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Geophysical Data from the Spring and Snake Valleys Area, Nevada and Utah

By Edward A. Mankinen, Carter W. Roberts, Edwin H. McKee, Bruce A. Chuchel, and Barry C. Moring

Open File Report 2006–XXXX

U.S. Department of the Interior
U.S. Geological Survey

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ABSTRACT

The Spring and Snake Valleys area of Nevada and Utah are two of the major ground-water recharge areas in the eastern part of the Great Basin that were investigated in order to characterize the geophysical framework of the region. Although gravity coverage was extensive over parts of the study area, data were sparse for much of Spring Valley. We addressed this lack of data by establishing of five hundred and forty-five new gravity stations in the region. All available gravity data for the study area were then evaluated to determine their reliability, prior to calculating an isostatic residual gravity map of the area that can be used for subsequent analyses. A gravity inversion method was used to calculate depths to pre-Cenozoic basement rock and estimates of maximum alluvial/volcanic fill in the major valleys of the study area. The enhanced gravity coverage and the incorporation of lithologic information from several deep oil and gas wells yields a much improved view of subsurface shapes of these basins and will provide insights useful for the development of hydrogeologic models for the region.

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INTRODUCTION

The arid southwestern United States historically has been sparsely populated but the construction of dams, aqueducts, and pumped groundwater allowed the relatively recent growth of major population centers throughout the region, with Nevada being the fastest-growing state in the Union. Increased demands on existing supplies have focused attention on finding new, alternative sources of water such as in the Great Basin regional aquifer system, a vast spring and ground-water system described by Harrill and Prudic (1998). Particular attention is paid to the eastern part of the Great Basin where a major aquifer system is developed in a regionally-extensive, thick stratigraphic sequence of Paleozoic carbonate rocks. A second important ground-water system occurs in the Cenozoic basin-fill deposits found throughout the region. The current study is a collaborative effort between the U.S. Geological Survey (USGS) and the Southern Nevada Water Authority (SNWA) to characterize the geophysical framework of the Spring and Snake Valleys area of Nevada and Utah (fig. 1; herein referred to as the study area). These valleys are two of the major ground-water recharge areas in the region, with groundwater flowing into the Great Salt Lake Desert aquifer system (Harrill and Prudic, 1998; Nichols, 2000). Results of this study should significantly increase our understanding of the formation and subsurface shapes of these basins and provide insights into the structures that may impede or allow ground-water flow. Gravity and magnetic data are presented in this report while data from the concurrent audiomagnetotelluric (AMT) study are described separately (McPhee and others, 2006).

GEOLOGIC SETTING

A geologic summary of the area shown in figure 1 is found in Hose and others (1976). The oldest rocks in the region belong to the Precambrian McCoy Creek Group. The most abundant rock type in this group is massive quartzite, and similar rocks extend stratigraphically upward to include the Lower Cambrian Prospect Mountain Quartzite. Where not greatly faulted and fractured, these rocks form effective barriers to ground-water flow especially where they are in contact with younger carbonate rocks, and they may form the base of the carbonate-rock aquifer in areas where circulation extends throughout the entire stratigraphic thickness (Plume, 1996; Harrill and Prudic, 1998). The carbonate-rock aquifer is a thick sequence of predominately carbonate formations overlying the quartzite. These carbonate rocks range in age from the Middle Cambrian to Lower Triassic (Hose and others, 1976; Plume, 1996). The total stratigraphic thickness of the carbonate sequence ranges from about 1.5 to as much as 9 km, and the composite unit is present throughout the entire eastern two-thirds of the Great Basin (Plume, 1996).

The youngest of the deep-water carbonate strata in the eastern Great Basin were deposited during Lower Triassic time, after which the continental margin shifted westward and the shallow sea retreated (e.g., Speed, 1978). The eastern Great Basin was uplifted, and erosion and continental deposition occurred locally during the remainder of Mesozoic time. No sedimentary rocks dating to this interval of time are known in the study area (fig. 1) with the possible exception of some small areas of tectonic breccia (Hose and others, 1976). Other rocks forming part of the pre-Cenozoic basement in the study area are a series of intrusive igneous rocks exposed along the southern Snake Range extending northward into the Kern Mountains (Hose and others, 1976; Best and others, 1974) and in the Deep Creek Range in Utah (Miller and others, 1999). Numerous plutons throughout the region have also been inferred from interpretations of geophysical anomalies (Grauch and others, 1988; Ponce, 1990). Although plutons of the region range from Jurassic to Tertiary in age, all are grouped with the basement rocks because their density is similar to most of the pre-Cenozoic rocks and differs strongly from that of the later eruptive and basin-fill rocks. Intrusive igneous rocks typically are barriers to ground-water flow (Plume, 1996) except in areas where extensively fractured.

The oldest Cenozoic sedimentary rocks in the study area are local occurrences in the central and northern Schell Creek Range (Hose and others, 1976). These are likely Eocene in age and pre-date the late Eocene to late Miocene calc-alkaline volcanic rocks found in many places in the area. A major volcanic episode began during the early Oligocene when voluminous ash-flow eruptions resulted in the formation of collapse caldera complexes throughout the Great Basin (e.g., Best and others, 1989). Although impermeable in hand sample, these densely-welded tuffs are easily fractured and can allow water circulation and may be major aquifers where continuous over large areas. Because none of the volcanic rocks in the study area have regional extent or continuity, occurring generally as discontinuous outcrops on older rocks (Gans and others, 1989), they have limited importance as aquifers here.

Major extensional faulting began throughout the region at about 17 Ma (McKee, 1971; Christiansen and McKee, 1978; Stewart, 1978) and formed the horst-graben terrain that is typical of the Basin and Range Province. The province is characterized by long, linear north- to northeast-trending mountain ranges 15 to 20 km across, separated by valleys of comparable widths. Alluvial fill within the basins may range from a few hundred meters to several kilometers thick. This basin fill consists of clastic material derived from adjacent mountain ranges and is characterized by semi-consolidated to unconsolidated sand, gravel, silt, clay, and local evaporites with some interbedded volcanic units in many areas. The sand and gravel deposits form a major, shallow aquifer in the region where they are not clogged by clay or zeolitic intergranular materials. These aquifers are commonly exploited because groundwater in the valleys typically is within a few meters or tens of meters below the ground surface and easily reached by wells. Some of these basin-fill aquifers are hydraulically isolated from similar aquifers in adjacent valleys, while others are hydraulically connected by flow through the underlying carbonate aquifer (Plume, 1996).

PROCEDURES

Gravity data were obtained using LaCoste and Romberg meters (G614, G17C, and G8N) and observed gravity values were referenced to two base stations. The base station at the Ely, Nevada airport (***ELYA***), at 39°17.59'N, -114°50.52'W, is tied to the International Gravity Standardization Net 1971 (ISGN 71) gravity datum (Morelli, 1974) and has an observed gravity value of 979,480.08 mGal. The second base (***ELYW***) is at a U.S. Coast and Geodetic Survey vertical angle benchmark stamped 'Ely West Base 1944.' This station is approximately 35 km southeast of Ely at 39°01.55'N, -114°34.71'W, and has an observed gravity value of 979,462.96 mGal (D. Ponce, USGS, written communication, 1991).

Locations of gravity stations were determined using two differential Global Positioning Satellite (GPS) systems. One uses differential corrections provided by Continually Operated Reference Station (CORS) satellites, and locations after post-acquisition processing are accurate to within 1 meter, both horizontally and vertically. The second used a fixed base receiver in conjunction with a portable "rover." Survey networks were adjusted using established USGS and U.S. Coast and Geodetic Survey benchmarks for control, providing locations accurate to within about 0.1 m.

Magnetic data were obtained in the vicinity of Rattlesnake Knoll using a portable cesium-vapor magnetometer integrated with a differential GPS receiver. Because of the short duration of the traverse, we did not employ a stationary base-station magnetometer to record diurnal variations. Measurements were made at 1-second intervals, operating the instrument in continuous mode, while walking at a normal pace. Horizontal positional accuracy of the GPS readings is accurate to within about 1 m. Testing the unit over the Mount Hamilton, California gravity calibration loop (Barnes and others, 1969) indicates that elevations are accurate to about 5 m (J.E. Tilden, USGS, written communication, 2004).

An oriented hand-sample was obtained from a well-bedded section of the volcanic breccia that forms Rattlesnake Knoll. Two samples for paleomagnetic analysis were cored from this hand sample and re-oriented in the laboratory. Natural remanent magnetization (NRM) was measured using a superconducting magnetometer housed in a magnetically shielded room at the USGS Menlo Park Rock Magnetics Laboratory. Following the NRM measurement, progressive alternating-field (AF) demagnetization was performed using a commercial tumbling demagnetizer to confirm the magnetic stability and direction recorded by the sample.

GRAVITY DATA

Five hundred and forty-five new gravity stations were established in the area of Spring and Snake Valleys during 2004 and 2005 (fig. 2). Observed gravity at each station was adjusted by assuming a time-dependent linear drift between readings of a base station at the start and finish of each daily survey. This adjustment compensates for drift in the instrument's spring. Observed gravity values are considered accurate to about 0.05 mGal based on repeat measurements over several mountain calibration loops (Barnes and others, 1969; Ponce and Oliver, 1981). Gravity data were reduced using standard gravity corrections (Blakely, 1995) and a reduction density of 2670 kg/m^3. Field terrain corrections (zones A and B of Hayford and Bowie, 1912) were carried out to 68 m using templates and charts (e.g., Plouff, 2000). Inner-zone terrain corrections for zones C and D (Hayford and Bowie, 1912), which are necessary to account for variations in topography near a gravity station, were obtained to a radial distance of 2 km (D. Plouff, USGS, written communication, 2006). Outer terrain corrections, from 2 km to 167 km, are calculated using digitized topography in a digital elevation model (DEM) and a procedure by Plouff (1977). A regional isostatic field was calculated using an Airy-Heiskanen (Heiskanen and Vening Meinesz, 1958) model for local compensation of topographic loads (Jachens and Roberts, 1981; Simpson and others, 1986). This model assumes a crustal thickness of 25 km, a crustal density of 2670 kg/m^3, and a 400 kg/m^3 density contrast between the crust and mantle. This regional isostatic field was subtracted from the complete Bouguer anomaly, thus removing long-wavelength variations in the gravity field that are inversely related to topography. The resulting isostatic residual gravity anomaly, therefore, is a reflection of local density distributions within middle to upper crustal levels. Gravity data obtained during the course of this study, and their associated parameters, are given in table 1 and are available via download as an Excel spreadsheet.

Because prior gravity data for the study area were made by many different observers at different times (see compilation of Ponce, 1997), we examined the data set to remove duplicate and inconsistent entries. To test for possible errors, we first compared station elevations with elevations interpolated from 10- and 30-meter DEMs using a procedure by D. Plouff (USGS, written communication, 2005). Large elevation differences indicate possible errors in station location or elevation, and each station identified was examined individually to confirm the discrepancy before omitting it from the data set. An interim isostatic gravity field was then calculated using the revised data set and incorporating our new gravity observations.

To check for additional errors, a residual of this gravity field was produced by analytically upward-continuing the observed anomalies by 1 km (Hildenbrand, 1983) and subtracting the result from the original grid. By removing the contribution of deeper sources accentuated by the upward continuation, the procedure emphasizes density variations of material at or near the ground surface. Readily seen (fig. 3) are areas of low density material (cool colors) filling the valleys and relatively small, discontinuous patches of high density material (warm colors) probably reflecting volcanic rocks of limited areal extent at the surface or near-surface, especially in the northern and southern parts of the study area. Close inspection of this map also revealed a number of anomalies that were apparently produced by individual gravity observations. If an observation differed significantly from values at nearby stations (often by 10 mGal or more), it also was removed from the data set. New data from the southern part of the study area (Scheirer, 2005), that were evaluated using criteria similar to that described here, were added to the revised data set. All data were then gridded at a spacing of 0.5 km using a minimum curvature algorithm of Webring (1981), and the resulting isostatic residual gravity field (fig. 4) is considered reliable for subsequent analyses.

GROUND MAGNETIC DATA

Rattlesnake Knoll (aka Rattlesnake Heaven prospect) is a small outcrop of volcanic breccia rising approximately 30 m above the floor of Spring Valley east of Majors Place (fig. 5). It is described as part of the "Cooper" mining district (Tingley, 1998), and veins within the breccia were found to contain fluorspar, lead, and silver (Hose and others, 1976; Wong, 1983). No production of lead-silver ore has been reported (Hose and others, 1976) but by the late

1970's, 30-50 tons of low-grade fluorspar ore was stockpiled at the site (Hose and others, 1976; Papke, 1979). Even though Rattlesnake Knoll has been described as intrusive (e.g., Hose and Blake, 1970; Stewart and Carlson, 1978), it displays poorly developed bedding (Papke, 1979; P.D. Rowley, written communication, 2005). Our reconnaissance of the knoll recognized a relatively consistent, gently-dipping bedding everywhere it could be measured, arguing against an intrusive origin.

A ground magnetic traverse was conducted over and around Rattlesnake Knoll as shown in figure 6. The total magnetic variation was less than 20 nT over the entire length of the traverse. Only the part of the traverse crossing the axis of the knoll is shown in figure 6 for clarity. The exposed part of Rattlesnake Knoll does not have a magnetic character distinct from its immediate surroundings.

PALEOMAGNETIC DATA

The intensity of natural remanent magnetization (NRM) for the two cores drilled from the hand sample collected near the crest of Rattlesnake Knoll ranged from 0.7 to 1.3 Am^{-1}. Both cores, when corrected for strike and dip of bedding (N23°W, +21°SW), had magnetization directions that were essentially horizontal toward the south. Upon alternating-field demagnetization of one of these cores, the direction became northeasterly (fig. 7) and stabilized at a direction that is within 25° of that expected for the site locality. Although one hand sample is not necessarily representative of the entire knoll, this general agreement with the expected direction indicates that the knoll has not been significantly disrupted, other than slightly tilted, since it was emplaced.

The initial horizontal magnetization directions that were measured, coupled with a rapid loss of magnetic intensity during demagnetization (more than an order of magnitude by 15 mT), indicates that the hand sample probably was taken in close proximity to a lightning strike. Thus, a more representative magnetic intensity for the volcanic breccia at this locality is probably closer to 0.1 Am^{-1}or less. Even at this level, however, the rock is well within the range of detection by the portable magnetometer. The fact that we could not distinguish a magnetic character for the knoll that was distinct from its surroundings (fig. 6) may indicate that the knoll is only the exposed part of a much larger body. This possibility is corroborated by gravity data indicating a small magnitude anomaly encompassing an area much larger than the knoll itself (fig. 8).

GRAVITY INVERSION

To first order, the isostatic residual gravity field (fig. 4) reflects the pronounced contrast between dense (~2670 kg/m^3) pre-Cenozoic basement rocks and the significantly less dense (generally < 2500 kg/m^3) overlying volcanic and sedimentary basin-fill. Because of this relationship, the gravity inversion method (Jachens and Moring, 1990) can be used to separate the isostatic residual anomaly into pre-Cenozoic "basement" and Cenozoic "basin" fields, thus allowing an estimate of thickness of Cenozoic alluvial fill within the area. The accuracy of thickness estimates derived by the gravity inversion technique is dependent on the assumed density-depth relation of the Cenozoic rocks, and on the initial density assigned to the basement rocks. Density of basement rocks is generally assumed to be 2670 kg/m^3 and this value is considered appropriate in this area where major exposures consist of late Precambrian through late Paleozoic marine carbonate and quartzose sedimentary rocks. Subvolcanic Cenozoic intrusions are included here as part of the basement because their physical properties are similar to most of the older rocks, and differ greatly from those of the eruptive and basin-fill sedimentary sequences.

The density of basin-filling deposits generally increases with the degree of compaction and consolidation, and thus usually correlates with depth of burial, as well as with other factors such as increasing water content. The density-versus-depth relationship we use is given in table 2 and is the same used by Jachens and Moring (1990) to separate the isostatic residual anomaly into basement and basin fields. This density-depth distribution also is the same as used by Saltus and Jachens (1995) for their basin-depth map of the Basin and Range Province and similar to those shown to be widely applicable to other volcanic basin-fill deposits throughout Nevada (Blakely and others, 1998, 2000; Mankinen and others, 2003).

In the inversion process, the density of basement is allowed to vary horizontally but the density of basin-filling deposits is fixed using the density-depth distribution (table 2). In this iterative approach, a first approximation of the basement gravity field is derived from those gravity measurements made on exposed pre-Cenozoic rocks. As part of the iterative process, basement gravity values were approximated by correcting the isostatic gravity anomaly at sites where depth to basement is known from deep boreholes (Garside and others, 1988; Hess, 2004) or inferred from seismic data (Gans and others, 1985). At locations where wells did not penetrate the full thickness of basin fill, the maximum depths reached were used as minimum constraints in the iterative process. Information on oil and gas wells for Nevada and Utah is available on-line at http://www.nbmg.unr.edu/lists/oil/oil.htm and http://ogm.utah.gov/oilgas/, respectively. This basement gravity field ignores the gravity effects of nearby basins and is subtracted from the observed gravity, which provides the first approximation of the basin gravity field. Again using the selected density-depth relation, the thickness of the basin-filling deposits is calculated. The gravitational effect of this first approximation of the basin-filling layer is computed at each known basement station. This effect is, in turn, subtracted from the first approximation of the basement gravity field, and the process is repeated until successive iterations produce no substantial changes in the basement gravity field. Results of the inversion, shown in figure 9, were gridded at a spacing of 1.0 km using a minimum curvature algorithm Webring (1981).

CONCLUSIONS

New gravity data collected during the course of this study allows a much improved definition of basins in the study area. Comparison with a previously published map (Saltus and Jachens, 1995) illustrates the importance of an improved data distribution and incorporation of drill-hole data not available for the earlier interpretation. Note the generally very good agreement (in plan view) between the current and earlier study (fig. 11) in Snake Valley where the initial gravity coverage was good (fig. 2). On the other hand, thick alluvial fill is shown to be much more extensive in Spring and Tippett Valleys than previously determined. Use of drill-hole constraints, indicate that maximum thickness of fill in the deepest parts of Snake Valley is nearly 4 km rather than ~3.3 km determined by the earlier study. Thickness of fill throughout much of Spring Valley is generally between 1.5 and 2.0 km, with a maximum approaching 3.0 km in limited areas. In northern-most Spring Valley (north of 39°50'), however, maximum depths reach ~4.0 km (fig. 10). Thickness of fill in Tippett Valley is generally greater than 3 km, with maximum values between 5 and 5.5 km. Hamlin Valley seems to have a narrow basin that varies between 3 and 3.5 km deep. The valleys near the southern end of the study area and beyond tend to become much deeper as reported by Scheirer (2005).

ACKNOWLEDGMENTS

This study was performed with the cooperation of Southern Nevada Water Authority (SNWA) whose support is greatly appreciated. Reviews by D. Ponce and D. Scheirer, and informal comments by G.L. Dixon helped to clarify and improve the manuscript. Discussions with G.L. Dixon and P.R. Rowley during the course of this study proved very helpful.

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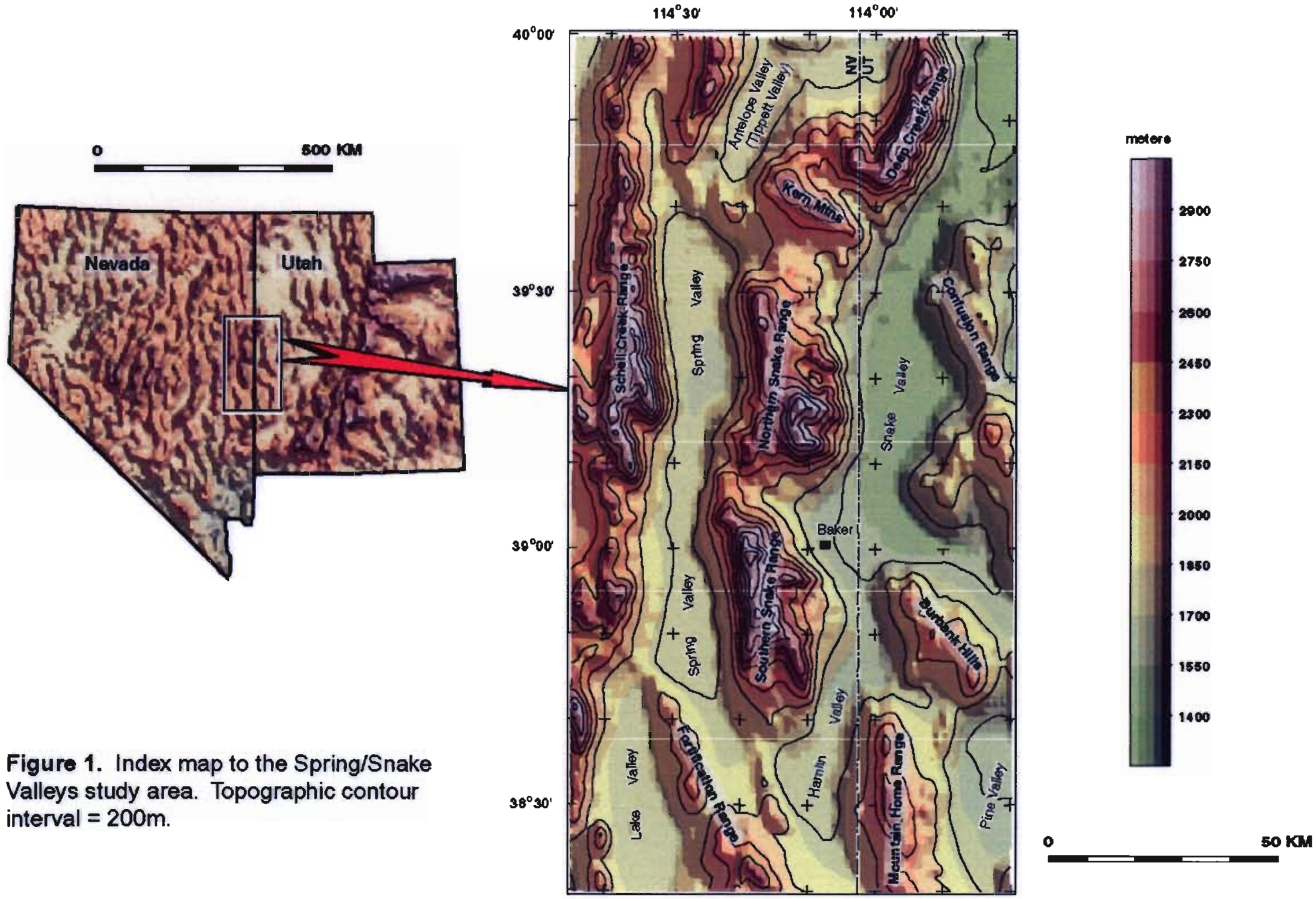

Figure 1. Index map to the Spring/Snake Valleys study area. Topographic contour interval = 200m.

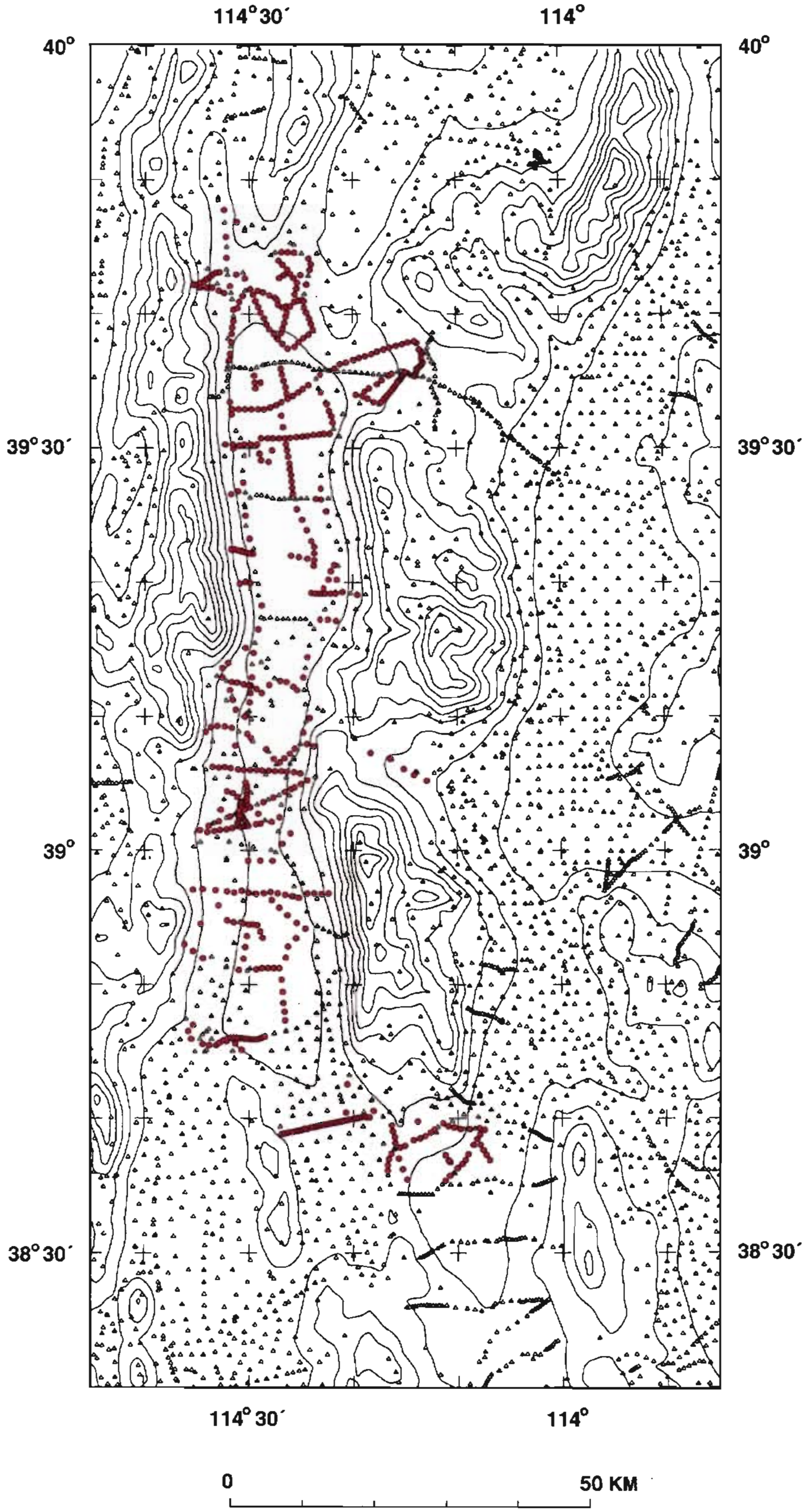

Figure 2. Locations of gravity stations in the study area. Triangles, previously available stations; Red dots, stations added during the current study.

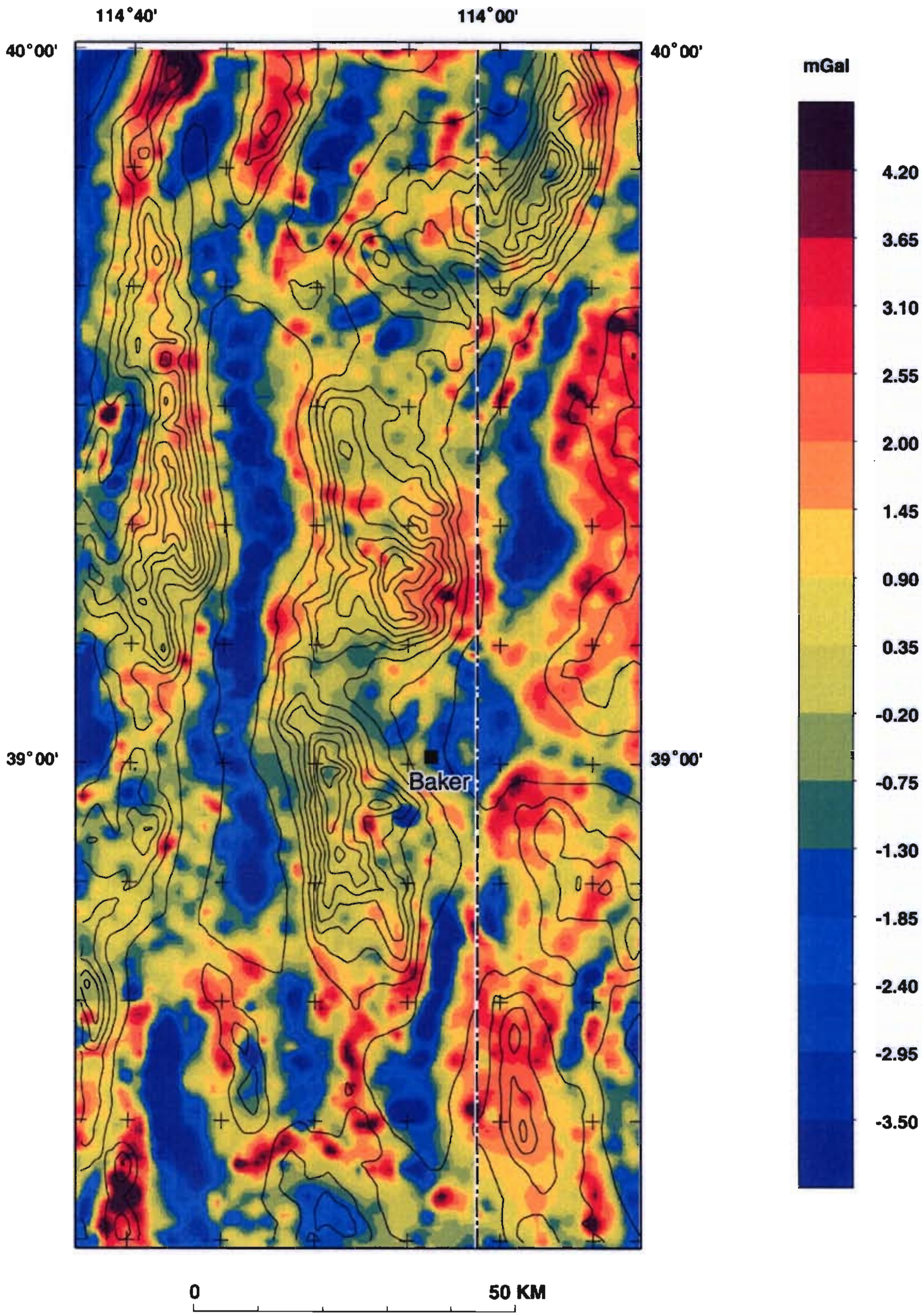

Figure 3. Residual of the isostatic gravity field. This map was calculated by analytically upward-continuing the isostatic anomalies by 1 km and subtracting the result from the original grid.

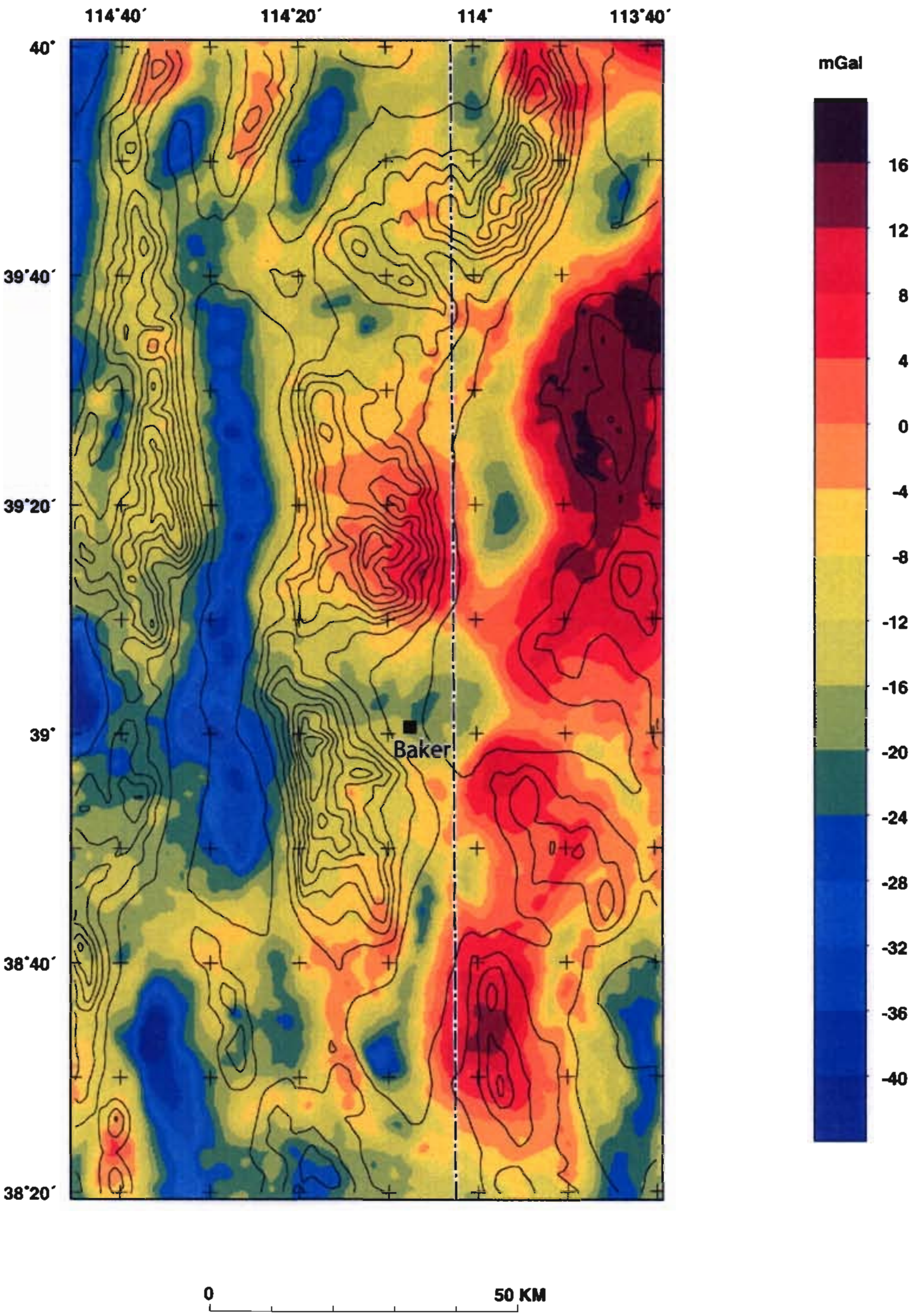

Figure 4. Isostatic gravity field. Anomalies shown reflect local density variations in the middle and upper crust. Gravity lows (cool colors) generally indicate sedimentary material within the valleys; gravity highs (warm colors) generally reflect denser basement rocks in the mountain ranges.

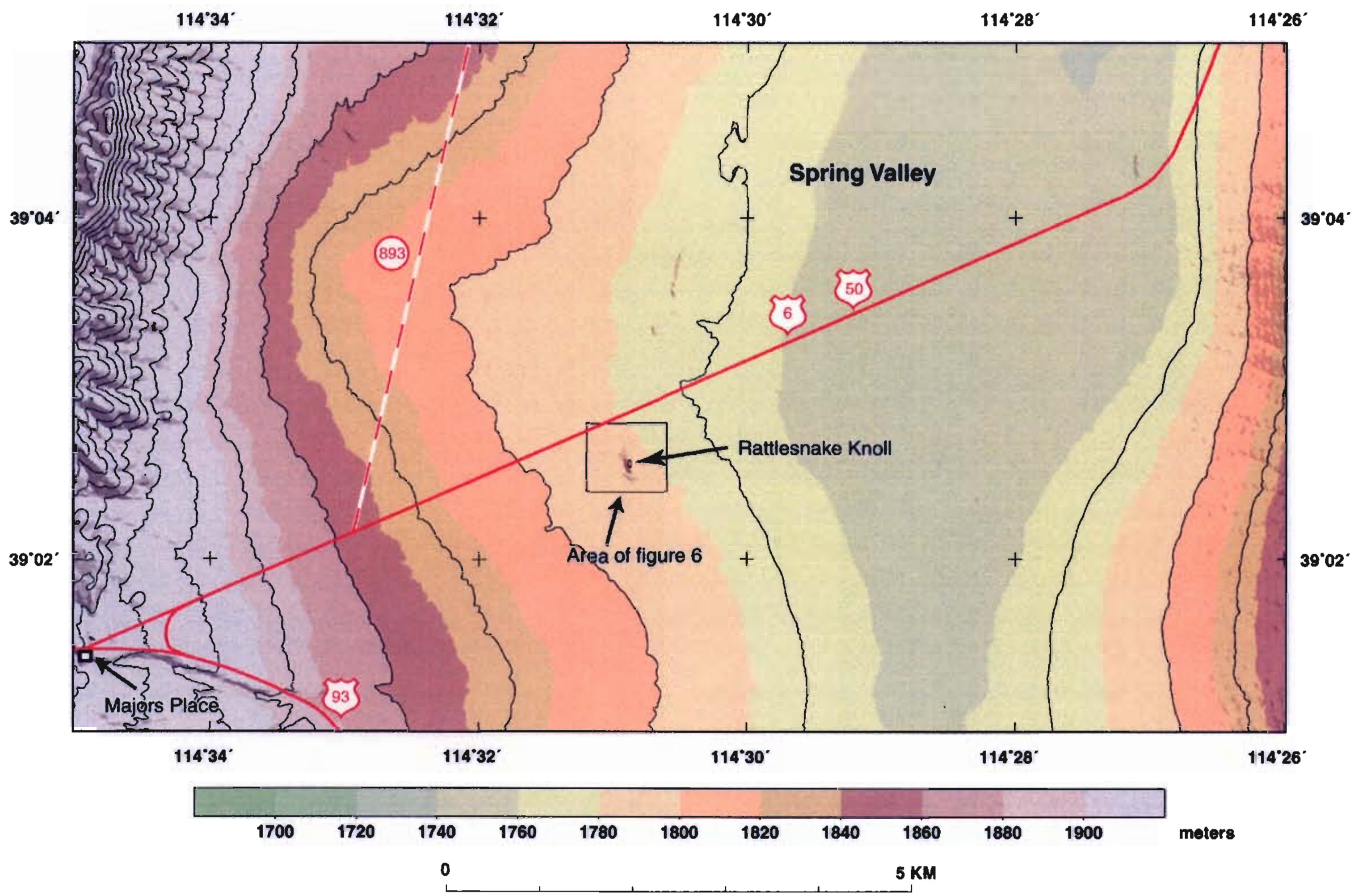

Figure 5. Map showing location of Rattlesnake Knoll. Topographic contour interval = 30 m.

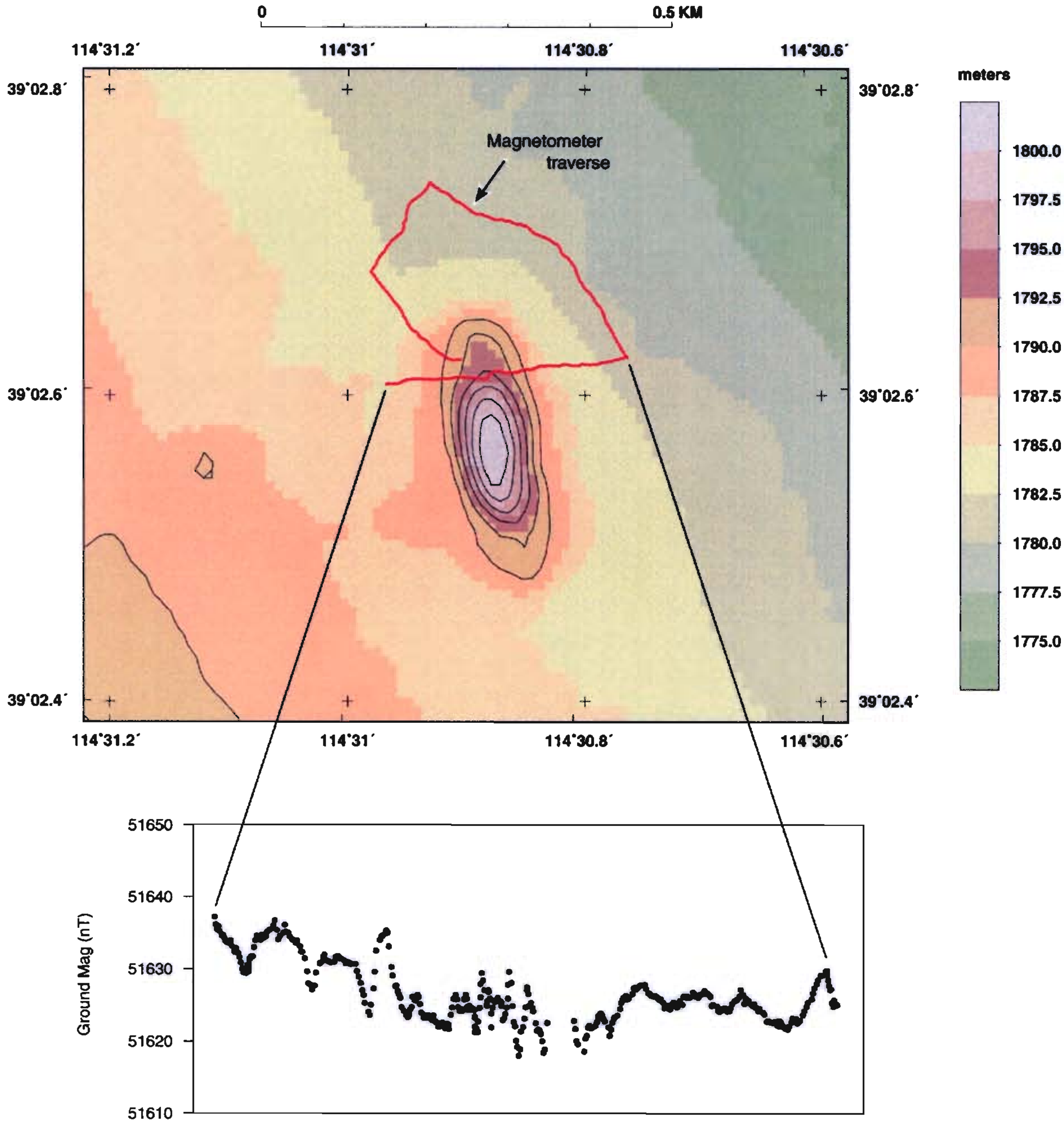

Figure 6. Ground magnetic traverse (red line) over and around Rattlesnake knoll. Topographic contour interval = 2 m.

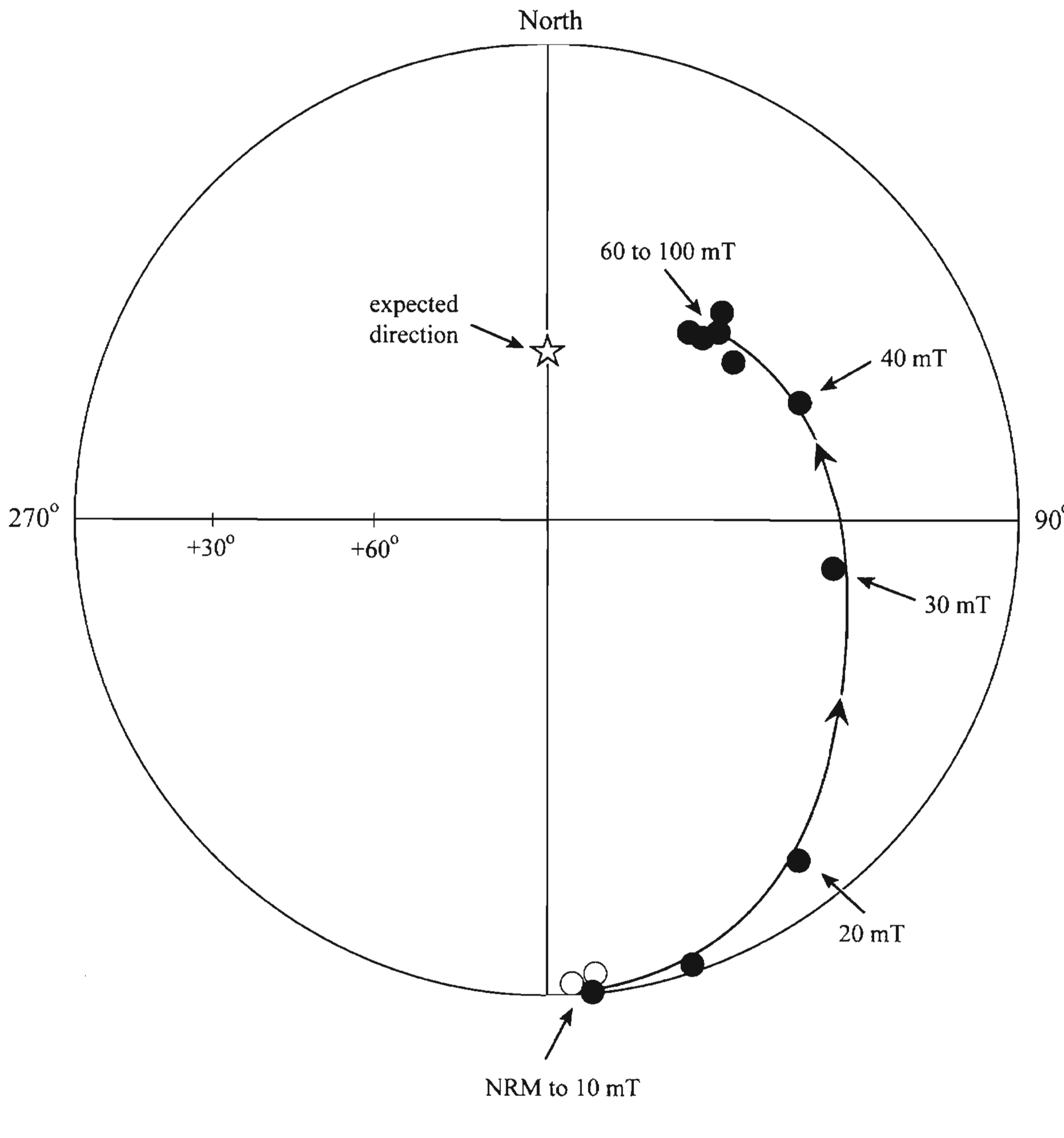

Figure 7. Changes in magnetization direction during alternating-field demagnetization of a sample from Rattlesnake knoll. Solid (open) symbols are directions on lower (upper) hemisphere of an equal-area projection. Star is the expected direction at the sample locality during middle Tertiary time.

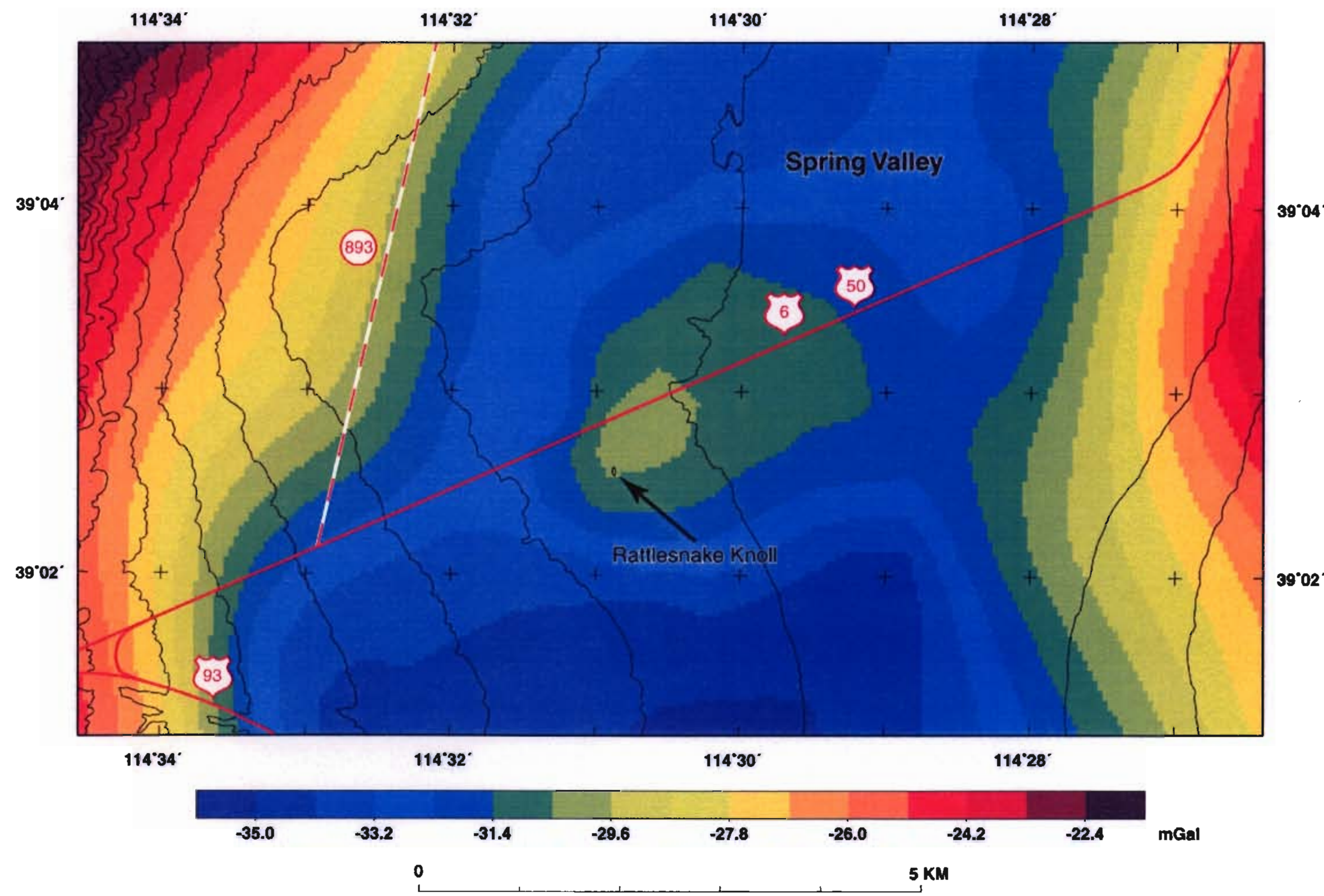

Figure 8. Map showing extent of the gravity anomaly associated with Rattlesnake Knoll. Topographic contour interval = 30 m.

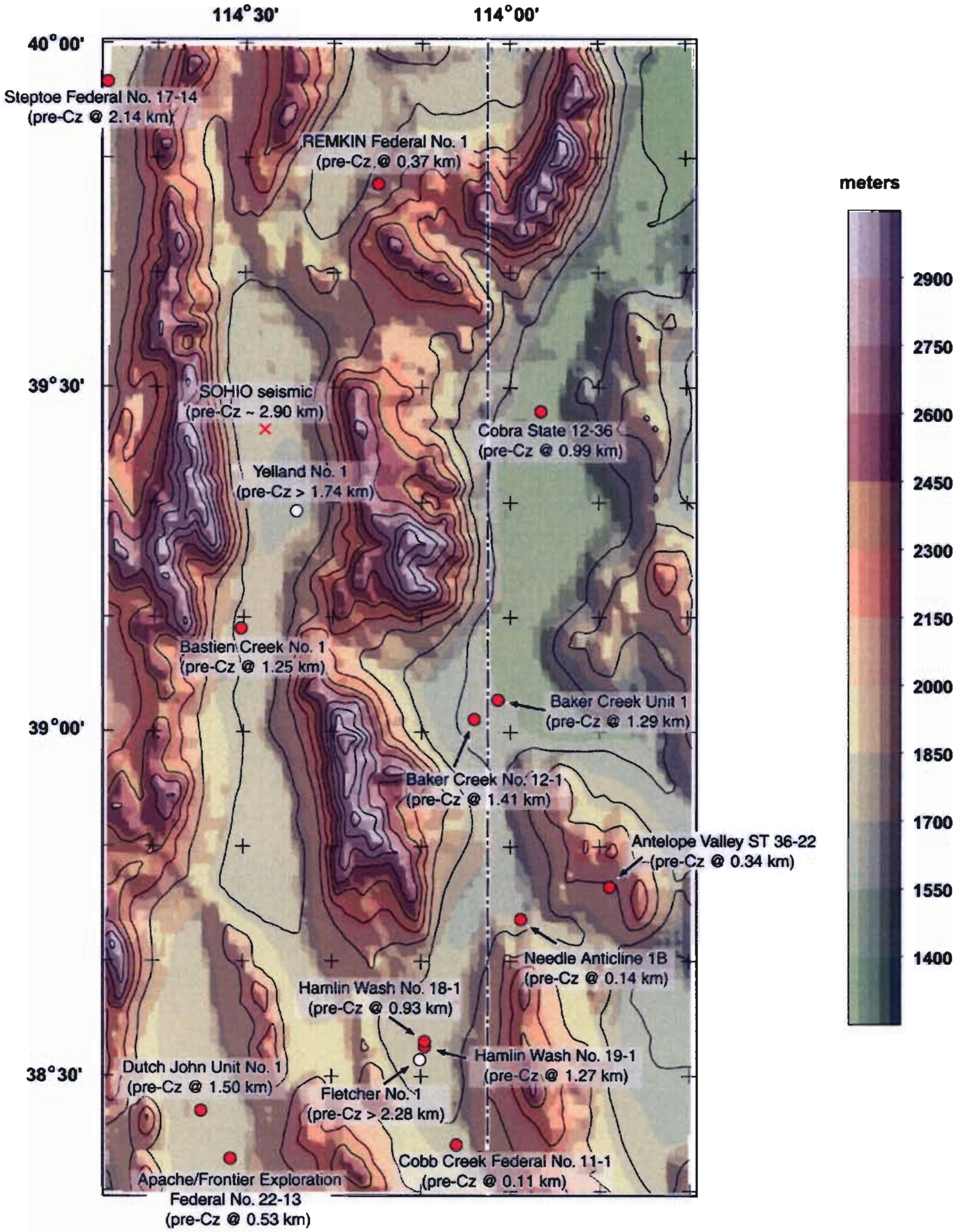

Figure 9. Depth-to-basement constraints in the study area. Red dots are drill holes that encountered pre-Cenozoic basement rocks; white dots are less-firm constraints on alluvial thickness; red "x" is basement pick from seismic interpretation (Gans and others, 1985).

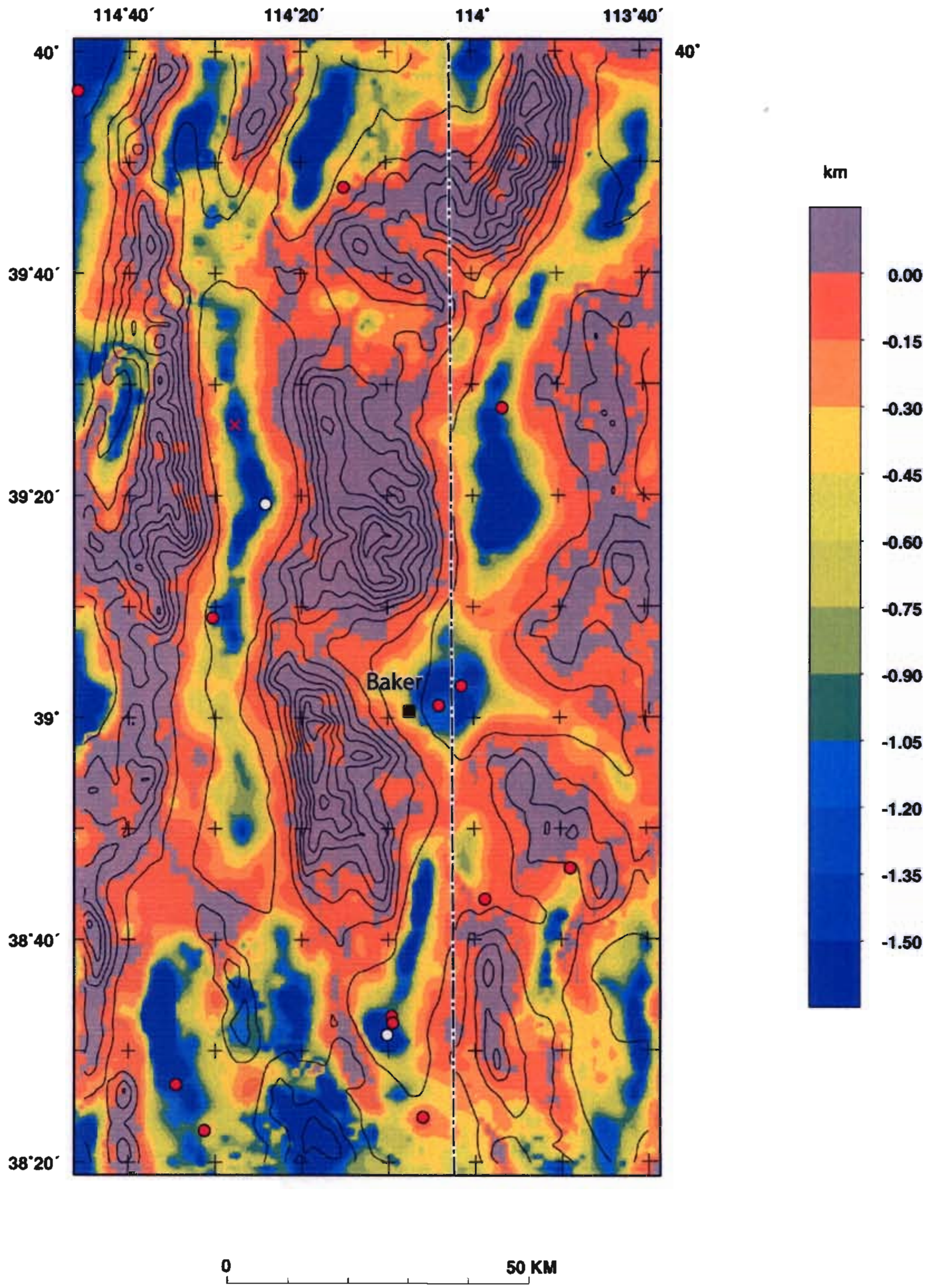

Figure 10. Depth to pre-Cenozoic basement. Symbols as in Figure 9.

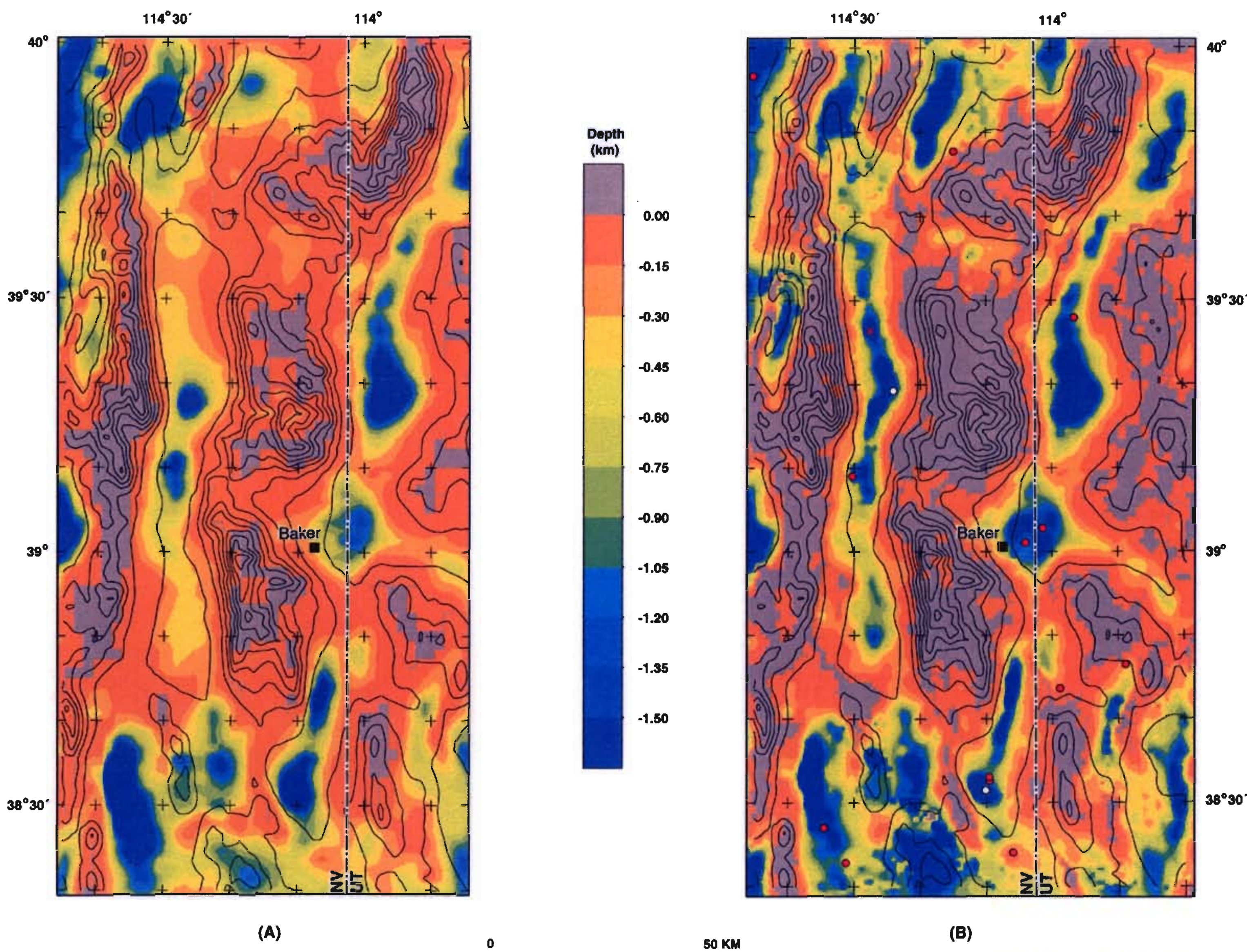

Figure 11. Depth to pre-Cenozoic basement in the Spring/Snake Valleys study area: (A) extracted from Saltus and Jachens (1995), (B) calculated incorporating new gravity data from Table 1 and Scheirer (2005), and drill hole constraints shown in Figure 9.

Table 1. Principal facts for new gravity stations from Spring Valley, Nevada

[Station coordinates, NAD27; elevations, NAVD29; Bouguer anomaly calculated using a reduction density of 2670 kg/m³; terrain corrections calculated out to 166.7 m]

Station Name	Longitude °W	Latitude °N	Elevation (meters)	Observed Gravity (mGal)	Free Air Anomaly (mGal)	Total Terrain Correction (mGal)	Complete Bouguer Anomaly (mGal)	Isostatic Anomaly (mGal)
04SPR001	-114.2538	39.5883	1995.8	979527.23	10.48	1.18	-213.18	-11.88
04SPR002	-114.2567	39.5847	1997.2	979526.87	10.87	1.25	-212.86	-11.46
04SPR003	-114.2605	39.5815	1989.6	979527.53	9.49	1.31	-213.34	-11.81
04SPR004	-114.2640	39.5777	1989.9	979526.52	8.91	1.36	-213.91	-12.32
04SPR005	-114.2672	39.5748	1989.3	979526.20	8.65	1.39	-214.06	-12.38
04SPR006	-114.2708	39.5713	1983.6	979527.05	8.05	1.43	-213.99	-12.18
04SPR007	-114.2743	39.5677	1964.6	979531.33	6.80	1.54	-213.01	-11.06
04SPR008	-114.2782	39.5643	1964.8	979531.17	7.01	1.50	-212.86	-10.79
04SPR009	-114.2823	39.5607	1952.9	979533.76	6.24	1.53	-212.26	-10.06
04SPR010	-114.2867	39.5573	1947.8	979534.86	6.08	1.57	-211.82	-9.47
04SPR011	-114.2990	39.5578	1916.2	979540.98	2.40	1.50	-212.02	-9.31
04SPR012	-114.3078	39.5617	1891.5	979544.93	-1.60	1.38	-213.38	-10.50
04SPR013	-114.3175	39.5645	1864.6	979550.76	-4.34	1.37	-213.10	-10.03
04SPR014	-114.3272	39.5663	1840.9	979555.71	-6.83	1.21	-213.10	-9.79
04SPR015	-114.3140	39.5707	1860.8	979551.83	-4.96	1.16	-213.52	-10.56
04SPR016	-114.3058	39.5745	1878.9	979548.72	-2.84	1.10	-213.48	-10.74
04SPR017	-114.2933	39.5800	1902.8	979543.27	-1.40	1.13	-214.69	-12.31
04SPR018	-114.2852	39.5848	1921.8	979538.64	-0.60	1.06	-216.09	-13.93
04SPR019	-114.2740	39.5902	1949.1	979534.79	3.47	1.06	-215.07	-13.25
04SPR020	-114.2542	39.5877	1995.4	979527.42	10.60	1.21	-212.98	-11.68
04SPR021	-114.2538	39.5883	1995.8	979527.32	10.57	1.18	-213.09	-11.79
04SPR022	-114.2520	39.5902	1998.6	979527.21	11.16	1.16	-212.83	-11.58
04SPR023	-114.2495	39.5927	1995.5	979528.08	10.86	1.17	-212.77	-11.59
04SPR024	-114.2473	39.5950	2002.2	979526.91	11.53	1.15	-212.86	-11.77
04SPR025	-114.2695	39.5927	1958.6	979533.41	4.82	1.05	-214.80	-13.11
04SPR026	-114.2325	39.5898	2052.7	979515.13	15.79	1.14	-214.27	-13.58
04SPR027	-114.2317	39.5923	2056.1	979514.28	15.76	1.14	-214.68	-14.03
04SPR028	-114.2302	39.5952	2063.3	979512.94	16.40	1.10	-214.89	-14.31
04SPR029	-114.2293	39.5983	2064.3	979513.30	16.79	1.13	-214.58	-14.03
04SPR030	-114.2263	39.6003	2050.7	979514.73	13.84	1.15	-215.98	-15.51
04SPR031	-114.2242	39.6022	2047.7	979514.67	12.70	1.17	-216.77	-16.38
04SPR032	-114.2217	39.6038	2063.1	979510.62	13.24	1.16	-217.97	-17.67
04SPR033	-114.2198	39.6067	2071.5	979508.93	13.90	1.19	-218.22	-18.00
04SPR034	-114.2212	39.6100	2065.2	979511.56	14.28	1.28	-217.04	-16.81
04SPR035	-114.2220	39.6130	2073.8	979510.71	15.83	1.29	-216.45	-16.21
04SPR036	-114.2217	39.6163	2085.4	979508.78	17.15	1.31	-216.39	-16.21
04SPR037	-114.2228	39.6198	2100.7	979505.38	18.17	1.31	-217.09	-16.93
04SPR038	-114.2248	39.6232	2111.0	979502.89	18.56	1.28	-217.88	-17.72
04SPR039	-114.2298	39.6307	2110.9	979501.48	16.45	1.32	-219.93	-19.71

04SPR040	-114.2337	39.6328	2106.7	979501.63	15.12	1.34	-220.79	-20.45
04SPR041	-114.2435	39.6310	2072.9	979506.72	9.95	1.24	-222.27	-21.63
04SPR042	-114.2533	39.6290	2048.4	979511.39	7.24	1.15	-222.33	-21.43
04SPR043	-114.2633	39.6275	2025.6	979515.97	4.91	1.07	-222.17	-21.00
04SPR044	-114.2730	39.6248	1999.6	979520.89	2.06	1.01	-222.19	-20.75
04SPR045	-114.2830	39.6225	1976.4	979524.88	-0.87	0.94	-222.60	-20.88
04SPR046	-114.2928	39.6198	1948.8	979530.96	-3.07	0.92	-221.73	-19.70
04SPR047	-114.3025	39.6170	1927.3	979536.65	-3.75	0.89	-220.03	-17.75
04SPR048	-114.3125	39.6143	1900.1	979543.78	-4.79	0.88	-218.03	-15.49
04SPR049	-114.3225	39.6118	1875.7	979550.30	-5.57	0.85	-216.10	-13.29
04SPR050	-114.3323	39.6093	1861.0	979553.55	-6.62	0.83	-215.53	-12.48
04SPR051	-114.3433	39.6067	1845.1	979557.46	-7.37	0.82	-214.51	-11.16
04SPR052	-114.3535	39.6040	1828.9	979563.09	-6.51	0.81	-211.84	-8.23
04SPR053	-114.3618	39.5987	1807.6	979564.50	-11.19	0.82	-214.12	-10.29
04SPR054	-114.5320	39.6093	1809.4	979549.55	-26.53	2.58	-227.91	-21.28
04SPR055	-114.5308	39.6177	1792.8	979552.93	-29.00	2.66	-228.44	-21.89
04SPR057	-114.5278	39.6415	1805.9	979552.79	-27.24	2.11	-228.68	-22.42
04SPR058	-114.5268	39.6497	1825.9	979550.16	-24.41	1.77	-228.44	-22.30
04SPR059	-114.5258	39.6577	1840.6	979548.84	-21.92	1.55	-227.82	-21.81
04SPR060	-114.5252	39.6720	1844.0	979550.91	-20.06	1.42	-226.48	-20.65
04SPR061	-114.5313	39.7017	1865.5	979545.73	-21.26	1.40	-230.11	-24.52
04SPR062	-114.5475	39.7188	1919.6	979537.81	-14.02	1.77	-228.56	-22.98
04SPR063	-114.5540	39.7178	1936.4	979534.98	-11.58	2.08	-227.69	-22.04
04SPR064	-114.5595	39.7147	1962.2	979530.86	-7.48	2.46	-226.09	-20.36
04SPR065	-114.5642	39.7118	1992.4	979525.82	-2.95	2.87	-224.53	-18.77
04SPR066	-114.5690	39.7092	2031.1	979518.63	2.03	3.42	-223.34	-17.55
04SPR067	-114.5738	39.7065	2075.4	979509.89	7.18	4.09	-222.48	-16.63
04SPR068	-114.5793	39.7048	2131.6	979498.98	13.76	5.11	-221.16	-15.32
04SPR069	-114.5845	39.7030	2176.4	979490.22	18.95	7.02	-219.07	-13.18
04SPR070	-114.5883	39.7033	2216.6	979481.13	22.24	9.09	-218.21	-12.32
04SPR071	-114.578	39.6998	2124.5	979502.32	15.33	4.54	-219.36	-13.46
04SPR072	-114.568	39.6993	2032.1	979517.29	1.88	3.16	-223.86	-17.93
04SPR073	-114.5598	39.6992	1977.0	979526.48	-5.90	2.52	-226.11	-20.23
04SPR074	-114.5483	39.6953	1917.7	979535.69	-14.64	1.90	-228.83	-22.98
04SPR075	-114.5403	39.6927	1893.2	979540.50	-17.16	1.63	-228.87	-23.08
04SPR076	-114.5187	39.6740	1828.9	979552.95	-22.88	1.25	-227.76	-22.02
04SPR077	-114.5157	39.6817	1828.6	979552.73	-23.85	1.18	-228.77	-23.15
04SPR078	-114.5105	39.6888	1824.0	979553.86	-24.80	1.09	-229.30	-23.81
04SPR079	-114.4983	39.6975	1823.6	979556.04	-23.50	0.99	-228.06	-22.84
04SPR080	-114.4938	39.6903	1814.1	979556.78	-25.05	0.97	-228.56	-23.33
04SPR081	-114.4897	39.6832	1808.8	979557.37	-25.46	0.95	-228.40	-23.14
04SPR082	-114.4853	39.6755	1804.4	979557.77	-25.75	0.93	-228.21	-22.96
04SPR083	-114.4812	39.6685	1797.6	979561.48	-23.51	0.93	-225.21	-19.96
04SPR084	-114.4765	39.6613	1791.8	979564.10	-22.03	0.89	-223.12	-17.83
04SPR085	-114.4723	39.6540	1787.4	979562.87	-23.97	0.85	-224.61	-19.33
04SPR086	-114.4675	39.6473	1781.9	979563.82	-24.11	0.83	-224.15	-18.85
04SPR087	-114.4605	39.6415	1776.8	979565.73	-23.25	0.79	-222.76	-17.51
04SPR088	-114.4533	39.6352	1771.7	979564.79	-25.21	0.78	-224.16	-18.96
04SPR089	-114.4463	39.6293	1768.0	979561.65	-28.97	0.76	-227.52	-22.39

04SPR090	-114.4383	39.6235	1763.8	979561.16	-30.26	0.75	-228.34	-23.32
04SPR091	-114.5210	39.7158	1856.4	979548.82	-22.24	1.21	-230.26	-24.97
04SPR092	-114.5065	39.7105	1835.2	979554.28	-22.83	1.07	-228.61	-23.42
04SPR093	-114.4858	39.6953	1828.2	979554.47	-20.37	0.92	-226.63	-21.60
04SPR094	-114.4775	39.6932	1865.5	979552.53	-13.71	0.92	-223.03	-18.17
04SPR095	-114.4672	39.6897	1889.6	979550.11	-8.39	0.87	-220.46	-15.76
04SPR096	-114.4585	39.6872	1898.1	979549.44	-6.21	0.83	-219.27	-14.69
04SPR097	-114.4547	39.6833	1899.0	979549.43	-5.60	0.78	-218.81	-14.26
04SPR098	-114.4537	39.6783	1894.2	979549.98	-6.10	0.74	-218.81	-14.21
04SPR099	-114.4465	39.6752	1868.2	979555.48	-8.32	0.74	-218.12	-13.60
04SPR100	-114.4405	39.6760	1848.1	979559.98	-10.28	0.71	-217.86	-13.43
04SPR101	-114.4347	39.6763	1835.6	979563.12	-10.84	0.72	-217.01	-12.65
04SPR102	-114.4275	39.6818	1845.3	979561.30	-10.16	0.69	-217.45	-13.32
04SPR103	-114.4213	39.6835	1861.3	979558.93	-7.75	0.69	-216.83	-12.83
04SPR104	-114.4153	39.6840	1878.3	979558.02	-3.46	0.74	-214.39	-10.48
04SPR105	-114.4122	39.6827	1889.9	979558.67	0.88	0.80	-211.29	-7.45
04SPR106	-114.4120	39.6750	1883.1	979556.71	-2.50	0.80	-213.91	-10.00
04SPR107	-114.4082	39.6683	1883.5	979554.89	-3.58	0.85	-214.98	-11.06
04SPR108	-114.4037	39.6613	1885.3	979555.20	-2.12	0.82	-213.75	-9.82
04SPR109	-114.4007	39.6543	1880.0	979553.45	-4.87	0.84	-215.90	-11.94
04SPR110	-114.3977	39.6477	1875.2	979553.35	-5.85	0.87	-216.31	-12.36
04SPR111	-114.4045	39.6412	1842.7	979557.11	-11.54	0.79	-218.44	-14.25
04SPR112	-114.4127	39.6365	1814.0	979560.44	-16.64	0.76	-220.35	-15.94
04SPR113	-114.4207	39.6318	1790.8	979561.65	-22.17	0.75	-223.29	-18.69
04SPR114	-114.4267	39.6258	1773.5	979561.82	-26.80	0.76	-225.97	-21.18
04SPR115	-114.4495	39.5987	1751.0	979557.60	-35.56	0.82	-232.14	-26.63
04SPR116	-114.4468	39.5910	1745.7	979558.40	-35.71	0.84	-231.68	-26.13
04SPR117	-114.4442	39.5833	1741.8	979559.17	-35.46	0.83	-231.00	-25.44
04SPR118	-114.4418	39.5755	1737.6	979559.72	-35.49	0.85	-230.55	-24.97
04SPR119	-114.4403	39.5677	1734.1	979559.98	-35.61	0.87	-230.25	-24.60
04SPR120	-114.4383	39.5608	1731.6	979560.33	-35.42	0.88	-229.78	-24.10
04SPR121	-114.4477	39.5568	1730.1	979557.92	-37.94	0.94	-232.07	-26.15
04SPR122	-114.4570	39.5537	1731.1	979555.23	-40.04	1.00	-234.22	-28.11
04SPR123	-114.4660	39.5502	1729.3	979553.11	-42.40	1.11	-236.27	-30.00
04SPR124	-114.4757	39.5485	1732.3	979551.23	-43.21	1.24	-237.29	-30.84
04SPR125	-114.4857	39.5485	1730.5	979552.02	-42.99	1.39	-236.71	-30.10
04SPR126	-114.4963	39.5483	1732.1	979553.90	-40.61	1.65	-234.24	-27.48
04SPR127	-114.5067	39.5482	1741.9	979554.93	-36.53	1.94	-230.98	-24.05
04SPR128	-114.5165	39.5482	1755.6	979555.20	-32.03	2.36	-227.59	-20.52
04SPR129	-114.5273	39.5483	1773.1	979553.45	-28.42	3.08	-225.22	-18.00
04SPR130	-114.5310	39.5568	1791.7	979551.21	-25.67	3.16	-224.48	-17.34
04SPR131	-114.5285	39.5415	1767.0	979554.81	-28.33	3.45	-224.08	-16.80
04SPR132	-114.4937	39.3685	1740.0	979540.26	-35.84	4.29	-227.72	-19.64
04SPR133	-114.4997	39.3697	1772.9	979534.73	-31.33	4.71	-226.48	-18.35
04SPR134	-114.5058	39.3707	1821.2	979526.04	-25.22	5.17	-225.32	-17.17
04SPR135	-114.5115	39.3717	1862.5	979518.63	-19.99	5.74	-224.15	-15.97
04SPR136	-114.5177	39.3728	1907.0	979510.61	-14.39	6.62	-222.66	-14.50
04SPR137	-114.5232	39.3745	1959.0	979501.60	-7.53	7.69	-220.54	-12.32
04SPR138	-114.5288	39.3747	2008.4	979491.72	-2.19	9.60	-218.82	-10.62
04SPR139	-114.4795	39.3047	1709.8	979539.21	-40.53	4.21	-229.11	-21.02

04SPR140	-114.4853	39.2750	1722.3	979532.38	-40.88	4.80	-230.27	-22.09
04SPR141	-114.4927	39.2455	1740.4	979523.51	-41.55	3.75	-234.02	-25.75
04SPR142	-114.4960	39.2153	1792.7	979511.70	-34.56	2.30	-234.34	-26.12
04SPR143	-114.4973	39.2052	1796.8	979509.76	-34.35	2.11	-234.78	-26.53
04SPR144	-114.5003	39.2057	1805.9	979508.76	-32.57	2.17	-233.97	-25.68
04SPR145	-114.5193	39.209	1850.1	979500.61	-27.39	2.76	-233.15	-24.70
04SPR146	-114.5425	39.2152	1905.0	979490.76	-20.87	4.69	-230.84	-22.11
04SPR147	-114.4878	39.2012	1772.9	979511.91	-39.21	1.91	-237.16	-29.06
04SPR148	-114.4802	39.1963	1752.3	979512.79	-44.25	1.82	-239.99	-31.97
04SPR149	-114.4982	39.1962	1788.4	979509.57	-36.32	2.05	-235.88	-27.68
04SPR150	-114.5072	39.1668	1760.7	979504.31	-47.53	2.12	-243.90	-35.63
04SPR151	-114.5220	39.1310	1804.9	979502.18	-32.87	1.93	-234.39	-26.16
04SPR152	-114.5297	39.1025	1849.7	979490.18	-28.51	1.53	-235.45	-27.39
04SPR153	-114.5385	39.1042	1874.2	979488.14	-23.16	1.65	-232.72	-24.58
04SPR154	-114.548	39.1032	1898.5	979485.57	-18.13	1.90	-230.18	-21.97
04SPR155	-114.5582	39.1043	1926.8	979481.78	-13.32	2.16	-228.27	-19.96
04SPR156	-114.5187	39.0457	1784.4	979495.28	-38.54	1.29	-238.39	-30.80
04SPR157	-114.5177	39.0443	1784.5	979495.19	-38.46	1.28	-238.35	-30.77
04SPR158	-114.5168	39.0430	1785.1	979494.94	-38.42	1.28	-238.36	-30.80
04SPR159	-114.5157	39.0413	1785.7	979494.76	-38.26	1.27	-238.29	-30.78
04SPR160	-114.5150	39.0400	1786.4	979494.48	-38.20	1.25	-238.32	-30.84
04SPR161	-114.5163	39.0370	1790.3	979491.70	-39.52	1.24	-240.10	-32.63
04SPR162	-114.5183	39.0343	1795.8	979489.63	-39.66	1.22	-240.87	-33.43
04SPR163	-114.5178	39.0312	1799.3	979488.20	-39.74	1.20	-241.36	-33.97
04SPR164	-114.5132	39.0295	1795.8	979488.45	-40.41	1.19	-241.64	-34.31
04SPR165	-114.5090	39.0300	1789.4	979489.79	-41.10	1.20	-241.61	-34.33
04SPR166	-114.5052	39.0305	1783.3	979491.40	-41.40	1.22	-241.21	-33.95
04SPR167	-114.5012	39.0310	1777.1	979492.86	-41.91	1.25	-240.99	-33.78
04SPR168	-114.5038	39.0333	1780.2	979493.12	-40.90	1.24	-240.34	-33.05
04SPR169	-114.5058	39.0363	1778.7	979494.81	-39.92	1.26	-239.18	-31.86
04SPR170	-114.5082	39.0388	1779.4	979495.32	-39.42	1.24	-238.77	-31.39
04SPR171	-114.5107	39.0417	1779.5	979495.96	-38.99	1.26	-238.34	-30.90
04SPR172	-114.5118	39.0428	1780.0	979496.28	-38.63	1.28	-238.02	-30.55
04SPR173	-114.5130	39.0442	1778.9	979496.88	-38.49	1.30	-237.72	-30.20
04SPR174	-114.5145	39.0452	1779.9	979496.78	-38.37	1.30	-237.72	-30.16
04SPR175	-114.5160	39.0443	1782.2	979496.17	-38.19	1.32	-237.78	-30.21
04SPR176	-114.5152	39.0438	1791.5	979494.54	-36.92	1.31	-237.56	-30.01
04SPR177	-114.4985	39.0538	1763.5	979499.69	-41.27	1.33	-238.75	-31.30
04SPR178	-114.5030	39.0570	1769.4	979499.38	-40.07	1.31	-238.22	-30.70
04SPR179	-114.5073	39.0598	1776.7	979497.86	-39.57	1.29	-238.57	-30.97
04SPR180	-114.5105	39.0618	1774.2	979496.96	-41.43	1.34	-240.09	-32.42
04SPR181	-114.5123	39.0592	1774.0	979497.11	-41.10	1.34	-239.74	-32.08
04SPR182	-114.5135	39.0562	1775.5	979497.34	-40.15	1.34	-238.97	-31.34
04SPR183	-114.5135	39.0530	1775.6	979497.87	-39.31	1.32	-238.14	-30.55
04SPR184	-114.5155	39.0502	1776.5	979497.29	-39.35	1.31	-238.31	-30.71
04SPR185	-114.5185	39.0667	1787.0	979493.20	-41.66	1.37	-241.73	-33.99
04SPR186	-114.5263	39.0715	1807.5	979490.76	-38.22	1.36	-240.60	-32.79
04SPR187	-114.5350	39.0738	1824.4	979489.86	-34.10	1.44	-238.3	-30.38
04SPR188	-114.5182	39.1010	1821.6	979492.88	-34.36	1.43	-238.26	-30.27
04SPR189	-114.5080	39.1007	1796.1	979497.17	-37.91	1.39	-238.98	-31.12

04SPR190	-114.4982	39.1002	1778.1	979499.20	-41.36	1.40	-240.42	-32.68
04SPR191	-114.4883	39.1002	1764.0	979500.14	-44.78	1.40	-242.25	-34.61
04SPR192	-114.4785	39.0998	1752.9	979501.17	-47.13	1.48	-243.28	-35.72
04SPR193	-114.4687	39.0995	1744.2	979502.31	-48.67	1.62	-243.69	-36.25
04SPR194	-114.4588	39.0990	1735.9	979504.85	-48.63	1.87	-242.48	-35.21
04SPR195	-114.4490	39.0990	1749.1	979505.86	-43.55	2.02	-238.72	-31.64
04SPR196	-114.4390	39.0987	1782.0	979503.15	-36.08	2.28	-234.69	-27.79
04SPR197	-114.4285	39.0977	1845.6	979495.00	-24.53	2.55	-230.00	-23.33
04SPR198	-114.4177	39.0958	1928.6	979481.58	-12.20	3.11	-226.40	-20.03
04SPR199	-114.4608	39.1138	1732.3	979504.42	-51.49	1.75	-245.05	-37.63
04SPR200	-114.4722	39.1263	1730.3	979505.10	-52.54	1.64	-245.98	-38.38
04SPR201	-114.4973	39.1398	1754.0	979503.25	-48.28	1.69	-244.33	-36.34
04SPR202	-114.5030	39.1448	1757.4	979502.19	-48.74	1.80	-245.06	-36.96
04SPR203	-114.5087	39.2072	1823.7	979505.27	-30.71	2.37	-233.90	-25.52
04SPR204	-114.5282	39.2098	1872.5	979496.55	-24.62	3.13	-232.52	-23.98
04SPR205	-114.4678	39.2058	1728.2	979516.67	-48.64	1.85	-241.65	-33.79
04SPR206	-114.4500	39.2115	1708.0	979522.70	-49.34	1.79	-240.14	-32.54
04SPR207	-114.4405	39.2098	1707.7	979528.45	-43.54	1.80	-234.30	-26.85
04SPR208	-114.4292	39.2037	1710.4	979535.77	-34.83	1.89	-225.80	-18.59
04SPR209	-114.4232	39.1998	1727.1	979534.78	-30.36	1.92	-223.17	-16.05
04SPR210	-114.4135	39.2152	1713.6	979541.63	-29.03	2.65	-219.59	-12.62
04SPR211	-114.4070	39.2403	1741.4	979535.92	-28.40	2.02	-222.71	-15.90
04SPR212	-114.3843	39.4500	1708.0	979567.69	-25.53	2.28	-215.83	-10.23
04SPR213	-114.3837	39.4360	1705.8	979566.43	-26.21	2.24	-216.30	-10.63
04SPR214	-114.3930	39.4370	1699.9	979563.26	-31.28	1.92	-221.04	-15.16
04SPR215	-114.3753	39.4217	1705.3	979565.09	-26.43	2.53	-216.18	-10.59
04SPR216	-114.5303	39.0422	1805.1	979488.69	-38.44	1.31	-240.59	-32.93
04SPR217	-114.5067	39.0507	1769.9	979499.32	-39.41	1.31	-237.62	-30.12
04SPR218	-114.4857	39.0457	1755.0	979500.71	-42.18	1.41	-238.62	-31.37
04SPR219	-114.4643	39.0357	1763.5	979499.66	-39.71	1.69	-236.83	-29.96
04SPR220	-114.4818	39.0335	1756.4	979495.75	-45.63	1.45	-242.19	-35.13
04SPR221	-114.4890	39.0327	1762.7	979494.75	-44.59	1.35	-241.97	-34.84
04SPR222	-114.5270	39.0278	1817.0	979484.12	-38.06	1.20	-241.67	-34.24
04SPR223	-114.5367	39.0265	1838.8	979479.00	-35.37	1.21	-241.41	-33.94
04SPR224	-114.5463	39.0253	1862.5	979475.05	-32.86	1.27	-241.51	-34.00
04SPR225	-114.5560	39.0242	1889.9	979470.59	-28.79	1.37	-240.40	-32.83
04SPR226	-114.5660	39.0228	1925.3	979468.45	-19.90	1.50	-235.34	-27.74
04SPR227	-114.4512	39.0417	1779.9	979499.31	-35.54	2.06	-234.13	-27.45
04SPR228	-114.4338	39.0213	1850.3	979484.84	-26.50	2.44	-232.60	-26.38
04SPR229	-114.4468	39.0085	1797.3	979490.98	-35.76	1.97	-236.37	-30.00
04SPR230	-114.4620	38.9867	1769.4	979489.96	-43.24	1.60	-241.12	-34.74
04SPR231	-114.4820	38.9867	1772.4	979488.81	-43.47	1.32	-241.96	-35.33
04SPR232	-114.5013	38.9868	1793.9	979485.68	-39.98	1.19	-241.01	-34.23
04SPR233	-114.5485	39.0363	1853.5	979479.12	-32.56	1.38	-240.07	-32.41
04SPR235	-114.4248	38.6513	1845.8	979471.73	-8.31	0.77	-215.57	-14.49
04SPR236	-114.4473	38.6477	1896.9	979461.79	-2.16	1.56	-214.36	-13.37
04SPR237	-114.4428	38.6483	1885.3	979464.37	-3.21	1.42	-214.25	-13.24
04SPR238	-114.4383	38.6492	1874.4	979467.59	-3.44	1.20	-213.48	-12.44
04SPR239	-114.4338	38.6498	1864.4	979470.33	-3.82	1.09	-212.86	-11.77

04SPR240	-114.4293	38.6507	1855.3	979471.58	-5.46	0.88	-213.68	-12.59
04SPR241	-114.4203	38.6522	1837.3	979472.58	-10.15	0.70	-216.54	-15.44
04SPR242	-114.4158	38.6528	1830.4	979474.47	-10.44	0.64	-216.11	-15.00
04SPR243	-114.4113	38.6537	1826.1	979474.67	-11.64	0.59	-216.88	-15.78
04SPR244	-114.4068	38.6543	1821.5	979475.28	-12.50	0.56	-217.25	-16.15
04SPR245	-114.4023	38.6552	1818.0	979475.32	-13.62	0.54	-218.00	-16.90
04SPR246	-114.3978	38.6558	1813.8	979475.70	-14.59	0.52	-218.52	-17.43
04SPR247	-114.3933	38.6567	1809.1	979476.12	-15.70	0.52	-219.11	-18.03
04SPR248	-114.3888	38.6573	1807.0	979475.43	-17.08	0.50	-220.27	-19.19
04SPR249	-114.3843	38.6582	1801.6	979475.32	-18.95	0.53	-221.50	-20.42
04SPR250	-114.3798	38.6588	1799.9	979474.88	-19.97	0.54	-222.32	-21.23
04SPR251	-114.3753	38.6597	1804.5	979473.17	-20.32	0.53	-223.20	-22.15
04SPR252	-114.3708	38.6603	1809.6	979472.21	-19.78	0.52	-223.23	-22.16
04SPR253	-114.3663	38.6612	1815.3	979471.66	-18.64	0.53	-222.73	-21.70
04SPR254	-114.3618	38.6618	1821.9	979471.23	-17.11	0.53	-221.94	-20.95
04SPR255	-114.3573	38.6627	1828.2	979471.10	-15.36	0.54	-220.88	-19.92
04SPR256	-114.3528	38.6633	1835.9	979471.23	-12.91	0.53	-219.30	-18.35
04SPR257	-114.3483	38.6642	1842.8	979472.06	-10.02	0.56	-217.17	-16.23
04SPR258	-114.5348	38.7632	1797.7	979488.97	-15.75	0.95	-217.45	-13.79
04SPR259	-114.3438	38.6648	1851.4	979473.01	-6.50	0.57	-214.59	-13.69
04SPR260	-114.3393	38.6657	1859.7	979473.00	-4.01	0.58	-213.02	-12.15
04SPR261	-114.3348	38.6663	1869.3	979473.11	-1.00	0.59	-211.07	-10.22
04SPR262	-114.3303	38.6670	1878.7	979473.73	2.46	0.61	-208.65	-7.81
04SPR263	-114.3258	38.6678	1889.6	979473.57	5.57	0.63	-206.74	-5.91
04SPR264	-114.3213	38.6685	1898.4	979473.45	8.11	0.65	-205.17	-4.38
04SPR265	-114.3167	38.6687	1905.7	979471.67	8.58	0.68	-205.49	-4.76
04SPR266	-114.3122	38.6685	1912.2	979470.02	8.94	0.68	-205.86	-5.18
04SPR267	-114.3075	38.6685	1916.8	979470.19	10.52	0.70	-204.76	-4.14
04SPR268	-114.3008	38.6760	1926.7	979470.95	13.70	1.09	-202.32	-1.67
04SPR269	-114.5518	38.7583	1900.1	979468.06	-4.67	0.93	-217.86	-14.36
04SPR270	-114.5465	38.7613	1847.8	979478.52	-10.61	1.03	-217.83	-14.22
04SPR271	-114.5408	38.7640	1808.2	979486.41	-15.17	0.99	-218.00	-14.34
04SPR272	-114.5333	38.7672	1780.6	979491.63	-18.74	0.88	-218.58	-14.85
04SPR273	-114.5888	38.7835	2000.7	979446.67	2.74	1.58	-221.06	-17.07
04SPR274	-114.5958	38.7757	1944.6	979457.48	-3.06	1.10	-221.06	-17.15
04SPR275	-114.5913	38.7660	1901.5	979464.05	-8.94	0.91	-222.30	-18.53
04SPR276	-114.5728	38.7600	1861.1	979472.58	-12.31	0.79	-221.28	-17.62
04SPR277	-114.5622	38.7585	1877.6	979471.85	-7.84	0.75	-218.69	-15.12
04SPR278	-114.2732	38.6232	1824.1	979486.77	2.53	0.54	-202.53	-2.45
04SPR279	-114.2767	38.6167	1839.1	979483.47	4.42	0.48	-202.38	-2.34
04SPR280	-114.2788	38.6097	1857.0	979480.44	7.53	0.48	-201.28	-1.34
04SPR281	-114.2788	38.6025	1878.2	979475.72	9.98	0.57	-201.11	-1.27
04SPR282	-114.2663	38.6367	1865.6	979479.40	6.75	0.61	-202.88	-2.73
04SPR283	-114.2678	38.6435	1885.8	979476.18	9.16	0.74	-202.61	-2.39
04SPR284	-114.2703	38.6510	1914.3	979470.56	11.68	0.85	-203.18	-2.90
04SPR285	-114.2715	38.6583	1934.4	979466.82	13.48	1.06	-203.42	-3.09
04SPR286	-114.2615	38.6172	1816.3	979489.94	3.82	0.52	-200.39	-0.45
04SPR287	-114.2547	38.6040	1802.9	979487.97	-1.11	0.58	-203.75	-3.91
04SPR288	-114.2477	38.5913	1793.5	979488.70	-2.15	0.56	-203.77	-4.08
04SPR289	-114.2510	38.6328	1849.2	979485.14	7.78	0.59	-200.04	-0.04

04SPR290	-114.2368	38.6398	1865.0	979482.46	9.38	0.64	-200.17	-0.17
04SPR291	-114.2305	38.6630	1900.8	979471.43	7.32	0.91	-205.96	-5.83
04SPR292	-114.3450	38.6743	1862.2	979470.35	-6.66	0.61	-215.92	-14.90
04SPR293	-114.3430	38.7093	1895.2	979468.53	-1.39	1.15	-213.81	-12.33
04SPR294	-114.5213	38.7603	1778.9	979492.30	-17.97	0.82	-217.69	-14.13
04SPR295	-114.5110	38.7527	1786.3	979491.81	-15.52	0.75	-216.13	-12.77
04SPR296	-114.5290	38.7678	1772.1	979492.87	-20.16	0.85	-219.08	-15.32
04SPR297	-114.5243	38.7677	1765.9	979493.78	-21.17	0.83	-219.41	-15.65
04SPR298	-114.5198	38.7675	1765.3	979493.48	-21.60	0.79	-219.83	-16.11
04SPR299	-114.5150	38.7673	1765.3	979492.60	-22.48	0.75	-220.74	-17.09
04SPR300	-114.5107	38.7668	1765.2	979491.94	-23.15	0.73	-221.42	-17.80
04SPR301	-114.5060	38.7663	1764.9	979491.46	-23.68	0.70	-221.94	-18.35
04SPR302	-114.5015	38.7660	1764.9	979491.10	-24.01	0.68	-222.29	-18.72
04SPR303	-114.4967	38.7657	1764.7	979490.60	-24.54	0.67	-222.81	-19.27
04SPR304	-114.4922	38.7653	1763.9	979490.56	-24.78	0.67	-222.97	-19.47
04SPR305	-114.4878	38.7653	1764.0	979490.62	-24.70	0.66	-222.90	-19.42
04SPR306	-114.4833	38.7665	1763.0	979491.86	-23.86	0.66	-221.95	-18.46
04SPR307	-114.4790	38.7677	1762.4	979491.32	-24.69	0.67	-222.71	-19.20
04SPR308	-114.4747	38.7690	1763.4	979491.36	-24.48	0.67	-222.60	-19.10
04SPR309	-114.5340	38.9130	1838.7	979485.95	-19.39	1.37	-225.25	-19.14
04SPR310	-114.5243	38.9108	1816.4	979486.83	-25.20	1.26	-228.67	-22.64
04SPR311	-114.5098	38.9092	1793.2	979487.05	-31.98	1.15	-232.96	-27.03
04SPR312	-114.5002	38.9080	1778.8	979487.73	-35.64	1.14	-235.02	-29.18
04SPR313	-114.4925	38.9075	1762.9	979489.47	-38.74	1.18	-236.30	-30.48
04SPR314	-114.4862	38.9072	1755.0	979490.04	-40.57	1.21	-237.22	-31.46
04SPR315	-114.4820	38.8988	1753.4	979489.61	-40.77	1.18	-237.27	-31.65
04SPR316	-114.4778	38.8913	1753.7	979488.10	-41.52	1.16	-238.07	-32.56
04SPR317	-114.5030	38.8937	1775.1	979486.05	-37.19	1.13	-236.17	-30.53
04SPR318	-114.5062	38.8795	1770.0	979486.91	-36.65	1.10	-235.08	-29.59
04SPR319	-114.5088	38.8652	1769.3	979488.79	-33.71	1.05	-232.12	-26.82
04SPR320	-114.5158	38.8517	1784.2	979486.78	-29.92	0.98	-230.07	-24.92
04SPR321	-114.4882	38.8527	1753.7	979488.35	-37.86	0.97	-234.60	-29.61
04SPR322	-114.4790	38.8537	1753.9	979485.33	-40.91	0.99	-237.65	-32.71
04SPR323	-114.4698	38.8537	1753.3	979483.78	-42.65	1.03	-239.28	-34.41
04SPR324	-114.4605	38.8537	1753.3	979483.27	-43.14	1.09	-239.71	-34.90
04SPR325	-114.4510	38.8538	1753.8	979482.75	-43.53	1.19	-240.07	-35.35
04SPR326	-114.4415	38.8670	1753.7	979484.05	-43.41	1.40	-239.73	-34.93
04SPR327	-114.4380	38.8807	1753.3	979485.14	-43.65	1.58	-239.75	-34.78
04SPR328	-114.4248	38.8910	1754.3	979485.60	-43.80	2.04	-239.54	-34.54
04SPR329	-114.4103	38.9025	1760.4	979489.30	-39.25	2.79	-234.93	-29.97
04SPR330	-114.4240	38.9098	1755.4	979487.36	-43.38	2.25	-239.04	-33.87
04SPR331	-114.4475	38.8393	1755.8	979480.05	-44.33	1.15	-241.13	-36.70
04SPR332	-114.4462	38.8247	1755.7	979479.92	-43.20	1.08	-240.05	-35.85
04SPR333	-114.4447	38.8105	1755.8	979482.91	-38.91	1.01	-235.85	-31.85
04SPR334	-114.4437	38.7998	1756.7	979486.73	-33.88	0.98	-230.95	-27.15
04SPR335	-114.4425	38.7893	1757.8	979489.92	-29.43	0.91	-226.69	-23.05
04SPR336	-114.5767	38.9085	2002.7	979449.82	-4.55	2.78	-227.38	-21.29
04SPR337	-114.5480	38.9312	1878.8	979476.48	-18.08	1.58	-228.23	-21.88
04SPR338	-114.5530	38.9503	1892.4	979474.65	-17.41	1.52	-229.15	-22.48
04SPR339	-114.5730	38.9518	1963.6	979458.12	-12.13	1.98	-231.38	-24.62

04SPR340	-114.5880	38.9512	2033.7	979445.20	-3.40	2.89	-229.58	-22.84
04SPR341	-114.5345	38.9490	1852.3	979484.63	-19.70	1.28	-227.18	-20.60
04SPR342	-114.5233	38.9475	1829.7	979488.84	-22.33	1.22	-227.34	-20.79
04SPR343	-114.5115	38.9493	1810.5	979490.83	-26.39	1.15	-229.33	-22.88
04SPR344	-114.5000	38.9477	1791.7	979490.43	-32.46	1.16	-233.26	-26.99
04SPR345	-114.4885	38.9462	1774.7	979489.28	-38.72	1.23	-237.55	-31.30
04SPR346	-114.4767	38.9468	1766.0	979488.83	-41.92	1.30	-239.71	-33.51
04SPR347	-114.4637	38.938	1754.9	979486.23	-47.15	1.44	-243.55	-37.62
04SPR348	-114.4513	38.9285	1753.4	979485.91	-47.10	1.61	-243.16	-37.53
04SPR349	-114.4385	38.9195	1753.3	979486.36	-45.87	1.87	-241.66	-36.23
04SPR350	-114.4648	38.9478	1765.5	979485.84	-45.15	1.42	-242.76	-36.71
04SPR351	-114.4538	38.9463	1765.8	979485.03	-45.73	1.59	-243.20	-37.34
04SPR352	-114.4423	38.9448	1764.6	979486.70	-44.31	1.86	-241.38	-35.63
04SPR353	-114.4312	38.9430	1764.4	979490.09	-40.79	2.24	-237.47	-31.82
04SPR354	-114.4200	38.9407	1766.3	979492.22	-37.87	2.78	-234.22	-28.74
04SPR355	-114.4075	38.9463	1811.4	979485.86	-30.83	3.57	-231.44	-26.15
04SPR356	-114.3960	38.9468	1887.7	979470.23	-22.99	4.29	-231.43	-26.43
04SPR357	-114.3845	38.9457	1977.3	979452.72	-12.78	5.19	-230.35	-25.58
04SPR358	-114.3732	38.9467	2083.5	979433.23	0.40	6.56	-227.69	-23.19
04SPR359	-114.6025	38.8837	2127.2	979433.56	19.77	4.53	-215.24	-9.59
04SPR360	-114.5880	38.8748	2019.5	979447.00	0.78	2.66	-224.04	-18.42
04SPR361	-114.5732	38.8663	1936.6	979460.91	-10.13	1.82	-226.50	-20.97
04SPR362	-114.5037	39.0623	1774.2	979498.07	-40.34	1.30	-239.06	-31.50
04SPR363	-114.5037	39.0668	1774.0	979497.05	-41.85	1.30	-240.53	-32.96
04SPR364	-114.5037	39.0713	1769.4	979497.85	-42.86	1.35	-240.98	-33.38
04SPR365	-114.5035	39.0757	1771.0	979497.44	-43.15	1.35	-241.45	-33.82
04SPR366	-114.5035	39.0803	1776.2	979496.87	-42.55	1.34	-241.43	-33.77
04SPR367	-114.5063	39.0848	1783.2	979496.91	-40.72	1.35	-240.40	-32.66
04SPR368	-114.4037	39.1652	1786.0	979521.23	-22.65	2.81	-221.18	-14.61
04SPR369	-114.3968	39.1302	1977.0	979476.31	-5.61	6.31	-222.02	-15.98
04SPR370	-114.4078	39.1330	1833.0	979505.25	-21.30	4.19	-223.71	-17.24
04SPR371	-114.4270	39.1268	1738.2	979517.03	-38.19	2.65	-231.52	-24.63
04SPR372	-114.4348	39.1203	1735.8	979512.70	-42.69	2.38	-236.02	-29.03
04SPR373	-114.4438	39.1148	1736.7	979508.42	-46.22	2.09	-239.94	-32.83
04SPR374	-114.4508	39.1098	1736.1	979505.95	-48.45	1.93	-242.25	-35.03
04SPR375	-114.4433	39.0730	1774.2	979504.33	-35.06	2.38	-232.68	-25.87
04SPR376	-114.4330	39.0770	1815.2	979499.60	-27.49	2.80	-229.30	-22.68
04SPR377	-114.4278	39.0788	1840.6	979495.59	-23.82	3.02	-228.25	-21.73
04SPR378	-114.4175	39.0830	1904.0	979484.84	-15.40	3.63	-226.32	-20.03
04SPR379	-114.4073	39.0877	1996.7	979468.42	-3.64	4.28	-224.30	-18.29
04SPR380	-114.528	39.1528	1815.1	979504.19	-29.65	2.47	-231.77	-23.35
04SPR381	-114.5393	39.1542	1858.4	979498.79	-21.81	3.08	-228.17	-19.67
04SPR382	-114.5508	39.1553	1923.4	979486.55	-14.12	4.13	-226.71	-18.12
04SPR383	-114.5695	39.1477	2094.3	979455.56	8.28	8.11	-219.47	-10.95
04SPR384	-114.3852	39.2870	1730.7	979541.62	-30.14	2.10	-223.16	-16.81
04SPR385	-114.4002	39.3205	1692.1	979538.68	-47.94	1.91	-236.83	-30.20
04SPR386	-114.3943	39.3195	1693.5	979540.70	-45.40	1.97	-234.39	-27.88
04SPR387	-114.3885	39.3195	1694.2	979543.09	-42.79	2.06	-231.76	-25.36
04SPR388	-114.3827	39.3193	1694.7	979545.72	-39.98	2.17	-228.91	-22.65
04SPR389	-114.377	39.3195	1693.4	979548.93	-37.19	2.32	-225.82	-19.69

04SPR390	-114.3688	39.3195	1696.4	979552.43	-32.77	2.59	-221.46	-15.49
04SPR391	-114.3607	39.3195	1708.8	979553.48	-27.88	2.91	-217.65	-11.85
04SPR392	-114.3495	39.3218	1752.5	979546.29	-21.82	3.31	-216.08	-10.60
04SPR393	-114.3260	39.3180	1915.1	979517.75	0.11	4.49	-211.20	-6.49
04SPR394	-114.3588	39.3373	1705.5	979556.04	-27.93	2.95	-217.29	-11.59
04SPR395	-114.3622	39.3547	1694.7	979559.45	-29.39	2.85	-217.63	-11.91
04SPR396	-114.4230	39.4240	1694.5	979548.3	-46.75	1.62	-236.20	-29.64
04SPR397	-114.4153	39.4108	1692.7	979550.16	-44.28	1.67	-233.48	-26.99
04SPR398	-114.4077	39.3978	1692.0	979551.84	-41.67	1.74	-230.72	-24.30
04SPR399	-114.4000	39.3847	1692.7	979552.03	-40.10	1.82	-229.14	-22.78
04SPR400	-114.3690	39.5182	1713.7	979574.70	-22.79	2.30	-213.71	-8.98
04SPR401	-114.3782	39.5180	1710.7	979572.54	-25.87	1.80	-216.95	-12.03
04SPR402	-114.3873	39.5172	1710.3	979570.54	-27.91	1.53	-219.23	-14.13
04SPR403	-114.3967	39.5163	1709.7	979569.21	-29.34	1.35	-220.77	-15.45
04SPR404	-114.4060	39.5155	1709.5	979566.98	-31.76	1.25	-223.26	-17.74
04SPR405	-114.4152	39.5147	1708.8	979564.38	-34.31	1.19	-225.8	-20.12
04SPR406	-114.4245	39.5137	1708.7	979562.48	-36.16	1.16	-227.66	-21.81
04SPR407	-114.4338	39.5128	1708.7	979560.94	-37.62	1.15	-229.13	-23.10
04SPR408	-114.4423	39.5122	1709.7	979559.25	-38.95	1.17	-230.55	-24.33
04SPR409	-114.4455	39.5262	1712.8	979560.61	-37.86	1.11	-229.88	-23.74
04SPR410	-114.4485	39.5405	1721.8	979558.46	-38.51	1.03	-231.62	-25.55
04SPR411	-114.4523	39.5120	1708.9	979556.76	-41.67	1.23	-233.13	-26.72
04SPR412	-114.4617	39.5120	1709.2	979553.64	-44.70	1.31	-236.11	-29.56
04SPR413	-114.4710	39.5120	1709.5	979551.25	-46.98	1.46	-238.28	-31.57
04SPR414	-114.4803	39.5120	1710.2	979550.00	-48.01	1.62	-239.23	-32.37
04SPR415	-114.4873	39.5047	1709.3	979551.59	-46.07	1.85	-236.95	-29.92
04SPR416	-114.4977	39.5047	1719.1	979554.05	-40.58	2.15	-232.26	-25.02
04SPR417	-114.5073	39.5047	1732.5	979555.69	-34.82	2.58	-227.57	-20.20
04SPR418	-114.5163	39.5027	1760.0	979552.40	-29.44	3.04	-224.82	-17.36
04SPR419	-114.5250	39.4998	1796.1	979545.67	-24.79	3.67	-223.58	-15.99
04SPR421	-114.5182	39.4462	1786.7	979541.48	-27.10	4.76	-223.75	-15.82
04SPR422	-114.5293	39.4428	1870.9	979526.23	-16.10	6.51	-220.43	-12.43
04SPR423	-114.3723	39.2870	1750.4	979541.29	-24.37	2.36	-219.35	-13.26
04SPR424	-114.3597	39.2862	1765.0	979540.03	-21.05	2.89	-217.14	-11.36
04SPR425	-114.3458	39.2870	1810.7	979532.97	-14.11	3.87	-214.34	-8.91
05SPR426	-114.5453	39.0505	1814.4	979490.92	-34.07	1.18	-237.40	-29.57
05SPR427	-114.4993	39.1845	1766.9	979510.75	-40.75	1.97	-237.96	-29.74
05SPR428	-114.4992	39.3872	1747.2	979538.38	-37.15	4.42	-229.72	-21.65
05SPR429	-114.5062	39.4162	1731.9	979544.79	-38.04	4.72	-228.59	-20.57
05SPR430	-114.5098	39.4567	1727.6	979548.07	-39.68	3.84	-230.62	-22.82
05SPR431	-114.4833	39.4932	1710.9	979554.65	-41.49	1.85	-232.55	-25.48
05SPR432	-114.4805	39.4850	1713.3	979551.69	-42.98	1.86	-234.30	-27.22
05SPR433	-114.4690	39.4832	1711.2	979547.11	-48.04	1.62	-239.37	-32.47
05SPR434	-114.4635	39.4970	1706.4	979551.43	-46.44	1.41	-237.44	-30.72
05SPR435	-114.4917	39.5898	1752.6	979554.13	-37.73	1.25	-234.07	-27.79
05SPR436	-114.4913	39.5812	1747.0	979554.06	-38.75	1.28	-234.43	-28.04
05SPR437	-114.4895	39.5740	1742.9	979556.71	-36.75	1.31	-231.93	-25.54
05SPR438	-114.4817	39.5812	1741.1	979556.48	-38.16	1.15	-233.30	-27.10
05SPR439	-114.4298	39.5648	1728.1	979564.22	-32.97	0.85	-226.96	-21.48

05SPR440	-114.4212	39.5690	1732.2	979566.41	-29.91	0.79	-224.41	-19.14
05SPR441	-114.4137	39.5732	1731.9	979568.82	-27.95	0.79	-222.43	-17.34
05SPR442	-114.4047	39.5788	1738.5	979569.84	-25.39	0.75	-220.64	-15.74
05SPR443	-114.3850	39.5912	1761.6	979572.59	-16.62	0.71	-214.51	-10.12
05SPR444	-114.3843	39.5690	1735.5	979571.92	-23.37	0.86	-218.17	-13.59
05SPR445	-114.3743	39.5545	1734.1	979573.71	-20.73	1.00	-215.24	-10.71
05SPR446	-114.3698	39.5462	1728.3	979573.87	-21.61	1.14	-215.33	-10.80
05SPR447	-114.3662	39.5393	1729.6	979573.97	-20.51	1.21	-214.31	-9.80
05SPR448	-114.3645	39.5318	1725.8	979574.08	-20.89	1.33	-214.15	-9.63
05SPR449	-114.4408	39.5047	1709.4	979558.89	-38.73	1.17	-230.30	-24.03
05SPR450	-114.4392	39.4970	1707.2	979557.45	-40.17	1.20	-231.46	-25.19
05SPR451	-114.4375	39.4892	1706.0	979555.64	-41.66	1.24	-232.78	-26.47
05SPR452	-114.4357	39.4805	1705.4	979553.23	-43.47	1.29	-234.47	-28.13
05SPR453	-114.4342	39.4735	1704.1	979551.82	-44.66	1.33	-235.48	-29.14
05SPR454	-114.4327	39.4662	1702.7	979550.75	-45.52	1.36	-236.15	-29.74
05SPR455	-114.4312	39.4583	1701.8	979550.26	-45.58	1.40	-236.08	-29.63
05SPR456	-114.4305	39.4505	1701.5	979549.58	-45.67	1.43	-236.10	-29.59
05SPR457	-114.4297	39.4435	1701.3	979548.98	-45.71	1.46	-236.08	-29.54
05SPR458	-114.4138	39.1470	1761.9	979520.67	-29.04	2.14	-225.53	-18.78
05SPR459	-114.3798	39.3263	1689.8	979548.20	-39.66	1.75	-228.44	-22.25
05SPR460	-114.3678	39.3478	1695.7	979556.55	-31.39	1.97	-220.62	-14.73
05SPR461	-114.3720	39.3365	1693.3	979553.00	-34.66	1.88	-223.72	-17.70
05SPR462	-114.3953	39.3768	1692.5	979551.61	-39.87	1.67	-229.04	-22.72
05SPR463	-114.3957	39.3690	1688.9	979550.81	-41.08	1.67	-229.86	-23.51
05SPR464	-114.3958	39.3610	1688.9	979548.78	-42.41	1.68	-231.18	-24.75
05SPR465	-114.3962	39.3540	1689.4	979545.61	-44.79	1.59	-233.70	-27.24
05SPR466	-114.4065	39.3627	1687.5	979543.88	-47.90	1.63	-236.55	-29.93
05SPR467	-114.4162	39.3667	1686.2	979540.35	-52.16	1.67	-240.64	-33.87
05SPR468	-114.4263	39.3695	1686.6	979537.32	-55.32	1.70	-243.81	-36.89
05SPR469	-114.5262	39.5047	1790.4	979547.54	-25.11	3.75	-223.18	-15.64
05SPR470	-114.5378	39.5047	1858.7	979535.23	-16.35	4.99	-220.84	-13.23
05SPR471	-114.4495	39.6423	1780.9	979565.69	-22.10	0.70	-222.17	-17.11
05SPR472	-114.4460	39.6492	1796.5	979564.55	-19.05	0.68	-220.88	-15.99
05SPR473	-114.4433	39.6557	1805.0	979564.29	-17.26	0.65	-220.07	-15.27
05SPR474	-114.4413	39.6630	1824.5	979561.69	-14.50	0.66	-219.49	-14.85
05SPR475	-114.4397	39.6685	1831.2	979561.87	-12.74	0.65	-218.49	-13.95
05SPR476	-114.4267	39.6917	1844.7	979561.87	-10.66	0.58	-217.99	-13.95
05SPR477	-114.4240	39.6985	1838.3	979563.97	-11.14	0.65	-217.68	-13.72
05SPR478	-114.4225	39.7057	1828.2	979566.46	-12.39	0.69	-217.76	-13.89
05SPR479	-114.4285	39.7117	1837.0	979564.25	-12.41	0.67	-218.79	-14.92
05SPR480	-114.4340	39.7163	1848.0	979560.82	-12.87	0.67	-220.48	-16.59
05SPR481	-114.4392	39.7223	1855.3	979560.61	-11.36	0.73	-219.73	-15.82
05SPR482	-114.4463	39.7283	1861.7	979559.12	-11.41	0.88	-220.35	-16.39
05SPR483	-114.4527	39.7333	1873.3	979559.94	-7.46	1.27	-217.31	-13.32
05SPR484	-114.4483	39.7440	1852.0	979561.22	-13.71	0.91	-221.52	-17.68
05SPR485	-114.4377	39.7435	1818.7	979566.07	-19.06	0.76	-223.30	-19.59
05SPR486	-114.4278	39.7428	1800.8	979569.55	-21.06	0.72	-223.33	-19.78
05SPR487	-114.4047	39.7358	1808.1	979575.83	-11.91	0.65	-215.06	-11.82
05SPR488	-114.4005	39.7285	1825.5	979575.21	-6.52	0.66	-211.61	-8.41
05SPR489	-114.4027	39.7215	1841.9	979572.19	-3.84	0.71	-210.73	-7.42

05SPR490	-114.4078	39.7035	1884.9	979562.38	1.20	0.97	-210.24	-6.67
05SPR491	-114.4175	39.7148	1821.2	979570.07	-11.76	0.63	-216.40	-12.76
05SPR492	-114.4442	39.7153	1887.9	979555.55	-5.74	0.76	-217.73	-13.67
05SPR493	-114.4518	39.7113	1932.7	979544.86	-2.26	0.89	-219.15	-14.97
05SPR494	-114.2592	38.6308	1844.7	979485.61	7.04	0.29	-200.58	-0.52
05SPR495	-114.2272	38.6425	1856.7	979481.43	5.53	0.25	-203.47	-3.47
05SPR496	-114.2190	38.6452	1859.2	979479.52	4.17	0.25	-205.12	-5.17
05SPR497	-114.2105	38.6492	1864.8	979479.63	5.66	0.28	-204.23	-4.35
05SPR498	-114.2038	38.6530	1874.7	979480.04	8.77	0.31	-202.19	-2.34
05SPR499	-114.1900	38.6610	1892.8	979479.25	12.84	0.36	-200.10	-0.35
05SPR500	-114.1825	38.6573	1868.8	979481.75	8.28	0.40	-201.93	-2.22
05SPR501	-114.1727	38.6562	1849.3	979484.41	5.04	0.39	-203.00	-3.36
05SPR502	-114.1627	38.6532	1826.6	979485.96	-0.16	0.38	-205.66	-6.10
05SPR503	-114.1480	38.6532	1797.7	979487.26	-7.77	0.35	-210.06	-10.59
05SPR504	-114.1328	38.6548	1762.7	979488.03	-17.94	0.19	-216.47	-17.10
05SPR505	-114.1247	38.6530	1747.4	979490.58	-19.93	0.15	-216.79	-17.49
05SPR506	-114.1313	38.6470	1756.0	979488.04	-19.28	0.18	-217.08	-17.75
05SPR507	-114.1367	38.6413	1754.8	979487.31	-19.89	0.18	-217.55	-18.20
05SPR508	-114.1313	38.6343	1736.9	979489.43	-22.67	0.16	-218.34	-19.06
05SPR509	-114.1265	38.6278	1726.1	979492.02	-22.85	0.13	-217.33	-18.13
05SPR510	-114.1217	38.6217	1716.4	979495.85	-21.48	0.13	-214.87	-15.71
05SPR511	-114.1160	38.6153	1710.7	979499.73	-18.78	0.13	-211.54	-12.46
05SPR512	-114.1423	38.6342	1754.2	979487.68	-19.10	0.17	-216.69	-17.36
05SPR513	-114.1498	38.6228	1748.4	979488.96	-18.60	0.15	-215.57	-16.23
05SPR514	-114.1545	38.6157	1749.8	979489.98	-16.50	0.14	-213.63	-14.29
05SPR515	-114.1608	38.6102	1745.5	979491.94	-15.39	0.14	-212.04	-12.67
05SPR516	-114.1673	38.6055	1744.3	979493.09	-14.21	0.15	-210.71	-11.29
05SPR517	-114.1798	38.6127	1760.9	979494.31	-8.49	0.16	-206.85	-7.31
05SPR518	-114.1817	38.6152	1765.5	979495.34	-6.25	0.16	-205.13	-5.58
05SPR519	-114.1870	38.6212	1779.9	979495.53	-2.15	0.17	-202.63	-3.05
05SPR520	-114.1798	38.5957	1737.3	979491.47	-17.12	0.15	-212.83	-13.38
05SPR521	-114.1870	38.5897	1738.8	979488.98	-18.79	0.14	-214.69	-15.23
05SPR522	-114.4775	39.0602	1748.3	979501.89	-44.34	1.26	-240.18	-32.95
05SPR523	-114.4613	39.0657	1744.1	979504.78	-43.23	1.51	-238.35	-31.26
05SPR524	-114.5647	39.0305	1913.2	979470.88	-21.87	1.05	-236.41	-28.72
05SPR525	-114.3043	39.1215	2047.0	979469.45	9.91	1.71	-218.95	-14.85
05SPR526	-114.2732	39.1142	1944.3	979488.94	-1.62	1.85	-218.84	-15.33
05SPR527	-114.2525	39.1015	1884.2	979499.04	-8.95	1.66	-219.62	-16.54
05SPR528	-114.2358	39.0947	1854.8	979504.43	-12.02	1.44	-219.61	-16.86
05SPR529	-114.2153	39.0870	1812.1	979515.42	-13.52	1.37	-216.40	-14.15
05SPR530	-114.5292	39.6313	1782.7	979554.43	-31.86	2.72	-230.09	-23.70
05SPR531	-114.5362	39.7370	1892.0	979547.29	-14.69	1.41	-226.48	-21.24
05SPR532	-114.5375	39.7627	1890.7	979553.39	-11.25	1.71	-222.60	-17.65
05SPR533	-114.5193	39.7813	1992.6	979538.43	3.55	1.06	-219.87	-15.57
05SPR534	-114.5405	39.7960	1916.1	979554.09	-5.70	1.50	-220.11	-15.50
05SPR535	-114.5612	39.1535	1992.4	979472.00	-7.23	3.50	-228.18	-19.61
05SPR536	-114.5213	39.1750	1813.2	979502.21	-34.18	2.19	-236.37	-27.94
05SPR537	-114.5258	39.1878	1853.6	979498.88	-26.17	2.34	-232.73	-24.20
05SPR538	-114.5308	39.1997	1886.3	979493.85	-22.16	2.55	-232.19	-23.61
05SPR539	-114.5427	39.2270	2017.5	979471.35	-6.64	5.11	-228.79	-20.22

05SPR541	-114.5335	39.2332	1988.1	979508.95	21.34	5.26	-197.38	11.15
05SPR542	-114.5053	39.2520	1829.0	979539.02	0.70	5.30	-200.15	8.25
05SPR543	-114.5057	39.3340	1880.8	979510.39	-19.25	5.84	-225.36	-17.14
05SPR544	-114.5148	39.3318	1964.2	979495.59	-8.12	7.04	-222.39	-14.16
05SPR545	-114.4985	39.3330	1819.7	979521.72	-26.66	5.32	-226.45	-18.27

Table 2. Cenozoic density-depth function for the Spring/Snake Valleys study area.

Depth Range (km)	Sedimentary rocks (kg/m^3)	Volcanic rocks (kg/m^3)
0 to 0.2	2020	2220
0.2 to 0.6	2120	2270
0.6 to 1.2	2320	2320
> 1.2	2420	2420