

The monthly precipitation totals for each of Zone 7's precipitation stations for the 2012 Water Year are shown in Table 3.1-2. Table 3.1-3 shows historical monthly data from Station 15E in Livermore, the station with the longest historical record (1871-2012). Daily and 15-minute data are archived in Zone 7's database. Figure 3.1-2, a graph of cumulative rainfall from Station 15E, presents data for the 2012 Water Year, along with the driest water year (1977), the calculated average water year, the wettest year (1983), and the 2011 Water Year for comparison.

Table 3.1-4 provides the monthly evapotranspiration (ET_o) for each of the three monitoring stations during the 2012 Water Year, and Table 3.1-5 shows monthly pan evaporation measured at Lake Del Valle (LDV-EV) data going back to the 1969 Water Year.

There were some data confidence issues with the LWRP pan evaporation data for the 2012 Water Year. This station had multiple days of zero pan evaporation while the other two program stations recorded ET_o/evaporation values of up to 0.16" on the same days. The City of Livermore operates this monitoring station, but Zone 7 will continue to monitor its integrity in the 2013 Water Year.

3.2 Groundwater Elevation and Quality Monitoring Program

3.2.1 Program Description

The Groundwater Elevation and Quality Monitoring Program includes the measurement of groundwater levels in monitoring and production wells, and the collection and analyses of groundwater samples. These hydrologic data are needed to assess groundwater supplies (i.e., quantity, quality, and trends). The program focuses on the Main Basin, where groundwater is pumped for municipal uses. Other Zone 7 programs utilize the data collected in this program, and the results are used in water resources management planning and decision making.

There were a total of 239 wells in the Zone 7 groundwater monitoring program during the 2012 Water Year (shown on Figure 3.2-1). Each well in the program was monitored and/or sampled to fulfill one or more specific objectives. Table 3.2-1 lists all of the wells in the program, the objective(s) of each monitoring well, and the frequency of monitoring or sampling for each objective. The objectives are summarized below:

Zone 7's Water Level Monitoring – groundwater level measurements are made twice per year during seasonal extremes (i.e., spring highs and fall lows) for storage tracking. Water level measurements are also measured monthly in some wells to monitor subsidence, adjust recharge operations, and identify when semi-annual water level measurements should be scheduled.

Zone 7's Water Quality Sampling –sampling of groundwater is performed annually from each of the wells in the program. Sampling is performed in some wells more frequently if required for an additional program described below. Also, some of the wells in the program are sampled and tested by an outside contractor or property owner, and the results are supplied to Zone 7 staff.

Del Valle Water Rights (WR) – continuous or monthly monitoring of water levels and semi-annual sampling for water quality is required for Arroyo Valle water rights.

Municipal Supply Well (Mu) – continuous or monthly monitoring of municipal supply wells for water levels and sampled quarterly or annually for water quality and California Department of Health Services (CDPH) permit compliance.

Key Wells (Key) – index wells in each of the largest subbasins of the Main Basin. Since the Amador Sub-basin is the largest and most significant subbasin, it is split into the Amador West and Amador East Sub-basins. Starting in the 2008 Water Year, the objective was expanded to monitor conditions in upper and lower aquifers in each subbasin separately. The following table lists the monitoring wells used for the Key Well Program in the 2012 Water Year:

Table: Key Wells for 2012 Water Year

SubBasin	Key Well Name	Aquifer	Former Name	Well Number
Bernal	Key_Bern_U	Upper	Fairgrounds Key	3S/1E 20C 7
	Key_Bern_L	Lower		3S/1E 20C 8
Amador-West	Key_AmW_U	Upper	Mohr Ave Key	3S/1E 9P 5
	Key_AmW_L	Lower		3S/1E 9P10
Amador-East	Key_AmE_U	Upper		3S/1E 11G 1
	Key_AmE_L	Lower	Hagemann Key	3S/1E 12K 2
Mocho II	Key_Mo2_U	Upper	Livermore Key	3S/2E 8K 2
	Key_Mo2_L	Lower		3S/2E 8H 3

Water levels are measured monthly in the Key Wells, however two of the Key Wells have pressure transducers and data recorders installed to collect water levels at 15-minute intervals. In general, these wells are sampled for water quality analyses on an annual basis.

Salt Management Plan (SMP) – mostly semi-annual monitoring of water levels and annual sampling for water quality analyses to identify salt/mineral quantity and migration in groundwater.

Well construction details for each of the wells in the program are shown in Table 3.2-2.

3.2.2 Program Changes and Notes for 2012 Water Year

The following items have changed from the 2011 Water Year or are items of note for the 2012 Water Year:

General Program Changes – Well 3S/1E 1R 2 was destroyed in May 2011 as part of the Isabel/Highway 84 widening project. Therefore, the well, which was not replaced, was dropped from the groundwater monitoring program for the 2012 Water Year.

CASGEM – In 2012 Water Year DWR developed the California Statewide Groundwater Elevation Monitoring (CASGEM) program to track groundwater elevations in California groundwater basins to satisfy the requirements established as part of the 2009 Water Package of legislation. The program requires monitoring entities such as Zone 7 to submit groundwater level data semiannually to DWR. Working collaboratively with DWR staff, Zone 7 has tentatively selected the following ten wells (eight Key Wells plus two others), which are representative of overall groundwater elevations in the groundwater basin, to be included in the program:

- 3S/1E 6F 3 (northern portion of Fringe Basin, upper aquifer)
- 3S/1E 9P 5 (Amador West Upper Key Well)
- 3S/1E 9P10 (Amador West Lower Key Well)
- 3S/1E 11G 1 (Amador East Upper Key Well)
- 3S/1E 12K 2 (Amador East Lower Key Well)
- 3S/1E 20C 7 (Bernal Upper Key Well)
- 3S/1E 20C 8 (Bernal Lower Key Well)
- 3S/2E 8H 3 (Mocho II Lower Key Well)
- 3S/2E 8K 2 (Mocho II Upper Key Well)
- 3S/2E 19D 7 (southern portion of Amador, lower aquifer)

Construction details for the wells are shown in Table 3.2-2, and the locations are shown in Figure 3.2-2. Zone 7 has already uploaded to the CASGEM website all previous groundwater level data from these wells. Zone 7 staff are currently waiting for DWR approval for this list of wells and will submit a formal CASGEM Work Plan later this year to DWR that will include the final approved list of wells. Although the program is still in development, updates are available on the website, www.water.ca.gov/groundwater/casgem/.

Arroyo De La Laguna Wells - Groundwater elevations in the southwestern portion of the Bernal Subbasin (as indicated primarily by the Bernal Upper Key Well, 3S/1E 20C 7, and Well 3S/1E 29M 4) remained below 295 ft for the most of the 2012 Water Year. Groundwater tends to discharge into the Arroyo De La Laguna and flows out of the basin when water levels are above elevation 295 feet in this portion of the Bernal Subbasin. The overflow volumes are calculated as part of Zone 7's hydrologic inventory (see Section 4.2.3).

Dublin San Ramon Services District (DSRSD) Samples – Zone 7 continued its data sharing agreement with DSRSD to obtain water levels and quality results from several of DSRSD's wells (listed in table below) installed to monitor the impacts, if any, from their facultative sludge lagoons and sludge disposal operations in Pleasanton.

Table: DSRSD Wells Included in 2012 Water Year Program

Well Number	DSRSD Well	Aquifer
3S/1E 6N 2	MW-3	Upper
3S/1E 6N 3	MW-4	Upper
3S/1E 6N 6	NE-76	Upper
3S/1E 7D 1	SW-75	Upper
3S/1E 7D 3	SE-70	Upper
3S/1W 1J 1	MW-1	Upper
3S/1W 12A 9	NW-75	Upper

Water levels were monitored by DSRSD and supplied to Zone 7. The results are included in Table 3.2-3 and discussed in Section 3.2.4.2. Groundwater samples from these wells were collected and analyzed by DSRSD, and the results were supplied to Zone 7. During one of these sampling events, DSRSD supplied Zone 7 with split samples for analysis by the Zone 7 laboratory. The results are included in Table 3.2-4 and discussed in Section 3.2.5.2.

High Salts in Mocho Wellfield – Particular attention has been paid to relatively rapid rises in Total Dissolved Solids (TDS) and hardness that occurred between 2007 and 2010 in some of the Mocho wellfield supply wells; however, during the 2011 and 2012 Water Years TDS concentrations decreased in Mochos 1, 3, and 4, and only slightly increased in Mocho 2. The progress of this ongoing investigation is discussed in Section 3.2.5.4.

Arroyo Las Positas Recharge – Natural recharge of high TDS water from the Arroyo Las Positas typically contributes about 1,400 tons of salt to the Main Basin annually. During the 2011 and 2012 Water Years, Zone 7 released relatively-low TDS State Water Project (SWP) water into the Arroyo Las Positas to reduce the salt loading into the Main Basin from this arroyo. To assess the effectiveness of this salt management strategy, Zone 7 developed a special study sampling program that included periodic sampling from the stream and nearby shallow groundwater monitoring wells. These water samples were analyzed for deuterium and oxygen 18 isotopes to determine if the recharge water could be tracked as it recharged the upper aquifer. Results of this sampling effort are presented in Section 3.2.6.

3.2.3 Historical Lows

Zone 7's objective is to maintain groundwater levels above "historical lows", a piezometric surface that was created from a compilation of historical-low groundwater elevations in various wells in the basin to avoid subsidence. These data are typically from the 1960s, 1977, and 1987-1992 drought periods when groundwater elevations were lowest in the basin. This historical low surface corresponds to an estimated groundwater storage volume of about 128,000 AF; whereas, the historical high water levels correspond to a storage volume of about 254,000 AF. The range from historical low to historical high provides an operational storage of about 126,000 AF.

In 1987, Zone 7 adopted a Groundwater Management Policy that included maintaining groundwater levels high enough to provide emergency reserves adequate for the worst credible drought. In 2005, Zone 7 adopted mitigation measures for its Well Master Plan (WMP, *Zone 7, 2003*) that require Zone 7 to maintain groundwater elevations above the historical lows, and to reduce the pumping or shift it to wells

having higher groundwater elevations when groundwater elevations approach the historical lows to reduce the risk for groundwater pumping-induced subsidence (Mitigation Measures 3.3-1b and 3.3-1c). In addition, Zone 7 has a Subsidence Monitoring Program (see Section 3.4). It should be noted that Zone 7 uses static condition water level data from local monitoring wells rather than pumping level data to gauge the height above the historical lows and compliance with the mitigation measure.

The historical low surface used in the WMP and associated Environmental Impact Report (EIR) (*Zone 7, 2005b*) was revised in 2009 and converted to a surface grid (i.e., *ArcGIS* raster image) for comparison with end-of-water-year elevations and spatial analyses (Figure 3.2-3). Section 3.2.4 discusses the relationship of 2012 Water Year water levels to historical lows.

3.2.4 Groundwater Levels for 2012 Water Year

3.2.4.1 Overview

In general, the groundwater levels in the Upper and Lower Aquifer Key Wells dropped significantly and ended the year approximately 7 to 17 ft below the water levels observed at the end of the 2011 Water Year. In general, water levels in the Key Wells dropped during this Water Year, specifically water levels changed as follows from the 2011 Water Year:

**Table: Change in Groundwater Elevation in Key Wells
Between Fall 2011 and Fall 2012**

Subbasin	Upper Aquifer (in ft)	Lower Aquifer (in ft)
Bernal	Down 13.5	Down 13.9
Amador West	Down 9.4	Down 9.2
Amador East	Down 10.6	Down 11.7
Mocho II	Down 7	Down 17.4

Figure 3.2-4 shows long-term hydrographs from each of the eight Key Wells. Figure 3.2-5 shows graphs of groundwater elevations in the Key Wells along with Main Basin inflow/outflow components over the last two years. Water levels in the Key Wells in subbasins pumped by Zone 7 (Bernal and Amador) indicated that water levels in the lower aquifer were 34 to 116 ft above historical lows at the end of the 2012 Water Year (see Section 4.2.4 for a discussion on operational storage, which is based on groundwater elevations above historical lows).

Table 3.2-3 contains a tabulation of spring and fall groundwater elevations for all program wells and includes a comparison with water levels of the previous fall. The groundwater elevations and gradients for the upper and lower aquifers are discussed in detail in the following sections. Groundwater quality of the upper and lower aquifers is described in Sections 3.2.5.2 and 3.2.5.3, respectively.

3.2.4.2 Upper Aquifer Zone

Figure 3.2-6 and Figure 3.2-7 show groundwater elevations in the upper aquifer for the Spring 2012 Water Year and Fall 2012 Water Year water level measurement events, respectively. Both of these figures include water levels from mining area ponds, located in the central and southern portions of the Amador Subbasin, which are believed to be connected with the upper aquifer. The mining companies are actively pumping into or pumping from some of these ponds, creating a groundwater mound or depression, respectively (Section 3.5). Also, much of the upper aquifer gravels in the mining area have been excavated and have been either backfilled with relatively impervious fine-grained soil or left as an unfilled pit or pond.

As is usually the case, 2012 Water Year water levels varied with seasonal recharge and extraction; generally the highest water levels are found at the end of the rainy season and lowest at the end of the high demand summer/fall seasons. The groundwater gradient in the Upper Aquifer was generally from east to west towards the Bernal Subbasin, then to the south where groundwater flows out of the Main Basin. The gradient in the upper aquifer generally ranged from 0.005 to 0.025 with isolated areas of flatter or steeper gradients, especially near subbasin boundaries (Figure 3.2-6 and Figure 3.2-7).

For the first half of the 2012 Water Year (Fall 2011 to Spring 2012), groundwater elevations declined in response to low rainfall recharge and lack of supply for artificial recharge due to the South Bay Aqueduct (SBA) being out of service for an improvement project. During the second half of the 2012 Water Year (Spring 2012 to Fall 2012), the water levels in the central portion of the Main Basin continued to decline, as is usually the case, for summer and fall seasons. Overall, the Main Basin experienced a drop in upper aquifer water levels of 7 to 15 ft from Fall 2011 to Fall 2012 (Figure 3.2-5).

For the entire water year, water levels in wells near the Arroyo De La Laguna remained below the elevation at which basin overflow occurs (approximately 295 feet above mean sea level [MSL]). Consequently, there was no basin overflow from the upper aquifer into the Arroyo De La Laguna during the 2012 Water Year.

3.2.4.3 Lower Aquifer Zone

Figure 3.2-8 and Figure 3.2-9 show groundwater elevations in the lower aquifer of the Main Basin for Spring and Fall 2012, respectively. These maps show a piezometric depression around several municipal or domestic wells that were pumping around the time of the Spring and Fall measurements. The groundwater gradient within the Mocho II and Amador Subbasins in the Lower Aquifer ranged from 0.001 to 0.05 with groundwater flowing generally westward along the longitudinal axis of the Livermore-Amador Valley. In the Bernal Subbasin, the gradient (typically less than 0.006) was slightly towards the north and east towards the Hopyard and Mocho Wellfields. Typically, the lowest elevations correspond to the municipal pumping wellfields in those subbasins.

There are two major subsurface structural features that act as partial barriers to the lateral movement of groundwater and cause groundwater to cascade in the Lower Aquifer.

1. Groundwater elevations in the Mocho II Subbasin were about 120 ft higher than those across the Livermore Fault in the Amador Subbasin.
2. Groundwater elevations in the Dublin/Camp/Bishop Subbasins were 20 to 50 ft higher than those across the Main Basin Boundary to the south (a.k.a., the Parks Boundary).

For the first half of the 2012 Water Year (Fall 2011 to Spring 2012), the water levels in the lower aquifer dropped (up to about 26 ft) due to continued municipal supply pumping and lack of recharge due to the SBA being out of service for capital improvements. For the second half of the water year (Spring to Fall 2012), water levels continued to drop (up to about 48 ft) throughout the lower aquifer, particularly in the Bernal and Amador Subbasins due to the normal seasonal municipal pumping that occurred during the summer months. From the beginning to the end of the water year (Fall 2011 to Fall 2012), the majority of water levels generally dropped in the Bernal, Amador, and Mocho II Subbasins by up to about 35 ft (Figure 3.2-5).

Zone 7's objective of maintaining groundwater levels above historical lows in all parts of the Main Basin was met in 2012 Water Year. Figure 3.2-10 shows the difference between groundwater elevations measured in the lower aquifer in Fall 2012 and historical lows. At the end of the water year, water levels in the central and northwestern Main Basin, in the vicinity of Zone 7's municipal wells, remained 40 to 80 ft above historical lows. Further to the southwest, in the central and southern portions of the Bernal Subbasin, water levels remain at greater than 100 feet above historical lows. Only San Francisco Public Utilities Commission (SFPUC) is using this part of the basin for municipal supply (supplying Castlewood). In the eastern part of the Main Basin (Mocho II Subbasin), where California Water Service (CWS) wells are located, the end of year groundwater levels were 60 to 130 feet above their respective historical lows (see Section 4.2.4 for a discussion on operational storage, which is based on groundwater elevation above historical lows).

3.2.5 Groundwater Quality for 2012 Water Year

3.2.5.1 Overview

Zone 7 is currently updating the Salt Management Plan to include nutrients and chemicals of emerging concern. If new issues are identified, the groundwater quality objectives will likely be modified. For now, other than localized contamination from toxic sites (discussed in Section 5.3.3), the main constituents of concern for meeting the Livermore Basin groundwater quality objectives are TDS and nitrate. Whereas the TDS objectives are based on drinking water aesthetics i.e., State secondary Maximum Contaminant Level (MCL), the nitrate objective is the State's primary MCL for drinking water, which is human health-based. Boron is a groundwater parameter of interest for the valley's agriculture and golf communities because of its potential for impact on certain irrigated crops and turf. Hardness is another groundwater parameter that influences Zone 7's ability to meet its delivered water quality target. Although routinely analyzed for, this parameter is not tracked separately from TDS in the groundwater monitoring program because it is generally proportional to the TDS values found in the Main Basin's groundwater and because it is tracked as a blended water quality parameter at the Retailer turnouts.

The following are Zone 7's groundwater quality objectives for the three groundwater constituents of concern:

- TDS (Main Basin): Ambient or 500 milligrams per liter (mg/L), whichever is lower
- TDS (Fringe Basins): Ambient or 1,000 mg/L, whichever is lower
- Nitrate (as NO₃): 45mg/L
- Boron: 1.0 mg/L (an agricultural supply target)

Concentrations and spatial distribution of the tracked constituents are presented in the following figures and tables:

- Table 3.2-4 contains groundwater quality data collected from the groundwater monitoring program network wells during the 2012 Water Year.
- Figure 3.2-11 and Figure 3.2-14 show maps of TDS concentrations for the upper and lower aquifers, respectively.
- Figure 3.2-12 and Figure 3.2-15 show maps of nitrate concentrations for the upper and lower aquifers, respectively.
- Figure 3.2-13 and Figure 3.2-16 show maps of boron concentrations for the upper and lower aquifers, respectively.
- Figure 3.2-17 and Figure 3.2-18 show historical graphs of TDS concentrations in the Key Wells.
- Figure 3.2-19 to Figure 3.2-22 show groundwater hydro-chemographs (with water level, TDS, nitrate, and boron) from wells in each of the major subbasins.

In general, concentrations for these constituents remained the same as the 2011 Water Year concentrations. The specific results for the constituents are discussed below by aquifer zone.

3.2.5.2 Upper Aquifer Zone

TDS

In the upper aquifer, TDS concentrations depend primarily on location relative to a source of recharge water, the water quality of the recharge water, and groundwater depth. Over the last 30 years there has been a general upward trend in TDS concentrations, particularly in the western portion of the Main Basin. Concentrations in the eastern and central portions of the valley, particularly near the high recharge reaches of the Arroyo Mocho and Arroyo del Valle (see Section 3.3), have stayed relatively low, especially during times of significant stream recharge.

During the 2012 Water Year, the TDS content in groundwater was once again the lowest in the areas adjacent to the artificial stream recharge reaches on the Arroyo Valle and Arroyo Mocho, where it is generally less than 500 mg/L of TDS. There are two regions of the Main Basin where TDS concentrations exceed 1,000 mg/L (Figure 3.2-11):

1. In the southern portion of the Dublin and Camp Subbasins and extending to the northern portion of the Bernal and Amador Subbasins. The western portion of this high TDS area is most likely due to the combination of the concentrating effects of urban irrigation, leaching of buried lacustrine sediments, and historical wastewater and sludge disposal practices. The eastern portion is most likely due to poor quality water from the marine sediments to the east and north recharging along the Arroyo Las Positas. Irrigation, with recycled water is another potential source of high TDS water that is recharging the upper aquifer in this region.
2. For the 2012 Water Year (and occasionally in the past) three wells along the southern boundary of the Main Basin (3S/1E 20Q 2, 3S/1E 29P 2, and 3S/2E 33K 1) have TDS concentrations near or above 1,000 mg/L. It is believed that TDS may be entering the Main Basin as hill-front recharge and/or subsurface inflow from the neighboring Livermore Uplands to the south.

The TDS concentration in mining area pond C1 (shown on Figure 3.2-11) appears to be slightly higher than those in surrounding ponds. This is due to the salt-concentrating effects of evaporation in combination with low infiltration of the surrounding, lower-salt groundwater.

NITRATE

Nitrate (measured as nitrate ion [NO₃]) is detected in the upper aquifer at concentrations above the Basin Plan Objective and MCL of 45 mg/L (orange and red areas in Figure 3.2-12) in the following locations:

1. There is a plume that extends from the western portion of the Mocho I and eastern portion of the Mocho II Subbasins to the northeastern portion of the Amador Subbasin. Portions of this nitrate plume date back to at least the 1960s; however, over the last few years this plume has developed into two zones with concentrations above the MCL: in the Mocho I Subbasin up to 49.16 mg/L and in the Mocho II Subbasin up to 70.41 mg/L. Their causes are believed to be both natural (i.e., buried native vegetation) and artificial (i.e., existing and historical wastewater disposal, and fertilizer and livestock manure leaching). There are over 100 septic tanks still in use near the proximal end of the plume.
2. There are two areas of high nitrate concentrations in the southern portion of the Mocho I and Mocho II Subbasins south of Tesla Road (maximum concentration 147.47 mg/L in 2012 Water Year, 91.67 mg/L in 2011 Water Year). Both of these areas are based on single monitoring wells and are believed to be related to the overlying agricultural land use.
3. May Subbasin near May School Rd (164.74 mg/L, not sampled in 2011 Water Year, 119.13 mg/L in 2010 Water Year). This was the highest nitrate concentration detected in the basin. In 2008 Water Year as part of a one-time water quality study in this area, Zone 7 sampled and analyzed several domestic wells in the area to determine the extent of nitrate contamination. These results (presented in the 2008 Annual Report for the Groundwater Management Program, *Zone 7, 2009*) suggested that the nitrate appeared to be relatively localized with the highest concentration in the vicinity of 2S/2E 28D 2. The source of high nitrate was not identified; however, it likely comes from agricultural land use in that area and/or a leaky annular well seal.

4. Camp Subbasin in the eastern portion of Dublin (maximum concentration 65.54 mg/L in 2012 Water Year, 60.23 mg/L in 2011 Water Year). This may be a remnant of past dairy operations in the area that were discontinued long ago.
5. Over the last few years, nitrate concentrations in 3S/1E 22D 2 (in the southern portion of the Amador West Subbasin) have been fluctuating around the MCL. In 2012 Water Year and previously in 2009 Water Year the concentrations were measured to be slightly above the MCL (50.04 and 47.39 mg/L, respectively), while the concentrations were slightly below the MCL in 2010 and 2011 Water Years (40.17 and 43.44 mg/L, respectively). The source of high nitrate or the reason for the fluctuating concentrations have not been identified, but it is speculated that the nitrate may be entering the Main Basin as hill-front recharge and/or subsurface inflow from the neighboring Livermore Uplands to the south.

The nitrate loading and assimilative capacity of the Main Basin is currently being studied as part of the Salt Management Plan update. See Section 5.2.2 for a description of the objectives and progress for this update.

BORON

While there is no MCL for boron, it may become a problem for irrigated crops when it exceeds 1 or 2 mg/L, depending on the crop. Boron exists at elevated concentrations (up to 27 mg/L) in the upper aquifer in the following areas of the groundwater basin (Figure 3.2-13):

1. There is a plume of elevated boron concentrations that extends along the Dublin-Bernal and Camp-Amador boundaries. The highest localized concentration of boron in this area was detected near the center of this area in 3S/1E 4J 5 at a concentration of 13.2 mg/L in 2012 Water Year (14 mg/L in 2011 Water Year).
2. Boron was also detected in the eastern portion of the valley in the May, Spring, Mocho I, and Mocho II Subbasins. The highest concentration detected was in the northern portion of this area in 2S/2E 27P 2 at 27 mg/L in 2012 Water Year (31.2 mg/L in 2011 Water Year).

The source of boron is unknown but may be from natural alkali/marine sediments. It should be noted that the boron detected in the western portion of the basin is primarily along the Arroyo Las Positas and lower Arroyo Mocho. It is likely that some of the source of this boron may be from the high-boron groundwater in the eastern portion of the Valley that has discharged into the Arroyo Las Positas in the North Livermore area and flowed downstream to the Arroyo Mocho, recharging into the Amador Subbasin along the way.

3.2.5.3 Lower Aquifer Zone

TDS

Water quality in the majority of the lower aquifer of the Main Basin is generally of good quality, containing less than 500 mg/L TDS; however, in the Bernal Subbasin and around the margins of the Amador and Mocho II Subbasins, the lower aquifer contains groundwater with higher TDS concentrations

(up to about 968 mg/L in 2012 Water Year, see Figure 3.2-14; compared to a high of 902 mg/L in 2011 Water Year). This is most likely due to deep percolation of high TDS water from the upper aquifer and subsurface inflow of high TDS water from the Dublin and Camp fringe subbasins in the north.

Starting in 2007, TDS concentrations began increasing in wells located in and around the Mocho Wellfield. The concentrations have been decreasing in most wells over the last couple of years. The phenomenon is discussed below in Section 3.2.5.4.

NITRATE

Nitrate was only detected above the MCL in the eastern portion of the Mocho II Subbasin (Figure 3.2-15). While smaller in extent, the general location of this plume mirrors the nitrate plume in the upper aquifer, suggesting that some of the nitrate in the upper aquifer has migrated into the lower aquifer. For the 2012 Water Year, the highest concentration of nitrate in a lower aquifer well was 49.60 mg/L in 3S/2E 8H 3 (50.93 mg/L in nearby 3S/2E 16A 3 during 2011 Water Year).

BORON

In general, boron is not a problem in the lower aquifer where detections are typically less than 1 mg/L. However, boron was detected above 2 mg/L in three lower aquifer wells in the 2012 Water Year as follows (Figure 3.2-16):

1. Boron was detected in one well in the eastern portion of the Mocho II Subbasin: 2.47 mg/L in monitoring well 3S/2E 23E 2 (2.64 mg/L in 2011 Water Year).
2. Boron was also detected above 2 mg/L in two monitoring wells near the Hopyard 9 Well in the northern portion of the Bernal Basin: 2.48 mg/L in 3S/1E 17D 4 (2.63 mg/L in 2011) and 2.32 mg/L in 3S/1E 17D11 (2.47 mg/L in 2011 Water Year). Note that concentrations in Hopyard 9, itself, have always been below 0.6 mg/L.

The source of boron is unconfirmed, but may be from localized natural alkali/marine sediments or may have migrated from a shallower zone.

3.2.5.4 Increasing Salts Near Mocho Wellfield

Starting in the 2007 Water Year, TDS concentrations increased in several deep monitoring wells and the municipal supply wells in the Mocho Wellfield. In 2010 Water Year, the TDS concentrations began to stabilize or decrease slightly in most wells in the Mocho Wellfield. These trends continued in the 2011 and 2012 Water Years with only slight increases in isolated wells. Figure 3.2-23, which shows TDS, nitrate, and boron concentrations in the four Mocho municipal wells, illustrates how TDS concentrations increased dramatically in Mochos 3 and 4 as compared to those in Mochos 1 and 2 in 2008. The figure also shows that historically, especially from 1983 to 1985, before Mochos 3 and 4 were constructed, TDS concentrations in Mochos 1 and 2 have been higher than they are now, but decreased throughout the latter part of the 1980s, and have remained fairly constant since then.

Zone 7's ongoing investigation efforts include:

- Analyzing drawdown data that is being collected from Upper Aquifer monitoring wells and from nearby abandoned wells as the Mocho wells are routinely operated;
- Comparing individual characteristic constituents of the water being produced from the Mocho wells with those found in upper aquifer monitoring wells; and
- Preparing detailed stratigraphic cross-sections through the area of interest to identify whether discontinuities exist in the confining layer(s) that is believed to separate the Upper Aquifer Zone from the Lower Aquifer Zones.

The preliminary conclusion is that higher TDS groundwater in the overlying upper aquifer zone, which the Mocho Wells were designed to exclude, is migrating vertically to the Lower Aquifer via one or more potential pathways. This preliminary conclusion is based on the following findings:

- TDS concentrations have trended upwards in all Mocho supply wells over the last ten years except Mocho 1. Mocho 3 exhibited the steepest increase and the highest TDS.
- Higher TDS concentrations in the lower aquifer appear to be limited to Mochos 3 and 4, and are not exhibiting a plume-like distribution when the surrounding monitoring wells are considered.
- Historically, there is a good correlation between periods of downward vertical gradient (i.e., when the groundwater elevation in the upper aquifer is higher than the lower aquifer) and periods of increasing or elevated TDS concentrations (Figure 3.2-23).

The potential pathways for the vertical migration of the high TDS being considered are:

- Leakage through the semi-confining layer(s) which separate the Upper Aquifer Zone from the Lower Aquifer Zone;
- Conduits caused by unsealed or improperly sealed wells that penetrate both the upper and lower aquifers in the immediate area.

Salt transport through the semi-confining layer existing between the upper and lower aquifers can happen naturally, and occur in either direction depending on the head difference between the aquifers. However, the recent increased pumping from the lower aquifer Mocho wells for salt management has locally increased the gradient between the lower and upper aquifers thus increasing the potential for upper aquifer salts to be transported to the lower aquifer and be produced by the Mocho wells. Likewise, the increased gradient has the potential for increasing flow (and salt transport) through whatever artificial conduits may be present in the intermediate confining layer.

Three unsealed abandoned wells were identified as existing potential conduits in the Mocho Wellfield area. Two of the three abandoned wells (3S/1E 8H 4 and 3S/1E 8H14) were properly destroyed in 2012 Water Year. The remaining well (3S/1E 8H 3) is scheduled for destruction in 2013 Water Year. Staff will continue to closely monitor the water quality and aquifer conditions in the Mocho Wellfield to see if these

well destructions make a difference in the Mocho supply wells' TDS concentrations. More detail is provided in Section 5.4.4.

3.2.5.5 Nitrates in Happy Valley

In August 2012, Zone 7 kicked off a joint water quality study of the unincorporated area south of Pleasanton known as Happy Valley with Alameda County Environmental Health (ACEH). The objectives of the study were to:

- Assess current conditions of the area's water supply, which is mainly groundwater, and
- Evaluate the effectiveness of the County's long-standing septic tank moratorium to manage nitrates in groundwater beneath rural neighborhoods where the density of individual septic tanks is greater than 1 rural residential equivalent per 5 acres, which is the highest density allowed for new development in the Upper Alameda Creek Watershed (*Alameda County General Ordinance Chapter 15.18*).

For this study, ACEH and Zone 7 staff invited Happy Valley residents to volunteer to have their well water tested, free of charge, by Zone 7, in exchange for obtaining individual water quality information as well as facilitating the use of the data collectively with other's to assess the nitrate conditions in the local groundwater and the effectiveness of the moratorium to mitigate the high nitrates that existed when the moratorium was enacted. As of the end of 2012 Calendar Year, the Zone 7 Laboratory had analyzed 31 water samples from wells located in Happy Valley. Six of the 31 had nitrate concentrations that exceeded the MCL for nitrate (45 mg/L as NO₃). The six wells were distributed over the central part of the small basin. Twenty-one samples were preserved and sent to an outside laboratory for oxygen and nitrogen isotope analysis to try to verify that the source of high nitrates was septic tank effluent. The results of this analysis and the study conclusions were pending at the time of publication of this annual report. A technical report containing all findings and conclusions, and recommendations will be prepared in the 2013 Calendar Year, incorporated into the updated SMP, as part of the new nutrient component, and reviewed in next year's Annual Report.

3.2.6 Arroyo Las Positas Recharge

From June to October 2011, Zone 7 released relatively-low TDS SWP water into the Arroyo Las Positas (ALP) in an attempt to reduce the salt loading into the Main Basin from this losing stream. To assess the effectiveness of this strategy, Zone 7 developed a sampling program that included water sampling from the stream and from nearby shallow groundwater monitoring wells. Samples were taken in June 2011, September 2011, December 2011, and January 2012 and were analyzed by Zone 7's laboratory for major minerals and metals. The samples were also analyzed by Zymax Forensics in Escondido, California for Oxygen 18 and Deuterium, a relatively inexpensive set of analyses that can provide a good "fingerprint" for source water from higher altitudes like SWP water. The results from the ALP recharge study suggest that while the low TDS water from the SWP did make it down into the lower reaches of the Arroyo, none of this water has yet been detected in any of the groundwater monitoring wells. Consequently, Zone 7 staff conducted two separate synoptic recharge surveys along the recharge reaches of the ALP. The first survey was conducted with an initial flow of 2.8 cubic feet per second (cfs) and resulted in a total

recharge of 1.05 cfs. The second survey was conducted with an initial flow of 6.0 cfs. It resulted in a total recharge of 1.48 cfs. These recharge rates are much lower than anticipated and might explain the lack of SWP water being detected at any of the observation wells.

3.3 Surface Water Monitoring Program

3.3.1 Program Description

The objectives of Zone 7's Surface Water Monitoring Program are:

- **Surface Water Flow Monitoring** – Quantify inflow and outflow of surface water to/from the groundwater basin. Also, to quantify the portions recharging the groundwater basin's aquifers and the amounts being discharged from the groundwater basin as a result of the gravel quarries' dewatering operations;
- **Surface Water Quality Monitoring** - Provide a record of water quality for the basin's recharge and discharge waters with which the groundwater basin's annual salt loading is calculated;
- **Del Valle Water Rights** - Satisfy the requirements of Zone 7's and Alameda County Water District's (ACWD) "water rights" for the Arroyo Valle. This involves quarterly sampling and continuous flow monitoring at two surface water stations; and
- **NPDES Permitting** - Monitor Zone 7's water discharges at the Del Valle Water Treatment Plant (DVWTP), and Patterson Pass Water Treatment Plant (PPWTP) (as required by National Pollutant Discharge Elimination System (NPDES) No. CAG382001, Order No. R2-2003-0062). Samples are taken above and below existing treatment plant discharge points during the first significant rainfall event of the season.

The Surface Water Monitoring Program focuses on the four main gaining and losing streams that impact the groundwater basin (i.e., Arroyo Valle, Arroyo Mocho, Arroyo Las Positas, and Arroyo De La Laguna), and the diversions and accretions that affect the flows into or from each of them. The program utilizes a network of telemetered recorder stations and meters (Figure 3.3-1 and Table 3.3-1) to compute the quantity of water flowing past each station. Once per year, water samples are collected from all ten recorder sites and four other NPDES sites in the program and submitted to Zone 7's laboratory for analysis of metals and minerals; the same parameters that are routinely analyzed in the Groundwater Monitoring Program.

3.3.2 2012 Water Year Results

3.3.2.1 General

The 2012 Water Year Surface Water Monitoring Program included ten surface water recorder stations (Table 3.3-2). Monthly total flows for the 2012 Water Year from the recording stations are presented in Table 3.3-3. All stations were maintained throughout the year and all records have been reviewed and



**TABLE 3.2-1
GROUNDWATER MONITORING PROGRAM
WELLS AND MONITORING FREQUENCIES
2012 WATER YEAR**

SITE INFORMATION				GWP Freq		Other Programs					
State Name	Well Name	Subbasin	Aq	Levels	Sample Qual	WR	CasG	Mun	Key	SMP	Oth
2S/1E 32E 1	End of Arnold Rd	Camp	U	SA	A					T-HAC-1	
2S/1E 32N 1	Camp Parks	Camp	U	SA	A					T-HAC-2	
2S/1E 32Q 1	Summer Glen Dr	Camp	U	SA	A					32Q1	
2S/1E 33L 1	Gleason Dr @ Tassajara	Camp	U	SA	A					33L1	
2S/1E 33P 2	Central Pkwy at Emerald Glen	Camp	U	SA	A					33P2	
2S/1E 33R 1	Central Pkwy @ Grafton	Camp	U	SA	A					T-DUB-1	
2S/1W 15F 1	BOLLINGER	Bishop	U	SA	A						
2S/1W 26C 2	PINE VALLEY	Dublin	U	SA	A						
2S/1W 36E 3	Kolb Park	Dublin	U	SA	A					36E3	
2S/1W 36F 1	Dublin High shallow	Dublin	L	SA	A						
2S/1W 36F 2	Dublin High mid	Dublin	L	SA	A						
2S/1W 36F 3	Dublin High deep	Dublin	L	SA	A						
2S/2E 27C 2	Dagnino Rd	Spring	U	SA							
2S/2E 27P 2	hartford ave east	Spring	U	SA	A						
2S/2E 28D 2	May School	May	U	SA	A					T-MAY-1	
2S/2E 28J 2	FCC Well	May	L	SA	A						
2S/2E 28Q 1	hartford ave	May	U	SA	A					T-MAY-2	
2S/2E 32K 2	jenson's N liv. Ave	Cayetano	U	SA	A						
2S/2E 34E 1	mud city	May	U	SA	A					T-MAY-3	
2S/2E 34Q 2	Hollyhock & Crocus	Spring	U	SA	A					T-SPR-2	
3S/1E 1F 2	Constitution Dr	Mocho II	U	SA	A					T-AIR-1	
3S/1E 1H 3	Collier Canyon g1	Mocho II	U	SA	Q					1H3	
3S/1E 1J 3	Triad Vineyard	Mocho II	L	SA							
3S/1E 1L 1	Kitty Hawk	Camp	U	SA	A					T-AIR-2	
3S/1E 1P 2	airport gas g5	Amador	U	SA	A					T-AIR-3	
3S/1E 1P 3	New airport well	Amador	L	SA	Q						
3S/1E 2J 2	Maint. Bldg	Camp	U	SA	A					T-GLF-2	
3S/1E 2J 3	Doolan Rd East	Camp	U	SA	A					T-GLF-1	
3S/1E 2K 2	Doolan Rd West	Camp	U	SA	A					2K2	
3S/1E 2M 3	Friesman Rd North	Camp	U	SA	A					T-FRI-1	
3S/1E 2N 2	Friesman Rd Mid	Camp	U	SA	A					T-FRI-2	
3S/1E 2N 6	Friesman Rd South	Amador	U	SA	A					T-FRI-3	
3S/1E 2P 3	Crosswinds Church	Camp	L	SA	A						
3S/1E 2Q 1	LPGC #1	Amador	U	SA	A					T-GLF-3	
3S/1E 2R 1	Beebs	Amador	U	SA	Q						
3S/1E 3G 2	fallon rd	Camp	U	SA	A						
3S/1E 4A 1	SMP-DUB-2	Camp	U	SA	A					T-DUB-2	
3S/1E 4J 5	Pimlico shallow	Camp	U	SA	A					T-DUB-3	
3S/1E 4J 6	Pimlico deep	Camp	U	SA	A					T-DUB-4	
3S/1E 4Q 2	gulfstream	Amador	U	SA	A						

Aq = Aquifer: U = Upper; L = Lower; D = Deep Frequency: R = Recorder; M = Monthly; Q = Quarterly; SA = Semiannually; A = Annually

GWP Freq = Groundwater Program Frequency; Levels = Groundwater Levels Frequency, Sample Qual = Groundwater Sampling Frequency

Other Programs: WR = Water Rights; CasG = CASGEM; Mun = Municipal wells; Key = Key Wells; SMP = Salt Management Plan; Oth = Other

* = Groundwater levels only.

SITE INFORMATION				GWP Freq		Other Programs					
State Name	Well Name	Subbasin	Aq	Levels	Sample Qual	WR	CasG	Mun	Key	SMP	Oth
3S/1E 5K 6	Rosewood shallow	Camp	U	SA	A						
3S/1E 5K 7	Rosewood deep	Camp	L	SA	A						
3S/1E 5L 3	Oracle	Camp	U	SA	A					T-HAC-3	
3S/1E 5P 6	Owens Park	Camp	U	SA	A					T-HAC-4	
3S/1E 6F 3	Dublin Ct	Dublin	U	SA	A		√			6F3	
3S/1E 6G 5	Nissan Repair	Dublin	L	SA							
3S/1E 6N 2	DSRSD MW-3	Dublin	U	SA	A						
3S/1E 6N 3	DSRSD MW-4	Dublin	U	SA	A						
3S/1E 6N 6	DSRSD NE-76	Dublin	U	SA	A						
3S/1E 7B 2	Hopyard rd	Dublin	L	SA	A						
3S/1E 7B12	Hacienda Arch	Dublin	U	SA	A					T-CHA-1	
3S/1E 7D 1	DSRSD SW-75	Dublin	U	SA	A						
3S/1E 7D 3	DSRSD SE-70	Dublin	U	SA	A						
3S/1E 7G 7	Chabot Well	Dublin	U	SA	A					T-CHA-2	
3S/1E 7J 5	Thomas Hart School	Dublin	U	SA	A					T-CHA-3	
3S/1E 7M 2	DSRSD Sub	Dublin	U	SA	A					7M2	
3S/1E 7R 8	Mocho Canal North at Willow	Bernal	U	SA	A					T-CHA-4	
3S/1E 8B 1	Lizard Well	Amador	U	SA	A					T-HAC-5	
3S/1E 8G 4	Apache	Amador	U	SA	A					T-HAC-6	
3S/1E 8H 9	Mocho 4 Nested Shallow	Amador	L	M	A						
3S/1E 8H10	Mocho 4 Nested Middle	Amador	L	M	A						
3S/1E 8H11	Mocho 4 Nested deep	Amador	D	M	A						
3S/1E 8H13	Mocho 3 mon	Amador	D	M	A						
3S/1E 8H18	Mocho 4	Amador	L	R	Q			√			
3S/1E 8K 1	sutter gate	Amador	U	SA	A						
3S/1E 8N 1	sports park	Bernal	U	SA	A						
3S/1E 9B 1	Stoneridge	Amador	L	R	Q			√			
3S/1E 9G 1	3775 trenery - Kamp	Amador	U	SA	A						
3S/1E 9H10	NW Lake I Shallow	Amador	U	SA							
3S/1E 9H11	NW Lake I Deep	Amador	L	SA							
3S/1E 9J 7	SW Lake I Shallow	Amador	U	SA	A						
3S/1E 9J 8	SW Lake I Middle	Amador	L	SA	A						
3S/1E 9J 9	SW Lake I Deep	Amador	L	SA	A						
3S/1E 9M 2	Mocho 1	Amador	L		Q			√			
3S/1E 9M 3	Mocho 2	Amador	L	M	Q			√			
3S/1E 9M 4	Mocho 3	Amador	L	R	Q			√			
3S/1E 9P 5	Key_AmW_U (Mohr Key)	Amador	U	M	A		√		√		
3S/1E 9P 9	Mohr Ave Shallow	Amador	L	M	A						
3S/1E 9P10	Key_AmW_L	Amador	L	M	A		√		√		
3S/1E 9P11	Mohr Ave Deep	Amador	L	M	A						
3S/1E 10A 1	Rancho El Charro	Amador	L	SA							
3S/1E 10A 2	El C harro Rd	Amador	U	SA	A						
3S/1E 10B 8	Kaiser Rd Shallow	Amador	L	SA	A						
3S/1E 10B 9	Kaiser Rd Middle 1	Amador	L	SA	A						
3S/1E 10B10	Kaiser Rd Middle 2	Amador	L	SA	A						
3S/1E 10B11	Kaiser Rd Deep	Amador	D	SA	A						

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SITE INFORMATION				GWP Freq		Other Programs					
State Name	Well Name	Subbasin	Aq	Levels	Sample Qual	WR	CasG	Mun	Key	SMP	Oth
3S/1E 10D 2	Stoneridge Shallow	Amador	L	SA	A						
3S/1E 10D 3	Stoneridge Middle 1	Amador	L	SA	A						
3S/1E 10D 4	Stoneridge Middle 2	Amador	L	SA	A						
3S/1E 10D 5	Stoneridge Deep	Amador	D	SA	A						
3S/1E 10D 7	North Lake I Shallow	Amador	U	SA							
3S/1E 10D 8	North Lake I Cluster 2	Amador	L	SA							
3S/1E 10K 2	NorthWest Cope Lake	Amador	L	M	A						
3S/1E 10K 3	COL 1	Amador	L	M	A			√			
3S/1E 10N 2	South Lake I Shallow	Amador	U	SA							
3S/1E 10N 3	South Lake I Deep	Amador	L	SA							
3S/1E 11B 1	Airport West	Amador	U	SA	Q					11B1	
3S/1E 11C 3	LAVWMA ROW	Amador	U	SA	A					T-GLF-4	
3S/1E 11G 1	Key_AmE_U	Amador	U	M	A		√		√		
3S/1E 11G 2	Rancho Charro Middle 1	Amador	L	M	A						
3S/1E 11G 3	Rancho Charro Middle 2	Amador	L	M	A						
3S/1E 11G 4	Rancho Charro Deep	Amador	D	M	A						
3S/1E 11M 2	COL2 Monitoring	Amador	L	M	A						
3S/1E 11M 3	COL 2	Amador	L	M	A			√			
3S/1E 11P 6	New Jamieson Residence	Amador	L	SA	A						
3S/1E 12A 2	Airport South	Amador	U	SA	Q					12A2	
3S/1E 12D 2	LWRP G6	Amador	U		Q						
3S/1E 12G 1	Oaks Park Shallow	Amador	U	M	Q						
3S/1E 12H 4	LWRP Shallow	Amador	L	SA	A						
3S/1E 12H 5	LWRP Middle 1	Amador	L	SA	A						
3S/1E 12H 6	LWRP Middle 2	Amador	L	SA	A						
3S/1E 12H 7	LWRP Deep	Amador	D	SA	A						
3S/1E 12K 2	Key_AmE_L	Amador	L	R	A		√		√		
3S/1E 12K 3	Oaks Park Mid	Amador	L	M	A						
3S/1E 12K 4	Oaks Park Deep	Amador	D	M	A						
3S/1E 13P 1	cal rock	Amador	L	SA	A						
3S/1E 13P 5	LGA Grant Nested 1	Amador	U	M	A						
3S/1E 13P 6	LGA Grant Nested 2	Amador	L	M	A						
3S/1E 13P 7	LGA Grant Nested 3	Amador	L	M	A						
3S/1E 13P 8	LGA Grant Nested 4	Amador	L	M	A						
3S/1E 14B 1	Industrial Asphalt	Amador	L	SA	A						
3S/1E 14D 2	South Cope Lake	Amador	L	SA	A						
3S/1E 14K 2	lone star ind	Amador	L	SA							
3S/1E 15F 3	kaiser #8	Amador	L	SA							
3S/1E 15J 3	shadow cliff	Amador	L	SA	A						
3S/1E 15M 3	Bush/Valley South	Amador	L	SA	A						
3S/1E 16A 2	Pleas 8	AmWest	L	M	A			√			
3S/1E 16A 4	Bush/Valley Mid	Amador	L	SA	A						
3S/1E 16B 1	Bush/Valley North	Amador	D	SA	A						
3S/1E 16C 2	Santa Rita Valley Shallow	Amador	L	SA	A						
3S/1E 16C 3	Santa Rita Valley Middle	Amador	L	SA	A						
3S/1E 16C 4	Santa Rita Valley Deep	Amador	L	SA	A						

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* = Groundwater levels only.

SITE INFORMATION				GWP Freq		Other Programs					
State Name	Well Name	Subbasin	Aq	Levels	Sample Qual	WR	CasG	Mun	Key	SMP	Oth
3S/1E 16E 4	black ave - cultural	Amador	U	SA	A						
3S/1E 16L 2	Pleas 4	Amador	U	M	A						
3S/1E 16L 5	Pleas 5	Amador	L	M	A			√			
3S/1E 16L 7	Pleas 6	Amador	L	M	A			√			
3S/1E 16P 5	Vervais Monitor	Amador	U	R	SA	√					
3S/1E 16R 1	Stanley Berry Farm	Amador	L	SA							
3S/1E 17B 4	Casterson	Amador	L	SA	A						
3S/1E 17D 3	Hopyard Nested Shallow	Bernal	L	M	A						
3S/1E 17D 4	Hopyard Nested Middle 1	Bernal	L	M	A						
3S/1E 17D 5	Hopyard Nested Middle 2	Bernal	L	M	A						
3S/1E 17D 6	Hopyard Nested Middle 3	Bernal	L	M	A						
3S/1E 17D 7	Hopyard Nested Deep	Bernal	D	M	A						
3S/1E 17D10	Hopyard 7	Bernal	L	SA							
3S/1E 17D11	Hopyard 9 Monitoring Well	Bernal	L	SA	A						
3S/1E 17D12	Hopyard 9	Bernal	L	R	Q			√			
3S/1E 18A 5	Pleas 7	Bernal	L	M	A			√			
3S/1E 18A 6	Hopyard 6	Bernal	L	R	Q			√			
3S/1E 18E 4	Valley Trails II	Bernal	U	SA	A						
3S/1E 18J 2	camino segura	Bernal	U	SA	A						
3S/1E 18N 1	merritt	Bernal	L	SA							
3S/1E 19A10	SFWD South (B)	Bernal	L		A			√			
3S/1E 19A11	SFWD North (A)	Bernal	L	SA	A			√			
3S/1E 19C 4	del valle & laguna	Bernal	U	SA	A						
3S/1E 19K 1	680/bernal	Bernal	U	SA	A						
3S/1E 20B 2	Fairgrounds Potable	Bernal	L	SA	A			√			
3S/1E 20C 3	Fairgrounds Potable Backup	Bernal	L	SA	A			√			
3S/1E 20C 7	Key_Bern_U	Bernal	U	R	SA	√	√		√		
3S/1E 20C 8	Key_Bern_L	Bernal	L	M	A		√		√		
3S/1E 20C 9	Fair Nested Deep	Bernal	L	M	A						
3S/1E 20J 4	civic center	Bernal	U	SA	A						
3S/1E 20M11	S.F "M"LINE	Bernal	U	SA	A						
3S/1E 20Q 2	20Q2	Bernal	U	SA	A					T-PL-3	
3S/1E 22D 2	vineyard trailer	Amador	U	SA	A					T-BER-3	
3S/1E 23J 1	1627 vineyard trailer	Amador	U	SA	A						
3S/1E 24Q 1	Ruby Hills	Amador	L	SA							
3S/1E 25C 3	Katz Winery Mansion	Amador	U	SA	A						
3S/1E 29M 4	f.c. channel	Castle	U	M	A	√*					
3S/1E 29P 2	castlewood dr	Bernal	U	SA	A						
3S/1W 1B 9	DSRSD Shallow	Dublin	L	SA	A						
3S/1W 1B10	DSRSD Middle	Dublin	L	SA	A						
3S/1W 1B11	DSRSD Deep	Dublin	L	SA	A					1B11	
3S/1W 1J 1	DSRSD MW-1	Dublin	U	SA	A						
3S/1W 2A 2	McNamara's	Dublin	U	SA	A					2A2	
3S/1W 12A 9	DSRSD NW-75	Dublin	U	SA	A						
3S/1W 12B 2	Stoneridge Mall Rd	Dublin	U	SA	A						
3S/1W 12J 1	DSRSD South	Dublin	U	SA	A						

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SITE INFORMATION				GWP Freq		Other Programs					
State Name	Well Name	Subbasin	Aq	Levels	Sample Qual	WR	CasG	Mun	Key	SMP	Oth
3S/1W 13J 1	muirwood dr	Castle	U	SA	A						
3S/2E 1F 2	Brisa at Circuit City	Spring	U	SA	A						
3S/2E 2B 2	south front rd	Spring	U	SA	A						
3S/2E 3A 1	Bluebell	Spring	U	SA	A					T-SPR-1	
3S/2E 3K 3	first & S. front rd	Mocho I	U	SA	A					3K3	
3S/2E 5N 1	1037 portola - trailer	Mocho II	L	SA	A						
3S/2E 7C 2	york way - jaws - G4	Mocho II	U	SA	Q						
3S/2E 7H 2	dakota	Mocho II	U	SA	A						
3S/2E 7N 1	kittyhawk south	Amador	U	SA	A						
3S/2E 7P 3	CWS STA 24	Amador	L	M	A			√			
3S/2E 7R 2	CWS STA 31 Monitoring	Mocho II	D	M							
3S/2E 7R 3	CWS STA 31	Mocho II	L	M	A			√			
3S/2E 8F 1	CWS STA 10	Mocho II	L	M	A			√			
3S/2E 8G 1	CWS STA 19	Mocho II	L	M	A			√			
3S/2E 8H 2	North k	Mocho II	U	SA	A						
3S/2E 8H 3	Key_Mo2_L	Mocho II	L	M	A		√		√		
3S/2E 8H 4	N Liv Ave Deep	Mocho II	L	M	A						
3S/2E 8K 2	Key_Mo2_U (Livermore Key)	Mocho II	U	R	A		√		√		
3S/2E 8N 2	CWS STA 14	Mocho II	L	M	A			√			
3S/2E 8P 1	CWS STA 8	Mocho II	L	M	A			√			
3S/2E 9L 1	CWS STA 17	Mocho II	L	M							
3S/2E 9P 1	CWS STA 12	Mocho II	L	M	A			√			
3S/2E 9Q 1	CWS STA 9	Mocho II	L	M	A			√			
3S/2E 9Q 4	school st	Mocho II	U	SA	A						
3S/2E 10F 3	hexcel	Mocho I	U	SA	A						
3S/2E 10Q 1	almond	Mocho II	U	SA	A						
3S/2E 10Q 2	LLNL W-703	Mocho II	L	SA	A						
3S/2E 11C 1	joan way	Mocho I	U	SA	A					11C1	
3S/2E 12C 4	LLNL W-486	Spring	U	SA	A						
3S/2E 12J 3	LLNL W-017A	Spring	L	SA	A						
3S/2E 14A 3	S. vasco @east ave	Mocho I	U	SA	A						
3S/2E 14B 1	5763 east ave	Mocho I	L	SA	A						
3S/2E 15E 2	Retzlaff Winery	Mocho II	L	SA	A						
3S/2E 15Q 6	Concannon	Mocho II	L	SA	A						
3S/2E 15R17	Buena Vista Shallow	Mocho II	U	SA	A						
3S/2E 15R18	Buena Vista Deep	Mocho II	L	SA	A						
3S/2E 16A 3	Memory Gardens	Mocho II	L	SA	A						
3S/2E 16B 1	CWS STA 5	Mocho II	L	M	A			√			
3S/2E 16C 1	CWS STA 15	Mocho II	L	M	A			√			
3S/2E 16E 4	pepper tree	Mocho II	U	SA	A						
3S/2E 17E 2	Mocho Street	Mocho II	U	SA	A						
3S/2E 18B 1	CWS STA 20	Amador	L	M	A			√			
3S/2E 18E 1	E. stanley	Amador	U	SA	A						
3S/2E 19D 7	Isabel Shallow	Amador	L	SA	A		√				
3S/2E 19D 8	Isabel Middle 1	Amador	L	SA	A						
3S/2E 19D 9	Isabel Middle 2	Amador	L	SA	A						

Aq = Aquifer: U = Upper; L = Lower; D = Deep Frequency: R = Recorder; M = Monthly; Q = Quarterly; SA = Semiannually; A = Annually

GWP Freq = Groundwater Program Frequency; Levels = Groundwater Levels Frequency, Sample Qual = Groundwater Sampling Frequency

Other Programs: WR = Water Rights; CasG = CASGEM; Mun = Municipal wells; Key = Key Wells; SMP = Salt Management Plan; Oth = Other

* = Groundwater levels only.

SITE INFORMATION				GWP Freq		Other Programs					
State Name	Well Name	Subbasin	Aq	Levels	Sample Qual	WR	CasG	Mun	Key	SMP	Oth
3S/2E 19D10	Isabel Deep	Amador	L	SA	A						
3S/2E 20M 1	Alden Lane	Amador	L	SA	A						
3S/2E 22B 1	grapes	Mocho II	U	SA	A						
3S/2E 23E 1	Mines Nested Shallow	Mocho II	U	SA	A						
3S/2E 23E 2	Mines Nested Deep	Mocho II	L	SA	A						
3S/2E 24A 1	S. greenville	Mocho I	U	SA	A					24A1	
3S/2E 26J 2	mines rd	Mocho II	U	SA	A						
3S/2E 29F 4	usgs wetmore	Amador	U	M	SA	√					
3S/2E 30D 2	vineyard	Amador	U	R	A	√*				T-VIN-3	
3S/2E 30G 1	genesis farms	Amador	L	SA							
3S/2E 33G 1	crohare	Amador	U	M	SA	√					
3S/2E 33K 1	V.A.	Amador	U	Q	Q						
3S/2E 33L 1	VA/CROHARE FENCE	Amador	U	Q	Q						
3S/3E 7D 2	7D 2	Spring	U	SA	A						
3S/3E 7M 2	lupin way	Spring	L	SA							
TOTALS:	All Wells: 239	In Program: 239		236	219	6	10	28	8	51	0

Salt Management Plan (SMP) Designations

T-AIR = Airport Transect
T-BER = Bernal Transect
T-CHA = Chabot Transect
T-DUB = East Dublin Transect
T-FRI = Friesman Transect

T-HAC = Hacienda Transect
T-HV = Happy Valley Transect
T-LIV = South Livermore Transect
T-MAY = May Transect
T-PLE = Pleasanton Transect

T-RH = Ruby Hill Transect
T-SPR = Springtown Transect
T-VIN = Vineyard Transect
T-WEN = Wente Transect

Aq = Aquifer: U = Upper; L = Lower; D = Deep Frequency: R = Recorder; M = Monthly; Q = Quarterly; SA = Semiannually; A = Annually

GWP Freq = Groundwater Program Frequency; Levels = Groundwater Levels Frequency, Sample Qual = Groundwater Sampling Frequency

Other Programs: WR = Water Rights; CasG = CASGEM; Mun = Municipal wells; Key = Key Wells; SMP = Salt Management Plan; Oth = Other

* = Groundwater levels only.



**TABLE 3.2-2
GROUNDWATER MONITORING PROGRAM
WELL CONSTRUCTION DETAILS
2012 WATER YEAR**

<i>Site</i>	<i>Type</i>	<i>Other Name</i>	<i>Owner</i>	<i>Basin</i>	<i>Aquifer</i>	<i>RP</i>	<i>TD Dia</i>	<i>Perf</i>
2S/1E 32E 1	monitor	End of Arnold Rd	ZONE 7	Camp	Upper	392.56	70 2	55 - 70
2S/1E 32N 1	monitor	Camp Parks	ZONE 7	Camp	Upper	360.79	44 2.5	35 - 41
2S/1E 32Q 1	monitor	Summer Glen Dr	ZONE 7	Camp	Upper	367.55	45 2	30 - 45
2S/1E 33L 1	monitor	Gleason Dr @ Tassajara	ZONE 7	Camp	Upper	389.46	80 2	65 - 80
2S/1E 33P 2	monitor	Central Pkwy at Emerald Glen	ZONE 7	Camp	Upper	370.05	55 2	45 - 55
2S/1E 33R 1	monitor	Central Pkwy @ Grafton	ZONE 7	Camp	Upper	358.5	60 2	40 - 60
2S/1W 15F 1	monitor	BOLLINGER	ZONE 7	Bishop	Upper	439.44	60 2.5	50.3 - 55.3
2S/1W 26C 2	monitor	PINE VALLEY	ZONE 7	Dublin	Upper	406.53	50 2.5	40 - 45
2S/1W 36E 3	monitor	Kolb Park	ZONE 7	Dublin	Upper	346.51	60 2.5	50 - 55
2S/1W 36F 1	nested	Dublin High shallow	DSRSD	Dublin	Lower	342.71	190 2	140 - 180
2S/1W 36F 2	nested	Dublin High mid	DSRSD	Dublin	Lower	342.71	320 2	270 - 310
2S/1W 36F 3	nested	Dublin High deep	DSRSD	Dublin	Lower	342.71	520 2	440 - 510
2S/2E 27C 2	supply	Dagnino Rd	JACK PIECEFIELD	Spring	Upper	542.14	108 8	41 - 56
2S/2E 27P 2	monitor	hartford ave east	ZONE 7	Spring	Upper	505.43	68 4	35 - 63
2S/2E 28D 2	monitor	May School	ZONE 7	May	Upper	555.15	55 2.5	45 - 50
2S/2E 28J 2	supply	FCC Well	FCC	May	Lower	518.84	230 6	50 - 230
2S/2E 28Q 1	monitor	hartford ave	ZONE 7	May	Upper	513.04	28 2.5	17.6 - 22.6
2S/2E 32K 2	monitor	jenson's N liv. Ave	ZONE 7	Cayetano	Upper	507.43	43 2.5	33 - 38
2S/2E 34E 1	monitor	mud city	ZONE 7	May	Upper	499.73	49 2.5	40 - 45
2S/2E 34Q 2	monitor	Hollyhock & Crocus	ZONE 7	Spring	Upper	507.24	50 2	25 - 50
3S/1E 1F 2	monitor	Constitution Dr	ZONE 7	Mocho II	Upper	428.44	40 2	25 - 40
3S/1E 1H 3	monitor	Collier Canyon g1	ZONE 7	Mocho II	Upper	422.8	80 2.5	70 - 75
3S/1E 1J 3	irrigation	Triad Vineyard	TKG INTERNATIONAL	Mocho II	Lower	417.88	300 9	270 - 290
3S/1E 1L 1	monitor	Kitty Hawk	ZONE 7	Camp	Upper	403.04	70 2	60 - 70
3S/1E 1P 2	monitor	airport gas g5	ZONE 7	Amador	Upper	389.64	50 2.5	40 - 45
3S/1E 1P 3	supply	New airport well	CITY OF LIVERMORE	Amador	Lower	394.44	480 12	245 - 460
3S/1E 2J 2	monitor	Maint. Bldg	ZONE 7	Camp	Upper	380.89	41 2	31 - 41
3S/1E 2J 3	monitor	Doolan Rd East	ZONE 7	Camp	Upper	406.35	65 2	55 - 65
3S/1E 2K 2	monitor	Doolan Rd West	ZONE 7	Camp	Upper	397.04	46 2.5	36.5 - 41.5
3S/1E 2M 3	monitor	Friesman Rd North	ZONE 7	Camp	Upper	365.04	50 2	35 - 50
3S/1E 2N 2	supply	Friesman Rd Mid	Crosswinds Church	Camp	Upper	363.24	80 6	0 - 0
3S/1E 2N 6	monitor	Friesman Rd South	ZONE 7	Amador	Upper	366.14	55 2	40 - 55
3S/1E 2P 3	potable	Crosswinds Church	Crosswinds Church	Camp	Lower	371.73	380 10	340 - 372
3S/1E 2Q 1	monitor	LPGC #1	ZONE 7	Amador	Upper	369.92	45 2	35 - 45
3S/1E 2R 1	monitor	Beebs	ZONE 7	Amador	Upper	376.29	33 2.5	21 - 26
3S/1E 3G 2	monitor	fallon rd	ZONE 7	Camp	Upper	354.24	50 2.5	40 - 45
3S/1E 4A 1	monitor	SMP-DUB-2	ZONE 7	Camp	Upper	350.67	49.5 2	29.5 - 49.5
3S/1E 4J 5	monitor	Pimlico shallow	ZONE 7	Camp	Upper	345.2	47 2	22 - 47
3S/1E 4J 6	monitor	Pimlico deep	ZONE 7	Camp	Upper	345.55	110 2	68 - 110
3S/1E 4Q 2	monitor	gulfstream	ZONE 7	Amador	Upper	345.42	90 2.5	80 - 85
3S/1E 5K 6	monitor	Rosewood shallow	ZONE 7	Camp	Upper	346.05	75 4	40 - 70
3S/1E 5K 7	monitor	Rosewood deep	ZONE 7	Camp	Lower	346.19	150 4	134 - 144
3S/1E 5L 3	monitor	Oracle	ZONE 7	Camp	Upper	339.43	40 2	15 - 40
3S/1E 5P 6	monitor	Owens Park	ZONE 7	Camp	Upper	336.65	35 2	25 - 35
3S/1E 6F 3	monitor	Dublin Ct	ZONE 7	Dublin	Upper	329.82	36 2.5	27 - 32

<i>Site</i>	<i>Type</i>	<i>Other Name</i>	<i>Owner</i>	<i>Basin</i>	<i>Aquifer</i>	<i>RP</i>	<i>TD Dia</i>	<i>Perf</i>
3S/1E 6G 5	supply	Nissan Repair	VALLEY NISSAN/VOLVO	Dublin	Lower	332.22	200 8	103 - 178
3S/1E 6N 2	monitor	DSRSD MW-3	DSRSD	Dublin	Upper	335.2	67 4	42 - 67
3S/1E 6N 3	monitor	DSRSD MW-4	DSRSD	Dublin	Upper	340.74	72	49 - 72
3S/1E 6N 6	monitor	DSRSD NE-76	DSRSD	Dublin	Upper	333.58	75 2	50 - 70
3S/1E 7B 2	monitor	Hopyard rd	ZONE 7	Dublin	Lower	327.77	152 4	143 - 149
3S/1E 7B12	monitor	Hacienda Arch	ZONE 7	Dublin	Upper	327.82	70 2	50 - 70
3S/1E 7D 1	monitor	DSRSD SW-75	DSRSD	Dublin	Upper	330.09	75 2	54 - 74
3S/1E 7D 3	monitor	DSRSD SE-70	DSRSD	Dublin	Upper	332.28	70 2	45 - 65
3S/1E 7G 7	monitor	Chabot Well	ZONE 7	Dublin	Upper	327.33	55 2	35 - 55
3S/1E 7J 5	monitor	Thomas Hart School	ZONE 7	Dublin	Upper	326.78	50 2	30 - 50
3S/1E 7M 2	monitor	DSRSD Sub	ZONE 7	Dublin	Upper	328.4	88 4	70 - 85
3S/1E 7R 8	monitor	Mocho Canal North at Willow	ZONE 7	Bernal	Upper	326.63	52 2	42 - 52
3S/1E 8B 1	monitor	Lizard Well	ZONE 7	Amador	Upper	338.28	148 4	55 - 82
3S/1E 8G 4	monitor	Apache	ZONE 7	Amador	Upper	341.47	85 2	60 - 85
3S/1E 8H 9	nested	Mocho 4 Nested Shallow	DSRSD	Amador	Lower	338.53	240 2	210 - 230
3S/1E 8H10	nested	Mocho 4 Nested Middle	DSRSD	Amador	Lower	339.26	440 2	290 - 430
3S/1E 8H11	nested	Mocho 4 Nested deep	DSRSD	Amador	Deep	339.26	720 2	520 - 720
3S/1E 8H13	monitor	Mocho 3 mon	ZONE 7	Amador	Deep	338.96	800 2	570 - 790
3S/1E 8H18	muni	Mocho 4	ZONE 7	Amador	Lower	341.94	745 20	515 - 730
3S/1E 8K 1	monitor	sutter gate	ZONE 7	Amador	Upper	332.37	99 2.5	89 - 94
3S/1E 8N 1	monitor	sports park	ZONE 7	Bernal	Upper	323.68	72 2.5	62 - 67
3S/1E 9B 1	muni	Stoneridge	ZONE 7	Amador	Lower	349.23	810 20	250 - 800
3S/1E 9G 1	supply	3775 trenery - Kamp	MRS. KAMP	Amador	Upper	352.36	160 9	77 - 149
3S/1E 9H10	nested	NW Lake I Shallow	ZONE 7	Amador	Upper	352.89	145 2	120 - 140
3S/1E 9H11	nested	NW Lake I Deep	ZONE 7	Amador	Lower	353.04	190 2	165 - 185
3S/1E 9J 7	nested	SW Lake I Shallow	ZONE 7	Amador	Upper	357.36	505 2	120 - 140
3S/1E 9J 8	nested	SW Lake I Middle	ZONE 7	Amador	Lower	357.55	305 2	280 - 300
3S/1E 9J 9	nested	SW Lake I Deep	ZONE 7	Amador	Lower	357.68	505 2	480 - 500
3S/1E 9M 2	muni	Mocho 1	ZONE 7	Amador	Lower	343.95	530 16	150 - 510
3S/1E 9M 3	muni	Mocho 2	ZONE 7	Amador	Lower	347.47	575 18	250 - 570
3S/1E 9M 4	muni	Mocho 3	ZONE 7	Amador	Lower	342.89	498 20	315 - 493
3S/1E 9P 5	monitor	Key_AmW_U (Mohr Key)	ZONE 7	Amador	Upper	349.4	105 2.5	95 - 100
3S/1E 9P 9	nested	Mohr Ave Shallow	ZONE 7	Amador	Lower	349.59	210 2	185 - 205
3S/1E 9P10	nested	Key_AmW_L	ZONE 7	Amador	Lower	349.51	310 2	285 - 305
3S/1E 9P11	nested	Mohr Ave Deep	ZONE 7	Amador	Lower	349.44	425 2	405 - 420
3S/1E 10A 1	supply	Rancho El Charro	JAMIESON COMPANY	Amador	Lower	364.65	253 10	103 - 240
3S/1E 10A 2	monitor	El C harro Rd	ZONE 7	Amador	Upper	367.35	88 4	70 - 80
3S/1E 10B 8	nested	Kaiser Rd Shallow	DSRSD	Amador	Lower	353.6	200 2	100 - 190
3S/1E 10B 9	nested	Kaiser Rd Middle 1	DSRSD	Amador	Lower	353.49	294 2	244 - 284
3S/1E 10B10	nested	Kaiser Rd Middle 2	DSRSD	Amador	Lower	353.52	600 2	400 - 590
3S/1E 10B11	nested	Kaiser Rd Deep	DSRSD	Amador	Deep	353.52	810 2	660 - 800
3S/1E 10D 2	nested	Stoneridge Shallow	DSRSD	Amador	Lower	349.32	212 2	182 - 212
3S/1E 10D 3	nested	Stoneridge Middle 1	DSRSD	Amador	Lower	349.28	322 2	262 - 312
3S/1E 10D 4	nested	Stoneridge Middle 2	DSRSD	Amador	Lower	349.3	616 2	366 - 606
3S/1E 10D 5	nested	Stoneridge Deep	DSRSD	Amador	Deep	349.32	790 2	710 - 780
3S/1E 10D 7	nested	North Lake I Shallow	ZONE 7	Amador	Upper	361.06	215 2	118 - 138
3S/1E 10D 8	nested	North Lake I Cluster 2	ZONE 7	Amador	Lower	361.02	215 2	190 - 210
3S/1E 10K 2	monitor	NorthWest Cope Lake	ZONE 7	Amador	Lower	358.68	590.6 4	##### - 585.6
3S/1E 10K 3	muni	COL 1	ZONE 7	Amador	Lower	363.79	530 18	205 - 530
3S/1E 10N 2	nested	South Lake I Shallow	ZONE 7	Amador	Upper	360.31	195 2	125 - 145
3S/1E 10N 3	nested	South Lake I Deep	ZONE 7	Amador	Lower	360.18	195 2	170 - 190

<i>Site</i>	<i>Type</i>	<i>Other Name</i>	<i>Owner</i>	<i>Basin</i>	<i>Aquifer</i>	<i>RP</i>	<i>TD Dia</i>	<i>Perf</i>
3S/1E 11B 1	monitor	Airport West	ZONE 7	Amador	Upper	369.35	43 2.5	33 - 38
3S/1E 11C 3	monitor	LAVWMA ROW	ZONE 7	Amador	Upper	364.82	55 2	35 - 55
3S/1E 11G 1	nested	Key_AmE_U	DSRSD	Amador	Upper	371.62	120 2	100 - 110
3S/1E 11G 2	nested	Rancho Charro Middle 1	DSRSD	Amador	Lower	371.61	350 2	230 - 340
3S/1E 11G 3	nested	Rancho Charro Middle 2	DSRSD	Amador	Lower	371.64	590 2	380 - 580
3S/1E 11G 4	nested	Rancho Charro Deep	DSRSD	Amador	Deep	371.68	790 2	620 - 780
3S/1E 11M 2	monitor	COL2 Monitoring	ZONE 7	Amador	Lower	365.96	700 4.5	199 - 699
3S/1E 11M 3	muni	COL 2	ZONE 7	Amador	Lower	369.24	684 18	345 - 684
3S/1E 11P 6	potable	New Jamieson Residence	DOUG JAMIESON	Amador	Lower	376.67	400 5	240 - 380
3S/1E 12A 2	monitor	Airport South	ZONE 7	Amador	Upper	401.35	69 2.5	63.7 - 68.7
3S/1E 12D 2	monitor	LWRP G6	ZONE 7	Amador	Upper	384.45	44.6	36 - 41
3S/1E 12G 1	monitor	Oaks Park Shallow	ZONE 7	Amador	Upper	404.47	73 2.5	63 - 68
3S/1E 12H 4	nested	LWRP Shallow	CITY OF LIVERMORE	Amador	Lower	407.75	270 2	185 - 260
3S/1E 12H 5	nested	LWRP Middle 1	CITY OF LIVERMORE	Amador	Lower	407.78	400 2	360 - 390
3S/1E 12H 6	nested	LWRP Middle 2	CITY OF LIVERMORE	Amador	Lower	407.75	480 2	410 - 468
3S/1E 12H 7	nested	LWRP Deep	CITY OF LIVERMORE	Amador	Deep	407.67	684 2	609 - 674
3S/1E 12K 2	nested	Key_AmE_L	ZONE 7	Amador	Lower	406.29	300 2	210 - 295
3S/1E 12K 3	nested	Oaks Park Mid	ZONE 7	Amador	Lower	406.83	475 2	355 - 470
3S/1E 12K 4	nested	Oaks Park Deep	ZONE 7	Amador	Deep	406.71	575 2	550 - 570
3S/1E 13P 1	supply	cal rock	JAIMESON COMPANY	Amador	Lower	399.98	652 14	94 - 652
3S/1E 13P 5	nested	LGA Grant Nested 1	ZONE 7 WATER AGENCY	Amador	Upper	380.78	135 2	110 - 130
3S/1E 13P 6	nested	LGA Grant Nested 2	ZONE 7 WATER AGENCY	Amador	Lower	380.76	255 2	230 - 250
3S/1E 13P 7	nested	LGA Grant Nested 3	ZONE 7 WATER AGENCY	Amador	Lower	380.76	375 2	350 - 370
3S/1E 13P 8	nested	LGA Grant Nested 4	ZONE 7 WATER AGENCY	Amador	Lower	380.76	605 2	580 - 600
3S/1E 14B 1	industrial	Industrial Asphalt	VULCAN MATERIALS	Amador	Lower	384.2	435 8	200 - 410
3S/1E 14D 2	monitor	South Cope Lake	ZONE 7	Amador	Lower	371.83	740 16	170 - 740
3S/1E 14K 2	supply	lone star ind	LONESTAR	Amador	Lower	391.73	508 16	120 - 480
3S/1E 15F 3	supply	kaiser #8	KAISER	Amador	Lower	368.99	640 14	195 - 615
3S/1E 15J 3	supply	shadow cliff	EAST BAY REGIONAL PARK	Amador	Lower	344.59	196 8	154 - 184
3S/1E 15M 3	monitor	Bush/Valley South	ZONE 7	Amador	Lower	362.88	600 2	280 - 590
3S/1E 16A 2	muni	Pleas 8	CITY OF PLEASANTON	AmWest	Lower	358.2	510 20	200 - 495
3S/1E 16A 4	monitor	Bush/Valley Mid	ZONE 7	Amador	Lower	359.36	603 2	260 - 580
3S/1E 16B 1	monitor	Bush/Valley North	ZONE 7	Amador	Deep	355.81	805 2	605 - 800
3S/1E 16C 2	nested	Santa Rita Valley Shallow	ZONE 7	Amador	Lower	344.38	190 2	165 - 185
3S/1E 16C 3	nested	Santa Rita Valley Middle	ZONE 7	Amador	Lower	344.27	305 2	280 - 300
3S/1E 16C 4	nested	Santa Rita Valley Deep	ZONE 7	Amador	Lower	344.16	375 2	355 - 370
3S/1E 16E 4	monitor	black ave - cultural	ZONE 7	Amador	Upper	351.69	105 2.5	95 - 100
3S/1E 16L 2	monitor	Pleas 4	CITY OF PLEASANTON	Amador	Upper	355.86	151 12	56 - 136
3S/1E 16L 5	muni	Pleas 5	CITY OF PLEASANTON	Amador	Lower	358.05	685 18	149 - 650
3S/1E 16L 7	muni	Pleas 6	CITY OF PLEASANTON	Amador	Lower	354.47	647 18	165 - 647
3S/1E 16P 5	monitor	Vervais Monitor	ZONE 7	Amador	Upper	354.51	75 2.5	64 - 69
3S/1E 16R 1	supply	Stanley Berry Farm	R.L. IRBY	Amador	Lower	362.5	239 10	70 - 226
3S/1E 17B 4	supply	Casterson	LLOYD HAINES	Amador	Lower	337.69	248 8	0 - 248
3S/1E 17D 3	nested	Hopyard Nested Shallow	ZONE 7	Bernal	Lower	325.13	108 4	92 - 98
3S/1E 17D 4	nested	Hopyard Nested Middle 1	ZONE 7	Bernal	Lower	325.14	236 4	206 - 226
3S/1E 17D 5	nested	Hopyard Nested Middle 2	ZONE 7	Bernal	Lower	325.13	308 4	266 - 286
3S/1E 17D 6	nested	Hopyard Nested Middle 3	ZONE 7	Bernal	Lower	325.12	408 4	378 - 398
3S/1E 17D 7	nested	Hopyard Nested Deep	ZONE 7	Bernal	Deep	325.13	684 4	654 - 674
3S/1E 17D10	monitor	Hopyard 7	ZONE 7	Bernal	Lower	328.13	425 24	185 - 415
3S/1E 17D11	monitor	Hopyard 9 Monitoring Well	ZONE 7	Bernal	Lower	324.84	603 2	340 - 505
3S/1E 17D12	muni	Hopyard 9	ZONE 7	Bernal	Lower	327.9	315 18	235 - 310

<i>Site</i>	<i>Type</i>	<i>Other Name</i>	<i>Owner</i>	<i>Basin</i>	<i>Aquifer</i>	<i>RP</i>	<i>TD Dia</i>	<i>Perf</i>
3S/1E 18A 5	muni	Pleas 7	CITY OF PLEASANTON	Bernal	Lower	329.05	454 18	120 - 440
3S/1E 18A 6	muni	Hopyard 6	ZONE 7	Bernal	Lower	326.74	500 18	158 - 490
3S/1E 18E 4	monitor	Valley Trails II	ZONE 7	Bernal	Upper	320.21	83 4	69 - 79
3S/1E 18J 2	monitor	camino segura	ZONE 7	Bernal	Upper	323.02	71 2.5	61 - 66
3S/1E 18N 1	supply	merritt	RALPH MERRITT	Bernal	Lower	319.43	708 12	229 - 610
3S/1E 19A10	muni	SFWD South (B)	SFWD	Bernal	Lower	337.02	331	189 - 327
3S/1E 19A11	muni	SFWD North (A)	SFWD	Bernal	Lower	334.27	330 18	196 - 320
3S/1E 19C 4	monitor	del valle & laguna	ZONE 7	Bernal	Upper	322.23	78 4	68 - 73
3S/1E 19K 1	monitor	680/bernal	ZONE 7	Bernal	Upper	321.54	57.6 2.5	47.6 - 52.6
3S/1E 20B 2	supply	Fairgrounds Potable	ALAMEDA COUNTY	Bernal	Lower	342.62	500 12	218 - 500
3S/1E 20C 3	supply	Fairgrounds Potable Backup	ALAMEDA FAIRGROUNDS	Bernal	Lower	340.31	110	74 - 107
3S/1E 20C 7	monitor	Key_Bern_U	ZONE 7	Bernal	Upper	338.66	153 2	65 - 145
3S/1E 20C 8	nested	Key_Bern_L	ZONE 7	Bernal	Lower	338.67	315 2	295 - 315
3S/1E 20C 9	nested	Fair Nested Deep	ZONE 7	Bernal	Lower	338.78	515 2	495 - 515
3S/1E 20J 4	monitor	civic center	ZONE 7	Bernal	Upper	331.62	72 2.5	62 - 67
3S/1E 20M11	monitor	S.F "M"LINE	ZONE 7	Bernal	Upper	325.73	71 2.5	61 - 66
3S/1E 20Q 2	monitor	20Q2	CITY OF PLEASANTON	Bernal	Upper	325.82	65 10	45 - 53
3S/1E 22D 2	monitor	vineyard trailer	ZONE 7	Amador	Upper	368.05	72 2.5	62 - 67
3S/1E 23J 1	monitor	1627 vineyard trailer	D. SAFRENO	Amador	Upper	428.2	120 8	0 - 120
3S/1E 24Q 1	supply	Ruby Hills	RUBY HILLS	Amador	Lower	427.5	440 14	200 - 400
3S/1E 25C 3	monitor	Katz Winery Mansion	RUBY HILLS	Amador	Upper	454.16	146 2	70 - 140
3S/1E 29M 4	monitor	f.c. channel	ZONE 7	Castle	Upper	310.94	57 2.5	47 - 52
3S/1E 29P 2	monitor	castlewood dr	ZONE 7	Bernal	Upper	302.82	42 2.5	32 - 37
3S/1W 1B 9	nested	DSRSD Shallow	DSRSD	Dublin	Lower	333.56	162 2	122 - 152
3S/1W 1B10	nested	DSRSD Middle	DSRSD	Dublin	Lower	333.57	414 2	274 - 404
3S/1W 1B11	nested	DSRSD Deep	DSRSD	Dublin	Lower	333.74	560 2	480 - 550
3S/1W 1J 1	monitor	DSRSD MW-1	DSRSD	Dublin	Upper	334.36	70	44 - 64
3S/1W 2A 2	monitor	McNamara's	ZONE 7	Dublin	Upper	369.4	47 2.5	37 - 42
3S/1W 12A 9	monitor	DSRSD NW-75	DSRSD	Dublin	Upper	332.14	74 2	49 - 69
3S/1W 12B 2	monitor	Stoneridge Mall Rd	ZONE 7	Dublin	Upper	342.89	39.5 4	20 - 50
3S/1W 12J 1	monitor	DSRSD South	ZONE 7	Dublin	Upper	329.31	62 2.5	52 - 57
3S/1W 13J 1	monitor	muirwood dr	ZONE 7	Castle	Upper	343.94	48 2.5	39 - 44
3S/2E 1F 2	monitor	Brisa at Circuit City	ZONE 7	Spring	Upper	572.99	68.6 2.5	59 - 64
3S/2E 2B 2	monitor	south front rd	ZONE 7	Spring	Upper	539.45	46 2.5	36.9 - 41.9
3S/2E 3A 1	monitor	Bluebell	ZONE 7	Spring	Upper	517.63	54 2.5	44 - 49
3S/2E 3K 3	monitor	first & S. front rd	ZONE 7	Mocho I	Upper	522.83	60 2.5	50 - 55
3S/2E 5N 1	supply	1037 portola - trailer	TRAILER RANCH	Mocho II	Lower	440	210 10	0 - 210
3S/2E 7C 2	monitor	york way - jaws - G4	ZONE 7	Mocho II	Upper	420.84	49 2.5	39 - 44
3S/2E 7H 2	monitor	dakota	CITY OF LIVERMORE	Mocho II	Upper	442.85	54 2	44 - 54
3S/2E 7N 1	monitor	kittyhawk south	ZONE 7	Amador	Upper	421.06	130 4	76 - 130
3S/2E 7P 3	muni	CWS STA 24	CAL WATER SERVICE	Amador	Lower	431.46	510 16	300 - 490
3S/2E 7R 2	monitor	CWS STA 31 Monitoring	CAL WATER SERVICE	Mocho II	Deep	446	805 2	750 - 805
3S/2E 7R 3	muni	CWS STA 31	CAL WATER SERVICE	Mocho II	Lower	446	583 16	410 - 528
3S/2E 8F 1	muni	CWS STA 10	CAL WATER SERVICE	Mocho II	Lower	456.24	576 16	143 - 433
3S/2E 8G 1	muni	CWS STA 19	CAL WATER SERVICE	Mocho II	Lower	465.05	465 16	120 - 455
3S/2E 8H 2	monitor	North k	ZONE 7	Mocho II	Upper	469.61	46 2.5	36 - 41
3S/2E 8H 3	nested	Key_Mo2_L	ZONE 7	Mocho II	Lower	477.25	195 2	170 - 190
3S/2E 8H 4	nested	N Liv Ave Deep	ZONE 7	Mocho II	Lower	476.97	385 2	360 - 380
3S/2E 8K 2	monitor	Key_Mo2_U (Livermore Key)	ZONE 7	Mocho II	Upper	464.78	74 2.5	64 - 69
3S/2E 8N 2	muni	CWS STA 14	CAL WATER SERVICE	Mocho II	Lower	453.64	526 10	140 - 515
3S/2E 8P 1	muni	CWS STA 8	CAL WATER SERVICE	Mocho II	Lower	468.2	273 10	122 - 263

Site	Type	Other Name	Owner	Basin	Aquifer	RP	TD	Dia	Perf
3S/2E 9L 1	muni	CWS STA 17	CAL WATER SERVICE	Mocho II	Lower	499.39	516	16	136 - 496
3S/2E 9P 1	muni	CWS STA 12	CAL WATER SERVICE	Mocho II	Lower	501.28	515	16	192 - 492
3S/2E 9Q 1	muni	CWS STA 9	CAL WATER SERVICE	Mocho II	Lower	518.15	572	14	180 - 492
3S/2E 9Q 4	monitor	school st	ZONE 7	Mocho II	Upper	504.35	80	2.5	70 - 75
3S/2E 10F 3	monitor	hexcel	ZONE 7	Mocho I	Upper	534.84	45	2.5	35 - 40
3S/2E 10Q 1	monitor	almond	ZONE 7	Mocho II	Upper	555.36	43.5	2.5	33.5 - 33.8
3S/2E 10Q 2	monitor	LLNL W-703	LLNL	Mocho II	Lower	549.33	325	4.5	298 - 325
3S/2E 11C 1	monitor	joan way	ZONE 7	Mocho I	Upper	557.1	66.2	2.5	56.2 - 61.2
3S/2E 12C 4	monitor	LLNL W-486	LLNL	Spring	Upper	591.46	108	4.5	100 - 108
3S/2E 12J 3	monitor	LLNL W-017A	LLNL	Spring	Lower	628.84	160	5	127 - 157
3S/2E 14A 3	monitor	S. vasco @east ave	ZONE 7	Mocho I	Upper	601.87	110	2.5	100 - 105
3S/2E 14B 1	domestic	5763 east ave	LAS POSITAS SWIM CLUB	Mocho I	Lower	593.36	300	9	146 - 234
3S/2E 15E 2	irrigation	Retzlaff Winery	BOB TAYLOR	Mocho II	Lower	549.69	192	8	104 - 189
3S/2E 15Q 6	irrigation	Concannon	CONCANNON	Mocho II	Lower	577.26	301	12	220 - 301
3S/2E 15R17	nested	Buena Vista Shallow	ZONE 7	Mocho II	Upper	592.41	63	2	38 - 58
3S/2E 15R18	nested	Buena Vista Deep	ZONE 7	Mocho II	Lower	592.47	138	2	113 - 133
3S/2E 16A 3	irrigation	Memory Gardens	MEMORY GARDENS	Mocho II	Lower	527.06	240	10	91 - 240
3S/2E 16B 1	muni	CWS STA 5	CAL WATER SERVICE	Mocho II	Lower	520.22	410	14	140 - 390
3S/2E 16C 1	muni	CWS STA 15	CAL WATER SERVICE	Mocho II	Lower	510.97	584	16	150 - 523
3S/2E 16E 4	monitor	pepper tree	ZONE 7	Mocho II	Upper	506.26	45	2.5	35 - 40
3S/2E 17E 2	supply	Mocho Street	JOHN & BARBARA STEIGE	Mocho II	Upper	467.71	94	6	0 - 94
3S/2E 18B 1	muni	CWS STA 20	CAL WATER SERVICE	Amador	Lower	438.56	497	16	190 - 465
3S/2E 18E 1	monitor	E. stanley	ZONE 7	Amador	Upper	423.86	133.8	2.5	##### - 128.8
3S/2E 19D 7	nested	Isabel Shallow	ZONE 7	Amador	Lower	415.07	180	2	100 - 180
3S/2E 19D 8	nested	Isabel Middle 1	ZONE 7	Amador	Lower	415.04	260	2	210 - 260
3S/2E 19D 9	nested	Isabel Middle 2	ZONE 7	Amador	Lower	414.98	390	2	280 - 390
3S/2E 19D10	nested	Isabel Deep	ZONE 7	Amador	Lower	414.89	470	2	420 - 470
3S/2E 20M 1	supply	Alden Lane	ALDEN LANE NURSERY	Amador	Lower	478.79	184	12	0 - 184
3S/2E 22B 1	monitor	grapes	ZONE 7	Mocho II	Upper	585.88	31.9	2.5	21.9 - 26.9
3S/2E 23E 1	nested	Mines Nested Shallow	ZONE 7	Mocho II	Upper	613.36	40	2	20 - 35
3S/2E 23E 2	nested	Mines Nested Deep	ZONE 7	Mocho II	Lower	613.23	110	2	95 - 105
3S/2E 24A 1	monitor	S. greenville	ZONE 7	Mocho I	Upper	717.7	46.3	2.5	36.3 - 41.3
3S/2E 26J 2	monitor	mines rd	ZONE 7	Mocho II	Upper	689.92	44	2.5	34 - 39
3S/2E 29F 4	monitor	usgs wetmore	ZONE 7	Amador	Upper	457.5	36	2.5	26 - 31
3S/2E 30D 2	monitor	vineyard	ZONE 7	Amador	Upper	431.6	44	4	24 - 39
3S/2E 30G 1	domestic	genesis farms	GENISIS FARMS	Amador	Lower	453.69	390	12	150 - 370
3S/2E 33G 1	monitor	crohare	ZONE 7	Amador	Upper	511.52	17	2.5	9 - 14
3S/2E 33K 1	monitor	V.A.	ZONE 7	Amador	Upper	546.83	15	2.5	7 - 12
3S/2E 33L 1	monitor	VA/CROHARE FENCE	ZONE 7	Amador	Upper	557.63	25	2.5	11 - 16
3S/3E 7D 2	monitor	7D 2	ZONE 7	Spring	Upper	622.84	74	2.5	64 - 69
3S/3E 7M 2	supply	lupin way	LEON MOORE	Spring	Lower	628.64	199	6	171 - 188

RP = Reference Point Elevation (in feet above MSL)

TD = Total Depth of well (in feet below ground surface)

Dia = Diameter of well casing (in inches)

Perf = Preforated interval (in feet below ground surface), uppermost - lowermost perforation



TABLE 3.2-3
SEMIANNUAL GROUNDWATER LEVELS
(FEET above Mean Sea Level, NAVD88)
FALL 2011 TO FALL 2012

Well Number	Well Depth	Aquifer	Sub-Basin	Fall 2011		Spring 2012		Fall 2012		Change in Elevation		
				Depth to Water	GW Elev	Depth to Water	GW Elev	Depth to Water	GW Elev	Seasonal		Annual
										Fall 11 to Spring 12	Spring 12 to Fall 12	
2S/1E 32E 1	70	U	Camp	34.8	357.8	35.7	356.9	37.5	355.1	-0.9	-1.8	-2.7
2S/1E 32N 1	44	U	Camp	17.9	342.9	17.3	343.5	18.8	342.0	0.7	-1.6	-0.9
2S/1E 32Q 1	45	U	Camp	25.2	342.4	26.0	341.5	26.8	340.8	-0.8	-0.8	-1.6
2S/1E 33L 1	80	U	Camp	49.6	339.9	51.7	337.8	52.7	336.8	-2.1	-1.0	-3.1
2S/1E 33P 2	55	U	Camp	31.0	339.0	32.9	337.1	33.7	336.4	-1.9	-0.8	-2.7
2S/1E 33R 1	60	U	Camp	20.1	338.4	21.0	337.5	22.0	336.5	-0.9	-0.9	-1.8
2S/1W 15F 1	60	U	Bishop	10.2	429.2	9.8	429.7	10.9	428.6	0.5	-1.1	-0.6
2S/1W 26C 2	50	U	Dublin	23.7	382.8	23.2	383.3	25.6	381.0	0.5	-2.4	-1.9
2S/1W 36E 3	60	U	Dublin	4.2	342.3	3.1	343.4	4.2	342.3	1.0	-1.1	0.0
2S/1W 36F 1	190	L	Dublin	22.5	320.3	15.4	327.3	24.7	318.0	7.0	-9.3	-2.3
2S/1W 36F 2	320	L	Dublin	26.2	316.5	20.8	322.0	25.5	317.2	5.4	-4.8	0.7
2S/1W 36F 3	520	L	Dublin	56.0	286.7	46.0	296.7	52.3	290.4	10.0	-6.4	3.7
2S/2E 27C 2	108	U	Spring	15.4	526.8	16.1	526.0	16.5	525.6	-0.8	-0.4	-1.2
2S/2E 27P 2	68	U	Spring	2.6	502.9	2.1	503.3	3.6	501.8	0.4	-1.5	-1.1
2S/2E 28D 2	55	U	May	29.2	525.9	29.5	525.6	30.0	525.1	-0.3	-0.5	-0.8
2S/2E 28J 2	230	L	May	4.1	514.8	4.0	514.9	4.9	514.0	0.1	-0.9	-0.8
2S/2E 28Q 1	28	U	May	5.9	507.2	4.3	508.7	5.8	507.2	1.5	-1.5	0.1
2S/2E 32K 2	43	U	Cayetano	9.1	498.3	9.0	498.5	10.0	497.5	0.1	-1.0	-0.8
2S/2E 34E 1	49	U	May	5.1	494.7	4.4	495.4	5.7	494.0	0.7	-1.3	-0.6
2S/2E 34Q 2	50	U	Spring	2.7	504.6	2.5	504.8	3.0	504.2	0.2	-0.6	-0.3
3S/1E 1F 2	40	U	Mocho II	16.7	411.7	18.3	410.2	19.0	409.5	-1.5	-0.7	-2.2
3S/1E 1H 3	80	U	Mocho II	26.9	395.9	27.7	395.1	28.8	394.0	-0.8	-1.2	-1.9
3S/1E 1J 3	300	L	Mocho II	19.1	398.8	NM	-	25.7	392.2	-	-	-6.6
3S/1E 1L 1	70	U	Camp	54.4	348.7	57.3	345.8	59.7	343.4	-2.9	-2.4	-5.3
3S/1E 1P 2	50	U	Amador	20.5	369.1	22.2	367.4	24.1	365.5	-1.7	-1.9	-3.6
3S/1E 1P 3	480	L	Amador	113.8	280.6	125.2	269.2	125.9	268.5	-11.4	-0.7	-12.1
3S/1E 2J 2	41	U	Camp	14.4	366.5	13.0	367.9	16.5	364.4	1.5	-3.6	-2.1
3S/1E 2J 3	65	U	Camp	25.4	380.9	25.4	381.0	24.7	381.6	0.1	0.6	0.7
3S/1E 2K 2	46	U	Camp	27.2	369.8	26.6	370.5	28.3	368.8	0.6	-1.7	-1.0
3S/1E 2M 3	50	U	Camp	18.9	346.2	19.5	345.6	20.2	344.8	-0.6	-0.8	-1.3
3S/1E 2N 2	80	U	Camp	19.8	343.4	20.0	343.3	NM	-	-0.1	-	-
3S/1E 2N 6	55	U	Amador	31.9	334.3	31.8	334.4	32.7	333.4	0.1	-1.0	-0.9
3S/1E 2P 3	380	L	Camp	NM	-	NM	-	105.5	266.3	-	-	-
3S/1E 2Q 1	45	U	Amador	20.2	349.7	19.8	350.1	22.0	347.9	0.4	-2.2	-1.9
3S/1E 2R 1	33	U	Amador	18.7	357.6	17.2	359.1	11.2	365.1	1.5	6.0	7.6
3S/1E 3G 2	50	U	Camp	13.6	340.6	12.4	341.8	14.5	339.8	1.2	-2.1	-0.9
3S/1E 4A 1	50	U	Camp	17.2	333.5	18.1	332.6	19.0	331.7	-0.9	-0.9	-1.8
3S/1E 4J 5	47	U	Camp	16.1	329.1	16.2	329.0	17.7	327.5	0.0	-1.6	-1.6
3S/1E 4J 6	110	U	Camp	19.1	326.4	19.8	325.8	21.2	324.4	-0.7	-1.4	-2.1
3S/1E 4Q 2	90	U	Amador	52.7	292.7	54.3	291.2	59.6	285.9	-1.5	-5.3	-6.8
3S/1E 5K 6	75	U	Camp	13.6	332.4	13.3	332.7	14.2	331.8	0.3	-0.9	-0.6
3S/1E 5K 7	150	L	Camp	19.0	327.2	19.9	326.3	22.2	324.0	-0.9	-2.3	-3.2
3S/1E 5L 3	40	U	Camp	12.7	326.8	12.5	327.0	13.0	326.4	0.2	-0.6	-0.4
3S/1E 5P 6	35	U	Camp	11.2	325.5	12.0	324.6	11.9	324.7	-0.9	0.1	-0.8
3S/1E 6F 3	36	U	Dublin	4.9	325.0	4.4	325.4	5.4	324.5	0.4	-1.0	-0.5
3S/1E 6G 5	200	L	Dublin	9.9	322.3	9.0	323.2	11.4	320.8	0.9	-2.4	-1.5
3S/1E 6N 2	67	U	Dublin	13.4	321.8	12.5	322.7	14.2	321.1	0.9	-1.6	-0.7
3S/1E 7B 2	152	L	Dublin	9.7	318.1	9.3	318.5	11.2	316.6	0.3	-1.8	-1.5
3S/1E 7B12	70	U	Dublin	11.5	316.3	11.3	316.5	13.0	314.8	0.2	-1.7	-1.5
3S/1E 7G 7	55	U	Dublin	12.8	314.5	12.9	314.4	14.5	312.8	-0.1	-1.6	-1.7
3S/1E 7J 5	50	U	Dublin	15.2	311.6	15.4	311.4	16.5	310.3	-0.2	-1.2	-1.4
3S/1E 7M 2	88	U	Dublin	17.4	311.0	16.4	312.1	20.2	308.3	1.0	-3.8	-2.8
3S/1E 7R 8	52	U	Bernal	36.7	289.9	38.1	288.6	Dry	-	-1.4	-	-
3S/1E 8B 1	148	U	Amador	48.1	290.2	49.8	288.5	52.7	285.6	-1.7	-2.9	-4.6
3S/1E 8G 4	85	U	Amador	51.5	290.0	53.0	288.5	59.8	281.7	-1.5	-6.8	-8.3
3S/1E 8H 9	240	L	Amador	60.9	277.7	72.6	266.0	65.8	272.8	-11.7	6.8	-4.9
3S/1E 8H10	440	L	Amador	72.4	266.8	87.1	252.2	68.2	271.1	-14.7	18.9	4.3
3S/1E 8H11	720	D	Amador	61.5	277.8	88.2	251.1	70.6	268.7	-26.7	17.6	-9.1
3S/1E 8H13	800	D	Amador	60.9	278.0	87.2	251.7	70.0	268.9	-26.3	17.2	-9.1
3S/1E 8H18	745	L	Amador	65.6	276.3	92.0	250.0	74.8	267.2	-26.3	17.2	-9.1
3S/1E 8K 1	99	U	Amador	46.0	286.4	49.5	282.9	60.8	271.6	-3.5	-11.3	-14.8
3S/1E 8N 1	72	U	Bernal	33.8	289.9	36.7	287.0	49.0	274.7	-2.9	-12.2	-15.1
3S/1E 9B 1	810	L	Amador	69.4	279.9	NM	-	81.3	267.9	-	-	-12.0
3S/1E 9G 1	160	U	Amador	62.6	289.8	64.3	288.1	71.0	281.4	-1.7	-6.7	-8.5
3S/1E 9H10	145	U	Amador	62.2	290.7	64.1	288.8	70.2	282.7	-1.9	-6.0	-7.9
3S/1E 9H11	190	L	Amador	64.4	288.6	71.1	282.0	74.8	278.2	-6.6	-3.7	-10.4
3S/1E 9J 7	505	U	Amador	67.2	290.2	69.3	288.1	75.5	281.9	-2.1	-6.2	-8.3
3S/1E 9J 8	305	L	Amador	71.7	285.9	82.1	275.4	83.8	273.7	-10.5	-1.7	-12.2
3S/1E 9J 9	505	L	Amador	75.9	281.8	97.9	259.7	88.1	269.6	-22.1	9.9	-12.2
3S/1E 9M 3	575	L	Amador	61.4	286.0	NM	-	NM	-	-	-	-

Table 3.2-3
Page 1 of 4



**TABLE 3.2-3
SEMIANNUAL GROUNDWATER LEVELS
(FEET above Mean Sea Level, NAVD88)
FALL 2011 TO FALL 2012**

Well Number	Well Depth	Aquifer	Sub-Basin	Fall 2011		Spring 2012		Fall 2012		Change in Elevation		
				Depth to Water	GW Elev	Depth to Water	GW Elev	Depth to Water	GW Elev	Seasonal		Annual
										Fall 11 to Spring 12	Spring 12 to Fall 12	
2S/1E 32E 1	70	U	Camp	34.8	357.8	35.7	356.9	37.5	355.1	-0.9	-1.8	-2.7
2S/1E 32N 1	44	U	Camp	17.9	342.9	17.3	343.5	18.8	342.0	0.7	-1.6	-0.9
2S/1E 32Q 1	45	U	Camp	25.2	342.4	26.0	341.5	26.8	340.8	-0.8	-0.8	-1.6
2S/1E 33L 1	80	U	Camp	49.6	339.9	51.7	337.8	52.7	336.8	-2.1	-1.0	-3.1
2S/1E 33P 2	55	U	Camp	31.0	339.0	32.9	337.1	33.7	336.4	-1.9	-0.8	-2.7
2S/1E 33R 1	60	U	Camp	20.1	338.4	21.0	337.5	22.0	336.5	-0.9	-0.9	-1.8
3S/1E 9M 4	498	L	Amador	61.4	281.5	NM	-	72.9	270.0	-	-	-11.4
3S/1E 9P 5	105	U	Amador	61.1	288.3	63.3	286.1	70.5	278.9	-2.2	-7.2	-9.4
3S/1E 9P 9	210	L	Amador	63.7	285.9	68.1	281.5	73.0	276.6	-4.4	-4.8	-9.3
3S/1E 9P10	310	L	Amador	67.7	281.8	77.0	272.5	76.9	272.6	-9.3	0.1	-9.2
3S/1E 9P11	425	L	Amador	74.9	274.6	87.7	261.7	80.8	268.7	-12.8	6.9	-5.9
3S/1E 10A 1	253	L	Amador	NM	-	NM	-	NM	-	-	-	-
3S/1E 10A 2	88	U	Amador	60.2	307.2	60.5	306.9	65.3	302.0	-0.3	-4.8	-5.1
3S/1E 10B 8	200	L	Amador	62.8	290.8	68.1	285.5	73.2	280.5	-5.3	-5.1	-10.4
3S/1E 10B 9	294	L	Amador	65.9	287.6	74.1	279.4	78.2	275.3	-8.2	-4.2	-12.3
3S/1E 10B10	600	L	Amador	72.3	281.3	85.1	268.5	85.5	268.0	-12.8	-0.4	-13.3
3S/1E 10B11	810	D	Amador	71.9	281.6	87.5	266.1	85.1	268.4	-15.6	2.4	-13.2
3S/1E 10D 2	212	L	Amador	60.3	289.0	66.4	282.9	70.4	278.9	-6.1	-4.0	-10.1
3S/1E 10D 3	322	L	Amador	63.0	286.3	72.3	277.0	74.3	274.9	-9.3	-2.1	-11.4
3S/1E 10D 4	616	L	Amador	67.8	281.5	79.8	269.5	79.8	269.5	-12.0	0.1	-11.9
3S/1E 10D 5	790	D	Amador	68.2	281.1	85.1	264.2	79.8	269.6	-16.9	5.4	-11.5
3S/1E 10D 7	215	U	Amador	69.6	291.5	71.5	289.6	76.7	284.4	-1.9	-5.2	-7.1
3S/1E 10D 8	215	L	Amador	73.0	288.0	77.6	283.5	82.4	278.6	-4.5	-4.8	-9.4
3S/1E 10K 2	591	L	Amador	74.0	284.7	80.0	278.7	84.4	274.3	-6.0	-4.4	-10.4
3S/1E 10K 3	530	L	Amador	74.0	284.7	94.6	269.2	93.1	270.7	-15.5	1.4	-14.0
3S/1E 10N 2	195	U	Amador	69.6	290.8	71.6	288.8	77.3	283.1	-2.0	-5.7	-7.7
3S/1E 10N 3	195	L	Amador	72.4	287.8	76.2	284.0	82.2	278.0	-3.8	-6.1	-9.9
3S/1E 11B 1	43	U	Amador	31.9	337.5	32.0	337.4	34.2	335.2	-0.1	-2.2	-2.3
3S/1E 11C 3	55	U	Amador	31.2	333.6	31.0	333.9	31.4	333.5	0.3	-0.4	-0.1
3S/1E 11G 1	120	U	Amador	59.6	312.0	67.5	304.1	70.2	301.4	-7.9	-2.7	-10.6
3S/1E 11G 2	350	L	Amador	93.6	278.0	100.6	271.1	104.1	267.6	-6.9	-3.5	-10.4
3S/1E 11G 3	590	L	Amador	92.3	279.3	101.9	269.7	101.1	270.5	-9.6	0.8	-8.8
3S/1E 11G 4	790	D	Amador	95.4	276.3	108.1	263.6	103.9	267.8	-12.7	4.3	-8.4
3S/1E 11M 2	700	L	Amador	79.0	286.9	85.5	280.5	90.4	275.5	-6.4	-5.0	-11.4
3S/1E 11M 3	684	L	Amador	79.0	286.9	NM	-	101.6	267.6	-	-	-19.3
3S/1E 11P 6	400	L	Amador	94.1	282.6	104.8	271.9	104.2	272.5	-10.7	0.6	-10.0
3S/1E 12A 2	69	U	Amador	33.5	367.9	39.0	362.4	43.8	357.6	-5.5	-4.8	-10.3
3S/1E 12G 1	73	U	Amador	57.9	346.6	62.0	342.5	64.5	340.0	-4.1	-2.5	-6.6
3S/1E 12H 4	270	L	Amador	127.6	280.1	135.3	272.5	141.0	266.7	-7.6	-5.8	-13.4
3S/1E 12H 5	400	L	Amador	127.3	280.5	140.9	266.9	137.2	270.6	-13.6	3.8	-9.8
3S/1E 12H 6	480	L	Amador	129.1	278.7	142.2	265.6	139.6	268.2	-13.1	2.6	-10.6
3S/1E 12H 7	684	D	Amador	132.9	274.8	117.2	290.5	184.9	222.8	15.8	-67.7	-51.9
3S/1E 12K 2	300	L	Amador	135.6	270.7	141.7	264.6	147.3	259.0	-6.1	-5.6	-11.7
3S/1E 12K 3	475	L	Amador	121.6	285.3	135.0	271.9	134.2	272.6	-13.4	0.7	-12.7
3S/1E 12K 4	575	D	Amador	130.7	276.1	122.0	284.8	154.8	251.9	8.7	-32.9	-24.2
3S/1E 13P 1	652	L	Amador	98.6	301.4	104.1	295.9	NM	-	-5.5	-	-
3S/1E 13P 5	135	U	Amador	77.2	303.6	82.1	298.6	88.0	292.8	-4.9	-5.8	-10.8
3S/1E 13P 6	255	L	Amador	96.8	284.0	103.3	277.5	107.8	273.0	-6.5	-4.5	-11.0
3S/1E 13P 7	375	L	Amador	93.0	287.7	98.3	282.5	108.1	272.7	-5.3	-9.8	-15.1
3S/1E 13P 8	605	L	Amador	104.5	276.3	90.4	290.4	138.8	242.0	14.1	-48.4	-34.4
3S/1E 14B 1	435	L	Amador	105.2	279.0	115.6	268.6	115.3	269.0	-10.4	0.3	-10.1
3S/1E 14D 2	740	L	Amador	86.0	285.9	92.9	279.0	97.5	274.3	-6.9	-4.6	-11.5
3S/1E 14K 2	508	L	Amador	104.2	287.5	113.8	277.9	137.7	254.0	-9.6	-23.9	-33.5
3S/1E 15F 3	640	L	Amador	89.9	279.1	88.9	280.1	105.3	263.7	0.9	-16.4	-15.4
3S/1E 15J 3	196	L	Amador	67.0	277.6	77.6	267.0	76.7	267.9	-10.6	0.9	-9.7
3S/1E 15M 3	600	L	Amador	90.5	272.4	85.6	277.3	102.0	260.9	4.9	-16.4	-11.5
3S/1E 16A 4	603	L	Amador	87.5	271.8	89.0	270.3	91.0	268.4	-1.5	-1.9	-3.4
3S/1E 16B 1	805	D	Amador	82.8	273.0	90.0	265.8	88.3	267.5	-7.2	1.7	-5.5
3S/1E 16C 2	190	L	Amador	63.9	280.5	67.9	276.5	73.5	270.9	-4.1	-5.6	-9.7
3S/1E 16C 3	305	L	Amador	72.4	271.9	73.1	271.2	75.8	268.5	-0.7	-2.7	-3.3
3S/1E 16C 4	375	L	Amador	72.8	271.4	76.4	267.8	76.6	267.6	-3.6	-0.2	-3.8
3S/1E 16E 4	105	U	Amador	55.8	295.9	58.2	293.5	71.2	280.5	-2.4	-13.0	-15.4
3S/1E 16P 5	75	U	Amador	49.5	305.0	48.4	306.2	54.9	299.6	1.2	-6.6	-5.4
3S/1E 16R 1	239	L	Amador	79.8	282.8	78.5	284.0	98.3	264.3	1.3	-19.8	-18.5
3S/1E 17B 4	248	L	Amador	NM	-	56.2	281.5	61.7	276.0	-	-5.5	-
3S/1E 17D 3	108	L	Bernal	36.1	289.1	48.2	277.0	50.7	274.5	-12.1	-2.5	-14.6
3S/1E 17D 4	236	L	Bernal	39.9	285.3	50.2	275.0	50.2	274.9	-10.3	-0.1	-10.3
3S/1E 17D 5	308	L	Bernal	35.8	289.4	48.7	276.4	50.0	275.1	-13.0	-1.3	-14.3
3S/1E 17D 6	408	L	Bernal	34.6	290.5	42.5	282.6	48.6	276.6	-7.9	-6.1	-13.9
3S/1E 17D 7	684	D	Bernal	21.5	303.7	21.6	303.5	22.5	302.6	-0.2	-0.9	-1.0



**TABLE 3.2-3
SEMIANNUAL GROUNDWATER LEVELS
(FEET above Mean Sea Level, NAVD88)
FALL 2011 TO FALL 2012**

Well Number	Well Depth	Aquifer	Sub-Basin	Fall 2011		Spring 2012		Fall 2012		Change in Elevation		
				Depth to Water	GW Elev	Depth to Water	GW Elev	Depth to Water	GW Elev	Seasonal		Annual
										Fall 11 to Spring 12	Spring 12 to Fall 12	
2S/1E 32E 1	70	U	Camp	34.8	357.8	35.7	356.9	37.5	355.1	-0.9	-1.8	-2.7
2S/1E 32N 1	44	U	Camp	17.9	342.9	17.3	343.5	18.8	342.0	0.7	-1.6	-0.9
2S/1E 32Q 1	45	U	Camp	25.2	342.4	26.0	341.5	26.8	340.8	-0.8	-0.8	-1.6
2S/1E 33L 1	80	U	Camp	49.6	339.9	51.7	337.8	52.7	336.8	-2.1	-1.0	-3.1
2S/1E 33P 2	55	U	Camp	31.0	339.0	32.9	337.1	33.7	336.4	-1.9	-0.8	-2.7
2S/1E 33R 1	60	U	Camp	20.1	338.4	21.0	337.5	22.0	336.5	-0.9	-0.9	-1.8
3S/1E 17D10	425	L	Bernal	38.3	289.9	50.9	277.2	52.5	275.6	-12.6	-1.6	-14.2
3S/1E 17D11	603	L	Bernal	33.9	290.9	39.8	285.0	47.7	277.2	-5.9	-7.8	-13.8
3S/1E 17D12	315	L	Bernal	39.8	288.1	54.9	273.0	54.1	273.8	-15.1	0.9	-14.3
3S/1E 18A 6	500	L	Bernal	38.7	288.0	NM	-	53.3	273.4	-	-	-14.6
3S/1E 18E 4	83	U	Bernal	30.9	289.3	32.4	287.8	43.3	276.9	-1.5	-10.9	-12.4
3S/1E 18J 2	71	U	Bernal	33.1	289.9	34.9	288.1	46.5	276.5	-1.8	-11.6	-13.4
3S/1E 18N 1	708	L	Bernal	30.1	289.3	36.7	282.8	44.8	274.6	-6.6	-8.1	-14.7
3S/1E 19A11	330	L	Bernal	43.5	290.8	NM	-	57.1	277.2	-	-	-13.6
3S/1E 19C 4	78	U	Bernal	31.3	291.0	33.9	288.3	45.0	277.3	-2.7	-11.0	-13.7
3S/1E 19K 1	58	U	Bernal	32.5	289.0	37.1	284.5	46.2	275.4	-4.5	-9.1	-13.6
3S/1E 20B 2	500	L	Bernal	NM	-	NM	-	NM	-	-	-	-
3S/1E 20C 3	110	L	Bernal	NM	-	NM	-	63.5	276.8	-	-	-
3S/1E 20C 7	153	U	Bernal	48.7	290.0	50.6	288.1	62.2	276.4	-1.9	-11.7	-13.5
3S/1E 20C 8	315	L	Bernal	50.4	288.2	59.2	279.5	64.4	274.3	-8.7	-5.2	-13.9
3S/1E 20C 9	515	L	Bernal	51.4	287.4	57.2	281.6	64.4	274.4	-5.8	-7.2	-13.1
3S/1E 20J 4	72	U	Bernal	39.0	292.6	40.3	291.3	50.9	280.7	-1.3	-10.6	-11.9
3S/1E 20M11	71	U	Bernal	32.3	293.5	34.9	290.9	45.9	279.9	-2.6	-11.0	-13.6
3S/1E 20Q 2	65	U	Bernal	20.8	305.0	20.0	305.8	22.5	303.3	0.8	-2.5	-1.7
3S/1E 22D 2	72	U	Amador	47.2	320.9	47.7	320.4	58.3	309.8	-0.5	-10.6	-11.1
3S/1E 23J 1	120	U	Amador	78.7	349.6	81.0	347.2	91.2	337.0	-2.4	-10.2	-12.5
3S/1E 24Q 1	440	L	Amador	119.6	308.0	104.1	323.4	126.4	301.1	15.5	-22.3	-6.8
3S/1E 25C 3	146	U	Amador	84.5	369.7	87.7	366.5	90.2	364.0	-3.2	-2.5	-5.7
3S/1E 29M 4	57	U	Castle	22.4	288.6	23.9	287.0	34.8	276.1	-1.6	-10.9	-12.4
3S/1E 29P 2	42	U	Bernal	27.5	275.3	27.6	275.3	29.3	273.5	-0.1	-1.8	-1.8
3S/1W 1B 9	162	L	Dublin	12.5	321.1	9.9	323.7	13.8	319.8	2.6	-3.9	-1.3
3S/1W 1B10	414	L	Dublin	17.5	316.1	14.9	318.7	18.5	315.0	2.6	-3.6	-1.1
3S/1W 1B11	560	L	Dublin	39.2	294.6	32.7	301.0	39.8	293.9	6.5	-7.1	-0.7
3S/1W 2A 2	47	U	Dublin	24.9	344.5	23.4	346.0	26.6	342.8	1.6	-3.2	-1.6
3S/1W 12B 2	40	U	Dublin	21.0	321.9	19.9	323.0	21.8	321.1	1.1	-1.9	-0.8
3S/1W 12J 1	62	U	Dublin	18.0	311.3	17.2	312.2	21.3	308.0	0.9	-4.2	-3.3
3S/1W 13J 1	48	U	Castle	29.2	314.7	24.4	319.6	29.7	314.3	4.8	-5.3	-0.5
3S/2E 1F 2	69	U	Spring	21.6	551.4	22.4	550.6	23.0	550.0	-0.9	-0.5	-1.4
3S/2E 2B 2	46	U	Spring	9.2	530.3	9.2	530.3	10.0	529.5	0.0	-0.8	-0.8
3S/2E 3A 1	54	U	Spring	4.3	513.4	4.0	513.7	5.2	512.5	0.3	-1.2	-0.9
3S/2E 3K 3	60	U	Mocho I	13.3	509.6	13.6	509.2	13.8	509.0	-0.3	-0.2	-0.5
3S/2E 5N 1	210	L	Mocho II	35.5	404.5	38.3	401.7	42.8	397.2	-2.8	-4.5	-7.3
3S/2E 7C 2	49	U	Mocho I	26.2	394.6	36.3	384.5	29.8	391.1	-10.1	6.5	-3.6
3S/2E 7H 2	54	U	Mocho II	28.5	414.4	30.8	412.1	33.7	409.2	-2.3	-2.9	-5.2
3S/2E 7N 1	130	U	Amador	78.0	343.1	79.8	341.3	80.2	340.9	-1.8	-0.4	-2.2
3S/2E 8G 1	465	L	Mocho II	55.0	410.1	NM	-	63.0	402.1	-	-	-8.0
3S/2E 8H 2	46	U	Mocho II	37.6	432.0	39.6	430.0	36.6	433.1	-2.0	3.1	1.1
3S/2E 8H 3	195	L	Mocho II	63.4	413.9	72.2	405.1	80.8	396.5	-8.8	-8.6	-17.4
3S/2E 8H 4	385	L	Mocho II	124.1	352.8	138.8	338.2	159.3	317.7	-14.7	-20.5	-35.2
3S/2E 8K 2	74	U	Mocho II	35.4	429.3	38.1	426.7	42.4	422.4	-2.6	-4.3	-7.0
3S/2E 8N 2	526	L	Mocho II	77.0	376.6	NM	-	91.0	362.6	-	-	-14.0
3S/2E 8P 1	273	L	Mocho II	46.0	422.2	NM	-	52.0	416.2	-	-	-6.0
3S/2E 9L 1	516	L	Mocho II	81.0	418.4	NM	-	63.0	436.4	-	-	18.0
3S/2E 9P 1	515	L	Mocho II	102.0	399.3	NM	-	NM	-	-	-	-
3S/2E 9Q 1	572	L	Mocho II	83.0	435.2	NM	-	98.0	420.2	-	-	-15.0
3S/2E 9Q 4	80	U	Mocho II	19.3	485.1	27.3	477.1	30.1	474.3	-8.0	-2.8	-10.8
3S/2E 10F 3	45	U	Mocho I	12.6	522.3	14.0	520.8	14.6	520.3	-1.5	-0.6	-2.0
3S/2E 10Q 1	44	U	Mocho II	22.5	532.9	26.0	529.3	26.4	529.0	-3.6	-0.4	-3.9
3S/2E 11C 1	66	U	Mocho I	26.2	530.9	27.0	530.1	27.6	529.5	-0.8	-0.6	-1.4
3S/2E 14B 1	300	L	Mocho I	62.6	530.8	63.8	529.6	64.2	529.2	-1.1	-0.5	-1.6
3S/2E 15E 2	192	L	Mocho II	28.9	520.8	38.5	511.2	33.2	516.5	-9.6	5.3	-4.3
3S/2E 15Q 6	301	L	Mocho II	63.7	513.6	65.0	512.3	68.2	509.0	-1.4	-3.2	-4.6
3S/2E 15R17	63	U	Mocho II	11.8	580.6	11.2	581.2	10.7	581.8	0.6	0.6	1.2
3S/2E 15R18	138	L	Mocho II	13.4	579.1	13.7	578.7	14.5	578.0	-0.4	-0.8	-1.2
3S/2E 16A 3	240	L	Mocho II	31.6	495.4	39.3	487.8	NM	-	-7.6	-	-
3S/2E 16C 1	584	L	Mocho II	114.0	397.0	NM	-	50.0	461.0	-	-	64.0
3S/2E 16E 4	45	U	Mocho II	16.2	490.1	16.8	489.5	17.1	489.2	-0.6	-0.3	-0.9
3S/2E 17E 2	94	U	Mocho II	16.4	451.4	16.8	450.9	17.2	450.5	-0.5	-0.4	-0.9
3S/2E 18E 1	134	U	Amador	58.1	365.8	63.9	359.9	65.1	358.8	-5.8	-1.2	-7.0
3S/2E 19D 7	180	L	Amador	74.8	340.2	82.7	332.4	84.2	330.9	-7.9	-1.5	-9.4



TABLE 3.2-3
SEMIANNUAL GROUNDWATER LEVELS
(FEET above Mean Sea Level, NAVD88)
FALL 2011 TO FALL 2012

Well Number	Well Depth	Aquifer	Sub-Basin	Fall 2011		Spring 2012		Fall 2012		Change in Elevation		
				Depth to Water	GW Elev	Depth to Water	GW Elev	Depth to Water	GW Elev	Seasonal		Annual
										Fall 11 to Spring 12	Spring 12 to Fall 12	
2S/1E 32E 1	70	U	Camp	34.8	357.8	35.7	356.9	37.5	355.1	-0.9	-1.8	-2.7
2S/1E 32N 1	44	U	Camp	17.9	342.9	17.3	343.5	18.8	342.0	0.7	-1.6	-0.9
2S/1E 32Q 1	45	U	Camp	25.2	342.4	26.0	341.5	26.8	340.8	-0.8	-0.8	-1.6
2S/1E 33L 1	80	U	Camp	49.6	339.9	51.7	337.8	52.7	336.8	-2.1	-1.0	-3.1
2S/1E 33P 2	55	U	Camp	31.0	339.0	32.9	337.1	33.7	336.4	-1.9	-0.8	-2.7
2S/1E 33R 1	60	U	Camp	20.1	338.4	21.0	337.5	22.0	336.5	-0.9	-0.9	-1.8
3S/2E 19D 8	260	L	Amador	75.6	339.5	83.3	331.7	85.2	329.9	-7.7	-1.9	-9.6
3S/2E 19D 9	390	L	Amador	129.5	285.5	121.4	293.6	159.1	255.9	8.1	-37.7	-29.6
3S/2E 19D10	470	L	Amador	116.3	298.6	99.3	315.6	146.8	268.1	17.0	-47.5	-30.5
3S/2E 20M 1	184	L	Amador	53.1	425.7	51.5	427.3	58.9	419.9	1.6	-7.4	-5.8
3S/2E 22B 1	32	U	Mocho II	14.1	571.8	13.6	572.3	14.0	571.9	0.6	-0.5	0.1
3S/2E 23E 1	40	U	Mocho II	16.2	597.1	16.4	596.9	16.1	597.3	-0.2	0.4	0.1
3S/2E 23E 2	110	L	Mocho II	14.2	599.0	14.6	598.6	14.7	598.6	-0.4	-0.1	-0.5
3S/2E 24A 1	46	U	Mocho I	26.6	691.1	27.3	690.4	27.1	690.6	-0.7	0.2	-0.5
3S/2E 26J 2	44	U	Mocho II	10.7	679.2	7.7	682.2	12.6	677.4	3.0	-4.9	-1.9
3S/2E 29F 4	36	U	Amador	8.5	449.0	9.0	448.6	8.6	448.9	-0.4	0.3	-0.1
3S/2E 30D 2	44	U	Amador	21.4	410.2	21.6	410.0	21.4	410.2	-0.2	0.2	-0.1
3S/2E 30G 1	390	L	Amador	NM	-	NM	-	NM	-	-	-	-
3S/2E 33G 1	17	U	Amador	8.7	502.8	9.0	502.6	9.1	502.5	-0.3	-0.1	-0.4
3S/2E 33K 1	15	U	Amador	8.3	538.5	7.0	539.8	6.3	540.5	1.3	0.7	2.0
3S/2E 33L 1	25	U	Amador	11.1	546.5	9.9	547.7	10.7	546.9	1.2	-0.8	0.4
3S/3E 7M 2	199	L	Spring	45.6	583.0	46.0	582.6	46.4	582.2	-0.4	-0.4	-0.8
MA-C 1	0	U	Amador	NM	-	0.0	355.6	0.0	354.2	-	-1.4	-
MA-K 15	0	U	Amador	0.0	333.2	0.0	332.5	0.0	333.4	-0.7	0.9	0.2
MA-K 18	0	U	Amador	0.0	350.8	0.0	350.2	0.0	350.7	-0.6	0.5	-0.1
MA-K 28	0	U	Amador	0.0	291.4	0.0	288.7	0.0	284.3	-2.7	-4.4	-7.1
MA-K 37	0	U	Amador	0.0	291.2	0.0	288.4	0.0	284.3	-2.9	-4.1	-7.0
MA-P 10	0	U	Amador	0.0	366.8	0.0	366.1	0.0	366.3	-0.7	0.3	-0.4
MA-P 12	0	U	Amador	0.0	351.1	0.0	350.5	0.0	351.0	-0.6	0.5	-0.1
MA-P 27	0	U	Amador	0.0	300.9	0.0	295.6	0.0	289.0	-5.3	-6.6	-12.0
MA-P 28	0	U	Amador	0.0	401.1	0.0	403.2	0.0	403.0	2.1	-0.2	1.9
MA-P 40	0	U	Amador	0.0	304.8	0.0	302.2	0.0	297.6	-2.6	-4.6	-7.3
MA-P 41	0	U	Amador	0.0	408.9	0.0	410.8	0.0	409.7	1.9	-1.1	0.8
MA-P 42	0	U	Amador	0.0	287.8	0.0	281.3	0.0	280.3	-6.5	-1.1	-7.6
MA-P 44	0	U	Amador	0.0	322.8	0.0	318.6	0.0	316.4	-4.2	-2.2	-6.4
MA-R 3	0	U	Amador	0.0	335.6	0.0	334.0	0.0	335.6	-1.7	1.7	0.0
MA-R 4	0	U	Amador	0.0	313.6	0.0	312.3	0.0	311.3	-1.3	-1.0	-2.3
MA-R 22	0	U	Amador	NM	-	0.0	361.5	0.0	362.0	-	0.5	-
MA-R 23	0	U	Amador	0.0	359.8	0.0	358.8	0.0	359.0	-1.0	0.2	-0.8

U Upper
L Lower
NM Not measured
DRY Well was dry
OBS Well was obstructed
- Not applicable
Key Well



TABLE 3.2-4
ANNUAL MONITORING WELL WATER QUALITY RESULTS
2012 WATER YEAR

SITE ID	DATE	TEMP. °C	EC umhos/cm	pH	Mineral Constituents (mg/L)									Select Metals (mg/L)				TDS mg/L	Hard mg/L
					Ca	Mg	Na	K	HCO ₃	SO ₄	Cl	NO ₃	SiO ₂	B	As	Fe	Mn		
2S/1E 32E 1	26-Oct-11	19.1	1318	7.0	139	29	108	1.2	579	28	130	13.60	38.9	0.95	0.0034	<0.05	<0.01	773	467
2S/1E 32N 1	28-Mar-12	19.3	890	7.6	69	16	91	1.3	265	30	142	9.43	25.7	0.39	0.0019	<0.05	<0.01	516	239
2S/1E 32Q 1	28-Mar-12	18.7	1611	7.4	122	48	166	1.7	523	65	247	13.86	30.8	0.67	0.002	<0.05	<0.01	953	504
2S/1E 33L 1	28-Mar-12	17.8	1201	7.6	96	26	142	1.9	469	46	142	18.95	30.2	0.41	0.0021	<0.05	<0.01	736	346
2S/1E 33P 2	28-Mar-12	17.8	2188	7.4	164	74	229	2.5	685	83	389	34.37	25.3	0.94	0.0024	<0.1	<0.02	1340	715
2S/1E 33R 1	9-Jan-12	19.2	827	7.7	74	14	77	1.2	261	21	111	18.42	24.6	0.13	0.0022	<0.05	0.016	471	243
2S/1W 15F 1	30-May-12	20.3	1569	7.2	170	65	74	0.9	638	35	222	<0.44	23.8	0.19	0.0026	<0.05	1.8	906	694
2S/1W 26C 2	7-Feb-12	17.8	846	7.1	120	23	33	0.9	451	32	31	26.22	31.0	0.12	0.0041	0.14	0.48	520	394
2S/1W 36E 3	30-May-12	20.2	928	7.3	121	19	43	0.5	365	81	67	25.20	37.4	0.11	0.0039	<0.05	0.27	574	382
2S/1W 36F 1	7-Feb-12	17.2	742	7.7	64	20	69	0.9	415	16	34	<0.44	21.0	0.24	0.0079	<0.05	0.19	431	242
2S/1W 36F 2	7-Feb-12	17.9	845	7.8	38	15	140	0.6	403	<1	88	<0.44	22.7	0.60	0.15	0.24	0.2	505	159
2S/2E 27P 2	26-Mar-12	17.5	4729	7.9	84	41	816	2.0	205	<1.0	1500	<0.44	28.0	27	<0.005	1.	<0.05	2573	380
2S/2E 28D 2	30-May-12	19.9	1313	7.5	70	33	130	1.9	196	32	234	164.74	28.7	0.53	0.003	0.21	0.015	791	309
2S/2E 28J 2	16-Apr-12	11.3	936	8.2	5	4	218	<0.5	382	63	92	<0.44	17.3	1.52	<0.001	0.55	<0.01	593	27
2S/2E 28Q 1	26-Mar-12	17.8	1385	8.0	53	42	190	0.9	324	115	220	1.51	35.1	0.64	0.0088	<0.05	0.27	820	303
2S/2E 32K 2	16-Apr-12	18.1	1072	7.7	48	34	138	1.8	353	65	139	11.20	39.6	0.58	0.0069	<0.05	<0.01	652	258
2S/2E 34E 1	16-Apr-12	17.6	1259	8.2	16	11	263	0.6	356	79	170	<0.44	28.0	2.67	0.026	0.086	0.12	748	87
2S/2E 34Q 2	26-Mar-12	19.6	1813	7.9	84	58	203	1.2	265	147	391	4.65	36.8	3.4	0.0041	0.69	0.11	1058	448
3S/1E 1F 2	30-Nov-11	18.1	1206	7.1	107	31	113	<0.5	504	22	123	44.29	49.6	0.19	0.0051	<0.05	<0.01	738	394
3S/1E 1L 1	9-Jan-12	17.7	1982	7.4	129	29	278	1.4	555	87	333	22.50	30.0	4.45	0.0042	0.65	<0.01	1184	443
3S/1E 2J 3	28-Nov-11	18.5	1317	7.8	58	45	164	2.2	441	19	203	25.29	28.5	0.59	0.0035	0.32	<0.01	765	333
3S/1E 2K 2	28-Nov-11	18.3	818	8.0	14	11	161	1.0	452	34	14	14.70	20.7	0.89	0.0066	0.46	<0.01	497	82
3S/1E 2M 3	9-Jan-12	17.9	2134	7.6	86	34	379	1.9	779	82	254	65.54	25.5	2.75	0.0046	<0.1	<0.02	1314	354
3S/1E 2N 7	1-Nov-11		1174	7.8	66	51	113	1.7	380	60	139	23.16	24.6	1.35	0.003	<0.05	<0.01	668	377
3S/1E 2P 3	28-Nov-11	18.8	749	7.8	51	37	55	1.88	289	42	70	21.83	27.2	0.45	0.0024	<0.05	<0.01	450	281
3S/1E 3G 2	28-Nov-11	16.9	1574	7.5	59	35	258	1.3	720	25	176	1.06	21.0	1.52	0.0047	0.14	0.8	933	292
3S/1E 4A 1	9-Jan-12	19.0	941	7.7	76	19	99	1.0	333	35	112	7.22	21.3	0.31	0.0021	<0.05	<0.01	536	270
3S/1E 4J 5	11-Jan-12	17.5	4159	7.7	70	66	838	<2.5	906	290	811	49.16	18.8	13.2	0.0074	<0.25	0.3	2593	447
3S/1E 4J 6	11-Jan-12	17.0	1962	7.6	125	43	233	2.2	428	111	386	8.90	27.2	1.63	0.0024	<0.05	0.5	1148	490
3S/1E 4Q 2	11-Jan-12	18.4	1737	7.6	78	52	235	1.2	530	85	263	10.81	23.8	3.15	0.0039	<0.05	0.066	1012	407
3S/1E 5K 6	11-Jan-12	19.9	2115	7.6	154	51	266	2.1	508	250	319	45.17	18.0	1.57	0.0019	<0.05	0.67	1357	595
3S/1E 5K 7	11-Jan-12	19.9	1038	8.0	59	20	138	1.7	343	140	90	2.13	21.2	0.84	0.013	<0.05	0.1	644	231
3S/1E 5L 3	11-Jan-12	20.5	1563	7.6	90	43	204	0.9	496	236	157	0.58	21.4	0.97	0.0036	<0.05	1.	999	403
3S/1E 5P 6	11-Jan-12	19.8	2787	7.4	176	105	322	1.1	433	568	484	10.63	25.3	1.21	0.0025	<0.1	0.19	1906	872
3S/1E 6F 3	7-Feb-12	19.5	4122	7.3	291	107	522	2.2	604	656	866	<0.44	21.6	3.07	0.0061	<0.25	4.8	2764	1170
3S/1E 6N 2	2-Nov-11	19.2	25680	6.8	2000	1130	2470	16.5	337	883	9900	15.23	18.1	3.33	<0.2	<10.	51.	16599	9650
3S/1E 6N 3	10-Nov-11	17.9	9362	7.6	668	255	1060	3.7	218	147	3440	<0.44	17.1	<1.0	0.015	<0.5	7.5	5699	2720
3S/1E 6N 6	15-Nov-11	19.0	22440	7.2	757	1647	2520	5.6	216	812	9490	<0.44	18.2	2.81	<0.2	<10.	22.	15356	8670
3S/1E 7B 2	8-Feb-12	17.4	701	8.8	11	8	135	1.6	235	30	98	<0.44	12.0	0.85	0.0071	<0.05	0.035	425	60
3S/1E 7B12	7-Feb-12	18.1	13110	7.3	412	326	2145	2.4	334	1550	3900	<0.44	19.6	1.76	<0.01	<0.5	6.9	8520	2370
3S/1E 7D 1	10-Nov-11	19.3	5007	7.4	478	189	222	2.0	376	129	1370	<0.44	24.2	<0.50	0.017	<0.25	5.6	2600	1974
3S/1E 7D 3	9-Nov-11	19.2	16880	7.0	1056	695	1900	27	373	602	6170	1.06	22.0	4.48	<0.2	<10.	24.	10657	5500
3S/1E 7G 7	7-Feb-12	18.2	17290	7.2	416	503	3209	3.3	473	2800	4840	<0.44	19.0	4.18	<0.02	<1.	11.	12024	3110
3S/1E 7J 5	27-Mar-12	17.4	2310	7.3	125	102	293	2.1	922	358	170	<0.44	25.7	4.55	0.0035	0.25	0.36	1531	731
3S/1E 7M 2	28-Mar-12	19.7	908	8.8	84	27	93	2.1	418	78	69	<0.44	16.3	0.26	0.014	0.36	0.2	600	320
3S/1E 7R 8	18-Apr-12	19.7	2410	7.2	211	161	119	2.6	928	357	165	<0.44	36.2	1.77	0.0023	1.	0.12	1510	1190
3S/1E 8G 4	11-Jan-12	19.3	3166	7.3	156	126	434	2.4	740	689	365	3.23	28.9	5.28	0.0024	<0.1	<0.02	2170	908
3S/1E 8H 9	26-Oct-11	19.3	929	7.7	54	37	87	1.8	340	55	92	21.30	26.3	0.76	0.0021	<0.05	<0.01	543	288
3S/1E 8H10	27-Oct-11	19.4	1747	7.6	121	86	165	2.9	576	219	185	14.70	25.9	1.94	0.002	<0.05	<0.01	1105	654
3S/1E 8H11	26-Oct-11	19.0	1670	7.4	134	87	101	2.9	596	122	184	22.59	30.0	1.18	0.0014	<0.05	<0.01	978	696
3S/1E 8H13	26-Oct-11	18.9	1202	7.5	89	59	60	2.2	466	84	121	16.96	25.9	0.65	0.0011	<0.05	<0.01	689	464



TABLE 3.2-4
ANNUAL MONITORING WELL WATER QUALITY RESULTS
2012 WATER YEAR

SITE ID	DATE	TEMP. °C	EC umhos/cm	pH	Mineral Constituents (mg/L)									Select Metals (mg/L)				TDS mg/L	Hard mg/L
					Ca	Mg	Na	K	HCO ₃	SO ₄	Cl	NO ₃	SiO ₂	B	As	Fe	Mn		
3S/1E 8H18R	5-Jan-12	19.6	1102	7.6	86	51	82	2.6	404	87	112	15.37	23.3	0.64	0.0019	<0.005	<0.01	660	425
3S/1E 8H18R	8-Mar-12	20.0	1109	7.6	100	49	81	2.7	425	91	118	15.72	27.4	0.72	0.0017	<0.01	<0.01	696	452
3S/1E 8H18R	10-Sep-12	21.4	1052	7.9	100	40	73	2.4	402	87	110	14.92	28.2	0.68	0.0019	<0.01	<0.01	656	416
3S/1E 8K 1	27-Mar-12	17.3	2048	7.2	186	122	116	3.2	767	280	184	12.22	29.1	1.81	<0.002	0.13	<0.02	1311	967
3S/1E 8N 1	27-Mar-12	17.8	2375	7.1	192	135	178	3.4	853	392	203	19.49	29.3	2.23	0.0025	<0.1	<0.02	1573	1037
3S/1E 9B 1	5-Jan-12	18.6	777	7.7	55	41	50	1.9	307	39	68	22.81	22.9	0.43	0.0018	<0.005	<0.01	453	308
3S/1E 9B 1	6-Jun-12	19.0	669	7.7	53	34	40	1.5	283	35	53	19.93	26.5	0.32	0.0015	<0.01	<0.01	403	271
3S/1E 9G 1	10-Jan-12	18.4	761	7.4	42	32	61	5.5	224	45	96	0.66	17.6	0.71	<0.001	0.35	0.046	410	236
3S/1E 9J 7	10-Jan-12	17.2	969	7.5	66	39	74	2.1	298	55	131	<0.44	17.6	0.78	<0.001	<0.05	<0.01	532	327
3S/1E 9J 8	10-Jan-12	17.4	737	7.5	79	30	29	1.8	276	41	73	9.43	20.5	0.30	<0.001	<0.05	<0.01	420	322
3S/1E 9J 9	10-Jan-12	17.9	656	7.6	55	39	22	1.7	271	35	52	12.98	26.3	0.22	<0.001	<0.05	<0.01	378	298
3S/1E 9M 2R	5-Dec-11	17.5	1168	7.5	85	61	81	2.1	427	75	131	21.43	25.9	0.85	0.0011	<0.005	<0.01	694	464
3S/1E 9M 2R	5-Jan-12	16.8	1112	7.6	82	54	82	2.1	407	66	118	21.48	22.7	0.90	0.0015	<0.005	<0.01	650	430
3S/1E 9M 2R	6-Mar-12	17.3	1077	7.9	80	50	82	2.1	397	67	128	19.26	25.3	0.99	0.0014	<0.01	<0.01	652	404
3S/1E 9M 2R	4-Jun-12	17.5	1013	7.7	71	58	68	1.9	389	64	117	20.68	26.3	0.84	0.0015	<0.01	<0.01	620	418
3S/1E 9M 2R	11-Sep-12	17.4	997	7.8	78	49	66	1.8	369	61	115	12.84	26.3	0.82	0.0017	<0.01	<0.01	594	397
3S/1E 9M 3R	21-Dec-11	16.5	1003	7.5	90	44	57	1.9	361	61	106	12.40	19.7	0.58	<0.001	<0.005	<0.01	571	409
3S/1E 9M 3R	5-Jan-12	16.6	1080	7.4	99	52	65	2.1	403	69	115	15.06	19.1	0.67	<0.001	<0.005	<0.01	636	460
3S/1E 9M 3R	5-Mar-12	18.1	1179	7.6	115	55	67	2.2	447	74	133	18.29	23.3	0.76	0.0011	<0.01	<0.01	709	512
3S/1E 9M 3R	4-Jun-12	17.5	1106	7.8	106	54	62	2.0	418	75	134	17.05	23.5	0.74	<0.001	<0.01	<0.01	682	486
3S/1E 9M 4R	5-Jan-12	18.1	1555	7.5	117	73	127	2.8	529	150	191	20.50	24.4	1.44	0.0018	<0.005	<0.01	968	592
3S/1E 9M 4R	7-Jun-12	18.6	1456	7.5	112	69	107	2.8	510	139	182	20.02	28.2	1.33	0.0015	<0.01	<0.01	912	566
3S/1E 9M 4R	6-Aug-12	20.1	1320	7.6	102	63	99	2.5	485	117	155	20.42	27.6	1.14	0.0016	<0.01	<0.01	827	516
3S/1E 9M 4R	10-Sep-12	19.6	1261	7.6	96	63	90	2.5	472	104	148	18.51	28.5	1.11	0.0019	<0.01	<0.01	785	498
3S/1E 9P 5	10-Jan-12	18.2	1016	7.2	85	39	66	2.5	307	66	132	4.25	19.8	0.75	<0.001	<0.05	<0.01	566	374
3S/1E 9P 9	10-Jan-12	17.6	1061	7.4	72	42	94	2.4	340	75	132	4.78	22.5	0.98	<0.001	<0.05	<0.01	613	352
3S/1E 9P10	10-Jan-12	17.4	760	7.4	70	31	40	1.6	248	54	82	10.01	20.9	0.39	<0.001	<0.05	<0.01	432	304
3S/1E 9P11	10-Jan-12	17.9	711	7.6	54	47	26	1.6	295	36	56	16.34	27.4	0.25	0.0011	<0.05	<0.01	411	330
3S/1E 10B 8	25-Oct-11	17.6	1471	7.6	75	72	135	1.9	529	81	171	35.87	27.2	2.21	0.0022	<0.05	<0.01	861	483
3S/1E 10B 9	25-Oct-11	18.2	1122	7.8	74	58	76	2.0	388	59	123	31.44	25.5	1.16	0.0018	<0.05	<0.01	642	422
3S/1E 10B10	25-Oct-11	18.6	724	7.6	51	43	36	1.6	292	38	63	15.06	24.4	0.36	0.0013	<0.05	<0.01	417	305
3S/1E 10B11	25-Oct-11	18.5	715	7.6	54	42	32	1.9	282	35	57	25.77	27.2	0.25	<0.001	<0.05	<0.01	415	307
3S/1E 10D 2	25-Oct-11	18.1	1285	7.9	76	59	114	1.8	464	69	144	37.51	26.7	1.55	0.0028	<0.05	0.022	760	432
3S/1E 10D 3	25-Oct-11	18.7	951	7.9	67	50	59	1.9	344	48	94	30.38	26.7	0.55	0.002	<0.05	<0.01	549	373
3S/1E 10D 4	25-Oct-11	19.3	767	8.0	53	40	49	1.5	301	40	74	15.85	27.4	0.43	0.002	<0.05	<0.01	452	296
3S/1E 10D 5	25-Oct-11	19.2	635	7.7	43	31	43	1.9	270	32	42	17.05	26.5	0.24	0.0017	<0.05	<0.01	371	236
3S/1E 10K 2	17-Apr-12	18.4	703	7.5	65	32	30	1.6	238	39	75	6.78	22.5	0.32	<0.001	<0.05	<0.01	390	292
3S/1E 10K 3	5-Jan-12	17.4	782	7.5	60	51	36	1.7	325	43	71	19.00	20.5	0.34	<0.001	0.036	<0.01	463	360
3S/1E 10K 3	6-Jun-12	17.3	807	7.6	69	47	33	1.3	315	46	81	20.24	23.8	0.34	<0.001	<0.01	<0.01	478	364
3S/1E 10K 3	10-Sep-12	18.3	789	7.7	60	52	33	1.3	322	44	76	18.42	24.2	0.33	0.0011	0.011	<0.01	469	364
3S/1E 11G 1	18-Apr-12	19.6	1250	7.3	86	74	80	2.7	504	70	131	50.49	34.0	1.02	0.0016	<0.05	<0.01	777	521
3S/1E 11G 2	18-Apr-12	19.6	1080	7.5	85	55	69	2.2	397	58	116	34.14	23.3	0.84	<0.001	<0.05	<0.01	639	440
3S/1E 11G 3	18-Apr-12	19.6	807	7.4	70	48	32	2.0	312	50	76	23.74	27.2	0.29	<0.001	<0.05	<0.01	483	373
3S/1E 11G 4	18-Apr-12	20.5	603	7.9	55	31	37	2.3	311	34	23	9.52	26.3	0.23	0.0014	<0.05	<0.01	373	264
3S/1E 11M 2	18-Apr-12	18.4	768	7.5	64	47	31	1.7	291	43	81	10.58	25.3	0.33	<0.001	<0.05	<0.01	448	352
3S/1E 11M 3	9-Jan-12	17.2	777	7.5	54	37	29	1.5	265	38	59	16.83	20.3	0.24	<0.001	<0.005	<0.01	387	287
3S/1E 11M 3	7-Jun-12	17.6	713	7.5	57	40	31	1.3	279	40	69	15.72	23.5	0.28	<0.001	<0.01	<0.01	416	308
3S/1E 11P 6	26-Mar-12	17.7	654	7.7	60	27	33	1.5	219	40	78	3.37	17.6	0.31	<0.001	<0.05	<0.01	369	262
3S/1E 12H 4	7-Feb-12	18.8	752	7.7	49	51	25	1.5	308	38	56	14.92	27.4	0.27	<0.001	<0.05	<0.01	416	332
3S/1E 12H 5	7-Feb-12	19.9	694	7.7	51	47	22	1.3	304	37	48	13.73	29.1	0.27	<0.001	<0.05	<0.01	400	321
3S/1E 12H 6	7-Feb-12	20.0	673	8.0	48	45	29	1.8	348	36	31	11.12	28.7	0.25	0.0011	<0.05	<0.01	405	307



TABLE 3.2-4
ANNUAL MONITORING WELL WATER QUALITY RESULTS
2012 WATER YEAR

SITE ID	DATE	TEMP. °C	EC umhos/cm	pH	Mineral Constituents (mg/L)									Select Metals (mg/L)				TDS mg/L	Hard mg/L
					Ca	Mg	Na	K	HCO3	SO4	Cl	NO3	SiO2	B	As	Fe	Mn		
3S/1E 12H 7	7-Feb-12	21.3	464	8.6	6	3	95	0.7	203	18	35	5.45	24.0	0.44	0.028	<0.05	<0.01	295	27
3S/1E 12K 2	6-Feb-12	17.9	609	7.6	39	40	24	1.3	231	35	59	7.97	24.0	0.27	<0.001	<0.05	<0.01	345	264
3S/1E 12K 3	6-Feb-12	18.6	845	7.4	52	58	32	1.6	320	51	82	24.05	26.3	0.34	<0.001	<0.05	<0.01	485	368
3S/1E 12K 4	6-Feb-12	19.5	331	7.6	20	17	22	1.2	153	8.7	17	16.16	28.7	0.13	<0.001	<0.05	<0.01	207	119
3S/1E 13P 1	17-Apr-12	18.7	652	7.7	56	18	48	1.8	188	45	80	0.49	14.5	0.34	<0.001	0.058	<0.01	357	214
3S/1E 13P 5	17-Apr-12	18.8	650	7.6	50	22	49	1.7	182	45	83	0.71	17.1	0.35	<0.001	0.91	0.011	359	218
3S/1E 13P 6	17-Apr-12	19.3	725	7.7	86	22	34	2.0	267	42	69	3.76	23.5	0.33	<0.001	0.68	0.03	415	305
3S/1E 13P 7	17-Apr-12	19.3	533	7.8	49	12	50	2.0	246	40	16	0.53	23.8	0.21	<0.001	0.072	0.047	316	171
3S/1E 13P 8	17-Apr-12	20.1	653	7.5	61	17	52	2.1	229	43	56	4.87	27.0	0.29	<0.001	0.17	0.077	376	223
3S/1E 14B 1	26-Mar-12	17.0	725	7.7	72	30	31	1.7	263	43	76	5.05	18.6	0.32	<0.001	<0.05	<0.01	408	303
3S/1E 14D 2	17-Apr-12	18.1	861	7.4	82	32	50	1.7	279	51	98	15.28	20.9	0.43	<0.001	0.058	<0.01	489	337
3S/1E 15J 3	30-May-12	21.9	1140	7.6	111	51	46	2.2	413	35	166	5.36	17.6	0.40	<0.001	1.8	0.11	639	487
3S/1E 15M 3	30-Nov-11	18.0	711	7.4	52	22	59	1.4	241	37	89	9.57	25.9	0.23	<0.001	<0.05	<0.01	415	223
3S/1E 16A 2	7-Nov-11	15.6	685	7.5	70	26	35	1.5	275	39	59	9.21	18.6	0.32	<0.001	<0.05	<0.01	394	285
3S/1E 16A 4	30-Nov-11	18.3	735	7.5	80	27	30	1.6	283	42	71	11.16	21.6	0.28	<0.001	<0.05	<0.01	424	313
3S/1E 16B 1	30-Nov-11	18.1	730	7.5	80	27	30	1.6	270	44	79	7.26	23.5	0.25	<0.001	<0.05	<0.01	426	310
3S/1E 16C 2	30-Nov-11	17.8	995	7.1	109	38	43	1.8	353	64	106	11.12	22.0	0.39	<0.001	<0.05	<0.01	569	431
3S/1E 16C 3	30-Nov-11	17.8	977	7.4	120	34	33	1.9	359	58	100	17.18	25.7	0.30	<0.001	<0.05	<0.01	567	439
3S/1E 16C 4	30-Nov-11	18.0	735	7.5	88	23	29	1.7	287	42	70	12.00	24.4	0.26	<0.001	<0.05	<0.01	432	316
3S/1E 16E 4	11-Jan-12	15.9	1106	7.0	99	42	81	2.6	452	66	97	25.64	22.5	0.57	<0.001	<0.05	<0.01	659	420
3S/1E 16L 5	11-Nov-11	15.9	1208	7.7	124	50	56	2.3	472	70	96	22.01	21.8	0.49	<0.001	<0.05	<0.01	677	517
3S/1E 16L 7	11-Nov-11	14.9	1192	7.7	123	52	52	2.3	464	69	97	19.97	21.4	0.46	<0.001	<0.05	<0.01	667	520
3S/1E 16P 5	29-Nov-11	16.3	486	7.1	32	19	38	1.5	222	19	32	0.97	16.1	0.25	<0.001	0.44	0.022	268	158
3S/1E 16P 5	18-Apr-12	16.7	556	6.8	35	25	39	2.1	177	38	65	1.64	12.7	0.23	<0.001	<0.05	<0.01	306	189
3S/1E 17B 4	27-Mar-12	14.8	1086	7.6	111	54	42	2.1	506	60	84	23.25	20.2	0.43	0.0012	<0.05	<0.01	647	502
3S/1E 17D 3	27-Mar-12	16.9	1577	7.2	161	91	60	2.5	721	96	118	51.37	24.2	0.54	0.0019	0.17	<0.01	960	775
3S/1E 17D 4	27-Mar-12	17.6	1188	8.5	15	4	221	0.8	275	25	218	<0.44	20.2	2.48	0.0086	0.077	<0.01	648	55
3S/1E 17D 5	27-Mar-12	17.8	1165	8.4	18	9	206	0.6	279	23	212	<0.44	15.3	2.45	0.067	0.13	0.22	628	79
3S/1E 17D 6	27-Mar-12	16.8	1474	8.2	22	6	269	0.9	284	19	322	<0.44	20.7	1.44	0.0072	0.085	0.049	804	77
3S/1E 17D 7	27-Mar-12	17.3	1295	9.0	9	5	229	1.9	108	<1.0	355	<0.44	2.2	1.68	0.0097	0.1	0.034	665	45
3S/1E 17D11	27-Mar-12	17.9	1361	8.4	20	4	249	0.8	289	3.1	288	<0.44	23.1	2.32	0.01	<0.05	0.041	737	67
3S/1E 17D12	9-Jan-12	17.2	929	7.7	77	39	37	1.7	335	49	63	16.61	19.6	0.34	0.0015	<0.005	<0.01	469	353
3S/1E 17D12	7-Aug-12		808	7.7	70	43	37	1.5	338	46	66	15.94	22.9	0.37	0.0014	<0.01	<0.01	470	350
3S/1E 18A 6	5-Jan-12	16.5	921	7.5	93	42	80	1.8	417	81	90	14.35	21.0	0.53	0.0022	<0.005	<0.01	630	406
3S/1E 18A 6	5-Jun-12	17.5	1003	7.8	84	47	71	1.7	417	83	94	14.48	24.6	0.54	0.0016	<0.01	<0.01	627	405
3S/1E 18A 6	7-Aug-12		1029	7.6	81	50	72	1.8	418	85	94	15.06	24.1	0.53	0.0019	<0.01	<0.01	630	408
3S/1E 18A 6	10-Sep-12	18.4	1000	7.7	82	48	70	1.7	421	79	90	14.17	25.3	0.53	0.0021	<0.01	<0.01	619	402
3S/1E 18E 4	28-Mar-12	16.8	695	7.8	56	18	71	0.7	306	61	45	<0.44	24.8	0.47	0.0013	0.29	0.85	429	215
3S/1E 18J 2	29-Nov-11	16.3	4050	7.6	181	288	449	1.1	1253	938	491	<0.44	28.9	2.03	0.022	0.48	4.	2998	1639
3S/1E 19A10	22-May-12	18.1	1077	7.7	121	50	44	2.0	436	83	113	12.58	20.4	0.43	<0.001	<0.05	<0.01	663	508
3S/1E 19A11	22-May-12	18.4	1179	7.7	138	55	42	2.0	436	102	140	12.09	20.2	0.40	<0.001	<0.05	<0.01	728	571
3S/1E 19C 4	28-Mar-12	17.4	1074	7.6	109	59	50	2.2	452	148	81	13.24	23.5	0.36	<0.001	0.24	0.036	710	513
3S/1E 19K 1	28-Mar-12	17.5	1115	7.7	79	44	121	1.7	556	88	71	<0.44	16.7	0.58	0.004	<0.05	2.1	698	378
3S/1E 20C 7	29-Nov-11	16.8	768	7.5	71	29	48	2.0	304	48	77	3.28	18.2	0.37	<0.001	<0.05	<0.01	447	296
3S/1E 20C 7	28-Mar-12	17.2	765	7.4	67	31	51	2.2	319	48	75	3.63	17.6	0.37	<0.001	<0.05	<0.01	453	296
3S/1E 20C 8	29-Nov-11	16.3	820	7.5	82	38	37	1.9	355	44	65	20.68	22.5	0.23	<0.001	<0.05	<0.01	487	361
3S/1E 20C 9	29-Nov-11	10.5	961	7.6	95	45	46	2.1	386	66	97	13.82	25.3	0.38	0.0014	<0.05	<0.01	582	423
3S/1E 20J 4	6-Feb-12	17.8	1213	6.7	72	39	138	1.1	450	76	134	15.85	29.5	0.58	<0.001	<0.05	<0.01	727	342
3S/1E 20M11	18-Apr-12	16.9	1123	7.0	103	54	62	2.3	434	69	97	22.14	25.0	0.47	<0.001	<0.05	<0.01	648	479
3S/1E 20Q 2	8-Feb-12	19.0	1481	7.5	94	83	143	0.8	732	60	139	<0.44	21.4	0.65	0.0017	2.7	1.2	904	576
3S/1E 22D 2	30-Nov-11	19.6	1029	6.7	53	38	105	<0.5	315	59	121	50.04	45.6	<0.10	<0.001	<0.05	<0.01	627	287



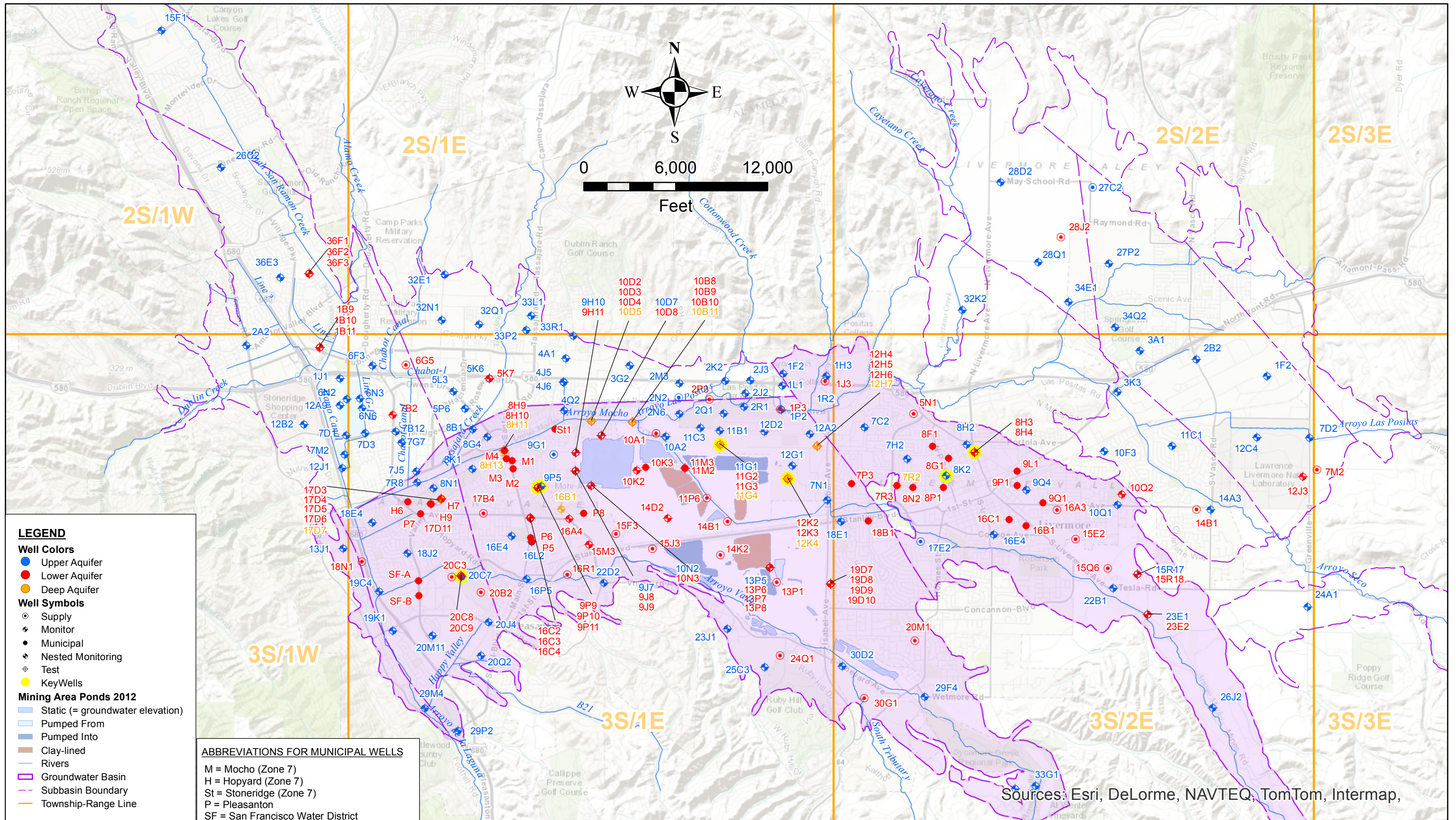
TABLE 3.2-4
ANNUAL MONITORING WELL WATER QUALITY RESULTS
2012 WATER YEAR

SITE ID	DATE	TEMP. °C	EC umhos/cm	pH	Mineral Constituents (mg/L)									Select Metals (mg/L)				TDS mg/L	Hard mg/L
					Ca	Mg	Na	K	HCO ₃	SO ₄	Cl	NO ₃	SiO ₂	B	As	Fe	Mn		
3S/1E 23J 1	8-Feb-12	19.4	773	7.0	53	30	58	1.0	166	13	144	28.74	37.0	0.13	<0.001	0.052	<0.01	447	258
3S/1E 25C 3	8-Feb-12	19.1	719	7.3	56	23	69	1.3	254	31	96	18.91	25.0	0.34	<0.001	<0.05	<0.01	446	233
3S/1E 29M 4	8-Feb-12	16.6	608	6.9	50	33	35	3.1	284	36	42	<0.44	22.7	0.26	0.016	5.7	0.34	362	260
3S/1E 29P 2	8-Feb-12	17.1	1959	7.4	126	109	176	3.4	766	56	309	<0.44	21.6	1.54	0.003	0.14	1.	1180	761
3S/1W 1B 9	8-Feb-12	18.9	846	7.9	46	18	129	1.2	338	33	90	<0.44	21.6	0.47	0.0053	<0.05	0.12	508	188
3S/1W 1B10	8-Feb-12	19.2	814	7.9	45	16	129	0.7	384	<1	98	<0.44	25.0	0.53	0.12	0.42	0.18	506	177
3S/1W 1B11	8-Feb-12	20.5	887	8.1	29	8	165	0.8	270	<1	163	<0.44	23.5	0.69	0.021	0.11	0.045	525	107
3S/1W 1J 1	15-Nov-11	17.4	2801	7.5	179	81	427	2.0	1087	555	183	<0.44	26.5	0.90	0.03	<0.1	1.8	1992	782
3S/1W 2A 2	11-Jan-12	19.1	1535	6.9	189	31	118	0.6	660	68	180	4.43	23.3	0.36	0.0018	<0.05	<0.01	940	601
3S/1W 12A 9	10-Nov-11	18.4	5781	7.3	514	207	340	3.6	287	74	1710	<0.44	24.4	<0.50	0.0064	<0.25	7.3	3015	2138
3S/1W 12B 2	8-Feb-12	19.9	885	6.9	98	28	55	<0.5	312	123	68	11.16	33.2	0.19	0.001	<0.05	1.4	570	361
3S/1W 12J 1	28-Mar-12	20.5	1589	7.8	114	36	204	0.9	496	277	165	2.70	27.4	0.73	0.0027	<0.05	0.69	1074	433
3S/1W 13J 1	28-Mar-12	18.7	898	7.1	95	40	41	<0.50	340	118	71	15.01	26.1	0.17	<0.001	<0.05	<0.01	574	402
3S/2E 1F 2	26-Oct-11	18.2	2767	7.5	118	52	360	1.4	227	197	676	19.26	50.1	7.56	0.0034	<0.1	<0.02	1586	508
3S/2E 2B 2	25-Oct-11	20.2	1686	7.7	114	34	171	1.0	243	92	357	25.29	39.6	1.87	0.0024	<0.05	<0.01	955	426
3S/2E 3A 1	26-Mar-12	18.6	1064	7.9	62	30	122	1.0	274	73	148	26.04	36.8	1.44	0.0036	<0.05	<0.01	636	279
3S/2E 3K 3	26-Mar-12	19.0	962	7.9	56	38	90	2.0	291	59	108	37.95	28.5	1.33	0.0013	0.14	<0.01	565	295
3S/2E 5N 1	26-Mar-12	19.2	787	7.7	50	51	36	1.8	288	36	72	43.05	29.1	0.52	0.0011	0.058	<0.01	462	336
3S/2E 7H 2	6-Feb-12	19.1	1237	7.2	58	69	103	3.3	436	150	87	56.69	30.8	0.66	<0.001	<0.05	0.059	773	428
3S/2E 7N 1	17-Apr-12	17.2	506	7.5	27	26	35	1.5	176	29	44	3.06	24.4	0.23	<0.001	<0.05	<0.01	277	172
3S/2E 8H 2	27-Oct-11	17.8	867	7.1	48	60	51	0.9	308	55	86	22.41	30.8	0.31	0.0012	0.22	0.013	506	365
3S/2E 8H 3	27-Oct-11	18.2	1168	7.3	104	63	50	1.4	404	68	125	49.60	30.0	0.42	<0.001	<0.05	<0.01	691	520
3S/2E 8H 4	27-Oct-11	19.2	1014	7.9	58	48	91	2.1	339	46	130	12.22	20.1	0.62	0.0055	<0.05	<0.01	577	342
3S/2E 8K 2	6-Feb-12	19.3	1016	7.4	56	76	42	1.9	375	63	96	36.62	30.8	0.34	<0.001	<0.05	<0.01	588	450
3S/2E 9Q 4	27-Oct-11	19.3	1094	7.4	61	81	57	1.8	363	80	124	39.46	33.0	0.61	0.0018	4.1	0.062	657	487
3S/2E 10F 3	26-Oct-11	19.5	1473	7.3	109	80	99	0.9	553	105	168	30.96	30.8	1.27	0.0013	<0.05	<0.01	897	603
3S/2E 10Q 1	26-Oct-11	20.2	1512	7.2	84	97	99	1.0	530	95	168	42.87	34.0	1.38	0.001	<0.05	<0.01	882	609
3S/2E 10Q 2	11-Jan-12	18.1	709	7.9	46	32	50	2.0	185	68	85	26.26	25.7	0.64	0.0011	<0.05	<0.01	427	249
3S/2E 11C 1	26-Oct-11	19.8	1026	7.6	90	37	77	2.2	393	37	102	33.75	30.8	0.54	0.0011	<0.05	<0.01	605	377
3S/2E 12C 4	11-Jan-12	16.4	1051	8.2	48	7	153	1.7	91	146	183	15.32	31.7	3.45	0.0028	<0.05	<0.01	632	149
3S/2E 12J 3	11-Jan-12	17.8	681	8.2	40	11	71	3.4	46	60	152	1.51	20.8	0.39	0.0015	<0.05	<0.01	383	146
3S/2E 14A 3	27-Oct-11	20.0	949	7.4	99	39	69	2.4	405	44	90	49.16	26.5	0.53	0.0011	<0.05	0.057	619	410
3S/2E 14B 1	30-May-12	20.7	878	7.7	72	31	60	1.8	288	38	107	41.36	28.7	0.52	<0.001	<0.05	<0.01	523	308
3S/2E 15E 2	30-May-12	19.3	1097	7.8	52	89	43	1.2	389	89	112	45.61	28.9	0.44	<0.001	0.12	<0.01	654	496
3S/2E 15R17	27-Oct-11	18.9	930	7.7	45	82	38	1.4	347	55	91	56.24	26.7	0.52	0.0014	0.21	<0.01	568	450
3S/2E 15R18	27-Oct-11	19.8	671	7.7	54	43	30	1.5	314	38	40	4.61	24.8	0.23	0.0013	<0.05	0.32	392	311
3S/2E 16A 3	26-Oct-11	17.1	1045	7.8	61	86	37	1.3	363	80	95	48.27	27.0	0.41	<0.001	0.055	<0.01	616	505
3S/2E 16E 4	6-Feb-12	16.6	525	7.2	24	32	38	2.0	219	31	41	2.97	18.6	0.28	<0.001	<0.05	<0.01	298	190
3S/2E 18E 1	6-Feb-12	17.6	569	7.4	38	38	19	1.8	218	33	56	5.14	25.0	0.22	<0.001	<0.05	<0.01	324	251
3S/2E 19D 7	16-Apr-12	19.4	900	7.6	75	51	30	2.1	281	22	135	21.26	25.3	<0.10	<0.001	0.14	<0.01	501	395
3S/2E 19D 8	16-Apr-12	19.9	983	7.5	88	56	32	2.3	304	25	152	20.37	27.0	<0.10	<0.001	<0.05	<0.01	553	450
3S/2E 19D 9	16-Apr-12	22.0	465	7.5	44	15	27	1.4	133	10	48	54.91	27.4	<0.10	<0.001	<0.05	<0.01	294	171
3S/2E 19D10	16-Apr-12	21.3	725	7.5	61	30	44	1.8	208	32	97	54.03	26.3	<0.10	<0.001	<0.05	<0.01	449	276
3S/2E 20M 1	8-Feb-12	17.5	838	7.5	73	33	68	1.7	326	53	89	11.16	20.7	0.31	0.0014	<0.05	0.087	511	316
3S/2E 22B 1	18-Apr-12	18.0	1286	7.4	72	108	62	1.4	351	250	91	70.41	29.1	0.44	0.001	<0.05	<0.01	857	625
3S/2E 23E 1	27-Oct-11	22.5	828	7.6	45	61	49	1.9	363	35	69	19.44	23.1	0.47	<0.001	0.31	0.036	483	365
3S/2E 23E 2	27-Oct-11	22.0	1095	7.7	49	60	107	2.8	374	44	164	<0.44	20.0	2.47	0.0026	<0.05	0.31	633	370
3S/2E 24A 1	27-Oct-11	19.4	1595	7.2	139	62	143	1.7	560	91	156	147.47	28.7	1.41	<0.001	<0.05	<0.01	1045	604
3S/2E 26J 2	27-Oct-11	19.5	1422	7.5	77	119	60	3.2	519	52	159	94.77	15.1	0.69	<0.001	<0.05	0.14	837	680
3S/2E 29F 4	29-Nov-11	17.1	666	7.6	73	24	35	1.6	306	59	36	<0.44	21.4	0.29	0.0035	0.41	0.081	402	282
3S/2E 29F 4	16-Apr-12	17.2	647	8.0	64	26	38	1.9	285	56	42	<0.44	19.9	0.31	0.0043	0.47	0.097	391	269



TABLE 3.2-4
ANNUAL MONITORING WELL WATER QUALITY RESULTS
2012 WATER YEAR

SITE ID	DATE	TEMP. °C	EC umhos/cm	pH	Mineral Constituents (mg/L)									Select Metals (mg/L)				TDS mg/L	Hard mg/L
					Ca	Mg	Na	K	HCO ₃	SO ₄	Cl	NO ₃	SiO ₂	B	As	Fe	Mn		
3S/2E 30D 2	30-May-12	22.0	561	7.7	44	22	37	1.9	202	43	54	1.02	22.3	0.22	<0.001	1.7	0.044	326	202
3S/2E 33G 1	29-Nov-11	23.3	662	7.8	69	27	36	1.6	304	59	37	<0.44	20.8	0.30	0.0035	<0.05	0.12	402	283
3S/2E 33G 1	16-Apr-12	13.6	618	7.5	46	20	50	2.4	159	60	87	1.64	13.2	0.32	0.0014	<0.05	<0.01	359	197
3S/3E 7D 2	26-Oct-11	20.3	2130	7.5	107	52	261	2.0	247	242	437	21.88	48.8	5.44	0.0029	<0.1	<0.02	1294	483



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR/MG

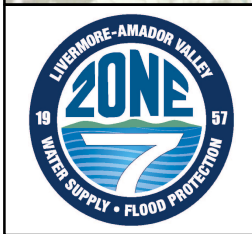
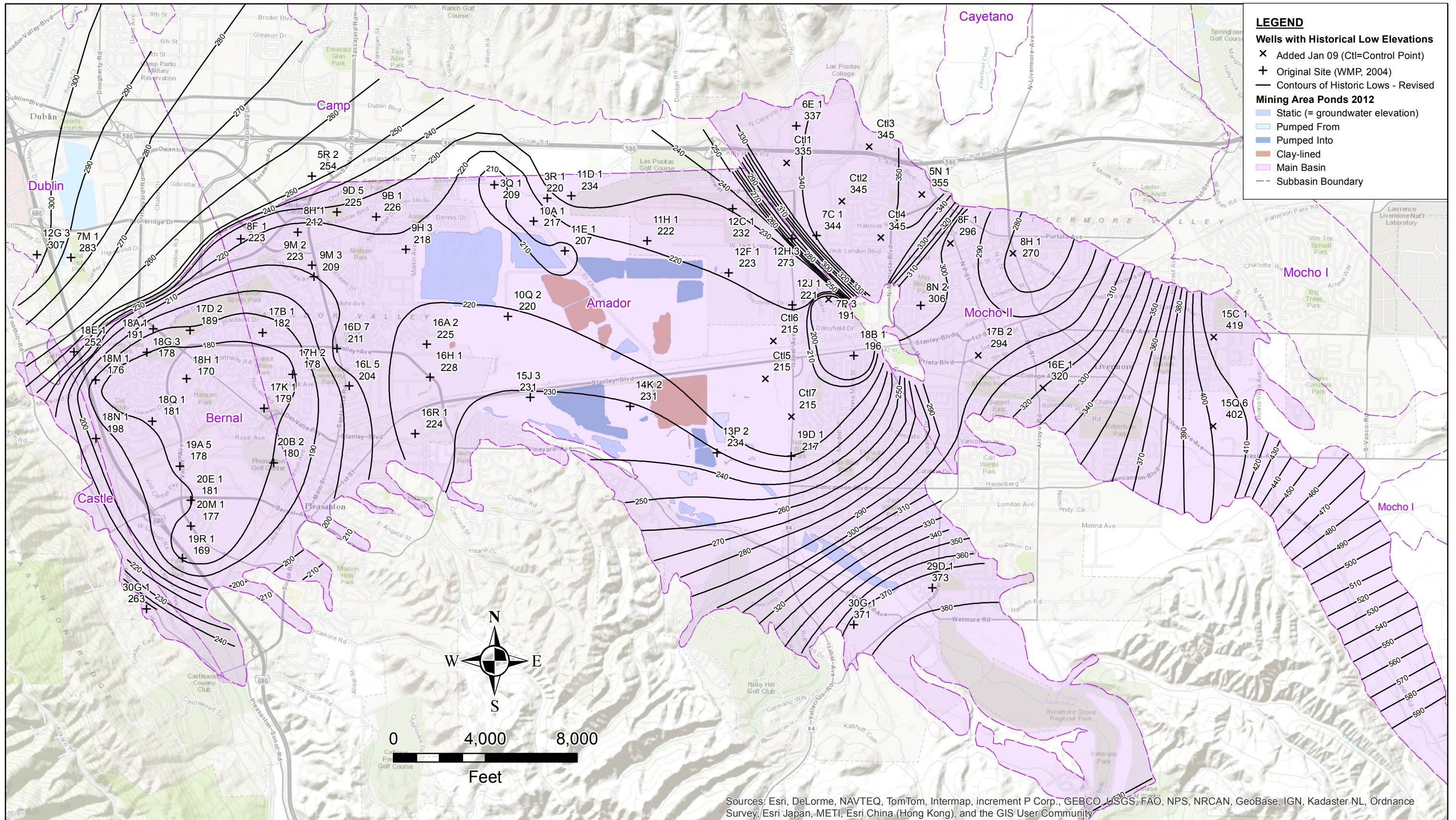
REVIEWED: CW

FILE: E:\MONITOR\GM\2012WY\AnnualReport\Fig3.2-01-AllWells2012.mxd

SCALE: 1 in = 6,000 ft

DATE: May 2, 2013

Figure 3.2-1
Zone 7 Groundwater Program
Wells in 2012 Program
Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR

REVIEWED: MK

File: E:\MONITOR\GM\2012WY\AnnualReport2012\Fig3.2-03-HLLower.mxd

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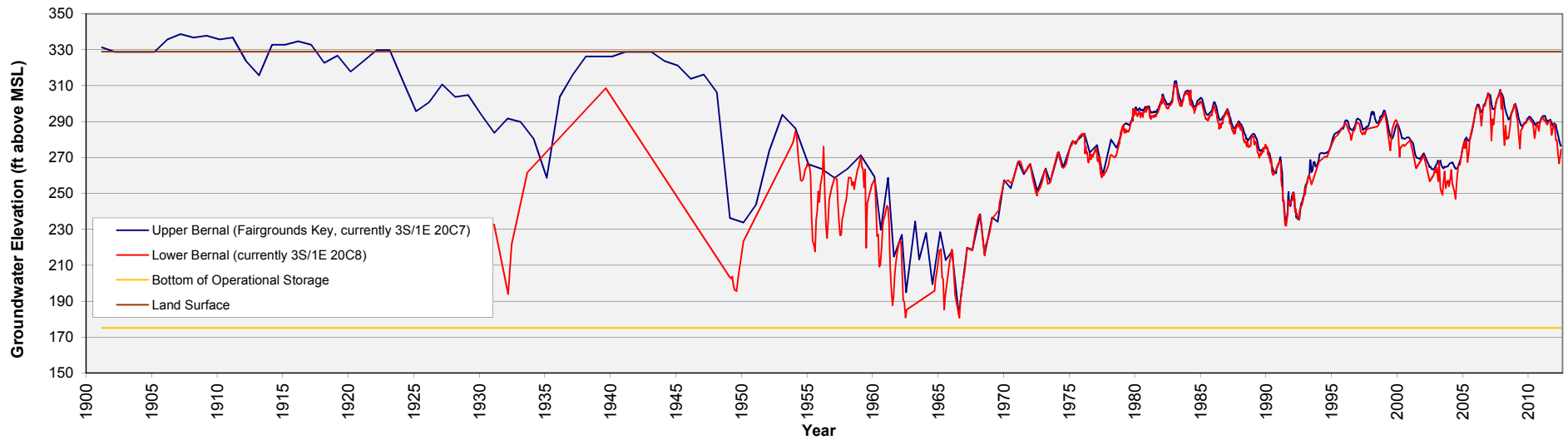
DATE: May 2, 2013

Figure 3.2-3
Historical Lows (Update Jan 2009)
Lower Aquifer
Livermore Valley Groundwater Basin



FIGURE 3.2-4
GROUNDWATER MONITORING PROGRAM
KEY WELL HYDROGRAPHS - HISTORICAL
WESTERN PORTION OF MAIN BASIN

BERNAL SUBBASIN KEY WELLS



AMADOR WEST SUBBASIN KEY WELLS

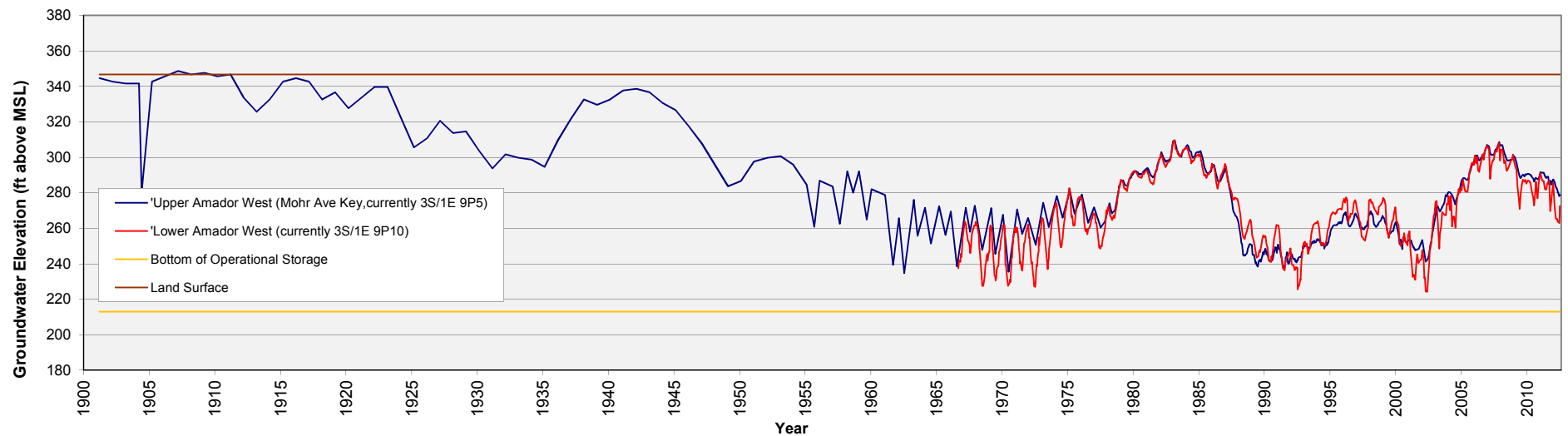




FIGURE 3.2-4
GROUNDWATER MONITORING PROGRAM
KEY WELL HYDROGRAPHS - HISTORICAL
EASTERN PORTION OF MAIN BASIN

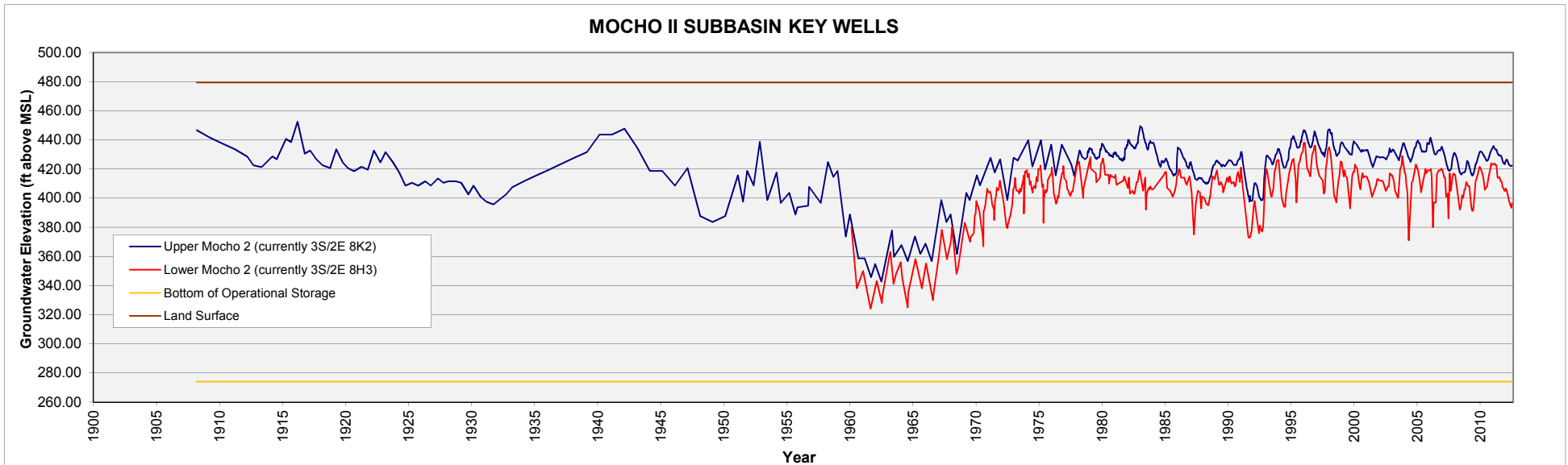
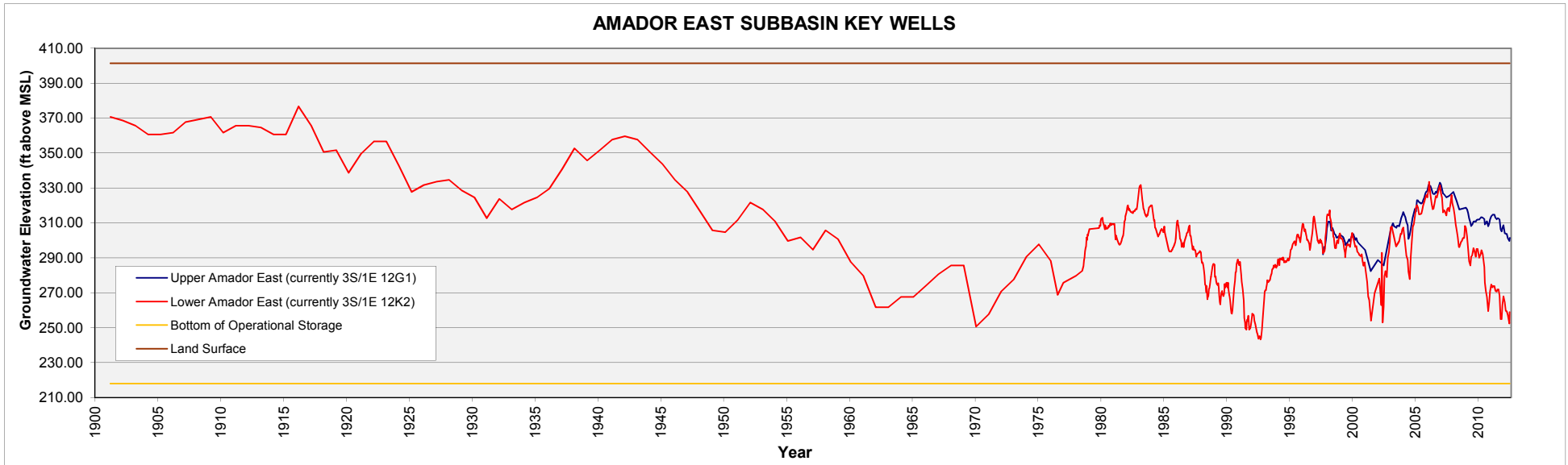
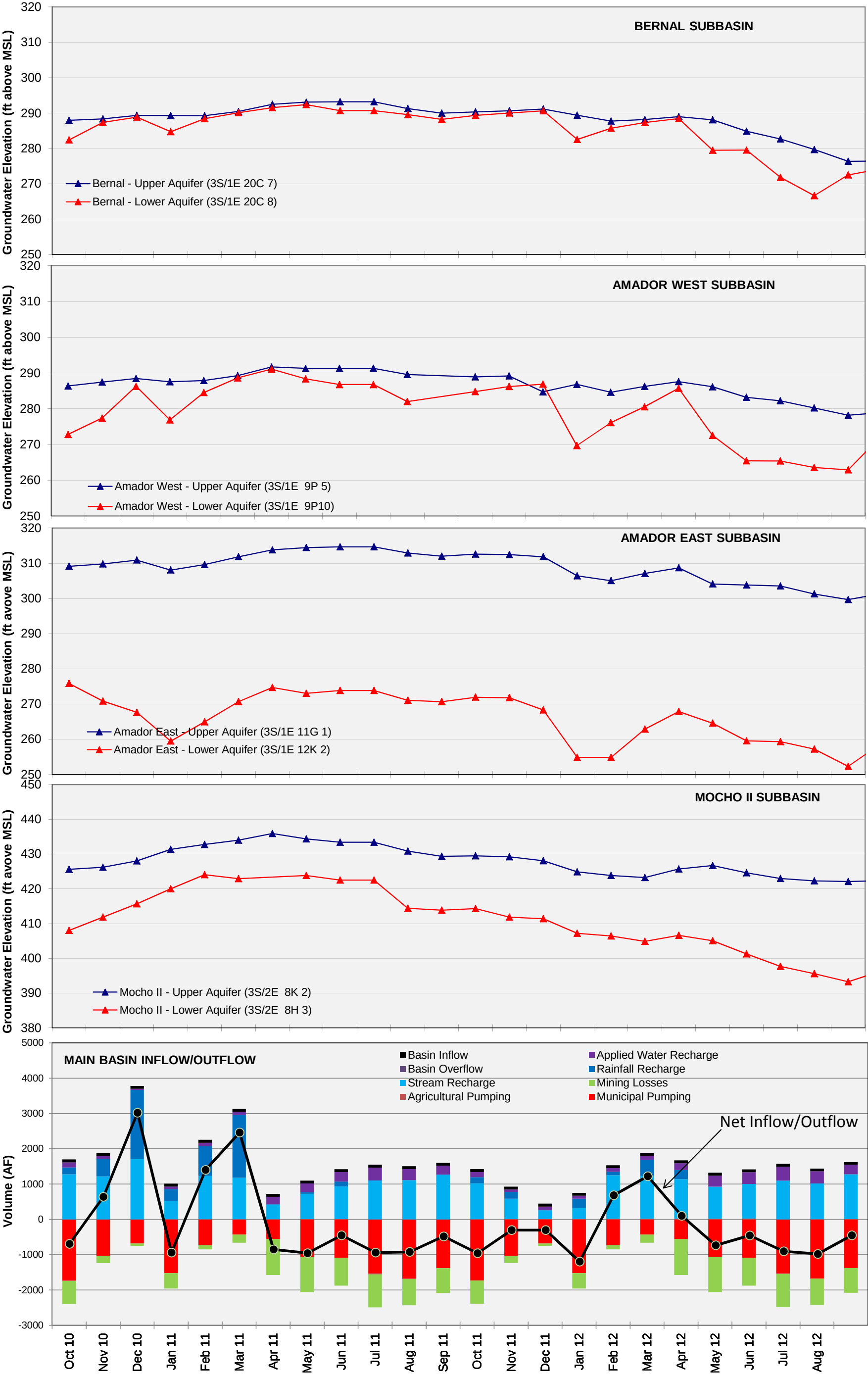
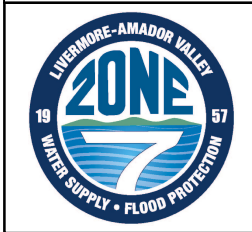
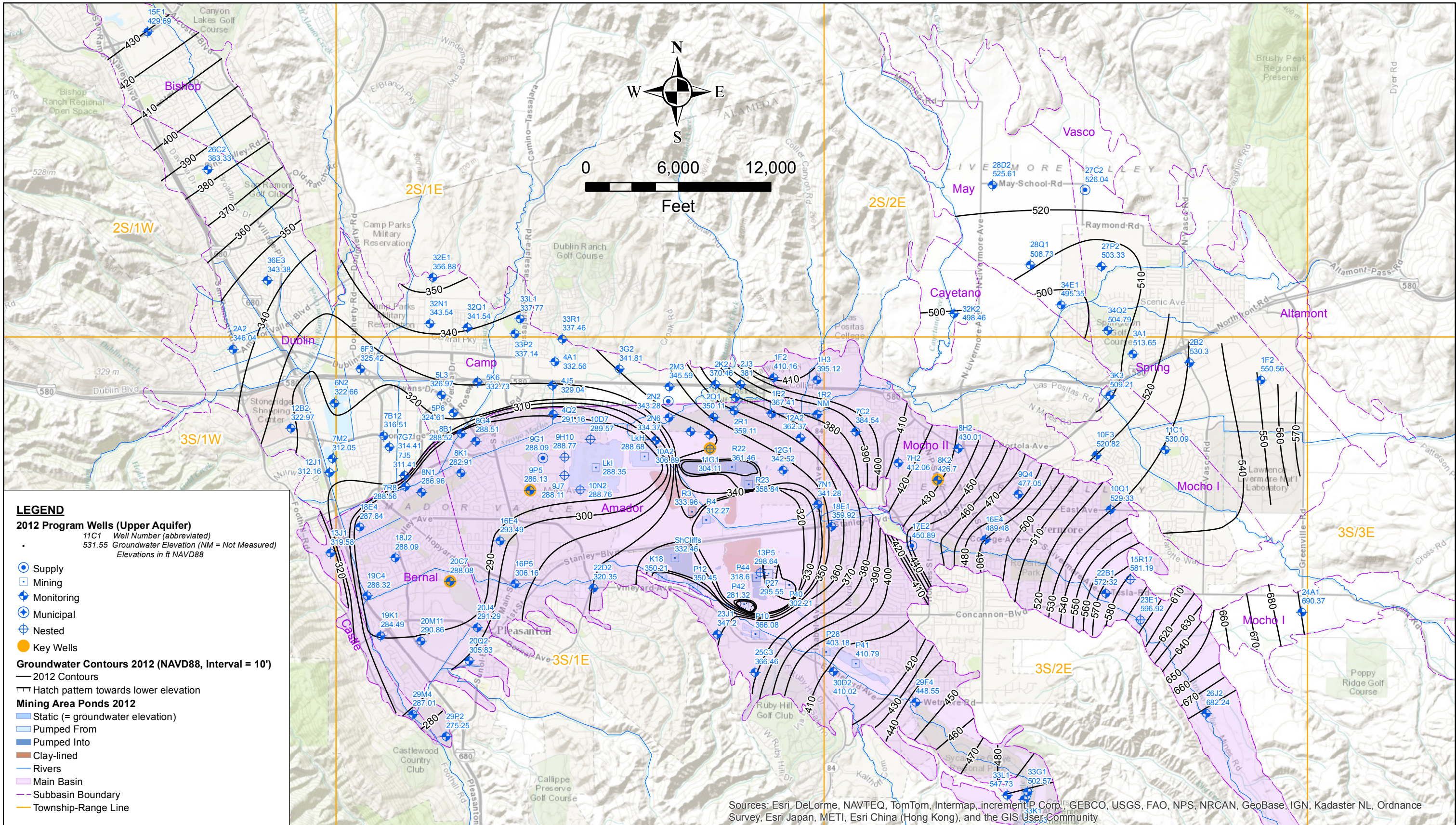




FIGURE 3.2-5
GROUNDWATER MONITORING PROGRAM
KEY WELL HYDROGRAPHS
2011 TO 2012 WATER YEARS





ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR

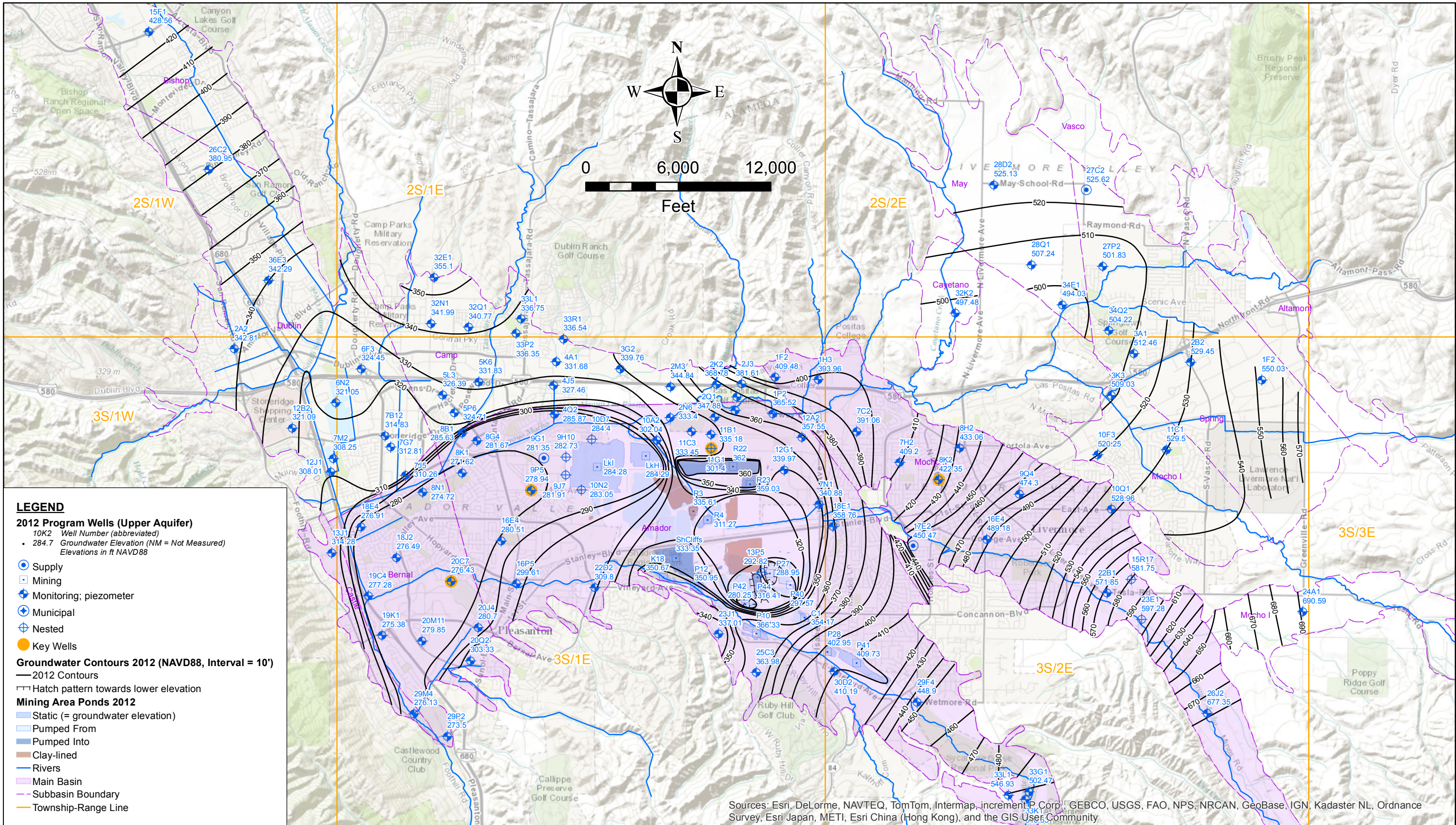
REVIEWED: MK

FILE: E:\MONITOR\GM\2012wy\Annual\Fig3.2-05-SASpringUpper2012.mxd

SCALE: 1 in = 6,000 ft

DATE: May 2, 2013

Figure 3.2-6
Groundwater Gradient Map
Upper Aquifer; Spring 2012 (April)
Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR

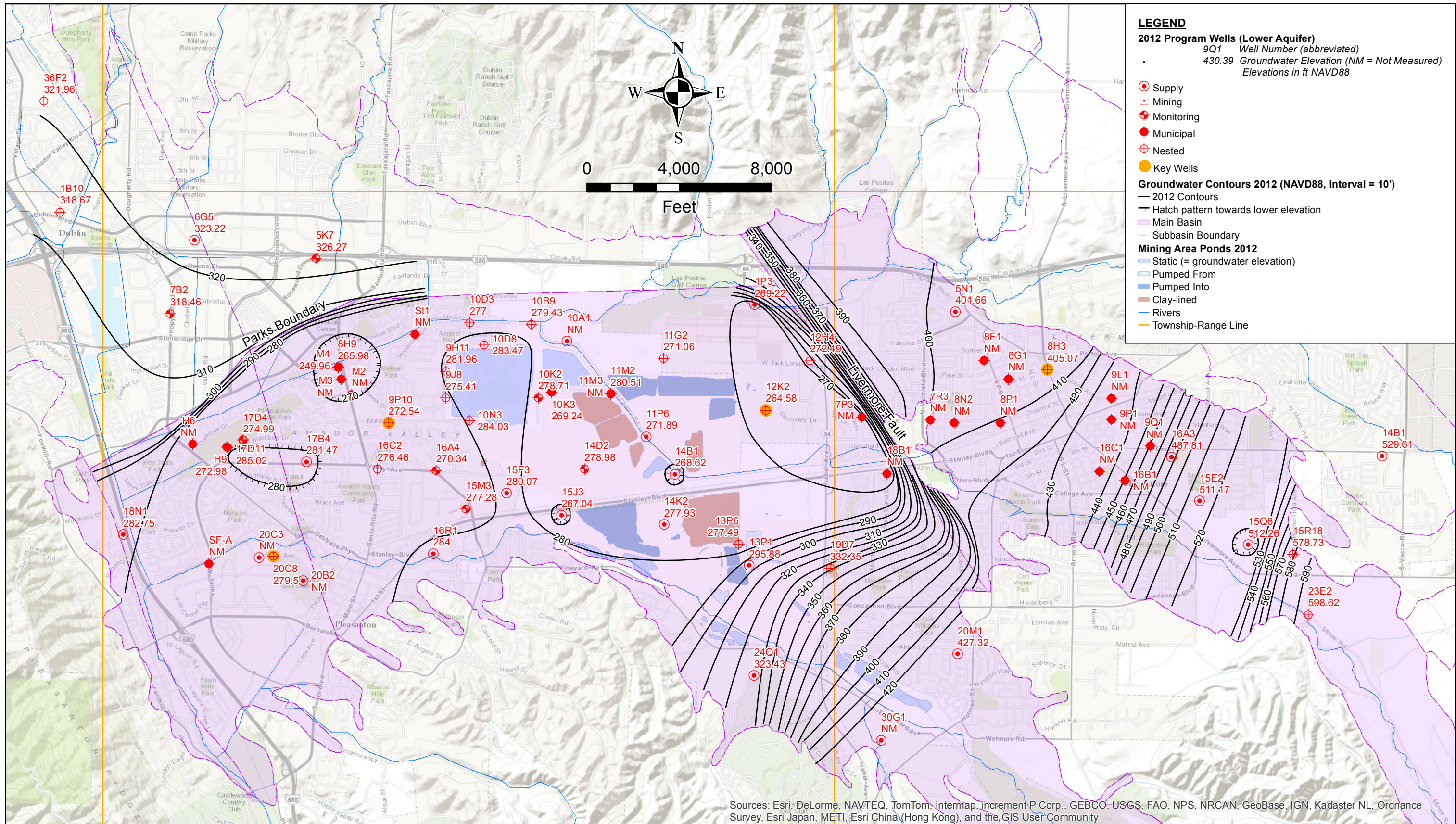
REVIEWED: MK

FILE: E:\MONITOR\GM\2012wy\Annual\Fig3.2-06-SAFallUpper2012.mxd

SCALE: 1 in = 6,000 ft

DATE: May 2, 2013

Figure 3.2-7
Groundwater Gradient Map
Upper Aquifer; Fall 2012 (September)
Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
 100 North Canyons Parkway
 Livermore, CA

DRAWN: TR

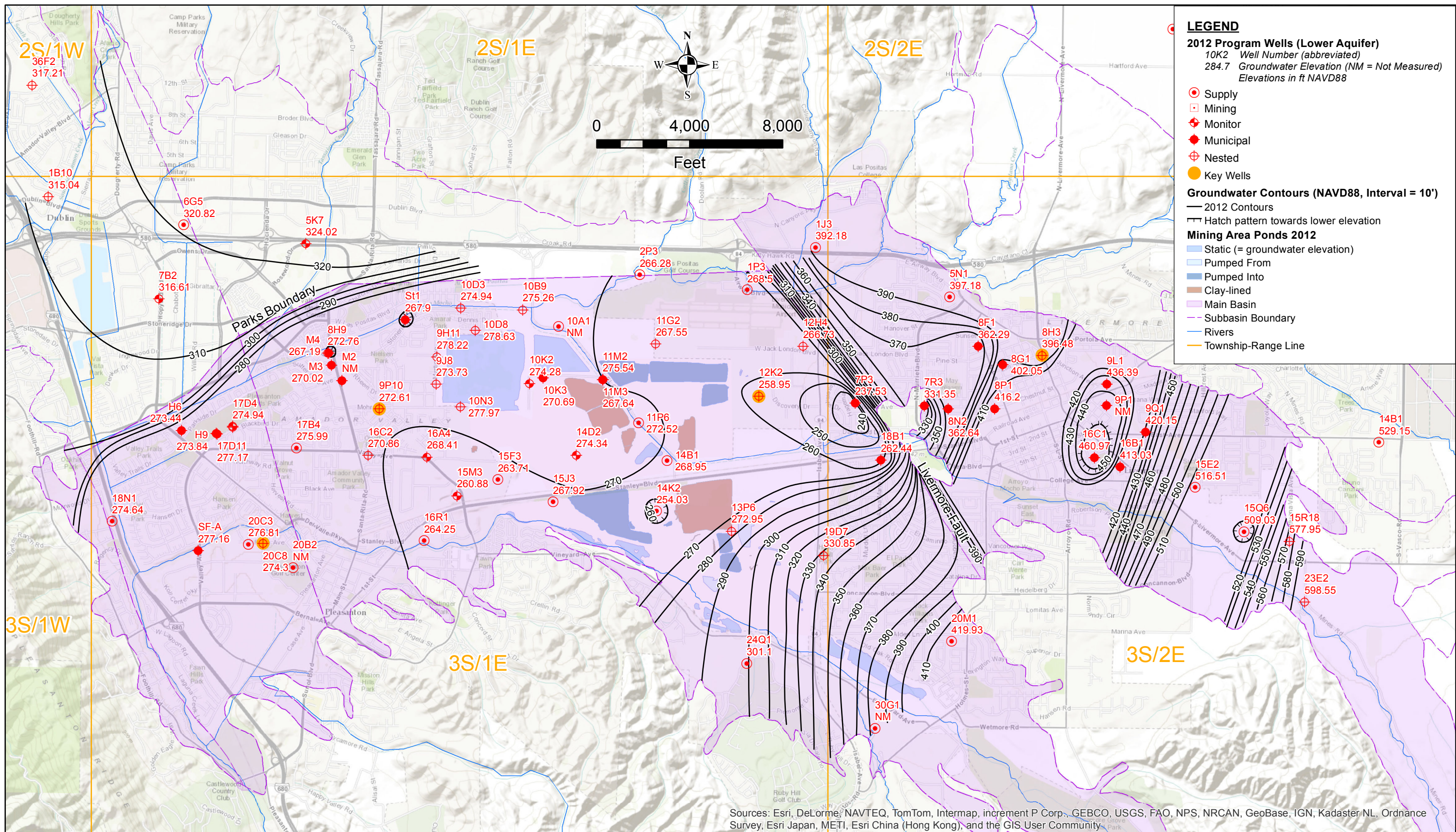
REVIEWED: MK

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SCALE: 1 in = 4,000 ft

DATE: May 2, 2013

Figure 3.2-8
Groundwater Gradient Map
Lower Aquifer; Spring 2012 (April)
Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
 100 North Canyons Parkway
 Livermore, CA

DRAWN: TR

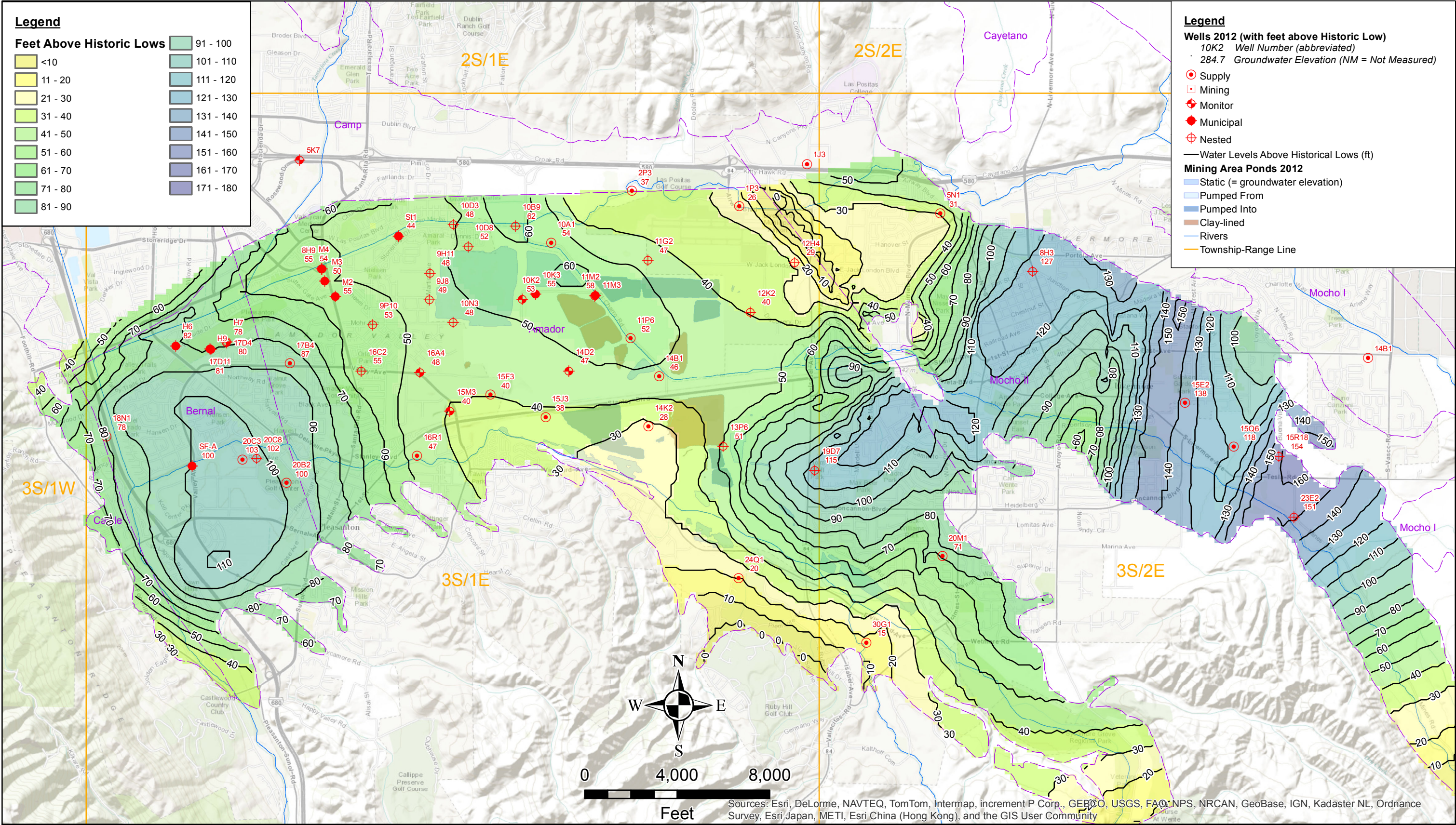
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DATE: May 2, 2013

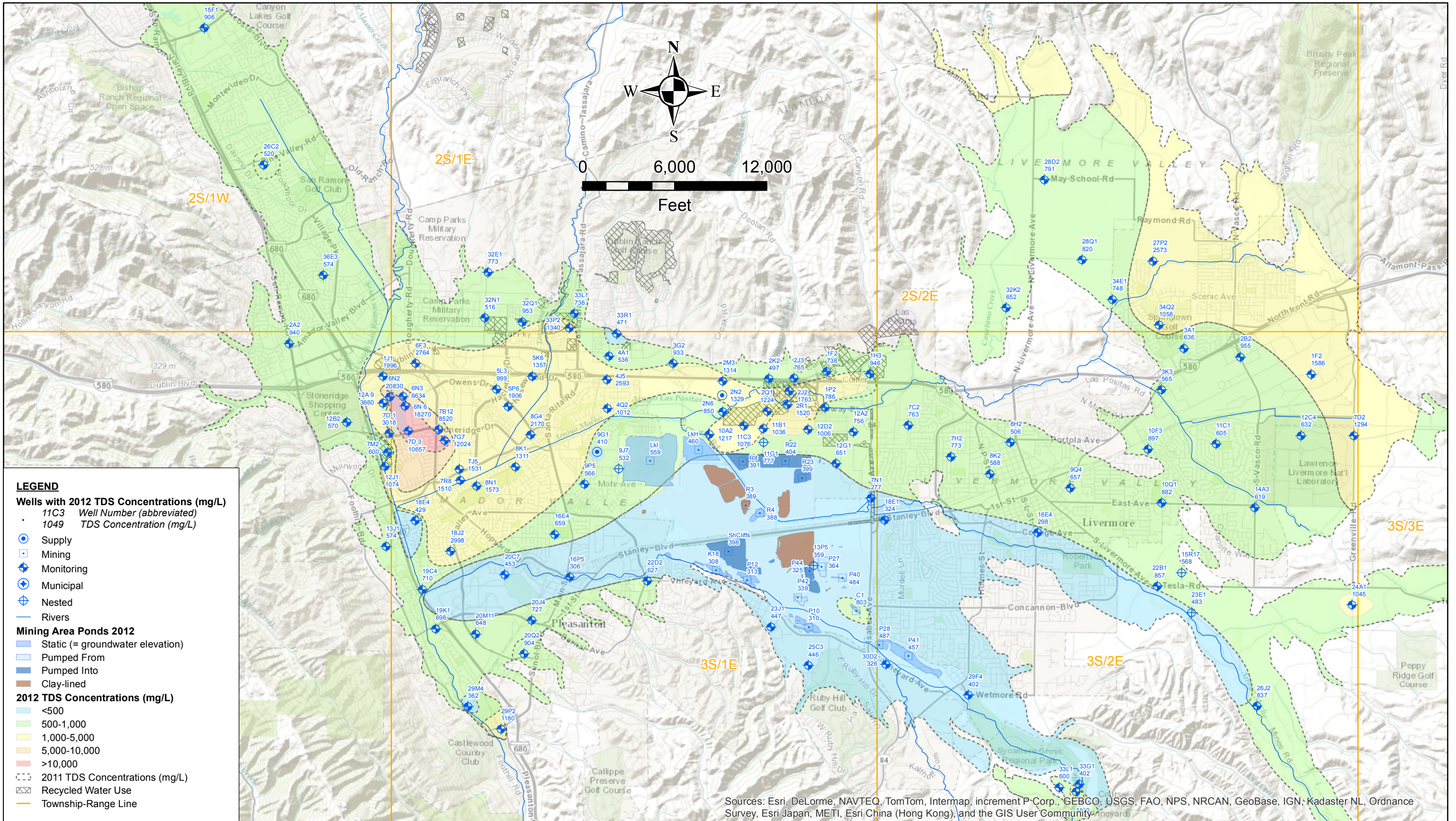
Figure 3.2-9
Groundwater Gradient Map
Lower Aquifer; Fall 2012 (October)
Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR/CW	SCALE: 1 in = 4,000 ft
REVIEWED: TR	DATE: Mar 26, 2013
File: E:\MONITOR\GM\2012WY\AnnualReport2012\Fig3.2-10-AboveHL12.mxd	

Figure 3.2-10
Groundwater Levels Above Historical Lows
Lower Aquifer; Fall 2012 (September)
Western Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR

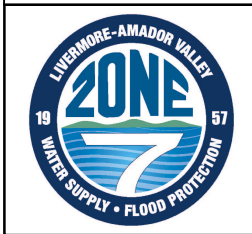
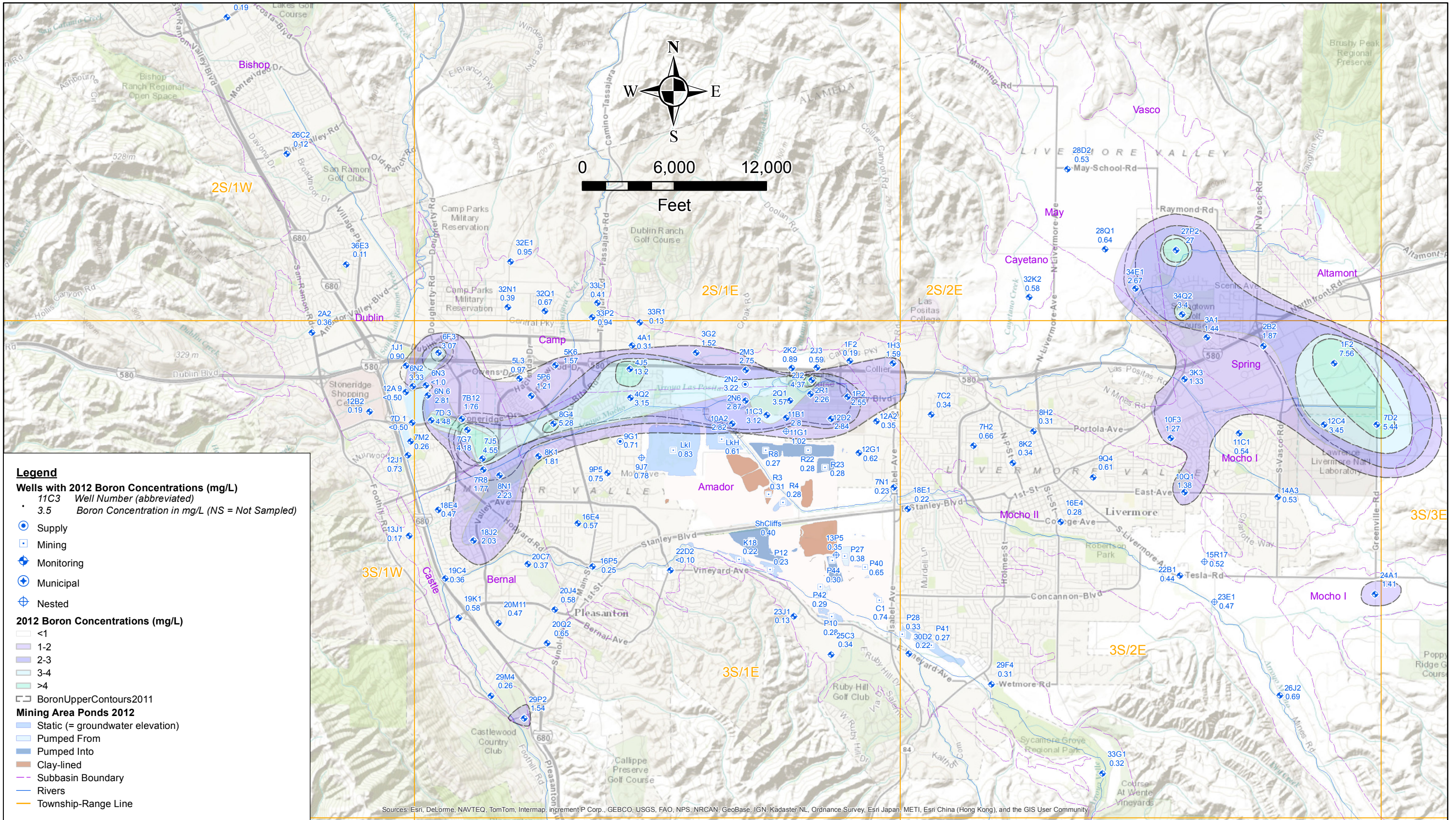
REVIEWED: CW

File: E:\MONITOR\GM\2012WY\AnnualReport2012\Fig3.2-11-TDSUpper12.mxd

SCALE: 1 in = 6,000 ft

DATE: May 2, 2013

Figure 3.2-11
TDS Concentrations (mg/L)
Upper Aquifer; 2012 Water Year
Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR

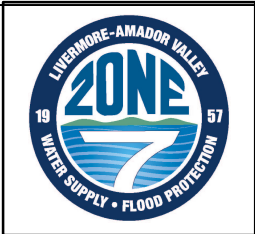
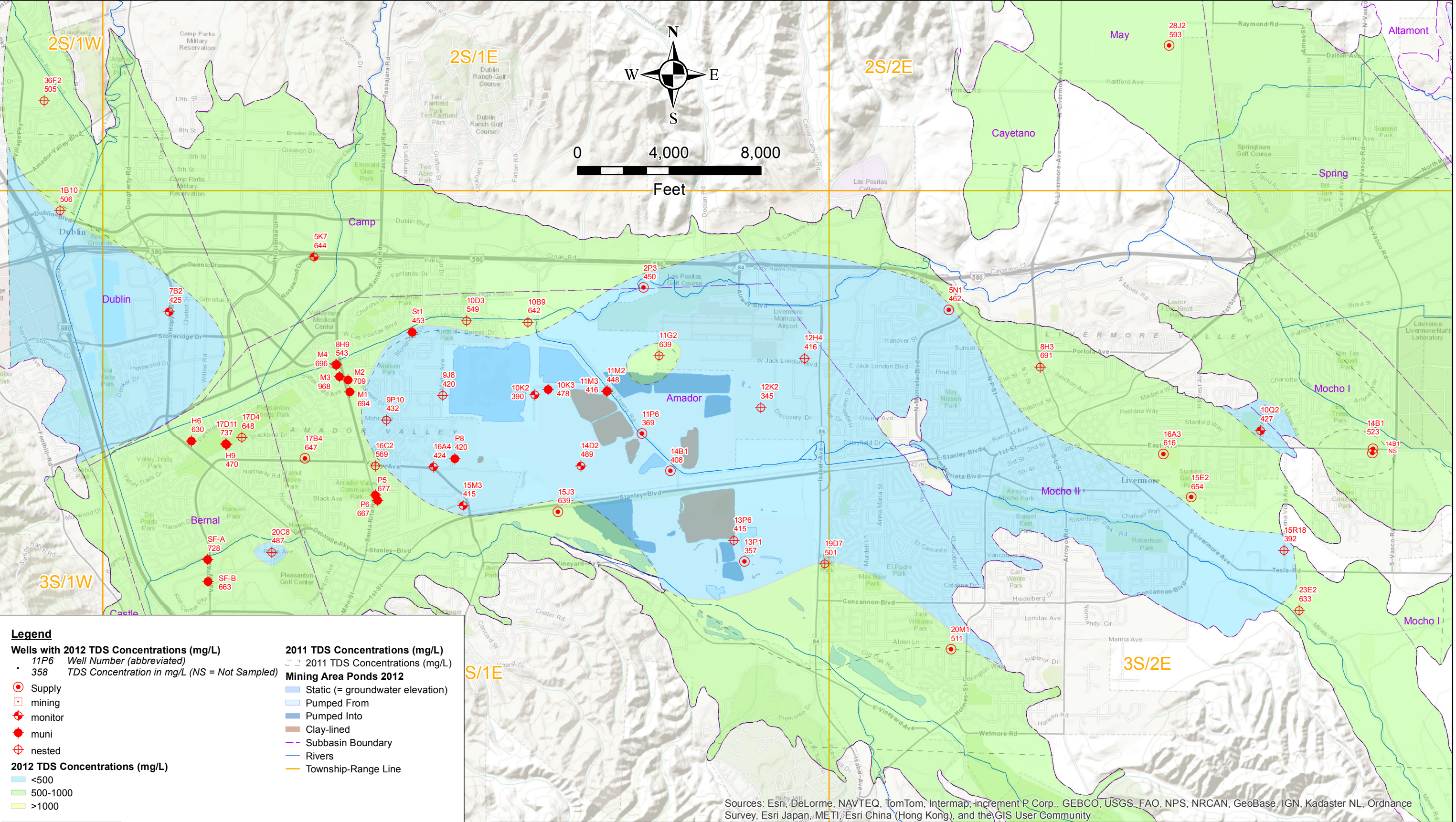
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SCALE: 1 in = 6,000 ft

DATE: Mar 29, 2013

Figure 3.2-13
Boron Concentrations (mg/L)
Upper Aquifer; 2012 Water Year
Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR

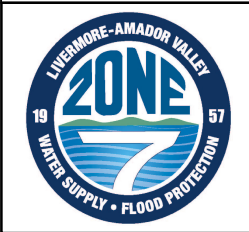
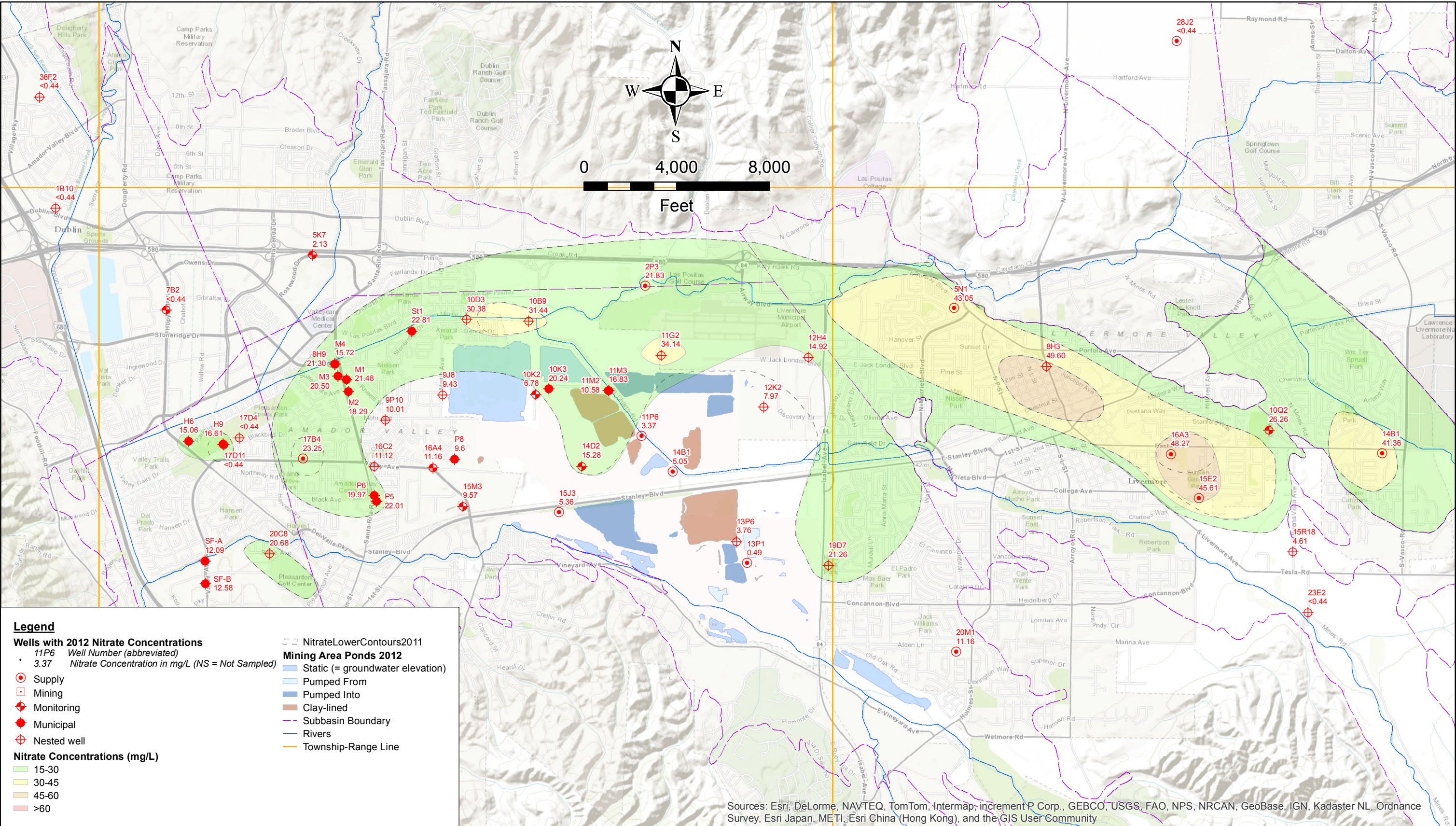
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SCALE: 1 in = 4,000 ft

DATE: May 2, 2013

Figure 3.2-14
TDS Concentrations (mg/L)
Lower Aquifer; 2012 Water Year
Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: CW/TR

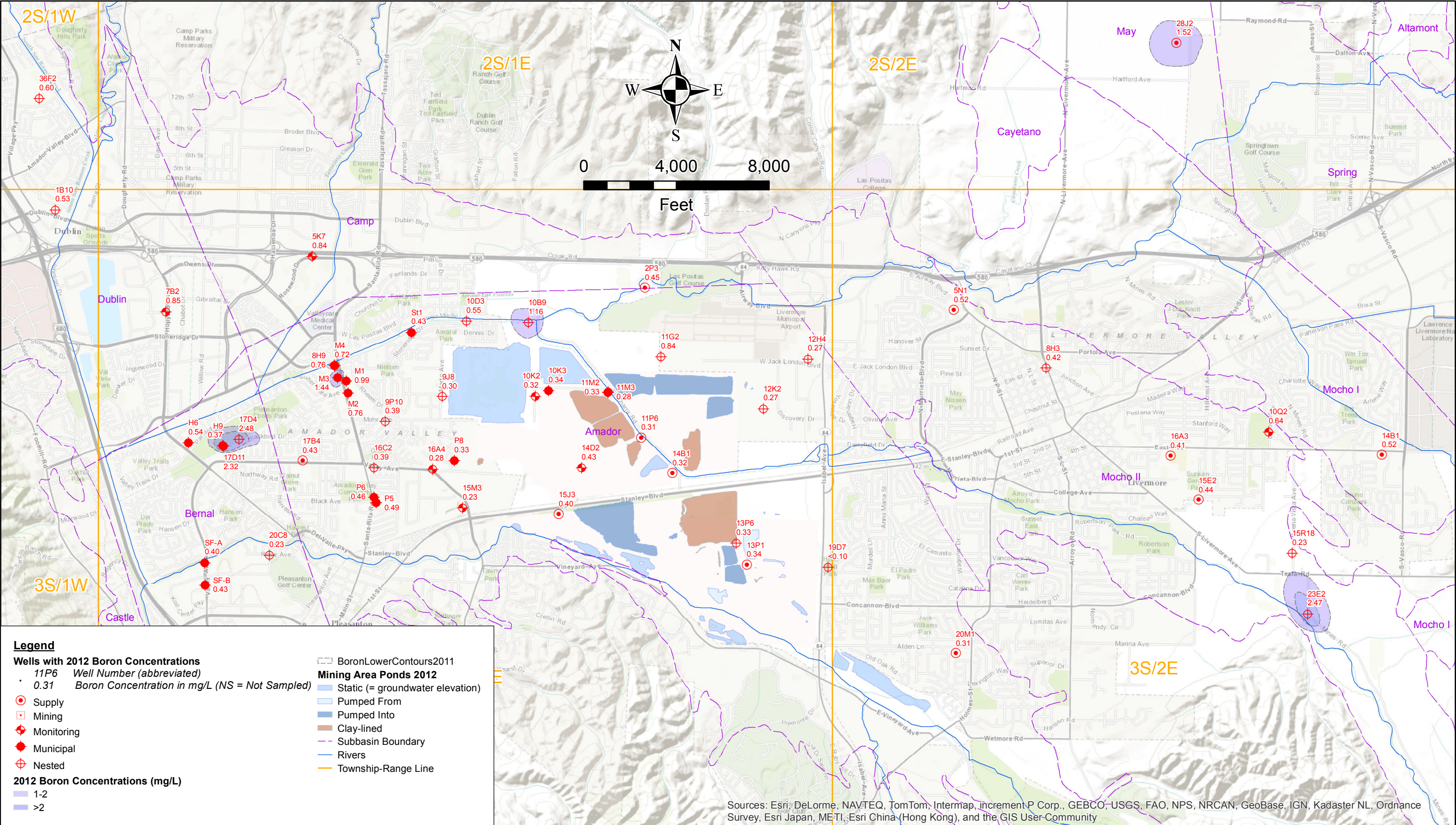
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SCALE: 1 in = 4,000 ft

DATE: Mar 29, 2013

Figure 3.2-15
Nitrate Concentrations (mg/L)
Lower Aquifer; 2012 Water Year
Livermore Valley Groundwater Basin



Legend

Wells with 2012 Boron Concentrations

11P6 Well Number (abbreviated)

0.31 Boron Concentration in mg/L (NS = Not Sampled)

Supply

Mining

Monitoring

Municipal

Nested

2012 Boron Concentrations (mg/L)

1-2

>2

BoronLowerContours2011

Mining Area Ponds 2012

Static (= groundwater elevation)

Pumped From

Pumped Into

Clay-lined

Subbasin Boundary

Rivers

Township-Range Line

Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User-Community



FIGURE 3.2-17
GROUNDWATER MONITORING PROGRAM
GRAPH OF TDS CONCENTRATIONS IN WESTERN KEY WELLS
1974 TO 2012 WATER YEARS

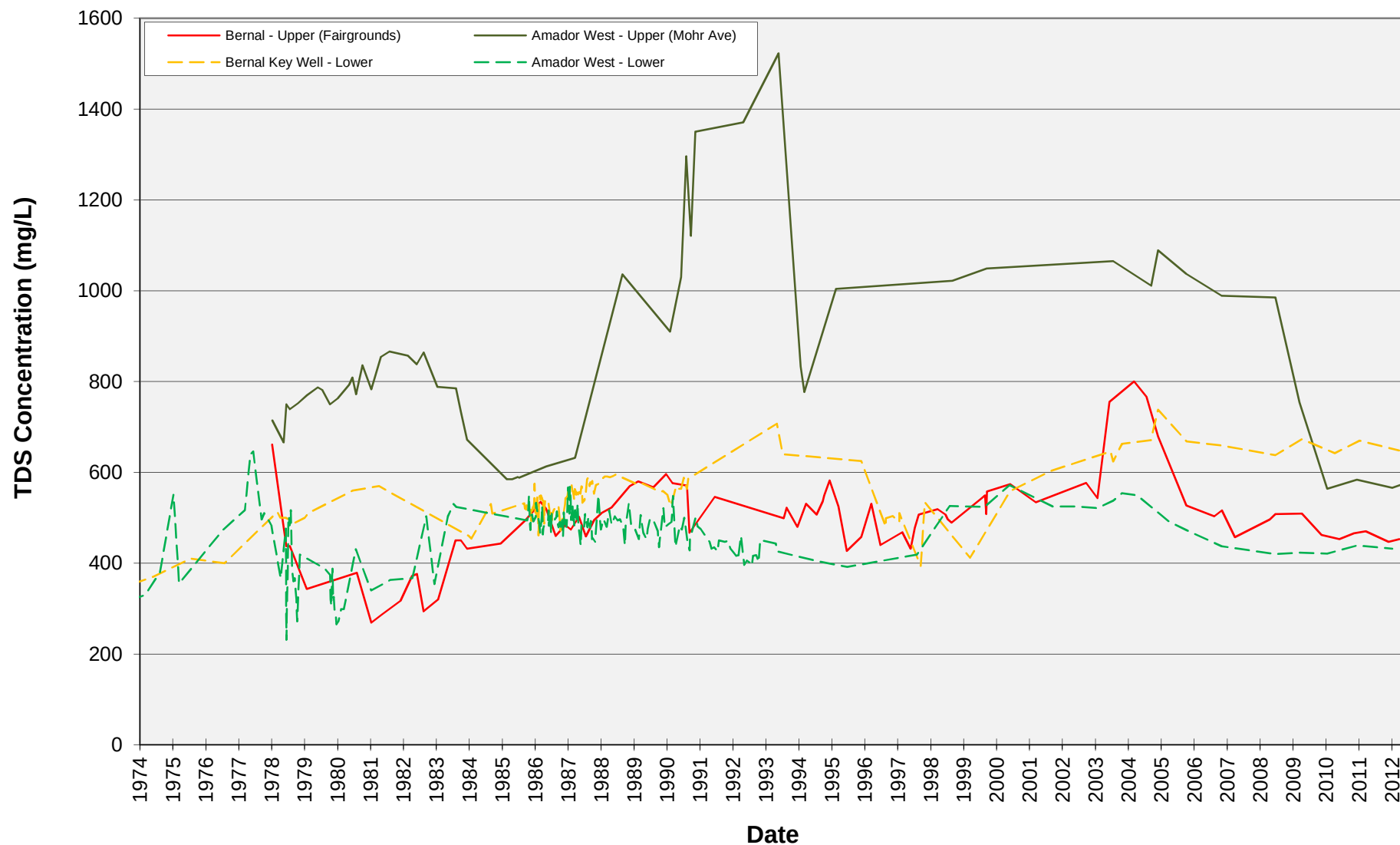




FIGURE 3.2-18
GROUNDWATER MONITORING PROGRAM
GRAPH OF TDS CONCENTRATIONS IN EASTERN KEY WELLS
1974 TO 2012 WATER YEARS

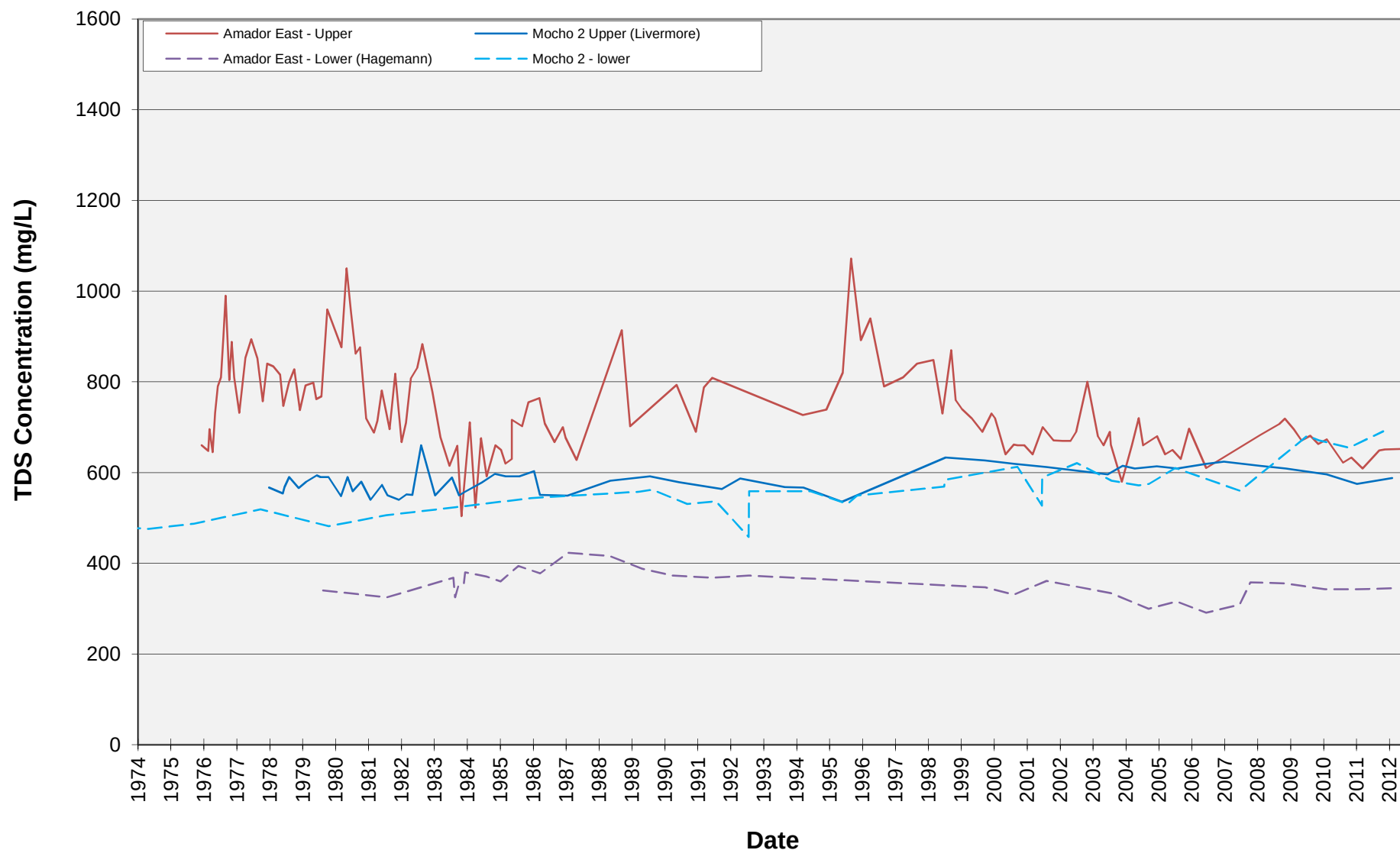
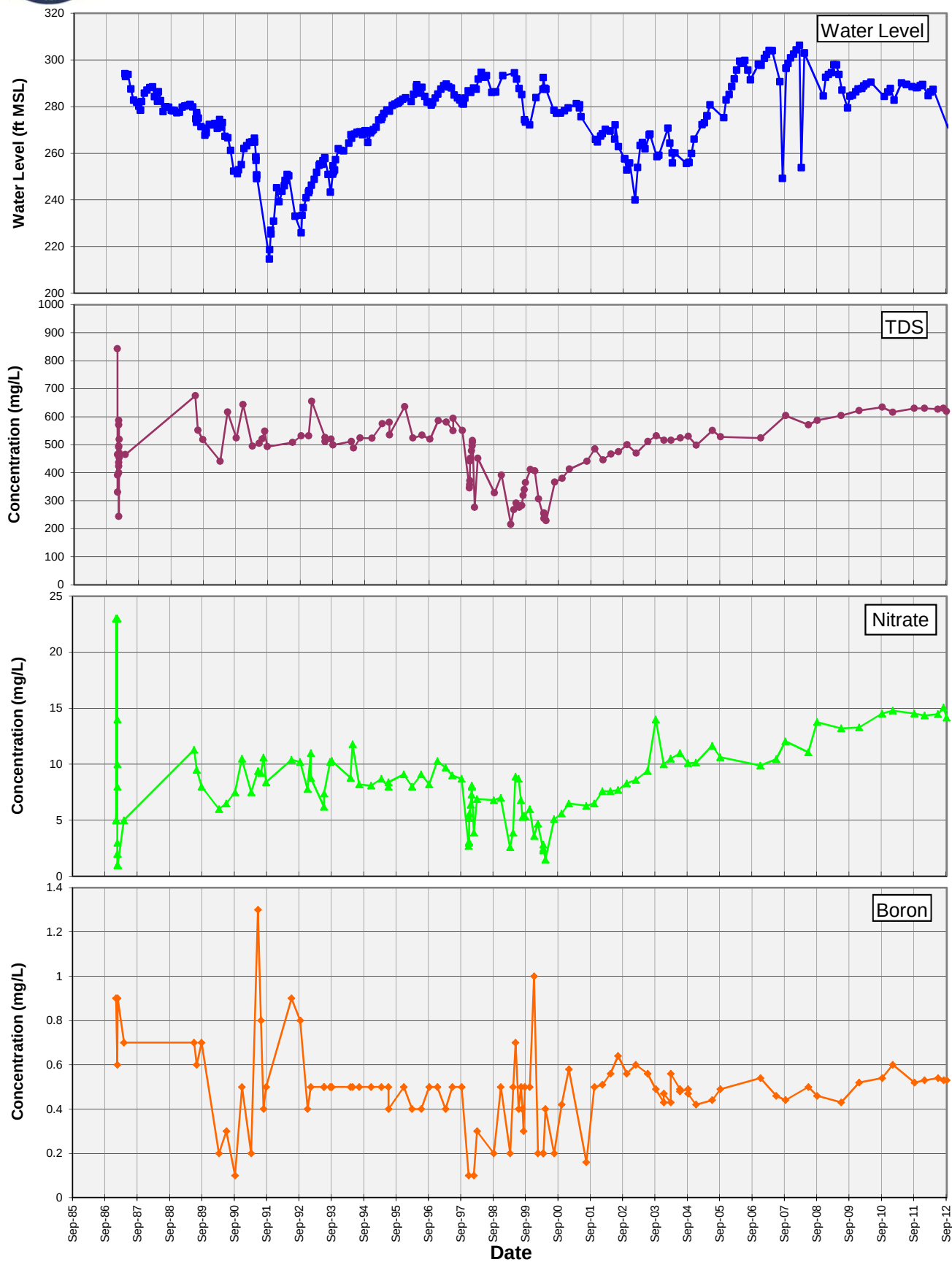




FIGURE 3.2-19
HYDRO-CHEMO GRAPH FOR 3S/2E 18A 6 (Hopyard 6)
BERNAL SUBBASIN - LOWER AQUIFER

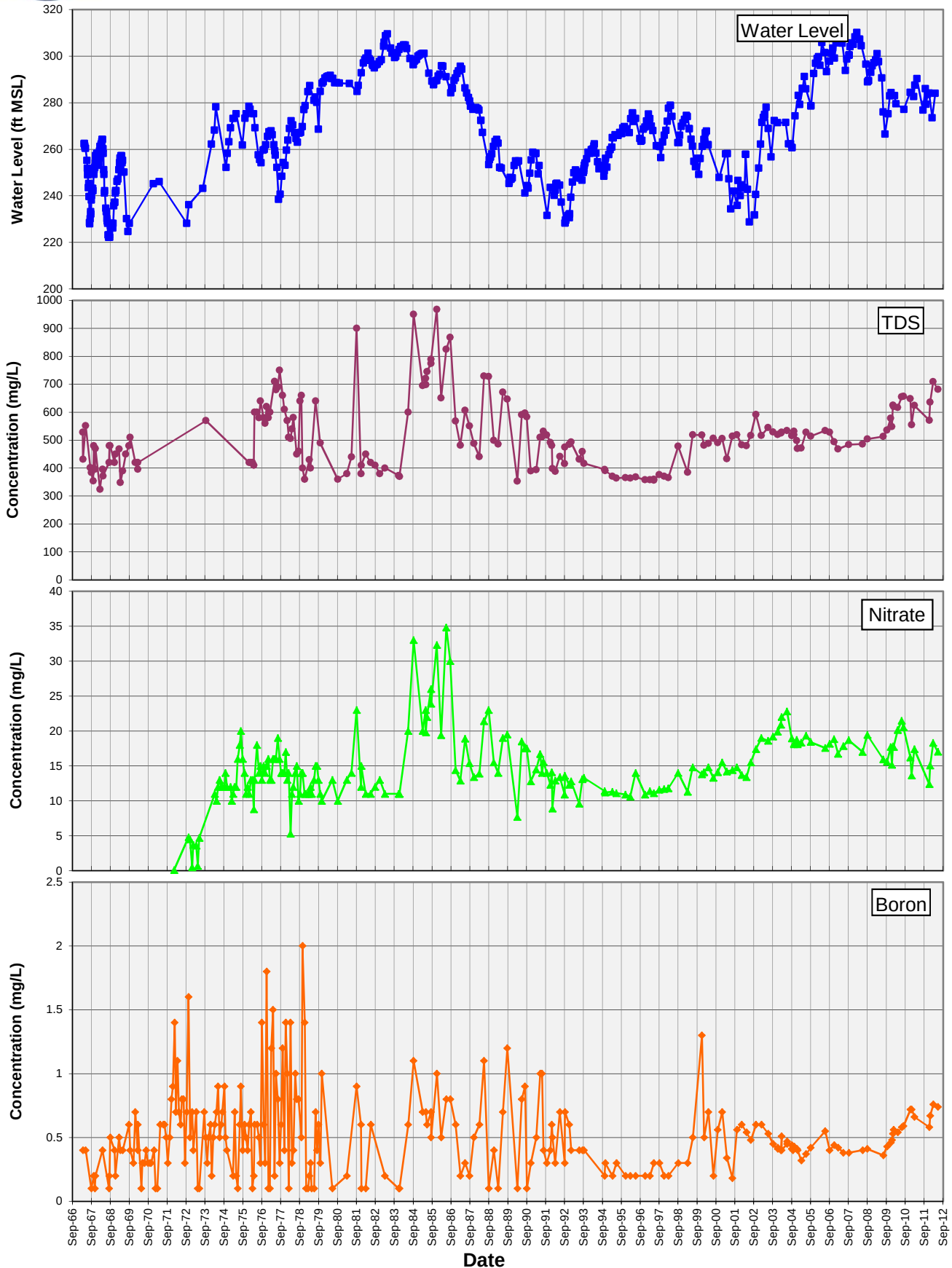


Well Depth = 273'; Wellhead Elevation = 466'; Well Screen Depth: 122 to 263' bgs.
 E:\MONITOR\GM\2012WY\AnnualReport2012\Fig3.2-19to22-HydroChemoGraphs12.xls\18A6Graph

Figure 3.2-19



FIGURE 3.2-20
HYDRO-CHEMO GRAPH FOR 3S/1E 9M 3 (Mocho 2)
AMADOR WEST SUBBASIN - LOWER AQUIFER

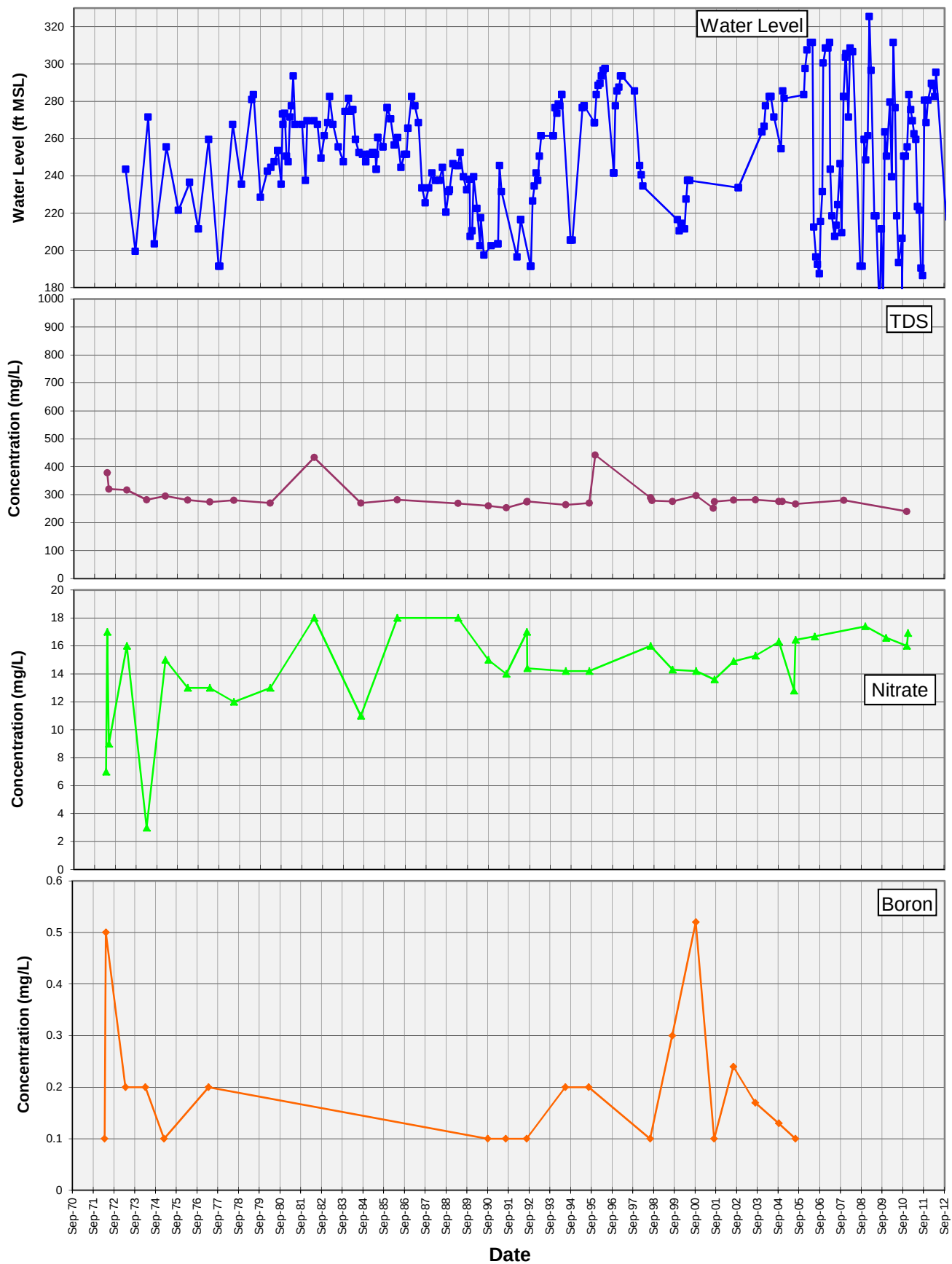


Well Depth = 575'; Wellhead Elevation = 344'; Well Screen Depth: 250 to 570' bgs.
 E:\MONITOR\GM\2012WY\AnnualReport2012\Fig3.2-19to22-HydroChemoGraphs12.xls\9M3Graph

Figure 3.2-20



FIGURE 3.2-21
HYDRO-CHEMO GRAPH FOR 3S/2E 7P 3
AMADOR EAST SUBBASIN - LOWER AQUIFER

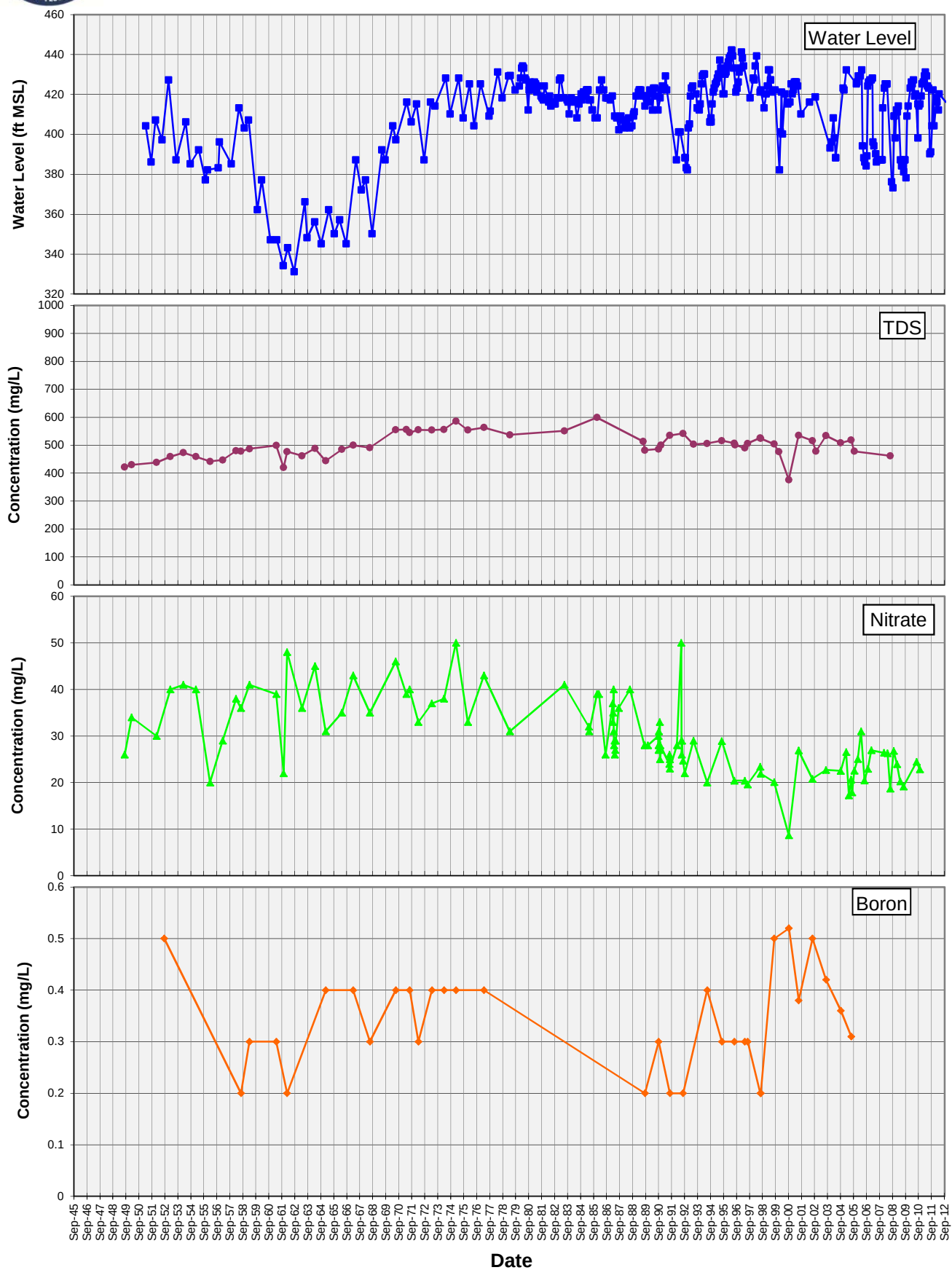


Well Depth = 510'; Wellhead Elevation = 429'; Well Screen Depth: 300 to 490' bgs.
 E:\MONITOR\GM\2012WY\AnnualReport2012\Fig3.2-19to22-HydroChemoGraphs12.xls\7P3Graph

Figure 3.2-21



FIGURE 3.2-22
HYDRO-CHEMO GRAPH FOR 3S/2E 8P 1
MOCHO II SUBBASIN - LOWER AQUIFER



Well Depth = 273'; Wellhead Elevation = 466'; Well Screen Depth: 122 to 263' bgs.
E:\MONITOR\GM\2012WY\AnnualReport2012\Fig3.2-19to22-HydroChemoGraphs12.xls\8P1Graph

Figure 3.2-22



FIGURE 3.2-23
MOCHO WELLFIELD MUNICIPAL WELLS
GROUNDWATER CONCENTRATIONS, ELEVATIONS, AND PUMPING

