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SOUTHERN NEVADA WATER AUTHORITY

Water Resources Division

2012 Delamar, Dry Lake, and Cave Valleys Hydrologic Monitoring, Management, and Mitigation Plan Status and Data Report

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Executive Committee

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ACRONYMS

BLM	Bureau of Land Management
BRT	Biological Resource Team
DDC	Delamar, Dry Lake, and Cave valleys
DOI	U.S. Department of the Interior
EC	Executive Committee
EPA	U.S. Environmental Protection Agency
JFA	Joint Funding Agreement
NAD83	North American Datum of 1983
NAVD88	North American Vertical Datum of 1988
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NSE	Nevada State Engineer
NWS	National Weather Service
SNOTEL	SNOwpack TELemetry
SNWA	Southern Nevada Water Authority
SR	State Route
TRP	Technical Review Panel
US 93	U.S. Highway 93
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator
WRCC	Western Regional Climate Center

ABBREVIATIONS

°C	degrees Celsius
afy	acre-feet per year
amsl	above mean sea level
bgs	below ground surface
cfs	cubic feet per second
cm	centimeter
ft	foot

ABBREVIATIONS (CONTINUED)

gal	gallon
gpm	gallons per minute
in.	inch
L	liter
m	meter
mg	milligram
mi	mile
µg	microgram
µm	micrometer
µmho	micromho
µS	microsiemen
pmc	percent modern carbon

1.0 INTRODUCTION

This report was prepared by the Southern Nevada Water Authority (SNWA) in satisfaction of monitoring and reporting requirements set forth in the *Hydrologic Monitoring and Mitigation Plan for Delamar, Dry Lake, and Cave Valleys* (DDCMM Plan) (SNWA, 2011a). The location of the primary study area associated with this report is presented in Figure 1-1. The report provides the Nevada State Engineer (NSE) hydrologic data collected in 2012 and the current status of each element of the DDCMM Plan. The hydrologic data contained in this report were submitted to the NSE in electronic format.

This report also satisfies the hydrologic data reporting requirements of the U.S. Department of the Interior (DOI) and SNWA Stipulation Agreement. The DDCMM Plan contains all the hydrologic monitoring elements of the Stipulation Agreement, as well as, monitoring related to existing non-federal water-rights as required by the NSE.

This is the sixth hydrologic data report in a series of reports associated with the Delamar, Dry Lake, and Cave valleys (DDC) hydrologic monitoring, management, and mitigation program. The reports document historic hydrologic conditions and plan status since 2007 (SNWA, 2008, 2009b, 2010, 2011b, and 2012).

1.1 Background

On January 7, 2008 prior to the NSE hearing for applications 53987 to 53992, a Stipulation for Withdrawal of Protests (Stipulation, 2008) was established between SNWA and DOI on behalf of the Bureau of Indian Affairs, the Bureau of Land Management (BLM), the National Park Service, and the U.S. Fish and Wildlife Service (USFWS) (collectively known as the DOI Bureaus). Exhibits A and B of the Stipulation require the development of biologic and hydrologic monitoring plans. As part of the Stipulation, an Executive Committee (EC) was established to oversee the implementation of the agreement. A hydrologic Technical Review Panel (TRP), composed of technical expert representatives of parties to the stipulation, was established to develop and oversee implementation of the monitoring, management, and mitigation plan, review program data, and modify the monitoring plan, if necessary. A Biological Resource Team (BRT) was also established to oversee the development and implementation of the biological monitoring plan.

On July 9, 2008, SNWA was granted groundwater rights in DDC hydrographic areas (HA180-182) for municipal and domestic purposes under permits 53987 through 53992. Ruling 5875 required the development of biologic and hydrologic monitoring plans. The hydrologic DDCMM Plan associated with this ruling was approved by the NSE on December 22, 2009.

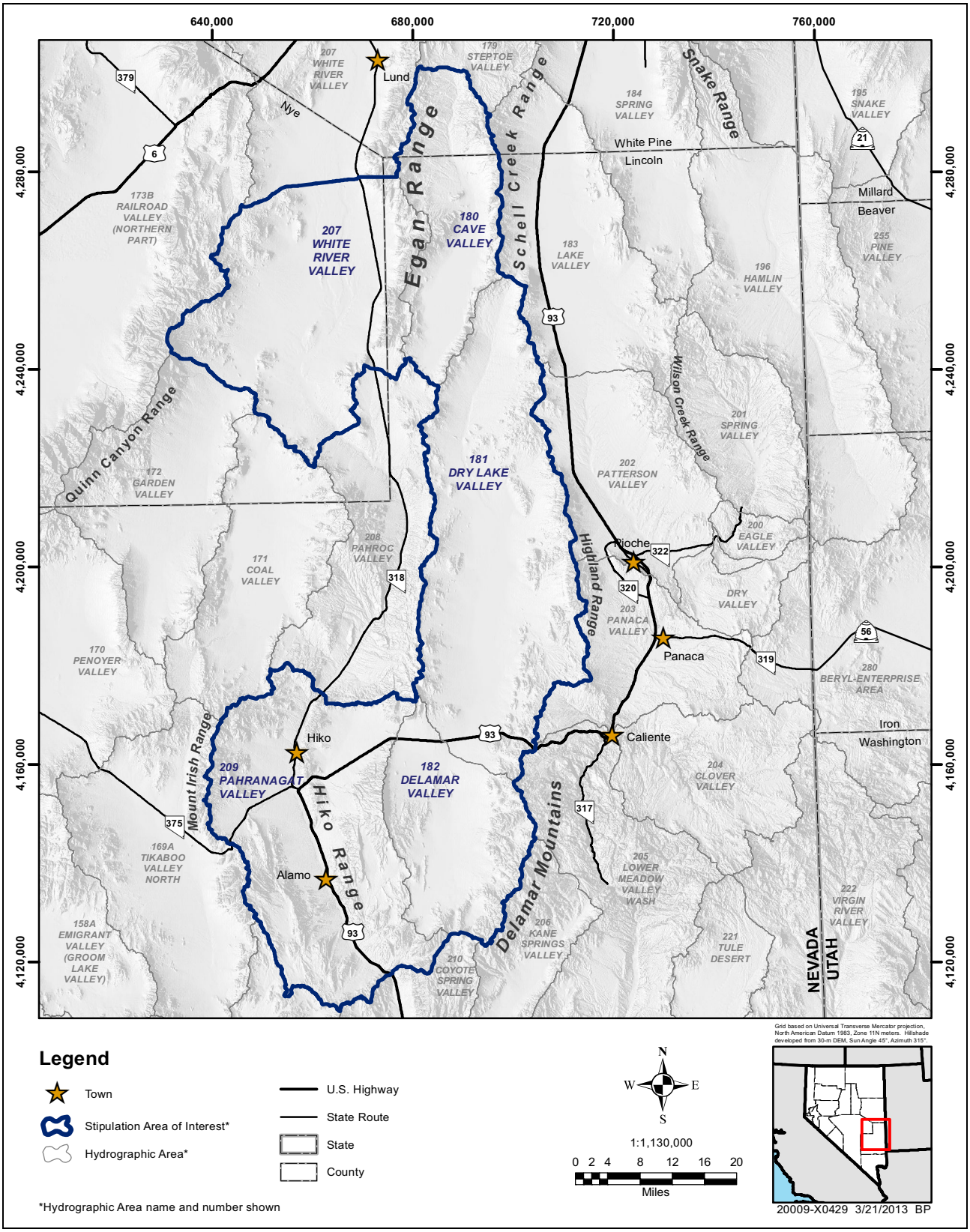

Figure 1-1
Primary Study Area Location

Since the issuance of Ruling 5875, an opinion by the Nevada Supreme Court required that the NSE re-notice SNWA's original groundwater applications and reopen the protest period (Great Basin Water Network, et. al. v. NSE, et. al., June 17, 2010) (NSC, 2010). A new hearing was held by the NSE in regard to the water-right applications in September through November, 2011. On March 22, 2012, the NSE issued Rulings 6165 through 6167 granting SNWA DDC Application Numbers 53987 through 53992. Rulings 6165 through 6167 approved the SNWA Hydrologic Monitoring and Mitigation Plan for DDC and required annual data reports be submitted to the NSE. This report is submitted for the purpose of meeting the Stipulation reporting requirements as well as the reporting requirements under Rulings 6165 through 6167.

1.2 Major Activities Performed in 2012

Major activities associated with the DDCMM Plan performed in 2012 are as follows:

- Continued implementation of the DDCMM Plan.
- Performed periodic water-level measurements on monitoring network wells. Maintained continuous water-level and spring discharge recording instrumentation at locations specified in the plan.
- Installed new well enclosures at SNWA well sites with continuous water-level monitoring instrumentation.
- Submitted required monitoring data quarterly to the NSE and the TRP. Maintained the SNWA data-exchange web site accessible by NSE, EC, TRP, and BRT.
- Maintained BLM right-of-way access for three future monitor-well locations.
- Provided technical assistance to the BRT.

1.3 Report Scope

Section 2.0 of this report presents the hydrologic data collected from the groundwater, spring, and precipitation monitoring networks associated with the DDCMM Plan. Section 3.0 presents anticipated activities in 2013. Section 4.0 documents report references. Appendix A through Appendix F present tables and graphs of various data discussed in the report. Photos documenting current DDC spring conditions are also presented.

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2.0 DDCMM PLAN STATUS AND DATA

The hydrologic data collected in 2012 and the current status of each major element of the DDCMM Plan are presented in this section. Each subsection follows the order of topic presentation in the plan.

2.1 Hydrologic Monitoring Program

The DDCMM Plan established a hydrologic monitoring program and network to collect data for the purposes of defining baseline hydrologic conditions prior to SNWA withdrawals in DDC and evaluating the influence of these withdrawals. The network includes monitor wells and springs located within DDC and adjacent hydrographic areas. The monitoring locations are presented on Figure 2-1. The program also includes reporting of available regional precipitation-station data with an established historical record.

2.2 Monitor-Well Network

The DDCMM Plan includes monitoring of SNWA and existing non-SNWA wells completed in the basin-fill, carbonate-rock, and volcanic-rock aquifers at strategic locations to provide representative groundwater data spatially across the program area. Monitor-well locations were selected with consideration of the hydrogeologic conditions at each location. Geologic reconnaissance, stratigraphic and structural field mapping, aerial photo documentation, surface geophysics, and a review of existing hydrogeologic data were performed to assist in well-site selection. This network will provide long-term monitoring and early detection of drawdown propagation, if any, induced by SNWA groundwater development that might adversely affect existing water-right holders and groundwater- dependent areas sustaining critical habitat for endangered and/or threatened species.

2.2.1 Existing-Well Monitoring Network

SNWA collects continuous groundwater level data at six representative monitor wells in the project area. Groundwater levels are also measured quarterly at nine additional network well locations associated with the DDCMM Plan. This network includes seven SNWA wells, three private wells, four U.S. Geological Survey (USGS-MX) wells, and one BLM well located in DDC and the adjacent White River Valley and Pahranagat Valley hydrographic areas. The locations of the monitor wells in the network are shown on Figure 2-1. Well-location coordinates, elevation, construction attributes, and monitoring frequencies are presented in Table 2-1. A professional survey of location coordinates, ground-surface elevations, and measuring-point elevations of the wells has been completed.

SNWA constructed seven monitor wells associated with this network in 2005. These consist of four 6-in. diameter and three 12-in. diameter monitor wells in DDC. Geologic analysis reports were

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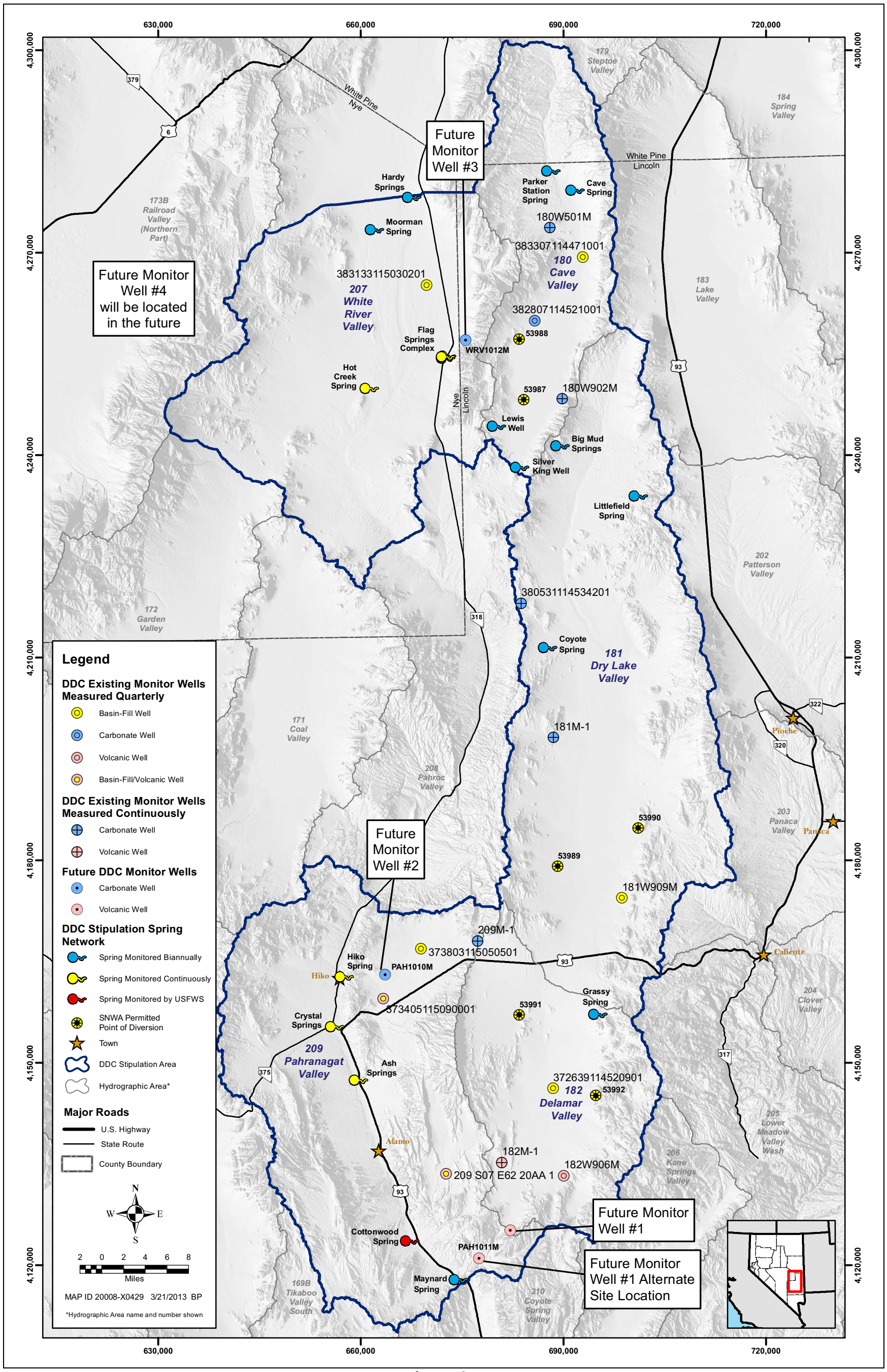

Figure 2-1
DDC Monitor-Well and Spring Network

Table 2-1
DDC Existing-Well Monitoring Network

SNWA Site Number	NDWR Station Local Number[b]	Location[a]		Surface[c] Elevation (ft amsl)	Completion Date	Drill Depth (ft bgs)	Well Depth (ft bgs)	Well Casing Diameter (in.)	Screened Interval (ft bgs)	Open Interval (ft bgs)	Aquifer	Monitor Frequency
		UTM Northing (m)	UTM Easting (m)									
180W902M	180 N06 E64 19ADCC1	4,248,355.59	689,816.08	5,984.89	10/19/2005	917	903	12	195-882	77-917	Carbonate	Continuous
382807114521001	180 N07 E63 14BADD1	4,259,963.15	685,737.56	6,012.39	9/30/1980	460	460	10	210-250, 375-435	40-460	Carbonate[d]	Quarterly
383307114471001	180 N08 E64 15BCBC1	4,269,378.23	692,859.57	6,162.55	---	---	---	7	---	---	Basin Fill	Quarterly
180W501M	180 N09 E64 31CBBD1	4,273,712.79	687,971.03	6,428.63	9/23/2005	1,215	1,212	6	788-1,192	54-1,215	Carbonate	Continuous
182W906M	182 S07 E64 19ACDB1	4,133,304.57	690,065.21	4,796.96	9/2/2005	1,735	1,703	6	1,275-1,678	130-1,735	Volcanic	Quarterly
182M-1	182 S07 E63 18AAAA1	4,135,293.37	680,867.32	4,597.78	7/10/2005	1,345	1,331	12	1,006-1,290	58-1,345	Volcanic	Continuous
372639114520901	182 S06 E63 12AD 1	4,146,220.24	688,472.41	4,706.30	5/10/1980	1,215	1,195	10	920-980, 1,040-1,180	40-1,215	Basin Fill	Quarterly[e]
181W909M	181 S03 E65 07CCDA1	4,174,462.59	698,676.17	4,799.41	10/16/2007	1,285	1,260	12	637-1,240	183-1,285	Basin Fill	Quarterly
181M-1	181 N01 E63 36ABAA1	4,198,199.90	688,534.99	4,963.07	8/30/2005	1,501	1,471	6	765-1,451	58-1,501	Carbonate	Continuous
380531114534201	181 N03 E63 27CAA 1	4,218,085.09	683,720.32	5,456.35	1/1/1981	2,395	2,395	10	---	775-2,395	Carbonate	Continuous[d]
209 S07 E62 20AA 1	209 S07 E62 20AA 1	4,133,610.32	672,648.88	4,082.46	1/10/1981	695	695	8	600-695	55-695	Basin Fill/ Volcanic	Quarterly
373405115090001	209 S04 E61 28CD 1	4,159,504.38	663,314.66	4,230.58	9/19/1968	1,314	1,314	12	1,200-1,300	52-1,314	Basin Fill/ Volcanic	Quarterly
373803115050501	209 S04 E61 01AACB1	4,166,944.29	668,927.03	4,528.90	---	---	700	8	---	---	Basin Fill	Quarterly
209M-1	209 S03 E62 35DAAD1	4,168,065.79	677,323.46	5,097.30	8/4/2005	1,616	1,616	6	1,274-1,595	50-1,616	Carbonate	Continuous
383133115030201	207 N08 E62 30CD 1	4,265,229.62	669,732.25	5,290.20	---	---	101	2	---	---	Basin Fill	Quarterly

[a]Professional survey complete on location and elevation. All coordinates are Universal Transverse Mercator, North American Datum, 1983, Zone 11.
[b]Station Local Numbers provided by the Nevada Division of Water Resources.
[c]Elevations are North American Vertical Datum of 1988 (NAVD88).
[d]Carbonate bedrock was encountered at 265 ft bgs according to the well log.
[e]Well is monitored continuously by the USGS.
Well-construction data are based upon best available information from well logs, MX Project Report (Ertec Western Inc., 1981), and direct field measurements.
Monitoring frequency agreed to by the TRP. Additional water-level data in the study area may be collected by SNWA or USGS and reported in future data reports.

completed for each of the seven SNWA monitor wells included in the network (Eastman, 2007a through g). Copies of the reports have been posted on the SNWA data-exchange web site.

Continuous water-level data were collected at the six designated monitor wells within the network. Site visits were conducted approximately every 6 weeks to obtain periodic water-level measurements and download continuous data for processing and analysis. Physical measurements of water levels were compared to pressure transducer data to ensure proper function and calibration of the instrumentation.

The USGS collects continuous data at two USGS-MX wells within the network 372639114520901 USGS-MX (Delamar Well) and 380531114534201 USGS-MX (N. Dry Lake). Also, the USGS collects continuous data at 374215114453101 USGS-MX (S. Dry Lake Well), which is not included in the network.

Periodic water-level measurements collected by SNWA in 2012 are presented in Appendix A. Historical and 2012 hydrographs for the nine existing DDC network wells that are monitored quarterly are also presented in Appendix A. Water-level data collected by SNWA and USGS at the six continuously monitored network wells are presented in Appendix B. Appendix B also includes tables presenting periodic and daily mean continuous water-level data as well as associated 2012 and historical hydrographs. Historical USGS data are presented at the National Water Information System's website at http://waterdata.usgs.gov/nv/nwis/gw.

2.2.2 Future Monitor Wells

The installation of four future monitor wells is included in the monitoring plan. In 2009, three primary sites and one contingency site were selected by the TRP and NSE for the installation of three of the monitor wells. The location of the fourth well will be selected after more baseline data are collected and information is known regarding the production-well configuration. Location coordinates of future wells, estimated surface elevation and depth to groundwater are presented in Table 2-2. The future monitor-well location sites are presented in Figure 2-1.

Table 2-2
Future DDC Monitor Wells

Well Name	Location[a]		Estimated Surface Elevation (ft amsl)	Estimated Depth to Water (ft)
	UTM Northing (m)	UTM Easting (m)		
WRV1012M	4,257,087	675,519	5,794	420
PAH1010M	4,163,098	663,576	4,380	700
DEL4003X	4,125,223	682,153	4,738	1,450
PAH1011M (alternate site)	4,121,019	677,508	3,727	635

[a]All coordinates are Universal Transverse Mercator, North American Datum, 1983, Zone 11.

The northernmost future monitor well, WRV1012M, is located on the west side of the Egan Range northeast of Flag Springs in White River Valley. This well is anticipated to be completed in the Ely Springs Dolomite. The location was selected as a monitoring point between Flag Springs and southern Cave Valley. The new well and other existing monitor wells in Cave Valley will provide baseline water-level data to assist in the evaluation of the hydraulic gradient through Shingle Pass. The depth to groundwater is estimated to be approximately 420 ft bgs at this location.

The second future monitor well, PAH1010M, is located on the east side of the Hiko Range in Sixmile Flat in Pahranagat Valley. The site is located 3.5 mi east of Hiko Spring. The target completion zone is saturated fractured carbonate rocks within the middle to lower units of the Guilmette Formation and possibly the Simonson Dolomite. Carbonate bedrock is anticipated to be encountered within 50 ft of land surface, and it is expected that rocks will be fractured at depth because of the movement along the range-front fault and ancillary normal faults. The depth to water in this area is estimated to be approximately 700 ft bgs.

Both WRV1012M and PAH1010M are located on BLM managed land, and National Environmental Policy Act of 1969 right-of-way applications have been approved by BLM.

The third future monitor well will be installed at the well site of a proposed SNWA exploratory well, DEL4003X, which is located near the southern boundary of Delamar Valley within a structural feature of the Pahranagat Shear Zone. This well is anticipated to be completed in volcanic materials. An alternative site, PAH1011M, was identified and is also located along a major structural feature of the Pahranagat Shear Zone but southwest of the exploratory well site. The right-of-way applications have been approved by BLM for both locations. Selection of the primary or alternative site for a monitor well will be determined in consensus with the TRP.

2.2.3 Exploratory- and Production-Well Monitoring

The exploratory-and production-well monitoring section of the DDCMM Plan states that SNWA shall record discharge and water levels in all completed SNWA production wells on a continuous basis. SNWA has not constructed any production wells associated with this project; however, continuous measurements will be collected from all future production wells. Water-level measurements are required in all SNWA exploratory wells at least quarterly.

Water-level data were collected quarterly from two SNWA exploratory and test wells. The wells, one 6-in.-diameter monitor well (CAV6002M2), and one 20-in.-diameter test well (CAV6002X) were installed in southern Cave Valley near Monitor Well 180W902M on October 13 and 28, 2007, respectively. Well-construction attributes and the locations of the two wells are presented in Table 2-3 and Figure 2-2.

Water-level measurements were regularly collected from the wells in accordance with SNWA field operating procedures. Periodic water-level data and the associated hydrographs from the test and exploratory wells are presented in Appendix C.

Table 2-3
SNWA Exploratory Wells

Site Number	Station Local Number[b]	Location[a]		Surface[c] Elevation (ft amsl)	Completion Date	Drill Depth (ft bgs)	Well Depth (ft bgs)	Well Casing Diameter (in.)	Screened Interval (ft bgs)	Open Interval (ft bgs)	Aquifer	Monitor Frequency
		UTM Northing (m)	UTM Easting (m)									
CAV6002X	---	4,248,307.58	689,819.01	5,987.97	10/28/2007	917	901	20	219-901	50-917	Carbonate	Quarterly
CAV6002M2	---	4,248,365.83	689,782.96	5,982.81	10/13/2007	893	885	6	159-882	50-893	Carbonate	Quarterly

[a]Professional survey complete on location and elevation. All coordinates are Universal Transverse Mercator, North American Datum, 1983, Zone 11.
[b]Station Local Numbers provided by the Nevada Division of Water Resources.
[c]Elevations are North American Vertical Datum of 1988 (NAVD88).
Note: Well-construction data are based upon best available information from well logs.

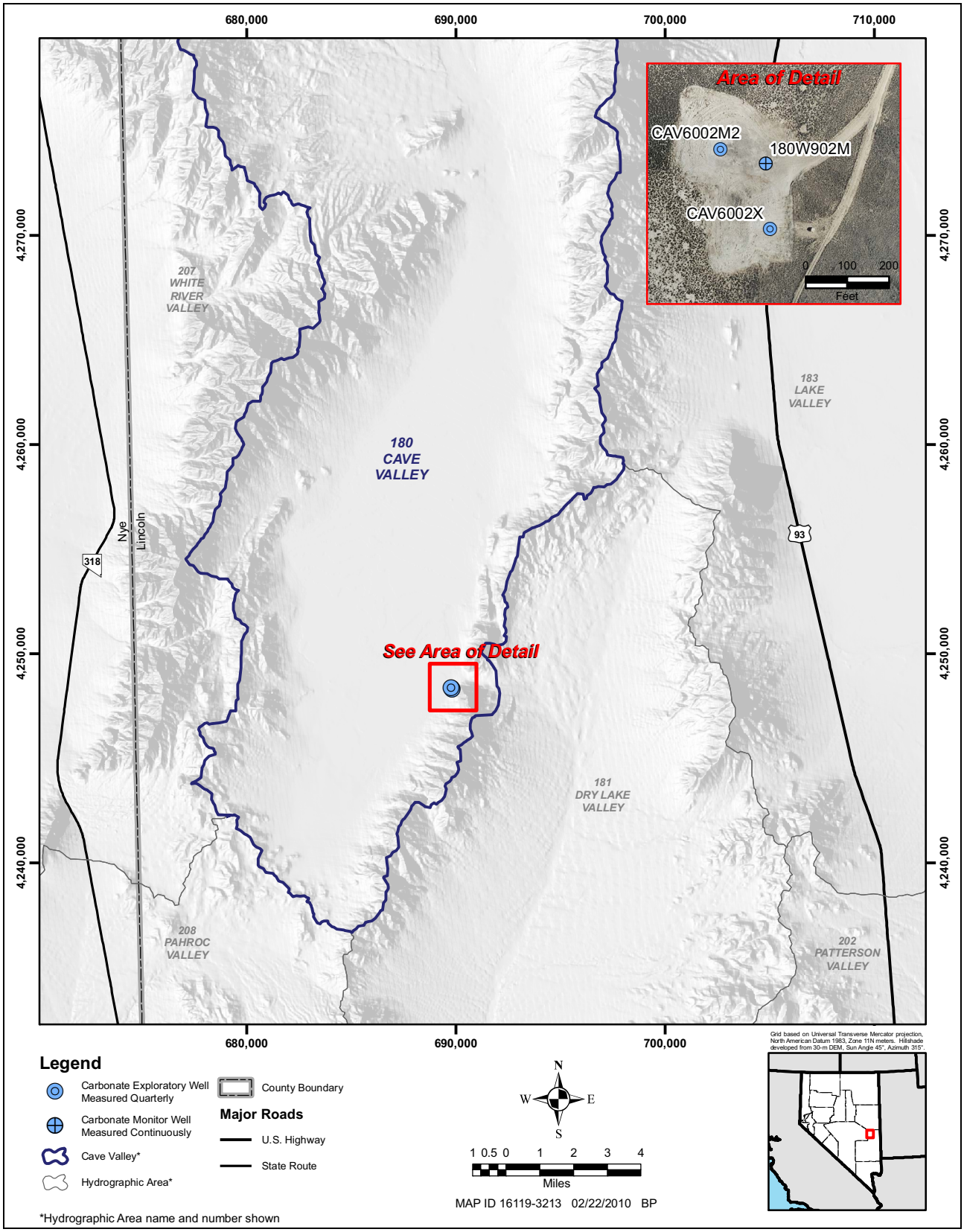

Figure 2-2
SNWA DDC Exploratory Wells

2.2.4 Aquifer Testing

A constant-rate pumping test will be performed on each future production well to evaluate aquifer properties. Aquifer-testing results would be used to assess well performance, provide aquifer-property data and assist in evaluating potential future pumping effects. Well-performance step tests and 72-hour constant-rate tests have been performed on SNWA Test Well CAV6002X and Monitor Well 180W902M located in Cave Valley. A summary and results of the tests are presented in *Hydrologic Data Analysis Report for Test Well CAV6002X in Cave Valley Hydrographic Area 180* (Prieur et al., 2011).

2.3 Spring Monitoring Network

The DDCMM Plan spring monitoring network has two components each of which were implemented in 2009. The first component consists of nine springs in White River and Pahranagat valleys that are monitored for discharge. The second component consists of eight springs within DDC that are monitored biannually for discharge (if measurable), field water-quality parameters, and general physical conditions. The spring locations and monitoring frequency are listed in Table 2-4 and presented in Figure 2-3. Photos of these spring locations and detailed descriptions were presented in SNWA (2009b). A description of each spring and corresponding discharge data are presented in this section.

2.3.1 White River and Pahranagat Valleys Springs

Nine springs located in White River and Pahranagat valleys are included in the spring monitoring network. Hot Creek, Ash, and Crystal springs are currently being monitored continuously through a joint funding agreement (JFA) between SNWA, USGS, and the Nevada Division of Water Resources (NDWR). USGS also measures discharge biannually at Flag Springs and Moorman Spring as part of the JFA.

SNWA established spring discharge monitoring sites at Hardy and Hiko springs in 2009. SNWA and NSE staff worked together to secure property access to install the flume at Hardy Springs, and a flow meter and data logger at Hiko Spring. The flow meter provides continuous discharge data on the agricultural diversion pipeline to which Hiko Spring is diverted.

SNWA coordinated with the Nevada Department of Wildlife (NDOW) to install a flume and continuous-monitoring instrumentation at Flag Spring 2 (Middle Flag Spring) in 2009. Flag Spring 1 and 3 continue to be measured biannually by SNWA and USGS.

Maynard Spring is monitored quarterly by SNWA. SNWA will document conditions at this site dependent upon continued property access. Cottonwood Spring is monitored by USFWS and data provided will be included in future annual data reports.

Table 2-4
DDC Springs Monitoring Locations and Monitoring Frequency

Basin Number	Station Number	Station Name	Elevation[a]	Location[b]		Monitoring Frequency
				UTM Northing (m)	UTM Easting (m)	
180	1800101	Cave Spring	6,490	4,279,249	691,760	Biannual
	1800301	Parker Station Spring	6,490	4,282,096	688,179	
	381624114540302	USBLM Silver King Well	6,230	4,238,220	683,551	
	381943114562201	Lewis Well	6,260	4,244,297	680,106	
181	1810301	Littlefield Spring	6,150	4,233,949	701,112	Biannual
	1810401	Coyote Spring	5,220	4,211,513	687,693	
	1810501	Big Mud Springs	6,430	4,241,387	689,547	
182	1820101	Grassy Spring	5,790	4,157,193	695,124	
207	2070501	Hot Creek Spring near Sunnyside, NV	5,230	4,249,926	661,290	Continuous
	2071101	Moorman Spring	5,300	4,273,440	662,053	Biannual
	2071501	Hardy Springs	5,350	4,278,196	667,553	
209	2090101	Hiko Spring	3,880	4,162,744	657,549	Continuous
	2090201	Cottonwood Spring	3,240	4,123,643	667,261	Quarterly[c]
	2090801	Maynard Spring	3,110	4,117,909	674,444	Biannual[d]
Flag Springs						
207	2071301	Flag Spring 3 (South)	5,290	4,254,416	672,579	Biannual
	2071302	Flag Spring 2 (Middle)	5,280	4,254,570	672,576	Continuous
	2071303	Flag Spring 1 (North)	5,290	4,254,696	672,719	Biannual
Crystal Springs						
209	09415589	Crystal Springs Diversion near Hiko, NV	3,820	4,155,336	656,011	Continuous
	2090401	Crystal Springs near Hiko, NV	3,800	4,155,348	656,165	
Ash Springs						
209	09415639	Ash Springs Diversion at Ash Springs, NV	3,600	4,147,415	659,716	Continuous
	2090501	Ash Springs	3,600	4,147,460	659,684	

[a]All elevations are rounded to the nearest 10 ft, North American Vertical Datum, 1988 (NAVD88). High-resolution Global Positioning System (GPS) will be used to determine elevations at a later date.
[b]All coordinates are Universal Transverse Mercator, North American Datum, 1983 (NAD83) Zone 11.
[c]Monitoring performed by USFWS and data to be provided to SNWA and presented in the annual data report.
[d]Monitoring frequency will be increased to quarterly after monitoring points are established in consultation with USFWS and BLM.

2.3.1.1 Flag Springs

The Flag Springs is located in Nye County at the NDOW Headquarters for the Wayne Kirsch Wildlife Management Area approximately 60 mi south of Ely, Nevada, along Nevada State Route (SR) 318 (Figure 2-3). Three primary springs (South, Middle, and North) compose the Flag Springs. Flag Springs form the headwaters of Sunnyside Creek at the NDOW headquarters in White River Valley, which flows into the Adams-McGill Reservoir where the water is used for livestock, wildlife, and recreation.

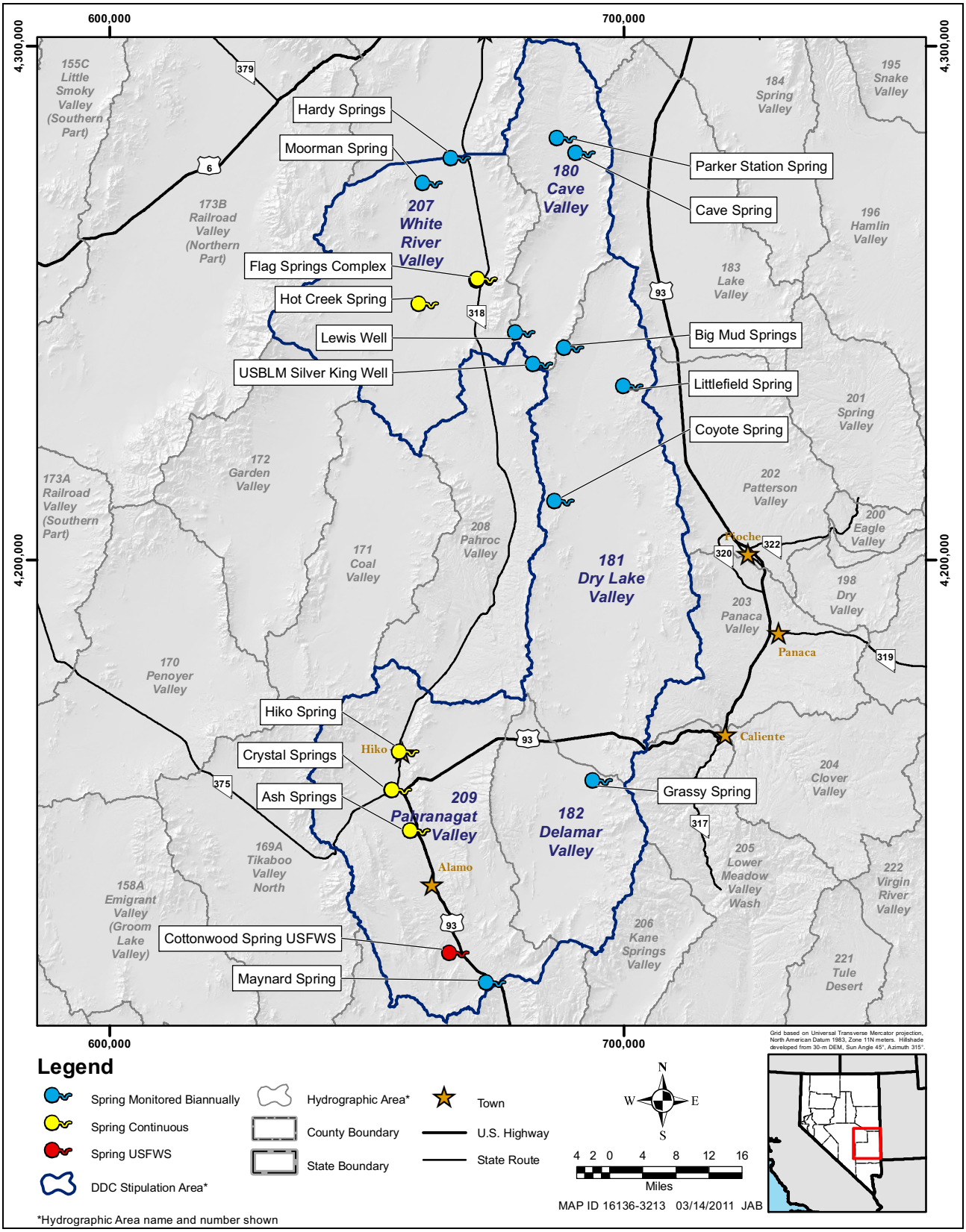

Figure 2-3
Locations of Springs Associated with the DDCMM Plan

Monitoring at Flag Springs currently consists of continuous monitoring of Flag Spring 2 (Middle Flag Spring), which was installed through a cooperative project with NDOW and SNWA, in November 2009, and biannual monitoring of Flag Spring 1 and 3 (North and South Flag Spring) orifices.

The earliest reported discharge measurement of 2.5 cfs was taken at Flag Spring 1 in 1949 (Maxey and Eakin, 1949). The USGS, beginning in 1982, measured the discharge of the three springs annually. During 1992, the discharge measurements were increased to a biannual frequency that continued through the end of 1994. No discharge measurements were reported between 1995 and 1996. During 1997, the springs were again measured by the USGS biannually, which continued through 2008, as part of the JFA with SNWA and NDWR. Miscellaneous discharge measurements for 2012 and a historical hydrograph are presented in Appendix D. A continuous discharge hydrograph for Flag Spring 2 is also presented in Appendix D.

2.3.1.2 Hardy Springs

Hardy Springs is located approximately 16 mi south of Lund, Nevada, and 1.5 mi west of SR 318 in White River Valley in Nye County (Figure 2-3). Hardy Springs is composed of five individual spring orifices that discharge into a main channel that is a tributary to the White River. In August 2009, SNWA installed a new flume to obtain biannual discharge measurements upstream of an old diversion approximately 100 to 150 ft downstream of the confluence of Hardy Springs. Hydrologic data collected in 2012 are presented in Appendix D.

The channel between Hardy Springs and the flume was modified by a contractor with permission from the landowner to provide a water source to the power transmission line construction project. A photo of the original condition of the channel and the modified condition with reservoir are presented in Figures 2-4 and 2-5, respectively. Discharge measurements performed by SNWA in 2012 used a 3-inch modified Parshall Flume located between the confluence of the five springs and upstream of the reservoir.

2.3.1.3 Moorman Spring

Moorman Spring is located in White River Valley approximately 20 mi southwest of Lund, Nevada, in Nye County (Figure 2-3). The spring discharges from the alluvium along a fault scarp. The spring forms a small pool, approximately 30 ft long and 15 to 20 ft wide, behind an old irrigation diversion structure. The discharge at Moorman Spring is currently measured biannually through the JFA.

In 1935, the reported discharge was 0.22 cfs (Stearns et al., 1937). This discharge measurement was likely influenced by the extreme drought in the western United States during the mid-1930s. The same 1935 discharge measurement was again reported in Miller et al. (1953). Since 1935, the average discharge at Moorman Spring has been approximately 0.47 cfs, and the historical discharge measurements appear relatively constant. Discharge data collected at Moorman Spring during 2012 and a hydrograph of the historical data are presented in Appendix D.

Figure 2-4
Hardy Springs Original Condition

Figure 2-5
Hardy Springs Modified Condition

2.3.1.4 Hot Creek Spring

Hot Creek Spring is located in southern White River Valley, approximately 36 mi southwest of Lund, Nevada, and 2 mi west of Adams-McGill Reservoir in Nye County (Figure 2-3). The spring discharge forms Hot Creek, which flows southeast to the Adams-McGill Reservoir. The spring and reservoir are located on the Wayne Kirch Wildlife Management Area, administered by NDOW. At one time, the flow of Hot Creek could be diverted to the Dacey Reservoir to the northeast. Spring discharge is currently being monitored continuously by USGS through the JFA.

A detailed description, site photos, and discussion of historical measurements at Hot Creek Spring are presented in SNWA (2009b). Data collected through 2012, along with historical mean daily discharge data from 2006 to 2012 are provided in Appendix D. Discharge measurements prior to 2006 were measured below the current gage, 50 to 60 ft below the ponded swimming area.

2.3.1.5 Ash Springs

Ash Springs is located in Ash Springs, Nevada, approximately 600 ft east of U.S. Highway 93 (US 93) (Figure 2-3). The spring is used for irrigation, domestic supply, and recreation and is composed of many orifices that extend more than a quarter mile along the north-south-trending Hiko Fault. The spring area was developed in the 1970s and through the 1980s as a privately owned resort. The main orifice is on public land administered by the BLM and has a large picnic area and swimming pool. Ash Springs discharge and irrigation diversion are currently measured by the USGS using two gaging stations which are funded through the JFA. The two stations were relocated by the USGS during 2011.

A detailed description, photos, and discussion of historical data collected at Ash Springs are presented in SNWA (2009b). Hydrologic data collected through the 2012 water year, historical mean daily discharge, and a 30-day moving average of mean daily discharge values for Ash Springs are presented in Appendix D.

2.3.1.6 Crystal Springs

Crystal Springs is located approximately a quarter mile west of the SR 318/SR 375 junction and a half mile west of the US 93/SR 318 junction in Lincoln County. Crystal Springs is approximately 4 mi south of Hiko, Nevada, and 5 mi north of Ash Springs, Nevada (Figure 2-3). This locale, used as a watering location and campsite, was the principal stopover on the Mormon Trail alternate route (State of Nevada, 2004). The main channel of the spring and irrigation diversion discharge is currently monitored by USGS through the JFA.

A detailed description and photo documentation of Crystal Springs are presented in SNWA (2009b), including a discussion of the historical data collected at the spring complex. Hydrologic data collected through the 2012 water year, historical mean daily discharge, days of diversion, and annual discharge data are presented in Appendix D.

2.3.1.7 Hiko Spring

Hiko Spring is located on the Cannon Ranch approximately a half mile northeast of Hiko, Nevada, in the north end of Pahranagat Valley (Figure 2-3) and has historically provided water for various uses. Hiko Spring discharges from the base of the Hiko Range and currently provides water for domestic, agricultural, and wildlife purposes.

SNWA monitors discharge at Hiko Spring continuously using a flow meter and datalogger installed on the 18-in.-diameter pipe located approximately 0.5 mi southwest of the spring. The monitoring station was constructed in cooperation with the Hiko Spring Irrigation District and the owners of the Cannon and Whipple Ranches. All work was completed June 2009.

The Hiko Irrigation Company uses a perpetual calendar which assigns irrigation times to each of the twelve members of the company. One complete rotation of the 12 users equates to 11.5 days. There are periods during each rotation when water is diverted above the gage. Daily discharge rates vary between 4.3 to 8.3 cfs depending upon the season and irrigation needs of the individual users.

A detailed description and photo documentation of Hiko Spring are presented in SNWA (2009b), including a discussion of the historical data collected at the spring complex. Hydrologic data collected during the 2012 water year and a historical hydrograph are presented in Appendix D.

2.3.1.8 Maynard Spring

Maynard Spring is located off of US 93 about 14 mi southeast of Alamo, Nevada, and 2.5 mi southeast of Lower Pahranagat Lake on BLM land in Pahranagat Valley (Figure 2-3). The spring is composed of two springheads, referred to as North Maynard Spring and South Maynard Spring, which are separated by a distance of roughly 400 ft. Photos of Maynard Spring in May and October 2012 are presented in Figures E-1 and E-2. SNWA will continue to coordinate with BLM and USFWS to establish water-level monitoring points at Maynard Spring. Observations in 2012 indicated no measurable discharge.

2.3.1.9 Cottonwood Spring

Cottonwood Spring is approximately 9.5 mi south of Alamo, Nevada, 1 mi west of US 93 on the USFWS Pahranagat Wildlife Refuge (Figure 2-3), and 1.5 mi south of the Refuge Headquarters along the Corn Creek/Alamo Road. As per Exhibit A of the Stipulation, USFWS is to provide data collected from Cottonwood Spring to the TRP. SNWA will coordinate with USFWS to obtain and present the data in the annual data report. The water at Cottonwood Spring is used for wildlife. Photo documentation and historical data reported for Cottonwood Spring is presented in SNWA (2009b).

2.3.2 DDC Springs Biannual Monitoring

Eight spring monitoring locations were selected within the DDC valleys by the TRP in consultation with the NSE for biannual monitoring. These springs are generally characterized as being sourced in

the mountain block and as having no hydraulic connection to the regional aquifer. However, biannual baseline monitoring is being performed to document variability in spring conditions.

Springs included in the program are Grassy Spring in Delamar Valley; Coyote, Big Mud, and Littlefield springs in Dry Lake; Parker Station and Cave springs in northern Cave Valley; and Lewis Well and Silver King Well in southern Cave Valley. Spring locations are presented in Figure 2-3. Several of the springs (Grassy, Big Mud, Coyote, and Lewis Well) have been modified in the past with a collector system to transmit water to distribution points away from the spring. Silver King Well is a shallow dug well with a gravity discharge line to a stock water area.

Field visits to the sites are conducted in the spring and fall of each year when site-access conditions permit. Wetted area and discharge (if measurable) are documented. Spring water-quality is measured in the field for pH, electrical conductivity, and temperature. Photographs are taken to document site conditions.

Physical descriptions, photos, and historical hydrologic and water-chemistry data for the springs are presented in SNWA (2009b).

A site visit was performed in May and October 2012. Data collected during the visit and photo documentation are presented in Appendices D and E, respectively.

2.3.2.1 Cave Spring

Cave Spring is located at the far southwest corner of a low northeast-southwest-trending hill approximately 3 mi southeast of Parker Station, Nevada (Figure 2-3). The decrease in discharge rates during the summer months and the cold temperature of the water indicate that this spring is fed solely by local recharge. Biannual discharge measurements and conditions are being documented at the spring with permission from the owner, Cave Valley Ranch, LLC.

A detailed description and photo documentation of Cave Spring are presented in SNWA (2009b), including a discussion of historical data collected at the spring. Hydrologic data collected during the 2012 water year are presented in Appendix D. A photo of the spring, taken in May 2012, during high discharge is presented in Figure E-3. The photo taken in October 2012 is presented in Figure E-4 and shows that the spring was dry at that time. This is consistent with observed conditions in 2009, 2010, and 2011 (SNWA, 2010 and 2011b).

Currently, no active diversions exist at the spring. Historically, it appears that a small, hand-dug well was placed in the stream channel and was used to divert water by pump. The water now flows freely down the channel into a small reservoir in the center of the valley where it is used for livestock watering.

2.3.2.2 Parker Station

Parker Station is in north-central Cave Valley, approximately 16 mi southeast of Lund, Nevada. Parker Station was once used as a stagecoach station. This site is located in Lincoln County, nearly a mile south of the White Pine/Lincoln County line.

Parker Station Spring lies on Cave Valley Ranch, LLC, property. A description of the physical conditions are documented biannually at the flowing well and nearby spring with access permission from Cave Valley Ranch, LLC. A photo of spring discharge in the Parker Station Area in May 2012 is presented in Figure E-5. Access was not available to the site in October 2012.

2.3.2.3 Lewis Well

The Lewis Well is located in southern Cave Valley, approximately 36 mi south of Lund, Nevada, and 6 mi east of SR 318 (Figure 2-3). It is located at the base of the Egan Range on the eastern slope. The well was reportedly constructed in 1925 and was completed with a 42-in. steel casing to a depth of 26 ft. Photos of the springhead area for Lewis Well taken in May and October 2012 are presented in Figures E-6 and E-7, respectively.

2.3.2.4 Silver King Well

Silver King Well is a hand-dug well located within Lincoln County, Nevada, in southern Cave Valley as shown in Figure 2-3. The dug well may have been a modification to a historic spring. Water is discharged from the Silver King Well by gravity drainage through approximately 600 ft of 2-in. pipe into a partially buried trough. Photos of the Silver King Well and discharge area are presented in SNWA (2009b). Photos taken May and October 2012 are presented in Figures E-8 and E-9, respectively.

Water-level data collected at the Silver King Well is limited prior to implementation of the SNWA monitoring program with only two records available. A depth-to-water level on March 21, 1990, was reported as 8.90 ft bgs. The second depth-to-water measurement was made on August 25, 2003, and was reported as 7.95 ft bgs**.** Two depth-to-water measurements were taken in 2012. The first, on May 15, 2012 was 11.34 ft bgs and the second, on October 22, 2012 was 11.83 ft bgs.

2.3.2.5 Coyote Spring

Coyote Spring is located in Dry Lake Valley approximately 8 mi west-southwest of Bristol Wells, Nevada (Figure 2-3), and lies at the center of an abandoned homestead compound. Two spring orifices exist at the site. Photos of Coyote Spring and the discharge area are presented in SNWA (2009b). Photos taken in May and October 2012 are presented in Figures E-10 and E-11, respectively.

Coyote Spring discharges from the base of a scarp approximately 15 ft high in volcanic rocks. The spring discharge is collected and piped to a large concrete tank. Discharge from Coyote Spring was measured at 5 gpm in 1912 and at 0.9 gpm in August 1979. On June 3, 2004, discharge was measured

at 0.11 gpm. On June 21, 2004, the discharge was 0.02 gpm. Discharge on the May 15, 2012 field visit was 0.73 gpm, and 0.34 gpm on October 22, 2012.

2.3.2.6 Big Mud Springs

Big Mud Springs is located in northern Dry Lake Valley as shown in Figure 2-3. The springs are located in the Schell Creek Range along Big Mud Pass approximately 7 mi north of Silver King Mountain. A wood fence is present at the springs. The area is surrounded by dense vegetation, such as junipers, willows, and wild roses. A collection basin is in place to divert the spring discharge for stock watering.

Photos of Big Mud Springs and water storage tanks are presented in SNWA (2009b). Photos of the springhead taken in May and October 2012 are presented in Figures E-12 and E-13, respectively.

2.3.2.7 Littlefield Spring

Littlefield Spring is located approximately 3 mi south of Meloy Spring on the east side of Dry Lake Valley (Figure 2-3). Littlefield Spring discharges from the alluvium near an outcrop of volcanic rock. This spring had a reported discharge of 0.02 cfs in May 1980 (Bunch and Harrill, 1984). No diversions exist near the spring. The spring head for Littlefield Spring was restored in 2004. A photo of the spring discharge area taken in May 2012 is presented in Figure E-14. The photo taken in October 2012 of the spring area and discharge measuring point is presented in Figure E-15. Discharge measured on May 15 and October 22, 2012 was 0.06 and 0.04 cfs, respectively.

2.3.2.8 Grassy Spring

Grassy Spring is located in Delamar Valley approximately 40 mi south of Bristol Wells, Nevada, along the western flank of the Delamar Mountains (Figure 2-3). Photos of Grassy Spring taken in May and October 2012 are presented in Figures E-16 and E-17. Grassy Spring is currently used for stock watering. The discharge is captured at the source and is transferred to livestock-watering tanks through black polyvinyl tubing.

The spring discharges from alluvial sediments in close contact with volcanic rocks. The discharge was measured volumetrically at the livestock tank, approximately 300 ft west of the spring. The discharge measured at the site on May 15 and October 22, 2012 was 0.20 gpm and 0.16 gpm, respectively.

2.4 Precipitation-Station Network

Precipitation-station data from selected network sites which are currently operating and have an established historical record in the vicinity of the study area were compiled and are presented in Appendix F. The precipitation network will assist in assessing climate variability in the vicinity of the project basins and discerning pumping effects from natural variability. The precipitation network stations are listed in Table 2-5 and are presented on Figure 2-6.

Table 2-5
DDC Precipitation-Station Locations

Station Number	Station Name	Location[a]		Surface Elevation[b] (ft amsl)	Data Source
		UTM Northing (m)	UTM Easting (m)		
RP1730201	Blue Eagle Ranch Hank	4,264,579	626,889	4,780	WRCC
RP1790202	McGill	4,365,043	691,693	6,270	WRCC
RP2010201	Spring Valley State Park	4,214,070	747,476	5,950	WRCC
RP2050201	Caliente	4,166,217	719,251	4,400	WRCC
RP2050202	Elgin	4,136,286	717,627	3,420	WRCC
RP2070201	Sunnyside	4,254,668	672,599	5,297	WRCC
RP2070202	Lund	4,303,974	672,091	5,546	WRCC
RP2090201	Hiko	4,158,266	656,900	3,900	WRCC
RP2090202	Pahranagat Wildlife Refuge	4,126,390	666,716	3,400	WRCC
RP2070301	Ward Mountain	4,333,574	677,187	9,200	NRCS (SnoTel)
RP1840401	Mount Washington	4,309,377	732,764	10,440	USGS
RP1840402	Cave Mountain	4,337,545	706,107	10,650	USGS
RP2030401	Highland Peak	4,196,772	712,963	9,330	USGS
RP2090401	Mount Irish	4,168,657	641,846	8,607	USGS
RP1830401	Mount Wilson	4,236,084	728,118	9,200	USGS
RP1730401	Quinn Canyon Range	4,228,799	620,297	9,050	USGS
RP1820401	Unnamed Peak South of Chokecherry Peak	4,154,830	700,904	7,800	USGS
RP1820402	Unnamed Peak in South Delamar Mountains	4,135,352	701,473	7,800	USGS

[a]All coordinates in Universal Transverse Mercator, North American Datum, 1983 (NAD83), Zone 11.
[b]Elevations are North American Vertical Datum, 1988 (NAVD88).

The precipitation-station network includes the following:

- Eight high-altitude precipitation stations maintained and operated by USGS through a JFA with SNWA and NDWR.
- Nine National Oceanic and Atmospheric Administration, National Weather Service (NOAA/NWS) Stations. Data were obtained through the Western Regional Climate Center (WRCC).
- One U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) SNOwpack TELemetry (SNOTEL) site located in the Egan Range. This site provides precipitation and snow-accumulation data.

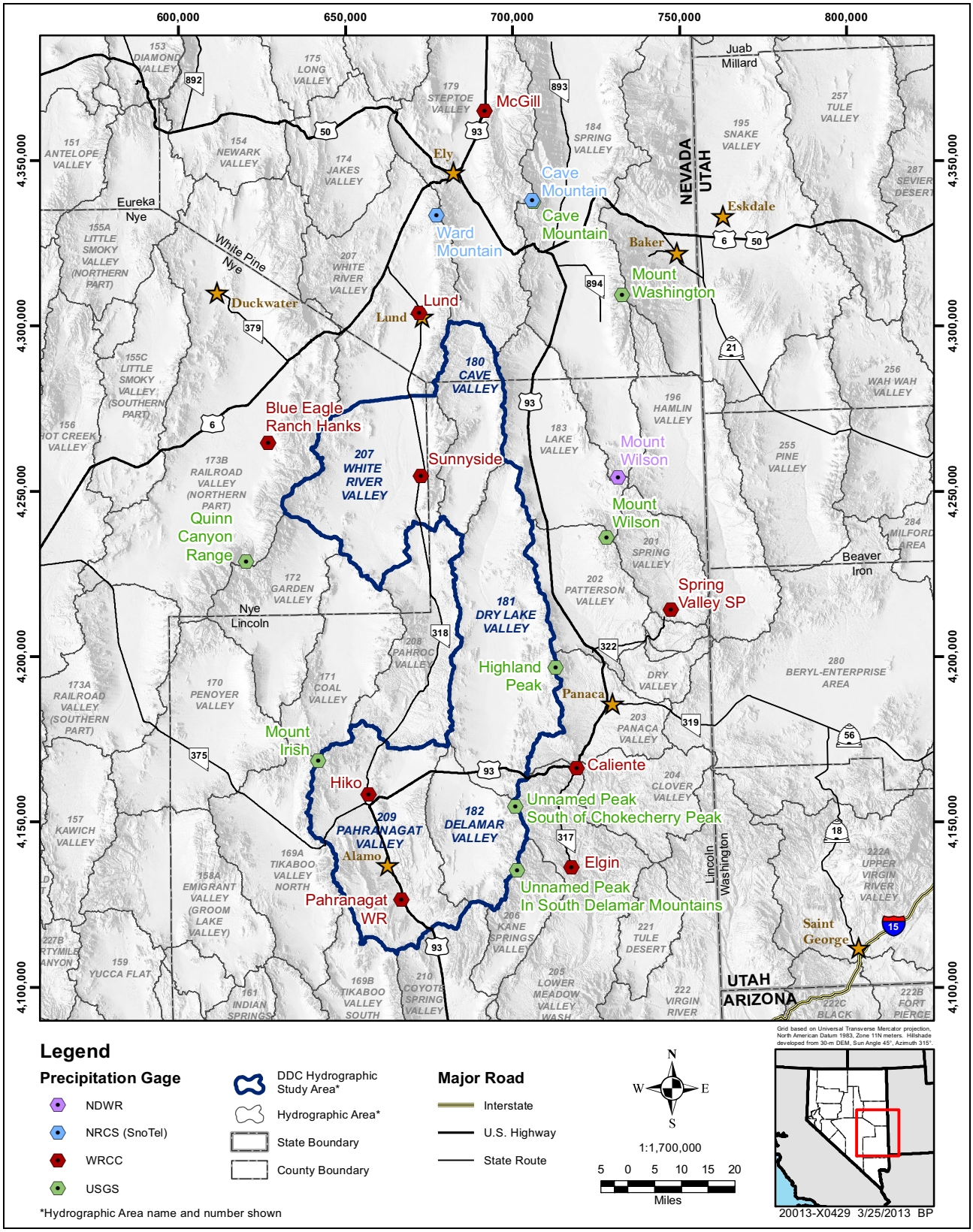

Figure 2-6
DDC Precipitation-Station Locations

Provisional 2012 precipitation data for the stations, along with historical data and statistics, are presented in Appendix F. SNWA will continue to compile and report precipitation data from these sites as long as the data are made available and the stations are in operation.

Data sources for precipitation information presented in this report are as follows:

- USGS data is cited from USGS National Water Information System (USGS, 2013)
- SNOTEL data is cited from USDA Natural Resources Conservation Service (USDA, 2013)
- National Weather Service data is cited from Western Regional Climate Center (WRCC, 2013)

2.5 Water Chemistry

A summary of water-chemistry results from program wells and springs of the DDC monitoring network were presented in SNWA (2009b). The results were derived from samples collected by SNWA, USGS, and Desert Research Institute as well as those reported in historical reports dating as far back as 1912 (Carpenter, 1915). On July 2, 2009, water samples were collected from Hiko and Hardy springs and analyzed for a suite of chemical constituents. The results for these samples were presented in SNWA, 2010.

Spring field measurements of the water-quality parameters were performed using SNWA and the National Field Manual for the Collection of Water-Quality Data (USGS, 2008) procedures. All measurement equipment was calibrated according to the manufacturer calibration procedures.

On March 31, 2010 the TRP held a conference call to discuss the water-chemistry sampling programs required by the DDCMM Plan. The TRP recommended to the EC that the water-chemistry sampling program be postponed and implemented after the three future monitor wells specified in the DDCMM Plan have been installed. The EC approved the TRP recommendation. Implementation of the program will include collection of two rounds of water-chemistry samples six months apart at 10 locations selected by the TRP. SNWA will collect and submit samples for chemical analysis for the water-chemistry parameters listed in Table 2-6. Subsequent sampling will be performed once every 5 years following the start of SNWA groundwater production.

2.6 Data Reporting

A data-exchange web site accessible by the NSE, EC, TRP, and BRT members was created in April 2008. The data-exchange web site is used to distribute SVMM Plan monitoring data to the TRP within 90 days of collection. Data is also submitted directly to the NSE on a quarterly basis in electronic format.

A data and status report will be submitted annually to the other members of the TRP and NSE.

2.7 Proposed Schedule of Groundwater Withdrawals

No groundwater production is scheduled for the next two years with the exception of short-term development, well-performance testing, and aquifer testing of any new wells drilled during this

Table 2-6
Water-Chemistry Parameters

Field Parameters	Major Ions	Isotopes	Minor and Trace Elements
Water temperature	TDS	Oxygen-18	Arsenic
Air temperature	Calcium	Deuterium	Barium
pH	Sodium	Tritium	Cadmium
Electrical conductivity	Potassium	Chlorine-36[a]	Chromium
Dissolved oxygen	Chloride	Carbon-14[a]	Lead
	Bromide	Carbon-13[a]	Mercury
	Fluoride	Strontium-87[a]	Selenium
	Nitrate	Uranium-238[a]	Silver
	Phosphate		Manganese
	Sulfate		Aluminum
	Alkalinity		Iron
	Silica		Bromide
	Magnesium		Fluoride

[a]These parameters shall be included only in the first sampling event and shall not be included in any further water-chemistry sampling performed pursuant to this plan.

time-frame. The duration of well-performance testing is typically one day. The duration of the constant-rate aquifer testing is typically under one week.

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3.0 ANTICIPATED 2013 SNWA DDCMM PLAN ACTIVITIES

Anticipated DDCMM Plan-related activities in 2013 are summarized below.

- Continue to collect required quarterly and continuous water-level and spring discharge measurements at program sites throughout 2013.

- Coordinate activities and provide technical assistance to the BRT as requested.

- Data will be reported quarterly to other TRP members through the SNWA data-exchange web site. Data will be submitted to NSE in an approved electronic format and included in the annual data report to be submitted in March 2014.

SNWA will continue to work with the NSE and the other members of the TRP participants to implement the DDCMM Plan and identify and address technical issues related to the program.

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Appendix A

Periodic Water-Level Measurement Data from the DDC Existing-Well Monitoring Network

Table A-1
Periodic Water-Level Measurement Data from the DDC Existing-Well Monitoring Network
(Page 1 of 3)

Site Number	Station Local Number[a]	Well Depth (ft bgs)	Surface[b] Elevation (ft amsl)	Water Level			
				Date	Depth to Water (ft bgs)	Well Status[c]	Measurement Method[d]
180W902M[e]	180 N06 E64 19ADCC1	903	5,984.89	1/2/2012	142.17	S	T
				2/14/2012	141.98	S	T
				4/2/2012	142.07	S	T
				7/11/2012	142.21	S	T
				8/7/2012	142.38	S	T
				9/4/2012	142.41	S	T
				10/1/2012	142.32	S	T
				11/14/2012	142.49	S	T
382807114521001	180 N07 E63 14BADD 1	460	6,012.39	2/14/2012	217.35	S	T
				5/10/2012	217.20	S	T
				8/7/2012	217.34	S	T
				11/14/2012	217.25	S	T
383307114471001	180 N08 E64 15BCBC1	---	6,162.55	2/14/2012	262.25	S	T
				5/10/2012	262.42	S	T
				8/7/2012	262.60	S	T
				11/14/2012	262.77	S	T
180W501M[e]	180 N09 E64 31CBBD1	1,212	6,428.63	1/2/2012	1056.87	S	T
				2/14/2012	1056.89	S	T
				4/2/2012	1056.91	S	T
				5/10/2012	1056.98	S	T
				7/9/2012	1057.08	S	T
				8/7/2012	1057.14	S	T
				10/1/2012	1057.03	S	T
				11/14/2012	1057.27	S	T
182W906M	182 S07 E64 19ACDB1	1,703	4,796.96	1/2/2012	1316.92	S	T
				2/15/2012	1315.92	S	T
				4/2/2012	1316.42	S	T
				5/7/2012	1316.59	S	T
				6/14/2012	1316.19	S	T
				7/10/2012	1316.37	S	T
				8/7/2012	1316.50	S	T
				10/1/2012	1316.67	S	T
				11/14/2012	1316.15	S	T
182M-1[e]	182 S07 E63 18AAAA1	1,321	4,597.78	1/2/2012	827.24	S	T
				2/15/2012	827.13	S	T
				4/2/2012	827.19	S	T
				5/7/2012	827.07	S	T
				7/10/2012	827.03	S	T
				8/7/2012	827.26	S	T
				10/1/2012	827.06	S	T
				11/14/2012	827.47	S	T

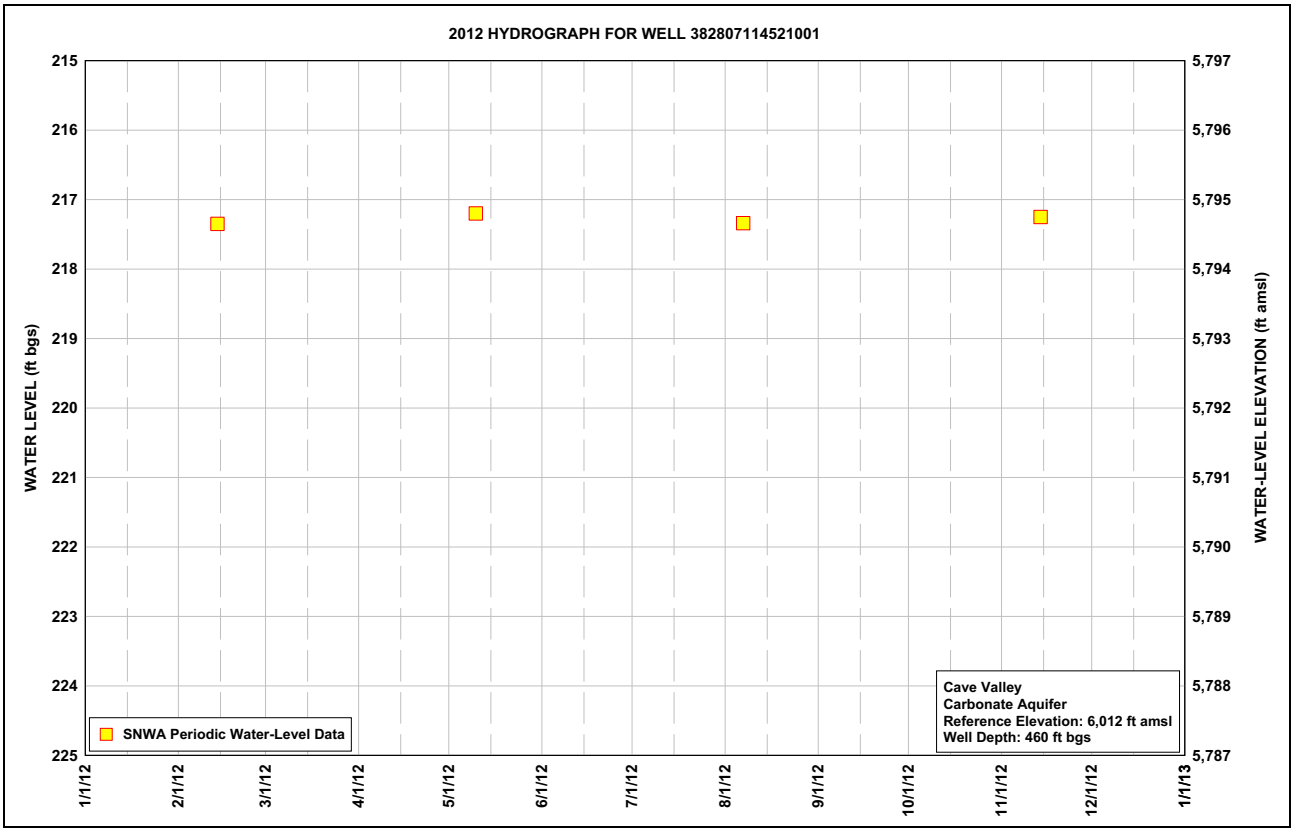
Table A-1
Periodic Water-Level Measurement Data from the DDC Existing-Well Monitoring Network
(Page 2 of 3)

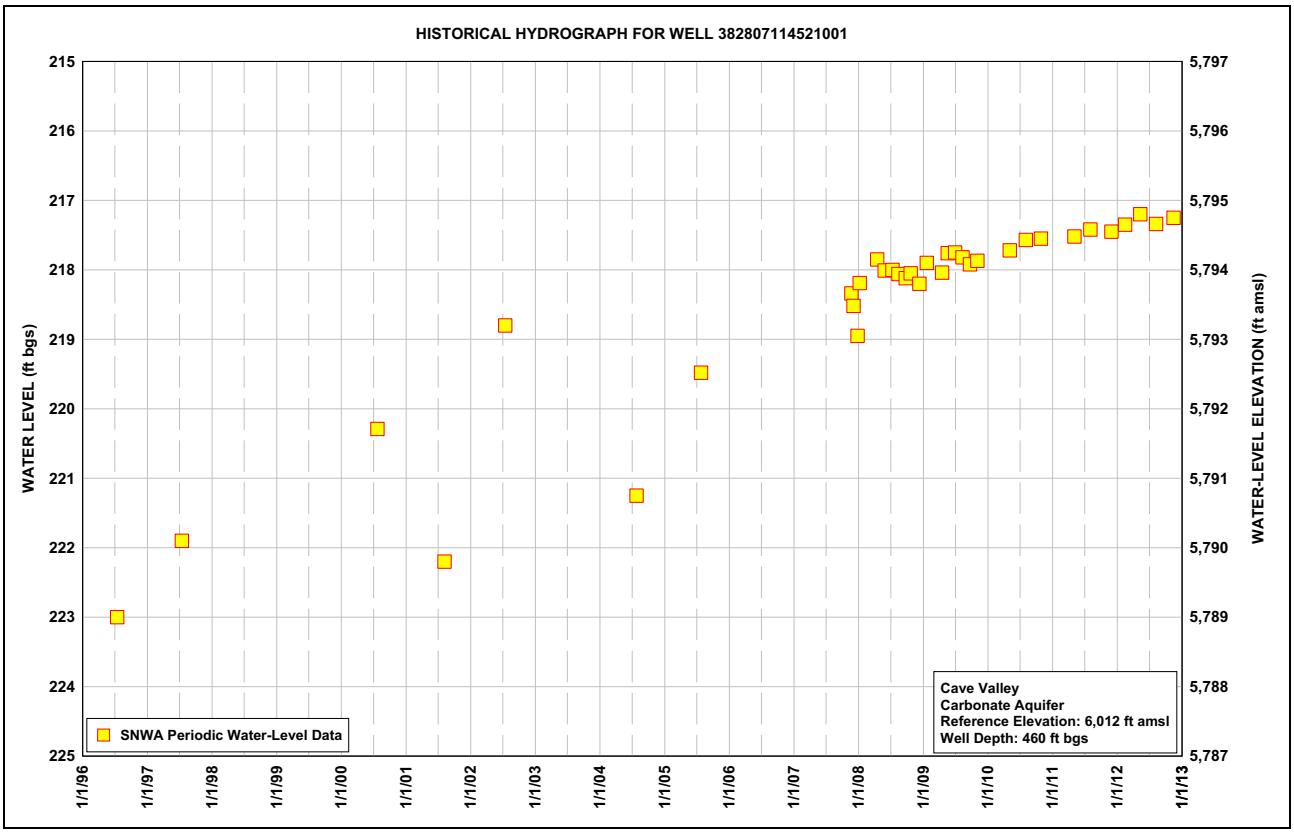
Site Number	Station Local Number[a]	Well Depth (ft bgs)	Surface[b] Elevation (ft amsl)	Water Level			
				Date	Depth to Water (ft bgs)	Well Status[c]	Measurement Method[d]
181W909M	181 S03 E65 07CCDA1	1,260	4,799.41	1/2/2012	498.17	S	T
				2/14/2012	497.69	S	T
				2/28/2012	497.80	S	T
				4/2/2012	497.91	S	T
				5/8/2012	498.03	S	T
				6/14/2012	497.84	S	T
				7/10/2012	498.05	S	T
				8/7/2012	498.23	S	T
				10/1/2012	498.11	S	T
				11/13/2012	498.43	S	T
181M-1[e]	181 N01 E63 36ABAA1	1,472	4,963.07	1/2/2012	675.39	S	T
				2/14/2012	675.32	S	T
				4/2/2012	675.20	S	T
				5/8/2012	675.26	S	T
				7/10/2012	675.09	S	T
				8/7/2012	675.37	S	T
				10/1/2012	675.20	S	T
				11/13/2012	675.12	S	T
380531114534201[e]	181 N03 E63 27CAA 1	2,395	5,456.35	2/14/2012	845.02	S	T
				5/8/2012	845.08	S	T
				8/8/2012	845.41	S	T
				11/13/2012	845.69	S	T
209 S07 E62 20AA 1	209 S07 E62 20AA 1	695	4,082.46	2/15/2012	600.05	S	T
				8/7/2012	600.21	S	T
				11/14/2012	600.35	S	T
373405115090001	209 S04 E61 28CD 1	980	4,230.58	2/14/2012	586.27	S	T
				5/8/2012	586.35	S	T
				8/7/2012	586.27	S	T
				11/13/2012	586.69	S	T
373803115050501	209 S04 E61 01AACB1	700	4,528.90	2/14/2012	784.98	S	T
				5/8/2012	785.86	S	T
				8/7/2012	785.43	S	T
				11/12/2012	786.10	S	T
209M-1[e]	209 S03 E62 35DAAD1	1,616	5,097.30	1/2/2012	1200.29	S	T
				2/14/2012	1200.01	S	T
				4/2/2012	1200.11	S	T
				5/8/2012	1200.05	S	T

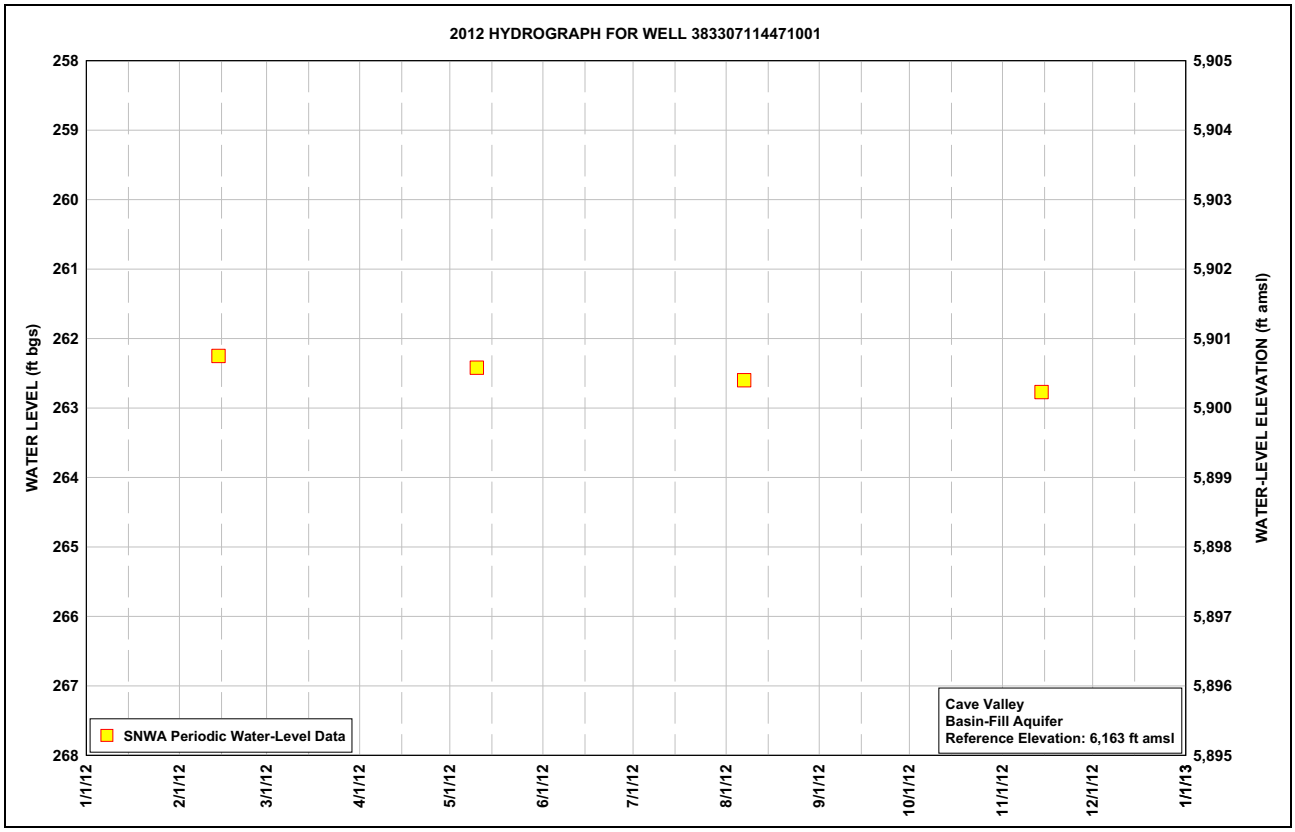
Table A-1
Periodic Water-Level Measurement Data from the DDC Existing-Well Monitoring Network
(Page 3 of 3)

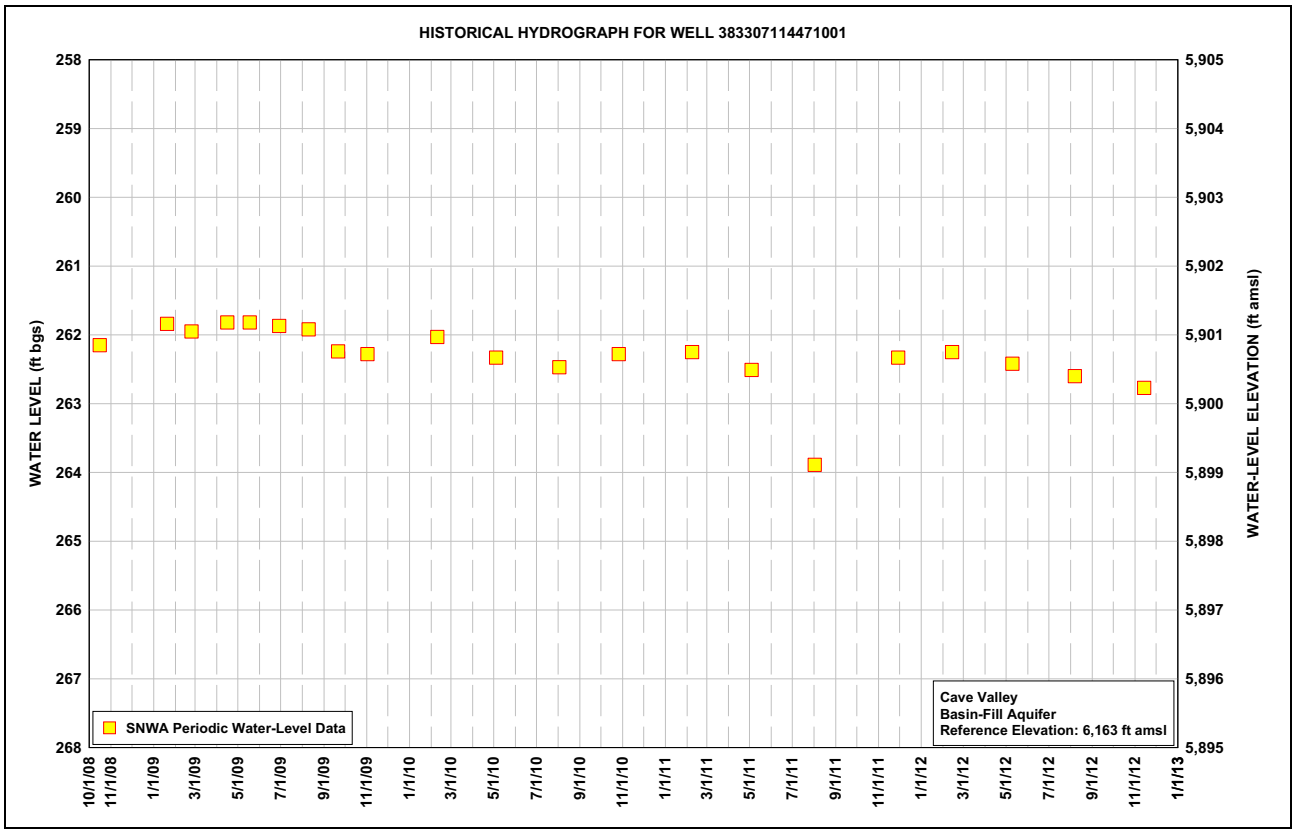
Site Number	Station Local Number[a]	Well Depth (ft bgs)	Surface[b] Elevation (ft amsl)	Water Level			
				Date	Depth to Water (ft bgs)	Well Status[c]	Measurement Method[d]
209M-1[e]	209 S03 E62 35DAAD1	1,616	5,097.30	7/9/2012	1199.95	S	T
				8/7/2012	1199.98	S	T
				9/4/2012	1200.15	S	T
				10/1/2012	1200.22	S	T
				11/13/2012	1200.19	S	T
383133115030201	207 N08 E62 30CD 1	101	5,290.20	2/13/2012	64.24	S	T
				5/10/2012	64.24	S	T
				8/6/2012	64.27	S	T
				11/12/2012	64.41	S	T
372639114520901	182 S06 E63 12AD 1	1,195	4,706.30	2/15/2012	863.26	S	T
				5/7/2012	863.53	S	T
				8/8/2012	863.92	S	T
				11/14/2012	863.99	S	T

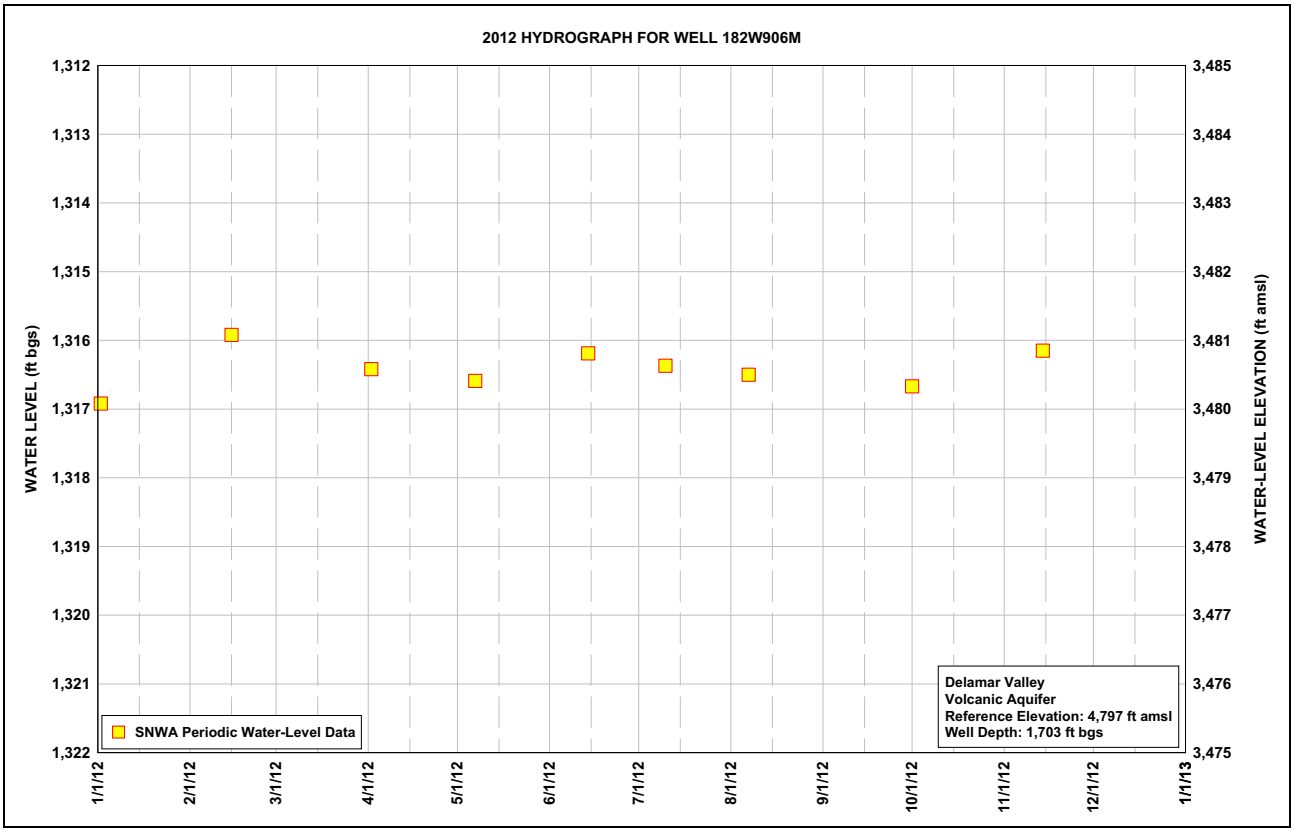
[a]Station Local Numbers provided by the Nevada Division of Water Resources.
[b]Elevations are North American Vertical Datum of 1988 (NAVD88).
[c]S = Static conditions, P = Pumping
[d]T = Electric tape measurement, S = Steel tape measurement
[e]2012 and historical hydrographs with periodic and continuous data are presented in Appendix B.
Note: SNWA tape calibration program started in August 2008.

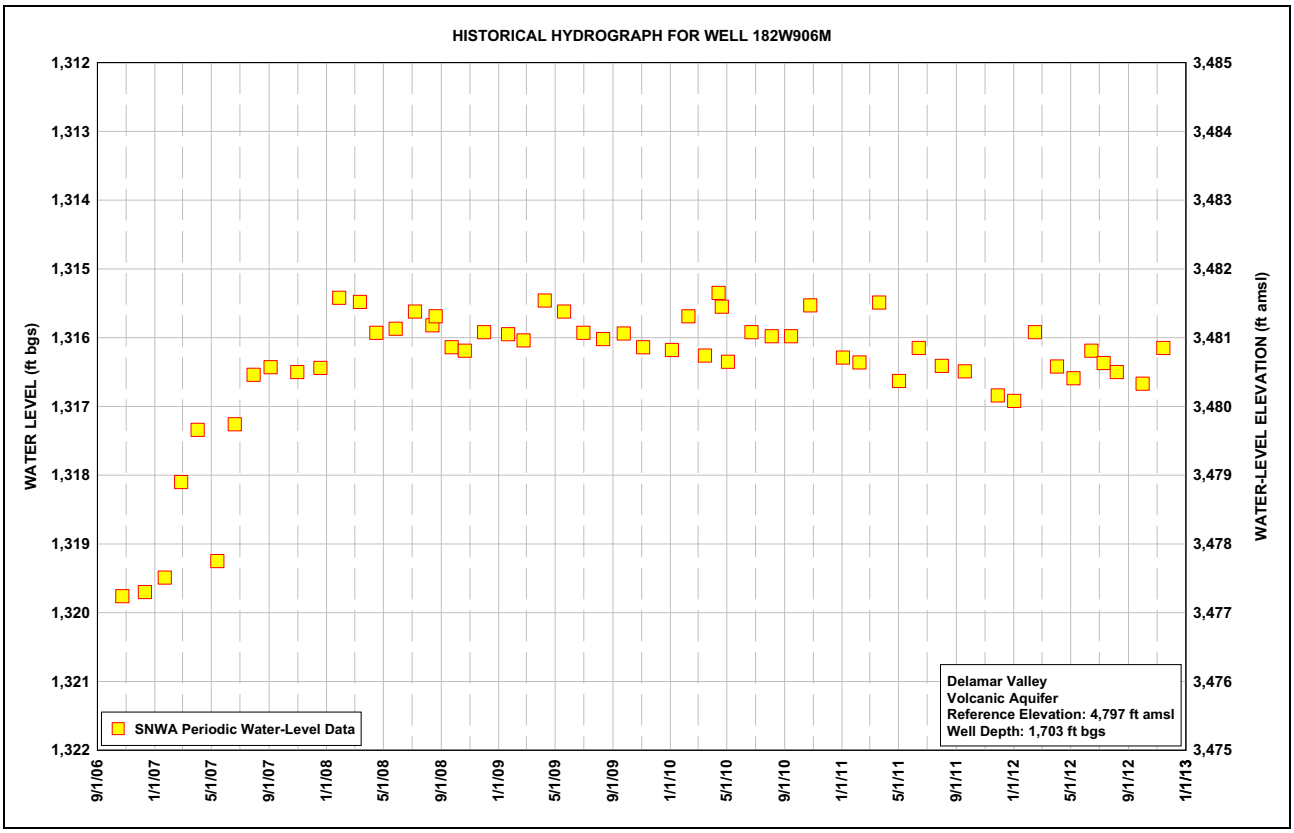

2012 HYDROGRAPH FOR WELL 382807114521001
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
215
216
217
218
219
220
221
222
223
224
225
5,797
5,796
5,795
5,794
5,793
5,792
5,791
5,790
5,789
5,788
5,787
1/1/12
2/1/12
3/1/12
4/1/12
5/1/12
6/1/12
7/1/12
8/1/12
9/1/12
10/1/12
11/1/12
12/1/12
1/1/13
SNWA Periodic Water-Level Data
Cave Valley
Carbonate Aquifer
Reference Elevation: 6,012 ft amsl
Well Depth: 460 ft bgs


HISTORICAL HYDROGRAPH FOR WELL 382807114521001
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
215
216
217
218
219
220
221
222
223
224
225
5,797
5,796
5,795
5,794
5,793
5,792
5,791
5,790
5,789
5,788
5,787
1/1/96
1/1/97
1/1/98
1/1/99
1/1/00
1/1/01
1/1/02
1/1/03
1/1/04
1/1/05
1/1/06
1/1/07
1/1/08
1/1/09
1/1/10
1/1/11
1/1/12
1/1/13
SNWA Periodic Water-Level Data
Cave Valley
Carbonate Aquifer
Reference Elevation: 6,012 ft amsl
Well Depth: 460 ft bgs


2012 HYDROGRAPH FOR WELL 383307114471001
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
258
259
260
261
262
263
264
265
266
267
268
5,905
5,904
5,903
5,902
5,901
5,900
5,899
5,898
5,897
5,896
5,895
1/1/12
2/1/12
3/1/12
4/1/12
5/1/12
6/1/12
7/1/12
8/1/12
9/1/12
10/1/12
11/1/12
12/1/12
1/1/13
SNWA Periodic Water-Level Data
Cave Valley
Basin-Fill Aquifer
Reference Elevation: 6,163 ft amsl


HISTORICAL HYDROGRAPH FOR WELL 383307114471001
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
258
259
260
261
262
263
264
265
266
267
268
5,905
5,904
5,903
5,902
5,901
5,900
5,899
5,898
5,897
5,896
5,895
10/1/08
11/1/08
1/1/09
3/1/09
5/1/09
7/1/09
9/1/09
11/1/09
1/1/10
3/1/10
5/1/10
7/1/10
9/1/10
11/1/10
1/1/11
3/1/11
5/1/11
7/1/11
9/1/11
11/1/11
1/1/12
3/1/12
5/1/12
7/1/12
9/1/12
11/1/12
1/1/13
SNWA Periodic Water-Level Data
Cave Valley
Basin-Fill Aquifer
Reference Elevation: 6,163 ft amsl


2012 HYDROGRAPH FOR WELL 182W906M
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
1,312
1,313
1,314
1,315
1,316
1,317
1,318
1,319
1,320
1,321
1,322
3,485
3,484
3,483
3,482
3,481
3,480
3,479
3,478
3,477
3,476
3,475
1/1/12
2/1/12
3/1/12
4/1/12
5/1/12
6/1/12
7/1/12
8/1/12
9/1/12
10/1/12
11/1/12
12/1/12
1/1/13
SNWA Periodic Water-Level Data
Delamar Valley
Volcanic Aquifer
Reference Elevation: 4,797 ft amsl
Well Depth: 1,703 ft bgs


HISTORICAL HYDROGRAPH FOR WELL 182W906M
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
1,312
1,313
1,314
1,315
1,316
1,317
1,318
1,319
1,320
1,321
1,322
3,485
3,484
3,483
3,482
3,481
3,480
3,479
3,478
3,477
3,476
3,475
9/1/06
1/1/07
5/1/07
9/1/07
1/1/08
5/1/08
9/1/08
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5/1/09
9/1/09
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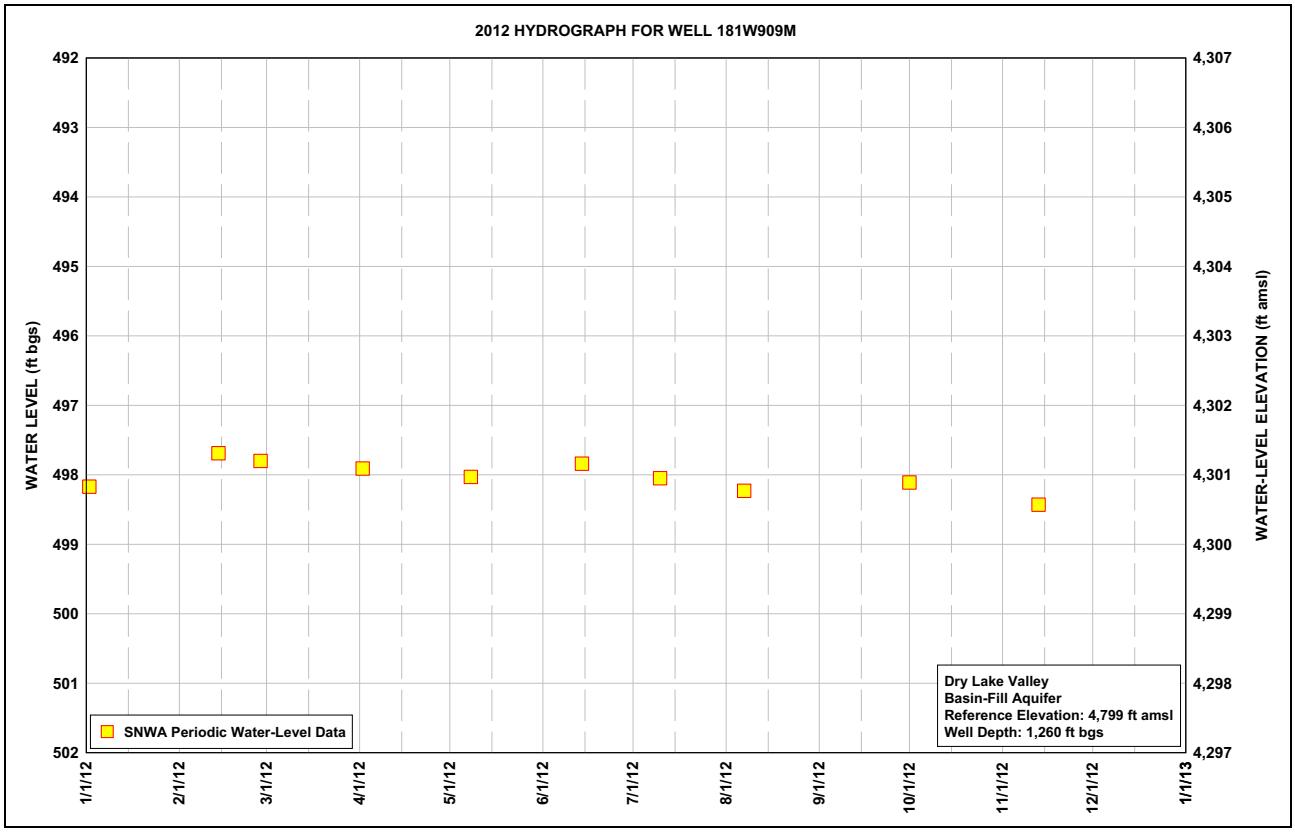
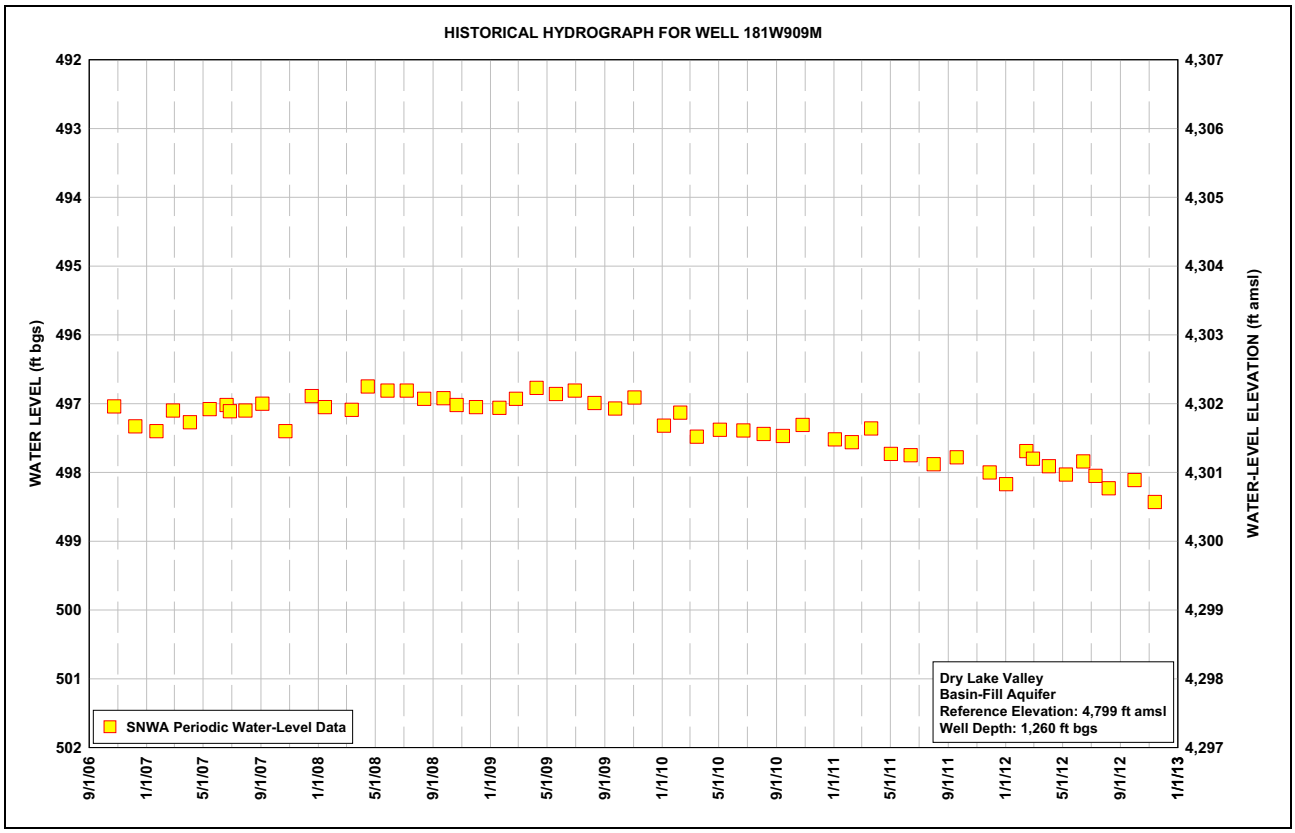
5/1/10
9/1/10
1/1/11
5/1/11
9/1/11
1/1/12
5/1/12
9/1/12
1/1/13
SNWA Periodic Water-Level Data
Delamar Valley
Volcanic Aquifer
Reference Elevation: 4,797 ft amsl
Well Depth: 1,703 ft bgs


2012 HYDROGRAPH FOR WELL 181W909M
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
492
493
494
495
496
497
498
499
500
501
502
4,307
4,306
4,305
4,304
4,303
4,302
4,301
4,300
4,299
4,298
4,297
1/1/12
2/1/12
3/1/12
4/1/12
5/1/12
6/1/12
7/1/12
8/1/12
9/1/12
10/1/12
11/1/12
12/1/12
1/1/13
SNWA Periodic Water-Level Data
Dry Lake Valley
Basin-Fill Aquifer
Reference Elevation: 4,799 ft amsl
Well Depth: 1,260 ft bgs


HISTORICAL HYDROGRAPH FOR WELL 181W909M
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
492
493
494
495
496
497
498
499
500
501
502
4,307
4,306
4,305
4,304
4,303
4,302
4,301
4,300
4,299
4,298
4,297
9/1/06
1/1/07
5/1/07
9/1/07
1/1/08
5/1/08
9/1/08
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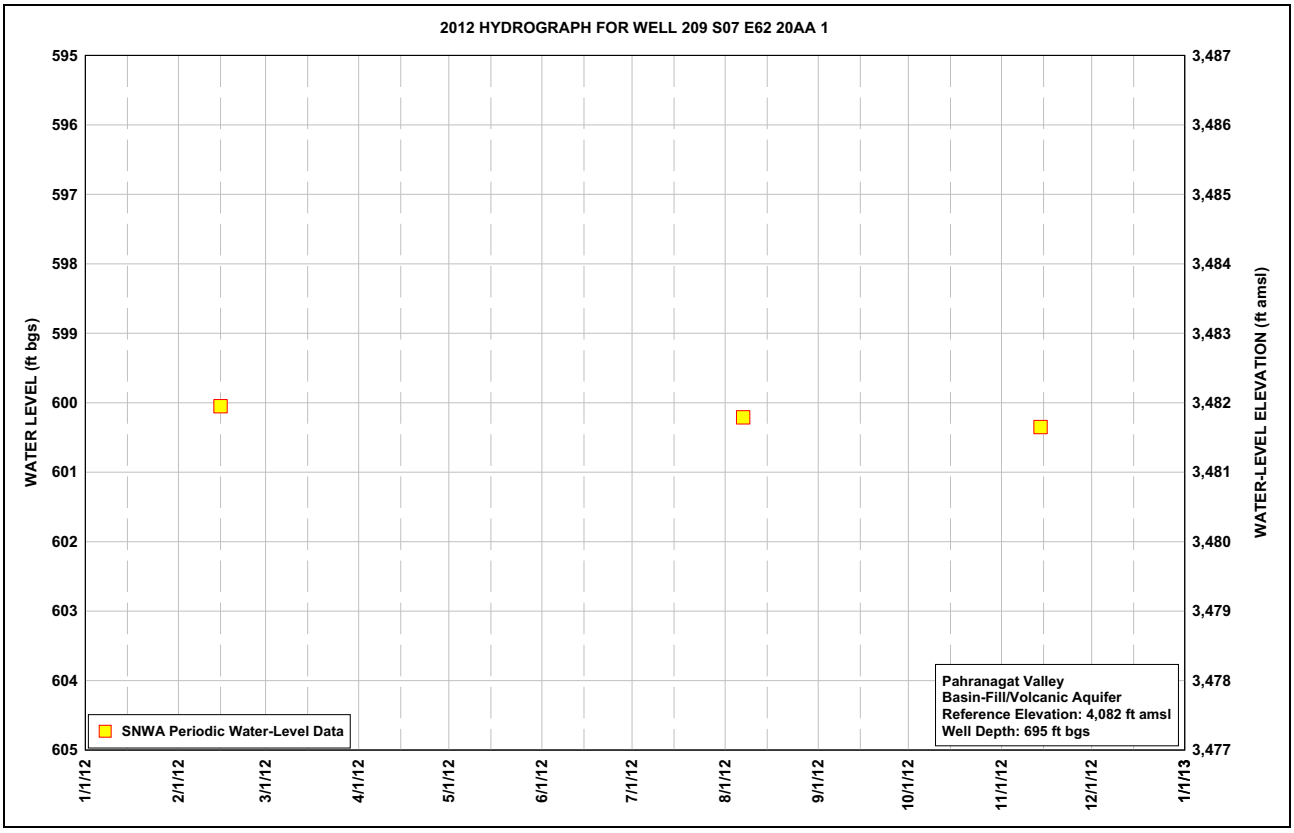
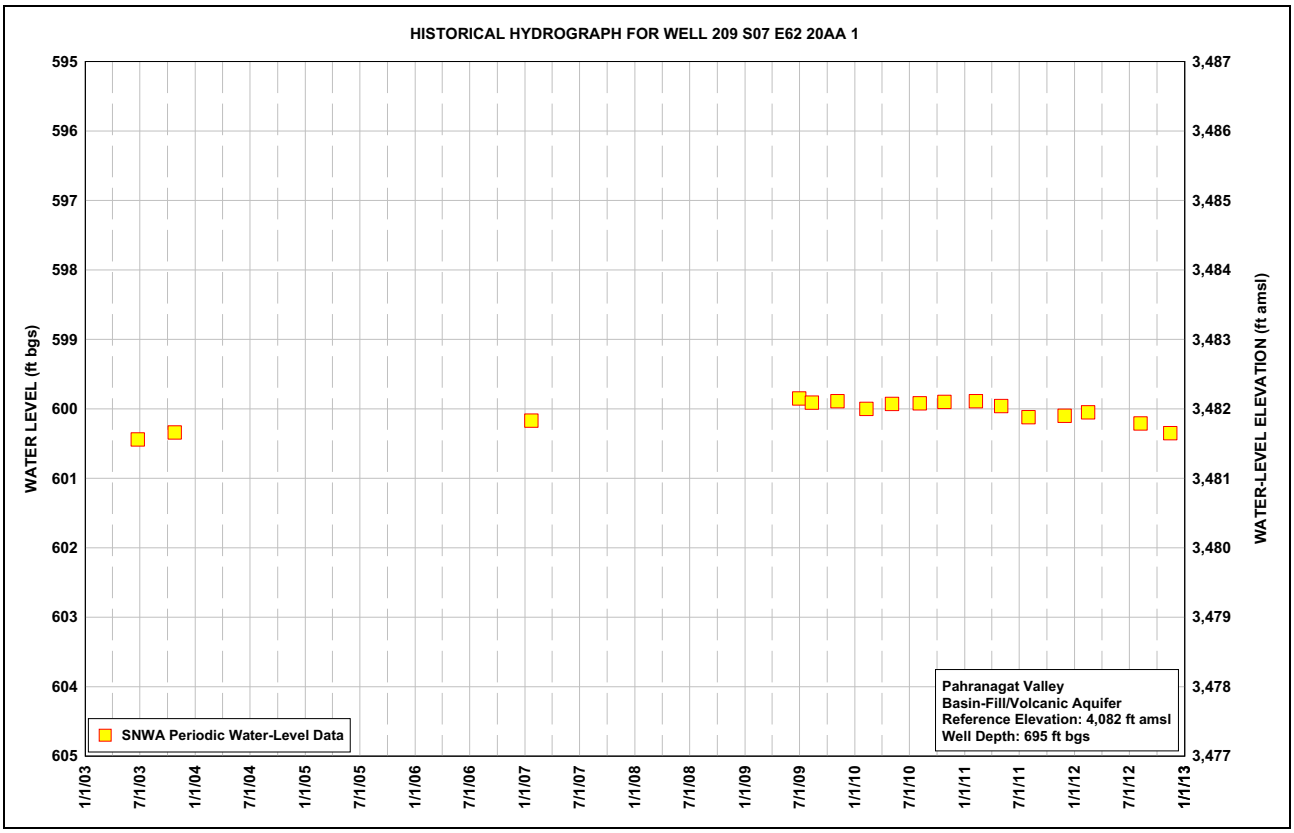
5/1/09
9/1/09
1/1/10
5/1/10
9/1/10
1/1/11
5/1/11
9/1/11
1/1/12
5/1/12
9/1/12
1/1/13
SNWA Periodic Water-Level Data
Dry Lake Valley
Basin-Fill Aquifer
Reference Elevation: 4,799 ft amsl
Well Depth: 1,260 ft bgs


2012 HYDROGRAPH FOR WELL 209 S07 E62 20AA 1
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
595
596
597
598
599
600
601
602
603
604
605
3,487
3,486
3,485
3,484
3,483
3,482
3,481
3,480
3,479
3,478
3,477
1/1/12
2/1/12
3/1/12
4/1/12
5/1/12
6/1/12
7/1/12
8/1/12
9/1/12
10/1/12
11/1/12
12/1/12
1/1/13
SNWA Periodic Water-Level Data
Pahranagat Valley
Basin-Fill/Volcanic Aquifer
Reference Elevation: 4,082 ft amsl
Well Depth: 695 ft bgs


HISTORICAL HYDROGRAPH FOR WELL 209 S07 E62 20AA 1
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
595
596
597
598
599
600
601
602
603
604
605
3,487
3,486
3,485
3,484
3,483
3,482
3,481
3,480
3,479
3,478
3,477
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7/1/07
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7/1/08
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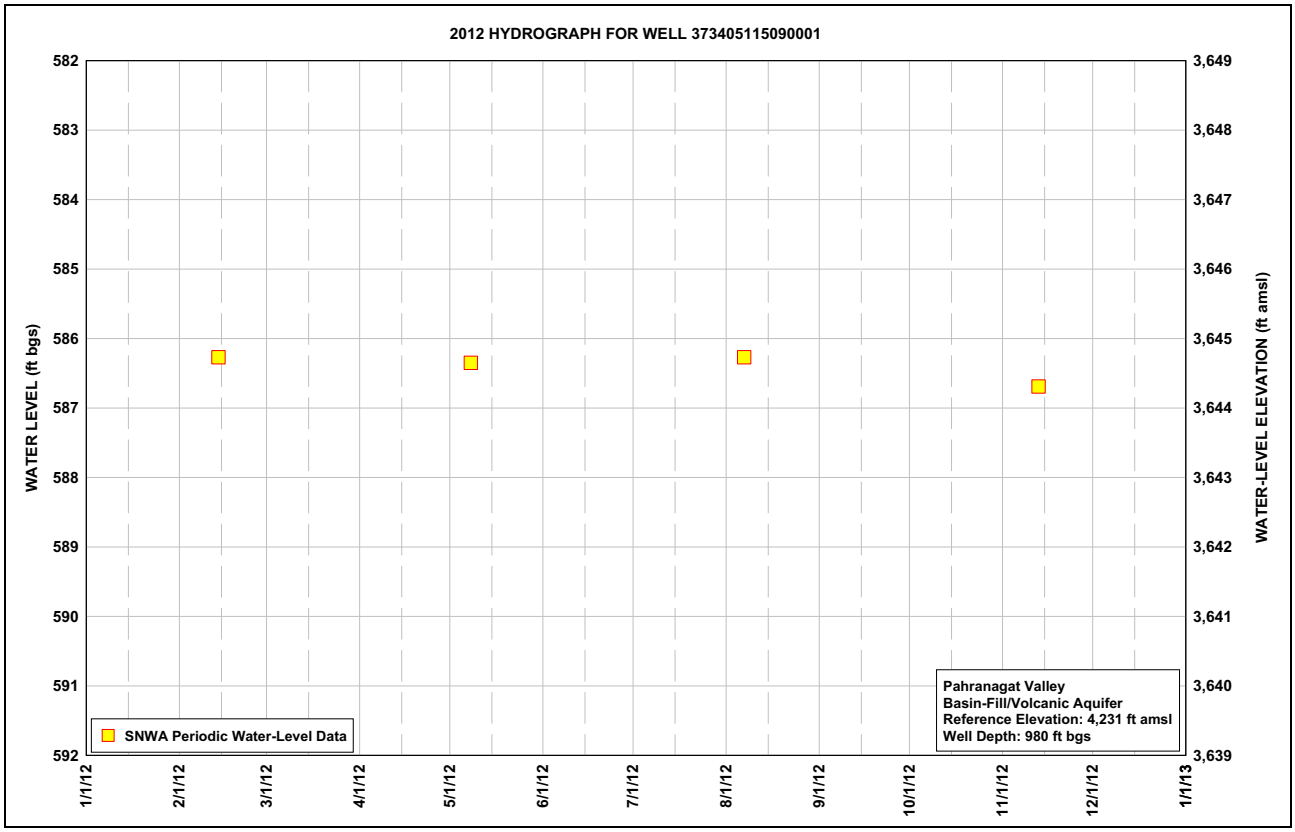
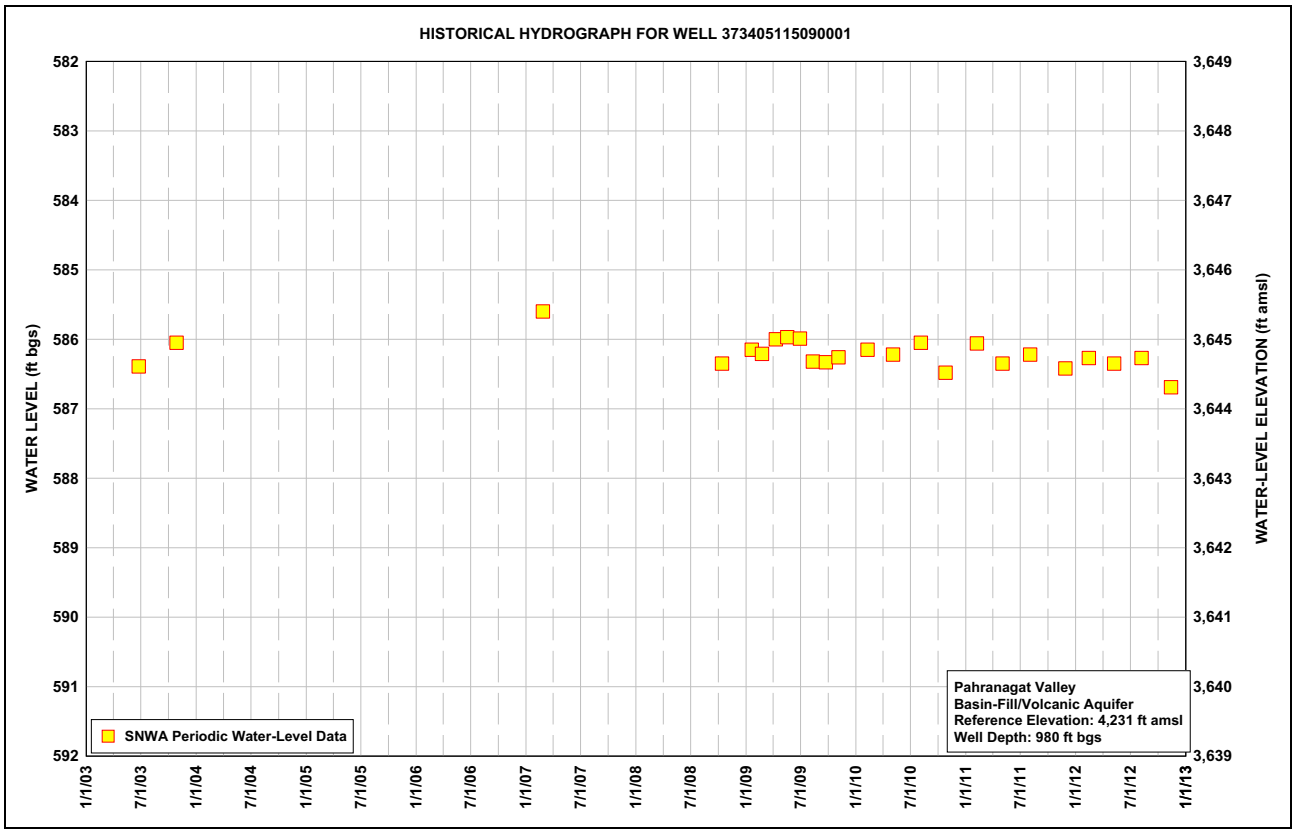
7/1/09
1/1/10
7/1/10
1/1/11
7/1/11
1/1/12
7/1/12
1/1/13
SNWA Periodic Water-Level Data
Pahranagat Valley
Basin-Fill/Volcanic Aquifer
Reference Elevation: 4,082 ft amsl
Well Depth: 695 ft bgs


2012 HYDROGRAPH FOR WELL 373405115090001
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
582
583
584
585
586
587
588
589
590
591
592
3,649
3,648
3,647
3,646
3,645
3,644
3,643
3,642
3,641
3,640
3,639
1/1/12
2/1/12
3/1/12
4/1/12
5/1/12
6/1/12
7/1/12
8/1/12
9/1/12
10/1/12
11/1/12
12/1/12
1/1/13
SNWA Periodic Water-Level Data
Pahranagat Valley
Basin-Fill/Volcanic Aquifer
Reference Elevation: 4,231 ft amsl
Well Depth: 980 ft bgs


HISTORICAL HYDROGRAPH FOR WELL 373405115090001
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
582
583
584
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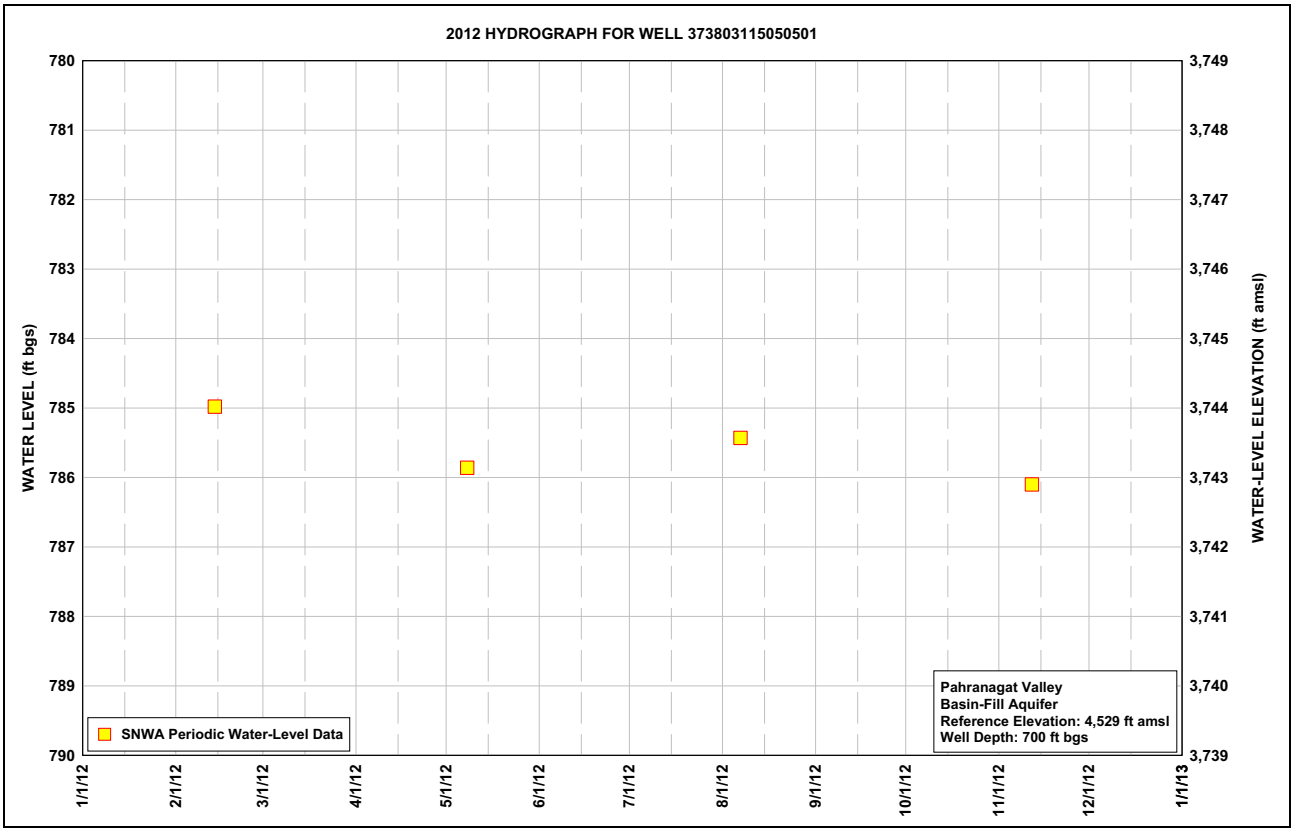
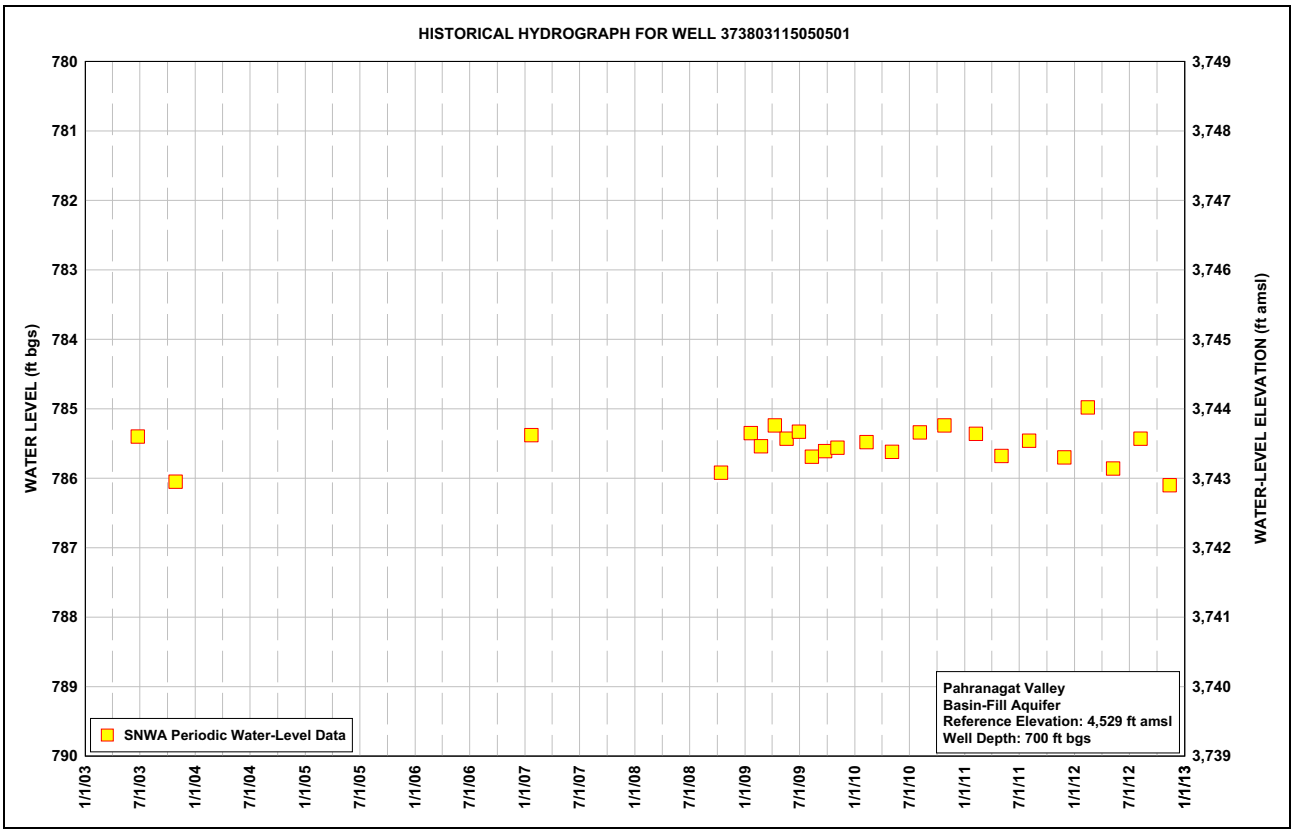
587
588
589
590
591
592
3,649
3,648
3,647
3,646
3,645
3,644
3,643
3,642
3,641
3,640
3,639
1/1/03
7/1/03
1/1/04
7/1/04
1/1/05
7/1/05
1/1/06
7/1/06
1/1/07
7/1/07
1/1/08
7/1/08
1/1/09
7/1/09
1/1/10
7/1/10
1/1/11
7/1/11
1/1/12
7/1/12
1/1/13
SNWA Periodic Water-Level Data
Pahranagat Valley
Basin-Fill/Volcanic Aquifer
Reference Elevation: 4,231 ft amsl
Well Depth: 980 ft bgs


2012 HYDROGRAPH FOR WELL 373803115050501
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
780
781
782
783
784
785
786
787
788
789
790
3,749
3,748
3,747
3,746
3,745
3,744
3,743
3,742
3,741
3,740
3,739
1/1/12
2/1/12
3/1/12
4/1/12
5/1/12
6/1/12
7/1/12
8/1/12
9/1/12
10/1/12
11/1/12
12/1/12
1/1/13
SNWA Periodic Water-Level Data
Pahranagat Valley
Basin-Fill Aquifer
Reference Elevation: 4,529 ft amsl
Well Depth: 700 ft bgs


HISTORICAL HYDROGRAPH FOR WELL 373803115050501
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
780
781
782
783
784
785
786
787
788
789
790
3,749
3,748
3,747
3,746
3,745
3,744
3,743
3,742
3,741
3,740
3,739
1/1/03
7/1/03
1/1/04
7/1/04
1/1/05
7/1/05
1/1/06
7/1/06
1/1/07
7/1/07
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7/1/08
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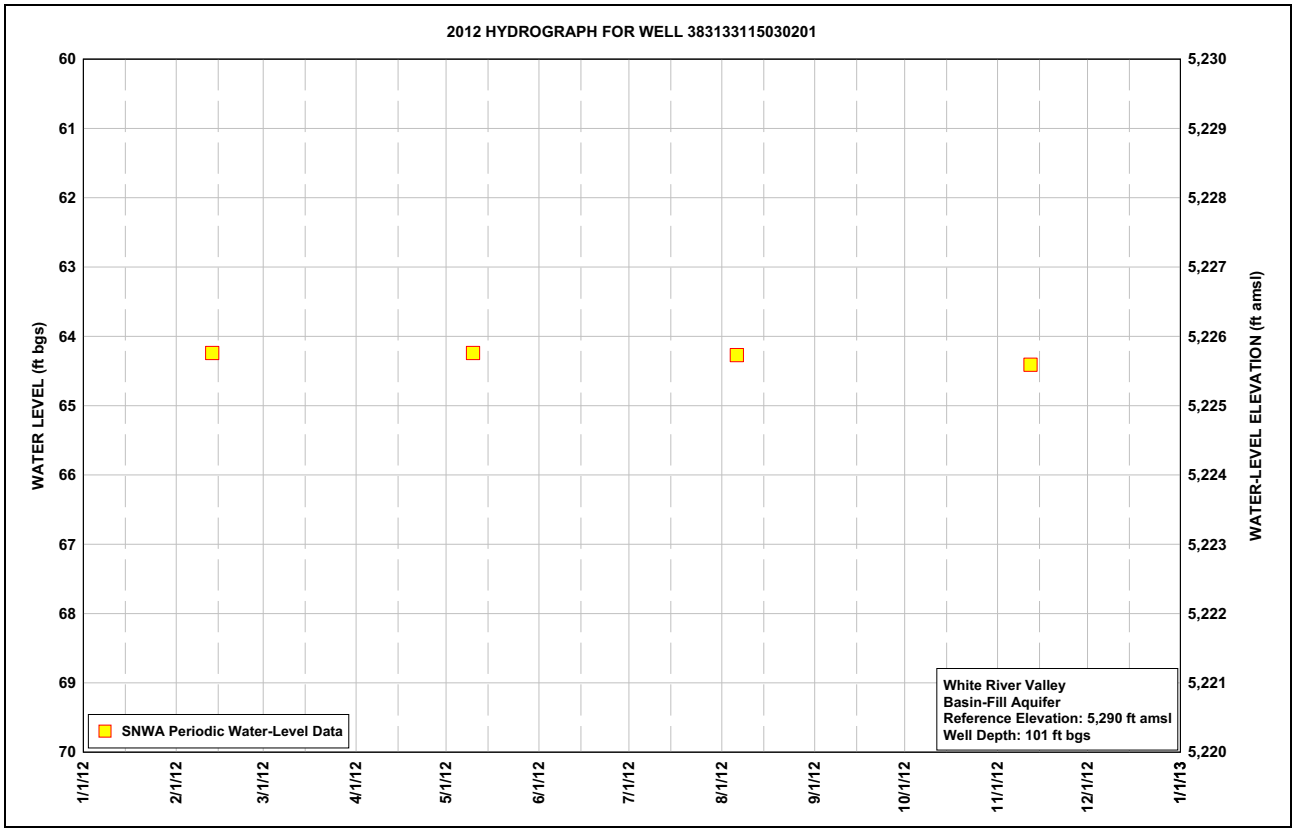
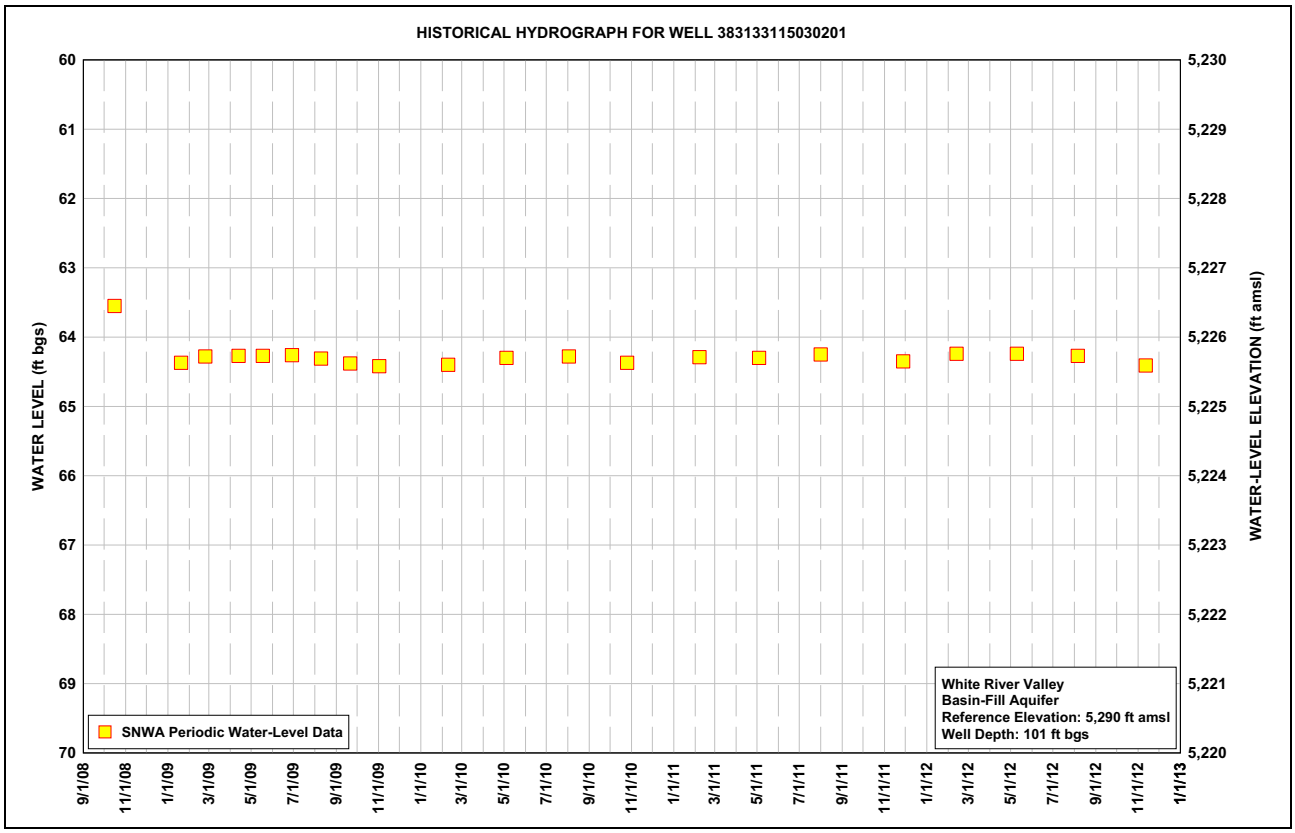
1/1/10
7/1/10
1/1/11
7/1/11
1/1/12
7/1/12
1/1/13
SNWA Periodic Water-Level Data
Pahranagat Valley
Basin-Fill Aquifer
Reference Elevation: 4,529 ft amsl
Well Depth: 700 ft bgs


2012 HYDROGRAPH FOR WELL 383133115030201
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
60
61
62
63
64
65
66
67
68
69
70
5,230
5,229
5,228
5,227
5,226
5,225
5,224
5,223
5,222
5,221
5,220
1/1/12
2/1/12
3/1/12
4/1/12
5/1/12
6/1/12
7/1/12
8/1/12
9/1/12
10/1/12
11/1/12
12/1/12
1/1/13
SNWA Periodic Water-Level Data
White River Valley
Basin-Fill Aquifer
Reference Elevation: 5,290 ft amsl
Well Depth: 101 ft bgs


HISTORICAL HYDROGRAPH FOR WELL 383133115030201
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
60
61
62
63
64
65
66
67
68
69
70
5,230
5,229
5,228
5,227
5,226
5,225
5,224
5,223
5,222
5,221
5,220
9/1/08
11/1/08
1/1/09
3/1/09
5/1/09
7/1/09
9/1/09
11/1/09
1/1/10
3/1/10
5/1/10
7/1/10
9/1/10
11/1/10
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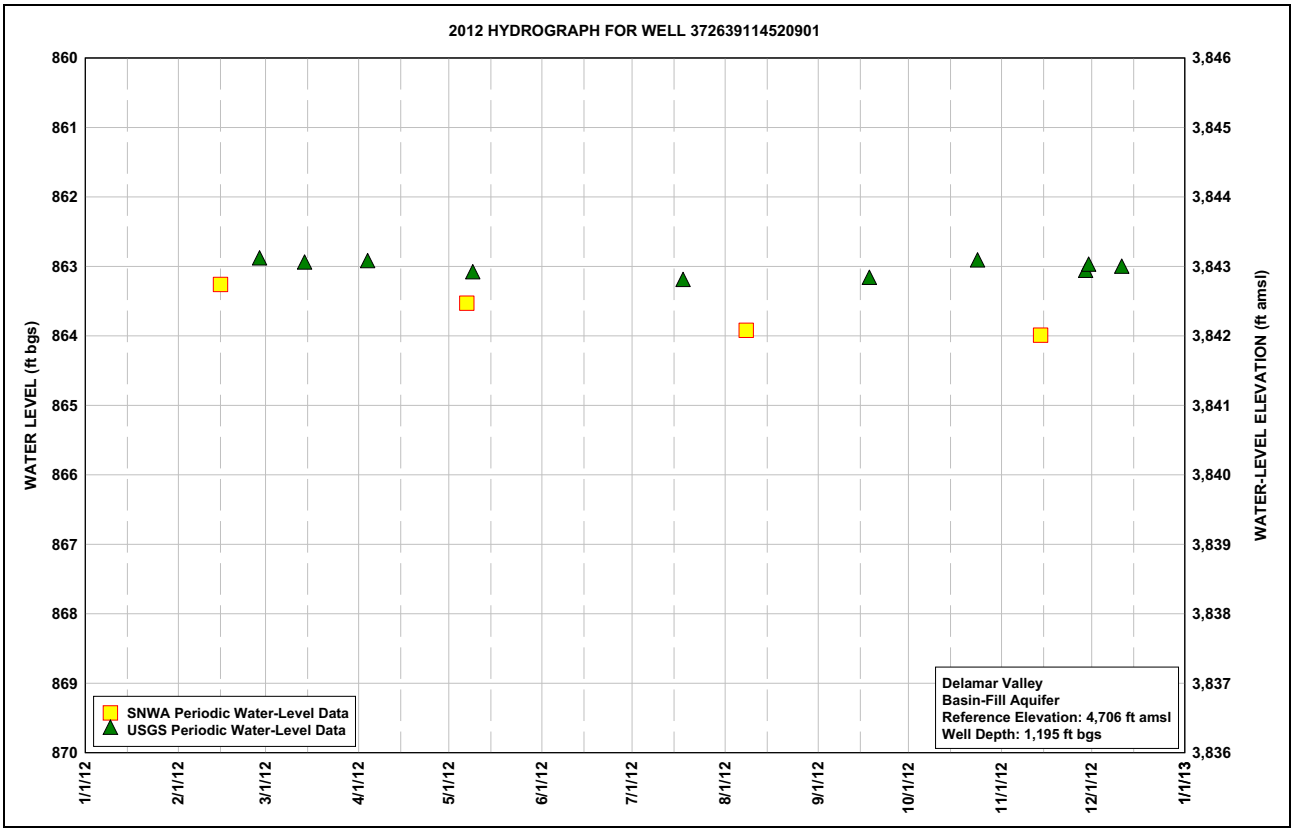
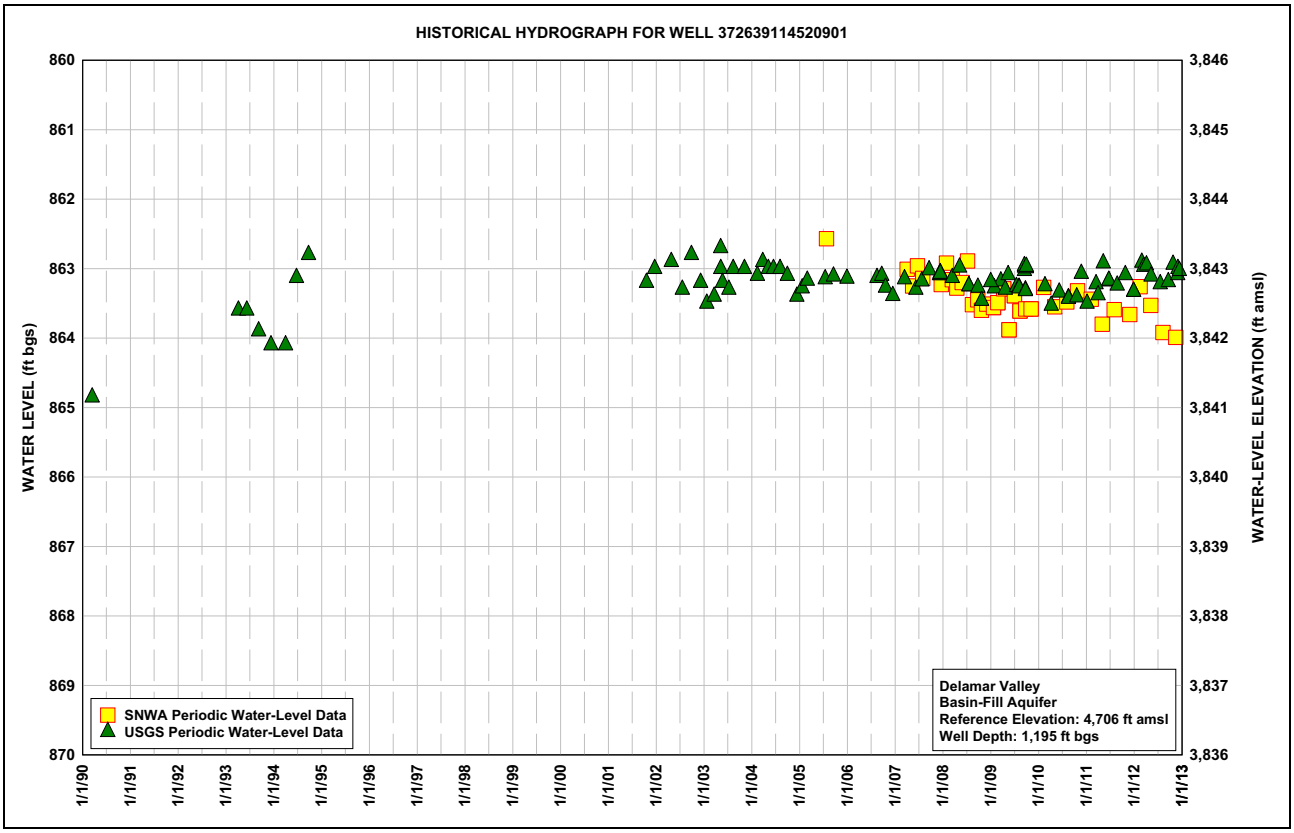
3/1/11
5/1/11
7/1/11
9/1/11
11/1/11
1/1/12
3/1/12
5/1/12
7/1/12
9/1/12
11/1/12
1/1/13
SNWA Periodic Water-Level Data
White River Valley
Basin-Fill Aquifer
Reference Elevation: 5,290 ft amsl
Well Depth: 101 ft bgs


2012 HYDROGRAPH FOR WELL 372639114520901
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
860
861
862
863
864
865
866
867
868
869
870
3,846
3,845
3,844
3,843
3,842
3,841
3,840
3,839
3,838
3,837
3,836
1/1/12
2/1/12
3/1/12
4/1/12
5/1/12
6/1/12
7/1/12
8/1/12
9/1/12
10/1/12
11/1/12
12/1/12
1/1/13
SNWA Periodic Water-Level Data
USGS Periodic Water-Level Data
Delamar Valley
Basin-Fill Aquifer
Reference Elevation: 4,706 ft amsl
Well Depth: 1,195 ft bgs


HISTORICAL HYDROGRAPH FOR WELL 372639114520901
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
860
861
862
863
864
865
866
867
868
869
870
3,846
3,845
3,844
3,843
3,842
3,841
3,840
3,839
3,838
3,837
3,836
1/1/90
1/1/91
1/1/92
1/1/93
1/1/94
1/1/95
1/1/96
1/1/97
1/1/98
1/1/99
1/1/00
1/1/01
1/1/02
1/1/03
1/1/04
1/1/05
1/1/06
1/1/07
1/1/08
1/1/09
1/1/10
1/1/11
1/1/12
1/1/13
SNWA Periodic Water-Level Data
USGS Periodic Water-Level Data
Delamar Valley
Basin-Fill Aquifer
Reference Elevation: 4,706 ft amsl
Well Depth: 1,195 ft bgs

Appendix B

Continuous Water-Level Measurement Data from the DDC Existing-Well Monitoring Network

B.1.0 MONITORING PROGRAM WELLS WITH CONTINUOUS TRANSDUCER DATA

Continuous data collection was performed in 2012 for the following monitor wells:

- Cave Valley Well 180W902M
- Cave Valley Well 180W501M
- Delamar Valley Well 182M-1
- Dry Lake Valley Well 181M-1
- Dry Lake Valley Well 380531114534201
- Pahranagat Valley Well 209M-1

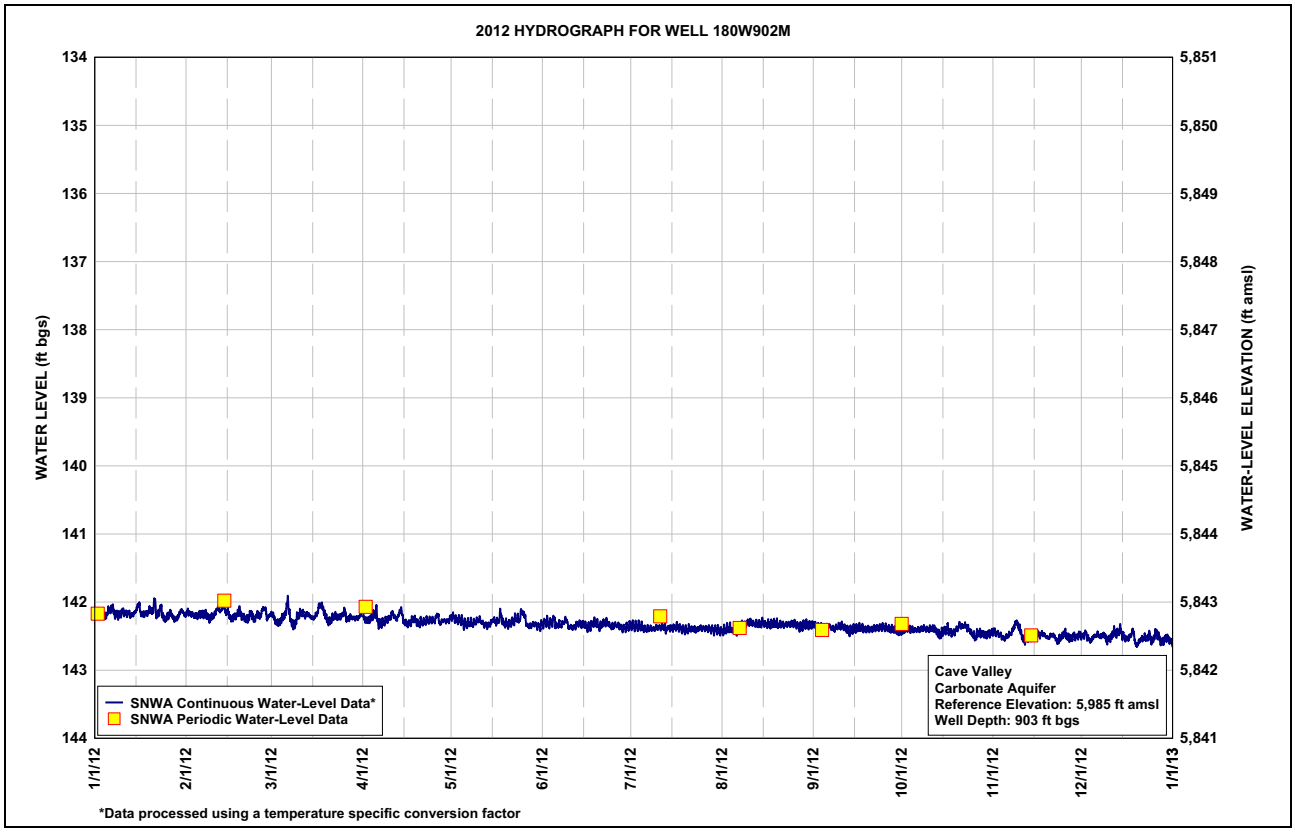
For these sites, two hydrographs are presented that include data collected in 2012 and during the historical period of record. Continuous data have been corrected for temperature and transducer cable stretch. Additional data processing, including barometric pressure, may be applied in the future.

Table B-1
Cave Valley Well 180W902M, Calendar Year 2012
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	142.21	142.16	142.20	142.23	142.22	142.31	142.35	142.42	142.34	142.42	142.44	142.50
2	142.19	142.17	142.29	142.26	142.25	142.30	142.36	142.41	142.36	142.39	142.46	142.47
3	142.19	142.19	142.30	142.25	142.26	142.31	142.36	142.39	142.37	142.40	142.49	142.54
4	142.21	142.20	142.25	142.19	142.27	142.28	142.37	142.42	142.37	142.40	142.53	142.56
5	142.14	142.18	142.18	142.17	142.32	142.31	142.39	142.43	142.37	142.41	142.51	142.50
6	142.10	142.18	142.04	142.31	142.32	142.33	142.40	142.45	142.36	142.40	142.49	142.49
7	142.15	142.18	142.24	142.31	142.31	142.33	142.40	142.37	142.39	142.40	142.44	142.51
8	142.18	142.22	142.33	142.28	142.31	142.29	142.40	142.32	142.38	142.39	142.33	142.49
9	142.18	142.23	142.26	142.25	142.29	142.31	142.38	142.31	142.36	142.40	142.34	142.55
10	142.14	142.19	142.18	142.21	142.27	142.37	142.37	142.31	142.35	142.40	142.45	142.54
11	142.17	142.11	142.16	142.20	142.30	142.37	142.37	142.32	142.37	142.39	142.56	142.49
12	142.17	142.12	142.20	142.24	142.33	142.34	142.39	142.32	142.40	142.41	142.53	142.44
13	142.19	142.09	142.19	142.16	142.34	142.31	142.39	142.32	142.43	142.46	142.51	142.44
14	142.16	142.15	142.22	142.20	142.31	142.32	142.38	142.31	142.40	142.46	142.50	142.43
15	142.08	142.17	142.22	142.31	142.27	142.33	142.38	142.32	142.39	142.41	142.50	142.50
16	142.13	142.25	142.16	142.31	142.28	142.37	142.36	142.33	142.38	142.39	142.47	142.54
17	142.19	142.21	142.05	142.28	142.21	142.34	142.38	142.34	142.38	142.44	142.47	142.51
18	142.17	142.17	142.10	142.26	142.28	142.30	142.40	142.32	142.40	142.45	142.49	142.44
19	142.13	142.16	142.21	142.30	142.32	142.33	142.41	142.33	142.39	142.42	142.52	142.61
20	142.13	142.22	142.28	142.31	142.33	142.36	142.40	142.33	142.40	142.36	142.50	142.60
21	142.05	142.25	142.24	142.29	142.30	142.33	142.40	142.33	142.39	142.36	142.49	142.54
22	142.18	142.21	142.21	142.28	142.26	142.31	142.40	142.34	142.39	142.35	142.55	142.52
23	142.11	142.20	142.22	142.27	142.25	142.32	142.41	142.33	142.38	142.39	142.55	142.52
24	142.23	142.23	142.21	142.27	142.21	142.36	142.38	142.32	142.38	142.45	142.50	142.52
25	142.23	142.19	142.15	142.26	142.17	142.35	142.39	142.32	142.38	142.50	142.47	142.54
26	142.17	142.17	142.23	142.22	142.29	142.34	142.39	142.34	142.39	142.49	142.52	142.46
27	142.22	142.10	142.23	142.30	142.35	142.37	142.39	142.36	142.40	142.46	142.53	142.54
28	142.26	142.21	142.23	142.28	142.33	142.39	142.40	142.35	142.40	142.46	142.50	142.58
29	142.20	142.19	142.24	142.28	142.33	142.37	142.41	142.33	142.42	142.48	142.50	142.54
30	142.14	---	142.23	142.25	142.35	142.35	142.41	142.34	142.44	142.47	142.48	142.53
31	142.18	---	142.16	---	142.34	---	142.42	142.34	---	142.45	---	142.58
Max	142.26	142.25	142.33	142.31	142.35	142.39	142.42	142.45	142.44	142.50	142.56	142.61
Min	142.05	142.09	142.04	142.16	142.17	142.28	142.35	142.31	142.34	142.35	142.33	142.43

Year 2012 Statistics: **Year Max 142.61; Year Min 142.04**

Note: Water level in ft bgs


2012 HYDROGRAPH FOR WELL 180W902M
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
134
135
136
137
138
139
140
141
142
143
144
5,851
5,850
5,849
5,848
5,847
5,846
5,845
5,844
5,843
5,842
5,841
1/1/12
2/1/12
3/1/12
4/1/12
5/1/12
6/1/12
7/1/12
8/1/12
9/1/12
10/1/12
11/1/12
12/1/12
1/1/13
SNWA Continuous Water-Level Data*
SNWA Periodic Water-Level Data
Cave Valley
Carbonate Aquifer
Reference Elevation: 5,985 ft amsl
Well Depth: 903 ft bgs
*Data processed using a temperature specific conversion factor

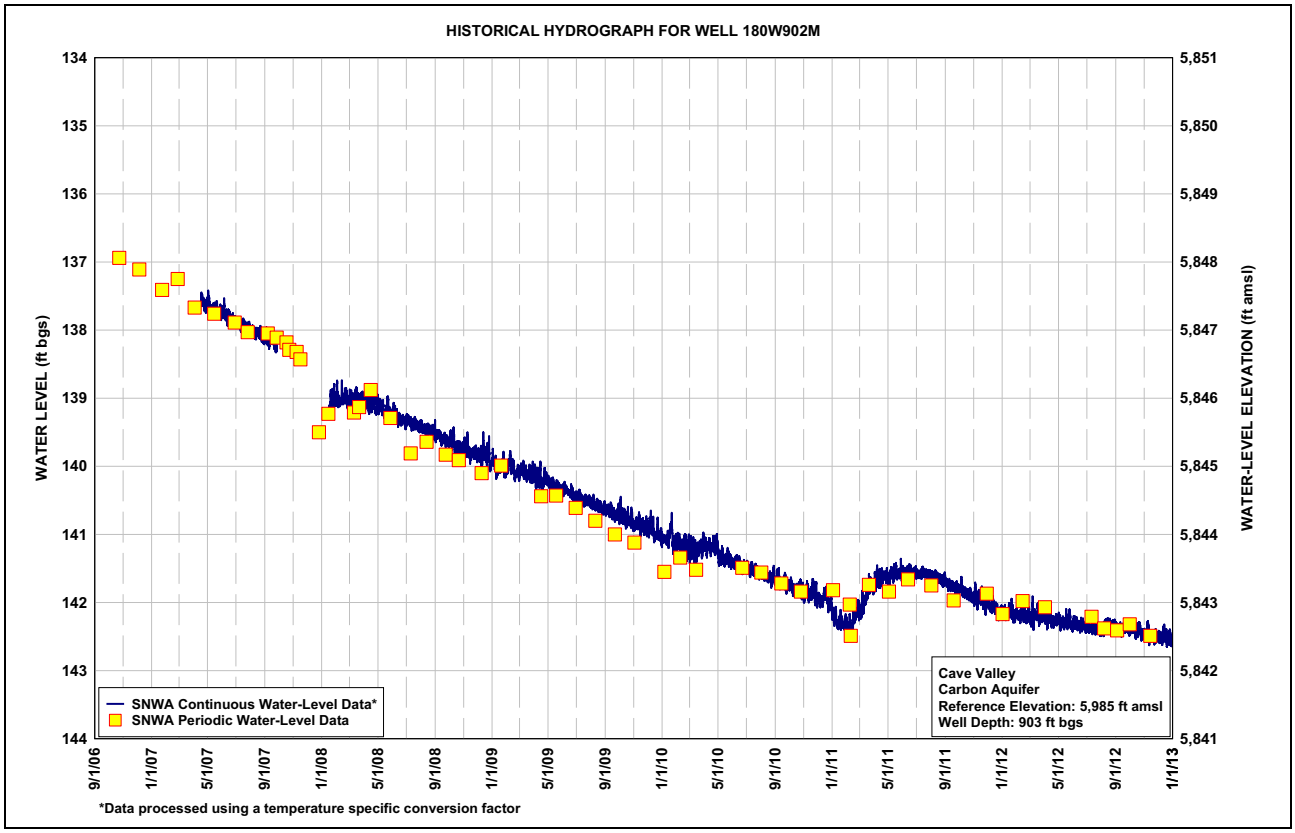
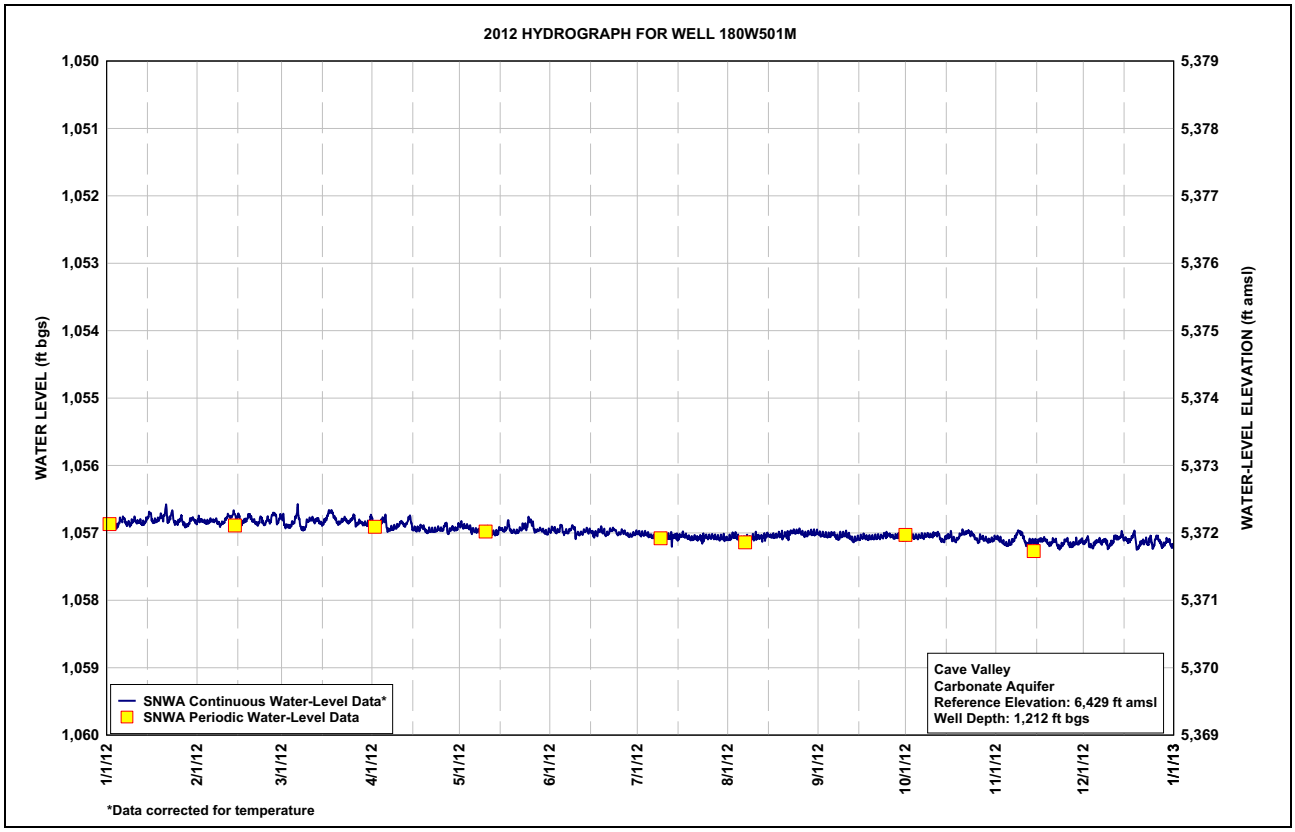

HISTORICAL HYDROGRAPH FOR WELL 180W902M
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
134
135
136
137
138
139
140
141
142
143
144
5,851
5,850
5,849
5,848
5,847
5,846
5,845
5,844
5,843
5,842
5,841
9/1/06
1/1/07
5/1/07
9/1/07
1/1/08
5/1/08
9/1/08
1/1/09
5/1/09
9/1/09
1/1/10
5/1/10
9/1/10
1/1/11
5/1/11
9/1/11
1/1/12
5/1/12
9/1/12
1/1/13
SNWA Continuous Water-Level Data*
SNWA Periodic Water-Level Data
Cave Valley
Carbon Aquifer
Reference Elevation: 5,985 ft amsl
Well Depth: 903 ft bgs
*Data processed using a temperature specific conversion factor

Table B-2
Cave Valley Well 180W501M, Calendar Year 2012
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1,056.91	1,056.81	1,056.79	1,056.87	1,056.88	1,056.96	1,057.00	1,057.08	1,057.02	1,057.08	1,057.08	1,057.14
2	1,056.88	1,056.81	1,056.90	1,056.90	1,056.91	1,056.95	1,057.02	1,057.06	1,057.03	1,057.04	1,057.11	1,057.10
3	1,056.89	1,056.83	1,056.90	1,056.87	1,056.91	1,056.98	1,057.01	1,057.05	1,057.04	1,057.06	1,057.14	1,057.19
4	1,056.91	1,056.84	1,056.87	1,056.82	1,056.92	1,056.93	1,057.03	1,057.08	1,057.04	1,057.06	1,057.17	1,057.19
5	1,056.83	1,056.82	1,056.81	1,056.81	1,056.98	1,056.97	1,057.04	1,057.09	1,057.03	1,057.06	1,057.16	1,057.13
6	1,056.80	1,056.82	1,056.70	1,056.95	1,056.97	1,056.98	1,057.06	1,057.10	1,057.03	1,057.05	1,057.13	1,057.12
7	1,056.84	1,056.82	1,056.89	1,056.94	1,056.97	1,056.98	1,057.06	1,057.08	1,057.07	1,057.05	1,057.08	1,057.14
8	1,056.86	1,056.87	1,056.94	1,056.93	1,056.97	1,056.92	1,057.07	1,057.09	1,057.05	1,057.03	1,056.99	1,057.12
9	1,056.85	1,056.86	1,056.87	1,056.91	1,056.95	1,056.97	1,057.06	1,057.07	1,057.03	1,057.04	1,057.00	1,057.19
10	1,056.81	1,056.82	1,056.81	1,056.87	1,056.93	1,057.01	1,057.05	1,057.06	1,057.02	1,057.04	1,057.07	1,057.16
11	1,056.84	1,056.76	1,056.80	1,056.86	1,056.98	1,057.01	1,057.06	1,057.07	1,057.04	1,057.02	1,057.16	1,057.10
12	1,056.84	1,056.76	1,056.83	1,056.88	1,057.00	1,056.99	1,057.08	1,057.07	1,057.08	1,057.04	1,057.14	1,057.07
13	1,056.86	1,056.71	1,056.81	1,056.80	1,057.01	1,056.96	1,057.06	1,057.06	1,057.10	1,057.11	1,057.13	1,057.07
14	1,056.82	1,056.76	1,056.86	1,056.85	1,056.97	1,056.98	1,057.06	1,057.04	1,057.08	1,057.10	1,057.13	1,057.05
15	1,056.74	1,056.77	1,056.84	1,056.94	1,056.95	1,057.00	1,057.05	1,057.05	1,057.08	1,057.05	1,057.13	1,057.09
16	1,056.79	1,056.85	1,056.77	1,056.94	1,056.96	1,057.03	1,057.03	1,057.05	1,057.06	1,057.04	1,057.10	1,057.12
17	1,056.83	1,056.81	1,056.69	1,056.93	1,056.88	1,057.00	1,057.05	1,057.05	1,057.07	1,057.10	1,057.10	1,057.08
18	1,056.81	1,056.76	1,056.72	1,056.92	1,056.96	1,056.95	1,057.07	1,057.03	1,057.08	1,057.10	1,057.13	1,057.03
19	1,056.76	1,056.77	1,056.79	1,056.97	1,056.98	1,056.99	1,057.08	1,057.04	1,057.08	1,057.05	1,057.17	1,057.21
20	1,056.77	1,056.82	1,056.85	1,056.97	1,056.99	1,057.02	1,057.08	1,057.04	1,057.07	1,057.00	1,057.13	1,057.17
21	1,056.69	1,056.86	1,056.83	1,056.96	1,056.96	1,056.98	1,057.08	1,057.03	1,057.06	1,057.01	1,057.13	1,057.14
22	1,056.80	1,056.81	1,056.80	1,056.96	1,056.92	1,056.96	1,057.07	1,057.00	1,057.06	1,056.98	1,057.21	1,057.12
23	1,056.73	1,056.83	1,056.83	1,056.95	1,056.91	1,056.97	1,057.08	1,056.98	1,057.04	1,057.01	1,057.19	1,057.13
24	1,056.85	1,056.85	1,056.82	1,056.95	1,056.85	1,057.02	1,057.05	1,056.99	1,057.04	1,057.05	1,057.13	1,057.15
25	1,056.84	1,056.81	1,056.77	1,056.93	1,056.84	1,056.99	1,057.07	1,056.98	1,057.04	1,057.11	1,057.12	1,057.14
26	1,056.79	1,056.79	1,056.86	1,056.90	1,056.92	1,056.99	1,057.06	1,057.00	1,057.05	1,057.09	1,057.18	1,057.08
27	1,056.87	1,056.72	1,056.84	1,056.98	1,056.97	1,057.02	1,057.07	1,057.03	1,057.06	1,057.08	1,057.17	1,057.15
28	1,056.89	1,056.82	1,056.85	1,056.93	1,056.95	1,057.04	1,057.07	1,057.02	1,057.05	1,057.10	1,057.14	1,057.18
29	1,056.84	1,056.77	1,056.87	1,056.95	1,056.96	1,057.03	1,057.08	1,057.00	1,057.08	1,057.12	1,057.15	1,057.13
30	1,056.79	---	1,056.86	1,056.91	1,056.99	1,057.01	1,057.08	1,057.00	1,057.09	1,057.11	1,057.12	1,057.13
31	1,056.84	---	1,056.79	---	1,056.99	---	1,057.09	1,057.00	---	1,057.09	---	1,057.20
Max	1,056.91	1,056.87	1,056.94	1,056.98	1,057.01	1,057.04	1,057.09	1,057.10	1,057.10	1,057.12	1,057.21	1,057.21
Min	1,056.69	1,056.71	1,056.69	1,056.80	1,056.84	1,056.92	1,057.00	1,056.98	1,057.02	1,056.98	1,056.99	1,057.03

Year 2012 Statistics: **Year Max 1,057.21; Year Min 1,056.69**

Note: Water level in ft bgs


2012 HYDROGRAPH FOR WELL 180W501M
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
1,050
1,051
1,052
1,053
1,054
1,055
1,056
1,057
1,058
1,059
1,060
5,379
5,378
5,377
5,376
5,375
5,374
5,373
5,372
5,371
5,370
5,369
1/1/12
2/1/12
3/1/12
4/1/12
5/1/12
6/1/12
7/1/12
8/1/12
9/1/12
10/1/12
11/1/12
12/1/12
1/1/13
SNWA Continuous Water-Level Data*
SNWA Periodic Water-Level Data
Cave Valley
Carbonate Aquifer
Reference Elevation: 6,429 ft amsl
Well Depth: 1,212 ft bgs
*Data corrected for temperature

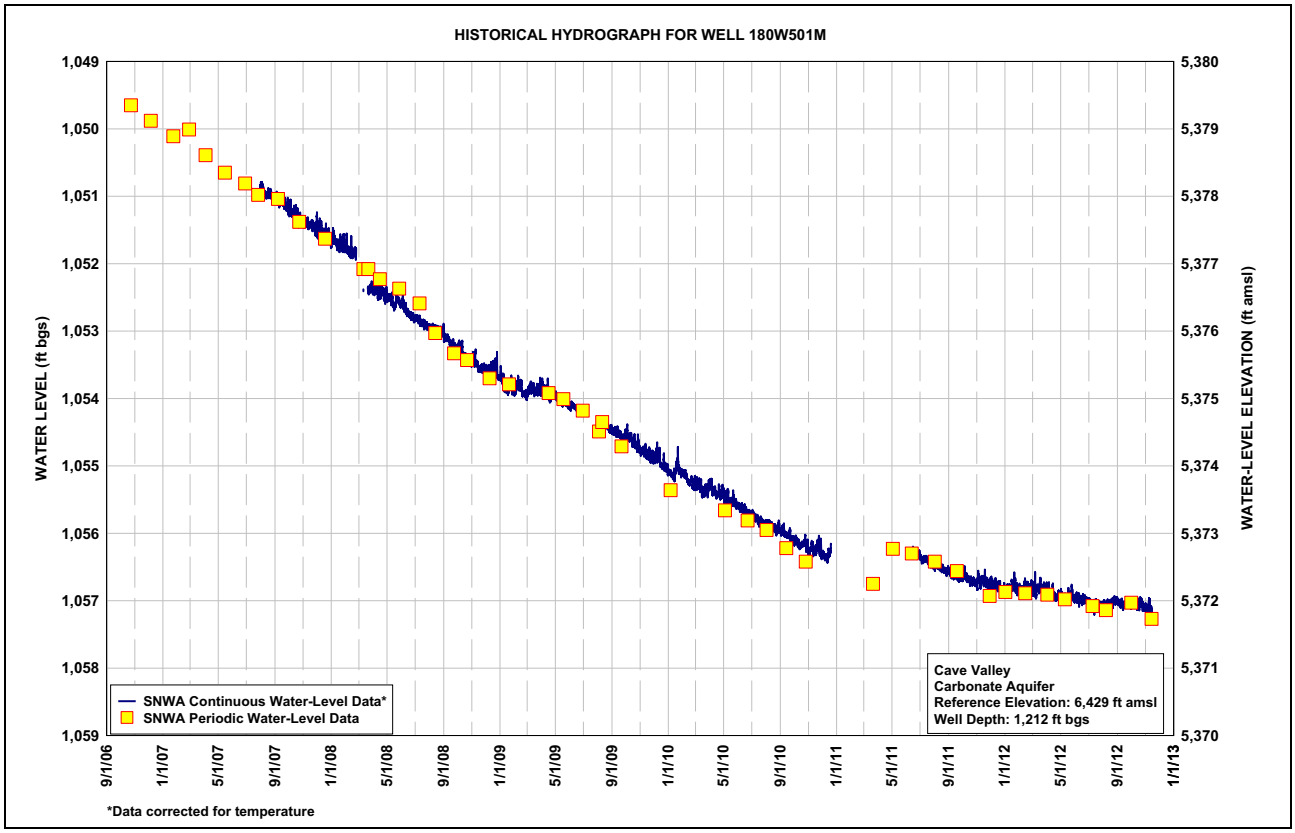

HISTORICAL HYDROGRAPH FOR WELL 180W501M
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
1,049
1,050
1,051
1,052
1,053
1,054
1,055
1,056
1,057
1,058
1,059
5,380
5,379
5,378
5,377
5,376
5,375
5,374
5,373
5,372
5,371
5,370
9/1/06
1/1/07
5/1/07
9/1/07
1/1/08
5/1/08
9/1/08
1/1/09
5/1/09
9/1/09
1/1/10
5/1/10
9/1/10
1/1/11
5/1/11
9/1/11
1/1/12
5/1/12
9/1/12
1/1/13
SNWA Continuous Water-Level Data*
SNWA Periodic Water-Level Data
Cave Valley
Carbonate Aquifer
Reference Elevation: 6,429 ft amsl
Well Depth: 1,212 ft bgs
*Data corrected for temperature

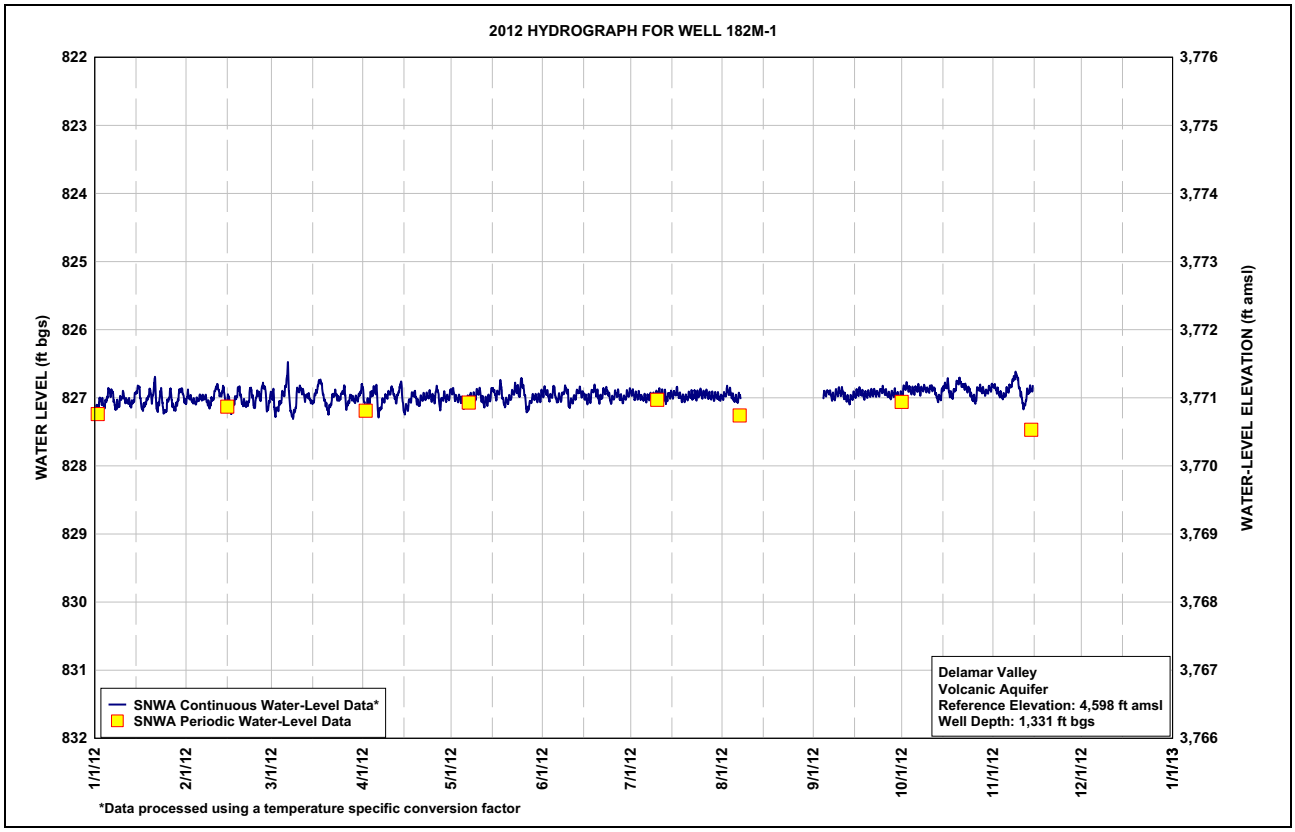
Table B-3
Delamar Valley Well 182M-1, Calendar Year 2012
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	827.16	826.98	826.97	827.03	826.90	826.92	826.93	826.98	---[b]	826.92	826.84	---[b]
2	827.07	827.00	827.20	827.09	827.00	826.93	826.97	826.92	---[b]	826.83	826.90	---[b]
3	827.06	827.05	827.12	827.00	827.01	826.99	826.97	826.91	---[b]	826.87	826.96	---[b]
4	827.09	827.05	826.99	826.91	827.02	826.92	826.99	826.98	826.97	826.90	826.98	---[b]
5	826.94	827.01	826.90	826.91	827.07	826.97	827.00	827.01	826.93	826.89	826.92	---[b]
6	826.92	827.00	826.69	827.20	827.04	827.01	827.01	827.01	826.93	826.86	826.86	---[b]
7	827.04	827.00	827.16	827.09	827.00	826.99	826.99	---[a]	826.99	826.90	826.79	---[b]
8	827.11	827.08	827.24	827.01	826.99	826.89	826.98	---[b]	826.96	826.86	826.67	---[b]
9	827.06	827.06	827.02	826.96	826.96	826.95	826.96	---[b]	826.92	826.88	826.75	---[b]
10	826.97	826.96	826.87	826.90	826.91	827.08	826.94	---[b]	826.91	826.88	826.95	---[b]
11	827.04	826.84	826.90	826.94	827.02	827.03	826.96	---[b]	826.96	826.85	827.11	---[b]
12	827.05	826.94	826.99	827.02	827.07	826.95	826.98	---[b]	827.02	826.93	826.97	---[b]
13	827.10	826.90	826.97	826.86	827.04	826.89	826.99	---[b]	827.03	827.00	826.89	---[b]
14	827.00	827.04	827.05	827.00	826.95	826.94	826.96	---[b]	826.97	826.95	826.86	---[b]
15	826.88	827.02	827.01	827.17	826.90	826.99	826.96	---[b]	826.94	826.84	---[b]	---[b]
16	827.00	827.17	826.87	827.11	826.97	827.03	826.91	---[b]	826.91	826.81	---[b]	---[b]
17	827.13	827.04	826.76	827.00	826.86	826.98	826.97	---[b]	826.93	826.94	---[b]	---[b]
18	827.05	826.93	826.93	826.95	826.99	826.87	827.01	---[b]	826.97	826.94	---[b]	---[b]
19	826.93	826.95	827.09	827.05	827.07	826.94	827.01	---[b]	826.95	826.83	---[b]	---[b]
20	826.98	827.08	827.17	827.05	827.03	827.02	826.98	---[b]	826.94	826.76	---[b]	---[b]
21	826.87	827.10	827.03	826.99	826.97	826.95	826.97	---[b]	826.92	826.81	---[b]	---[b]
22	827.13	826.98	826.94	826.99	826.88	826.90	826.96	---[b]	826.94	826.83	---[b]	---[b]
23	826.95	826.98	827.00	826.96	826.88	826.95	826.97	---[b]	826.93	826.87	---[b]	---[b]
24	827.18	827.07	826.98	826.99	826.86	827.03	826.93	---[b]	826.89	826.95	---[b]	---[b]
25	827.12	826.94	826.89	826.98	826.85	826.97	826.95	---[b]	826.92	827.02	---[b]	---[b]
26	826.95	826.95	827.09	826.92	827.11	826.94	826.95	---[b]	826.96	826.95	---[b]	---[b]
27	827.10	826.84	827.03	827.09	827.11	827.00	826.97	---[b]	826.96	826.86	---[b]	---[b]
28	827.13	827.11	827.00	826.98	827.01	827.03	826.98	---[b]	826.93	826.89	---[b]	---[b]
29	826.98	827.00	827.03	827.01	826.99	826.97	826.99	---[b]	826.98	826.92	---[b]	---[b]
30	826.89	---	826.99	826.96	827.00	826.93	826.98	---[b]	826.98	826.88	---[b]	---[b]
31	827.03	---	826.87	---	826.98	---	827.00	---[b]	---	826.85	---	---[b]
Max	827.18	827.17	827.24	827.20	827.11	827.08	827.01	827.01	827.03	827.02	827.11	---
Min	826.87	826.84	826.69	826.86	826.85	826.87	826.91	826.91	826.89	826.76	826.67	---

Year 2012 Statistics: **Year Max 827.24; Year Min 826.67**

Note: Water level in ft bgs

[a]Insufficient data points to report a daily average.
[b]No data available due to logger malfunction.


2012 HYDROGRAPH FOR WELL 182M-1
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
822
823
824
825
826
827
828
829
830
831
832
3,776
3,775
3,774
3,773
3,772
3,771
3,770
3,769
3,768
3,767
3,766
1/1/12
2/1/12
3/1/12
4/1/12
5/1/12
6/1/12
7/1/12
8/1/12
9/1/12
10/1/12
11/1/12
12/1/12
1/1/13
SNWA Continuous Water-Level Data*
SNWA Periodic Water-Level Data
Delamar Valley
Volcanic Aquifer
Reference Elevation: 4,598 ft amsl
Well Depth: 1,331 ft bgs
*Data processed using a temperature specific conversion factor

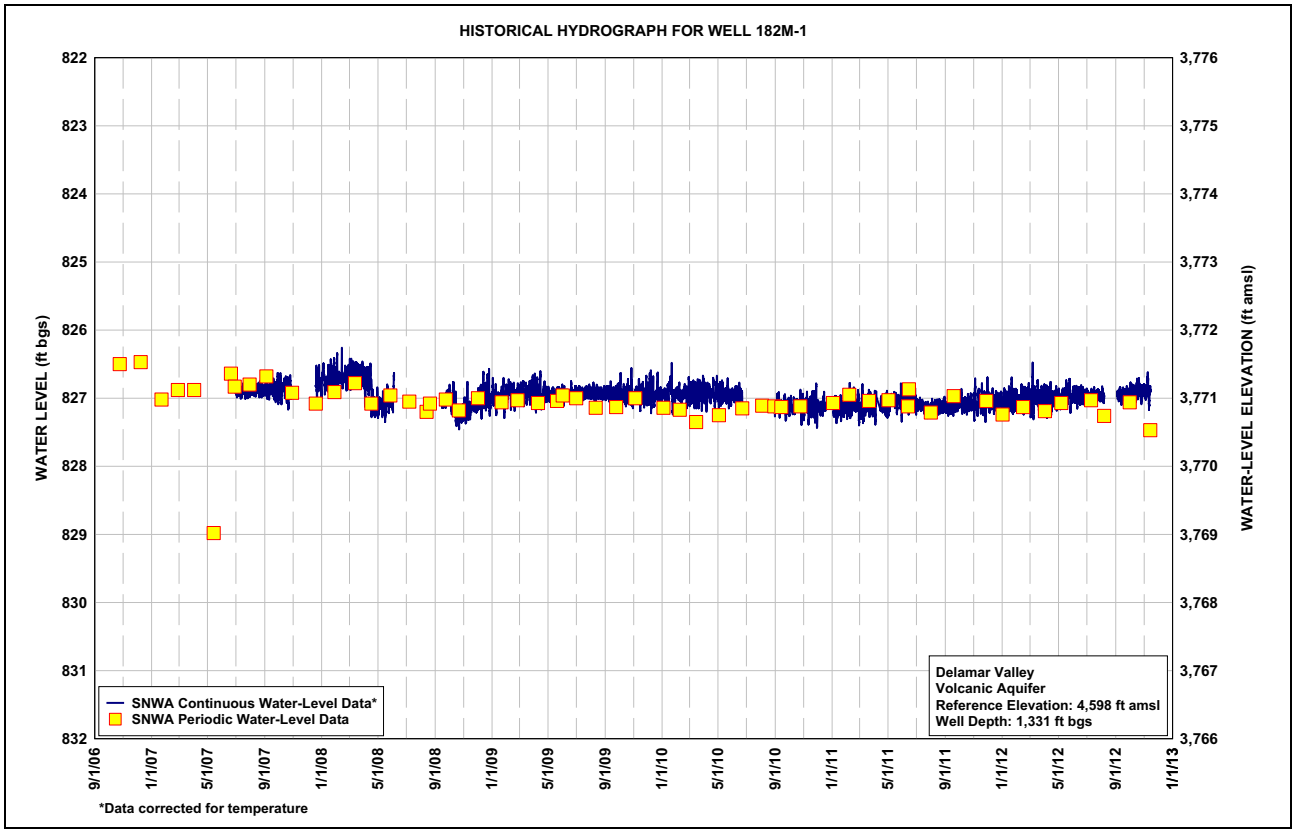
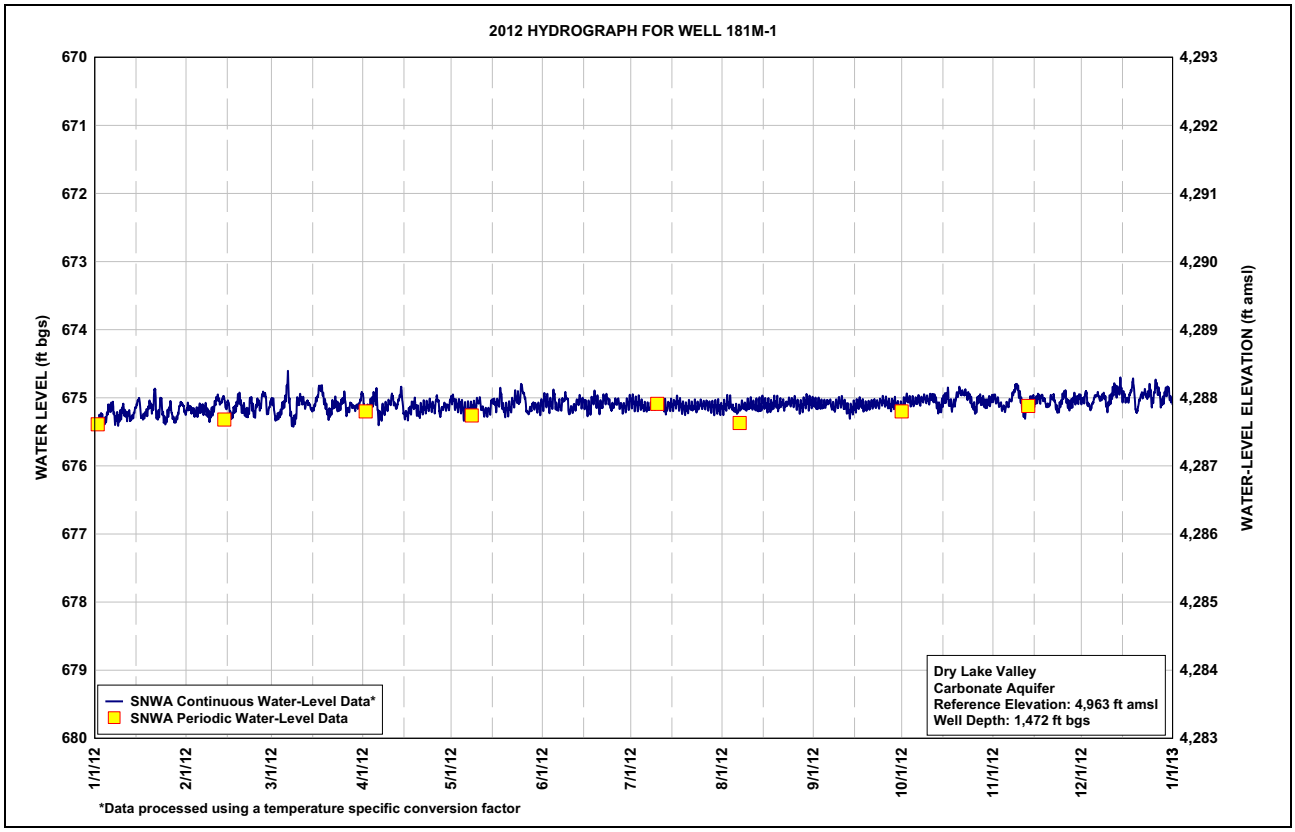

HISTORICAL HYDROGRAPH FOR WELL 182M-1
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
822
823
824
825
826
827
828
829
830
831
832
3,776
3,775
3,774
3,773
3,772
3,771
3,770
3,769
3,768
3,767
3,766
9/1/06
1/1/07
5/1/07
9/1/07
1/1/08
5/1/08
9/1/08
1/1/09
5/1/09
9/1/09
1/1/10
5/1/10
9/1/10
1/1/11
5/1/11
9/1/11
1/1/12
5/1/12
9/1/12
1/1/13
SNWA Continuous Water-Level Data*
SNWA Periodic Water-Level Data
Delamar Valley
Volcanic Aquifer
Reference Elevation: 4,598 ft amsl
Well Depth: 1,331 ft bgs
*Data corrected for temperature

Table B-4
Dry Lake Valley Well 181M-1, Calendar Year 2012
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	675.38	675.15	675.07	675.11	675.02	675.06	675.05	675.15	675.08	675.10	675.00	675.04
2	675.31	675.16	675.29	675.18	675.09	675.04	675.08	675.09	675.10	675.02	675.05	674.96
3	675.29	675.20	675.26	675.12	675.11	675.11	675.09	675.08	675.11	675.03	675.11	675.10
4	675.33	675.21	675.16	675.03	675.12	675.04	675.10	675.14	675.11	675.06	675.15	675.13
5	675.19	675.17	675.05	675.01	675.20	675.07	675.13	675.17	675.08	675.06	675.13	675.00
6	675.14	675.16	674.83	675.27	675.18	675.12	675.15	675.18	675.07	675.03	675.08	674.96
7	675.22	675.16	675.21	675.22	675.15	675.11	675.14	675.13	675.13	675.05	674.99	675.02
8	675.31	675.23	675.34	675.16	675.14	675.01	675.14	675.13	675.13	675.01	674.86	674.97
9	675.27	675.23	675.18	675.11	675.10	675.06	675.12	675.12	675.07	675.03	674.88	675.10
10	675.18	675.14	675.03	675.04	675.05	675.18	675.09	675.09	675.06	675.03	675.03	675.06
11	675.24	675.01	675.03	675.05	675.15	675.15	675.10	675.11	675.10	675.00	675.22	674.95
12	675.25	675.06	675.10	675.12	675.21	675.10	675.13	675.12	675.15	675.03	675.14	674.87
13	675.29	675.01	675.08	674.98	675.21	675.03	675.13	675.12	675.20	675.14	675.07	674.90
14	675.20	675.12	675.16	675.05	675.13	675.06	675.10	675.08	675.15	675.12	675.04	674.86
15	675.07	675.11	675.14	675.25	675.06	675.10	675.11	675.08	675.12	675.02	675.05	674.97
16	675.16	675.26	675.00	675.23	675.10	675.15	675.06	675.11	675.09	674.97	675.00	675.02
17	675.28	675.17	674.86	675.15	675.00	675.11	675.10	675.13	675.09	675.08	675.00	674.96
18	675.23	675.06	674.96	675.09	675.10	675.00	675.14	675.09	675.14	675.11	675.04	674.81
19	675.12	675.06	675.12	675.18	675.18	675.06	675.16	675.08	675.12	675.00	675.12	675.14
20	675.14	675.17	675.24	675.20	675.17	675.14	675.14	675.11	675.11	674.91	675.05	675.09
21	675.01	675.21	675.16	675.15	675.12	675.07	675.13	675.09	675.09	674.94	675.01	674.97
22	675.25	675.13	675.08	675.14	675.03	675.02	675.12	675.11	675.10	674.93	675.14	674.94
23	675.09	675.11	675.12	675.11	675.02	675.05	675.15	675.06	675.09	674.97	675.15	674.96
24	675.30	675.20	675.11	675.12	674.96	675.14	675.09	675.07	675.06	675.04	675.02	674.94
25	675.29	675.07	675.01	675.12	674.92	675.09	675.11	675.06	675.06	675.14	674.96	675.00
26	675.15	675.08	675.17	675.04	675.13	675.06	675.10	675.10	675.09	675.11	675.09	674.83
27	675.28	674.95	675.14	675.21	675.20	675.11	675.11	675.13	675.11	675.02	675.09	674.95
28	675.32	675.16	675.12	675.13	675.12	675.15	675.13	675.10	675.08	675.05	675.02	675.05
29	675.20	675.10	675.14	675.14	675.11	675.11	675.14	675.06	675.12	675.09	675.03	674.94
30	675.09	---	675.11	675.09	675.14	675.06	675.13	675.06	675.14	675.06	675.00	674.90
31	675.19	---	674.99	---	675.13	---	675.16	675.07	---	675.02	---	675.03
Max	675.38	675.26	675.34	675.27	675.21	675.18	675.16	675.18	675.20	675.14	675.22	675.14
Min	675.01	674.95	674.83	674.98	674.92	675.00	675.05	675.06	675.06	674.91	674.86	674.81

Year 2012 Statistics: **Year Max 675.38; Year Min 674.81**

Note: Water level in ft bgs


2012 HYDROGRAPH FOR WELL 181M-1
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
670
671
672
673
674
675
676
677
678
679
680
4,293
4,292
4,291
4,290
4,289
4,288
4,287
4,286
4,285
4,284
4,283
1/1/12
2/1/12
3/1/12
4/1/12
5/1/12
6/1/12
7/1/12
8/1/12
9/1/12
10/1/12
11/1/12
12/1/12
1/1/13
SNWA Continuous Water-Level Data*
SNWA Periodic Water-Level Data
Dry Lake Valley
Carbonate Aquifer
Reference Elevation: 4,963 ft amsl
Well Depth: 1,472 ft bgs
*Data processed using a temperature specific conversion factor

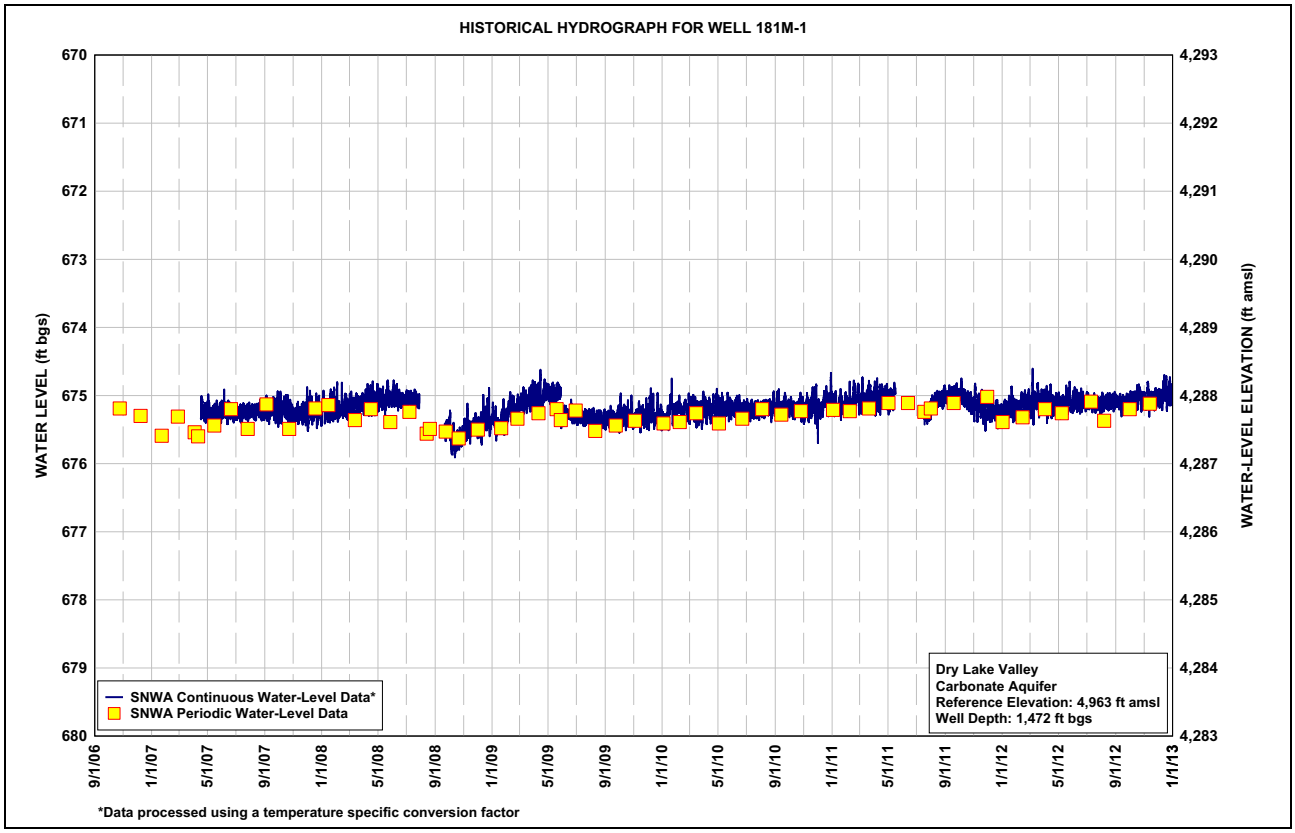
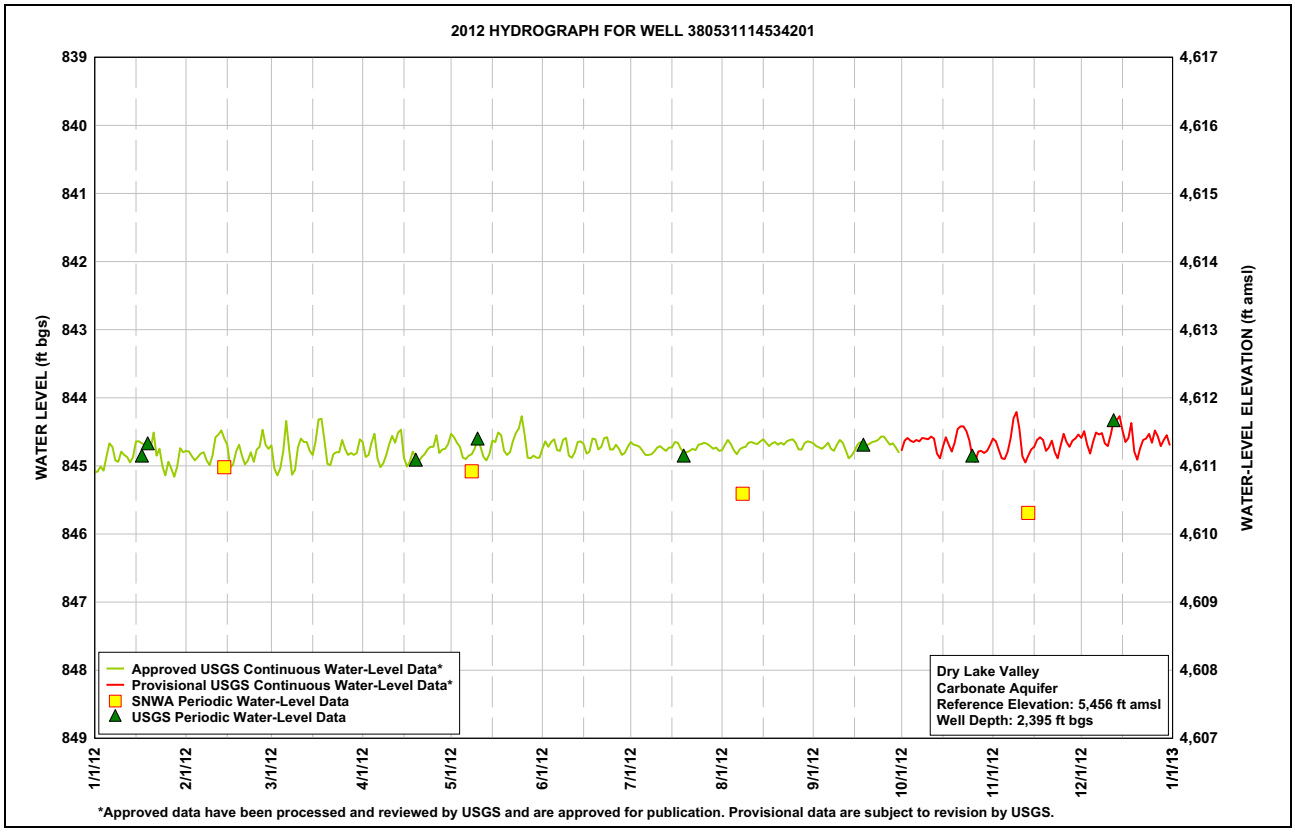

HISTORICAL HYDROGRAPH FOR WELL 181M-1
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
670
671
672
673
674
675
676
677
678
679
680
4,293
4,292
4,291
4,290
4,289
4,288
4,287
4,286
4,285
4,284
4,283
9/1/06
1/1/07
5/1/07
9/1/07
1/1/08
5/1/08
9/1/08
1/1/09
5/1/09
9/1/09
1/1/10
5/1/10
9/1/10
1/1/11
5/1/11
9/1/11
1/1/12
5/1/12
9/1/12
1/1/13
SNWA Continuous Water-Level Data*
SNWA Periodic Water-Level Data
Dry Lake Valley
Carbonate Aquifer
Reference Elevation: 4,963 ft amsl
Well Depth: 1,472 ft bgs
*Data processed using a temperature specific conversion factor

Table B-5
Dry Lake Valley Well 380531114534201, Calendar Year 2012
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT[b]	NOV[b]	DEC[b]
1	845.10	844.78	844.70	844.65	844.53	844.75	844.65	844.77	844.67	844.77	844.60	844.59
2	845.08	844.79	845.04	844.87	844.58	844.64	844.69	844.69	844.71	844.63	844.64	844.49
3	845.01	844.86	845.14	844.84	844.66	844.72	844.70	844.62	844.73	844.59	844.77	844.69
4	845.07	844.92	845.04	844.66	844.72	844.65	844.72	844.68	844.75	844.63	844.89	844.82
5	844.86	844.87	844.79	844.53	844.88	844.61	844.78	844.77	844.71	844.65	844.90	844.65
6	844.67	844.82	844.34	844.89	844.90	844.77	844.84	844.83	844.66	844.62	844.79	844.51
7	844.72	844.80	844.75	845.02	844.85	844.78	844.84	844.76	844.75	844.64	844.60	844.54
8	844.92	844.92	845.13	844.96	844.83	844.62	844.83	844.73	844.78	844.59	844.30	844.52
9	844.94	844.99	845.06	844.84	844.75	844.59	844.79	844.72	844.69	844.60	844.21	844.67
10	844.79	844.85	844.73	844.68	844.62	844.85	844.73	844.66	844.62	844.61	844.46	844.71
11	844.84	844.58	844.60	844.56	844.72	844.88	844.71	844.65	844.66	844.57	844.86	844.54
12	844.87	844.54	844.65	844.66	844.87	844.80	844.75	844.67	844.77	844.60	844.95	844.34
13	844.95	844.48	844.65	844.51	844.92	844.65	844.78	844.68	844.89	844.82	844.85	844.33
14	844.87	844.60	844.78	844.47	844.83	844.64	844.73	844.64	844.85	844.89	844.76	844.27
15	844.64	844.69	844.84	844.88	844.63	844.68	844.73	844.61	844.78	844.72	844.72	844.48
16	844.64	845.02	844.64	845.01	844.65	844.82	844.65	844.66	844.69	844.58	844.62	844.65
17	---[a]	844.98	844.32	844.94	844.51	844.79	844.66	844.71	844.65	844.69	844.58	844.59
18	---[a]	844.79	844.31	844.79	844.55	844.60	844.75	844.67	844.71	844.79	844.62	844.37
19	---[a]	844.69	844.62	844.87	844.78	844.61	844.80	844.65	844.70	844.66	844.78	844.79
20	844.75	844.85	844.97	844.94	844.84	844.76	844.80	844.69	844.68	844.46	844.73	844.91
21	844.51	844.98	844.99	844.87	844.80	844.72	844.78	844.66	844.65	844.42	844.63	844.74
22	844.85	844.92	844.83	844.83	844.64	844.59	844.75	844.69	844.64	844.42	844.80	844.62
23	844.75	844.80	844.80	844.76	844.52	844.58	844.77	844.64	844.62	844.49	844.89	844.60
24	845.01	844.94	844.80	844.72	844.45	844.76	844.69	844.62	844.57	844.63	844.70	844.53
25	845.14	844.76	844.62	844.72	844.27	844.76	844.68	844.61	844.57	844.86	844.53	844.66
26	844.94	844.72	844.75	844.55	844.55	844.69	844.66	844.66	844.63	844.94	844.65	844.48
27	845.04	844.47	844.84	844.81	844.88	844.75	844.68	844.76	844.69	844.79	844.72	844.57
28	845.16	844.69	844.81	844.76	844.89	844.84	844.71	844.76	844.67	844.78	844.63	844.71
29	845.01	844.75	844.84	844.75	844.85	844.81	844.75	844.67	844.73	844.81	844.60	844.62
30	844.74	---	844.81	844.68	844.88	844.72	844.73	844.64	844.80	844.78	844.54	844.55
31	844.80	---	844.61	---	844.88	---	844.78	844.65	---	844.70	---	844.69
Max	845.16	845.02	845.14	845.02	844.92	844.88	844.84	844.83	844.89	844.94	844.95	844.91
Min	844.51	844.47	844.31	844.47	844.27	844.58	844.65	844.61	844.57	844.42	844.21	844.27

Year 2012 Statistics: Year Max: 845.16; Year Min 844.21
Note: Water level in ft bgs

[a]Missing data
[b]Provisional data provided by the USGS


2012 HYDROGRAPH FOR WELL 380531114534201
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
839
840
841
842
843
844
845
846
847
848
849
4,617
4,616
4,615
4,614
4,613
4,612
4,611
4,610
4,609
4,608
4,607
1/1/12
2/1/12
3/1/12
4/1/12
5/1/12
6/1/12
7/1/12
8/1/12
9/1/12
10/1/12
11/1/12
12/1/12
1/1/13
Approved USGS Continuous Water-Level Data*
Provisional USGS Continuous Water-Level Data*
SNWA Periodic Water-Level Data
USGS Periodic Water-Level Data
Dry Lake Valley
Carbonate Aquifer
Reference Elevation: 5,456 ft amsl
Well Depth: 2,395 ft bgs
*Approved data have been processed and reviewed by USGS and are approved for publication. Provisional data are subject to revision by USGS.

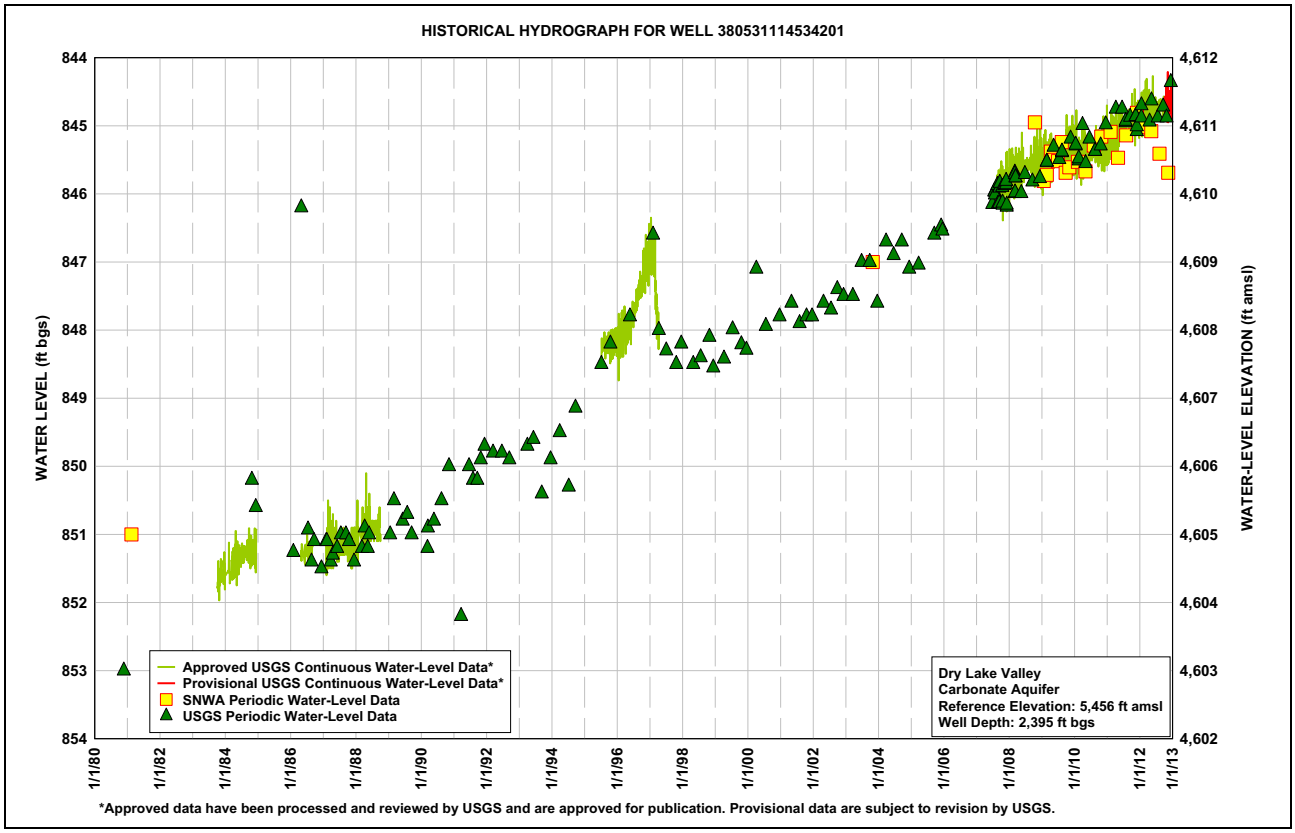

HISTORICAL HYDROGRAPH FOR WELL 380531114534201
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
844
845
846
847
848
849
850
851
852
853
854
4,612
4,611
4,610
4,609
4,608
4,607
4,606
4,605
4,604
4,603
4,602
1/1/80
1/1/82
1/1/84
1/1/86
1/1/88
1/1/90
1/1/92
1/1/94
1/1/96
1/1/98
1/1/00
1/1/02
1/1/04
1/1/06
1/1/08
1/1/10
1/1/12
1/1/13
Approved USGS Continuous Water-Level Data*
Provisional USGS Continuous Water-Level Data*
SNWA Periodic Water-Level Data
USGS Periodic Water-Level Data
Dry Lake Valley
Carbonate Aquifer
Reference Elevation: 5,456 ft amsl
Well Depth: 2,395 ft bgs
*Approved data have been processed and reviewed by USGS and are approved for publication. Provisional data are subject to revision by USGS.

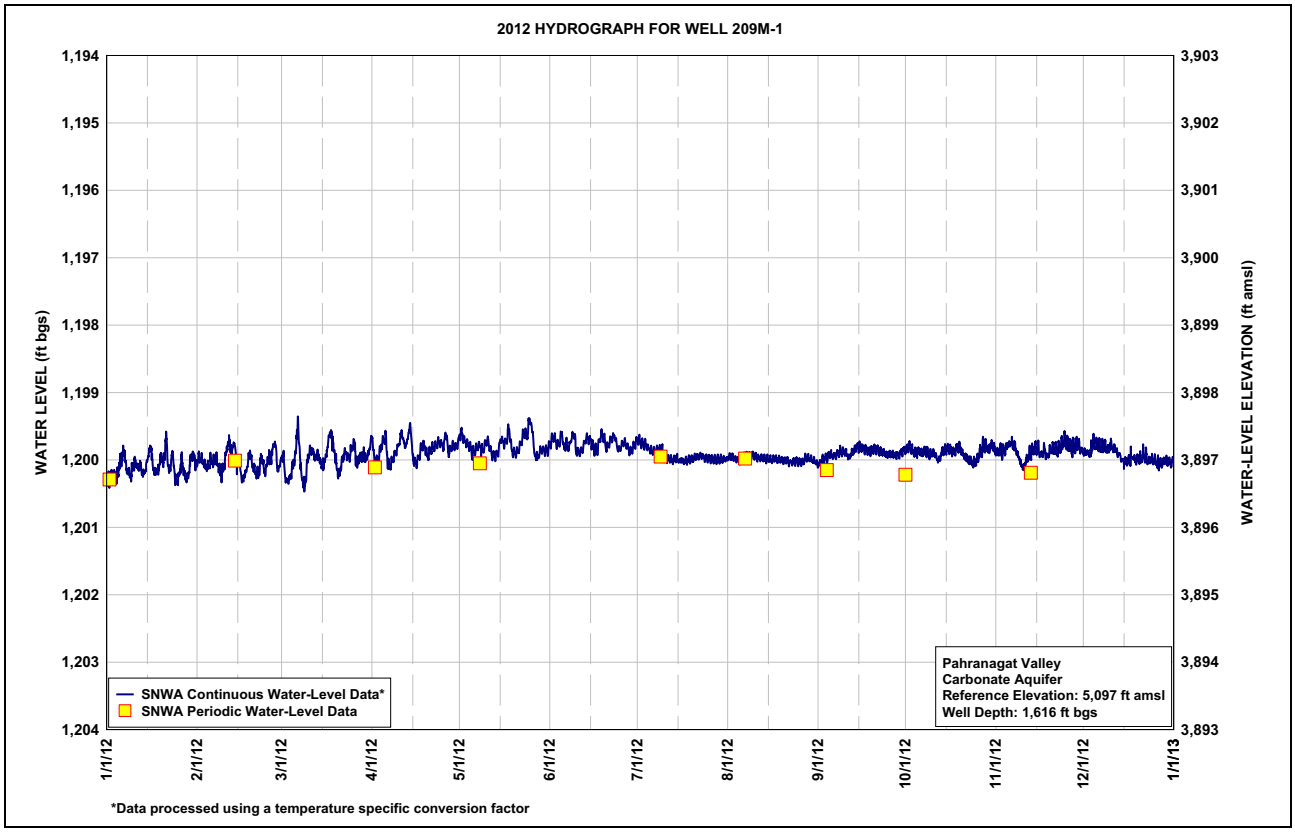
Table B-6
Pahranagat Valley Well 209M-1, Calendar Year 2012
Water-Level Data, Daily Mean Values

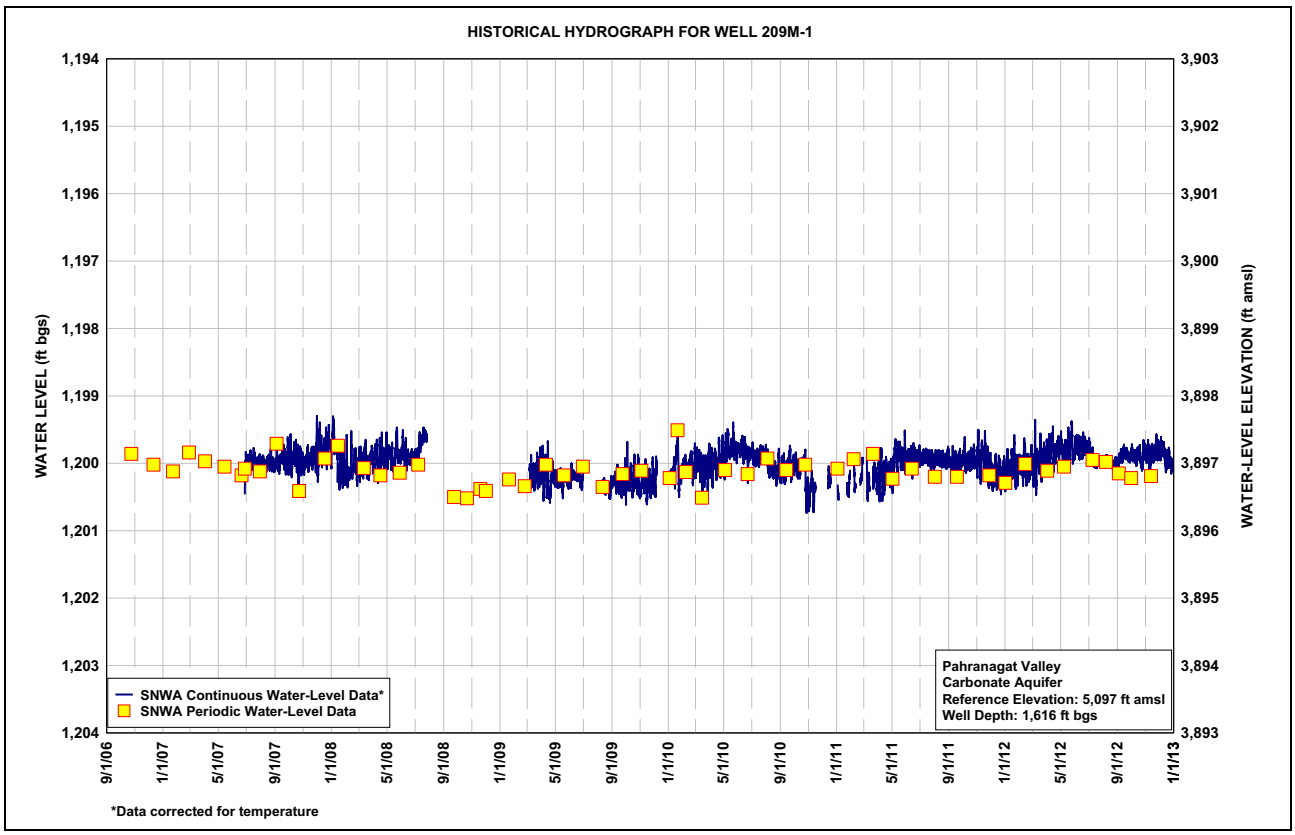
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1,200.31	1,200.00	1,199.98	1,199.84	1,199.61	1,199.72	1,199.71	1,199.97	1,200.06	1,199.83	1,199.88	1,199.89
2	1,200.25	1,200.01	1,200.27	1,200.00	1,199.69	1,199.68	1,199.75	1,199.96	1,200.01	1,199.83	1,199.86	1,199.90
3	1,200.21	1,200.07	1,200.29	1,199.93	1,199.75	1,199.76	1,199.77	1,199.98	1,199.97	1,199.87	1,199.88	1,199.88
4	1,200.25	1,200.1,1	1,200.15	1,199.76	1,199.79	1,199.70	1,199.81	1,200.00	1,199.96	1,199.89	1,199.83	1,199.79
5	1,200.06	1,200.06	1,199.96	1,199.69	1,199.89	1,199.71	1,199.85	1,199.99	1,199.93	1,199.88	1,199.76	1,199.79
6	1,199.94	1,200.03	1,199.60	1,200.03	1,199.86	1,199.81	1,199.88	1,199.95	1,199.94	1,199.89	1,199.77	1,199.80
7	1,200.02	1,200.02	1,200.03	1,200.06	1,199.80	1,199.80	1,199.86	1,199.94	1,199.92	1,199.86	1,199.81	1,199.82
8	1,200.18	1,200.12	1,200.34	1,199.96	1,199.83	1,199.67	1,199.84	1,199.93	1,199.89	1,199.88	1,199.92	1,199.81
9	1,200.18	1,200.15	1,200.18	1,199.85	1,199.81	1,199.68	1,199.88	1,199.93	1,199.88	1,199.90	1,200.04	1,199.83
10	1,200.06	1,200.02	1,199.91	1,199.72	1,199.71	1,199.88	1,199.96	1,199.95	1,199.90	1,199.90	1,200.11	1,199.79
11	1,200.09	1,199.80	1,199.86	1,199.66	1,199.83	1,199.88	1,199.98	1,199.97	1,199.96	1,199.95	1,200.01	1,199.83
12	1,200.12	1,199.82	1,199.95	1,199.78	1,199.93	1,199.81	1,200.00	1,199.97	1,199.91	1,200.00	1,199.92	1,199.88
13	1,200.20	1,199.79	1,199.94	1,199.62	1,199.94	1,199.68	1,200.00	1,199.98	1,199.85	1,199.89	1,199.87	1,199.93
14	1,200.10	1,199.97	1,200.05	1,199.67	1,199.83	1,199.70	1,199.99	1,199.99	1,199.81	1,199.85	1,199.83	1,200.01
15	1,199.90	1,200.04	1,200.05	1,200.01	1,199.71	1,199.75	1,200.02	1,200.00	1,199.81	1,199.82	1,199.85	1,200.02
16	1,199.93	1,200.28	1,199.88	1,200.02	1,199.75	1,199.85	1,200.01	1,200.00	1,199.83	1,199.85	1,199.91	1,200.00
17	1,200.18	1,200.21	1,199.63	1,199.90	1,199.62	1,199.81	1,200.02	1,200.00	1,199.85	1,199.87	1,199.87	1,199.97
18	1,200.15	1,200.03	1,199.73	1,199.79	1,199.71	1,199.65	1,200.01	1,200.00	1,199.87	1,199.83	1,199.94	1,199.99
19	1,200.00	1,199.97	1,199.99	1,199.87	1,199.89	1,199.68	1,199.99	1,200.01	1,199.84	1,199.81	1,199.87	1,199.99
20	1,199.98	1,200.13	1,200.18	1,199.91	1,199.89	1,199.81	1,199.98	1,200.01	1,199.84	1,199.89	1,199.84	1,199.98
21	1,199.80	1,200.21	1,200.07	1,199.83	1,199.82	1,199.75	1,199.96	1,200.02	1,199.85	1,199.96	1,199.84	1,199.94
22	1,200.12	1,200.12	1,199.92	1,199.80	1,199.69	1,199.67	1,199.94	1,200.03	1,199.87	1,199.99	1,199.84	1,199.97
23	1,199.96	1,200.02	1,199.93	1,199.75	1,199.62	1,199.69	1,199.96	1,200.02	1,199.89	1,200.02	1,199.77	1,200.00
24	1,200.24	1,200.15	1,199.92	1,199.75	1,199.57	1,199.83	1,199.97	1,200.02	1,199.93	1,200.03	1,199.73	1,200.00
25	1,200.28	1,199.98	1,199.78	1,199.77	1,199.47	1,199.80	1,199.98	1,200.03	1,199.91	1,200.01	1,199.78	1,200.02
26	1,200.07	1,199.96	1,199.95	1,199.66	1,199.78	1,199.74	1,199.98	1,200.04	1,199.92	1,199.91	1,199.81	1,200.05
27	1,200.17	1,199.78	1,199.98	1,199.87	1,199.95	1,199.80	1,199.98	1,199.99	1,199.93	1,199.82	1,199.80	1,200.06
28	1,200.27	1,200.04	1,199.96	1,199.79	1,199.90	1,199.86	1,199.99	1,199.97	1,199.92	1,199.80	1,199.79	1,200.03
29	1,200.10	1,200.05	1,199.96	1,199.80	1,199.85	1,199.82	1,199.99	1,199.99	1,199.88	1,199.82	1,199.81	1,200.03
30	1,199.93	---	1,199.93	1,199.74	1,199.86	1,199.74	1,200.00	1,200.02	1,199.85	1,199.79	1,199.86	1,200.03
31	1,200.01	---	1,199.76	---	1,199.83	---	1,199.99	1,200.06	---	1,199.85	---	1,200.04
Max	1,200.31	1,200.28	1,200.34	1,200.06	1,199.95	1,199.88	1,200.02	1,200.06	1,200.06	1,200.03	1,200.11	1,200.06
Min	1,199.80	1,199.78	1,199.60	1,199.62	1,199.47	1,199.65	1,199.71	1,199.93	1,199.81	1,199.79	1,199.73	1,199.79

Year 2012 Statistics: **Year Max 1,200.34; Year Min 1,199.47**

Note: Water level in ft bgs

[a]Insufficient data points to report a daily average.
[b]No data available due to logger malfunction.


2012 HYDROGRAPH FOR WELL 209M-1
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
1,194
1,195
1,196
1,197
1,198
1,199
1,200
1,201
1,202
1,203
1,204
3,903
3,902
3,901
3,900
3,899
3,898
3,897
3,896
3,895
3,894
3,893
1/1/12
2/1/12
3/1/12
4/1/12
5/1/12
6/1/12
7/1/12
8/1/12
9/1/12
10/1/12
11/1/12
12/1/12
1/1/13
SNWA Continuous Water-Level Data*
SNWA Periodic Water-Level Data
Pahranagat Valley
Carbonate Aquifer
Reference Elevation: 5,097 ft amsl
Well Depth: 1,616 ft bgs
*Data processed using a temperature specific conversion factor


HISTORICAL HYDROGRAPH FOR WELL 209M-1
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
1,194
1,195
1,196
1,197
1,198
1,199
1,200
1,201
1,202
1,203
1,204
3,903
3,902
3,901
3,900
3,899
3,898
3,897
3,896
3,895
3,894
3,893
9/1/06
1/1/07
5/1/07
9/1/07
1/1/08
5/1/08
9/1/08
1/1/09
5/1/09
9/1/09
1/1/10
5/1/10
9/1/10
1/1/11
5/1/11
9/1/11
1/1/12
5/1/12
9/1/12
1/1/13
SNWA Continuous Water-Level Data*
SNWA Periodic Water-Level Data
Pahranagat Valley
Carbonate Aquifer
Reference Elevation: 5,097 ft amsl
Well Depth: 1,616 ft bgs
*Data corrected for temperature

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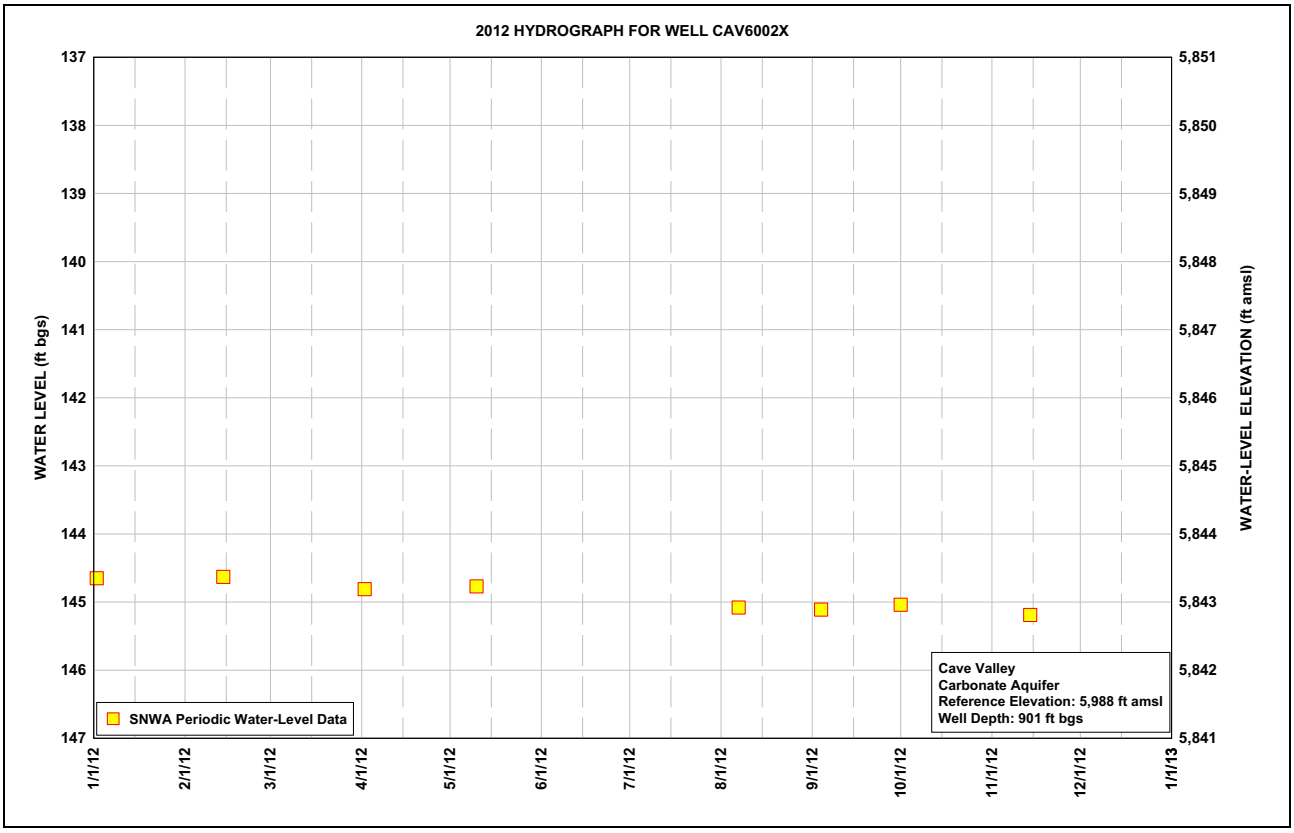
Appendix C

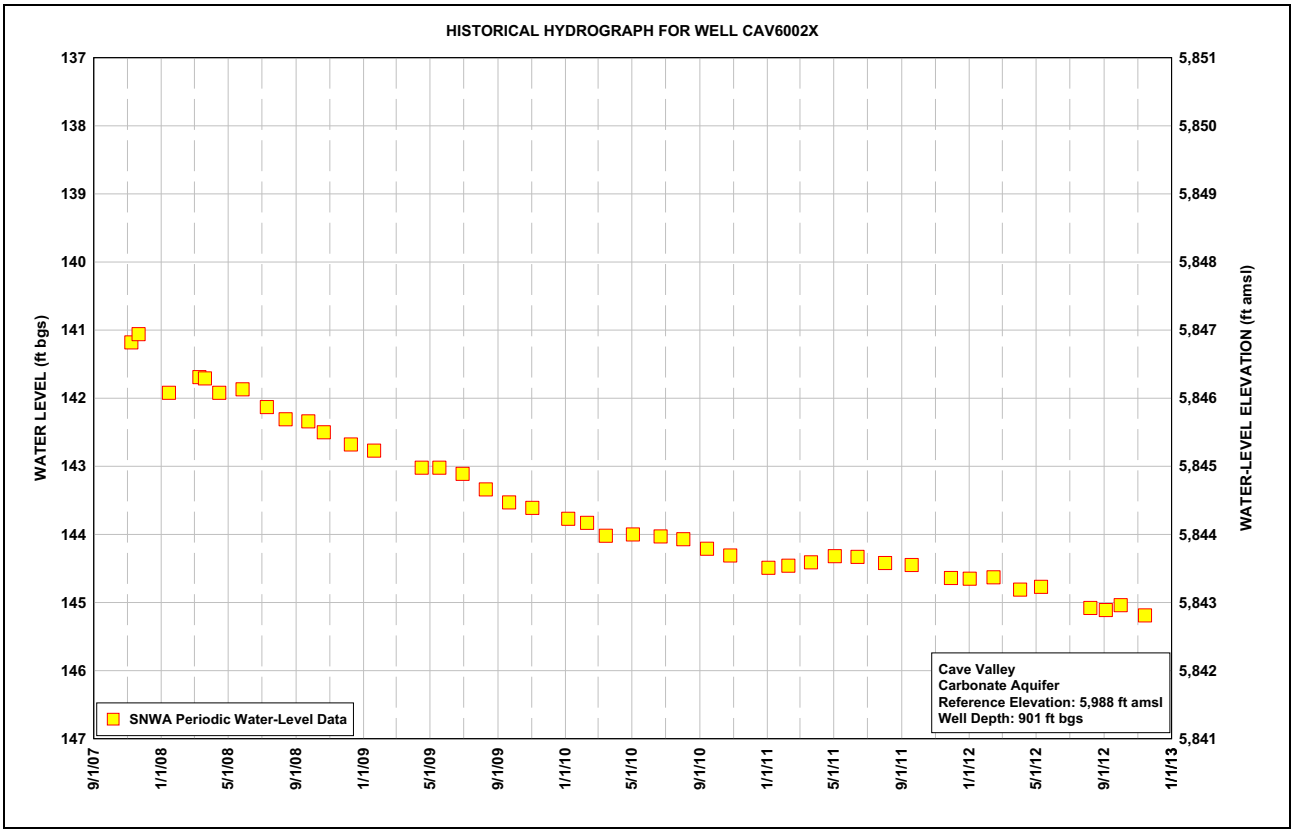
Periodic Water-Level Measurements and Hydrographs for SNWA Exploratory and Test Wells

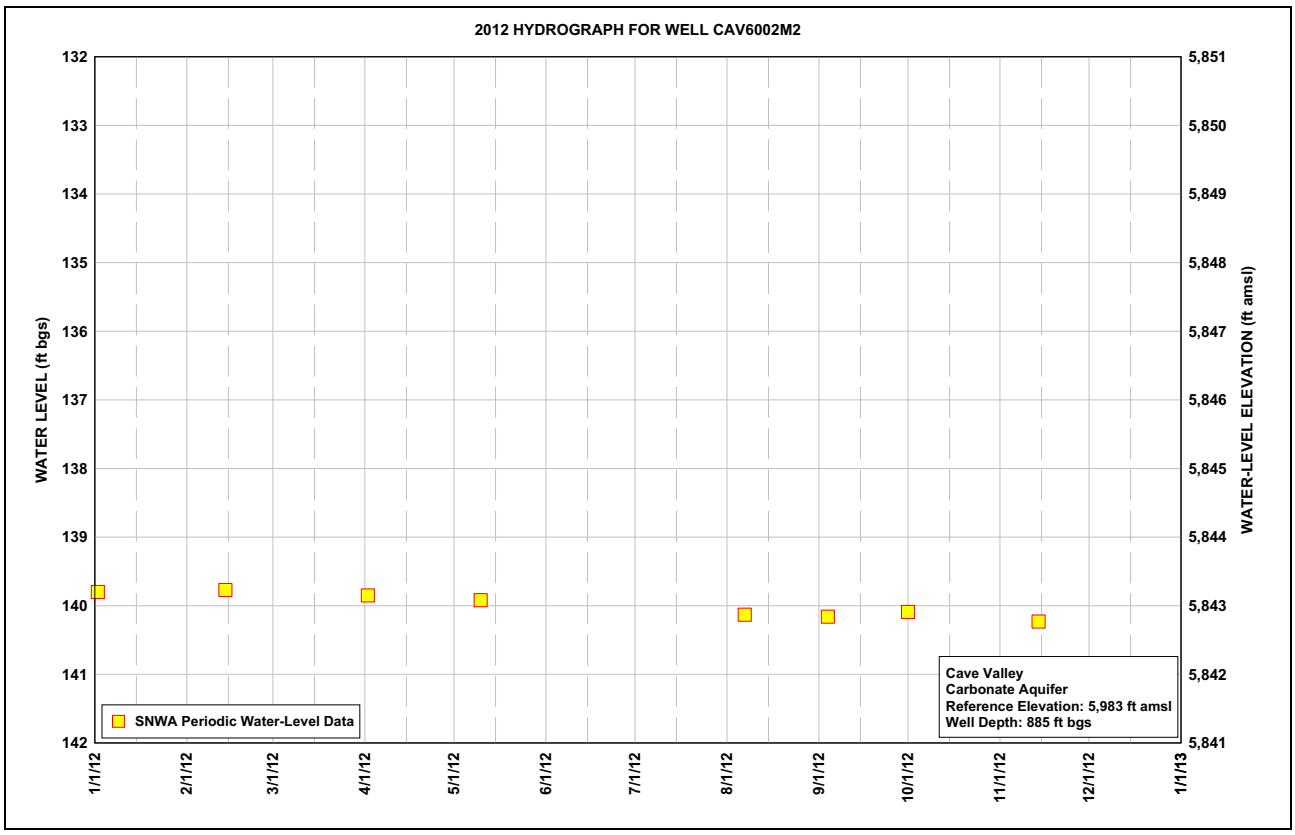
Table C-1
Periodic Water-Level Measurements Collected at SNWA Exploratory and Test Wells

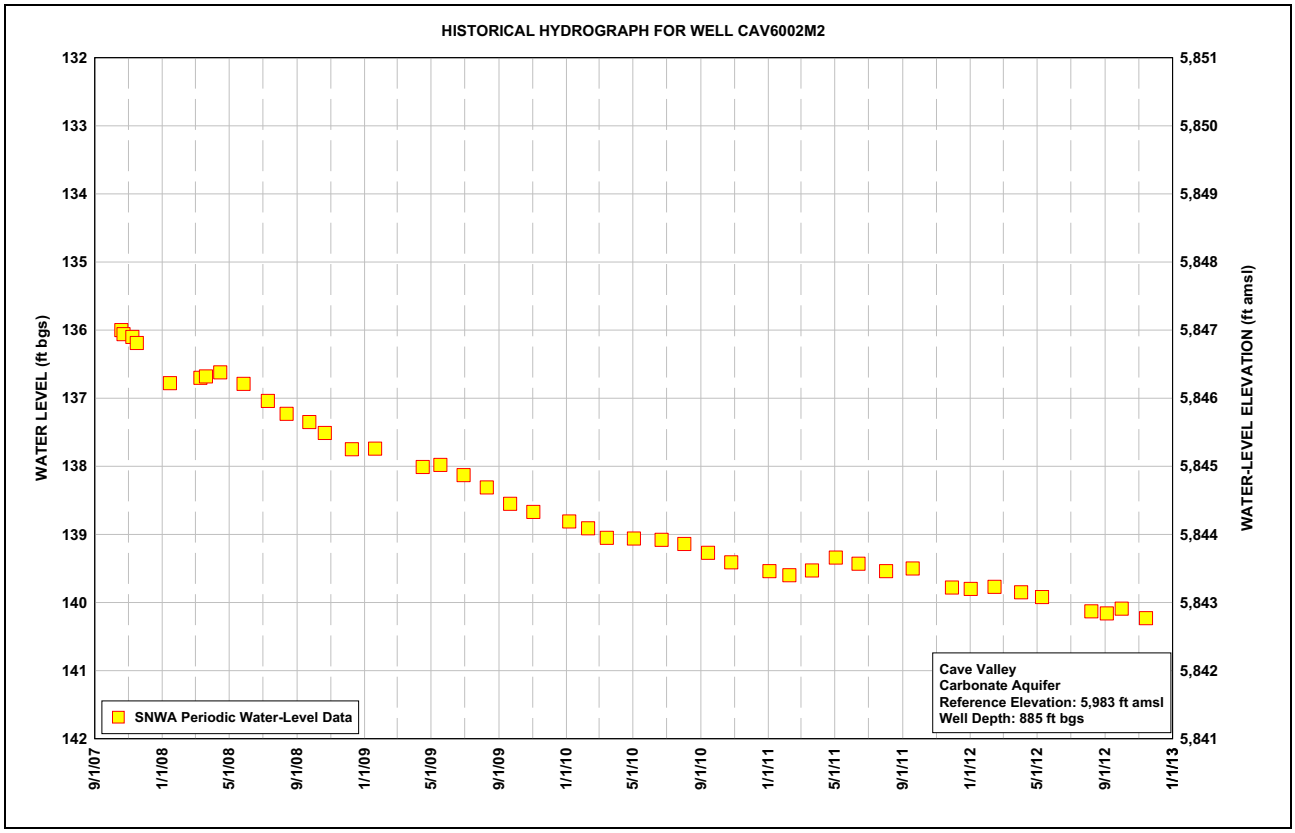
Site Number	Station Local Number[a]	Well Depth (ft bgs)	Surface[b] Elevation (ft amsl)	Water Level			
				Date	Depth to Water (ft bgs)	Well Status[c]	Measurement Method[d]
CAV6002X	---	901	5,987.97	1/2/2012	144.65	S	T
				2/14/2012	144.63	S	T
				4/2/2012	144.81	S	T
				5/10/2012	144.77	S	T
				8/7/2012	145.08	S	T
				9/4/2012	145.11	S	T
				10/1/2012	145.04	S	T
				11/14/2012	145.19	S	T
CAV6002M2	---	885	5,982.81	1/2/2012	139.80	S	T
				2/14/2012	139.77	S	T
				4/2/2012	139.85	S	T
				5/10/2012	139.92	S	T
				8/7/2012	140.13	S	T
				9/4/2012	140.16	S	T
				10/1/2012	140.09	S	T
				11/14/2012	140.23	S	T

[a]Station Local Numbers provided by the Nevada Division of Water Resources.
[b]Elevations are North American Vertical Datum of 1988 (NAVD88).
[c]S = Static conditions
[d]T = Electric tape measurement


2012 HYDROGRAPH FOR WELL CAV6002X
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
137
138
139
140
141
142
143
144
145
146
147
5,851
5,850
5,849
5,848
5,847
5,846
5,845
5,844
5,843
5,842
5,841
1/1/12
2/1/12
3/1/12
4/1/12
5/1/12
6/1/12
7/1/12
8/1/12
9/1/12
10/1/12
11/1/12
12/1/12
1/1/13
SNWA Periodic Water-Level Data
Cave Valley
Carbonate Aquifer
Reference Elevation: 5,988 ft amsl
Well Depth: 901 ft bgs


HISTORICAL HYDROGRAPH FOR WELL CAV6002X
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
137
138
139
140
141
142
143
144
145
146
147
5,851
5,850
5,849
5,848
5,847
5,846
5,845
5,844
5,843
5,842
5,841
9/1/07
1/1/08
5/1/08
9/1/08
1/1/09
5/1/09
9/1/09
1/1/10
5/1/10
9/1/10
1/1/11
5/1/11
9/1/11
1/1/12
5/1/12
9/1/12
1/1/13
SNWA Periodic Water-Level Data
Cave Valley
Carbonate Aquifer
Reference Elevation: 5,988 ft amsl
Well Depth: 901 ft bgs


2012 HYDROGRAPH FOR WELL CAV6002M2
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
132
133
134
135
136
137
138
139
140
141
142
5,851
5,850
5,849
5,848
5,847
5,846
5,845
5,844
5,843
5,842
5,841
1/1/12
2/1/12
3/1/12
4/1/12
5/1/12
6/1/12
7/1/12
8/1/12
9/1/12
10/1/12
11/1/12
12/1/12
1/1/13
SNWA Periodic Water-Level Data
Cave Valley
Carbonate Aquifer
Reference Elevation: 5,983 ft amsl
Well Depth: 885 ft bgs


HISTORICAL HYDROGRAPH FOR WELL CAV6002M2
WATER LEVEL (ft bgs)
WATER-LEVEL ELEVATION (ft amsl)
132
133
134
135
136
137
138
139
140
141
142
5,851
5,850
5,849
5,848
5,847
5,846
5,845
5,844
5,843
5,842
5,841
9/1/07
1/1/08
5/1/08
9/1/08
1/1/09
5/1/09
9/1/09
1/1/10
5/1/10
9/1/10
1/1/11
5/1/11
9/1/11
1/1/12
5/1/12
9/1/12
1/1/13
SNWA Periodic Water-Level Data
Cave Valley
Carbonate Aquifer
Reference Elevation: 5,983 ft amsl
Well Depth: 885 ft bgs

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Appendix D

Spring Discharge Measurements and Hydrographs

Table D-1
Spring Discharge Measurements
(Page 1 of 3)

Station Name	Primary Name	Date	Discharge	Unit
Coyote Spring	1810401	5/15/2012	0.73[a]	gpm
		10/22/2012	0.34[a]	gpm
Hot Creek Spring near Sunnyside, NV	09415558	1/5/2012	15.8	cfs
		1/5/2012	14.7	cfs
		2/14/2012	14.6	cfs
		3/27/2012	13.8	cfs
		5/8/2012	14.5	cfs
		6/18/2012	14.6	cfs
		7/12/2012	14.5	cfs
		7/30/2012	14.1	cfs
		9/10/2012	14.4	cfs
		10/24/2012	13.8	cfs
		12/13/2012	14.7	cfs
Moorman Spring	2071101	4/25/2012	0.44	cfs
		4/25/2012	0.43	cfs
		9/19/2012	0.49	cfs
		9/19/2012	0.56	cfs
Flag Spring 3	2071301	4/24/2012	1.92	cfs
		4/24/2012	1.88	cfs
		5/14/2012	1.7[a]	cfs
		5/14/2012	1.7[a]	cfs
		9/19/2012	2.08	cfs
		9/19/2012	2.08	cfs
Flag Spring 2	2071302	1/11/2012	2.6[a]	cfs
		2/16/2012	2.6[a]	cfs
		4/4/2012	2.8[a]	cfs
		4/24/2012	2.79	cfs
		4/24/2012	2.87	cfs
		6/21/2012	2.5[a]	cfs
		8/8/2012	NA[a,b]	N/A
		9/19/2012	2.72	cfs
		9/19/2012	2.69	cfs
		9/20/2012	2.6[a]	cfs
		11/21/2012	2.5[a]	cfs
Flag Spring 1	2071303	4/24/2012	2.45	cfs
		4/24/2012	2.38	cfs
		9/19/2012	2.31	cfs
		9/19/2012	2.36	cfs

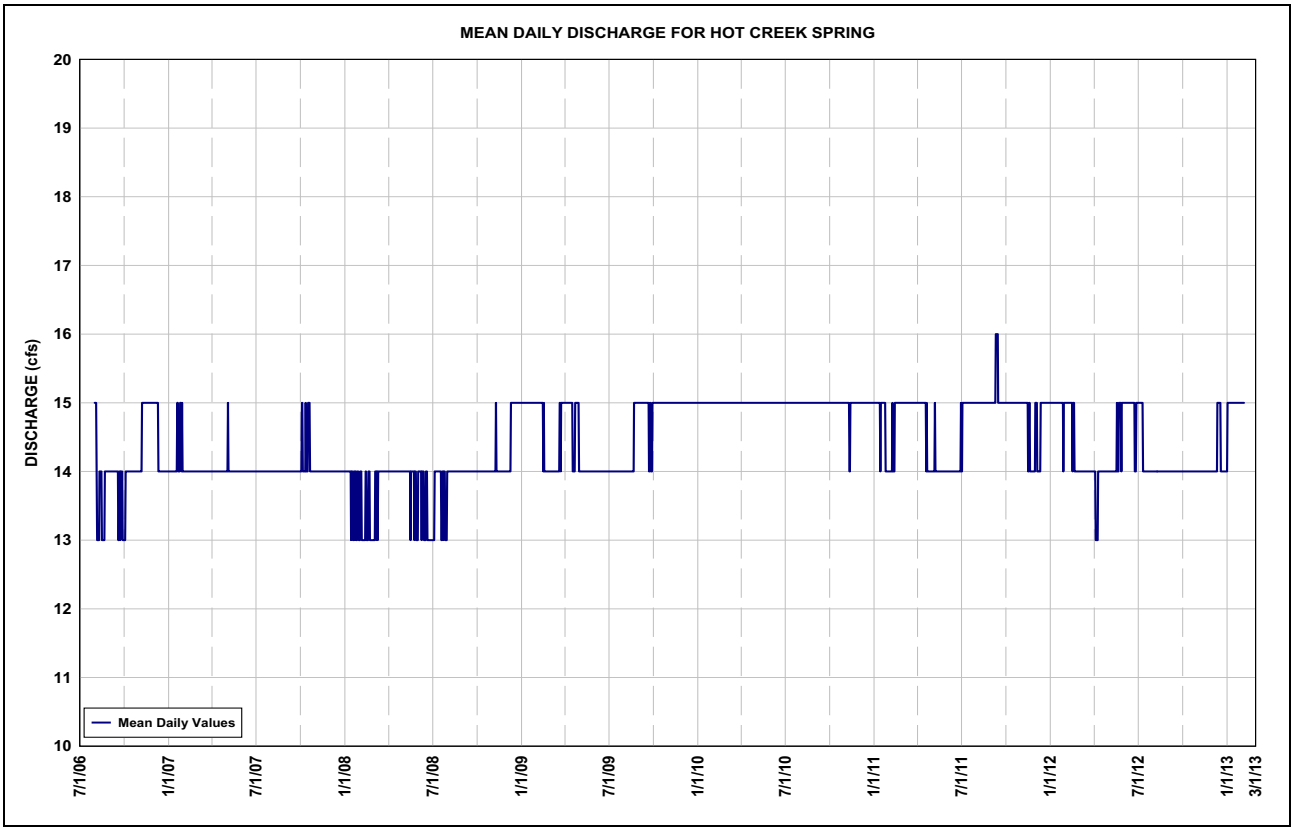
Table D-1
Spring Discharge Measurements
(Page 2 of 3)

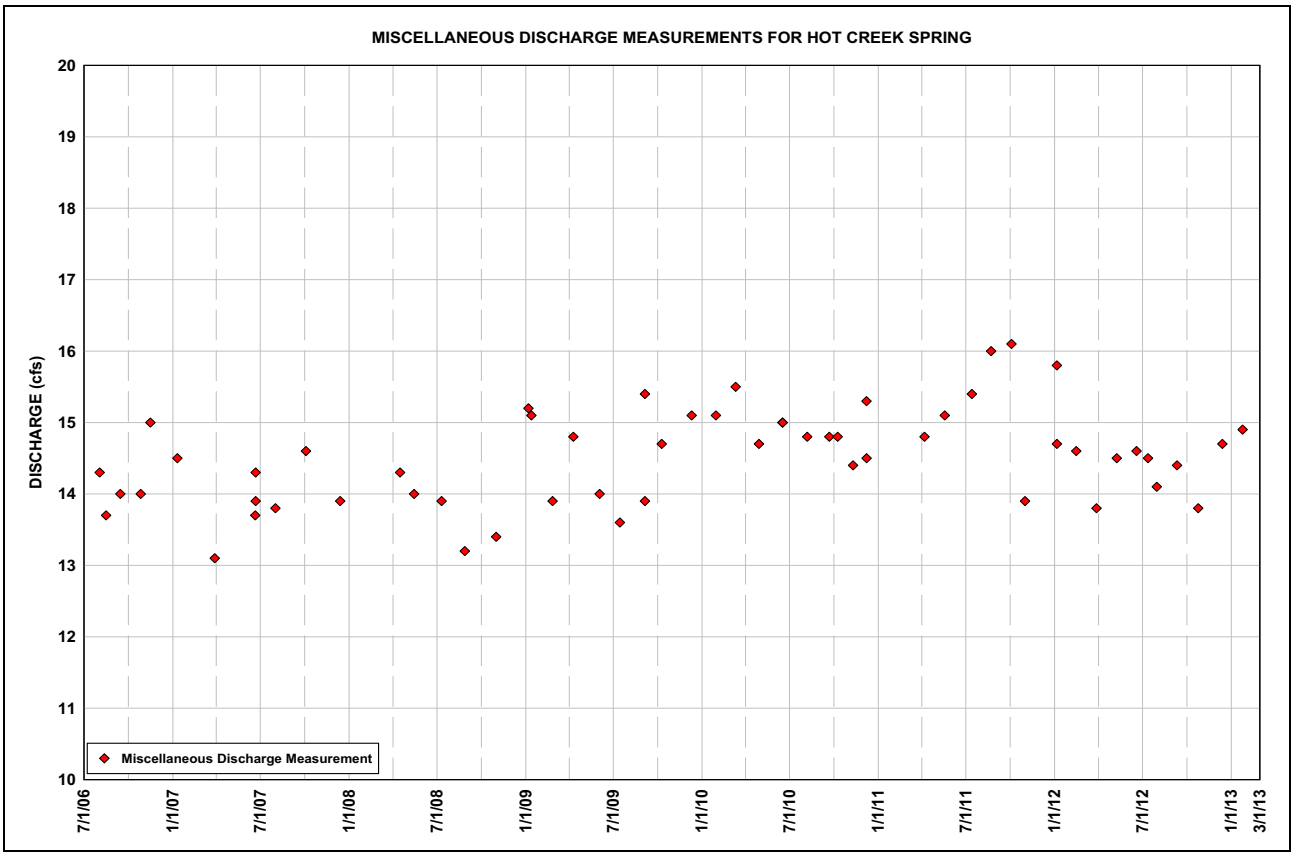
Station Name	Primary Name	Date	Discharge	Unit
Hardy Springs	2071501	5/14/2012	0.27[a]	cfs
		10/23/2012	0.39[a]	cfs
Crystal Springs near Hiko, NV	2090401	1/5/2012	13.6	cfs
		2/14/2012	12.8	cfs
		3/27/2012	12.2	cfs
		4/5/2012	3.39	cfs
		5/8/2012	12.9	cfs
		6/18/2012	13.0	cfs
		6/18/2012	12.5	cfs
		7/30/2012	13.0	cfs
		9/10/2012	12.4	cfs
		9/10/2012	13.0	cfs
		10/24/2012	12.3	cfs
		11/8/2012	3.03	cfs
		12/13/2012	12.0	cfs
Crystal Springs Diversion near Hiko, NV	09415589	1/5/2012	0	cfs
		2/14/2012	0	cfs
		3/27/2012	0	cfs
		4/5/2012	8.85	cfs
		4/5/2012	8.43	cfs
		4/19/2012	0	cfs
		5/8/2012	0	cfs
		6/7/2012	NA[b]	cfs
		6/7/2012	8.07	cfs
		6/7/2012	8.73	cfs
		6/18/2012	0	cfs
		7/30/2012	0	cfs
		9/10/2012	0	cfs
		10/24/2012	0	cfs
		11/8/2012	NA[b]	cfs
		11/8/2012	8.21	cfs
		11/8/2012	8.53	cfs
		12/13/2012	0	cfs
Ash Springs Creek below Diversion at Hwy 93 at Ash Springs, NV	09415645	1/5/2012	17.0	cfs
		1/5/2012	17.3	cfs
		2/14/2012	13.2	cfs
		2/14/2012	12.7	cfs
		3/27/2012	17.7	cfs

Table D-1
Spring Discharge Measurements
(Page 3 of 3)

Station Name	Primary Name	Date	Discharge	Unit
Ash Springs Creek below Diversion at Hwy 93 at Ash Springs, NV	09415645	3/27/2012	18.4	cfs
(con't)	(con't)	5/8/2012	NA[b]	cfs
		5/8/2012	20.1	cfs
		5/8/2012	20.0	cfs
		6/18/2012	19.6	cfs
		8/1/2012	19.2	cfs
		9/10/2012	18.4	cfs
		10/22/2012	18.1	cfs
		11/13/2012	15.0	cfs
		12/13/2012	16.9	cfs
		12/13/2012	17.8	cfs
Ash Springs Diversion Ditch below Hwy 93 at Ash Springs, NV	094156395	1/5/2012	0	cfs
		1/24/2012	3.32	cfs
		1/24/2012	3.24	cfs
		2/14/2012	3.48	cfs
		3/27/2012	0	cfs
		4/19/2012	0	cfs
		5/8/2012	0	cfs
		5/17/2012	0.039	cfs
		5/17/2012	0.032	cfs
		6/18/2012	0	cfs
		8/1/2012	0	cfs
		9/10/2012	0	cfs
		10/22/2012	0	cfs
		11/13/2012	2.86	cfs
		11/13/2012	2.97	cfs
		12/13/2012	0	cfs
Cave Spring	1800101	5/15/2012	0.43[a]	cfs
		10/23/2012	0[a]	N/A
Littlefield Spring	1810301	5/15/2012	0.06[a]	cfs
		10/22/2012	0.04[a]	cfs
Grassy Spring	1820101	5/15/2012	0.20[a]	gpm
		10/22/2012	0.16[a]	gpm
Silver King Well	381624114540302	5/15/2012	0.002[a]	cfs
		10/22/2012	0.001[a]	cfs

[a]Data collected by SNWA which is the data owner agency.
[b]No measurement made.
Note: USGS is the owner agency for the data presented unless otherwise specified.


MEAN DAILY DISCHARGE FOR HOT CREEK SPRING
DISCHARGE (cfs)
20
19
18
17
16
15
14
13
12
11
10
Mean Daily Values
7/1/06
1/1/07
7/1/07
1/1/08
7/1/08
1/1/09
7/1/09
1/1/10
7/1/10
1/1/11
7/1/11
1/1/12
7/1/12
1/1/13
3/1/13


MISCELLANEOUS DISCHARGE MEASUREMENTS FOR HOT CREEK SPRING
DISCHARGE (cfs)
20
19
18
17
16
15
14
13
12
11
10
Miscellaneous Discharge Measurement
7/1/06
1/1/07
7/1/07
1/1/08
7/1/08
1/1/09
7/1/09
1/1/10
7/1/10
1/1/11
7/1/11
1/1/12
7/1/12
1/1/13
3/1/13

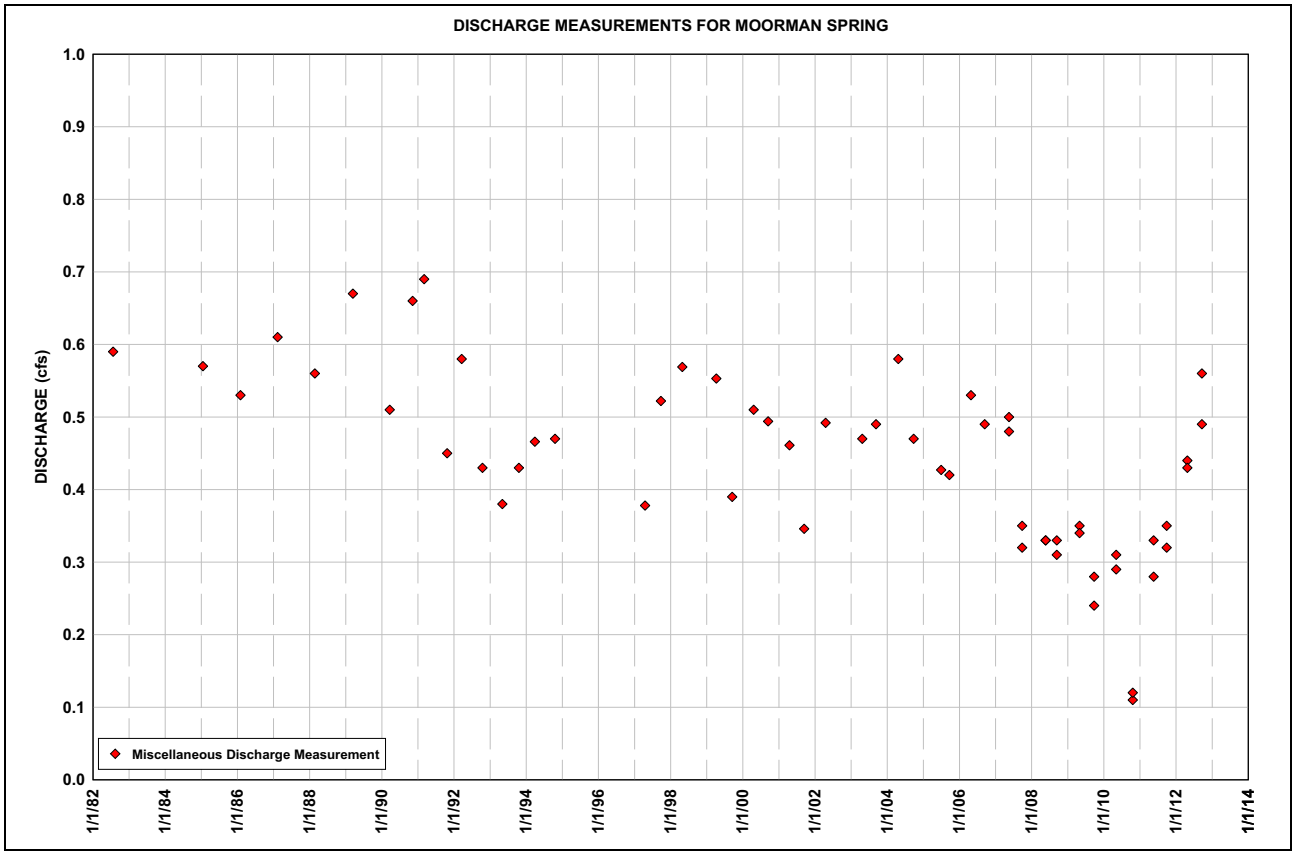

DISCHARGE MEASUREMENTS FOR MOORMAN SPRING
DISCHARGE (cfs)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Miscellaneous Discharge Measurement
1/1/82
1/1/84
1/1/86
1/1/88
1/1/90
1/1/92
1/1/94
1/1/96
1/1/98
1/1/00
1/1/02
1/1/04
1/1/06
1/1/08
1/1/10
1/1/12
1/1/14

Table D-2
Discharge Measurement Summary of Flag Springs Complex

Spring Name	Average Discharge[a] (cfs)	Minimum Discharge[a] (cfs)	Maximum Discharge[a] (cfs)	Standard Deviation[a] (cfs)	April 2012 Discharge[b] (cfs)	September 2012 Discharge[b] (cfs)
Flag Spring 1 (North)	2.38	1.54	3.49	0.39	2.42	2.34
Flag Spring 2 (Middle)	2.84	0.50	3.64	0.42	2.83	2.70
Flag Spring 3 (South)	2.14	1.22	3.66	0.44	1.90	2.08

[a]Period of record (1982-2012).
[b]2012 Discharge measurements are the average of two reported measurements.
Source: USGS (2013)

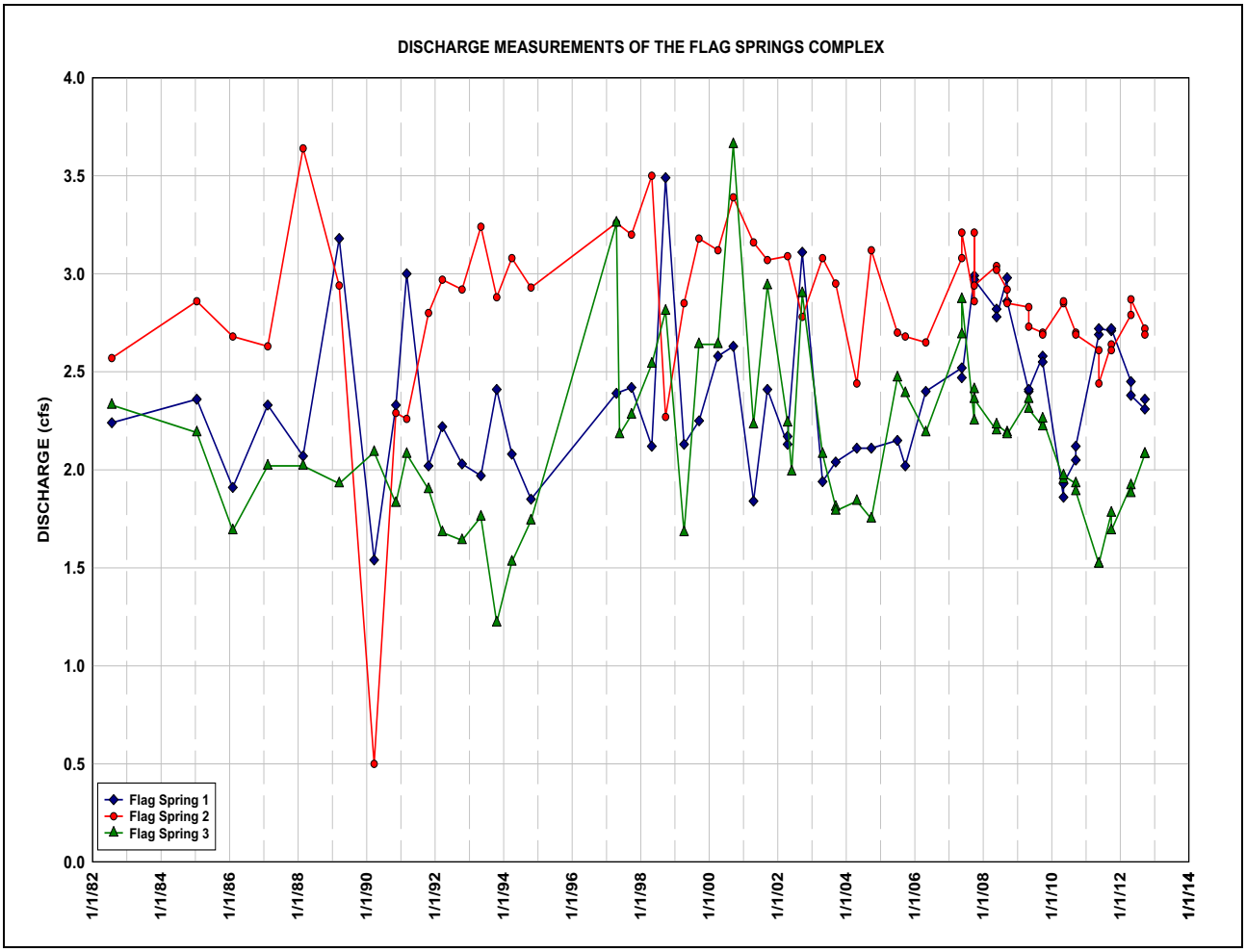


Table D-3
Discharge Measurement Summary of Hardy Springs

Spring Name	Average Discharge[a,b] (cfs)	Minimum Discharge[a,b] (cfs)	Maximum Discharge[a,b] (cfs)	Standard Deviation (cfs)	October 2012 Discharge[b] (cfs)
Hardy Springs	0.34	0.27	0.44	0.05	0.39

[a]Based on single measurements in 2004 and 2009 and biannual measurements from 2010 through 2012.
[b]Source: SNWA data

Table D-4
Annual Discharge at Crystal Springs

Water Year[a,b]	Crystal Springs (09415590)		Crystal Springs Diversion (09415589)			Total Combined Discharge (afy)
	Annual Discharge (afy)	Average Annual Discharge (cfs)	Annual Discharge (afy)	Average Annual Discharge (cfs)	Days Diverted	
2005	8,110	11.2	1,230	1.70	78	9,340
2006	8,190	11.3	923	1.28	67	9,113
2007	8,230	11.4	998	1.38	67	9,228
2008	8,100	11.2	1,020	1.40	80	9,120
2009	8,090	11.2	987	1.36	74	9,077
2010	8,120	11.2	743	1.03	52	8,863
2011	7,860	10.9	1,100	1.52	78	8,960
2012	8,150	11.2	709	0.98	50	8,859
Average for the period of record[c]	8,106	11.2	964	1.33	68	9,070

[a]Water years 1990, 1991, 1992, 1993, and 1999 are excluded as explained in the text.
[b]Data are from USGS Water Resources Data - Nevada water years 2005 through 2012 (USGS, 2013).
[c]These values are extrapolated from the Crystal Springs gaging station records published by USGS (USGS, 2013).

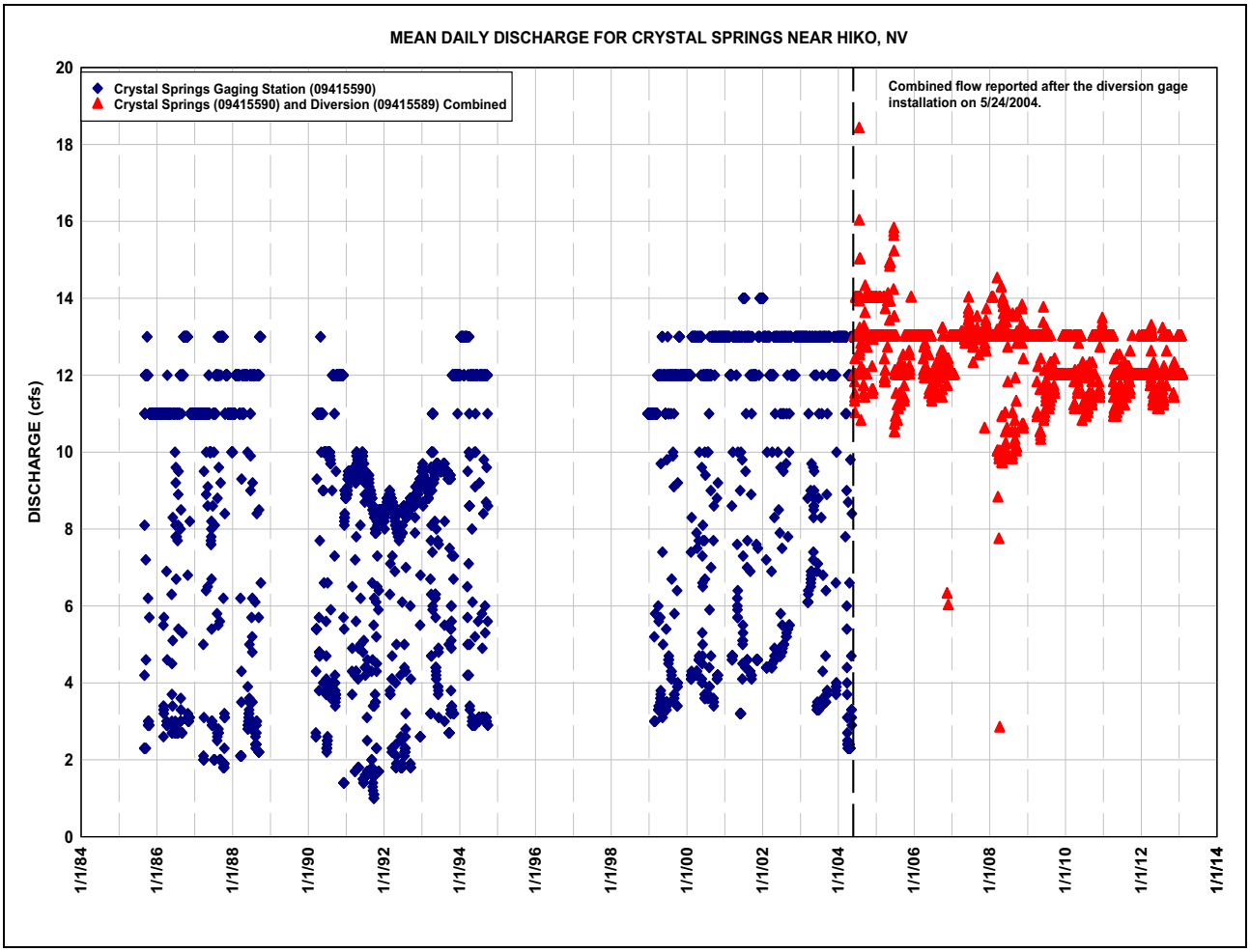
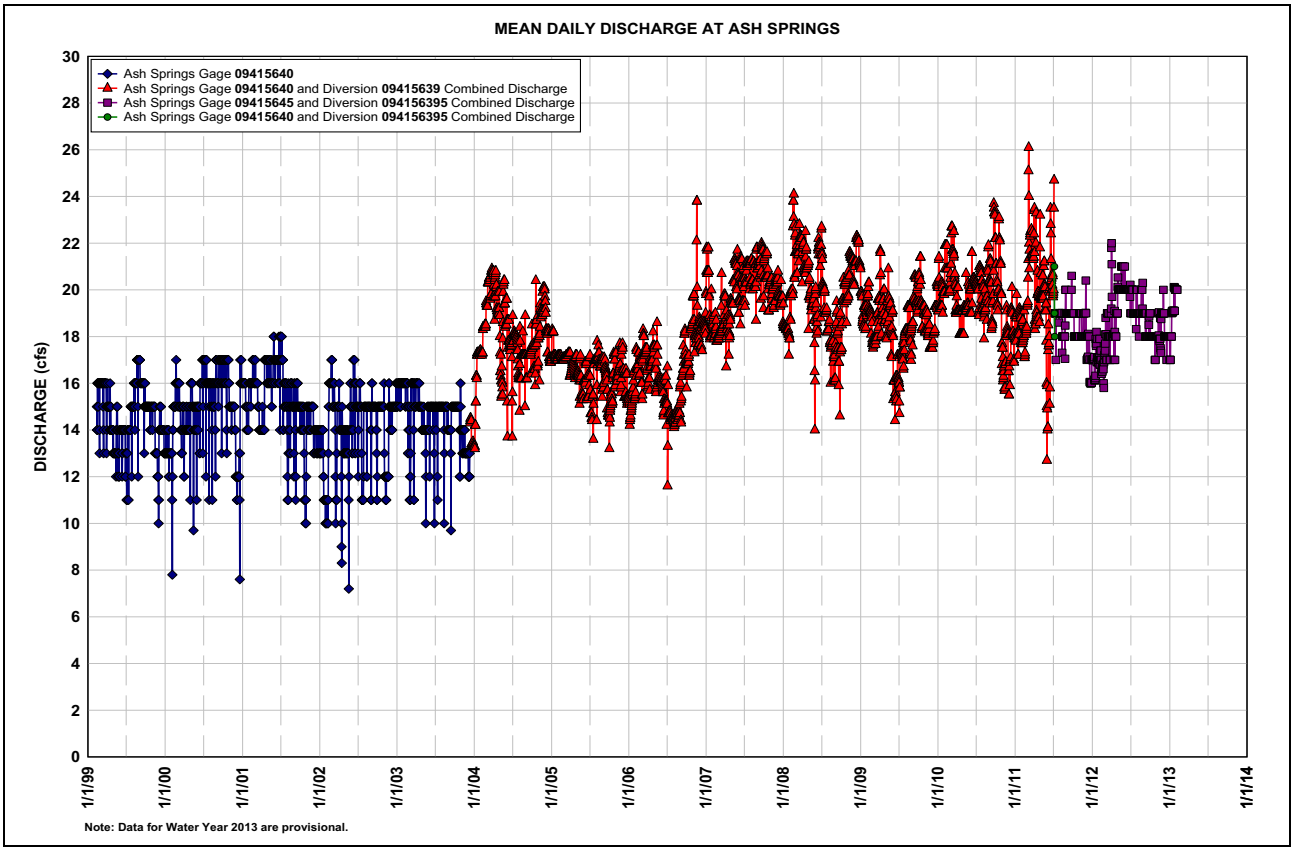

MEAN DAILY DISCHARGE FOR CRYSTAL SPRINGS NEAR HIKO, NV
Crystal Springs Gaging Station (09415590)
Crystal Springs (09415590) and Diversion (09415589) Combined
Combined flow reported after the diversion gage installation on 5/24/2004.
DISCHARGE (cfs)
0
2
4
6
8
10
12
14
16
18
20
1/1/84
1/1/86
1/1/88
1/1/90
1/1/92
1/1/94
1/1/96
1/1/98
1/1/00
1/1/02
1/1/04
1/1/06
1/1/08
1/1/10
1/1/12
1/1/14

Table D-5
Annual Discharge at Ash Springs

Water Year[a,b]	Ash Springs[c] (09415640 and 09415645)		Ash Springs Diversion[d] (09415639 and 094156395)			Total Combined Discharge (afy)
	Annual Discharge (afy)	Average Annual Discharge (cfs)	Annual Discharge (afy)	Average Annual Discharge (cfs)	Days Diverted	
2005	10,080	13.9	2,190	3.03	365	12,270
2006	8,780	12.1	2,810	3.88	365	11,590
2007	11,570	16.0	2,480	3.43	365	14,050
2008	11,740	16.2	2,600	3.58	366	14,340
2009	11,900	16.4	1,860	2.57	365	13,760
2010	12,710	17.6	1,570	2.17	365	14,280
2011	12,260	16.9	1,560	2.16	282	13,820
2012	12,970	17.9	430	0.59	70	13,420
Average for the period of record[e]	11,501	15.9	1,938	2.68	318	13,441

[a]Data from USGS Water Resources Data-Nevada water years 2005 through 2012 (USGS, 2013).
[b]Period of record for Ash Springs Diversion (09415639) is December 12, 2003 to July 7, 2011. The 2004 water year is incomplete.
[c]Mean daily values for new site (09415645) used from July 8, 2011 to present.
[d]Mean daily values for new site (094156395) used from July 5, 2011 to present.
[e]These values are extrapolated from the Ash Springs gaging station records published by USGS (USGS, 2013).


MEAN DAILY DISCHARGE AT ASH SPRINGS
Ash Springs Gage 09415640
Ash Springs Gage 09415640 and Diversion 09415639 Combined Discharge
Ash Springs Gage 09415645 and Diversion 094156395 Combined Discharge
Ash Springs Gage 09415640 and Diversion 094156395 Combined Discharge
DISCHARGE (cfs)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
1/1/99
1/1/00
1/1/01
1/1/02
1/1/03
1/1/04
1/1/05
1/1/06
1/1/07
1/1/08
1/1/09
1/1/10
1/1/11
1/1/12
1/1/13
1/1/14
Note: Data for Water Year 2013 are provisional.

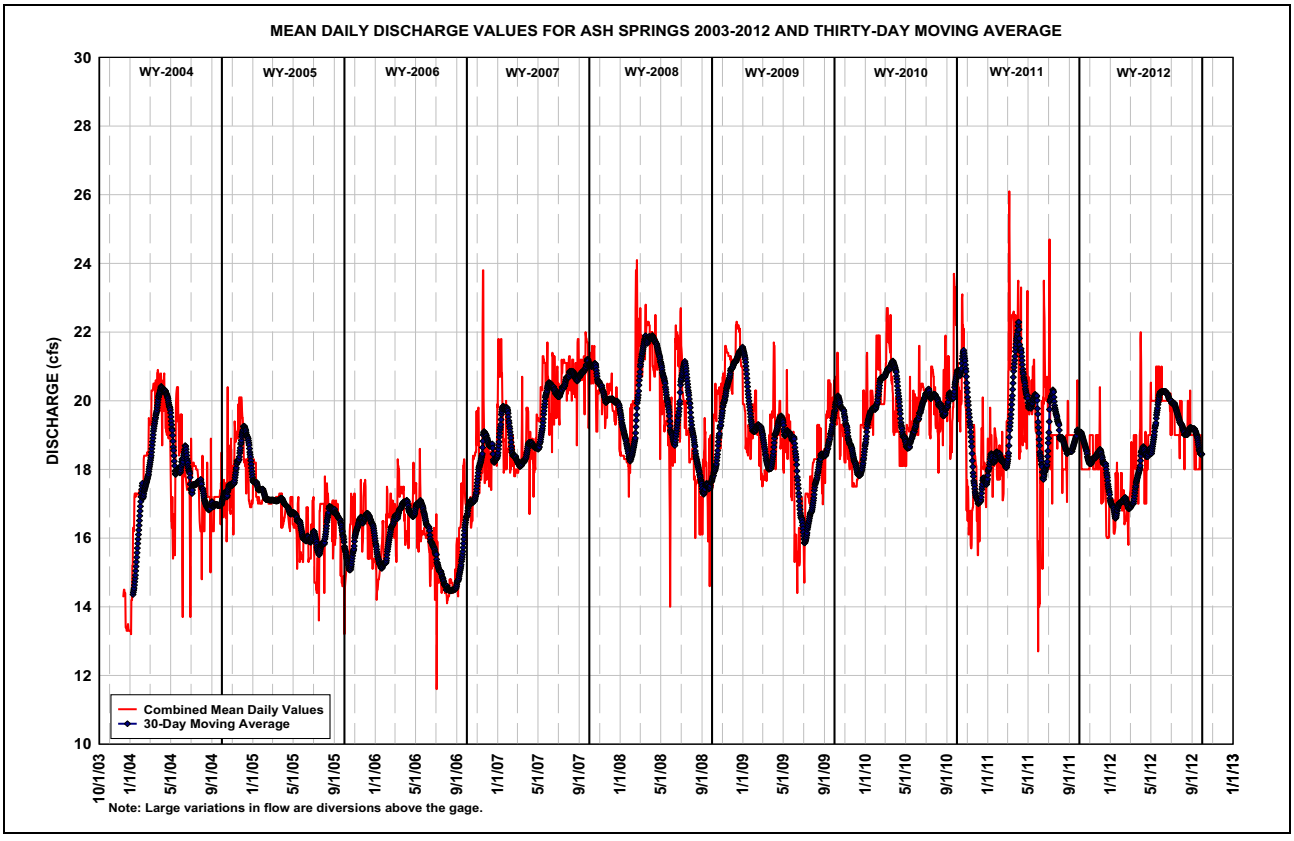

MEAN DAILY DISCHARGE VALUES FOR ASH SPRINGS 2003-2012 AND THIRTY-DAY MOVING AVERAGE
WY-2004
WY-2005
WY-2006
WY-2007
WY-2008
WY-2009
WY-2010
WY-2011
WY-2012
DISCHARGE (cfs)
10
12
14
16
18
20
22
24
26
28
30
Combined Mean Daily Values
30-Day Moving Average
10/1/03
1/1/04
5/1/04
9/1/04
1/1/05
5/1/05
9/1/05
1/1/06
5/1/06
9/1/06
1/1/07
5/1/07
9/1/07
1/1/08
5/1/08
9/1/08
1/1/09
5/1/09
9/1/09
1/1/10
5/1/10
9/1/10
1/1/11
5/1/11
9/1/11
1/1/12
5/1/12
9/1/12
1/1/13
Note: Large variations in flow are diversions above the gage.

Table D-6
Station Number 2090102 - Hiko Spring at Hiko, NV, Water Year 2012
Mean Daily Discharge Values

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	--	--	5.6	5.4	5.8	5.6	5.9e	5.0	5.7	0.0	5.9	6.6e
2	--	--	5.4	5.4	5.8	5.4	6.7e	5.2	5.8	0.0	5.9	5.6
3	--	--	5.7	5.6	5.9	5.6	5.3	4.9	5.7e	5.5e	6.0	5.6
4	--	--	5.9	6.1	5.6	5.6	4.4e	4.9	6.2e	5.9	6.0	4.5
5	--	--	5.9	5.8	5.4	5.5	4.8e	5.3	4.8e	5.7	6.5e	4.6
6	--	--	5.8	6.0	6.0	5.4	5.8e	5.6	4.7e	5.8e	7.4e	4.6
7	--	--	5.9	6.0	6.1	5.3e	5.2	5.6	5.5e	5.9e	0.0	4.7
8	--	5.1e	5.6	5.6	6.1	5.7e	5.2	5.6	5.7e	5.7e	8.3e	5.0
9	--	5.7e	5.9	5.8	6.1	0.0	5.5	5.6e	5.6	4.8	8.3e	5.1
10	--	5.9	5.9	5.6	6.1	7.6e	5.7	4.8e	5.0	5.3	5.8	5.0
11	--	6.0	6.0	5.8	6.4	6.6e	5.6	0.0	5.5	6.1e	6.0	5.0e
12	--	6.0	6.1	5.8	6.1	5.6e	5.8	0.0	5.8	6.4e	5.8	5.9e
13	--	6.0e	6.1	5.9	5.4	5.6	6.0	7.5e	5.9	6.9e	5.7	6.0
14	--	6.9e	6.1	5.9	3.8	5.1	6.2	6.3	5.9	7.6e	5.6	6.6
15	--	5.8	6.1	5.9	3.7	5.4	5.8	5.6	5.9	5.4e	5.8	7.1
16	--	5.7	6.1	5.9	3.9	5.7	4.0	4.8	6.5	5.8	5.9	6.0
17	--	5.5	6.1	6.4	5.5	5.9	3.2	5.2	7.2	5.9	5.8e	5.5
18	--	5.5	6.1	6.2	5.8	6.0	6.1	5.5	7.8	5.7	7.2e	5.4e
19	--	5.5	6.1	6.2	5.9	6.0	5.8	6.5	6.8	5.9	0.0	5.2e
20	--	5.4	6.1	6.0	5.9	6.2	5.3	5.0	6.0	5.9	7.2e	5.0e
21	--	5.3	6.2	5.8	6.0	3.1	4.8	5.7e	5.3	5.9	6.6e	5.5
22	--	5.9	6.0	5.8	6.0	1.6	4.6	6.8e	5.4	6.0	5.5e	5.8
23	--	6.0	5.9	5.3	6.2	1.7	4.7	0.0	5.6	6.0	5.8	6.0
24	--	6.0	5.9	5.8	7.3	4.0	5.3	0.0	5.8e	7.5e	5.3	6.2e
25	--	5.9	6.0	6.0	7.0	5.0	5.4	0.0	5.8e	7.1e	5.3	7.7e
26	--	5.8	6.1	6.1	6.5	5.4	5.2e	6.6e	4.8e	7.0e	5.5	0.0
27	--	5.7	6.1	6.1	5.5	7.3e	6.7e	5.5	5.3	7.5	5.3	0.0
28	--	5.6	6.1	6.1	5.6	5.8e	6.8e	5.0	5.1e	6.3	5.3	5.5e
29	--	5.6	6.0	6.0	5.6	5.0	6.8e	4.9	6.6e	5.8	5.7	5.7
30	--	5.6	5.6	5.8	--	5.4	6.0e	5.4	0.0	5.8	6.2	5.3
31	--	--	5.4	5.8	--	5.8	--	5.5	--	5.9	7.0e	--
Total	--	--	184	182	167	160	165	144	168	177	179	157
Min	--	--	5.4	5.3	3.7	0.0	3.2	0.0	0.0	0.0	0.0	0.0
Max	--	--	6.2	6.4	7.3	7.6	6.8	7.5	7.8	7.6	8.3	7.7
Mean	--	--	5.93	5.87	5.76	5.16	5.49	4.65	5.59	5.71	5.76	5.22
Ac-ft	--	--	364	360	331	317	327	285	333	350	354	311

Note: Values are in cfs unless noted otherwise. e = Estimated day.

LOCATION: UTM NAD 1983 Zone 11N (meters), Northing 4,162,554 m, Easting 656,915 m, in SW1/4 NE1/4 SW1/4 sec.14, T. 4S., R. 60E, Lincoln County, 0.5 mi southwest of the office.

DRAINAGE AREA: Indeterminate.

PERIOD OF RECORD: June 2009 to current year.

GAGE: Ultra-sonic flow meter. Elevation of the gage is 3,868 ft amsl NAVD88.

REMARKS: Records are good except for estimated days which are rated as poor. Discharge records are affected by both upstream and downstream agricultural diversions.

Annual Statistics	
Min:	---
Max:	---
Annual Total (Acre-ft):	---
Annual Mean (cfs):	---

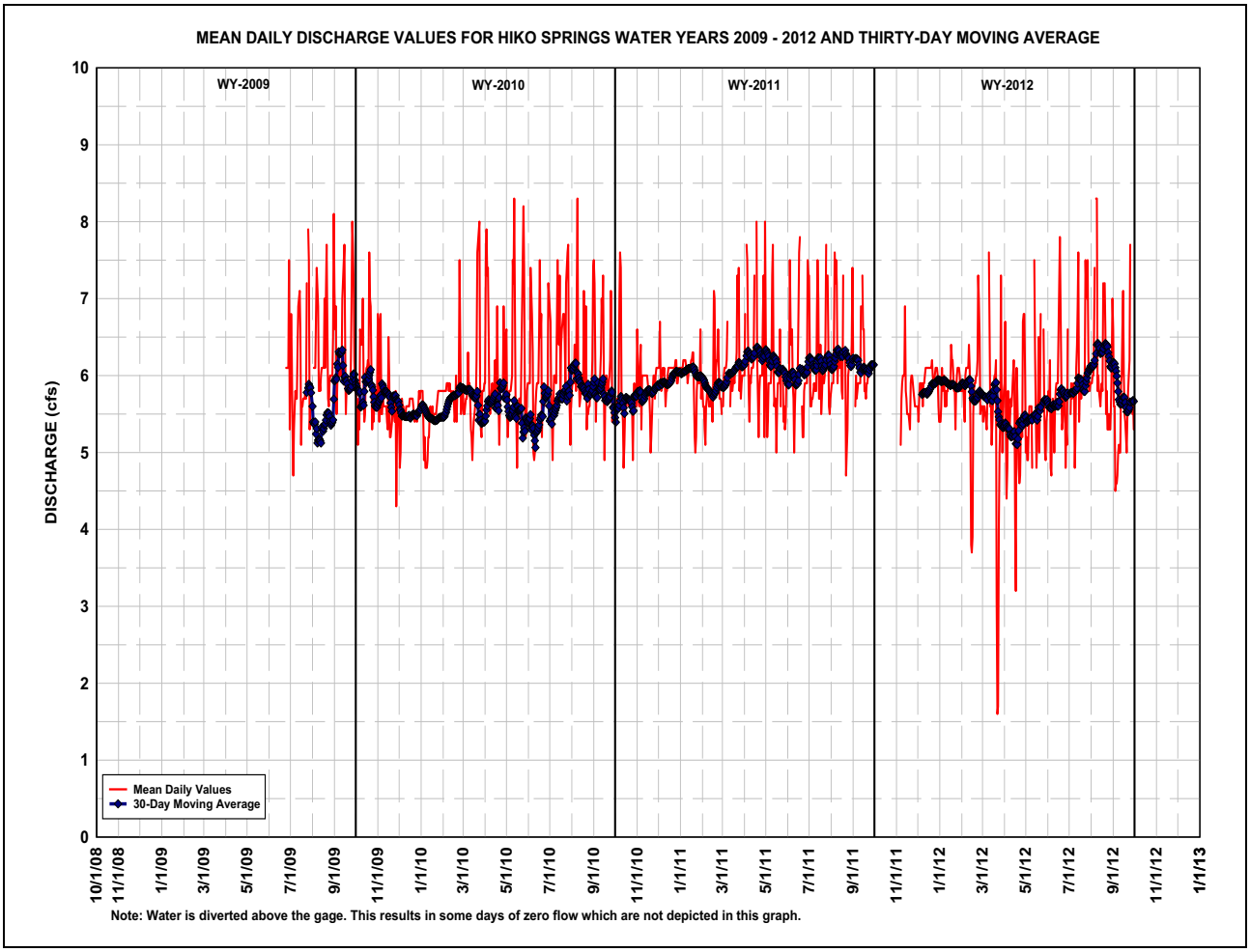

MEAN DAILY DISCHARGE VALUES FOR HIKO SPRINGS WATER YEARS 2009 - 2012 AND THIRTY-DAY MOVING AVERAGE
WY-2009
WY-2010
WY-2011
WY-2012
DISCHARGE (cfs)
0
1
2
3
4
5
6
7
8
9
10
Mean Daily Values
30-Day Moving Average
10/1/08
11/1/08
1/1/09
3/1/09
5/1/09
7/1/09
9/1/09
11/1/09
1/1/10
3/1/10
5/1/10
7/1/10
9/1/10
11/1/10
1/1/11
3/1/11
5/1/11
7/1/11
9/1/11
11/1/11
1/1/12
3/1/12
5/1/12
7/1/12
9/1/12
11/1/12
1/1/13
Note: Water is diverted above the gage. This results in some days of zero flow which are not depicted in this graph.

Table D-7
Station Number 2071302 - Flag Spring 2 near Sunnyside, NV, Water Year 2012
Mean Daily Discharge Values

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.6	2.5	2.6
2	2.7	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.6	2.5	2.6
3	2.7	2.6	2.6	2.6	2.7	2.6	2.7	2.7	2.6	2.5	2.5	2.6
4	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.5	2.5	2.6
5	2.7	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.5	2.5	2.6
6	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.5	2.5	2.6
7	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.5	2.5	2.6
8	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.7	2.6	2.5	2.5	2.6
9	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.7	2.6	2.5	2.5	2.6
10	2.6	2.6	2.6	2.7	2.6	2.7	2.7	2.7	2.6	2.5	2.5	2.6
11	2.6	2.6	2.6	2.7	2.6	2.7	2.8	2.7	2.6	2.5	2.5	2.6
12	2.6	2.6	2.6	2.7	2.6	2.7	2.8	2.7	2.6	2.5	2.5	2.6
13	2.6	2.6	2.6	2.7	2.6	2.7	2.8	2.6	2.6	2.5	2.5	2.6
14	2.6	2.6	2.6	2.7	2.6	2.7	2.7	2.7	2.6	2.5	2.5	2.6
15	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.7	2.6	2.5	2.5	2.6
16	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.5	2.5	2.5	2.6
17	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.6	2.5	2.5	2.6
18	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.6	2.5	2.5	2.6
19	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.5	2.5	2.5	2.6
20	2.6	2.6	2.7	2.6	2.6	2.7	2.7	2.6	2.5	2.5	2.5	2.6
21	2.6	2.6	2.7	2.6	2.6	2.7	2.7	2.6	2.6	2.5	2.5	2.6
22	2.6	2.6	2.7	2.6	2.6	2.7	2.7	2.6	2.6	2.5	2.5	2.6
23	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.6	2.5	2.5	2.6
24	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.6	2.5	2.6	2.6
25	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.6	2.5	2.6	2.6
26	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.6	2.5	2.6	2.6
27	2.6	2.6	2.6	2.6	2.7	2.7	2.7	2.6	2.6	2.5	2.6	2.6
28	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.6	2.5	2.6	2.6
29	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.6	2.5	2.6	2.6
30	2.6	2.6	2.6	2.6	--	2.7	2.7	2.6	2.6	2.5	2.6	2.6
31	2.6	--	2.6	2.6	--	2.7	--	2.6	--	2.5	2.6	--
Total	81.0	78.0	80.9	81.1	75.6	83.0	81.3	82.0	77.7	77.7	78.3	78.0
Min	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.6	2.5	2.5	2.5	2.6
Max	2.7	2.6	2.7	2.7	2.7	2.7	2.8	2.7	2.6	2.6	2.6	2.6
Mean	2.61	2.60	2.61	2.62	2.61	2.68	2.71	2.65	2.59	2.51	2.53	2.60
Ac-ft	160	154	160	161	150	164	161	162	154	154	155	154

Note: Values are in cfs unless noted otherwise.

LOCATION: UTM NAD 1983 Zone 11N (meters), Northing 4,254,570 m, Easting 672,576 m, in SW1/4 SW1/4 NW1/4 sec. 33 T. 7N., R. 62E., Nye County.

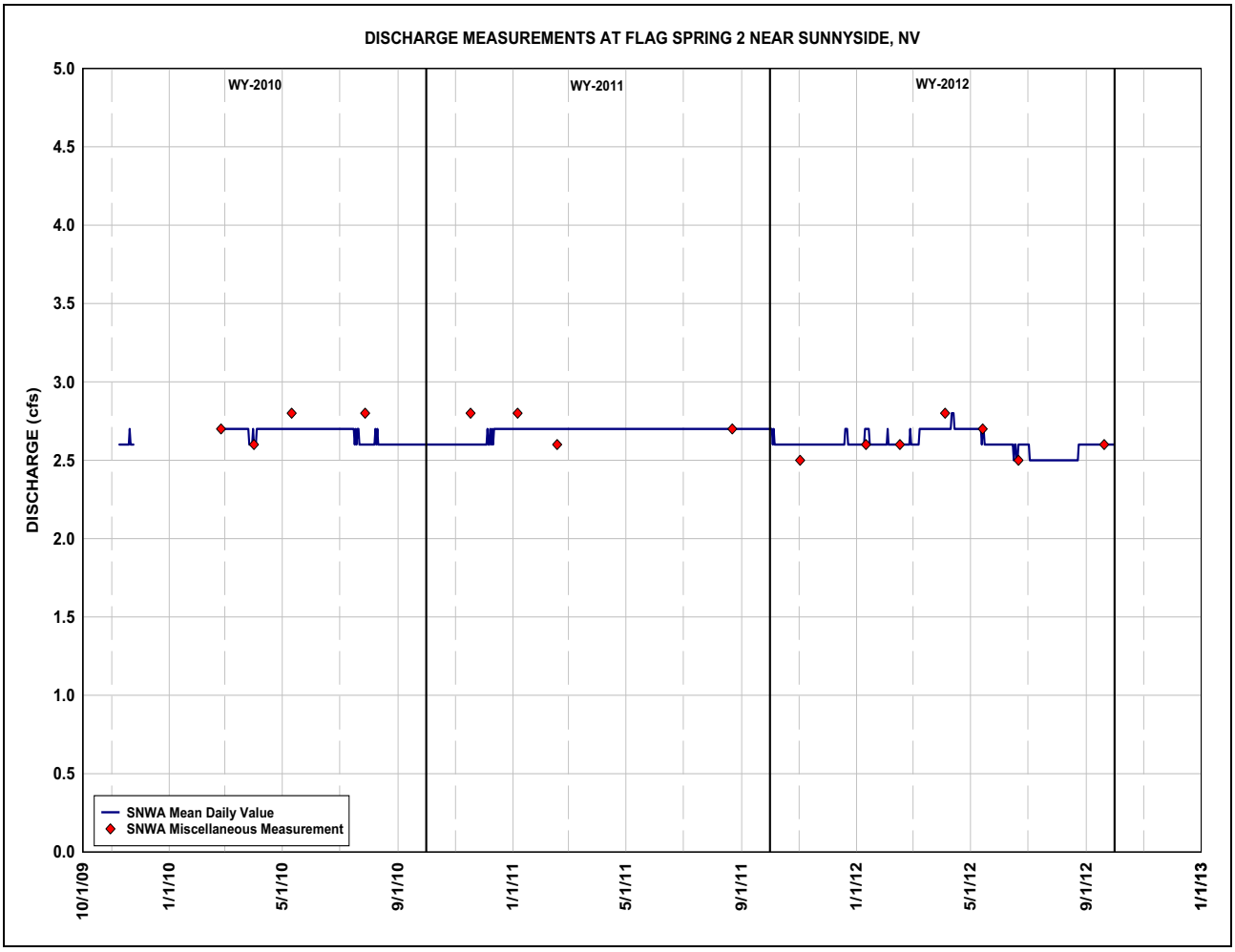
DRAINAGE AREA: Indeterminate.

PERIOD OF RECORD: November 2009 to current year.

GAGE: Bubbler/Pressure sensor. Elevation of the gage is estimated at 5,285 ft amsl NAVD88.

REMARKS: Records are rated as good.

Annual Statistics	
Min:	2.5
Max:	2.8
Annual Total (Acre-ft):	1,889
Annual Mean (cfs):	2.61


DISCHARGE MEASUREMENTS AT FLAG SPRING 2 NEAR SUNNYSIDE, NV
WY-2010
WY-2011
WY-2012
DISCHARGE (cfs)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
SNWA Mean Daily Value
SNWA Miscellaneous Measurement
10/1/09
1/1/10
5/1/10
9/1/10
1/1/11
5/1/11
9/1/11
1/1/12
5/1/12
9/1/12
1/1/13

References

U.S. Geological Survey, 2013, National water information system (NWIS Web), [Internet], [accessed February 2013], available from http://waterdata.usgs.gov/nwis.

USGS, see U.S. Geological Survey.

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Appendix E

2012 DDC Springs Site Photos

E.1.0 INTRODUCTION

This appendix presents photos taken during the biannual field visits to document DDC spring conditions. Many of the DDC springs are controlled by collector systems and have been modified from their natural condition. Others, such as Littlefield and Cave Springs, remain in their natural condition.

Figure E-1
Maynard Spring, May 2012

Figure E-2
Maynard Spring, October 2012

Figure E-3
Cave Spring, May 2012

Figure E-4
Cave Spring, October 2012

Figure E-5
Parker Station, May 2012

Figure E-6
Lewis Well, May 2012

Figure E-7
Lewis Well, October 2012

Figure E-8
Silver King Well, May 2012

Figure E-9
Silver King Well, October 2012

Figure E-10
Coyote Spring, May 2012

Figure E-11
Coyote Spring, October 2012

Figure E-12
Big Mud Spring, May 2012

Figure E-13
Big Mud Spring, October 2012

Figure E-14
Littlefield Spring, May 2012

Figure E-15
Littlefield Spring, October 2012

Figure E-16
Grassy Spring, May 2012

Figure E-17
Grassy Spring, October 2012

Appendix F

Regional and High-Altitude Precipitation-Station Data

Table F-1
2012 Regional Precipitation Data
(Page 1 of 3)

Blue Eagle Ranch Hank (RP1730201)													
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
2012	0.62	0.71	0.15	0.42	0.12	0.02	0.95	1.26	0.34a	0.03*	0.19*	1.09*	5.90
Period of Record Statistics (1978 to Present)													
Mean	0.69	0.70	0.86	0.91	0.93	0.40	0.53	0.73	0.67	0.90*	0.68*	0.50*	8.5
Min	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.41
Max	1.66	1.97	2.43	2.93	3.43	1.52	2.94	3.92	3.95	4.23	2.53	1.54	15.11
No. Yrs.	33	33	34	34	34	35	35	35	34	35	34	35	
McGill (RP1790201)													
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
2012	0.55	0.91	0.92	0.78	0.00	0.00	0.68	1.10	2.02a	0.62*	0.18*	1.53*	9.29
Period of Record Statistics (1892 to Present)													
Mean	0.63	0.65	0.75	0.95	1.03	0.76	0.69	0.76	0.68	0.80*	0.56*	0.60*	8.86
Min	0	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.76
Max	4.58	2.38	2.54	3.19	3.33	4.30	3.03	3.25	5.57	3.38	1.90	3.05	16.21
No. Yrs.	103	104	105	106	104	104	104	103	103	101	104	105	
Spring Valley State Park (RP2010201)													
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
2012	0.60a	1.01f	1.02	0.45	0.26	0.00c	0.40l	1.68p	1.6	1.40h*	0.20b*	0.00t*	8.62
Period of Record Statistics (1974 to Present)													
Mean	0.87	1.21	1.32	0.92	1.07	0.42	0.88	1.29	1.23	1.20*	0.65*	0.82*	11.88
Min	0	0	0	0	0	0	0	0	0	0	0	0	5.05
Max	3.81	3.65	4.3	3.92	3.7	2.14	3.68	5.41	9.72	4.95	3.43	6.62	23.48
No. Yrs.	34	34	36	35	36	37	36	38	37	36	36	34	
Caliente (RP2050201)													
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
2012	0.63	0.95b	1.25c	0.45	0.00e	0.00c	2.48c	2.75a	0.36c	0.83h*	0.02e*	1.41f*	11.13
Period of Record Statistics (1903 to Present)													
Mean	0.82	0.94	1.01	0.69	0.53	0.33	0.78	0.90	0.61	0.80*	0.67*	0.66*	8.74
Min	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.84
Max	3.47	3.98	4.59	3.71	2.27	1.95	5.36	4.18	3.14	5.12	3.38	3.76	18.73
No. Yrs.	87	88	85	88	87	87	87	89	90	87	89	88	

Table F-1
2012 Regional Precipitation Data
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Elgin (RP2050202)													
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
2012	0.00z	0.00z	0.78	0.68	0.00	0.00z	0.00z	0.00z	0.00z	0.95z*	0.00*	0.00r*	2.41
Period of Record Statistics (1951 to Present)													
Mean	1.59	2.04	1.46	0.94	0.42	0.31	0.82	0.87	0.65	0.96*	0.83*	0.91*	11.80
Min	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.72
Max	6.49	8.01	6.28	3.09	1.54	1.16	6.06	5.07	3.22	5.18	4.63	3.28	24.98
No. Yrs.	24	26	28	28	28	26	26	28	27	26	26	22	
Sunnyside (RP2070201)													
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
2012	0.3a	0.66	0.03d	0.45a	0.09	0j	0.83	0.64f	0.73c	0.64*	0.28*	0.91*	5.56
Period of Record Statistics (1891 to Present)													
Mean	0.68	0.8	0.97	0.79	0.81	0.48	0.75	0.82	0.83	0.90*	0.55*	0.66*	9.04
Min	0	0	0	0	0	0	0	0	0	0	0	0	5.73
Max	2.64	3.55	4.82	2.81	3.23	2.79	4.37	3.89	3.69	3.76	4.19	2.8	17.11
No. Yrs.	51	51	52	52	52	52	55	52	50	50	49	45	
Lund (RP2070202)													
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
2012	0.73	0.69	0.58a	0.16a	0.03	0.01	1.98a	1.37	0.93	0.62*	0.21*	1.45*	8.76
Period of Record Statistics (1957 to Present)													
Mean	0.78	0.85	1.00	0.98	0.95	0.82	0.69	0.87	0.77	0.92*	0.68*	0.74*	10.05
Min	0.01	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.99
Max	2.78	2.22	3.44	3.44	3.45	5.37	3.05	4.58	5.01	3.66	2.62	2.91	18.83
No. Yrs.	54	54	53	55	55	55	54	54	55	55	56	55	
Hiko (RP2090201)													
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
2012	0.56r	0.31i	0.78	0.77	0	0	1.27	1.17a	0.35	0.71*	0.04*	0.70*	6.66
Period of Record Statistics (1989 to Present)													
Mean	0.78	1.15	0.69	0.53	0.37	0.33	0.45	0.48	0.41	0.66*	0.41*	0.71*	6.97
Min	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.45
Max	2.94	4.13	3.07	1.56	1.69	1.66	1.65	2.52	2.43	3.38	1.91	4.02	13.68
No Yrs	21	22	23	23	23	23	23	23	24	23	24	24	

Table F-1
2012 Regional Precipitation Data
(Page 3 of 3)

Paharanagat Wildlife Refuge (RP2090202)													
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
2012	0.22	0.31	0.57	0.66	0.00	0.00a	0.03b	1.21s	0.21b	1.08*	0.00*	1.20a*	5.49
Period of Record Statistics (1964 to Present)													
Mean	0.71	0.75	0.73	0.61	0.37	0.19	0.46	0.60	0.35	0.53*	0.48*	0.41*	6.19
Min	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.23
Max	3.21	3.22	3.03	4.04	1.59	1.20	4.22	3.60	2.3	3.18	2.48	1.74	11.54
No. Yrs.	41	44	46	43	43	47	46	45	48	46	45	44	
Ward Mountain (RP2070301)													
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
2012	1.5	1.6	3	1.7	0.2	0	2.6	4.2	2.7	1.3	0.8	3.7	23.3
Period of Record Statistics (1979 to Present)													
Mean	2.56	2.83	2.79	2.48	2.41	0.94	1.00	1.39	1.46	2.03	1.82	2.24	23.95
Min	0.00	0.40	0.30	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.80
Max	6.10	9.50	8.10	5.70	7.00	3.90	4.80	4.70	7.90	6.60	7.20	10.70	39.70
No. Yrs.	32	32	32	32	31	31	31	31	31	35	34	33	

Note: Star(*) = Provisional Data; a = 1 day missing, b = 2 days missing, c = 3 days missing, etc.., z = 26 or more days missing; Long-term means based on summation of long-term monthly row values.

Table F-2
2012 High-Altitude Precipitation Data

Source	Station Number	Station Name	2012 Precipitation (in.)	Period of Record Statistics				
				Time Period	Mean	Min	Max	No. Yrs.
USGS	RP1840401	Mount Washington	16.00	1984 - 2012	26.51	12.00	62.00	28
USGS	RP1840402	Cave Mountain	19.75	1984 - 2012	20.39	12.00	32.16	29
USGS	RP2030401	Highland Peak	16.25	2001 - 2012	15.38	0.00	28.00	12
USGS	RP2090401	Mt. Irish	9.50	2001 - 2012	7.52	0.00	17.25	12
USGS	RP1830401	Mt. Wilson	20.75	1983 - 2012	19.04	0.00	47.00	30
USGS	RP1730401	Quinn Canyon Range	12.25	2003 - 2012	12.83	1.75	23.25	10
USGS	RP1820401	Unnamed peak S. of Chokecherry Peak	8.50	2001 - 2012	8.96	0.00	22.50	12
USGS	RP1820402	Unnamed peak in S. Delamar Mtns	11.50	2001 - 2012	11.02	0.00	32.50	12

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March 28, 2013

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Dear Mr. King and Stipulation Executive Committee Members:

SUBJECT: SUBMITTAL OF THE 2012 DDC AND SPRING VALLEY HYDROLOGIC MONITORING, MANAGEMENT AND MITIGATION PLAN STATUS AND DATA REPORTS

The Southern Nevada Water Authority (SNWA) hereby submits the subject reports to the Nevada State Engineer (NSE) and Stipulation Executive Committee (EC). These reports are submitted in satisfaction of reporting requirements set forth in hydrologic monitoring plans approved by the NSE associated with Rulings 6164 through 6167, and Exhibit A of the Dry Lake, Delamar, and Cave (DDC) and Spring Valley Stipulations for Withdrawal of Protests. The hydrologic monitoring plans approved by the NSE were submitted as SNWA exhibits 148 and 0149 during the 2011 administrative hearings regarding SNWA applications in the subject basins.

These reports provide the NSE, EC, and Technical Review Panel (TRP) with hydrologic data for calendar year 2012 and a status update of monitoring activities performed by SNWA. Copies of the reports have also been submitted to the TRP representatives.

An electronic copy of the data has been submitted to the NSE in the required format. Copies of the reports and NSE electronic data submittal will also be posted on the DDC and Spring Valley data-exchange web site.

If you have any questions regarding these reports, please contact James Prieur at (702) 862-7437.

Sincerely,

Zane L. Marshall
Director, Water & Environmental Resources

Enc.

ZM:clw

c: Rick Felling, Nevada Division of Water Resources
John Guillory, Nevada Division of Water Resources
Mark D'Aversa, Bureau of Land Management
Dan Netcher, Bureau of Land Management
Amy Lueders, Bureau of Land Management
Ray Roessel, Bureau of Indian Affairs, Western Region
William Van Liew, National Park Service, WRD
Sue Braumiller, U.S. Fish and Wildlife Service
Joe Gurrieri, USDA Forest Service
Andrew Burns, Southern Nevada Water Authority
James Prieur, Southern Nevada Water Authority