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GRAVITY SURVEY

ON THE

NEWBERRY PROJECT

DESCHUTES COUNTY, OREGON

FOR

DAVENPORT RESOURCES LLC.

DATA ACQUISITION REPORT

ISSUE DATE: January 6, 2010

ZONGE JOB # 10016

ZONGE GEOSCIENCES INC.

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Sparks, Nevada 89431

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LIST OF PLATES

Located in back pocket of report

GRAVITY SURVEY

ON THE

NEWBERRY PROJECT

INTRODUCTION

Zonge Geosciences, Inc. performed a Gravity survey on the Newberry Project, located in Deschutes County, Oregon for Davenport Resources LLC. The survey was conducted during the period of 13 October 2010 to 30 October 2010.

The survey area is located in R11-14E; T20-22S, and lies within the Paulina Peak, Lava Cast Forest, Finley Butte, Anns Butte, Fuzztail Butte, East Lake, Evans Well, and China Hat, Oregon 1:24000 topographic sheets. Gravity data were acquired for a total of 343 original stations at various intervals along roads, and along one cross-country traverse by foot. Station locations are shown in Figure 1.

This survey was conducted by Grady Pearce, Geophysicist for Zonge Geosciences, under Zonge job number 10016. Zonge job number 10016 was performed in addition to Zonge job number 2006.103, which was conducted during the period of 16 October 2006 to 8 November 2006, where 438 original stations were acquired.

In addition, Zonge acquired 126 gravity stations for Ormat Nevada, Inc. under Zonge job number 10194. These stations have been incorporated into the data-set resulting in a total of 907 gravity stations.

This report covers data acquisition, instrumentation and processing for job number 10016.

INSTRUMENTATION

Gravity data were acquired using LaCoste & Romberg (L&R) Model-G gravimeters, serial numbers 233 and 735. These L&R gravity meters have a reading resolution of .01 milligals and a typical repeatability of .01 milligals. Specifications for this instrument are included in Appendix B.

Positioning was obtained with Leica Geosystems model VIVA GS15 GPS/GLONASS receivers. These are survey-grade receivers capable of centimeter-level accuracy. GPS/GLONASS receiver specifications are included in Appendix C.

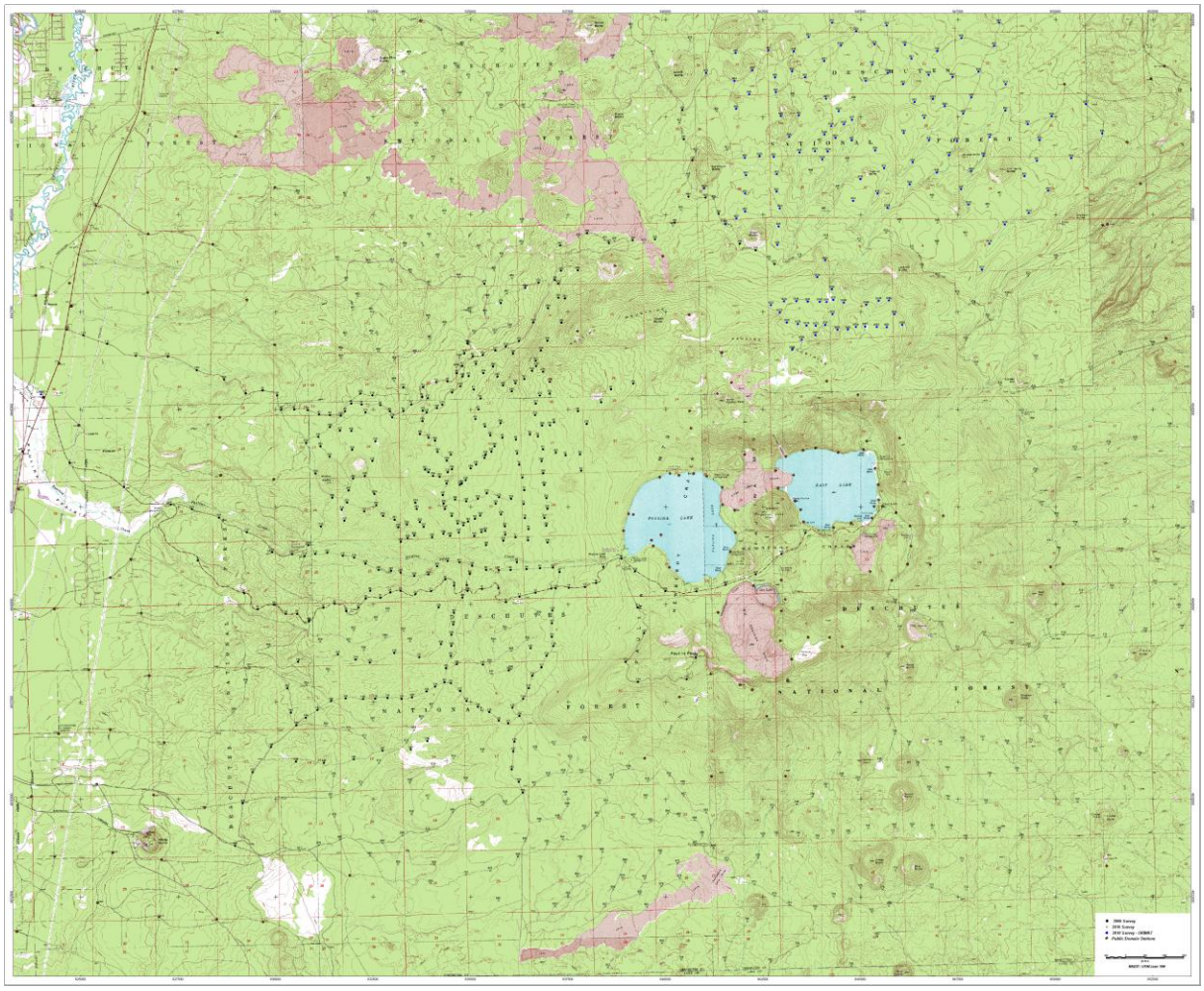


Figure 1: *Station location map.*

DATA ACQUISITION

GPS DATA

Carrier-phase GPS data were acquired for four to six minute sessions at each station during simultaneous acquisition at a fixed GPS base station. Real Time Kinematic (RTK) mode was used to acquire GPS data for this survey. Operation in RTK mode allowed for on-site evaluation of positioning solution quality and stake out. At locations where radio reception was lost, GPS observations were made for five to eight minute occupations. A discussion of positioning quality is given under the section titled Data Quality, GPS.

Four GPS base stations were used over the course of this survey (Carey, 1000, 2000, 3000). The National Geodetic Survey Control classifies "CAREY", PID PB0670, as a first-order horizontal and vertical control point. GPS base station 1000 was established by a 20 minute static observation. This static observation was post processed with respect to the Carey reference station. GPS base 3000 was established by a 25 minute static observation. This static observation was post processed with respect to reference station 2000.

The position of base station 2000 was determined by submitting a 7 hour occupation of this point to the National Geodetic Survey (NGS) On-line Positioning User Service (OPUS). OPUS processed this observation file with respect to 3 Continuously Operating Reference Stations (CORS).

Control point specifications are listed in Appendix D.

GRAVITY DATA

Gravity measurements were made in a series of looped-traverses that were closed within a maximum of ten hours. At least two measurements were made at each occupation.

Four gravity base stations were used for this survey. The gravity value for base station "Carey" was determined from two loop-traverses to the US Department of Defense absolute gravity base at the City Hall building in Oakridge, Oregon (DoD 4612-1). Three local base station (1000, 2000, and 3000) gravity values were determined by a minimum of two loop-traverses to "Carey".

A list of the gravity values and positions for these bases are shown in Appendix E.

DATA QUALITY

The average loop closure for the local survey was 0.016 milligals for the LaCoste & Romberg Model-G meter. Individual loop closures are tabulated in Appendix F.

Gravity measurement precision is evaluated by making repeat readings at selected gravity stations. For this survey, 34 gravity measurements were repeated. The average difference between repeat measurements is 0.022 milligals, and the maximum difference is 0.078 milligals. Three repeat gravity measurements were made between the 2006 and the 2010 surveys, and two repeat measurements were made between job numbers 10016 and 10194. Repeated gravity measurements are tabulated in Appendix G.

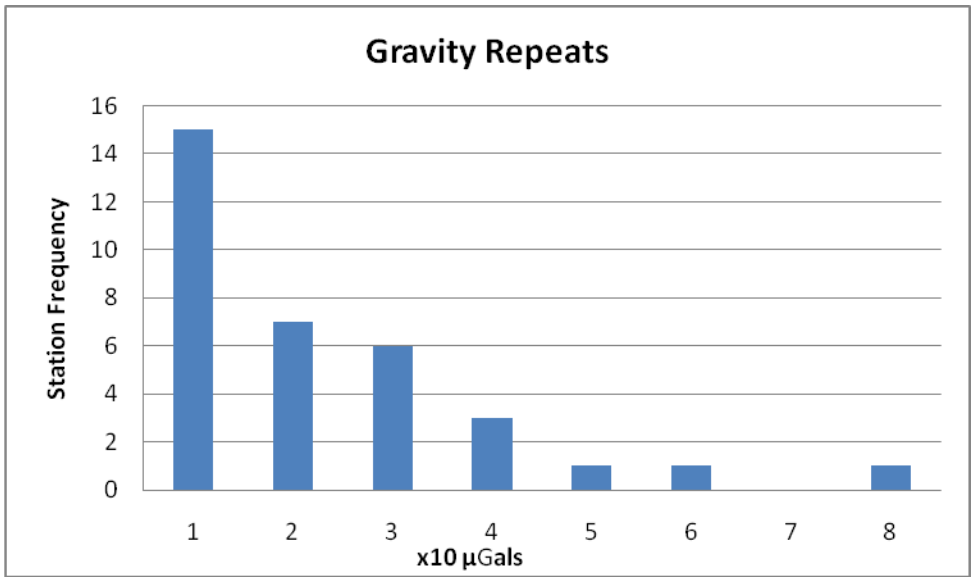


Figure 2: *Histogram of Gravity Repeats*

An important factor that determines the accuracy of the reduced measurement is the accuracy in determining a station's location, particularly the elevation. The vertical gradient of the earth's field is approximately -.308596 milligals per meter of increase in elevation. The Bouguer correction is .1119 milligals per meter of elevation increase, for a density of 2.67 gm/cc. This results in a total error in the Bouguer Anomaly of .1967 milligals per meter of elevation error, for a reduction density of 2.67 gm/cc.

GPS positioning precision is evaluated by making repeated GPS measurements at randomly selected stations. Comparison of 34 duplicate GPS measurements that were made over a range of field conditions and baseline lengths, show a maximum elevation difference of 1.16 meters. The Forest Canopy over the survey area caused high positioning errors for this survey. A tabulation of repeated GPS measurements is presented in Appendix G.

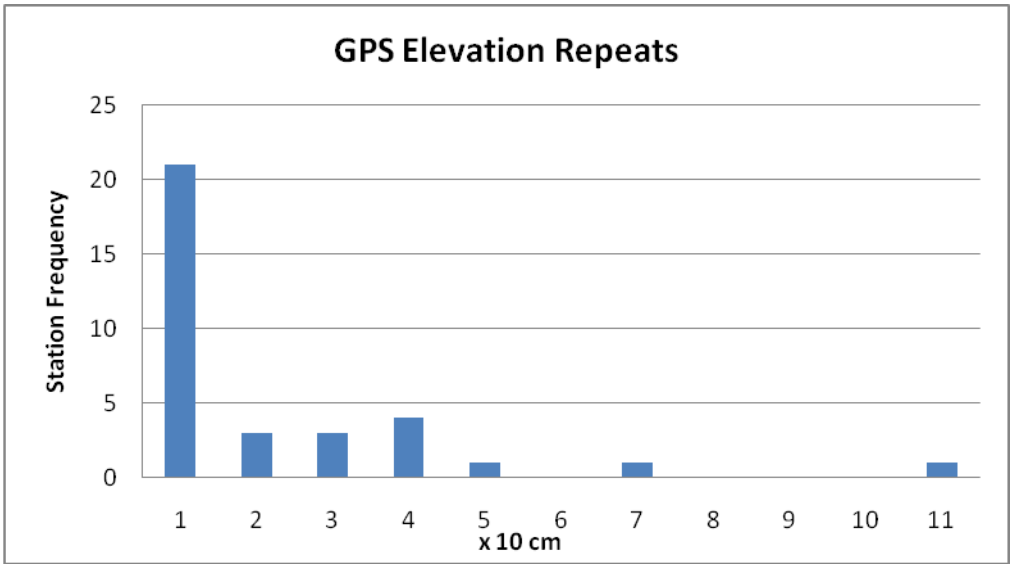


Figure 3: *Histogram of GPS Repeats*

DATA PROCESSING

GPS PROCESSING

Locations of the gravity stations were determined as baselines from the GPS base in WGS-84 coordinates and ellipsoidal heights. The Real Time Kinematic (RTK) solutions were used where available. Where RTK solutions were not available, the GPS observations were processed after data acquisition (post-processing) using Leica Geo-Office™ software. Stations that required post-processing are noted in the data files with a "PP" designation for the class.

The WGS84 ellipsoidal heights were converted to geoidal (orthometric) heights in the NAVD88 datum using the NGS program, GEOID 2009, and converted to the NGVD29

datum using the NGS program, VertCon version 2.0. Station coordinates were converted to the NAD27 horizontal datum to use with UTM Zone 10 metric coordinates as shown on 7.5' USGS maps.

GRAVITY PROCESSING

The basic processing of gravimeter readings to calculate the observed gravity was made using software from Geosoft LTD. of Toronto, Canada. The assigned gravity values for the local gravity base "CAREY" was established by two loop-traverses to DoD gravity base number, 4612-1, located at the City Hall building in Oakridge, Oregon .

The observed gravity is the gravitational acceleration, in milligals, that is determined by relative measurements made in a loop from a gravity base, after the meter readings have been corrected for instrument height, instrument scale factor, instrument drift and earth tides.

The long-term instrument drift is the rate at which each particular instrument accumulates error due to instrument factors such as vibration, battery voltage changes, and elastic relaxation, among others. It is minimized by proper technique, and warm up of the instrument.

Earth tides cause variations in observed gravity for land-based surveys of up to approximately .03 milligals per hour (Siegel, 1995). Corrections are computed by use of pre-programmed theoretical tide tables that are a part of the Geosoft™ gravity reduction software. The effect of earth tides can be further minimized by frequently tying loops to local gravity bases (Butler, 1991).

The observed gravity is a function of position (geographic latitude and elevation) and variations in the density of the subsurface material. A series of reductions are made to remove the gravity variation caused by position so that the gravity variations caused by subsurface density distribution remain.

A latitude correction must be made to the observed gravity measurements because the earth is not spherical, but has a slightly larger radius at the equator. It includes terms for both the Newtonian attraction of the earth as a flattened spheroid and the centrifugal force caused by the earth's rotation (Siegel, 1994). The latitude correction is calculated for the

International Ellipsoid of 1967 (International Association of Geodesy, 1971).

$$g_\phi = g_a(1 + f_2 \sin^2\phi + f_4 \sin^4\phi)$$

where:

g_ϕ = Latitude correction (gravity reference field on the ellipsoid).

ϕ = Latitude of the gravity observation.

$$f_2 = -f + \frac{5}{2}m + \frac{1}{2}f^2 - \frac{26}{7}fm + \frac{15}{4}m^2$$

$$f_4 = -\frac{1}{2}f^2 + \frac{5}{2}fm$$

$$m = \omega^2 a^2 b/(kM) = 3.44980143430 \times 10^{-3}$$

$$f = (a-b)/a = 1/298.24716742$$

a= Semi-major axis of the ellipsoid = 6378160 meter

b= Semi-minor axis of the ellipsoid = 6356775 meters

ω = Angular velocity of the Earth

M= Mass of the Earth

k= Newton's gravitational constant

The elevation correction has two parts: the free air correction and the Bouguer correction. The free air correction compensates for the variation of the earth's gravitational field with distance away from the center of the earth. The approximate and often-used correction is -0.308596 milligals per meter above the ellipsoid. In practice this is usually referenced to the Geoid due the fact that until recent advent of GPS technology, elevations were derived by leveling, which are by their nature, referenced to the Geoid. For this survey all elevations are referenced to the Geoid by use of the Geoid09 model.

The free air correction is calculated using the following formula:

$$\Delta g_{fa} = g_a - g_1 h_s + g_2 h_s^{\,2} - g_l$$

where,

$$g_1 = .308768 - 0.00043986\sin^2\phi$$

$$g_2 = 7.212x10^{-8}$$

g_{fa} = free air anomaly in milligals

g_a = observed gravity

g_l = latitude correction

h_s = station elevation in meters

The Bouguer correction compensates for the mass of material located between the station elevation and the Geoid (mean sea level). The Bouguer correction is calculated on the basis of the gravitational attraction of a horizontal slab of infinite extent whose thickness is equal to the elevation difference between the stations of interest and mean sea level:

$$g_{ba} = g_{fa} - 0.0419088*[\rho h_s]$$

where,

g_{ba} = Simple Bouguer anomaly in milligals

g_{fa} = free air anomaly

ρ = density of rock

The Complete Bouguer Anomaly includes those corrections found in the Simple Bouguer Anomaly, as well as, corrections for the effect of the surrounding topography and the curvature of the earth (Bullard B correction).

$$g_{cba} = g_{ba} + g_{BB} + g_{tc}$$

The Bullard B correction is used to correct for the fact that the mass of rock between the Geoid and the station elevation is a spherical shell as opposed to an infinite horizontal slab. The correction used by Zonge Geosciences is based on the formula given by LaFehr (1991):

$$g_{BB} = 2\pi k\rho(\mu h_s - \lambda R),$$

where

g_{BB} = Bullard B Correction

R = Earth radius to the station ($R_0 + h$, where R_0 is the earth's radius)

$2\pi k\rho$ is the simple Bouguer slab formula; μ and λ are dimensionless coefficients whose definitions are given in the appendix of LaFehr's 1991 paper.

Corrections for topography out to a radius of 16.6 meters from the station were calculated from field estimates of the average elevations for hammer zone B, which were made by the operator. The hammer zone corrections were made using software written by Geosoft Ltd of Toronto, Canada.

Corrections for the gravity effect of variable Terrain g_{tc} are made from digital elevation data. Terrain corrections for topography from 16.6 meters to 17 kilometer radius were made from National Elevation Dataset (NED) 1/3 Arc Second (9m) data using software (RASTERTC™) described by Cogbill (1990). This algorithm performs a surface fit from a user specified inner radius (16.6 m) out to a selected intermediate radius (17 km). Terrain corrections are computed for this interval using a numerical integration of the surface along radial lines at 6-degree increments. From the intermediate radius (17 km) out to an outer radius (167 km), terrain corrections are made using the approximation that each elevation represents the elevation of a rectangular compartment equal to the area of the elevation sample (cell size). The effect of each compartment is calculated using a line element formula.

Corrections from 17 km to 167 km were made using Shuttle Radar Topography Mission (SRTM) 2 Arc Second (~65m) digital terrain data. A curvature correction to the terrain model was computed at distances beyond 14 km.

Simple and Complete Bouguer gravity anomalies were computed for densities ranging from 2.00 gm/cm^3 to 2.67 gm/cm^3. If the density of the near-surface rocks differs from the reduction density, then an elevation dependent error will result. This error is approximately 1.25 microgals per foot for each 0.1 gm/cm^3 difference in density (Hinze, 1990). The density which minimizes the correlation between elevation and the reduced gravity is generally chosen as the reduction density for further processing and plotting. A principle fact file providing densities ranging from 2.00 gm/cm^3 to 2.67 gm/cm^3 is included on a DVD-ROM.

DATA PRESENTATION

Plan maps are provided as plates in the back pockets of this report. All plates are plotted at a scale of 1:48000 and registered in UTM Zone 10N, NAD27 datum. Plate 1

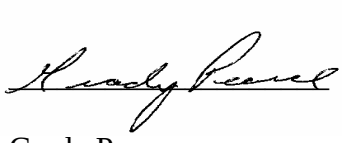
shows the locations of gravity stations on a topographic base. Plate 2 shows the Complete Bouguer Anomaly at a reduction density of 2.30 gm/cc. Plate 3 shows the Complete Bouguer Anomaly at a reduction density of 2.40 gm/cc. Plate 4 shows the Complete Bouguer Anomaly at a reduction density of 2.50 gm/cc. Plate 5 shows the Complete Bouguer Anomaly at a reduction density of 2.60 gm/cc. Plate 6 shows the horizontal gradient of the Complete Bouguer Anomaly at a reduction density of 2.30 gm/cc upward continued to 300 meters. Plate 7 shows the horizontal gradient of the Complete Bouguer Anomaly at a reduction density of 2.40 gm/cc upward continued to 300 meters. Plate 8 shows the horizontal gradient of the Complete Bouguer Anomaly at a reduction density of 2.50 gm/cc upward continued to 300 meters. Plate 9 shows the horizontal gradient of the Complete Bouguer Anomaly at a reduction density of 2.60 gm/cc upward continued to 300 meters. These plates are also included as page-size plots in Appendix A and as Arcview ™ tiff files on the Data DVD-ROM.

Digital data files are included on a DVD-ROM. A description of the DVD contents can be found in Appendix I.

SAFETY AND ENVIRONMENTAL ISSUES

No health, safety incidents or accidents occurred during the course of this survey. No environmental damage was sustained as a result of the survey progress. Vehicle travel was limited to existing roads during this survey.

Respectfully submitted,



Grady Pearce
Geophysicist
Zonge Geosciences, Inc.

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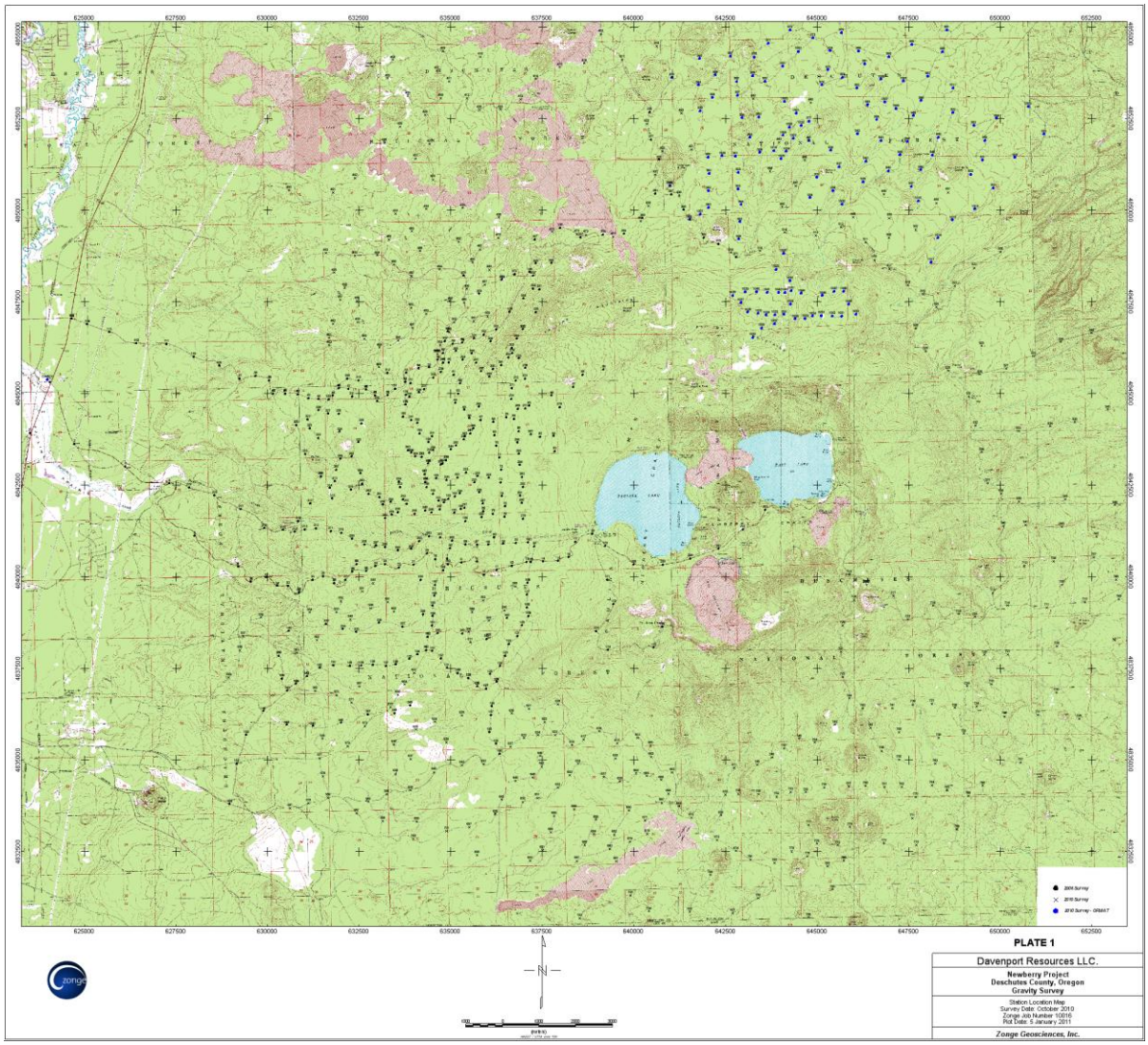
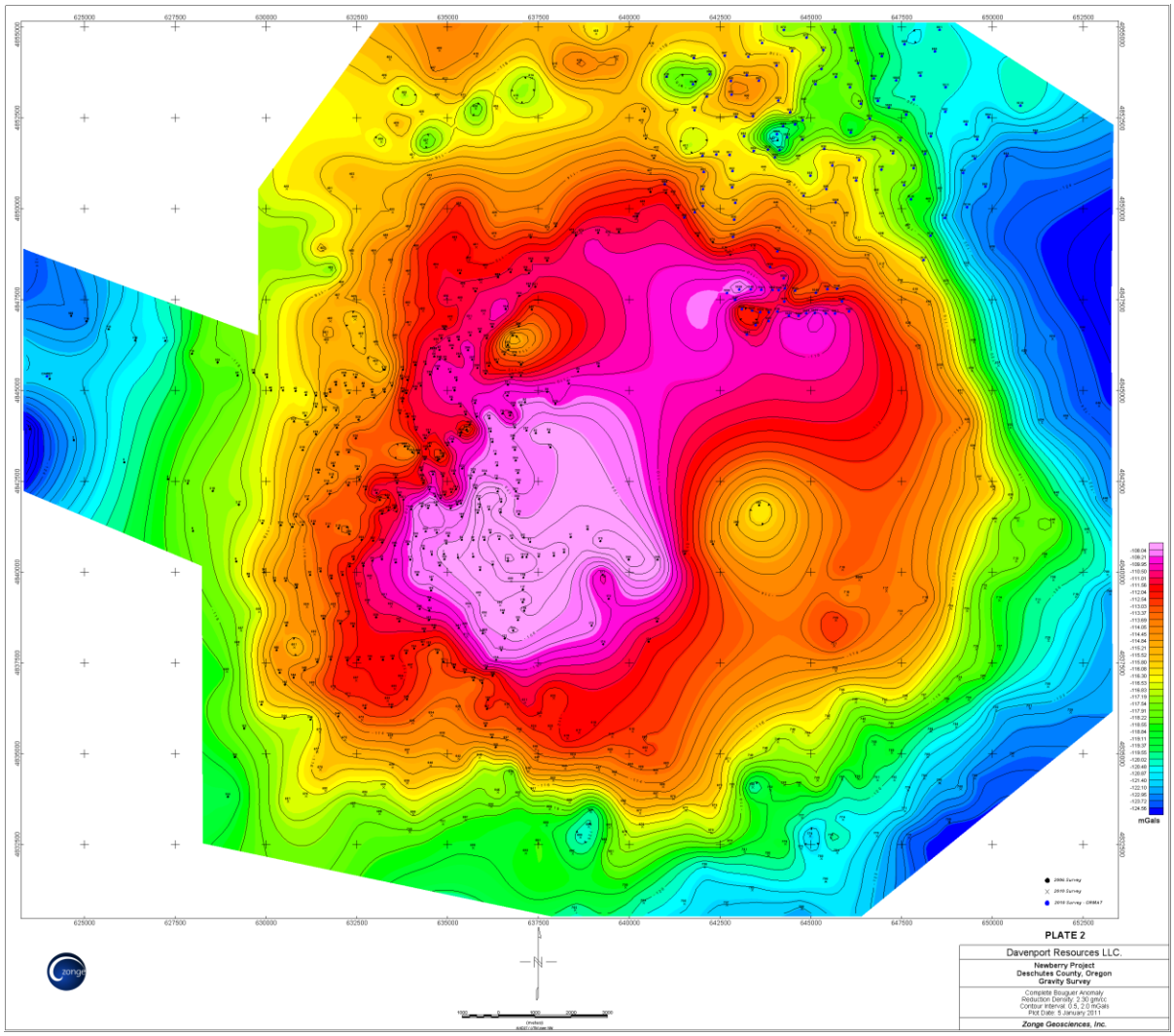
Hinze, W.J., 1990, The role of gravity and magnetic methods in engineering and environmental studies. In, Ward, S. H., ed. Geotechnical and Environmental Geophysics, Society of Exploration Geophysicists, Investigations in Geophysics, **5**, 75-126

LaFehr, T.R., 1991a, An exact solution for the gravity curvature (Bullard B) correction: Geophysics, **56**. 1179-1184.

Plouff, D., 1966, Digital terrain corrections based upon geographic coordinates (abstract): Geophysics, **31**, 1208.

APPENDIX A. PLATES AS FIGURES




625000
627500
630000
632500
635000
637500
640000
642500
645000
647500
650000
652500
mGals
2006 Survey
2010 Survey
2010 Survey - GRAV7
PLATE 2
Davenport Resources LLC.
Newberry Project
Deschutes County, Oregon
Gravity Survey
Complete Bouguer Anomaly
Reduction Density: 2.30 gm/cc
Contour Interval: 0.5, 2.0 mGals
Plot Date: 5 January 2011
Zonge Geosciences, Inc.

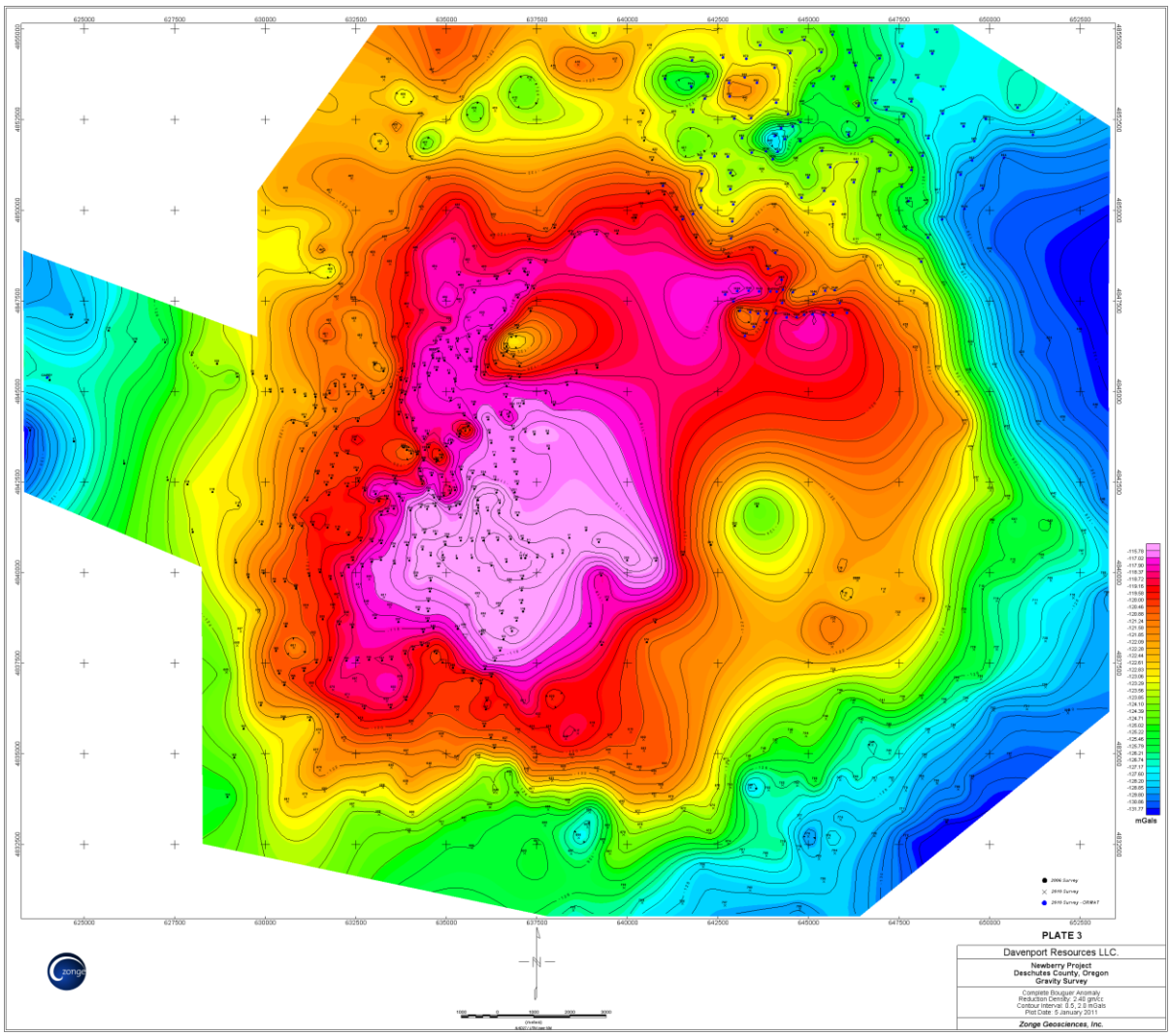


PLATE 3
Davenport Resources LLC.
Newberry Project
Deschutes County, Oregon
Gravity Survey
Complete Bouguer Anomaly
Reduction Density: 2.48 gm/cc
Contour Interval: 0.5, 2.5 mGals
Plot Date: 5 January 2011
Zonge Geosciences, Inc.
mGals

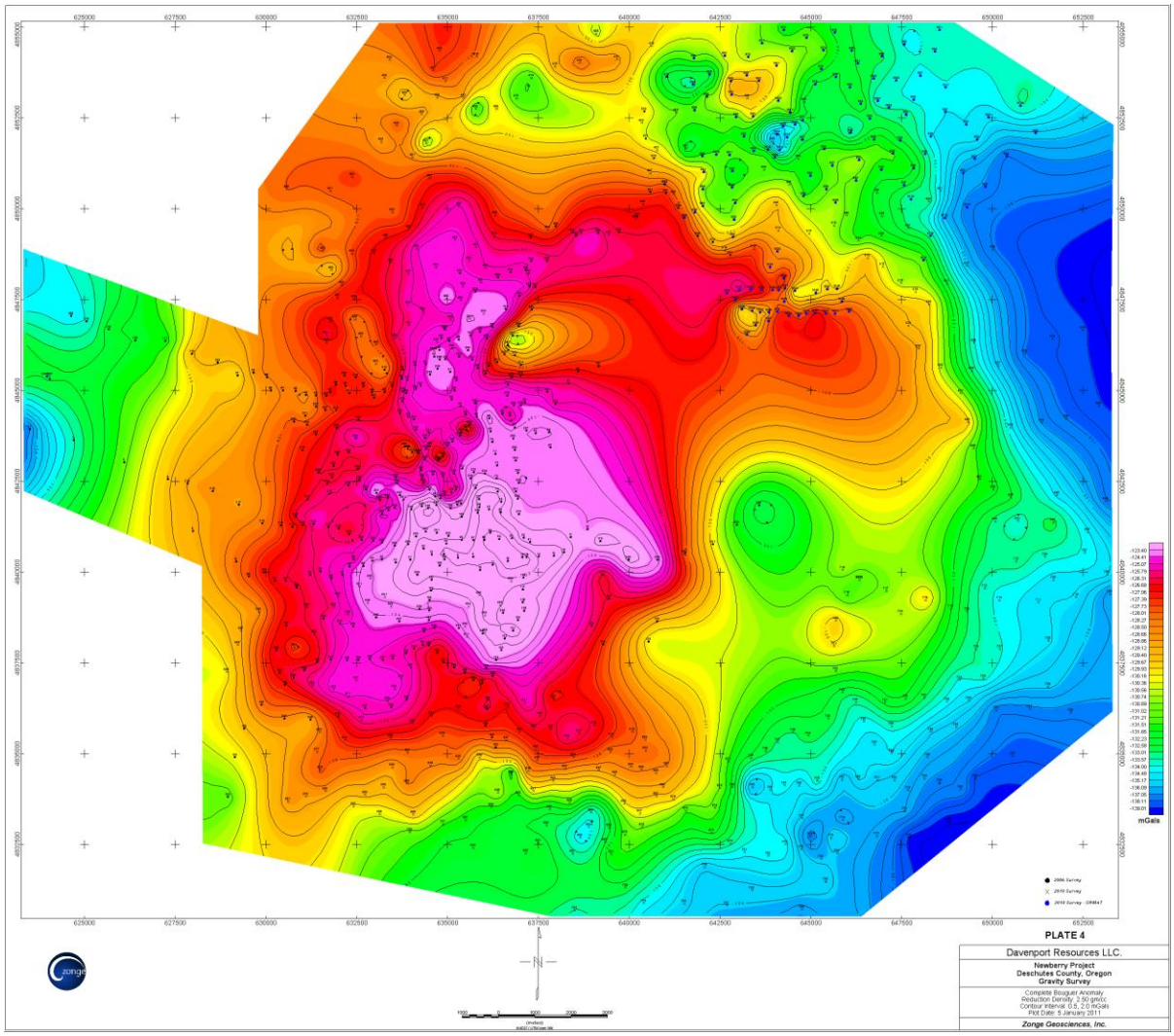


PLATE 4
Davenport Resources LLC.
Newberry Project
Deschutes County, Oregon
Gravity Survey
Complete Bouguer Anomaly
Reduction Density: 2.50 gm/cc
Contour Interval: 0.5, 2.0 mGals
Plot Date: 5 January 2011
Zonge Geosciences, Inc.
mGals

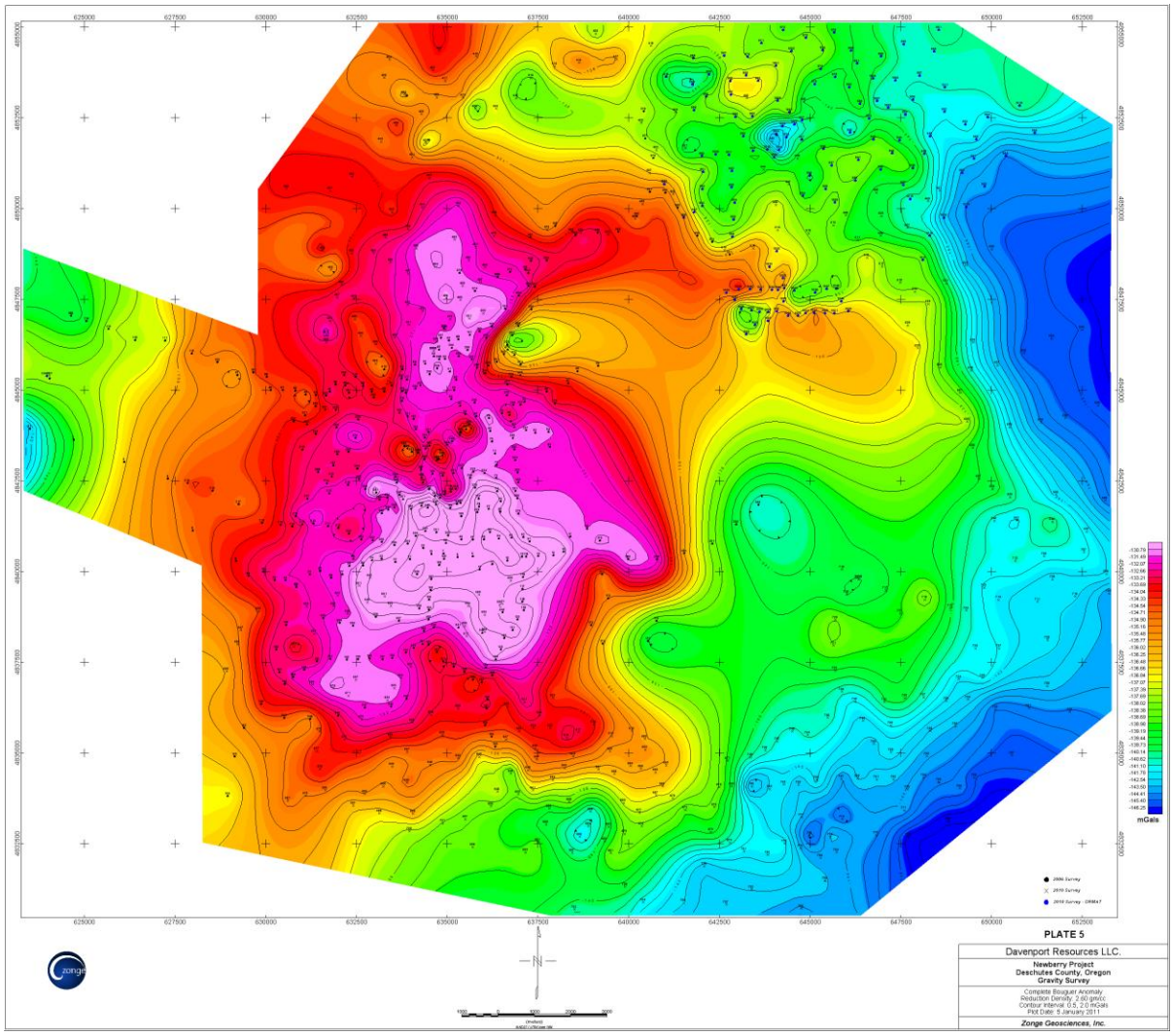


PLATE 5
Davenport Resources LLC.
Newberry Project
Deschutes County, Oregon
Gravity Survey
Zonge Geosciences, Inc.
mGals

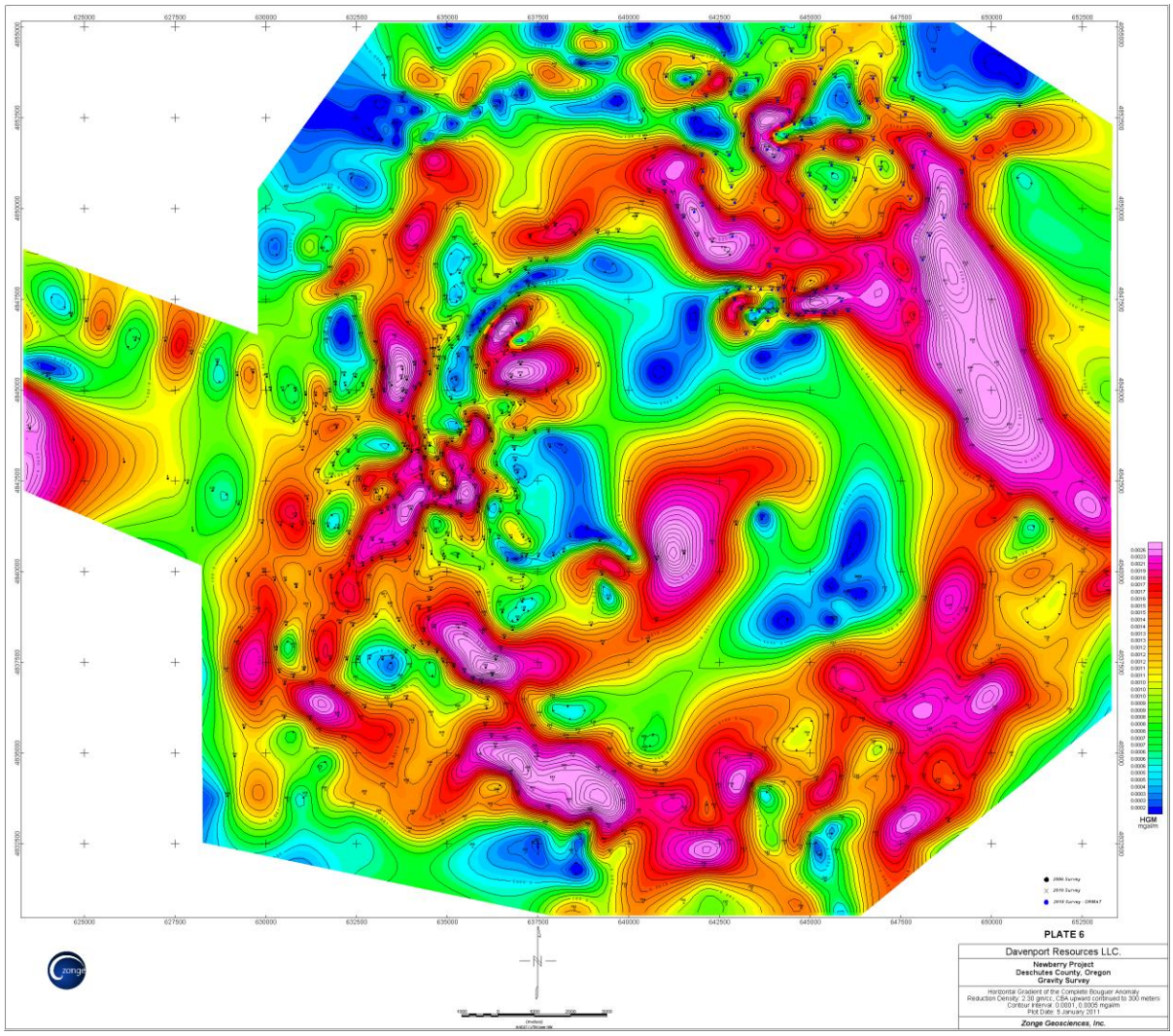


PLATE 6
Davenport Resources LLC.
Newberry Project
Deschutes County, Oregon
Gravity Survey
Horizontal Gradient of the Complete Bouguer Anomaly
Reduction Density: 2.30 gm/cc, CBA upward continued to 300 meters
Contour Interval: 0.0001, 0.0005 mgal/m
Plot Date: 5 January 2011
Zonge Geosciences, Inc.
HGM
mgal/m

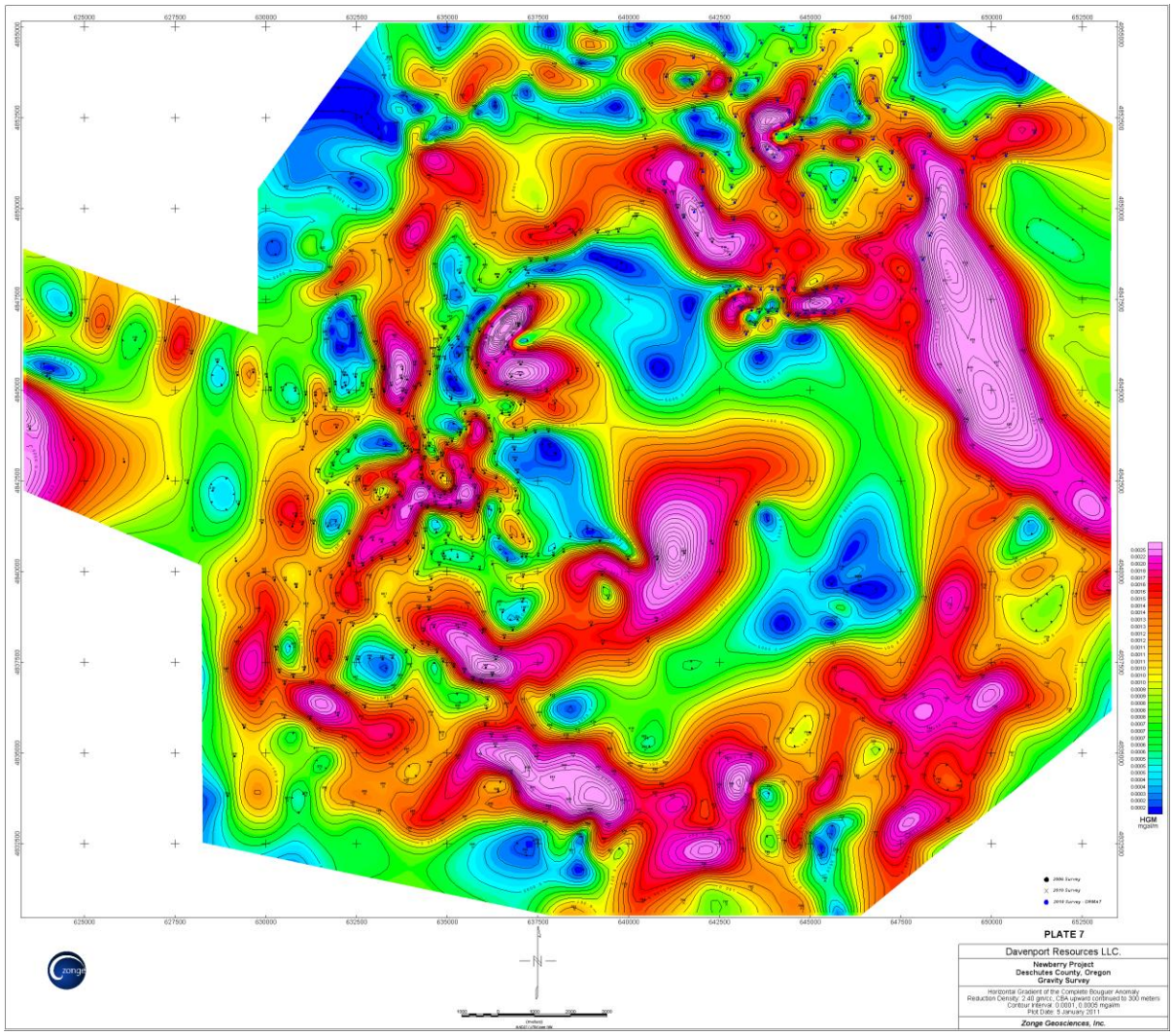
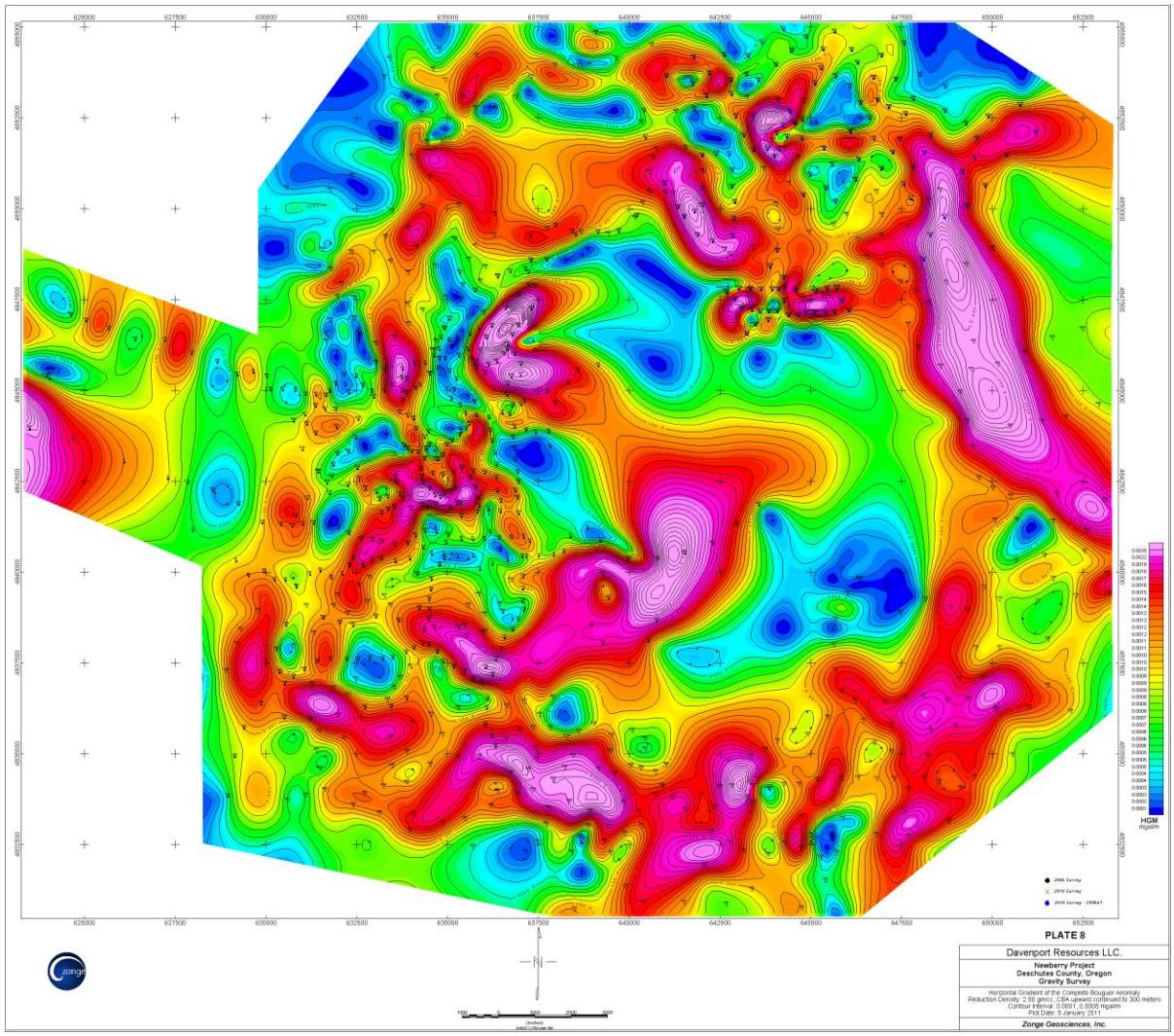


PLATE 7
Davenport Resources LLC.
Newberry Project
Deschutes County, Oregon
Gravity Survey
Horizontal Gradient of the Complete Bouguer Anomaly
Reduction Density: 2.40 gm/cc, CBA upward continued to 300 meters
Contour Interval: 0.0001, 0.0005 mgal/m
Plot Date: 5 January 2011
Zonge Geosciences, Inc.
HGM
mgal/m


HGM
mgal/m
PLATE 8
Davenport Resources LLC.
Newberry Project
Deschutes County, Oregon
Gravity Survey
Horizontal Gradient of the Complete Bouguer Anomaly
Reduction Density: 2.56 gm/cc, CBA upward continued to 300 meters
Contour Interval: 0.0001, 0.0005 mgal/m
Plot Date: 5 January 2011
Zonge Geosciences, Inc.

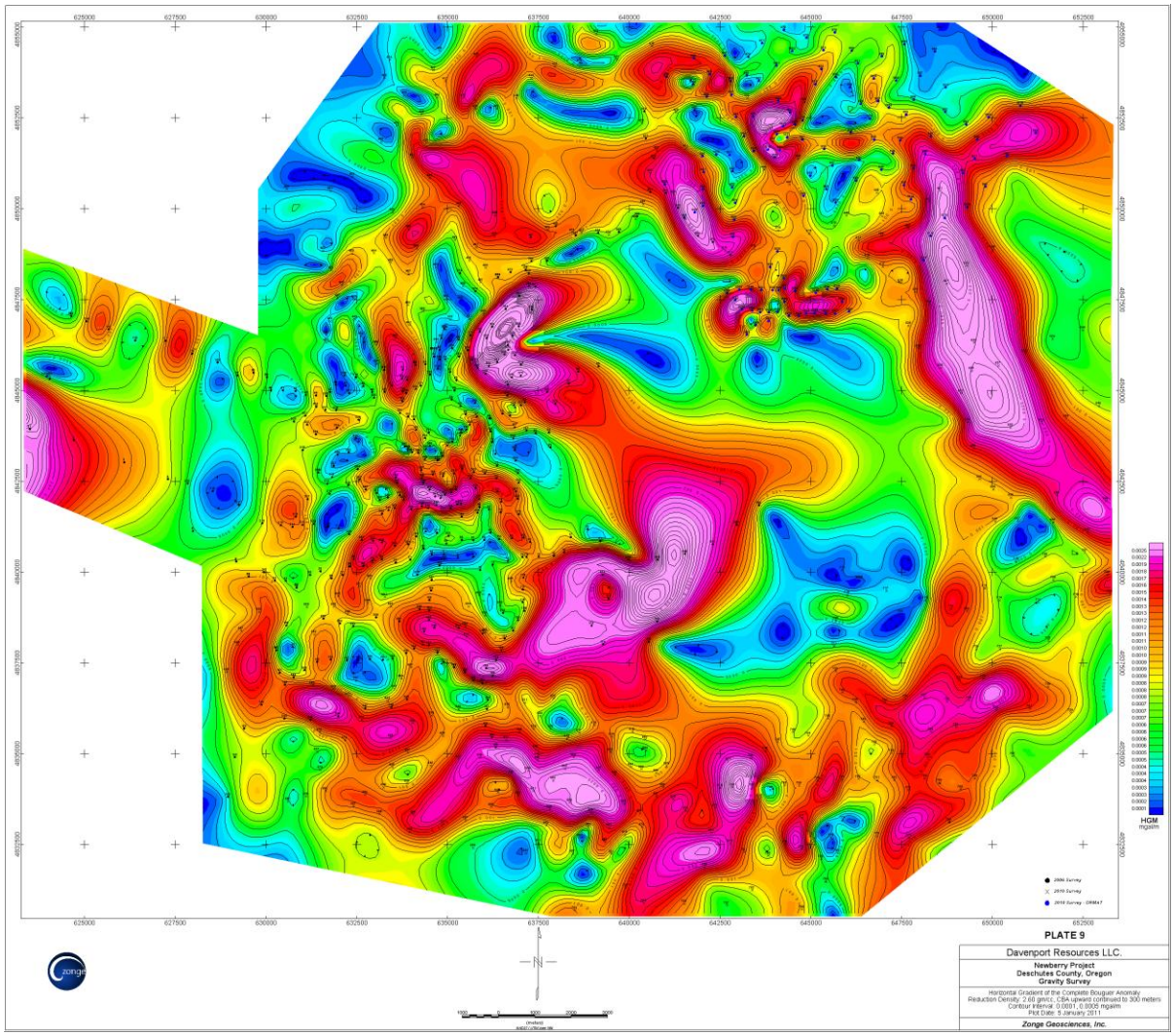


PLATE 9
Davenport Resources LLC.
Newberry Project
Deschutes County, Oregon
Gravity Survey
Horizontal Gradient of the Complete Bouguer Anomaly
Reduction Density: 2.60 gm/cc, CBA upward continued to 300 meters
Contour Interval: 0.0001, 0.0005 mgal/m
Plot Date: 5 January 2011
Zonge Geosciences, Inc.
HGM
mgal/m

APPENDIX B. GRAVITY METER SPECIFICATIONS

Range	7000 milligal
Accuracy	0.04 milligals
Drift	1 milligal per month or less
Repeatability	0.01 milligal
Length	7-3/4 inches (19.7 cm)
Width	7 inches (17.8 cm)
Height	9-7/8 inches (25.1 cm)
Weight	7 pounds (3.2 kg)
Weight of suitable battery	5 pounds (2.3 kg)
Weight of meter, battery, and case	22 pounds (10.0 kg)

LaCoste & Romberg Model-G Gravity Meter Specifications

TABLE I

Milligal Values for LaCoste & Romberg, Inc. Model G Gravity Meter # G-233

Counter Reading	Value in Milligals	Factor for Interval	Counter Reading	Value in Milligals	Factor for Interval
000	000	1.05537			
100	105.54	1.05526	3600	3797.67	1.05585
200	211.06	1.05516	3700	3903.26	1.05590
300	316.58	1.05506	3800	4008.85	1.05595
400	422.09	1.05497	3900	4114.44	1.05598
500	527.58	1.05487	4000	4220.04	1.05602
600	633.07	1.05478	4100	4325.64	1.05604
700	738.55	1.05470	4200	4431.24	1.05606
800	844.02	1.05463	4300	4536.85	1.05609
900	949.48	1.05456	4400	4642.46	1.05612
1000	1054.94	1.05451	4500	4748.07	1.05614
1100	1160.39	1.05447	4600	4853.69	1.05616
1200	1265.83	1.05443	4700	4959.30	1.05618
1300	1371.28	1.05442	4800	5064.92	1.05618
1400	1476.72	1.05442	4900	5170.54	1.05616
1500	1582.16	1.05443	5000	5276.15	1.05612
1600	1687.60	1.05445	5100	5381.77	1.05608
1700	1793.05	1.05447	5200	5487.37	1.05602
1800	1898.50	1.05452	5300	5592.98	1.05597
1900	2003.95	1.05457	5400	5698.57	1.05590
2000	2109.41	1.05463	5500	5804.16	1.05583
2100	2214.87	1.05468	5600	5909.75	1.05575
2200	2320.34	1.05475	5700	6015.32	1.05565
2300	2425.81	1.05482	5800	6120.89	1.05554
2400	2531.29	1.05488	5900	6226.44	1.05541
2500	2636.78	1.05496	6000	6331.98	1.05525
2600	2742.28	1.05504	6100	6437.51	1.05506
2700	2847.78	1.05512	6200	6543.01	1.05484
2800	2953.29	1.05518	6300	6648.50	1.05460
2900	3058.81	1.05526	6400	6753.96	1.05435
3000	3164.34	1.05534	6500	6859.39	1.05408
3100	3269.87	1.05542	6600	6964.80	1.05380
3200	3375.41	1.05550	6700	7070.18	1.05352
3300	3480.96	1.05560	6800	7175.53	1.05320
3400	3586.52	1.05570	6900	7280.85	1.05290
3500	3692.09	1.05577	7000	7386.14	

Note: Right hand wheel on counter indicates approximately 0.1 milligal.

DTH
3-16-70

Meter reading conversion for LaCoste & Romberg Model G, SN-233

TABLE 1

MILLIGAL VALUES FOR LACOSTE & ROMBERG, INC. MODEL G GRAVITY METER #G- 735

COUNTER READING*	VALUE IN MILLIGALS	FACTOR FOR INTERVAL	COUNTER READING*	VALUE IN MILLIGALS	FACTOR FOR INTERVAL
000	000.00	1.01246	3600	3646.41	1.01444
100	101.25	1.01226	3700	3747.85	1.01450
200	202.47	1.01213	3800	3849.30	1.01456
300	303.69	1.01204	3900	3950.76	1.01460
400	404.89	1.01199	4000	4052.22	1.01464
500	506.09	1.01196	4100	4153.68	1.01468
600	607.28	1.01196	4200	4255.15	1.01471
700	708.48	1.01198	4300	4356.62	1.01474
800	809.68	1.01201	4400	4458.10	1.01475
900	910.88	1.01206	4500	4559.57	1.01475
1000	1012.09	1.01212	4600	4661.05	1.01475
1100	1113.30	1.01218	4700	4762.52	1.01474
1200	1214.52	1.01224	4800	4864.00	1.01473
1300	1315.74	1.01231	4900	4965.47	1.01471
1400	1416.97	1.01239	5000	5066.94	1.01468
1500	1518.21	1.01247	5100	5168.41	1.01463
1600	1619.46	1.01257	5200	5269.87	1.01459
1700	1720.71	1.01266	5300	5371.33	1.01451
1800	1821.98	1.01274	5400	5472.78	1.01441
1900	1923.25	1.01283	5500	5574.22	1.01430
2000	2024.54	1.01292	5600	5675.65	1.01417
2100	2125.83	1.01302	5700	5777.07	1.01402
2200	2227.13	1.01311	5800	5878.47	1.01386
2300	2328.44	1.01321	5900	5979.86	1.01369
2400	2429.76	1.01332	6000	6081.23	1.01351
2500	2531.09	1.01343	6100	6182.58	1.01331
2600	2632.44	1.01354	6200	6283.91	1.01311
2700	2733.79	1.01364	6300	6385.22	1.01291
2800	2835.16	1.01375	6400	6486.51	1.01269
2900	2936.53	1.01384	6500	6587.78	1.01244
3000	3037.91	1.01394	6600	6689.02	1.01219
3100	3139.31	1.01403	6700	6790.24	1.01190
3200	3240.71	1.01412	6800	6891.43	1.01157
3300	3342.12	1.01421	6900	6992.59	1.01118
3400	3443.54	1.01429	7000	7093.71	
3500	3544.97	1.01437			

* Note: Right-hand wheel on counter indicates approximately 0.1 milligal.

2-29-84
ejk

Meter reading conversion for LaCoste & Romberg Model G, SN-735

APPENDIX C. GPS/GLONASS RECEIVER SPECIFICATIONS

Leica Geosystems Viva GS15 survey receiver

GNSS technology	Leica patented SmartTrack+ technology: • Advanced measurement engine • Jamming resistant measurements • High precision pulse aperture multipath correlator for pseudorange measurements • Excellent low elevation tracking • Very low noise GNSS carrier phase measurements with <0.5 mm precision • Minimum acquisition time
No. of channels	120 channels
Max. simultaneous tracked satellites	Up to 60 Satellites simultaneously on two frequencies
Satellite signals tracking	• GPS: L1, L2, L2C, L5 • GLONASS: L1, L2 • Galileo (Test): GIOVE-A, GIOVE-B • Galileo: E1, E5a, E5b, Alt-BOC • Compass1 • SBAS: WAAS, EGNOS, GAGAN, MSAS
GNSS measurements	Fully independent code and phase measurements of all frequencies • GPS: carrier phase full wave length, Code (C/A, P, C Code) • GLONASS: carrier phase full wave length, Code (C/A, P narrow Code) • Galileo: carrier phase full wave length, Code
Reacquisition time	< 1 sec
Accuracy (rms) Code differential with DGPS / RTCM	
DGPS / RTCM	Typically 25 cm (rms)
Accuracy (rms) with Real-Time (RTK)	
Standard of compliance	Compliance with ISO17123-8
Rapid static (phase) Static mode after initialization	Horizontal: 5 mm + 0.5 ppm (rms) Vertical: 10 mm + 0.5 ppm (rms)
Kinematic (phase) Moving mode after initialization	Horizontal: 10 mm + 1 ppm (rms) Vertical: 20 mm + 1 ppm (rms)
Accuracy (rms) with Post Processing	
Static (phase) with long observations	Horizontal: 3 mm + 0.5 ppm (rms) Vertical: 6 mm + 0.5 ppm (rms)
Static and rapid static (phase)	Horizontal: 5 mm + 0.5 ppm (rms) Vertical: 10 mm + 0.5 ppm (rms)
Kinematic (phase)	Horizontal: 10 mm + 1 ppm (rms) Vertical: 20 mm + 1 ppm (rms)

On the Fly (OTF) Initialization	
RTK technology	Leica SmartCheck+ technology
Reliability of OTF initialization	Better than 99,99%
Time for initalization	Typically 8 sec
OTF range	up to 50 km
Network RTK	
NetWork technology	Leica SmartRTK technology
Supported RTK network solutions	VRS, FKP, iMAX
Supported RTK network standards	MAC (Master Auxiliary Concept) approved by RTCM SC 104

APPENDIX D. GPS BASE DESCRIPTIONS

```
*********************************************************************
 PB0670  DESIGNATION -  CAREY
 PB0670  PID         -  PB0670
 PB0670  STATE/COUNTY-  OR/DESCHUTES
 PB0670  USGS QUAD   -  ANNS BUTTE (1981)
 PB0670
 PB0670                        *CURRENT SURVEY CONTROL
 PB0670
_____________________________________________________________________
 PB0670* NAD 83(1991)-  43 45 10.54240(N)    121 27 40.44186(W)
ADJUSTED
 PB0670* NAVD 88     -      1282.290  (meters)    4206.98   (feet)
ADJUSTED
 PB0670
_____________________________________________________________________
 PB0670  LAPLACE CORR-           5.82  (seconds)
DEFLEC99
 PB0670  GEOID HEIGHT-         -20.81  (meters)                     GEOID03
 PB0670  DYNAMIC HT  -        1281.699 (meters)    4205.04  (feet)  COMP
 PB0670  MODELED GRAV-     980,113.6   (mgal)                       NAVD 88
 PB0670
 PB0670  HORZ ORDER  -  FIRST
 PB0670  VERT ORDER  -  FIRST     CLASS II
 PB0670
 PB0670.The horizontal coordinates were established by classical geodetic
methods
 PB0670.and adjusted by the National Geodetic Survey in October 1991..
 PB0670
 PB0670.The orthometric height was determined by differential leveling
 PB0670.and adjusted by the National Geodetic Survey in June 1991..
 PB0670
 PB0670.The Laplace correction was computed from DEFLEC99 derived
deflections.
 PB0670
 PB0670.The geoid height was determined by GEOID03.
 PB0670
 PB0670.The dynamic height is computed by dividing the NAVD 88
 PB0670.geopotential number by the normal gravity value computed on the
 PB0670.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 PB0670.degrees latitude (g = 980.6199 gals.).
 PB0670
 PB0670.The modeled gravity was interpolated from observed gravity values.
 PB0670
 PB0670;                North         East     Units Scale Factor Converg.
 PB0670;SPC OR  -   232,196.633 1,422,589.713   MT  0.99994659   -0 39 27.5
 PB0670;SPC OR S -  761,799.98  4,667,289.08   iFT  0.99994659   -0 39 27.5
 PB0670;UTM  10 - 4,845,582.281   623,880.681   MT  0.99978876   +1 03 51.4
 PB0670             -  Elev Factor  x  Scale Factor =   Combined Factor
 PB0670!SPC OR S     -   0.99980223  x   0.99994659  =   0.99974883
 PB0670!UTM  10      -   0.99980223  x   0.99978876  =   0.99959103
```

APPENDIX D: GPS BASE DESCRIPTIONS (CONTINUED)

```
|---------------------------------------------------------------------|
 PB0670| PID Reference Object                 Distance      Geod. Az   |
 PB0670|                                                    dddmmss.s |
 PB0670| CD7060 CAREY RM 1                    24.717 METERS 07430      |
 PB0670| CD7061 CAREY RM 2                    30.468 METERS 15810      |
 PB0670| CD6825 T 315                                       1990243.4 |
 PB0670|---------------------------------------------------------------|
 PB0670
 PB0670                          SUPERSEDED SURVEY CONTROL
 PB0670
 PB0670NAD 83(1986)-  43 45 10.54784(N)    121 27 40.45008(W) AD(     ) 1
 PB0670  NAD 27      -  43 45 11.11421(N)    121 27 36.35797(W) AD(    )
 PB0670  NGVD 29 (07/19/86) 1280.6    (m)          4201.     (f) VERT ANG
 PB0670
 PB0670.Superseded values are not recommended for survey control.
 PB0670.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 PB0670.See file dsdata.txt to determine how the superseded data were
derived.
 PB0670
 PB0670_U.S. NATIONAL GRID SPATIAL ADDRESS: 10TFP2388145582(NAD 83)
 PB0670_MARKER: DS = TRIANGULATION STATION DISK
 PB0670_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 PB0670_SP_SET: CONCRETE POST
 PB0670_STAMPING: CAREY 1971
 PB0670_MARK LOGO: CGS
 PB0670_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 PB0670+STABILITY: SURFACE MOTION
 PB0670_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 PB0670+SATELLITE: SATELLITE OBSERVATIONS - May 05, 1989
 PB0670
 PB0670  HISTORY     - Date     Condition        Report By
 PB0670  HISTORY     - 1971     MONUMENTED       NGS
 PB0670  HISTORY     - 1971     GOOD             NGS
 PB0670  HISTORY     - 19880720 GOOD             NGS
 PB0670  HISTORY     - 19890505 GOOD             LOCSUR
 PB0670  HISTORY     - 20051011 GOOD             GEOCAC
 PB0670
 PB0670                           STATION DESCRIPTION
 PB0670
 PB0670'DESCRIBED BY NATIONAL GEODETIC SURVEY 1971 (LDF)
 PB0670'THE STATION IS LOCATED ABOUT 23 MILES SOUTH-SOUTHWEST OF BEND, 6
 PB0670'MILES NORTH-NORTHEAST OF LA PINE AND NEAR THE SOUTHWEST CORNER OF
 PB0670'THE JUNCTION OF U.S. HIGHWAY 97 AND A GRAVELLED ROAD LEADING TO
 PB0670'PAULINA LAKE.  IT IS ON COUNTY PROPERTY IN THE SOUTHWEST CORNER
 PB0670'OF THE SOUTHWEST QUARTER OF SECTION 18, T 21 S, R 11 E.
 PB0670'TO REACH THE STATION FROM THE POST OFFICE IN LA PINE, GO EAST
 PB0670'FOR 1 BLOCK TO THE JUNCTION OF U.S. HIGHWAY 97, TURN LEFT AND GO
 PB0670'NORTH-NORTHEAST ON HIGHWAY 97 FOR 2.75 MILES TO A CROSSROAD AND A
 PB0670'RAILROAD CROSSING.  CONTINUE NORTH-NORTHEAST ON HIGHWAY 97 FOR
 PB0670'2.65 MILES TO A SIDE ROAD ON THE LEFT AND BENCH MARK T 135 USGS
 PB0670'ON THE LEFT.  CONTINUE NORTH-NORTHEAST ON HIGHWAY 97 FOR 0.95
 PB0670'MILE TO A CROSSROAD, TURN LEFT AND GO WEST ON GRAVELLED ROAD
 PB0670'FOR 0.05 MILE TO THE STATION ON THE LEFT.
```

APPENDIX D: GPS BASE DESCRIPTIONS (CONTINUED)

```
 PB0670'STATIONS MARKS ARE STANDARD DISKS STAMPED CAREY 1971, THE SURFACE
 PB0670'STATION MARK IS SET IN THE TOP OF A 12-INCH CYLINDRICAL CONCRETE
 PB0670'MONUMENT, THAT PROJECTS 2 INCHES.  IT IS 90.0 FEET WEST OF THE
 PB0670'APPROXIMATE CENTER OF GRAVELLED ROAD, 82.9 FEET WEST OF A POWER
 PB0670'LINE POLE, 30.0 FEET NORTH OF A PINE TREE WITH TRIANGLE BLAZE,
 PB0670'11.0 FEET EAST OF A NORTH-SOUTH FENCE LINE AND 10.5 FEET EAST OF
 PB0670'A METAL WITNESS POST WITH SIGN.  THE UNDERGROUND STATION MARK
 PB0670'IS SET 42 INCHES BELOW THE GROUND SURFACE.
 PB0670'
 PB0670'REFERENCE MARK 1 IS A STANDARD DISK STAMPED CAREY NO 1 1971, SET
 PB0670'IN THE TOP OF A 12-INCH CYLINDRICAL CONCRETE MONUMENT, THAT
PROJECTS
 PB0670'8 INCHES.  IT IS 91.0 FEET EAST OF THE FENCE, 92.0 FEET NORTHEAST
 PB0670'OF THE PINE TREE WITH TRIANGLE BLAZE, 90.5 FEET EAST OF THE
 PB0670'WITNESS POST, 27 FEET WEST OF THE APPROXIMATE CENTER OF THE
 PB0670'GRAVELLED ROAD, 1.7 FEET WEST OF A POWER LINE POLE AND IT IS
 PB0670'ABOUT THE SAME IN ELEVATION AS THE STATION.
 PB0670'
 PB0670'REFERENCE MARK 2 IS A STANDARD DISK STAMPED CAREY NO 2 1971, SET
 PB0670'IN THE TOP OF A 12-INCH CYLINDRICAL CONCRETE MONUMENT, THAT
PROJECTS
 PB0670'4 INCHES.  IT IS 178 FEET WEST OF THE APPROXIMATE CENTER OF THE
 PB0670'GRAVELLED ROAD, 52.0 FEET EAST OF THE FENCE, 72.0 FEET SOUTHEAST
 PB0670'OF THE PINE TREE WITH TRIANGLE BLAZE AND IT IS ABOUT THE SAME IN
 PB0670'ELEVATION AS THE STATION.
 PB0670'
 PB0670'B M T 315 USGS IS A BRONZE DISK OF THE U.S. GEOLOGICAL SURVEY
 PB0670'STAMPED 4215.910 T 315 1927, CEMENTED IN A DRILL HOLE IN THE TOP
 PB0670'AND NEAR THE CENTER OF A CONCRETE CULVERT ON THE EAST SIDE OF
 PB0670'RAILROAD TRACKS.  IT IS 72 FEET NORTH OF THE APPROXIMATE CENTER
 PB0670'OF A BLADED ROAD, 113.0 FEET WEST OF THE PAINTED CENTERLINE OF
 PB0670'U.S. HIGHWAY 97 AND 15.3 FEET EAST OF THE EAST RAIL OF RAILROAD
 PB0670'TRACKS.
 PB0670'
 PB0670'HEIGHT OF LIGHT ABOVE STATION MARK 36.3 METERS.
 PB0670
  PB0670                          STATION RECOVERY (2005)
 PB0670
 PB0670'RECOVERY NOTE BY GEOCACHING 2005 (JLH)
 PB0670'STATION DISK, RM1, RM2 AND B M T (PB0231) ALL FOUND IN GOOD
CONDITION.
 PB0670'BLAZED TREE IN EARLIER DISCRIPTION SEARCHED FOR BUT NOT FOUND.
```

APPENDIX D: GPS BASE DESCRIPTIONS (CONTINUED)

```
FILE: 20002890.10o 000099837

 2005   NOTE:  The IGS precise and IGS rapid orbits were not available
 2005   at processing time.  The IGS ultra-rapid orbit was/will be used to
 2005   process the data.
 2005
                            NGS OPUS SOLUTION REPORT
                            ========================

All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: http://www.ngs.noaa.gov/OPUS/about.html#accuracy

      USER: zonge.us                                DATE: October 16, 2010
RINEX FILE: 2000289p.10o                            TIME: 23:31:58 UTC


  SOFTWARE: page5  1009.28 master28.pl 100910      START: 2010/10/16  15:04:00
 EPHEMERIS: igu16056.eph [ultra-rapid]              STOP: 2010/10/16  22:01:00
  NAV FILE: brdc2890.10n                       OBS USED: 15258 / 16703   :  91%
  ANT NAME: LEIGS15         NONE             # FIXED AMB:    59 /    73   :  81%
ARP HEIGHT: 1.203                            OVERALL RMS: 0.014(m)


 REF FRAME: NAD_83(CORS96)(EPOCH:2002.0000)            ITRF00 (EPOCH:2010.7912)

         X:     -2392364.464(m)   0.072(m)          -2392365.254(m)   0.072(m)
         Y:     -3952588.735(m)   0.043(m)          -3952587.497(m)   0.043(m)
         Z:      4385386.195(m)   0.072(m)           4385386.221(m)   0.072(m)

       LAT:   43 41 54.41140      0.020(m)        43 41 54.42656      0.020(m)
     E LON:  238 48 53.78093      0.072(m)       238 48 53.72214      0.072(m)
     W LON:  121 11  6.21907      0.072(m)       121 11  6.27786      0.072(m)
    EL HGT:         2109.531(m)   0.084(m)              2109.079(m)   0.084(m)
 ORTHO HGT:         2129.679(m)   0.143(m) [NAVD88 (Computed using GEOID09)]

                        UTM COORDINATES    STATE PLANE COORDINATES
                         UTM (Zone 10)         SPC (3602 OR S)
Northing (Y) [meters]     4839981.498           225925.388
Easting (X)  [meters]      646247.243          1444780.427
Convergence  [degrees]     1.25409555          -0.46868257
Point Scale                0.99986308           0.99993734
Combined Factor            0.99953244           0.99960667

US NATIONAL GRID DESIGNATOR: 10TFP4624739981(NAD 83)


                             BASE STATIONS USED
PID       DESIGNATION                       LATITUDE    LONGITUDE DISTANCE(m)
DE6236 LPSB LANE CNTY COOP CORS ARP       N440304.406 W1230524.250  158083.8
DG5352 STAY STAYTON COOP CORS ARP         N444950.530 W1224915.036  181383.3
DG8527 ORS1 SENECA 1 CORS ARP             N440951.272 W1190331.461  178451.1

                 NEAREST NGS PUBLISHED CONTROL POINT
PB0697      PAULINA PEAK LOOKOUT HOUSE     N434121.087 W1211517.470    5711.2

This position and the above vector components were computed without any
knowledge by the National Geodetic Survey regarding the equipment or
field operating procedures used.
```

APPENDIX E. GRAVITY BASE DESCRIPTION

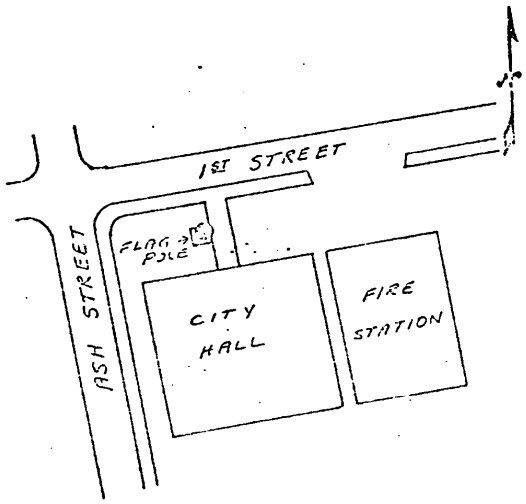
GRAVITY BASE STATION

LATITUDE 43°44.8'N (1)	STATION DESIGNATION OAKRIDGE E
LONGITUDE 122°27.4'W (1)	
ELEVATION 371.9 METERS (1)	COUNTRY/STATE USA/Oregon
REFERENCE CODE NUMBERS	ADOPTED GRAVITY VALUE
DoD 4612-1	g = 980 328.35 mgals
15732B GTS	
	ESTIMATED ACCURACY ± mgals / DATE MONTH/YEAR July 73

DESCRIPTION AND/OR SKETCH

Oakridge, Oregon, at City Hall, on the concrete base of the flagpole.

Station is located in Oakridg, Oregon, at the City Hall at the SE corner of the intersection of 1st and Ash Streets. (1)



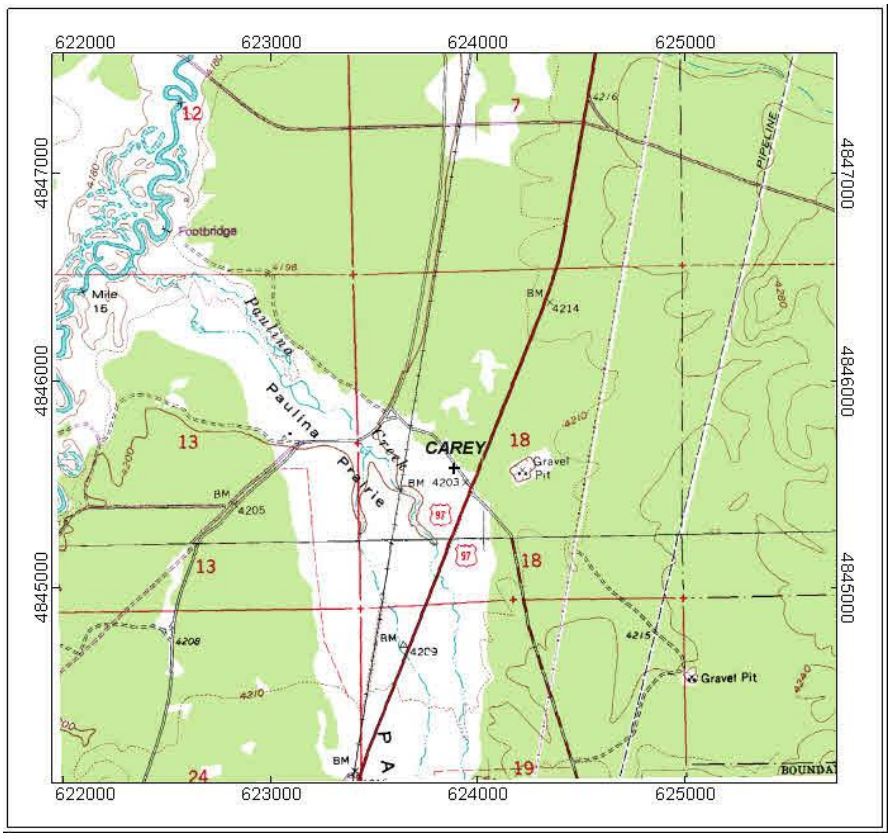
REFERENCE SOURCE
(1) 03682

AC FORM 8342/ GD-11 APR 79 PREVIOUS EDITIONS WILL BE USED

Gravity Base Station Description	Station Description **CAREY**	Date **October 2006**
Country **USA**	State **Oregon**	City, Town or Community **La Pine**
County **Deschutes**	Township/Range **T21S R11E**	1:24,000 Scale Quadrangle **Anns Butte**
Latitude WGS-84 N 43° 45' 10.54240"	Longitude WGS-84 W 121° 27' 40.44186"	Ellipsoid Height WGS-84 1261.480 m
UTM North NAD-83 Zone 10 N 4,845,582.281	UTM East NAD-83 Zone 10 E 623,880.681	Elevation NAVD88 1282.294m
Type of Mark NGS Control Point	Position Reference Static GPS Survey	Elevation Reference NGS Horz./Vert. Control Point
Tied to Known Station Oakridge, Oregon DoD 4612-1	Estimated Accuracy of Know Station ± 0.02 mGal	Estimated Accuracy ± 0.05 mGal
Gravity Value 980 113.560 mGal	Description By Zonge Geosciences, Inc.	

Description

6.15 miles northerly along U.S. Hwy 97 from the Post Office in La Pine, thence 0.05 mi. west along a paved road, 390 feet northwest of Bend Mark S 62, 95 feet southwest of the centerline of the road, 83 feet west of a utility pole, 11 feet east of a fence, flush with the ground, next to the concrete post.



Base Station	WGS84 Latitude	WGS84 Longitude	NAD83_z10 UTM_East	NAD83_z10 UTM_North	WGS 84 Ellipsoid Height (m)	NAVD 88 Elevation (m)	Absolute Gravity (mgal)
1000	43.797488	121.248691	640887.28	4850871.21	1846.659	1866.926	980000.932
2000	43.698448	121.185069	646247.24	4839981.5	2109.531	2129.679	979933.712
3000	43.757362	121.328768	634535.22	4846281.33	1611.165	1631.557	980049.432

Gravity Base Station Descriptions

APPENDIX F. LOOP CLOSURES

Date	Base	Meter	Loop #	Duration	Closure (mG)	Abs_Closure (mG)
10/11/2010	Carey	G233	1	4:13	0.010	0.010
10/13/2010	Carey	G233	1	8:53	-0.033	0.033
10/14/2010	Carey	G233	1	9:00	0.008	0.008
10/15/2010	Carey	G233	1	9:26	-0.001	0.001
10/16/2010	Carey	G233	1	8:40	0.017	0.017
10/17/2010	Carey	G233	1	8:50	0.010	0.010
10/18/2010	Carey	G233	1	10:56	0.026	0.026
10/19/2010	2000	G233	1	8:48	-0.008	0.008
10/20/2010	Carey	G233	1	9:23	-0.006	0.006
10/21/2010	Carey	G233	1	9:54	-0.013	0.013
10/22/2010	Carey	G233	1	9:52	-0.019	0.019
10/23/2010	1000	G233	1	9:07	-0.022	0.022
10/30/2010	Carey	G233	1	1:05	-0.032	0.032
11/14/2010	1000	G735	1	7:38	-0.021	0.021
11/15/2010	1000	G735	1	7:44	-0.009	0.009
11/16/2010	1000	G735	1	7:54	-0.001	0.001
11/17/2010	1000	G735	1	8:46	0.042	0.042
				Average Closure		**0.016**

APPENDIX G. GRAVITY AND GPS REPEATS

Stn	UTM83Z10_E	UTM83Z10_N	Elev_NAVD88	Time	Date	Obs_Gravity	Meter
551	632481.80	4839805.97	1516.28	10:16:00 AM	13-Oct	980068.58	G233
90551	632481.55	4839805.92	1516.32	11:49:01 AM	13-Oct	980068.56	G233
Diff	**0.25**	**0.05**	**-0.04**			**0.02**	
580	631546.05	4834173.41	1466.55	2:34:31 PM	13-Oct	980070.08	G233
90580	631546.46	4834173.53	1467.00	3:55:13 PM	14-Oct	980070.10	G233
Diff	**-0.41**	**-0.12**	**-0.45**			**-0.03**	
581	630513.15	4833886.60	1447.92	2:54:07 PM	13-Oct	980073.68	G233
90581	630513.11	4833886.59	1447.90	4:19:24 PM	14-Oct	980073.69	G233
Diff	**0.04**	**0.01**	**0.02**			**-0.02**	
649	636660.71	4834636.43	1640.76	3:01:50 PM	14-Oct	980031.21	G233
90649	636660.59	4834636.94	1640.26	4:15:58 PM	15-Oct	980031.21	G233
Diff	**0.12**	**-0.51**	**0.50**			**0.01**	
696	636114.27	4833729.27	1611.42	2:44:40 PM	14-Oct	980037.00	G233
90696	636108.90	4833730.10	1611.58	2:28:46 PM	15-Oct	980036.95	G233
Diff	**5.37**	**-0.83**	**-0.16**			**0.05**	
676	641124.69	4833953.34	1788.45	11:49:33 AM	15-Oct	980001.95	G233
90676	641123.46	4833953.22	1788.44	10:48:35 AM	16-Oct	980001.94	G233
Diff	**1.23**	**0.12**	**0.00**			**0.01**	
719	645783.77	4840257.56	2137.20	8:32:24 AM	16-Oct	979932.71	G233
90719	645783.82	4840257.59	2137.22	8:08:42 AM	17-Oct	979932.72	G233
Diff	**-0.05**	**-0.03**	**-0.02**			**-0.01**	
744	645777.34	4836891.42	1955.35	9:12:36 AM	16-Oct	979966.82	G233
90744	645777.42	4836891.42	1955.32	8:20:24 AM	17-Oct	979966.80	G233
Diff	**-0.08**	**0.00**	**0.03**			**0.02**	
748	643669.64	4835277.51	1913.52	9:55:02 AM	16-Oct	979974.27	G233
90748	643670.11	4835277.57	1913.09	11:58:19 AM	18-Oct	979974.26	G233
Diff	**-0.47**	**-0.06**	**0.43**			**0.01**	

APPENDIX G. GRAVITY AND GPS REPEATS (CONTINUED)

Stn	UTM83Z10_E	UTM83Z10_N	Elev_NAVD88	Time	Date	Obs_Gravity	Meter
798	643304.15	4834275.27	1903.31	2:35:24 PM	17-Oct	979971.93	G233
90798	643304.14	4834275.29	1903.32	11:44:12 AM	18-Oct	979971.90	G233
Diff	**0.01**	**-0.02**	**-0.01**			**0.03**	
752	643796.85	4834201.66	1865.40	11:17:32 AM	18-Oct	979981.70	G233
90752	643796.19	4834201.80	1865.44	9:32:30 AM	19-Oct	979981.68	G233
Diff	**0.66**	**-0.14**	**-0.03**			**0.02**	
768	649030.93	4834222.52	1800.11	12:45:29 PM	18-Oct	979992.46	G233
90768	649030.91	4834222.51	1800.11	2:21:13 PM	19-Oct	979992.45	G233
Diff	**0.02**	**0.01**	**0.01**			**0.01**	
783	645192.58	4832307.58	1837.33	4:14:47 PM	18-Oct	979984.48	G233
90783	645192.56	4832307.61	1837.28	12:45:50 PM	19-Oct	979984.45	G233
Diff	**0.02**	**-0.03**	**0.05**			**0.03**	
785	645318.29	4831680.25	1809.38	4:29:51 PM	18-Oct	979990.15	G233
90785	645319.85	4831680.33	1809.02	12:28:36 PM	19-Oct	979990.14	G233
Diff	**-1.56**	**-0.08**	**0.36**			**0.01**	
496	635334.32	4848069.51	1591.45	9:08:34 AM	20-Oct	980058.66	G233
90496	635334.34	4848069.51	1591.41	1:21:00 PM	21-Oct	980058.58	G233
Diff	**-0.02**	**0.00**	**0.03**			**0.08**	
499	635265.88	4847680.60	1586.42	8:57:00 AM	20-Oct	980059.16	G233
90499	635265.14	4847681.22	1585.69	10:54:07 AM	21-Oct	980059.14	G233
Diff	**0.74**	**-0.62**	**0.73**			**0.02**	
503	634851.50	4846870.90	1610.48	8:37:29 AM	20-Oct	980053.57	G233
90503	634850.55	4846871.19	1610.15	10:39:34 AM	21-Oct	980053.53	G233
Diff	**0.95**	**-0.29**	**0.33**			**0.04**	
495	634875.41	4847733.15	1572.84	2:53:01 PM	21-Oct	980063.06	G233
90495	634875.42	4847733.15	1572.85	10:13:33 AM	22-Oct	980063.05	G233
Diff	**-0.01**	**0.00**	**-0.01**			**0.01**	

APPENDIX G. GRAVITY AND GPS REPEATS (CONTINUED)

Stn	UTM83Z10_E	UTM83Z10_N	Elev_NAVD88	Time	Date	Obs_Gravity	Meter
493	634228.42	4847381.17	1574.20	3:03:02 PM	21-Oct	980061.04	G233
90493	634229.87	4847380.81	1573.74	10:24:26 AM	22-Oct	980061.03	G233
Diff	**-1.45**	**0.36**	**0.46**			**0.01**	
439	641130.73	4850600.28	1871.09	1:50:51 PM	22-Oct	980000.07	G233
90439	641130.72	4850600.17	1871.09	8:23:22 AM	23-Oct	980000.03	G233
Diff	**0.01**	**0.11**	**0.00**			**0.04**	
538	649932.17	4842471.54	1922.94	4:40:07 PM	19-Oct	979978.57	G233
90538	649932.31	4842471.44	1923.08	11:22:10 AM	23-Oct	979978.58	G233
Diff	**-0.14**	**0.10**	**-0.14**			**-0.01**	
493	634228.42	4847381.17	1574.20	3:03:02 PM	21-Oct	980061.04	G233
90493	634229.87	4847380.81	1573.74	10:24:26 AM	22-Oct	980061.03	G233
Diff	**-1.45**	**0.36**	**0.46**			**0.01**	
495	634875.41	4847733.15	1572.84	2:53:01 PM	21-Oct	980063.06	G233
90495	634875.42	4847733.15	1572.85	10:13:33 AM	22-Oct	980063.05	G233
Diff	**-0.01**	**0.00**	**-0.01**			**0.01**	
970	643187.82	4854380.65	1767.40	2:00:19 PM	14-Nov	980021.96	G735
90970	643187.70	4854381.21	1766.24	8:10:41 AM	15-Nov	980021.99	G735
Diff	**0.12**	**-0.56**	**1.16**			**-0.03**	
981	646207.04	4854196.06	1680.72	1:17:49 PM	14-Nov	980037.99	G735
90981	646207.09	4854196.16	1680.75	8:29:39 AM	15-Nov	980038.01	G735
Diff	**-0.05**	**-0.10**	**-0.03**			**-0.03**	
90419	640941.05	4853828.85	1768.06	2:29:02 PM	14-Nov	980019.63	G735
91419	640941.09	4853828.85	1768.08	7:59:29 AM	15-Nov	980019.63	G735
Diff	**-0.04**	**0.00**	**-0.02**			**-0.01**	
466	641427.27	4849953.55	1898.80	2:02:16 PM	22-Oct	979994.01	G233
90466	641427.29	4849953.55	1898.45	12:11:33 PM	16-Nov	979993.99	G735
Diff	**-0.02**	**0.00**	**0.36**			**0.01**	

APPENDIX G. GRAVITY AND GPS REPEATS (CONTINUED)

Stn	UTM83Z10_E	UTM83Z10_N	Elev_NAVD88	Time	Date	Obs_Gravity	Meter
1028	643989.50	4849022.09	1965.02	1:53:32 PM	16-Nov	979977.77	G735
91028	643989.79	4849021.76	1964.88	7:40:52 AM	17-Nov	979977.74	G735
Diff	**-0.29**	**0.33**	**0.13**			**0.03**	
1031	644198.33	4848006.25	2041.65	2:32:25 PM	16-Nov	979962.04	G735
91031	644198.33	4848006.22	2041.66	8:02:06 AM	17-Nov	979962.02	G735
Diff	**0.00**	**0.03**	**-0.01**			**0.02**	
Repeats Between Project Numbers 10016 and 10194							
441	644676.63	4852101.73	1770.79	3:03:57 PM	22-Oct	980017.39	G233
90441	644676.57	4852101.73	1770.83	10:48:20 AM	14-Nov	980017.45	G735
Diff	**0.06**	**0.00**	**-0.04**			**-0.06**	
90419	640941.05	4853828.85	1768.06	2:29:02 PM	14-Nov	980019.63	G735
91419	640941.09	4853828.85	1768.08	7:59:29 AM	15-Nov	980019.63	G735
Diff	**-0.04**	**0.00**	**-0.02**			**-0.01**	
Repeats Between 2006 and 2010 Surveys							
31	623408.52	4844127.33	1286.24	1:03:15 PM	17-Oct	980107.18	G233
90031	623408.48	4844127.34	1286.23	9:53:24 AM	30-Oct	980107.16	G233
Diff	**0.04**	**-0.01**	**0.01**			**0.02**	
4	627211.66	4842754.53	1316.62	7:49:55 AM	17-Oct	980106.75	G233
90004	627212.22	4842755.10	1316.64	10:14:43 AM	30-Oct	980106.79	G233
Diff	**-0.56**	**-0.57**	**-0.02**			**-0.04**	
1	623952.35	4845512.29	1282.46	7:12:40 AM	17-Oct	980113.50	G233
90001	623952.30	4845512.29	1282.43	10:31:28 AM	30-Oct	980113.50	G233
Diff	**0.05**	**0.00**	**0.04**			**0.00**	

APPENDIX H. DATA DISK CONTENTS

Data

Newberry_Gravity.csv: Comma separated ASCII XYZ file containing gravity principal facts for this survey.

The following are columns included in this file.

Stn:	Zonge 2006 Survey: 1-378, Zonge 2010 Survey: 400-799, Base stations: 1000, 2000, 3000. Public domain stations: 8000-8327. Ormat Nevada Survey: 901-1059
Date:	Date
Time:	Local time (GMT-7)
WGS84_LatDD:	WGS84 Latitude decimal degrees
WGS84_LonDD:	WGS84 Longitude decimal degrees
NAD27Z10_E:	UTM Easting, Zone 10N, meters. NAD27
NAD27Z10_N:	UTM Northing, Zone 10N, meters. NAD27
NAD83Z10_E:	UTM Easting, Zone 10N, meters. NAD83
NAD83Z10_N:	UTM Northing, Zone 10N, meters. NAD83
WGS84_Ht:	WGS84 Ellipsoidal Height
Geoid_09:	Geoid 2009
NAVD88:	Station elevation, meters. NAVD88 vertical datum
NGVD29:	Station elevation, meters. NGVD29 vertical datum
3D_Qual:	Station position and height quality
STD_Ht:	Station height quality
Class:	RTK=Real-time Kinematic, PP=Post processed
Code_ID:	Point Code= Gravity
Reading:	L&R G-735 and G-233 counter reading
Meter:	Meter serial number
Inst_ht:	Gravity meter height
Abs_Grav:	Observed Gravity, milligals
Free_Air:	Free Air gravity, milligals
Curv_C:	Bullard B curvature correction for a density of 1.00 gm/cc
TC_2m_16m:	Terrain corrections for 2m to 16.6m for a density of 1.00 gm/cc
gm/cc	

TC_16m_167Km:	RasterTC terrain correction results for a density of 1.00 gm/cc
SBA200, etc:	Simple Bouguer Anomaly. Density: 2.00 gm/cc to 2.67 gm/cc
CBA200, etc:	Complete Bouguer Anomaly. Density:2.00 gm/cc to 2.67 gm/cc

G233.sfc: Meter calibration file for Model-G serial number 233.

G735.sfc: Meter calibration file for Model-G serial number 735.

MMDDYYYY.raw files: Daily raw instrument dump files. X, Y in NAD83 UTM Zone 12N. Elevation in NAVD88 vertical datum.

Plots

Digital images in Geosoft map[1] and ArcView tiff file formats. Coordinates in NAD27, UTM Zone 10N, meters.

Terrain Grids

WGS84LATLON_10m.grd: NED 1/3 arc second digital terrain grid in Geosoft grid format to a radius of 20 km from the survey area.

WGS84LATLON_65m.grd: SRTM 2 arc second digital terrain grid in Geosoft grid format to a radius of 167 km from the survey area.

Horizontal datum: WGS84 Lat/Lon.

Vertical datum: NAVD88

Report

Newberry_Grav_LR: Gravity data acquisition logistics report (this report) in Adobe PDF format.

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[1] ***Requires Geosoft Oasis Montaj Viewer software. Free download available at:***

http://www.geosoft.com/downloads/index.asp