400.40	-146.57		-179.12
GRAVITY.	SV121	47 1.20	-112 56.66	4318.0	MT	980384.99	-980001.76	1.65	405.95	-148.59		-157.76
GRAVITY.	SV122	47 2.94	-112 55.28	4390.0	MT	980374.08	-980004.37	2.79	412.71	-151.06		-163.65
GRAVITY.	SV123	47 3.23	-112 53.43	4785.0	MT	980356.61	-980004.01	6.75	449.83	-164.59		-156.21
GRAVITY. LINCBASE					MT	980347.35		0.00				
GRAVITY. LINCBASE					MT	980347.35		0.00				
GRAVITY.	SV124	47 3.98	-112 57.12	4450.0	MT	980379.81	-980005.94	3.17	418.35	-153.11		-157.72
GRAVITY.	SV125	47 2.78	-112 57.81	4400.0	MT	980373.68	-980004.13	1.67	413.65	-151.40		-166.53
GRAVITY.	SV126	47 1.23	-113 1.48	4200.0	MT	980375.77	-980001.80	0.99	394.86	-144.55		-174.73
GRAVITY.	SV127	47 2.74	-113 4.75	4459.0	MT	980369.77	-980004.07	1.03	419.20	-153.42		-167.49
GRAVITY.	SV128	47 2.84	-113 2.57	4460.0	MT	980367.81	-980001.22	1.46	419.29	-153.46		-169.12
GRAVITY.	SV129	47 4.78	-113 8.60	4210.0	MT	980385.29	-980007.14	1.56	395.40	-146.89		-169.36
GRAVITY.	SV130	47 7.09	-113 8.71	4130.0	MT	980394.30	-980010.62	3.68	388.27	-142.15		-161.52
GRAVITY.	SV131	47 6.31	-113 8.85	4145.0	MT	980396.79	-980009.45	2.97	389.69	-142.66		-162.66
GRAVITY.	SV132	46 59.56	-113 12.47	4307.0	MT	980381.42	-980799.29	1.97	404.91	-148.21		-159.20
GRAVITY.	SV133	46 59.13	-113 9.83	4075.0	MT	980397.04	-980798.64	2.31	383.11	-140.26		-154.44
GRAVITY. LINCBASE					MT	980347.35		0.00				
GRAVITY. LINCBASE					MT	980347.35		0.00				
GRAVITY.	SV134	46 56.86	-113 1.25	4298.0	MT	980347.49	-980795.22	0.43	404.07	-147.90		-191.13
GRAVITY.	SV135	46 56.44	-113 7.79	4405.0	MT	980371.04	-980794.59	1.93	414.12	-151.57		-159.07
GRAVITY.	SV136	46 53.17	-113 5.24	4410.0	MT	980359.82	-980789.67	1.73	414.59	-151.74		-165.27
GRAVITY.	SV137	46 52.43	-113 1.70	4289.0	MT	980360.11	-980786.55	0.59	403.22	-147.60		-172.23
GRAVITY.	SV138	46 51.61	-112 56.90	4350.0	MT	980342.77	-980787.32	0.74	408.95	-149.69		-184.55
GRAVITY. LINCBASE					MT	980347.35		0.00				

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