

**Annual Report for the
Groundwater Management Program
2009 Water Year
EXECUTIVE SUMMARY**

PREPARED BY:

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ES Executive Summary

This Annual Report of the Groundwater Management Program, a companion to the Groundwater Management Plan (GWMP, 2005), summarizes the status of Zone 7's groundwater management program for the 2009 Water Year (October 2008 through September 2009). This report includes 2009 Water Year data sets, results, and interpretations for the monitoring, evaluation, and management programs outlined in the GWMP.

ES 1 Overview

Due to the lack of rainfall (83% of normal) and reduced stream recharge (53% of normal) for the 2009 Water Year, available groundwater storage dropped about 13,000 acre-feet (AF) (from about 89,000 AF in 2008 to 76,000 AF in 2009). This resulted in a drop in Main Basin groundwater elevations by 45 feet; however, some water levels in the eastern portion of the Main Basin actually rose, due to the resumption of artificial recharge on the Arroyo Mocho. There is no evidence that suggests that the drop in groundwater resulted in any inelastic subsidence.

Zone 7 installed one new nested well-set (two wells total) in the Mocho II Subbasin during 2009, which will replace the existing Mocho II lower aquifer key well (currently California Water Services' Well 19, a.k.a. 3S/2E 8G 1) in the Key Well program.

There was an estimated 2,608 tons of salt added to the Main Basin for the 2009 Water Year (average is about 2,400 tons per year) primarily from applied water and stream recharge. Zone 7's Demineralization Plant, which is designed to reduce salt build-up in the basin, was put into operation in July 2009 and removed a total of approximately 800 tons of salt by the end of the 2009 Water Year.

In 2009 two new production wells (COL#1 and COL #2), including the associated pipelines, pump stations and treatment facility; were constructed in the Chain of Lakes/Gravel Pits Wellfield. These wells are currently undergoing testing and should be in-service by Summer 2010. They will add eight million gallons per day (mgd) production capacity to Zone 7's groundwater extraction capability.

There was no increase in the number of toxic sites (11) that impact or are an immediate threat to potable water supply wells within the valley.

ES 2 Monitoring Programs

Climatological –For the third water year in a row, rainfall in the valley was below average at 83% of normal (Figure ES-1 shows rainfall at Station 15E, which was 78% of normal). The evaporation for the Valley, represented by the Lake Del Valle Station, ended the year with 108% of normal evaporation.

Groundwater – Due to the third year of drought, groundwater levels generally dropped throughout most of the Main Basin (Figure ES-2 and Figure ES-3). In the upper aquifer (Figure ES-4), elevations in the western portion of the Main Basin generally dropped two to ten feet, especially near Zone 7's and the City of Pleasanton's municipal wells. However, in the western portion of the Mocho II and eastern portion of the Amador subbasins, water levels along the Arroyo Mocho rose 15 to 45 feet likely due to Zone 7's resumption of artificial recharge in 2009. In the lower aquifer (Figure ES-5), water levels generally dropped throughout the Amador Subbasin by ten to 35 feet. However, levels in the Bernal Subbasin remained fairly steady or actually rose up to six feet, likely related to Zone 7's pumping shift from the Hopyard Wellfield to the Mocho Wellfield for the demineralization plant. Levels in the Mocho II Subbasin varied significantly from relatively stable (+/- six feet) near the Arroyo Mocho to dropping 20 to 114 feet near municipal pumping wells. Water levels in the central and western portion of the Livermore-Amador Valley, where the majority of Zone 7's groundwater is pumped, remained at 20 to 110 feet above historical lows (Figure ES-6). Groundwater quality in the upper (Figure ES-7) and lower (Figure ES-8) aquifers remained relatively unchanged from the 2008 Water Year. However, individual municipal supply wells in the Mocho Wellfield are experiencing higher than average increases in hardness and salinity. Staff is investigating whether this feature is related to well construction or 'leaky' aquitards.

Surface Water - During the 2009 Water Year, watershed runoff total into Lake Del Valle was 11,220 AF, approximately 52% of average. There were no flood releases from Lake Del Valle in 2009. The total volume of State Water Project (SWP) water released from the South Bay Aqueduct (SBA) to the Arroyo Valle totaled 4,290 AF, and to the Arroyo Mocho totaled 1,900 AF. No recharge water was released to the Arroyo Las Positas this water year.

Subsidence - During the 2009 Water Year, most of Zone 7's survey benchmarks have lowered slightly from Fall 2008 to Fall 2009 (less than about 0.07 ft, Figure ES-9). The slight drop in land surface elevation corresponds with the groundwater elevation decrease observed in the West Amador Subbasins during the 2009 Water Year and is within the range of elastic subsidence observed over the life of the monitoring program. Elevation changes from Spring to Fall 2009, which varied from -0.001 to -0.096, were also within the range of elastic movement.

Mining Area - Mining activities continued for Vulcan Materials (formerly Calmat) and Cemex (formerly RMC and Lonestar). Vulcan Materials continued their mining in R28 located south of Stanley Boulevard (future Lake D area) and increased dewatering from various ponds (e.g., R24 – future Lake E). Cemex continued mining in P42, located just north of Arroyo Valle (in the future Lake B area), and is planning on resuming mining in P41 (future Lake A) when issues of bank stability are resolved. As a result of these mining operations, about 1,500 AF of water exited the Valley (570 AF in 2008), not including the evaporation from the mining ponds. Salt concentrations (measured as TDS) in the mining area pits ranged from about 300 mg/L to over 900 mg/L.

Land Use - For the 2009 Water Year, Main Basin land use remained relatively unchanged from the 2008 Water Year. Development continues to be slow due to the poor economy effect on real estate.

Groundwater Production - For the 2009 Water Year about 18,200 AF of groundwater was pumped from the Main Basin. Zone 7 produced approximately 9,958 AF of groundwater for the 2009 Water Year (about 129% of normal) and 10,911 AF for the Calendar Year (January to December). For the 2009 Calendar Year, California Water Service, which has a Groundwater Production Quota (GPQ) of 3,069 AF, pumped 3,064 AF. Pleasanton, which has a GPQ of 3,500 AF (and a carryover of 680 AF from 2008), pumped 3,505 AF and carried-over 675 AF into the 2010 Calendar Year. All other groundwater production was about normal for the basin.

Wastewater and Recycled Water – In 2009, 18,991 AF (compared to 19,860 AF in 2008) of wastewater was produced, about 18% of which was recycled. About 20% of the recycled water was applied over the Main Basin. Recycled water use by Livermore Water Reclamation Plan over the Main Basin continues to increase (from 406 for 2008 Water Year to 591 AF for 2009 Water Year). Nitrates and elevated salinity have been the primary groundwater quality concern, but nitrate levels have remained very low since LWRP discontinued nitrifying their effluent in 1995. Recycled water use by DSRSD decreased slightly (from 2,484 AF in 2008 to 2,221 AF in 2009), but that recycled water is currently applied only over the fringe basins and has little impact to the Main Basin supply.

ES 3 Basin Evaluation Programs

Recharge Calculations – For the 2009 Water Year, total natural recharge was about 9,117 AF, approximately 74% of normal. This includes rainfall recharge at about 27 AF (1% of normal), natural stream recharge at about 5,317 AF (92% of normal), and applied water recharge at about 1,720 AF (115% of normal). Artificial stream recharge for the 2009 Water Year was about 3,984 AF (46% of normal).

Groundwater Storage - At the end of the 2009 Water Year, the total groundwater in storage was estimated to be 204,000 AF. This is equivalent to an operational storage of about 76,000 AF, which is about 60% of the historical maximum (126,000 AF during the 1983 Water Year), and about 13,000 AF less than the 2008 Water Year storage (Figure ES-10).

Salt Loading Calculations – There was a net increase of approximately 2,608 tons of salt to the Main Basin for the 2009 Water Year, including about 800 tons which were removed by Zone 7's new demineralization plant. Over the last three years basin-wide average TDS concentration has risen at an average of about 42 mg/L likely due to the lack of artificial and natural stream recharge of low TDS water over this period. (Figure ES-11).

ES 4 Basin Management Programs

Most 2009 Basin Management Programs remained unchanged from 2008 except for:

Demineralization Plant - For the 2009 Water Year, 968 AF of groundwater from the Mocho Wellfield were sent through the membranes of Zone 7's new demineralization plant, and 759 AF of demineralized, low-salt permeate were introduced into Zone 7's distribution system. The export of the high-salt brine water to DSRSD, and eventually to the San Francisco Bay, resulted in the removal of about 800 tons of salt from the groundwater basin.

Monitoring Wells – Zone 7 installed two new monitoring wells (nested in the same borehole) in the Mocho II Subbasin, one of which will added to the Key Well monitoring program.

Well Ordinance Program - Zone 7 issued 100 drilling permits in the 2009 Calendar Year, 82 less than what was issued in 2008.

Septic Tank Management - There were no commercial septic tank applications received by Zone 7; therefore, no commercial septic systems were approved by the Zone 7 Board. However, one special approval was issued by Zone 7 staff for a new onsite sewage treatment system planned to serve two residences on a five-acre lot created by a split of a historic ten-acre lot-of-record.

Toxic Site Surveillance Program - In 2009, Zone 7 tracked the progress of 81 active sites (five were closed since 2008) where contamination has been detected or is threatening groundwater. Eleven of the sites are designated as 'High Priority' because they've impacted or are an immediate threat to potable water supply wells: six in Livermore, four in Pleasanton, and one in Sunol. Seven of the eleven high priority sites are fuel leak cases, whereas the other four are the result of industrial solvent contamination. All of the seven fuel leak cases are being overseen by Alameda County Environmental Health (ACEH). The four high priority industrial solvent cases involve tetrachloroethylene (PCE) contamination, two of which are being overseen by the Regional Water Quality Control Board (RWQCB) while the other two are not included in any of the Local Oversight Programs (LOP).

Capital Projects – In 2009 two new production wells (COL#1 and COL #2), including the associated pipelines, pump stations and treatment facility; have been constructed in the Chain of Lakes/Gravel Pits Wellfield. These wells are currently undergoing testing and should be in-service by Summer 2010. Construction of Zone 7's Demineralization Plant was completed in 2009.

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- Figure ES-2: Key Well Hydrographs-Western Portion of Main Basin
- Figure ES-3: Key Well Hydrographs-Eastern Portion of Main Basin
- Figure ES-4: Groundwater Gradient Map, Upper Aquifer, Fall 2009
- Figure ES-5: Groundwater Gradient Map, Lower Aquifer, Fall 2009
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- Figure ES-11: Graphs of Salt Loading and Salt Concentrations

FIGURE ES-1
ZONE 7 WATER AGENCY
Graph of Livermore Rainfall (Station 15E NOAA)

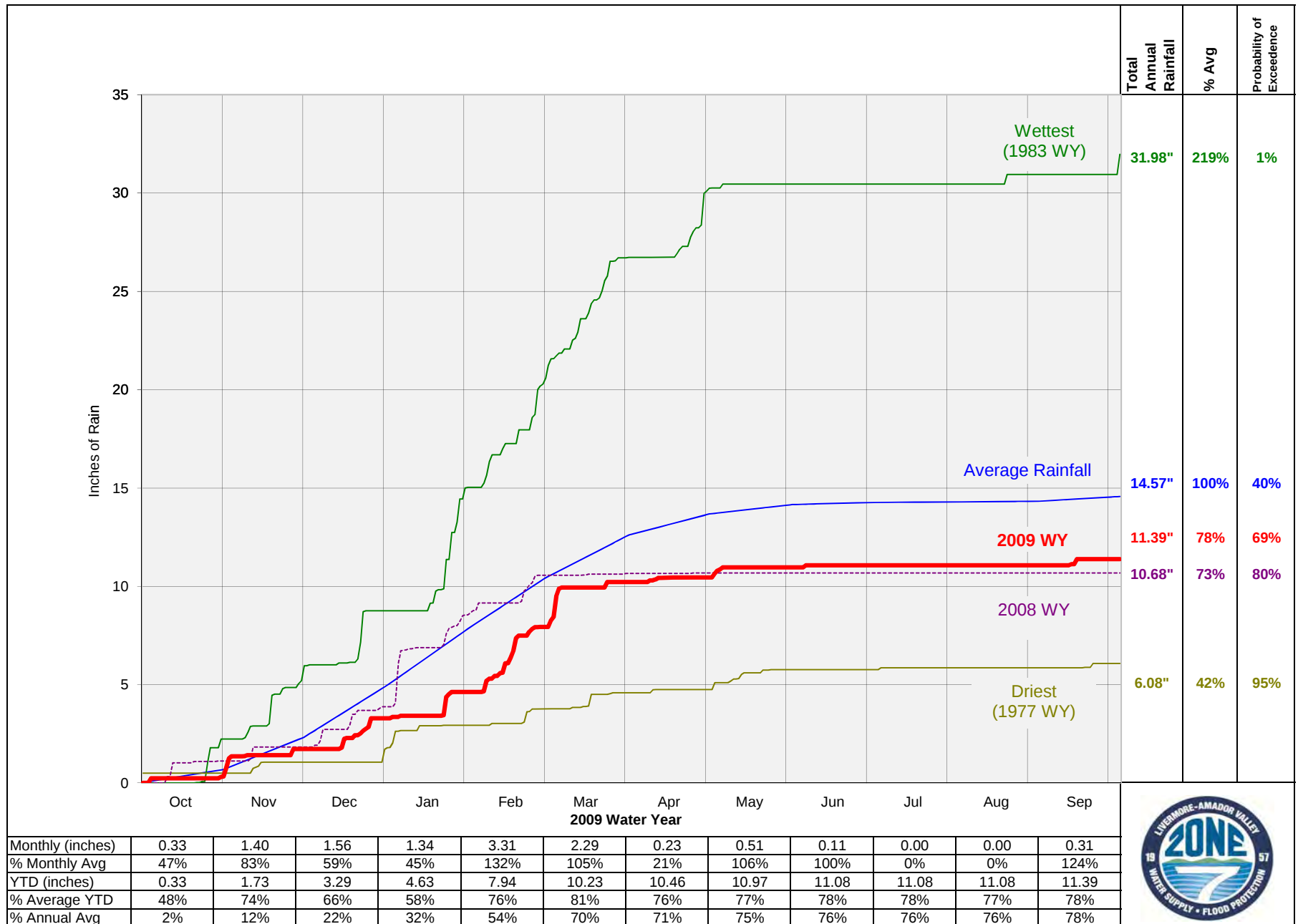


FIGURE ES-2
ZONE 7 WATER AGENCY
Key Well Hydrographs - Western Portion of Main Basin
2009 Water Year

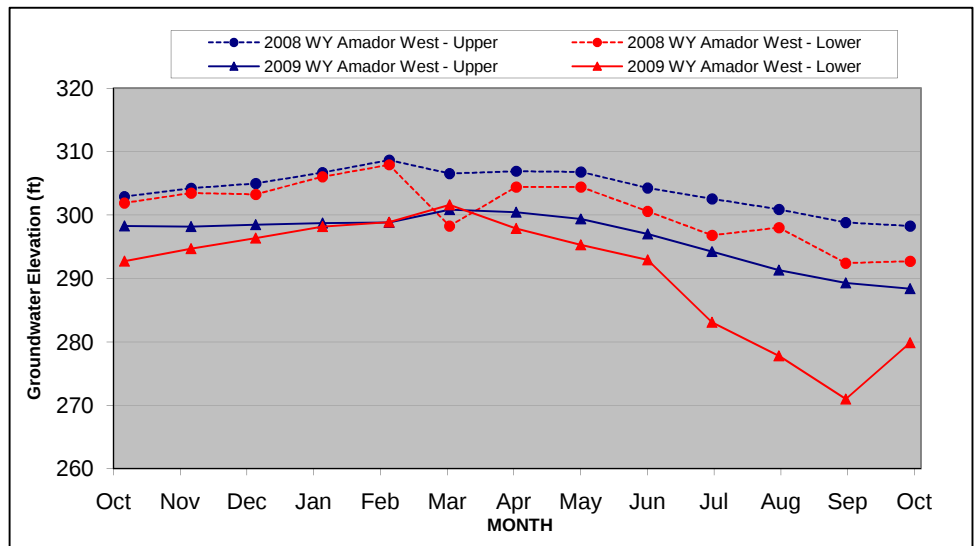
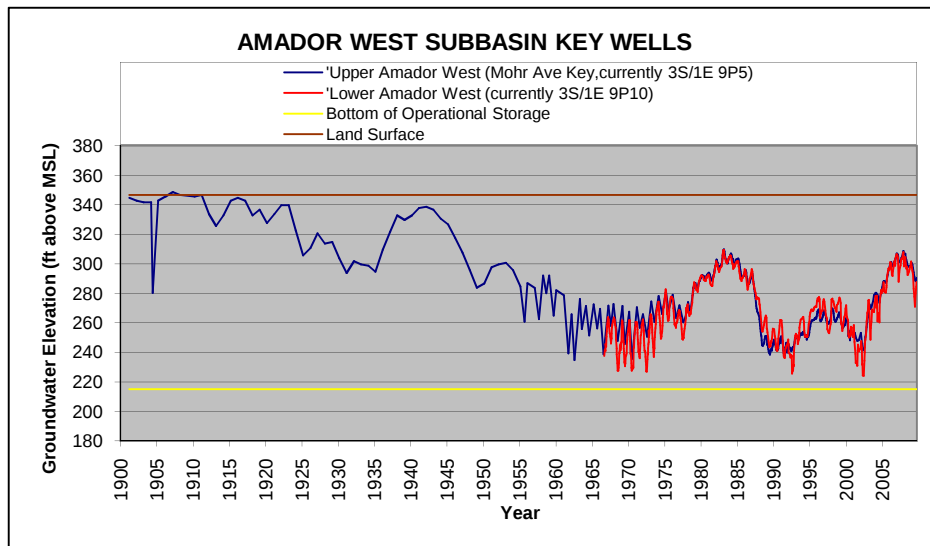
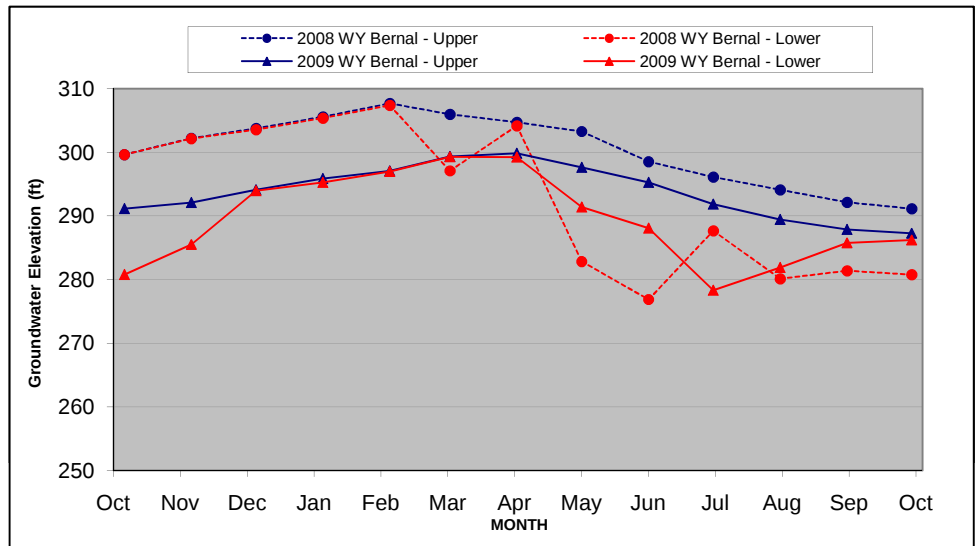
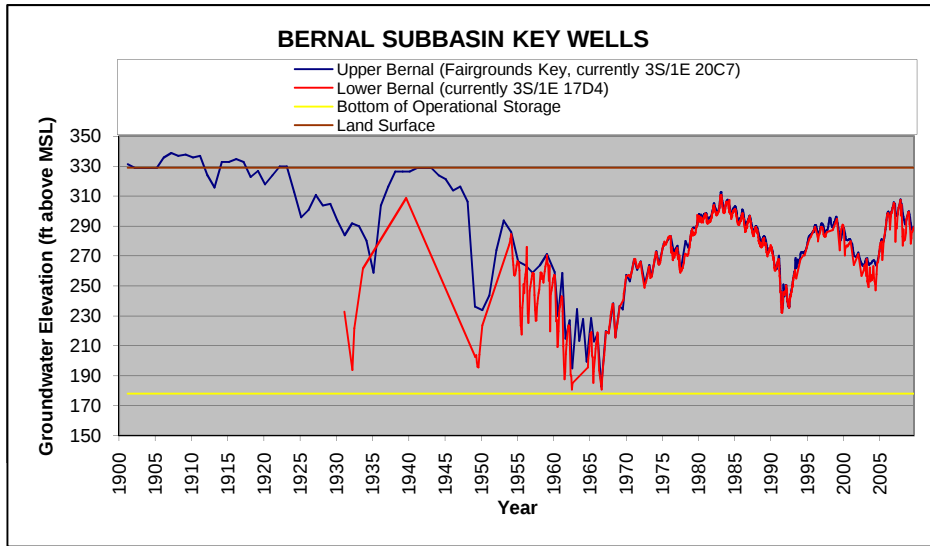
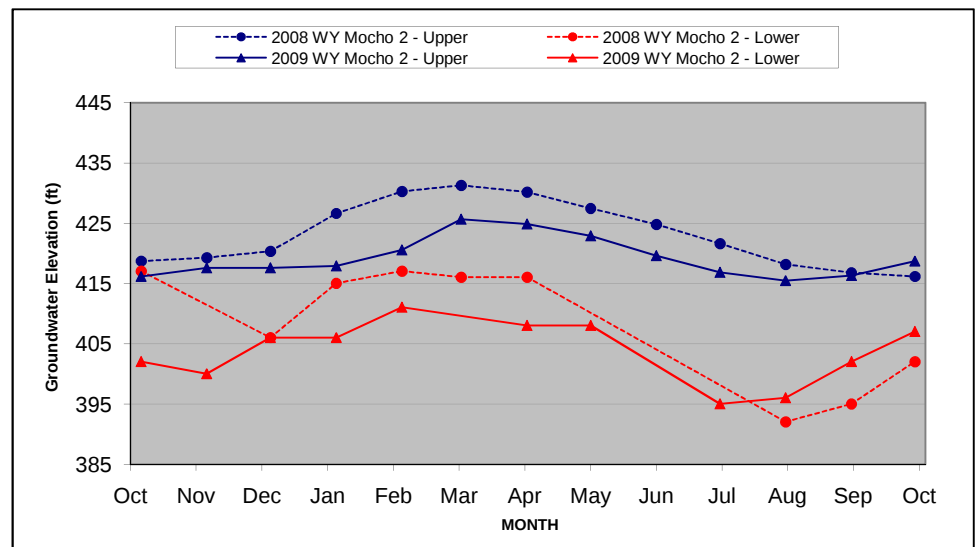
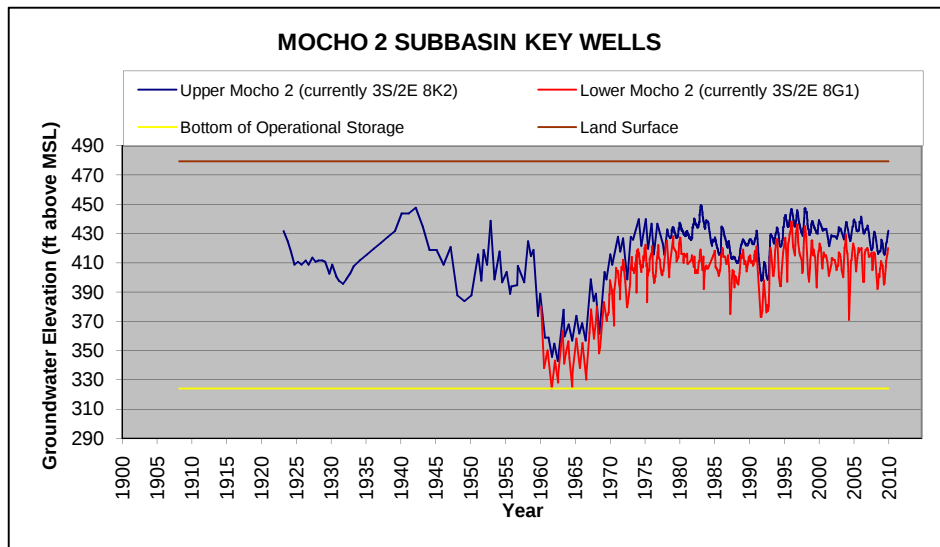
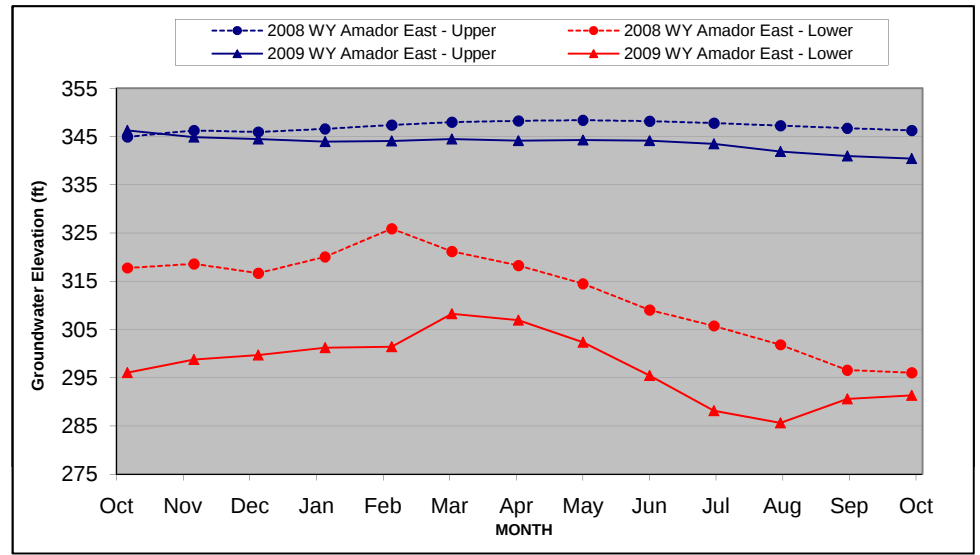
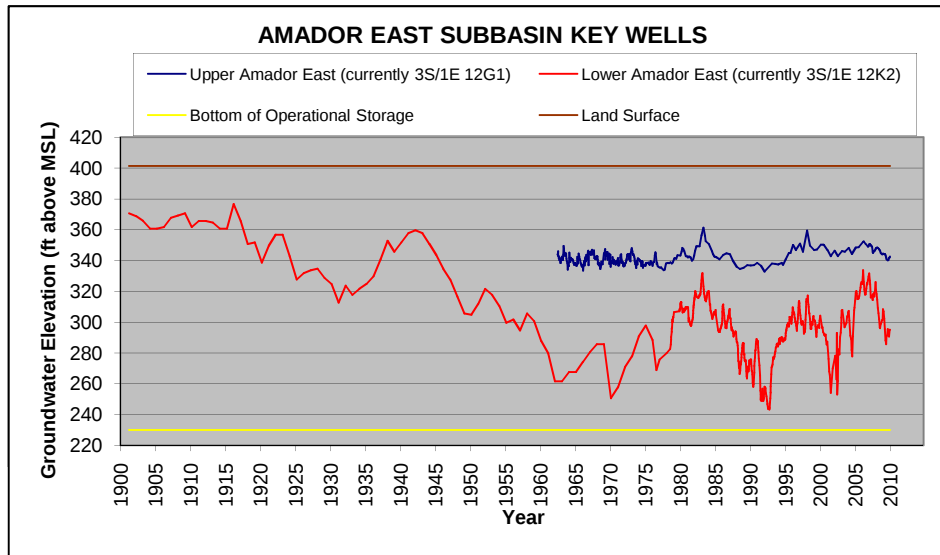
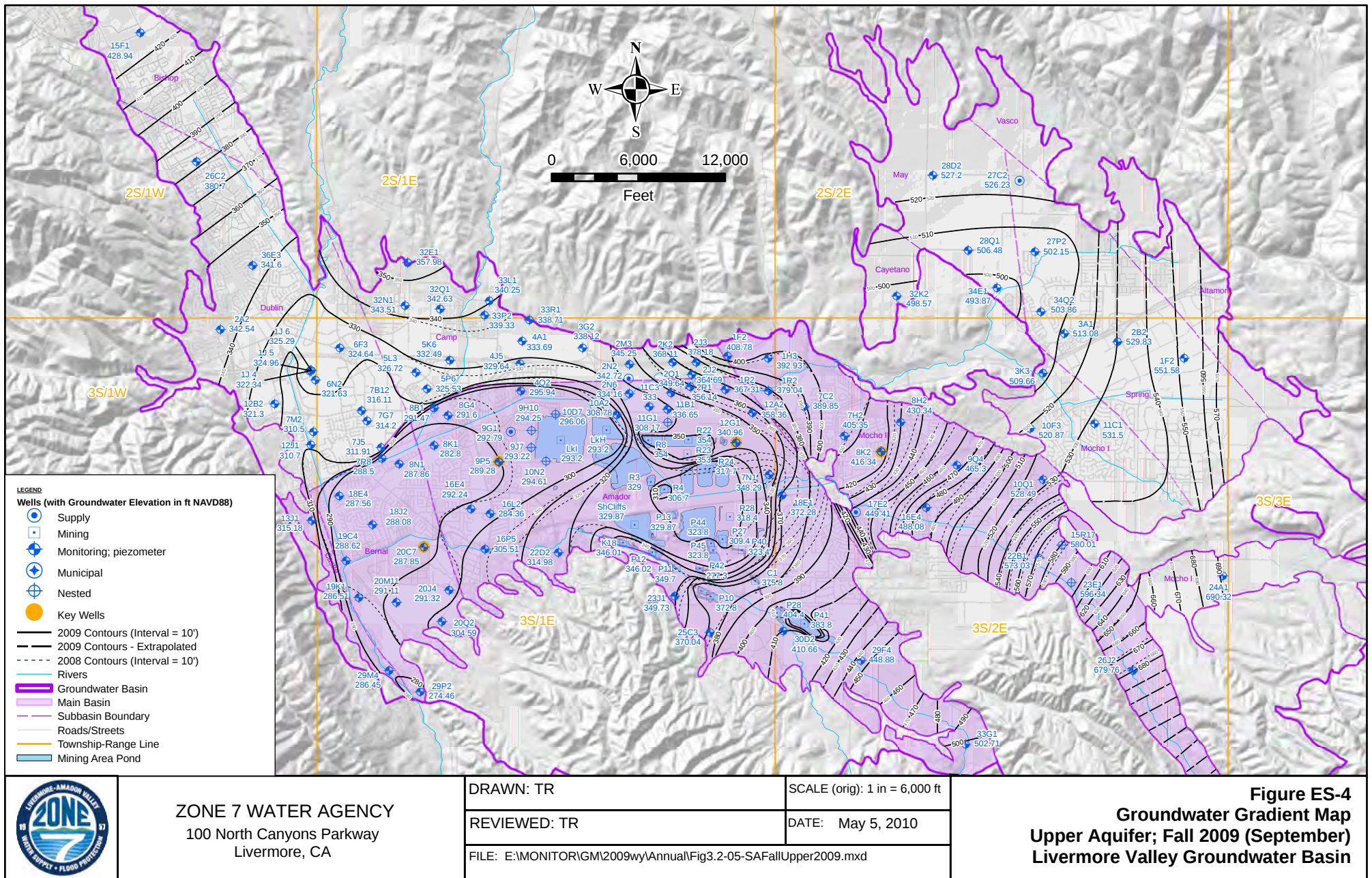
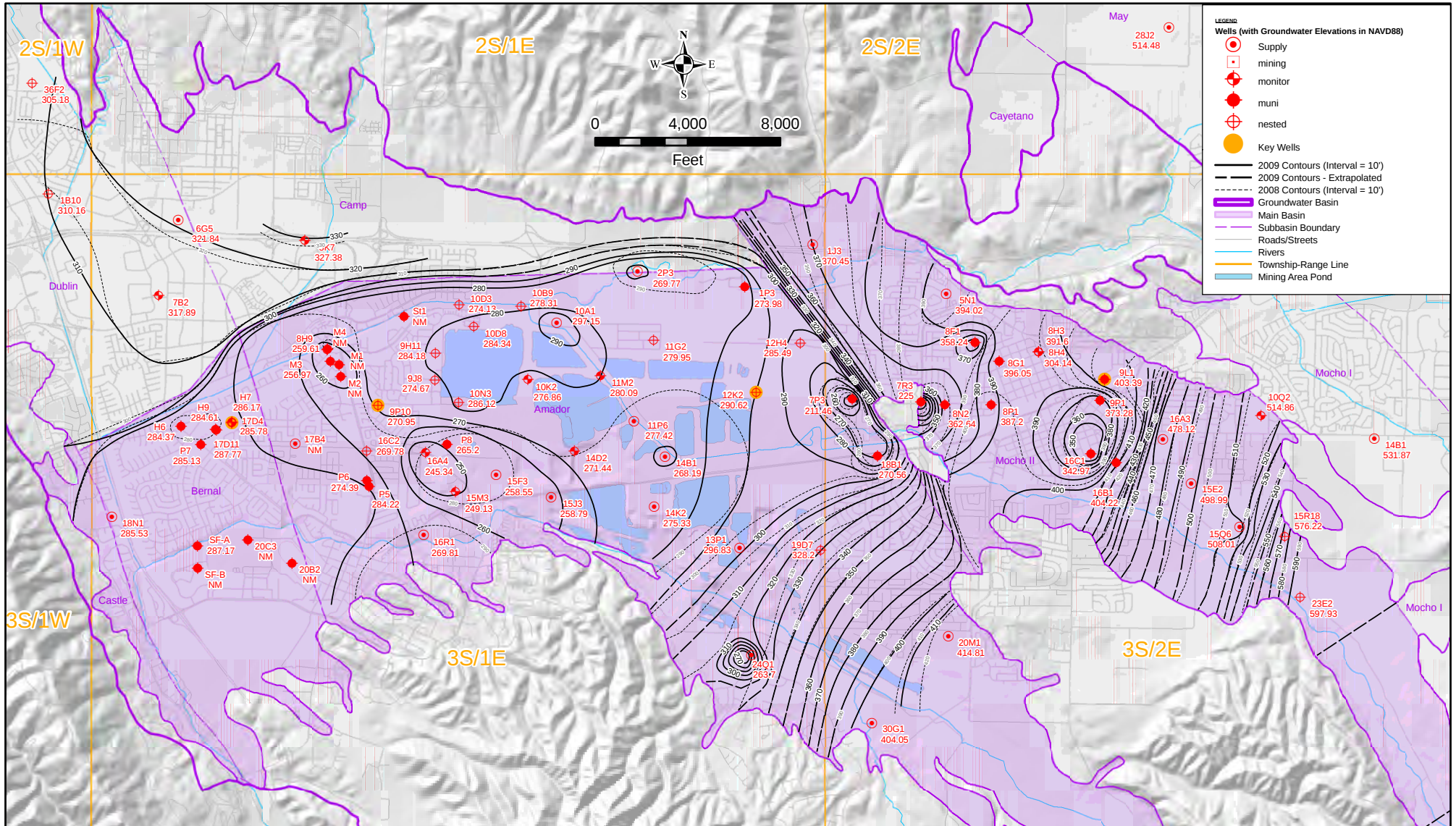


FIGURE ES-3
ZONE 7 WATER AGENCY
Key Well Hydrographs - Eastern Portion of Main Basin
2009 Water Year







ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR

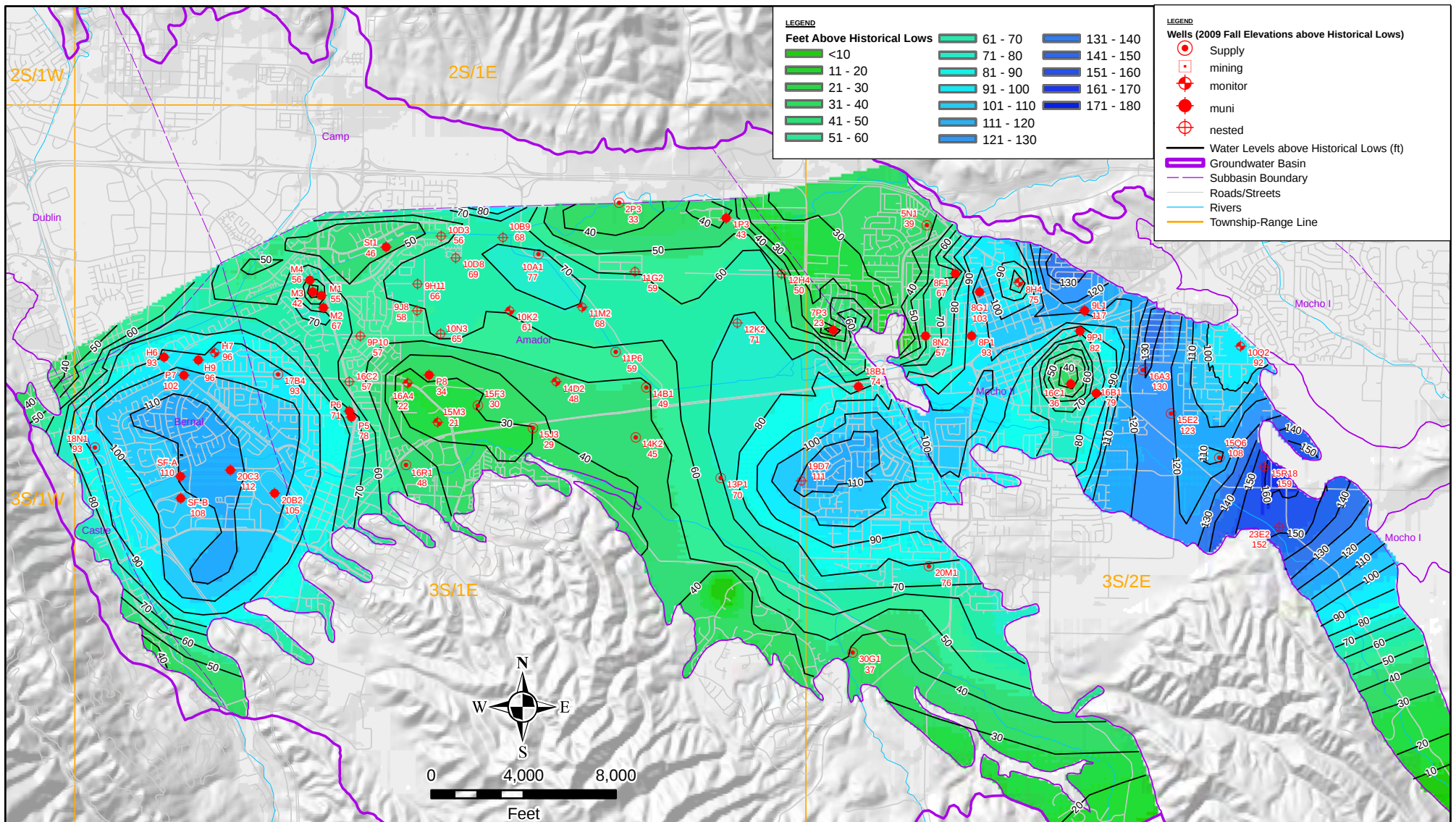
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SCALE (orig): 1 in = 4,000 ft

DATE: May 5, 2010

Figure ES-5
Groundwater Gradient Map
Lower Aquifer; Fall 2009 (September)
Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR/CW

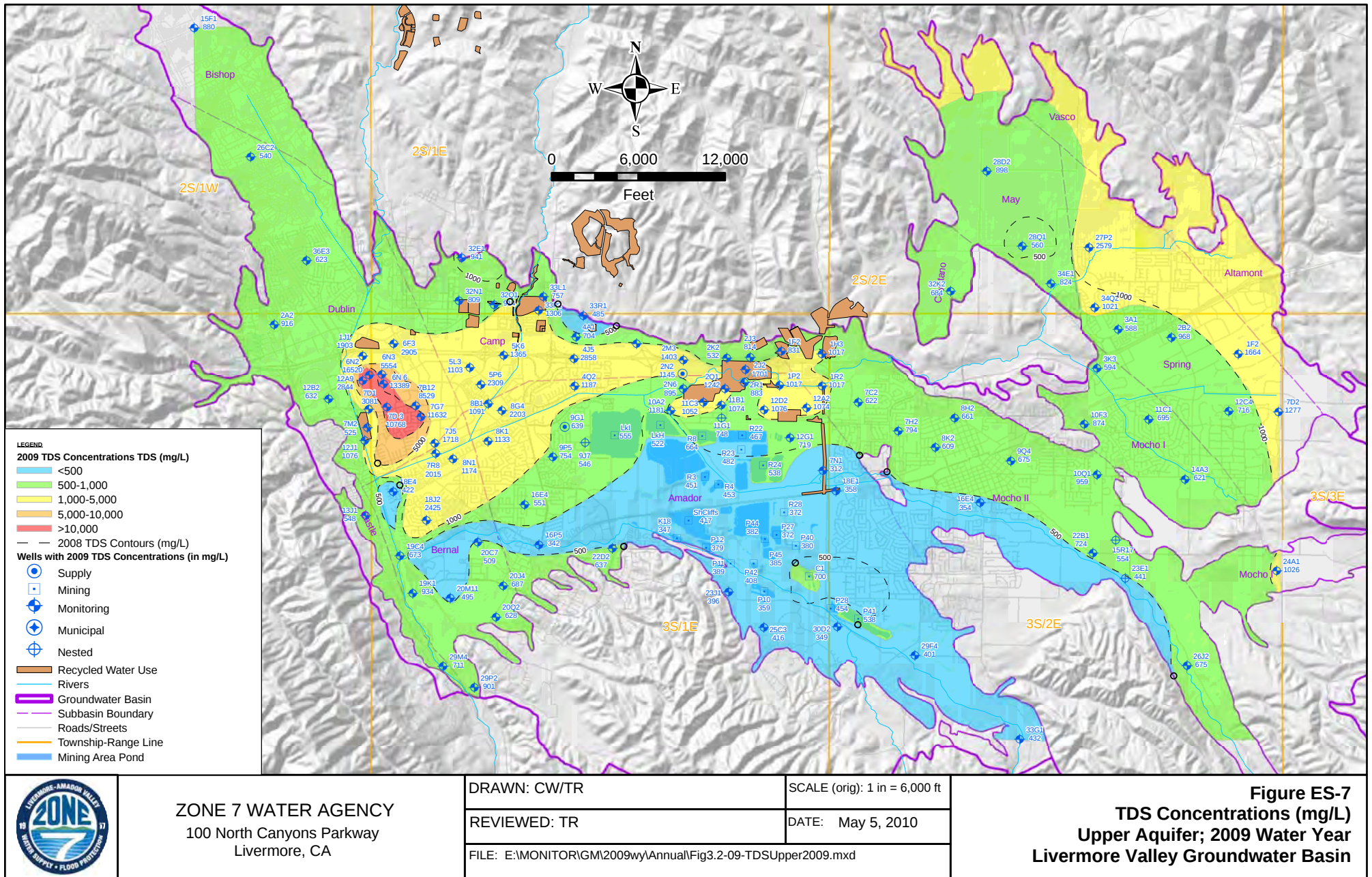
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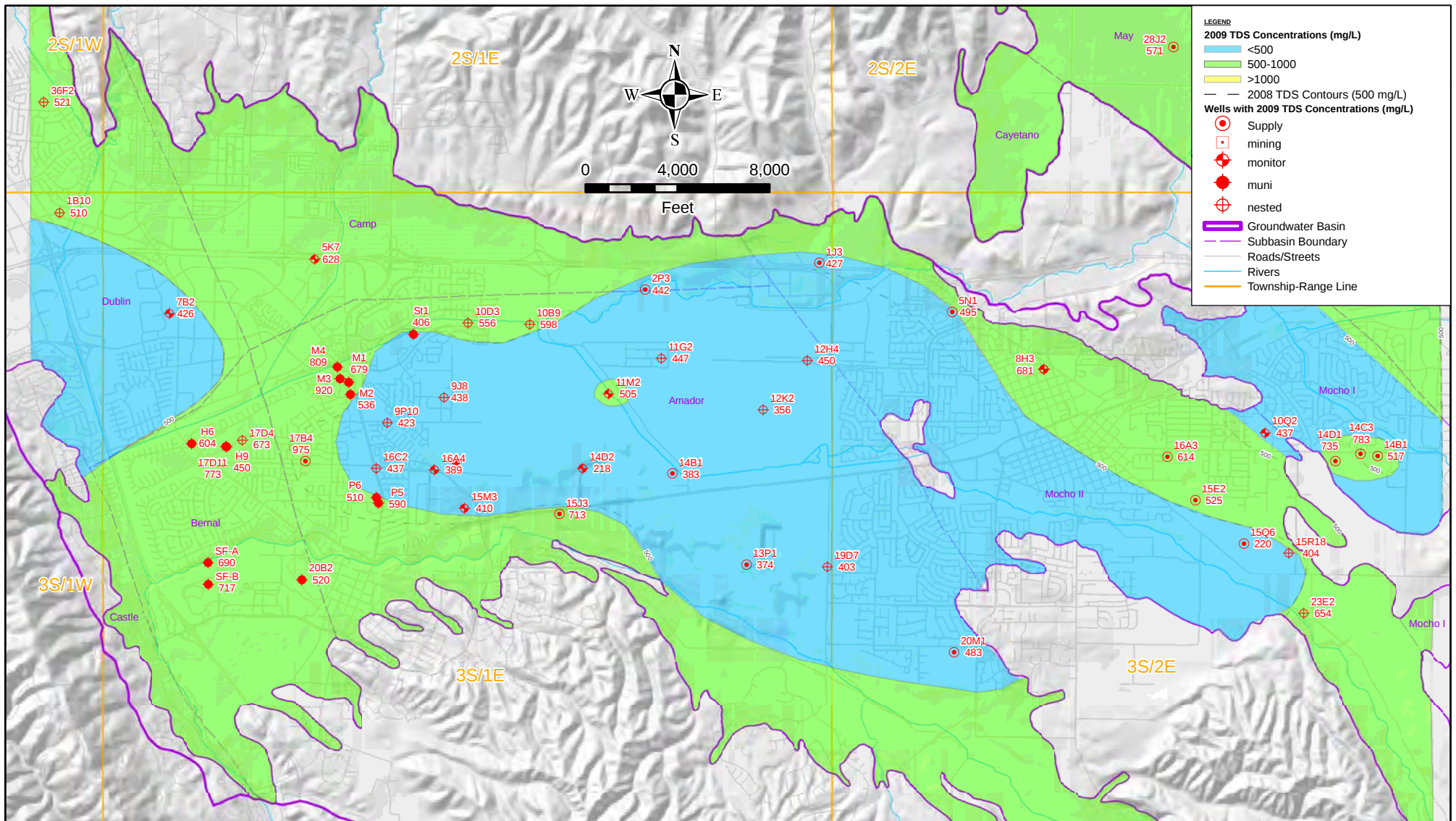
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DATE: May 5, 2010

Figure ES-6
Groundwater Levels Above Historical Lows
Lower Aquifer; Fall 2009 (September)
Livermore Valley Groundwater Basin





ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

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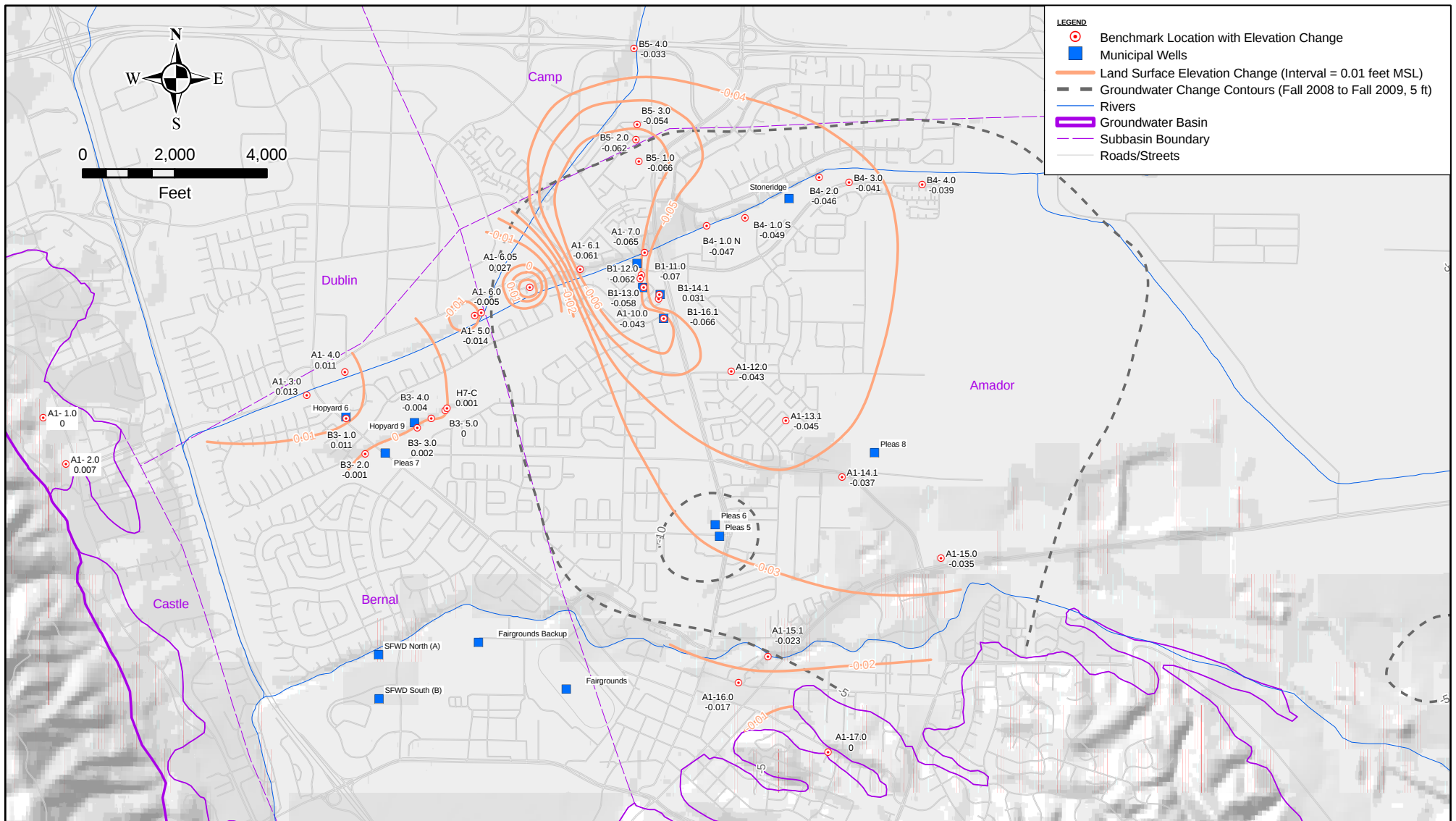
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Figure ES-8
TDS Concentrations (mg/L)
Lower Aquifer; 2009 Water Year
Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

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Figure ES-9
Ground Surface Elevation Change (ft)
Fall 2008 to Fall 2009
Livermore Valley Groundwater Basin

Figure ES-10
Graphs of Historical Main Basin Hydrologic Inventory
1974 to 2009 Water Years

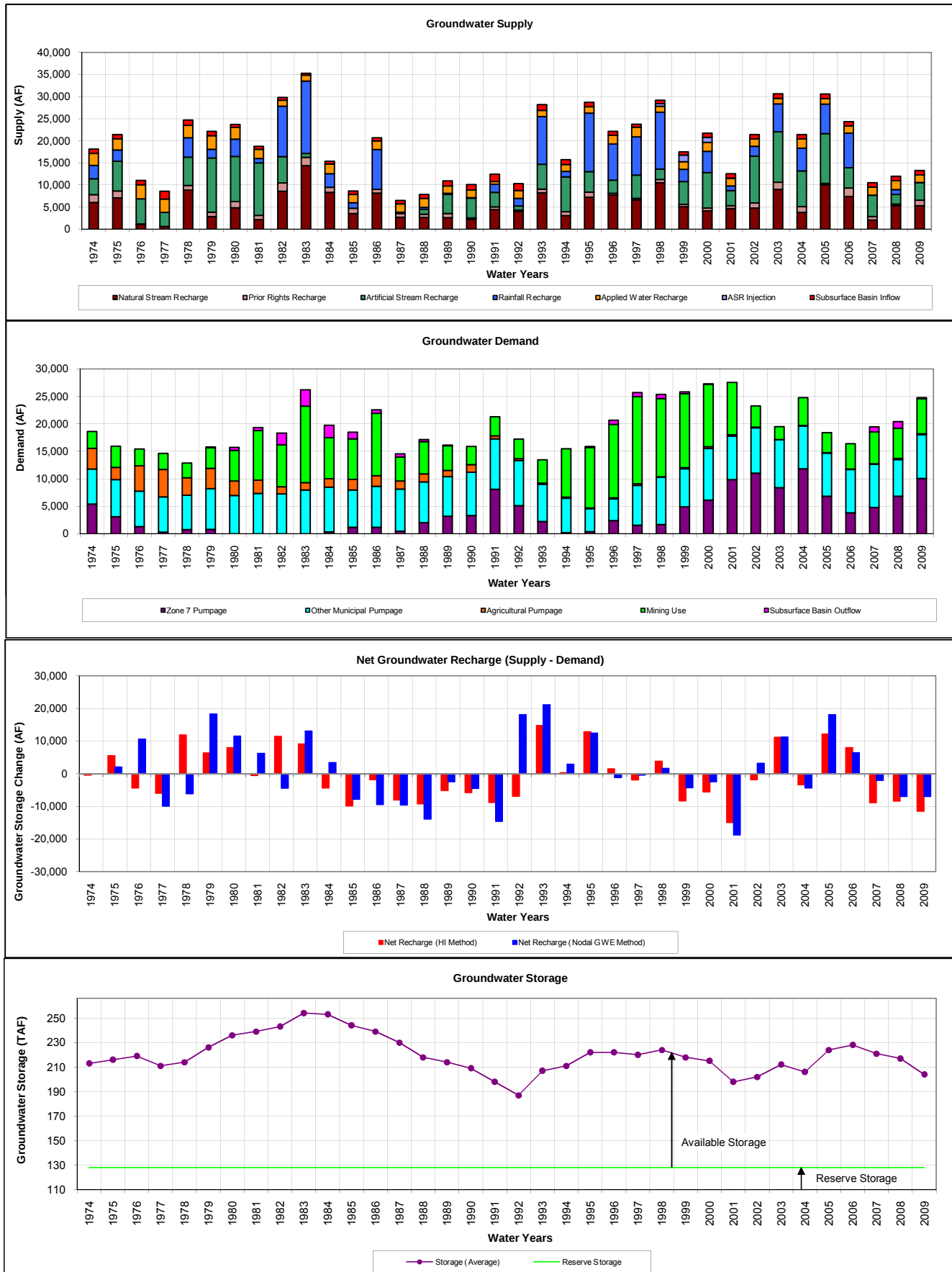


Figure ES-11
Graphs of Salt Loading and Salt Concentrations (1974-2009)

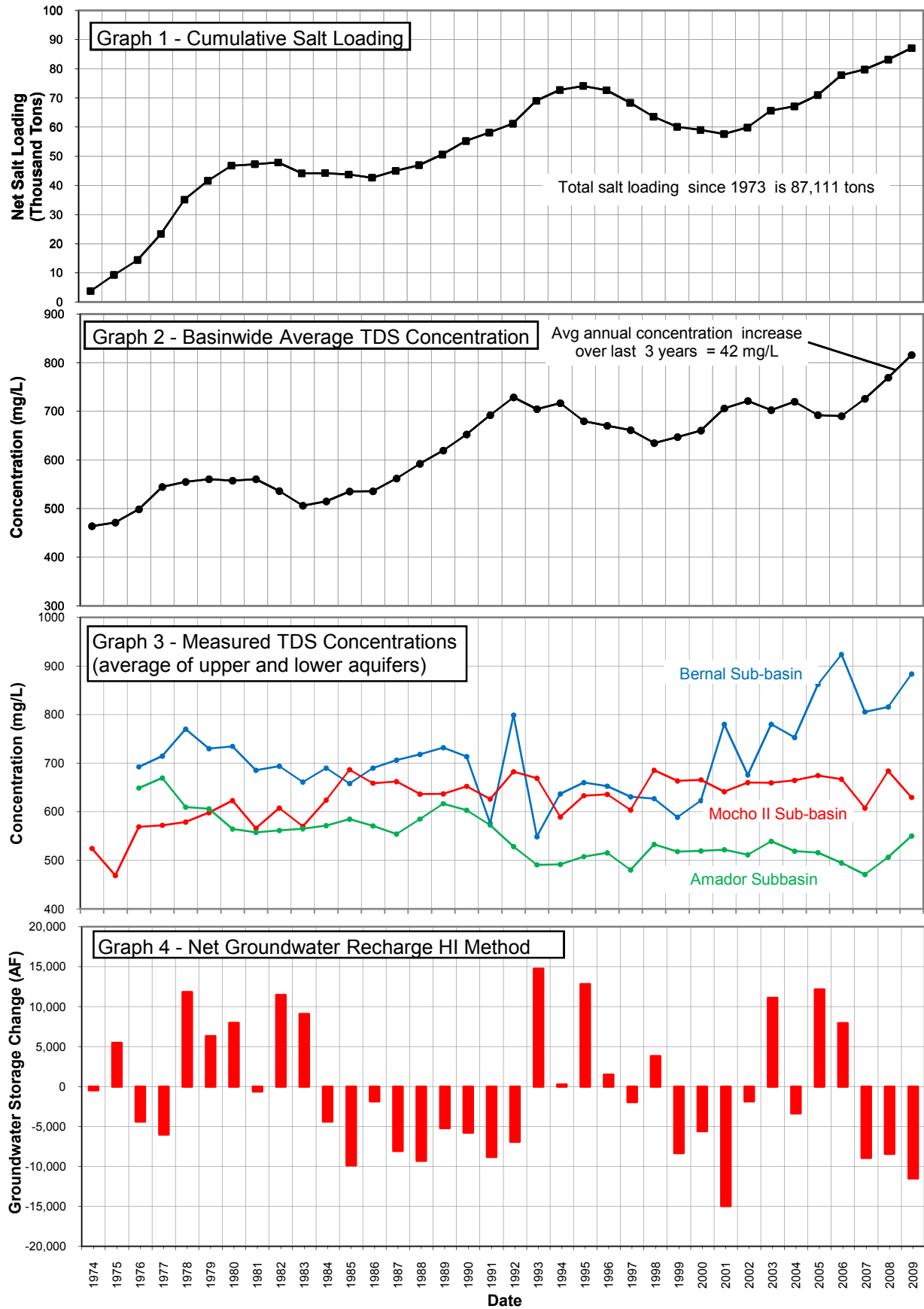


Figure ES-11
 5/6/2010