

Alamitos Barrier Project

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Member Agencies:

Orange County Water District

Water Replenishment District of Southern California

Long Beach Water Department

Golden State Water Company

Los Angeles County Flood Control District

Authors:

Matt Frary, Ramy Mattar, and Aric Rodriguez
Los Angeles County Department of Public Works

Submitted by:

Matt Frary, Secretary
Joint Management Committee

**Annual report on the control of seawater intrusion
2010 - 2011**

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INTRODUCTION

The Alamitos Barrier Project (ABP) was designed and constructed to protect the groundwater supplies of the Central Basin of the County of Los Angeles and the southwest portion of the Coastal Plain area in Orange County from the intrusion of seawater through the Alamitos Gap area. The project facilities are located near the Los Angeles-Orange County border about two miles inland from the terminus of the San Gabriel River. The original facilities included injection wells to form a freshwater pressure ridge and extraction wells to form a saltwater trough. The freshwater ridge that was intended to block the landward gradient of intruding seawater has proven to be historically effective. However, the saltwater trough that was intended to reverse the landward gradient of intruding seawater has proven to be historically ineffective. As a result, the extraction wells are currently not in operation. A map showing the supply pipeline, injection wells, extraction wells, and observation wells is shown on page A-12.

The County of Los Angeles Department of Public Works (Public Works) operates and maintains the project and its physical facilities under the direction and approval of the Joint Management Committee (JMC), acting on behalf of the Los Angeles County Flood Control District (LACFCD) and the Orange County Water District (OCWD).

This report summarizes design and construction issues, operation and maintenance activities, hydrogeologic effects, groundwater chloride concentrations, and project costs for Fiscal Year (FY) 2010-11 (i.e., July 1, 2010 through June 30, 2011).

The JMC is aware that the current depiction of the merge zones (first implemented in the FY 2006-07 Annual Report) conflicts with the labeled "Recent Zone Boundary." Though it doesn't impact data analyses, OCWD previously determined to resolve this conflict and the revised background maps will be implemented once available.

Point C Meter Errors, Corrected Volume Distributions, and Cost Reconciliations

During a January 2011 investigation of LACFCD's "Point C" flow meter/totalizer, it was discovered that erroneous meter reading interpretations had been skewing the water distribution ratio for approximately 5 years. As a result, between July 2005 and November 2010, the volume/percentage of ABP injection water allocated to LACFCD was too high. Likewise, during this same time period, the volume/percentage of injection water allocated to OCWD was too low. Overall, 1,705.8 acre-feet (or 6.5 percent) of the total water injected at the ABP was incorrectly allocated to LACFCD rather than OCWD. Public Works performed extensive calculations to determine the corrected monthly water distributions, which were reviewed and verified by staff from both the Water Replenishment District of Southern California (WRD) and OCWD. Full details of these calculations are available upon request, but a summary of the originally reported versus corrected distributions is shown in Appendix A-19. Corrections have been made within each agency's database and files as necessary.

These corrected volumes had direct implications on the cost distribution for water injected into the ABP and on the cost distribution for Operation and Maintenance of the ABP throughout the duration of the discrepancy. WRD (who pays the LACFCD share of water costs) and OCWD arranged their own terms to reconcile the costs of the injected water. Similarly, LACFCD and OCWD arranged their own terms to reconcile the Operations and Maintenance costs.

Total volumes and subtotals of reclaimed and recycled water were not impacted. All numbers in this FY 2010-11 report reflect the corrected distributions where applicable.

SUMMARY

During this reporting period, the total amount of water injected into the ABP was 5,066.1 acre-feet (an average rate of 7.0 cubic feet per second). Of that total, OCWD purchased 1,684.4 acre-feet (33%) and the Water Replenishment District of Southern

California (WRD) purchased 3,381.7 acre-feet (67%). This total injected amount is just slightly less than in FY09-10, but is consistent with historical volumes and is very close to the average of the previous five fiscal years (5,173.5 AF). No major shutdowns have occurred since FY06-07. A timeline detailing the main dates, durations, and events of those shutdowns is presented in the Injection Operations Section of both the FY06-07 Annual Report and the July 2007 to December 2007 Semi-Annual Report. All minor shutdowns for the current reporting period are detailed in Appendix A-18.

The total cost of the ABP in FY10-11 was \$6,681,264 (\$6,676,712 for injection-related operations, maintenance, water, and approved LACFCD and OCWD project expenses; \$4,552 for maintenance of idle extraction wells). Of the total injection-related expenses, the estimated cost of the injected water was \$3,845,911 (\$1,276,362 paid by OCWD and \$2,569,549 paid by WRD) and the total cost of services and supplies for injection and extraction was \$2,835,353 (\$626,180 paid by OCWD and \$2,209,173 paid by the LACFCD). The corresponding services and supplies cost to inject one acre-foot of water was \$558.77/acre-foot. This cost, and most of those from FY05-06 and beyond, is higher than historical amounts because it includes multiple capital improvement projects. However, it is very similar to that of FY09-10 because of similar injection volume totals, project cost totals, and O&M totals. The project costs are expected to vary from year to year depending on the need to repair or improve the barrier facilities. The observation well cleanout costs and injection well redevelopment costs vary each fiscal year because they are based on cyclical activities.

Overall, groundwater levels seemed to increase in all zones, especially on the east leg, but with localized decreases typically due to operational activities. Similarly, chloride concentrations typically decreased with the exception of various localized increases (some due to existing plumes and others due to limited operations). The southeast end of the barrier still displays more widespread high chloride concentrations, but these concentrations are decreasing.

Detailed analyses of the period's groundwater elevations and chloride concentrations are provided in the "Hydrogeologic Effects" section and the "Chlorides" section.

PROJECTS AND STUDIES

The current improvement projects and their status are briefly summarized below. The general location of each project is identified on the map in Appendix A-12 and further project details are included in the table in Appendix A-17.

Barrier Water Supply Facilities Improvements (BWSFI) Project Phase 2

This project involves bonding the pipe joints and installing sacrificial anodes along the ABP water supply pipeline. In FY 2006-07, the BWSFI project was split into 2 phases covering different portions of the ABP water supply line due to certain complications with right of way and funding. Near the end of FY 2006-07, Phase 1 construction was completed and Phase 2 Design plans and specifications for Phase 2 were initiated. The design of Phase 2 continued through FY 2007-08, the project was awarded near the end of FY 2008-09, and construction began shortly thereafter. The ABP portion of the project was completed during FY 2009-10. However, field acceptance of the overall project occurred in FY 2010-11 because similar work on the other LACFCD barriers followed the ABP and they were all under one contract.

ABP Condition Assessment

This project is jointly funded by the LACFCD, OCWD, and WRD, but is being managed by LACFCD. It involves the evaluation of portions of the ABP water supply pipeline, along with selected injection wells, observation wells, and extraction wells. The scope of work and cost-sharing agreement were developed during FY 2008-09. The project was advertised, awarded, and initiated during FY 2009-10. Field work was completed late in FY 2010-11 and the final report is anticipated in the first half of FY 2011-12.

ABP Groundwater Model

This project is jointly funded by the LACFCD, OCWD, and WRD, but led by OCWD. It involves the development of a groundwater model that will be used to operate the ABP more efficiently, identify locations and scenarios where new wells could make the ABP more effective against seawater intrusion, and to predict the flow and transport of injected reclaimed water. The scope of work and cost-sharing agreement were developed and finalized during FY 2008-09. The project was advertised, awarded, and initiated during this FY 2009-10. Work was completed early in FY 2010-11, but WRD continues to complete annual updates as required by their permit from the State.

Three-Barrier Injection Well Condition Assessment

This project involves the evaluation of injection wells at the ABP, the Dominguez Gap Barrier, and the West Coast Basin Barrier. For the ABP, it includes all injection wells not assessed during the ABP Condition Assessment. The project was advertised and awarded during FY 2009-10. The ABP portion of the field work began and ended during FY 2010-11, but project completion and final reports are anticipated in FY 2011-12.

New Observation Wells in Los Angeles County (ABP Unit 13)

During this reporting period, LACFCD began the design phase for 8 new observation well sites (18 casings) within Los Angeles County. These wells will provide valuable new data to serve as reference for operations near injection well 33G, fill data gaps in each of the injection zones, clarify intrusion through the B-zone mergence area (as suggested by the INTERA model, scenario 3), and replace the recently abandoned 34H'38(R). Design completion, execution of a cost-sharing agreement with WRD, advertisement, and award of the construction project are all anticipated in FY 2011-12.

Destruction of Observation Well in Los Angeles County

The LACFCD completed the destruction of observation well 35T'24 (504A) in February 2011. All applicable documentation has been filed with both LACFCD and OCWD and the well has been removed from LACFCD's monitoring schedules.

INJECTION OPERATIONS

The total amount of water injected into the ABP during this reporting period was 5,066.1 acre-feet. Of this total, 42% (2,143.8 acre-feet) was reclaimed water and 58% (2,922.3 acre-feet) was imported water. The percentage of reclaimed injection was the highest it's ever been, primarily because the reclamation plant was in operation fairly steadily during this entire reporting period. There were still a number of planned and unplanned interruptions in reclaimed water delivery, but most were very brief. There were only a few periods longer than one week where the reclamation plant was out of operation due to maintenance activities on the reclamation plant or the barrier itself.

According to the California Regional Water Quality Control Board (CRWQCB) permit, File No. 93-076 of Order No. R4-2005-0061, the 60-month running average of reclaimed water into the ABP cannot exceed 50 percent. Since ABP reclaimed injections began in October 2005, the 60-month period includes injections prior to the delivery of reclaimed water into the barrier. Through this reporting period, WRD's calculated 60-month running percentage of reclaimed water into the barrier is 29.8% and is therefore in compliance. Public Works' calculation through this period (which is consistent with the volumes identified throughout this report) is 30.0%. The slight discrepancy is due to differences in the timing and calculation methods of the monthly meter readings for both imported and recycled deliveries prior to April 2008.

The maximum monthly injection for this reporting period was 483.6 acre-feet (280.4 acre-feet imported and 203.2 acre-feet reclaimed) and occurred in February 2011. The minimum monthly injection of 339.9 acre-feet (225.6 acre-feet imported and 114.3 acre-feet reclaimed) occurred in November 2010 and was due to the combination of multiple shutdowns for the condition assessment projects, repairs, redevelopments, and surface leakages.

The injection volumes and costs from July through June of both FY 2009-10 and FY 2010-11 are shown in Table 1. The representative reclaimed unit costs included in Table 1 are calculated by WRD and a complete historical record of these unit costs is available from any of the agencies comprising the JMC. Table 1 shows that the injection amount for FY 2010-11 slightly decreased from the previous year. Nonetheless, the FY 2010-11 amount is still consistent with historical volumes and is very close to the average of the previous five fiscal years (5,173.5 AF).

The ABP operational status for FY 2010-11 is summarized in Figure 3 and Appendix A-18. There were no major shutdowns requiring further discussion in the body of this report.

TABLE 1. INJECTION OPERATIONS

Imported Water Injections			Reclaimed Water Injections			Total Injections		
FY09-10	FY10-11	Percent Change From Previous Year	FY09-10	FY10-11	Percent Change From Previous Year	FY09-10	FY10-11	Percent Change From Previous Year
<u>VOLUME OF WATER INJECTED IN ACRE-FEET</u>								
OCWD ¹	1,003.4	-3.1	716.6	711.8	-0.7	1,719.9	1,684.4	-2.1
WRD ²	2,325.2	-16.1	1,584.0	1,432.0	-9.6	3,909.3	3,381.7	-13.5
TOTAL	3,328.6	-12.2	2,300.6	2,143.8	-6.8	5,629.2	5,066.1	-10.0
<u>UNIT COST OF WATER PER ACRE-FEET³</u>								
JULY - AUG	\$584.00	20.9	\$637.48	\$778.29	22.1			
SEPT - DEC	\$706.00	0.0	\$759.48	\$778.29	2.5			
JAN - JUN	\$706.00	6.1	\$780.31	\$821.29	5.3			
<u>COST OF WATER PURCHASED</u>								
OCWD ¹	\$689,998	2.7	\$532,360	\$567,701	6.6	\$1,222,359	\$1,276,362	4.4
WRD ²	\$1,605,398	-11.3	\$1,185,682	\$1,145,216	-3.4	\$2,791,080	\$2,569,549	-7.9
TOTAL	\$2,295,397	-7.1	\$1,718,042	\$1,712,917	-0.3	\$4,013,439	\$3,845,910	-4.2
<u>AVERAGE INJECTION RATE IN CFS</u>								
OCWD ¹	1.4	-3.1	1.0	1.0	-0.7	2.4	2.3	-2.1
WRD ²	3.2	-16.1	2.2	2.0	-9.6	5.4	4.7	-13.5
TOTAL	4.6	-12.2	3.2	3.0	-6.8	7.8	7.0	-10.0

¹ Orange County Water District

² Water Replenishment District

³ The Unit Cost of **Imported Water** Per Acre-Foot is based on costs shown on invoices for Metropolitan Water District's meter at LB-07A (managed by Long Beach Water Department) and includes the \$5 Administrative Surcharge. The representative Unit Cost of **Reclaimed Water** Per Acre-Foot is based on calculations by the Water Replenishment District that include Readiness-To-Serve (RTS) and Capacity costs (using total volume plus penalties) in addition to the corresponding imported unit cost.

ADDITIONAL NOTES:

- The volumes shown hereon are the correct volumes based on the corrected water distributions between Aug 2005 and Nov 2010 (resulting from the Point C flow meter corrections). As a result, the FY09-10 volumes per Agency will not match previous reports (but the overall 5,629.2 AF total injected was not affected).

- The Unit Cost of Reclaimed Water for January through June 2011 was not yet available at the time of the Annual JMC Meeting. This value was estimated to be \$821.29 by adding the July through December 2010 RTS & CC charges to the January through June 2011 imported unit cost. Therefore, both the cost of reclaimed water and the overall total cost of injection water for FY10-11 are estimates only and should not be used for any other purposes.

Figure 1 presents the monthly amounts of water injected during FY 2010-11. Figure 2 illustrates the annual amounts of water injected over the last 20 years.

FIGURE 1 - MONTHLY AMOUNT OF WATER INJECTED

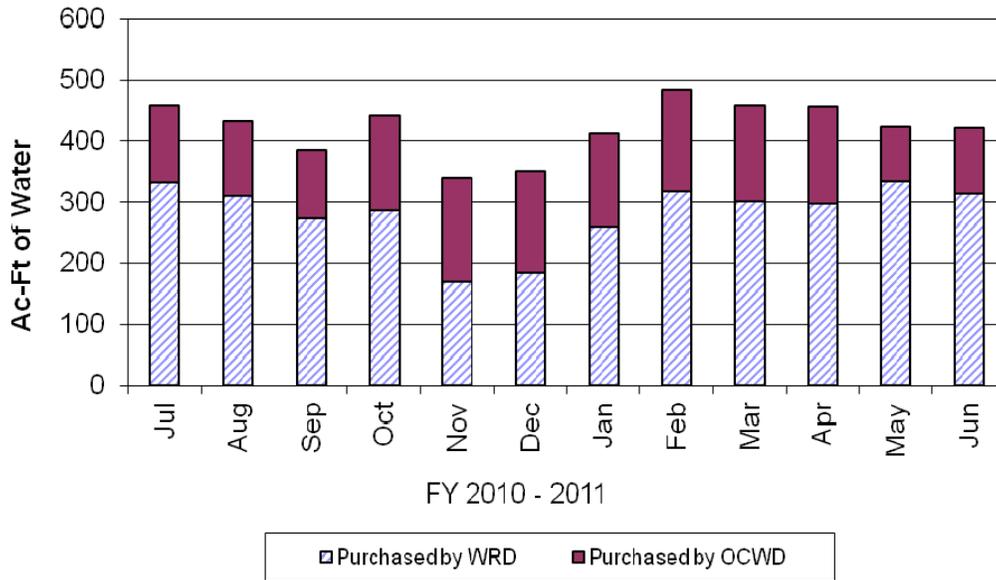
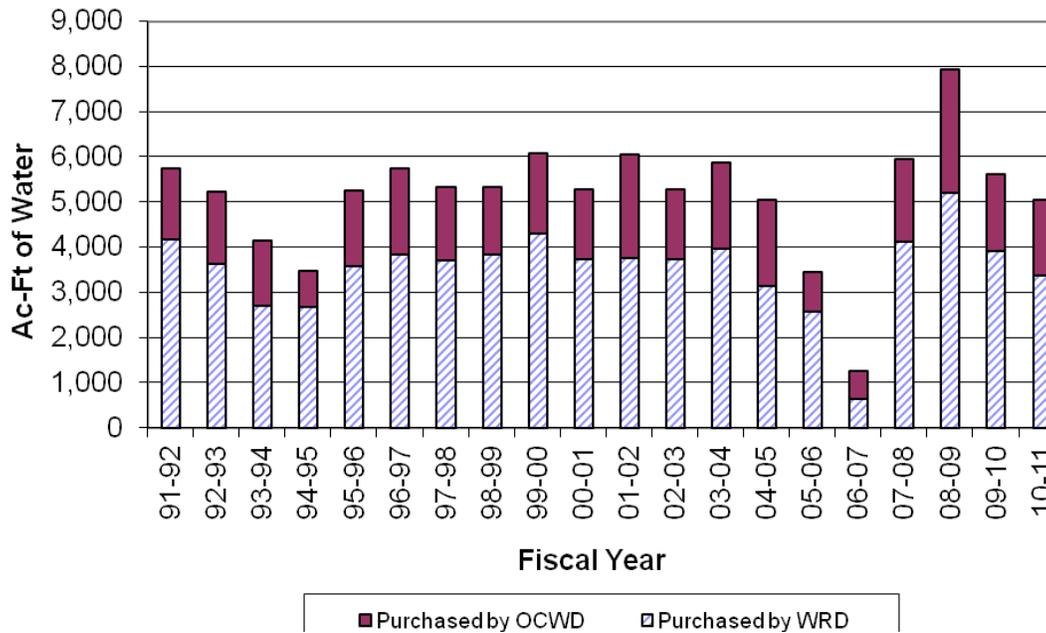


FIGURE 2 - ANNUAL AMOUNT OF WATER INJECTED



EXTRACTION OPERATIONS

There were no extraction activities during FY 2010-11. As recommended by the JMC Committee, these wells were taken out of operation in FY 2002-03. This decision was based on results of the one-year extraction well efficiency study, which demonstrated that the chloride levels in the area decreased when the extraction wells were turned off. The extraction wells will continue to receive minimal maintenance so that they can be turned back on if deemed necessary in the future. Since there has been no extraction activity since FY 2002-03, the traditional summary tables are no longer included in the annual reports.

MAINTENANCE

Typical well maintenance at the ABP includes observation well cleanouts and injection well redevelopments. The purpose of observation well cleanouts is to remove accumulated sediment at the bottom of the well casings. Removing the sediment ensures the full lengths of the well screens are in communication with the aquifer, and also allows chloride sampling to occur at all designated depths. The occurrence of sediment accumulation within the observation wells is typically analyzed every two years for all 220 active observation wells. Following the analysis, all observation wells determined to have significant sediment accumulation (i.e., covering a portion of the well screen) then receive the necessary cleanout services. Once cleanout activities are completed, the logs for each casing are typically analyzed to determine whether or not sediments were removed successfully and any resulting recommendations. During this FY10-11 reporting period, there were no ABP observation well casings cleaned out. A new cleanout cycle is anticipated to occur in late 2011.

The purpose of injection well redevelopments is to remove accumulated sediments and microbiological build-up within the well casings to restore each well's ability to operate at its maximum injection capacity. Each of the 45 injection and extraction well casings are routinely developed once every two years. During FY 2010-11, Public Works completed the redevelopment of the following 18 well casings¹: 34D(C,B,A,I), 33V(A,I), 33U3(C,B), 33U(A,I), 33T(A,I), 33S(A,I), 33S1(C,B), 33Q1(C,B), 33Q(A,I), 33N(A,I), 33L(A,I), 33J(A,I), 33G(A,I), 33V'15P(R), 34H'17P(R), 34H'18P(R), 34S'22P(R), and 35G(A,I). The first 17 casings listed completed one "two-year" ABP redevelopment cycle and 35G(A,I) marked the start of a new cycle in June 2011 (expected to be completed by April 2013).

Figure 3 depicts the operating status of each injection and extraction well during FY2010-11 and demonstrates that the barrier has predominantly been in operation throughout this reporting period. Nonetheless, there were a few instances of nonoperation due to surface leakage (33S1 and 34G), well redevelopments (various), well assessments (various), and repairs (various). As indicated, there were also other periods of localized nonoperation due to "Other Circumstances" which are explained in Appendix A-18. There were no periods of full barrier nonoperation. The transition time before and after all periods of nonoperation will continue to be minimized as much as possible.

¹ The capital letters in parenthesis represent the aquifer(s) receiving injections from that well casing. For example, (A) = A Zone aquifer, (A,I) = A and I Zone aquifers, and so forth.

FIGURE 3 - ABP INJECTION AND EXTRACTION WELL STATUS - FY10-11

Well No.	2010						2011					
	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
33G (A,I)					R	A						
33J (A,I)				R	D	A						
33L (A,I)				R		A						
33N (A,I)				R		A						
33Q (A,I)				R	R	A						
33Q1 (C,B)				R		A						
33S (A,I)						A	R	R				
33S1 (C,B)	S	S	S	S	S	G	O	O	O	O	O	O
33T (A,I)				O	O	O	O	O	A	O	R	X
33U (A,I)				R	R		A					
33U3 (C,B)				R					A			
33V (A,I)				R	R		A					
33W (C,B,A,I)							A					
33X (C,B,A,I)				H			A					
33Y (C,B,A,I)							A					
33Z (C,B,A,I)				S	S	S	S	A	S	S	S	S
33Z2 (A & I)				S	A	A	A	O	O	O	O	O
34D (C,B,A,I)	R	R					A					
34E (C,B)					A							
34E (I)					A							
34F (A)								A				
34F (I)								A				
34G (A)	S	S	S	S	S	S	S	S	S	S	S	S
34G2 (C,B)								A				
34G2 (I)								A				
34H (A)								A				
34H (I)								A				
34J (A&I)									A			
34L (C,B,A,I)						A						
34S (A)						A						O
34S (I)						A						O
34S (C,B)						A						O
34V (A)					A							O
34V (I)					A							O
34V (C,B)					A							O
34Z (I)				A	H	H						
35F (I)				A								
35G (A,I)					A							
35H1 (A)						A						
35H1 (I)						A						
35H2 (A)						A						
* 33V'15P	N	N	N	N	N	N	N	N	N	R	R	N
* 34H'17P	N	N	N	N	N	N	N	N	N	R	N	N
* 34H'18P	N	N	N	N	N	N	N	N	N	R	R	N
* 34S'22P	N	N	N	N	N	N	N	N	N	R	N	N

*Extraction Well

- | | | | |
|--|--|--|---|
| <input type="checkbox"/> - Well in Operation | <input type="checkbox"/> - Header Repair | <input type="checkbox"/> - Pressure Exceedance | <input type="checkbox"/> - Under Construction |
| <input type="checkbox"/> - Casing Repair | <input type="checkbox"/> - Misc. Repair | <input type="checkbox"/> - Redevelopment | <input type="checkbox"/> - Water Quality Sampling |
| <input type="checkbox"/> - Disassembled | <input type="checkbox"/> - Not Needed | <input type="checkbox"/> - Surface Leakage | <input type="checkbox"/> - Waiting for Repair |
| <input type="checkbox"/> - Grouted | <input type="checkbox"/> - Other Circumstances | <input type="checkbox"/> - Tremie Repair | <input type="checkbox"/> - Assessment Projects
<small>(blue=CH2MHill; green=MWH)</small> |

HYDROGEOLOGIC EFFECTS

Figures 4 through 8 (pp. 14-18) show the average monthly groundwater elevation against the 10-year average groundwater elevation (of the 10 preceding years) in the vicinity of the barrier alignment in the R, C, B, A, and I Zones, respectively. Two graphs were created for each aquifer to account for changes in groundwater elevation trends along the barrier alignment: wells west of the San Gabriel River and wells east of the San Gabriel River. It is important to note that the 10-year average does not represent an injection goal but is simply included for the sake of comparison. For example, the running 10-year average in this report is typically slightly lower than that shown in the FY09-10 report because the FY09-10 data now included was actually slightly lower than the FY99-00 data it replaced. The data includes all available semi-monthly, monthly, semi-annual, and annual values for wells within the barrier alignment and landward for approximately 2,000 feet from the barrier. As a result, the semi-monthly values are “weighted” more heavily than the annuals in the calculation of the monthly average. In each figure, monthly average groundwater elevations during FY 2010-11 are compared with the averages of the previous 10 years (Fiscal Years 2000-01 to 2009-10).

FIGURE 4a RECENT ZONE WEST OF THE SAN GABRIEL RIVER

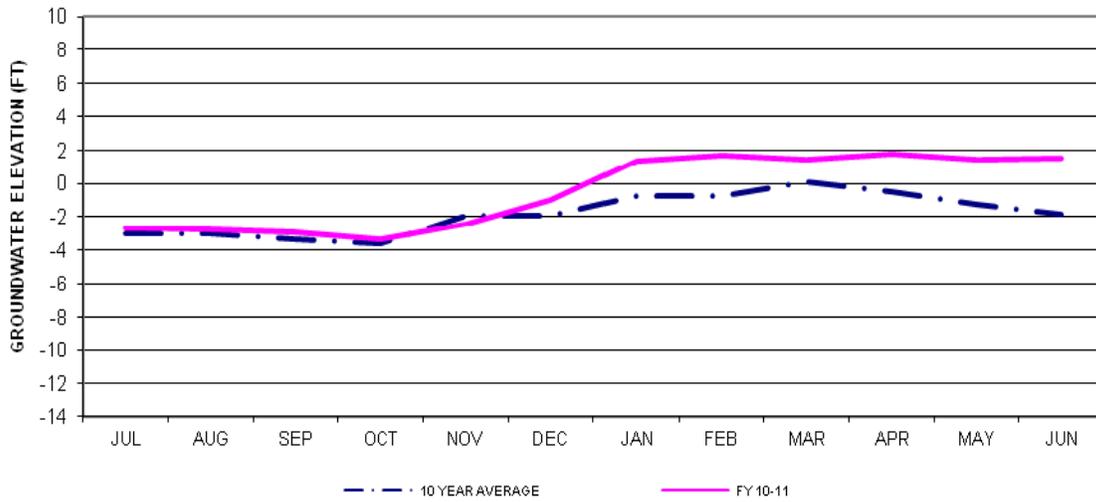


FIGURE 4b RECENT ZONE EAST OF THE SAN GABRIEL RIVER

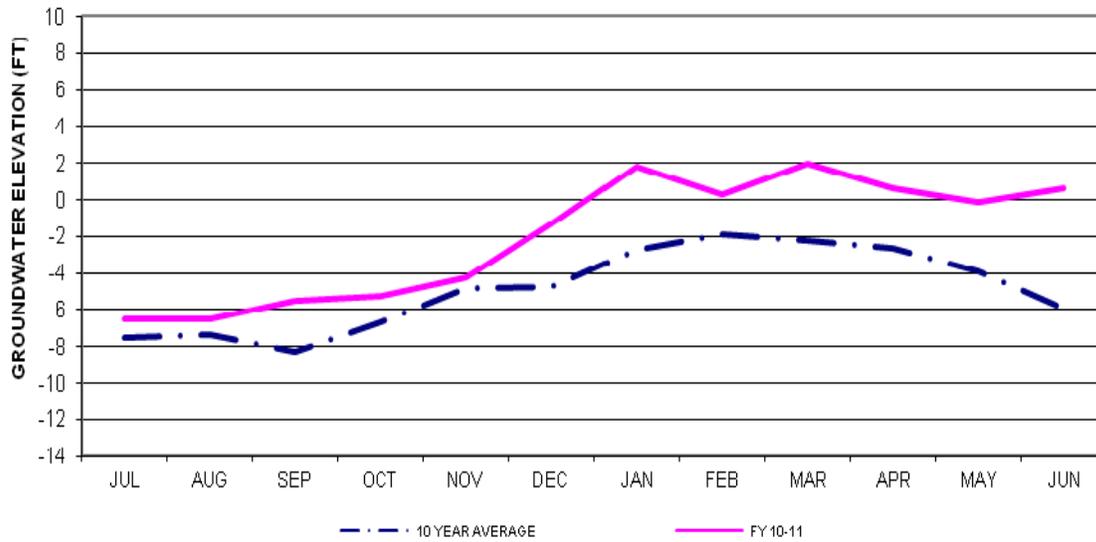


FIGURE 5a C-ZONE WEST OF THE SAN GABRIEL RIVER



FIGURE 5b C-ZONE EAST OF THE SAN GABRIEL RIVER

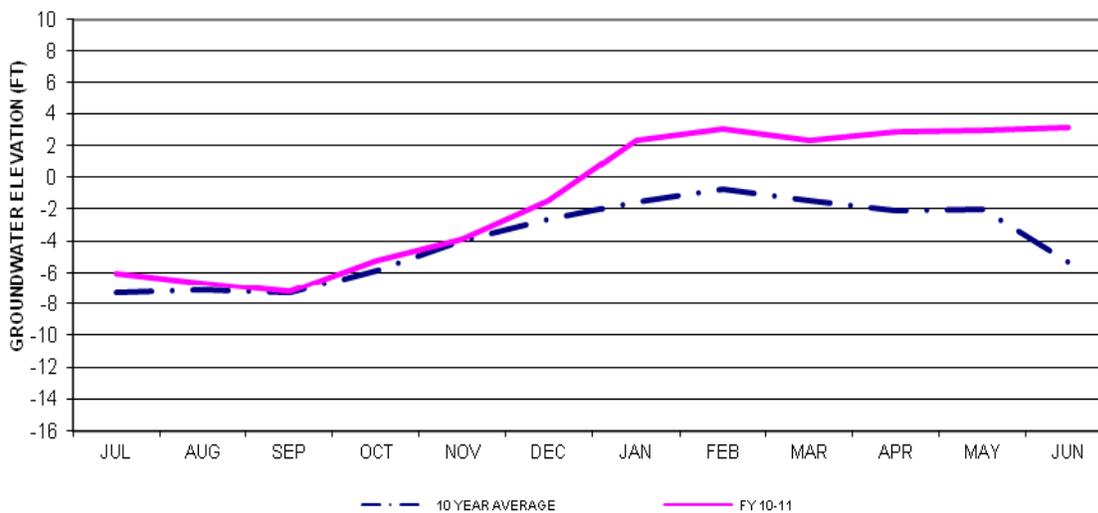


FIGURE 6a B-ZONE WEST OF THE SAN GABRIEL RIVER

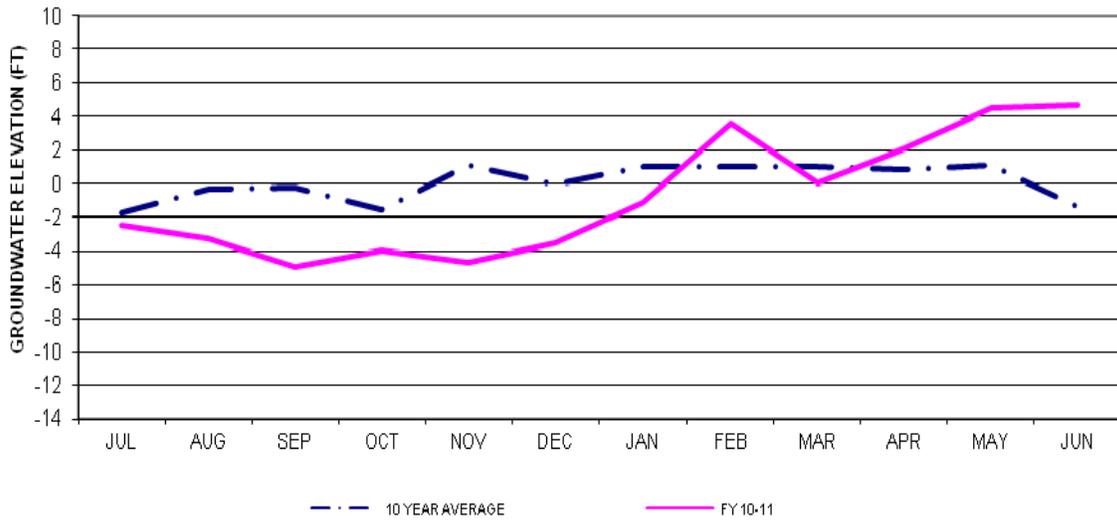


FIGURE 6b B-ZONE EAST OF THE SAN GABRIEL RIVER

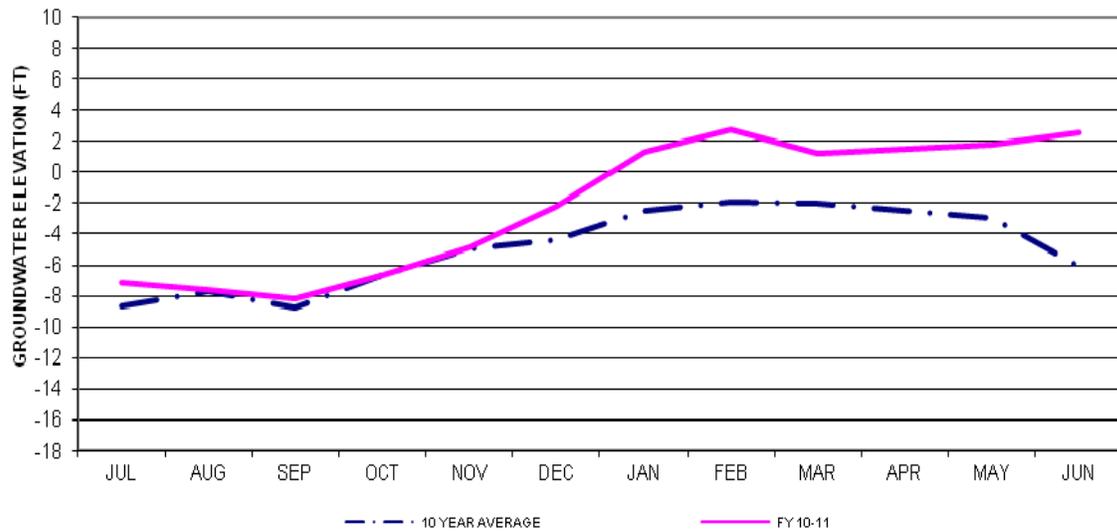


FIGURE 7a A-ZONE WEST OF THE SAN GABRIEL RIVER

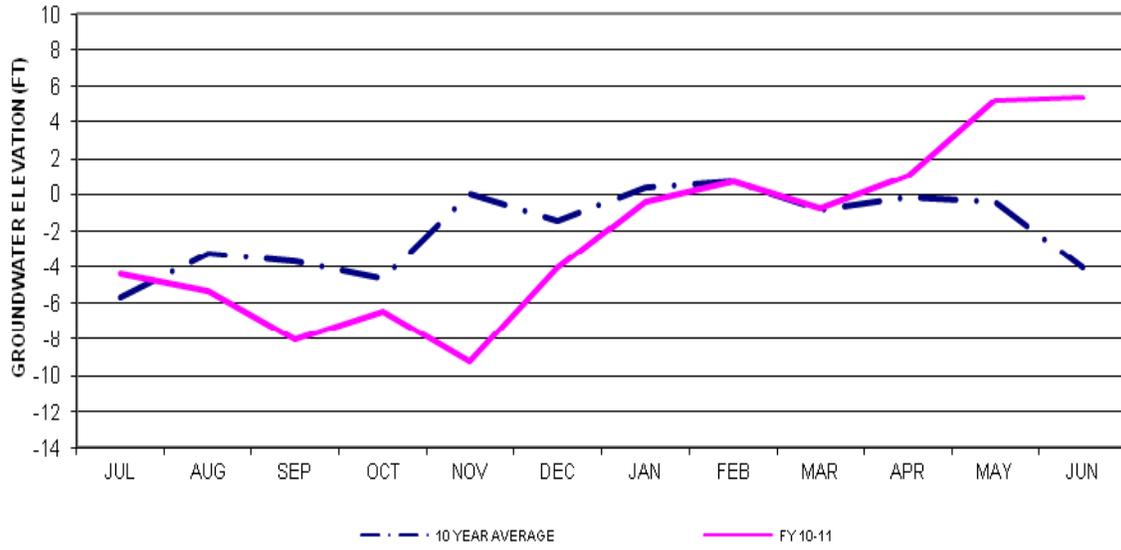


FIGURE 7b A-ZONE EAST OF THE SAN GABRIEL RIVER

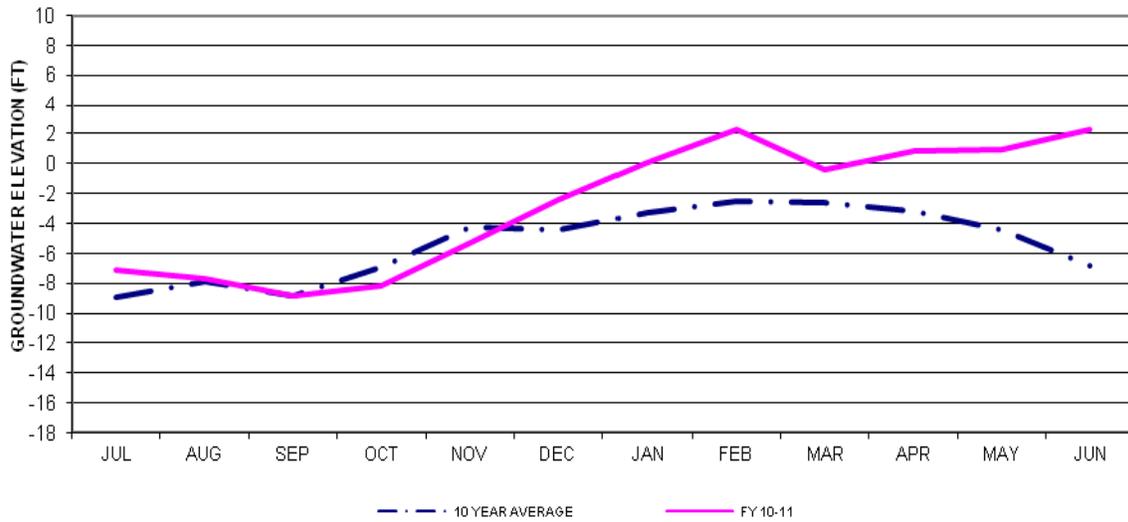


FIGURE 8a I-ZONE WEST OF THE SAN GABRIEL RIVER

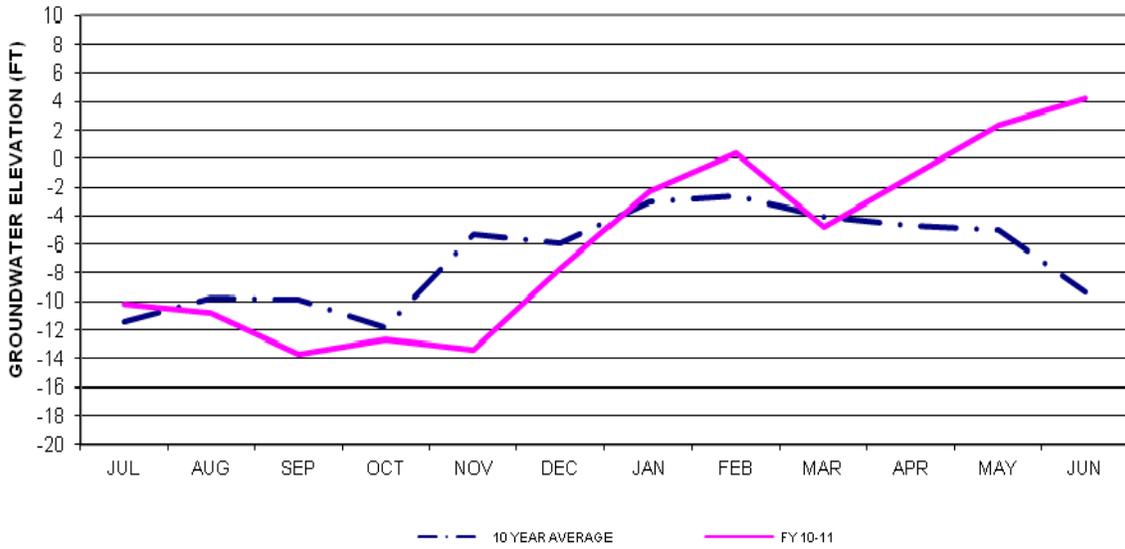
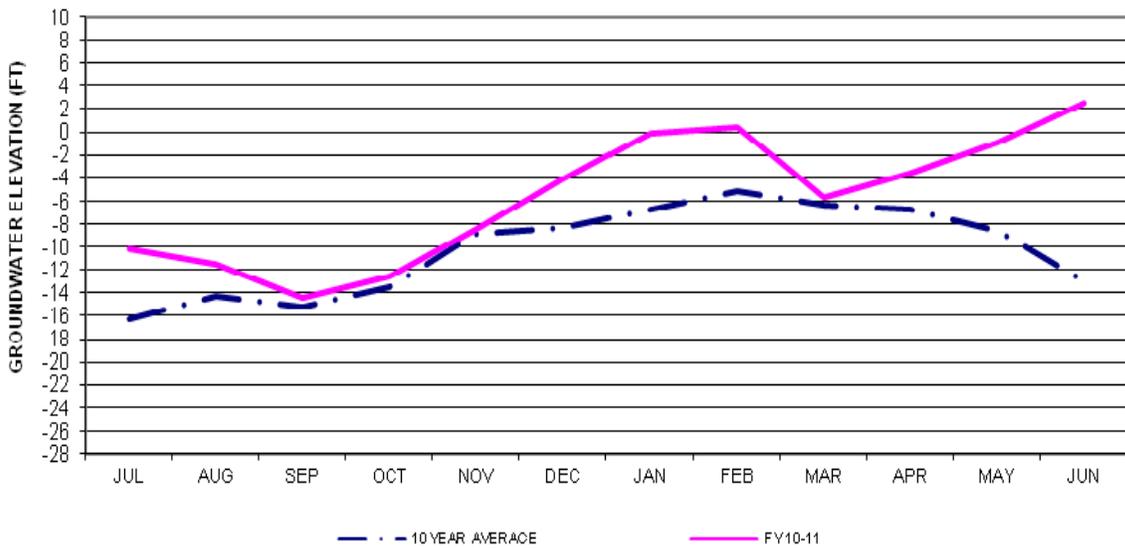


FIGURE 8b I-ZONE EAST OF THE SAN GABRIEL RIVER



Since groundwater elevations have been above average throughout the Central Basin and Orange County Basin during the first half of 2011 (due to decreased pumping demand and then Metropolitan Water District's (MWD) in-lieu program starting May 2011), it is no surprise that the same is true in the area immediately surrounding the ABP. As shown, groundwater elevations throughout the ABP were typically at or above historical averages during the spring and summer months of 2011. East of the San Gabriel River, elevations were above historical averages nearly the entire reporting period. The MWD in-lieu program came at an appropriate time for the ABP. It allowed some temporary recharge after multiple years of below average groundwater elevations (due to significantly increased pumping from both the Central and Orange County groundwater basins and reduced natural recharge in the Orange County groundwater basin).

It is noted that, in general, all the figures show the expected seasonal groundwater elevation trend of higher elevations in the winter months (decreased pumping) and lower elevations in the summer months (increased pumping). The exception is that groundwater levels actually increased through the spring and summer months of 2011 due to decreases in groundwater utilization resulting from MWD's in-lieu program. West of the San Gabriel River, the typical dip in November 2010 is likely due to various concurrent redevelopments and assessments on the west leg of the barrier. The February 2011 peaks found in all zones receiving injection water correspond to the highest monthly volume of water injected during the reporting period. The typical dip in March 2011 does not seem connected to any ABP operations and maintenance activities or known basin issues.

Groundwater elevation contours for the R, C, B, A, and I Zones have been prepared from data collected in Spring 2011 and are included in Appendix A-1.1, 2.1, 3.1, 4.1, and 5.1. A list of all data points used for these contours is also included in the Appendix (A-1.3, 2.3, 3.3, 4.3, and 5.3). As expected, the contours show that the groundwater levels typically decrease as you move landward of the barrier. The general shapes of

each contour are similar to the previous year and some similar groundwater mounds are seen around certain injection wells. Also, it should be noted that areas historically having higher groundwater elevations in the C and B zones, especially near the bend at the San Gabriel River, continue to have higher groundwater elevations than their surroundings. Other historically “higher” areas (e.g., near 33XY and 33YZ), which are believed to be more sensitive to shutdowns because the influencing injection wells (e.g., 33X, 33Y, and 33Z) inject into all four zones from one casing, do not appear as accentuated as in past years. These observation wells have been fairly constant, but typically demonstrate the most significant changes in elevation from barrier startups and shutdowns and are usually the largest contributors to the low and high points seen in Figures 4 through 8. Also, note that this is the first time we have had data from the appropriate WRD and OCWD monitoring wells in the vicinity of ABP. Two wells from WRD (note, three existed, but SB1_5 did not properly correspond with the surrounding I zone depths) and 5 wells from OCWD had groundwater elevation data that was included in the Spring 2011 groundwater elevation contours.

Groundwater elevation **change** contours for the R, C, B, A, and I Zones between Spring 2010 and Spring 2011 are shown in A-1.2, 2.2, 3.2, 4.2, and 5.2. The data set is based on available data from Spring 2011, which was then subtracted from the corresponding and available data from Spring 2010 (shown in A-1.3, 2.3, 3.3, 4.3, and 5.3). These contours very clearly identify the increases and decreases in elevations from one reporting period to the next, and replaced the previous “Groundwater Elevation Summary” (Table 2 in past JMC reports) starting in the FY09-10 Annual Report. In general, most areas saw increases in elevation, especially along the east leg. A brief summary and discussion is as follows:

- R Zone:
 - Groundwater elevation increases of about 6 feet in the area north of the barrier and up to 7 feet in the southeast, with gradual gradients toward zero groundwater elevation change seaward of the barrier alignment.

- C Zone:
 - Relatively the same groundwater elevations in the northwest with a gradual gradient to increases of six feet along the barrier's east leg and landward.
 - The peak localized increases of about 7 feet (around 34JL and 34L'1) are likely due to the fact that 34L was not in operation for repairs during Spring 2010 (though similar increases were not seen in the B zone).
- B Zone:
 - Groundwater elevation increases of up to 8 feet north of the barrier's west leg. Slight increases along parts of the barrier's west leg, and larger increases up to 6 feet along and east of the ABP east leg.
 - Localized decreases in the west leg between the Los Cerritos Channel and San Gabriel River, especially near Los Cerritos Channel, partially due to the non-operation of 33S1 in the Spring of 2011.
- A Zone:
 - Localized decreases along the west leg near 33JL and near each of the river crossings.
 - 4-foot increases north of the barrier, increasing to 8 feet south and east of the barrier's east leg.
 - The increases at 34JL and 34LS are likely because 34L was not in operation (for repairs) in Spring 2010.
- I Zone:
 - Localized decreases of 4-8 feet in the northwest (around 33N21 and 33S20).
 - Mostly small increases of about 2 feet along the west leg of the barrier, with bigger increases moving inland, especially at 33G9 in the west and 33T12.5 northward along Los Cerritos Channel.
 - Increases of up to 11 feet along, south, and east of the ABP east leg.

For further analyses of the C, B, A, and I Zone groundwater elevations, please refer to the graphs included as Appendix A-13 through A-16. These graphs show the average, maximum, and minimum groundwater elevations at each internodal observation well throughout FY10-11 in relation to the ground surface and the protective elevation. These graphs were implemented for the FY07-08 report as requested at the corresponding JMC technical meeting and have replaced the previous graphs that showed the elevations of individual wells over the given reporting period. As shown in A-13 to A-16, the average groundwater elevation was below the protective elevation at many wells along the barrier during FY10-11. However, elevations below the protective elevation did not necessarily correlate with areas of high chloride concentrations. A comparison of these graphs to the previous year's graphs indicates that overall elevations generally increased, but, similar to what was seen in the contours, there were a number of localized increases or decreases due to various operational activities. In all cases, the southeast portion of the barrier remained below protective elevations due to the limited injection capabilities (quantity of wells, pressure limitations, maintenance, etc), even though the average elevations have significantly increased. It is important to note that the JMC is seeking to remediate the limited injection capabilities in the southeast region through potential additional wells, modeling studies, grouting operations, and condition assessments to allow preventative maintenance.

CHLORIDES

Figures 9 through 13 (pp. 24-28) show the historical chloride concentrations (the average of the maximum value throughout the year for each observation well) in the individual aquifer zones. The data includes all available information from the annual and semi-annual sampling events for wells within the barrier alignment and landward for approximately 2,000 feet from the barrier. As a result, the semi-annual values are “weighted” more heavily than the annuals in the calculation of the annual average. Two sets of graphs were created for each aquifer to account for changes in chloride concentration trends in the areas to the west and east of the San Gabriel River, respectively. In each figure, the average of the annual maximum chloride concentrations for the last 10 fiscal years (including this year) is shown with respect to the freshwater condition (250 mg/L). Note that a couple of the 10-year average plots (R zone-west, I zone-west, and I zone-east) are shown differently herein when compared to the FY 2009-10 Annual Report. This is because the latest data allowed for a clearer interpretation of certain historical data (i.e., validating or negating certain outliers, etc).

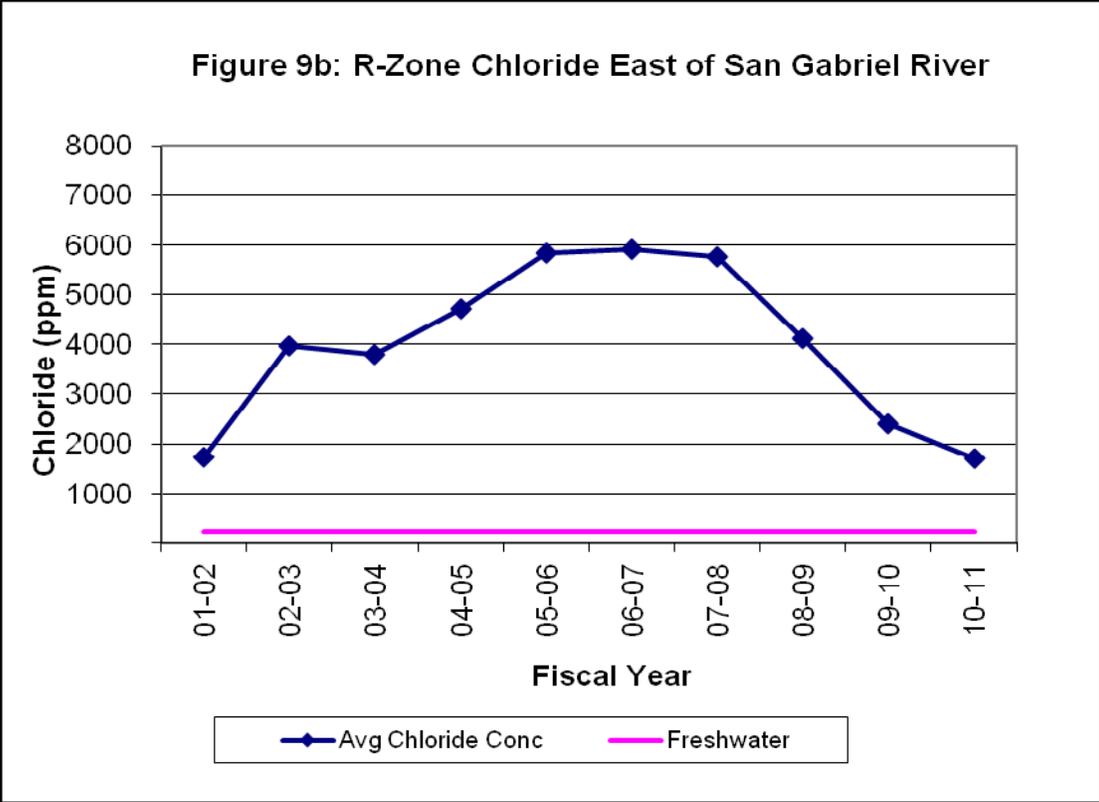
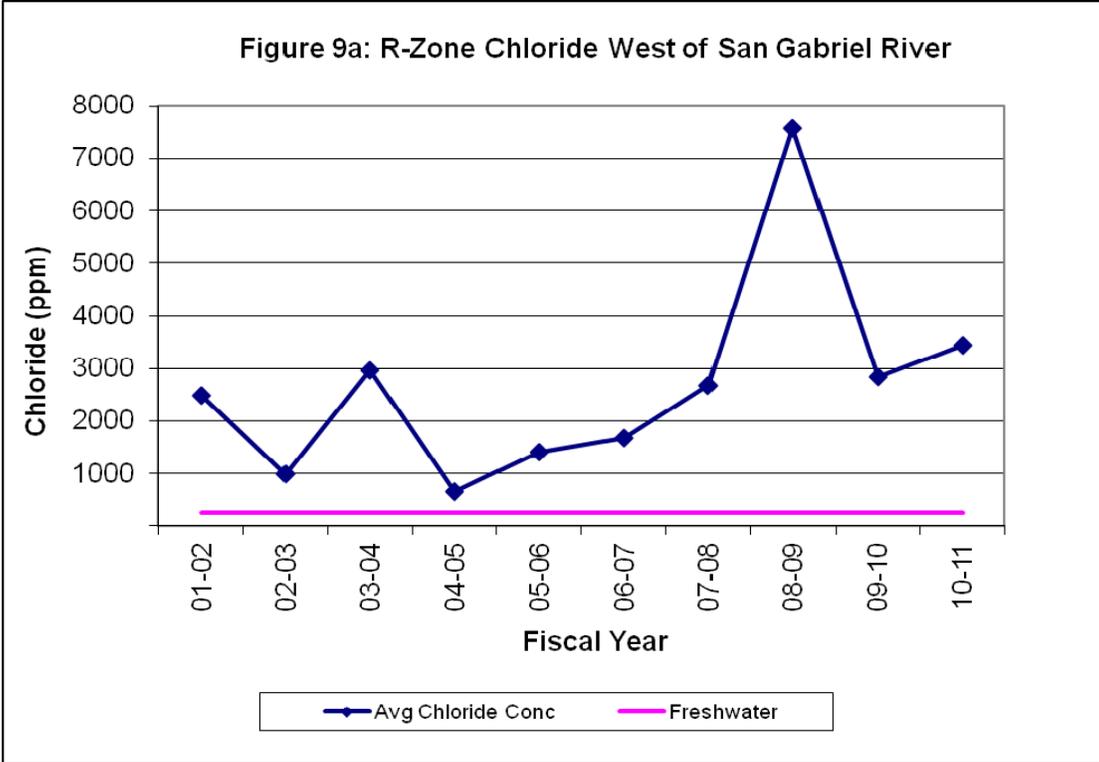


Figure 10a: C-Zone Chloride West of San Gabriel River

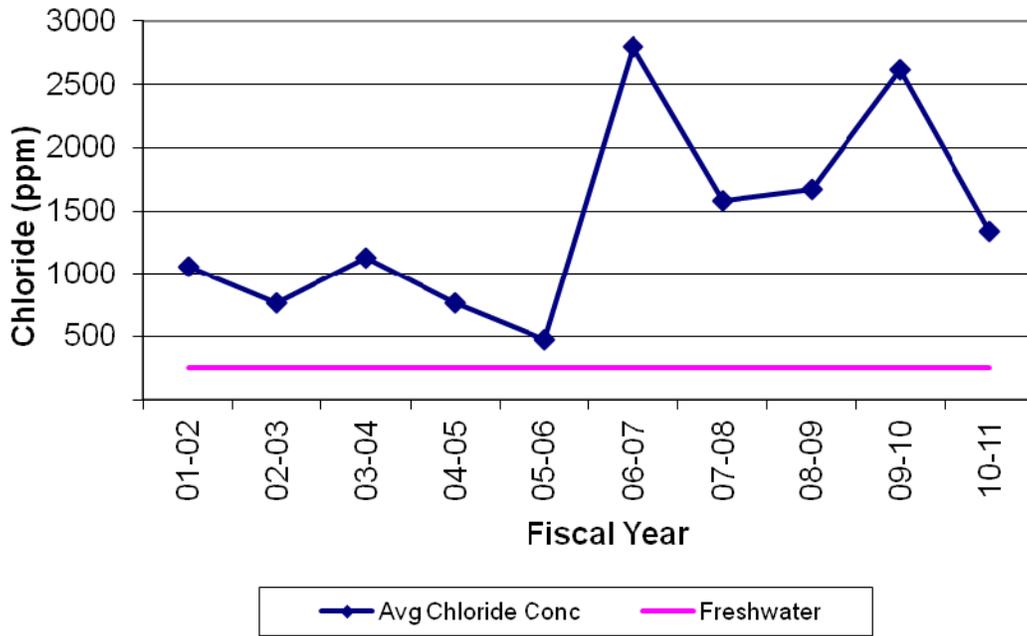
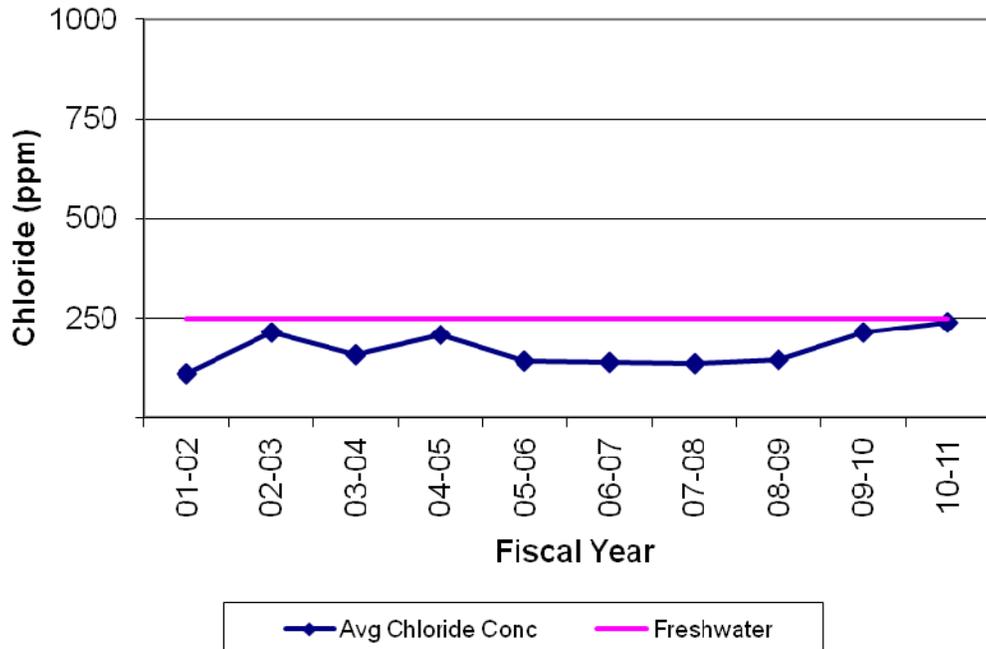


Figure 10b: C-Zone Chloride East of San Gabriel River



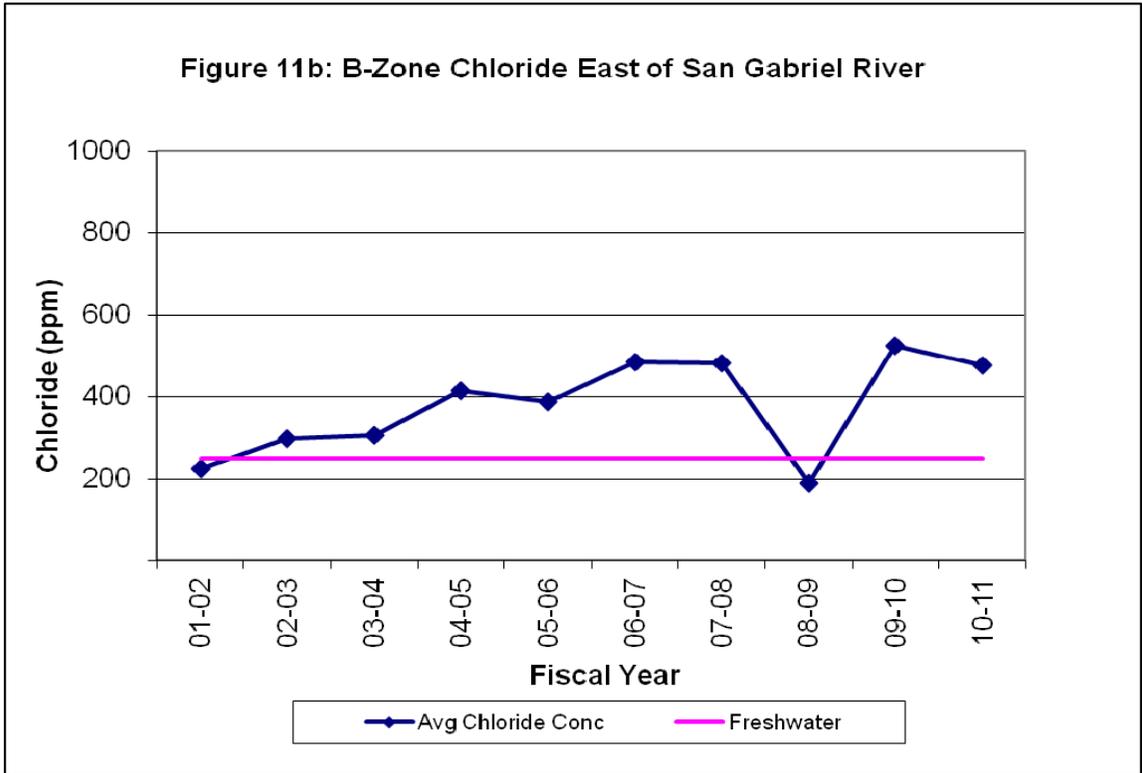
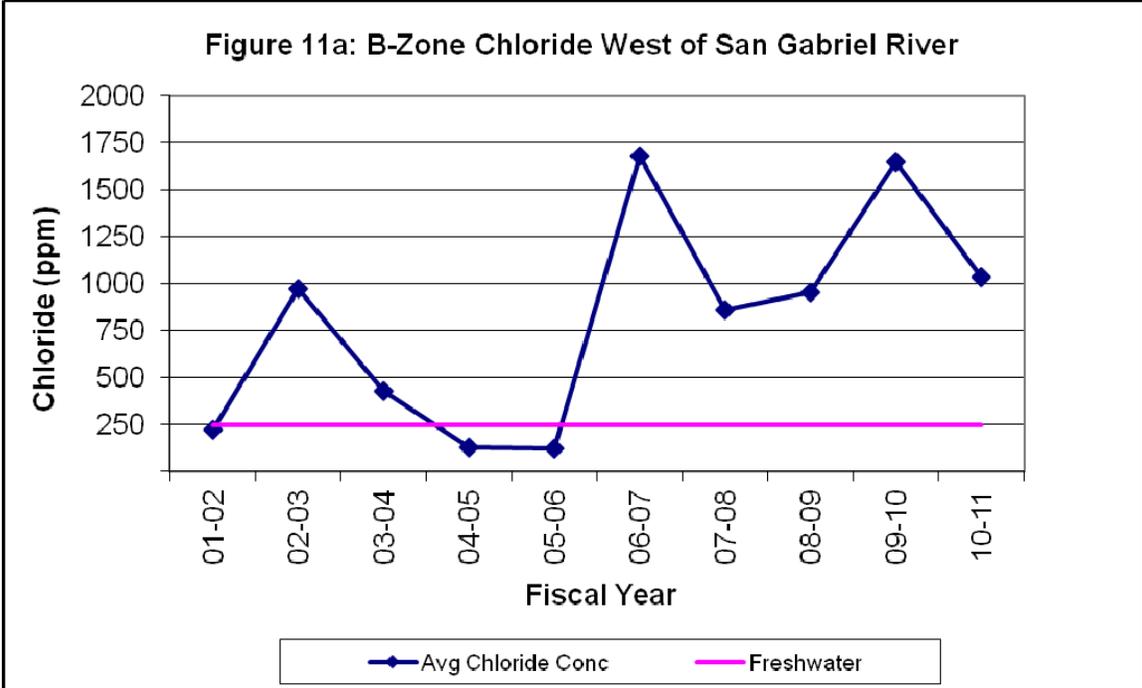


Figure 12a: A-Zone Chloride West of San Gabriel River

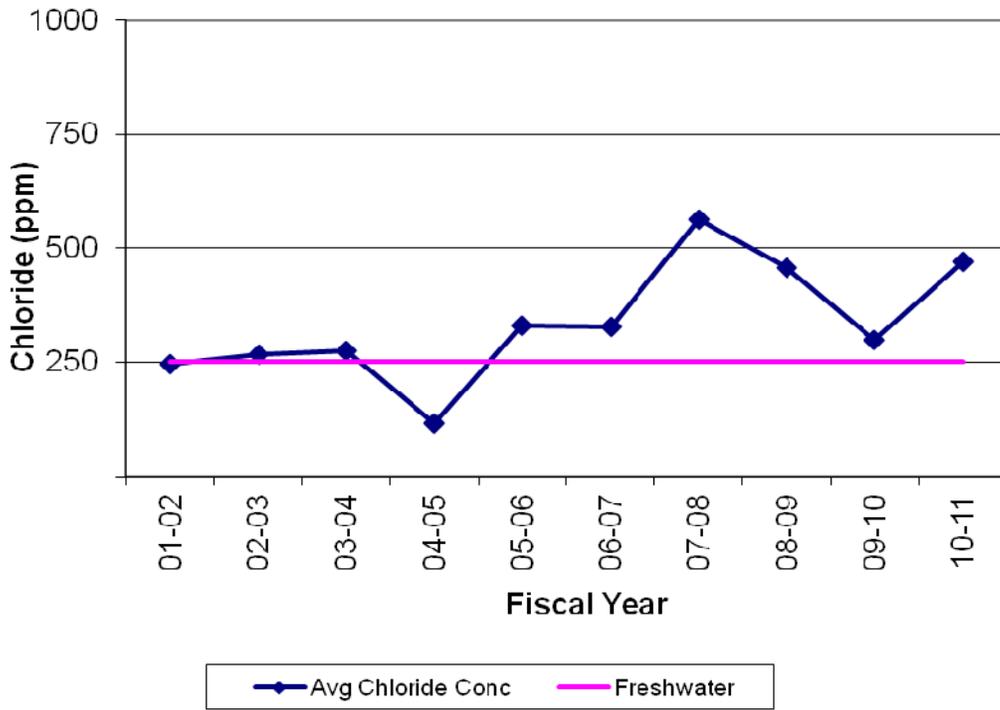


Figure 12b: A-Zone Chloride East of San Gabriel River

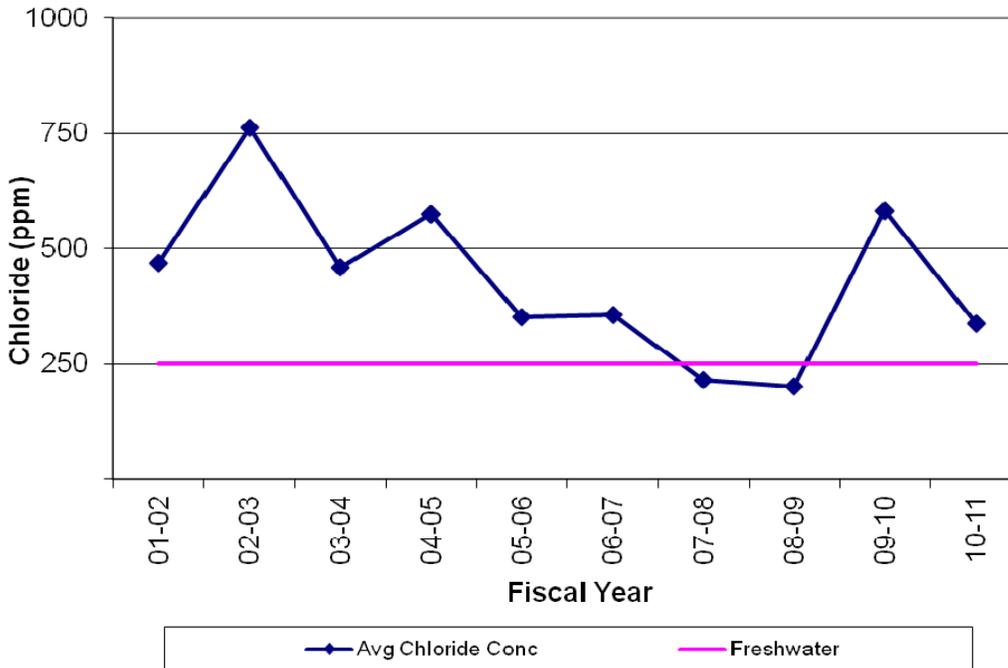


Figure 13a: I-Zone Chloride West of San Gabriel River

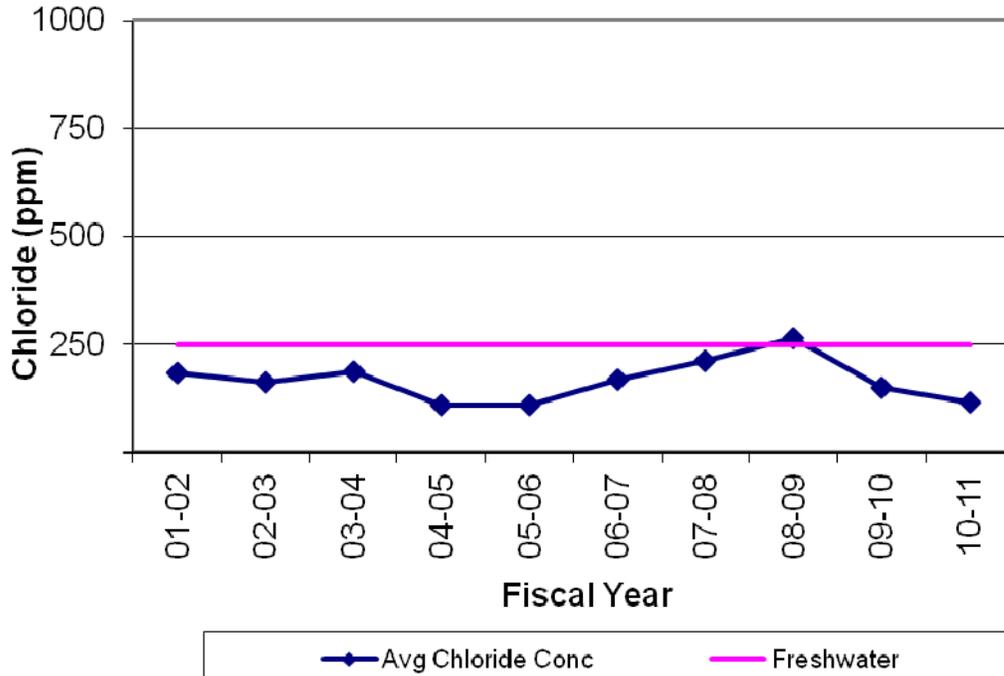
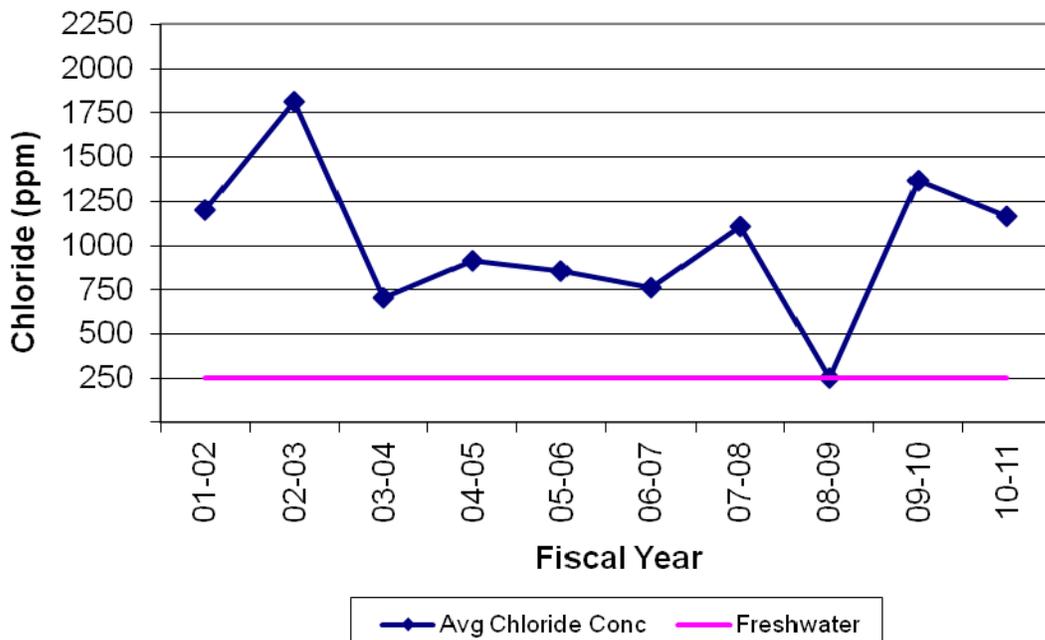


Figure 13b: I-Zone Chloride East of San Gabriel River



East of the San Gabriel River, FY10-11 chloride concentrations decreased in every zone with the exception of the C zone, where there was a small increase in chloride concentration but still remained fresh. The decreases in the easterly B, A and I Zones were all fairly minor (under 250mg/L change) and predominantly resulted from gradual drops at their respective higher concentration wells. West of the San Gabriel River, FY10-11 chloride concentrations in the C, B and I Zones decreased, with the I zone remaining below 250mg/L. However, westerly chloride concentrations in the R and A Zones showed increases of about 600mg/L and 150 mg/L, respectively. The small increase in the A zone is mainly because of higher values at 33UV, possibly the result of redevelopment shutdowns of adjacent injection wells a few months previous to sample collection.

Chloride concentration contour maps for the R, C, B, A, and I Zones have been prepared from data collected in the Spring of 2011 and are included in Appendix A-6.1, A-7.1, A-8.1, A-9.1, and A-10.1, respectively. A list of all data points used for these contours is also included in the Appendix (A-6.3, A-7.3, A-8.3, A-9.3, and A-10.3). The chloride contour maps are based on the maximum chloride ion concentration (mg/L) measured at each observation well. Chloride data was gathered from observation wells located within the immediate vicinity of the barrier and does not represent basin-wide conditions for the groundwater basin protected by the barrier. Wells with chloride concentrations of 250 mg/L or less were considered fresh. The chloride measurements used in this report were from the semi-annual sampling event in March and April 2011 and the annual event in February and March 2011. In a couple instances, it was beneficial to incorporate data from previous reporting periods (provided it was historically consistent and reasonable) in order to create the most accurate and complete representation of the conditions around the barrier. Also, note that this is the first time we have had data from the appropriate WRD and OCWD monitoring wells in the vicinity of ABP. Three wells from each agency had chloride data that was included in the Spring 2011 chloride contours.

Chloride **change** concentration contours for the R, C, B, A, and I Zones between Spring 2010 and Spring 2011 are shown in Appendices A-6.2, A-7.2, A-8.2, A-9.2, and A-10.2. The data set is based on available data for Spring 2011, which was then subtracted from the corresponding and available data for Spring 2010 (shown in A-6.3, A-7.3, A-8.3, A-9.3, and A-10.3). These contours very clearly identify the increases and decreases in chloride concentrations between these two reporting periods, and replaced the previous “Chloride Concentration Summary” (Table 3 in past JMC reports) starting in the FY09-10 Annual Report.

The chloride concentration contours are similar in shape and pattern to those of the previous year. These current contours and the corresponding chloride concentration cross-section (A-11) for this reporting period indicate that intrusion of seawater across the barrier continued to be controlled along much of the alignment. However, several areas recorded elevated chloride concentrations. For all zones receiving injection water, the southeastern end of the barrier continued to show elevated (but decreasing) chloride concentrations at most wells. Additional areas of high chloride concentrations and/or notable changes in concentration (since the FY09-10 report) are as follows:

- R Zone – High chloride concentrations were present north of west leg along Los Cerritos Channel and just south of 34L’1 on the east leg. Notable decreases and increases occurred as shown in A6.2 but are independent of injection operations.
- C Zone – High chloride concentrations remained along the west leg at the Los Cerritos Channel (33ST). Chloride concentrations increased along the east leg of the barrier around observation well 34T0.1, which was unexpected since adjacent wells 34S and 34V have been operating steadily aside from a couple brief shutdowns (see Figure 3 over the last two reporting periods).
- B Zone – West of the Los Cerritos Channel, there remained high chloride concentrations centered around 33ST, but otherwise minimal change except for a significant increase further inland at 33Q15. The chloride concentration at the southeast end of the barrier around 34U8 remained elevated, but seemingly

isolated and has not changed significantly from the previous year. The far southeast end actually improved (decreased) slightly.

- A Zone – High chloride concentrations remain northwest of the west leg although all wells in that vicinity have decreased. Chloride concentrations have increased along the west leg between the rivers (especially at 33UV and 33WX) and inland (33X10), therefore creating small intrusion bubbles. However, the majority of the barrier alignment and landward showed minimal changes or decreases in chloride concentrations, especially around the southeast end of the barrier.
- I Zone – In general, chloride concentrations remained fresh along the west leg and northward of the barrier. However, a significant increase in chloride concentration occurred at well 33U'3, suggesting an intrusion bubble between 33ST and 33UV (both fresh). Though the plumes/fingers appear similar to last year's, there were notable increases on the east leg at well 34LS, 34V20, and further east at 35F20. Nonetheless, the end of the alignment showed decreased chloride concentrations.

The mix of increases and decreases in all zones seaward of the barrier is as expected. There continue to be three possible causes of the high chloride concentrations north of, northwest of, and along portions of the ABP west leg (which was predominantly in steady operation during this reporting period). These include the transportation of seawater inland by the Los Cerritos Channel, a need for greater protection to prevent wrap-around on that end of the barrier, and remaining seawater from previous intrusions. It is possible that increases in chloride concentrations at other locations inland are still a continued result of the extended barrier shutdowns in 2006 and 2007. The increase in the west leg around the Los Cerritos Channel (33ST or 33U'3 for C, B, and I zones; 33UV for the A zone) could potentially be caused by a couple things. For the C and B zones, it is likely the result of lesser injection at nearby wells (i.e., not increasing injection due to achieved protective elevations, or 33S1 being off for grouting). For the A and I zones, it is likely from 33T's extended downtime. Though it increased compared to Spring 2010, the concentration at 34LS(I) is still lower than it had been in 2007 and 2009. The concentration is still expected to decrease due to the

continued maximization of operations at 34L and 34S. The decreases around much of the southeast end of the barrier are likely the result of more constant injection, made possible because pressures have not as frequently approached the maximum pressure limitations in that area.

Note that there are now two years of data for the new OCWD observation wells, so this is the first time they are shown in the chloride change contours. LACFCD is also planning additional observation wells which will aid in further understanding the conditions within LA County, particularly north and west of the west leg. Ultimately, both LACFCD and OCWD plan to utilize the additional data to determine whether or not to construct additional injections wells as necessary to better prevent seawater intrusion.

As discussed before, the extended shutdowns in FY06-07 and the resulting increases in chloride concentrations demonstrated that the barrier is effective when in operation. As expected, there were therefore many decreases in chloride concentrations in the FY07-08 reporting period where the barrier resumed more normalized operation. In FY08-09, there were multiple increases in concentration inland of the barrier in all zones except the I Zone even though most internodal locations decreased, perhaps due to the continued injection pushing small plumes of intrusion that arose during the prior shutdowns. In FY09-10, there were indicators of the same small plumes moving further inland but that the barrier was otherwise effectively preventing new intrusion while in operation. Similarly, FY10-11 shows solid protection in most cases, but highlights area where plumes continue to be pushed landward and/or current areas to improve upon if possible.

It is imperative that the barrier operate consistently and continuously to best prevent seawater intrusion. The JMC has discussed ways to minimize barrier down time and is currently finalizing the condition assessment project of the entire facility that will allow proactive maintenance rather than reactive. Additionally, the JMC will be ready to pursue the fastest option for as-needed/emergency contract repair work. The JMC and

Public Works will continue to press forward to ensure that the ABP is most efficiently, economically, and continuously protecting the region's groundwater supplies.

FINANCING AND COSTS

This section of the report is divided into four parts: Water Costs, Services and Supplies Costs (operation and maintenance), Fixed Assets Costs (capital outlay), and Budget. Under the terms of the 1964 Cooperative Agreement between LACFCD and OCWD, fixed assets are typically divided into facilities paid for by the LACFCD, facilities paid for by the OCWD, and joint facilities paid for by both agencies, depending on their location. Under the same agreement, water costs are divided between the LACFCD (whose portion is paid by the WRD per a separate agreement) and the OCWD. The total cost of the ABP in FY10-11 was \$6,681,264 (\$6,676,712 for injection-related operations, maintenance, water, and approved LACFCD and OCWD project expenses; \$4,552 for maintenance of idle extraction wells).

WATER COSTS

During the 2010-11 fiscal year, 5,066.1 acre-feet of water were injected at an estimated total cost of \$3,845,911. The monthly water rates (dollars per AF) from July 2010 to June 2011 varied periodically as shown earlier in Table 1. The monthly quantity of water injected and total water costs paid by each agency are shown below in Table 2.

TABLE 2. QUANTITY OF WATER INJECTED AND COSTS

MONTH	AMT BY WRD (AF)	AMT BY OCWD (AF)	TOTAL AMT (AF)
Jul-09	333.3	125.4	458.7
Aug-09	311.0	121.3	432.3
Sep-09	273.8	111.1	384.9
Oct-09	286.4	155.3	441.7
Nov-09	168.5	171.4	339.9
Dec-09	182.9	168.3	351.2
Jan-10	260.4	152.5	412.9
Feb-10	318.0	165.6	483.6
Mar-10	300.4	158.1	458.5
Apr-10	297.6	159.5	457.1
May-10	334.9	87.9	422.8
Jun-10	314.6	107.9	422.5
TOTAL INJECTED	3,381.7	1,684.4	5,066.1
TOTAL COST (\$) [From Tbl. 1]	\$2,569,549	\$1,276,362	\$3,845,911

SERVICES AND SUPPLIES COSTS

As shown in Appendix A-20, LACFCD spent a total of \$2,835,353 on services and supplies during the 2010-11 fiscal year (excluding liability insurance and water costs). Pursuant to the 1964 Cooperative Agreement, the OCWD pays a percentage of the applicable services and supplies costs for injection operations proportional to the percentage of the total amount of injection water paid for by the District. As a result, for this fiscal year, LACFCD was responsible for 67% of the cost for injection services and supplies while OCWD was responsible for the remaining 33%. The distribution of FY 2010-11 services and supplies costs is summarized in Table 3.

**TABLE 3. DISTRIBUTION OF SERVICES AND SUPPLIES COSTS FOR
INJECTION AND EXTRACTION ACTIVITIES**

ITEM	LOS ANGELES COUNTY	ORANGE COUNTY	TOTAL
Service & Supplies of Injection Facilities (including Observation Wells) ¹	\$1,315,977	\$626,180	\$1,942,157
Service & Supplies of Extraction Facilities ²	\$4,552	\$0	\$4,552
Special Programs ³	\$888,644	\$0	\$888,644
SUBTOTAL	\$2,209,173	\$626,180	\$2,835,353
Liability Insurance	\$13,296	\$13,296	\$26,592
TOTAL	\$2,222,469	\$639,476	\$2,861,945

These values in Table 3 come from the ABP FY10-11 Costs (see A-20) as follows:

¹ The sum of Items 1, 2, 3, 7, 8, 9, 10, 11, 12, 14, and 15. OCWD is responsible for 33% of all costs for these items except for Item 10 (flat \$375 per Agreement)

² The sum of Items 4, 5, and 6. OCWD is not responsible for any portion of the cost for these items.

³ Item 13. OCWD is not responsible for any portion of the cost for this item.

The yearly costs of the services and supplies (including special programs but excluding water costs) for the last 20 years of injection operations are shown in Table 4.

TABLE 4. COSTS OF SERVICES AND SUPPLIES FOR INJECTION

Fiscal Year	Volume of Water Injected (Ac-Ft)	Total Cost	Cost Per Ac-Ft Injected
1991-92	5,757.5	\$865,016	\$150.24
1992-93	5,240.8	\$692,864	\$132.21
1993-94	4,144.8	\$584,975	\$141.13
1994-95	3,495.7	\$651,845	\$186.47
1995-96	5,269.0	\$509,377	\$96.67
1996-97	5,739.4	\$408,064	\$71.10
1997-98	5,335.8	\$923,342	\$173.05
1998-99	5,330.4	\$795,044	\$149.15
1999-00	6,077.9	\$589,168	\$96.94
2000-01	5,398.8	\$961,649	\$178.12
2001-02	6,061.7	\$713,299	\$117.67
2002-03	5,012.3	\$1,555,921	\$310.42
2003-04	5,879.7	\$730,652	\$124.27
2004-05	5,066.1	\$918,020	\$181.21
2005-06	3,457.8	\$1,605,456	\$464.30
2006-07	1,265.1	\$2,309,300	\$1,825.39
2007-08	5,971.1	\$3,513,957	\$588.49
2008-09	7,936.2	\$1,875,902	\$236.37
2009-10	5,629.2	\$3,135,608	\$557.03
2010-11	5,066.1	\$2,830,801	\$558.77

¹ The higher costs per Ac-Ft injected in FY05-06 and beyond are typically because these years included costs for multiple repairs and/or capital improvement projects whereas not all other years did. The cost is especially high in FY06-07 because the improvement projects, observation well cleanouts, costs related to the reclaimed water program, and various fixed costs were still incurred despite reduced injections due to the extended shutdowns for repairs.

The costs of the services and supplies for extraction operations for the last 20 years, including electrical costs, are shown in Table 5.

TABLE 5. COSTS OF SERVICES AND SUPPLIES FOR EXTRACTION

Fiscal Year	Volume of Water Extracted (Ac-Ft)	Total Cost	Cost Per Ac-Ft Extracted
1991-92	1,378.4	\$151,520	\$109.92
1992-93	1,136.1	\$99,099	\$87.23
1993-94	992.0	\$169,621	\$170.99
1994-95	940.7	\$148,122	\$157.46
1995-96	998.4	\$130,901	\$131.11
1996-97	1,200.9	\$51,077	\$42.53
1997-98	883.5	\$64,774	\$73.32
1998-99	775.6	\$52,043	\$67.10
1999-00	679.9	\$41,320	\$60.77
2000-01	404.8	\$49,769	\$122.95
2001-02	495.0	\$53,153	\$107.38
2002-03	262.7	\$63,165	\$240.45
2003-04	0.0	\$6,068	N/A
2004-05	0.0	\$3,043	N/A
2005-06	0.0	\$2,857	N/A
2006-07	0.0	\$3,224	N/A
2007-08	0.0	\$4,224	N/A
2008-09	0.0	\$14,742	N/A
2009-10	0.0	\$20,223	N/A
2010-11	0.0	\$4,552	N/A

The increase in cost for FY08-09 and FY09-10 was due to increased maintenance needs at two deteriorating extraction well sites, 33V'15P and 34H'17P.

FIXED ASSETS

During Fiscal Year 2010-11, there were no new LACFCD facilities, OCWD facilities, or joint facilities added to the ABP. However, new OCWD facilities (injection and observation wells) and new LACFCD facilities (observation wells) are in the planning and design phases, respectively.

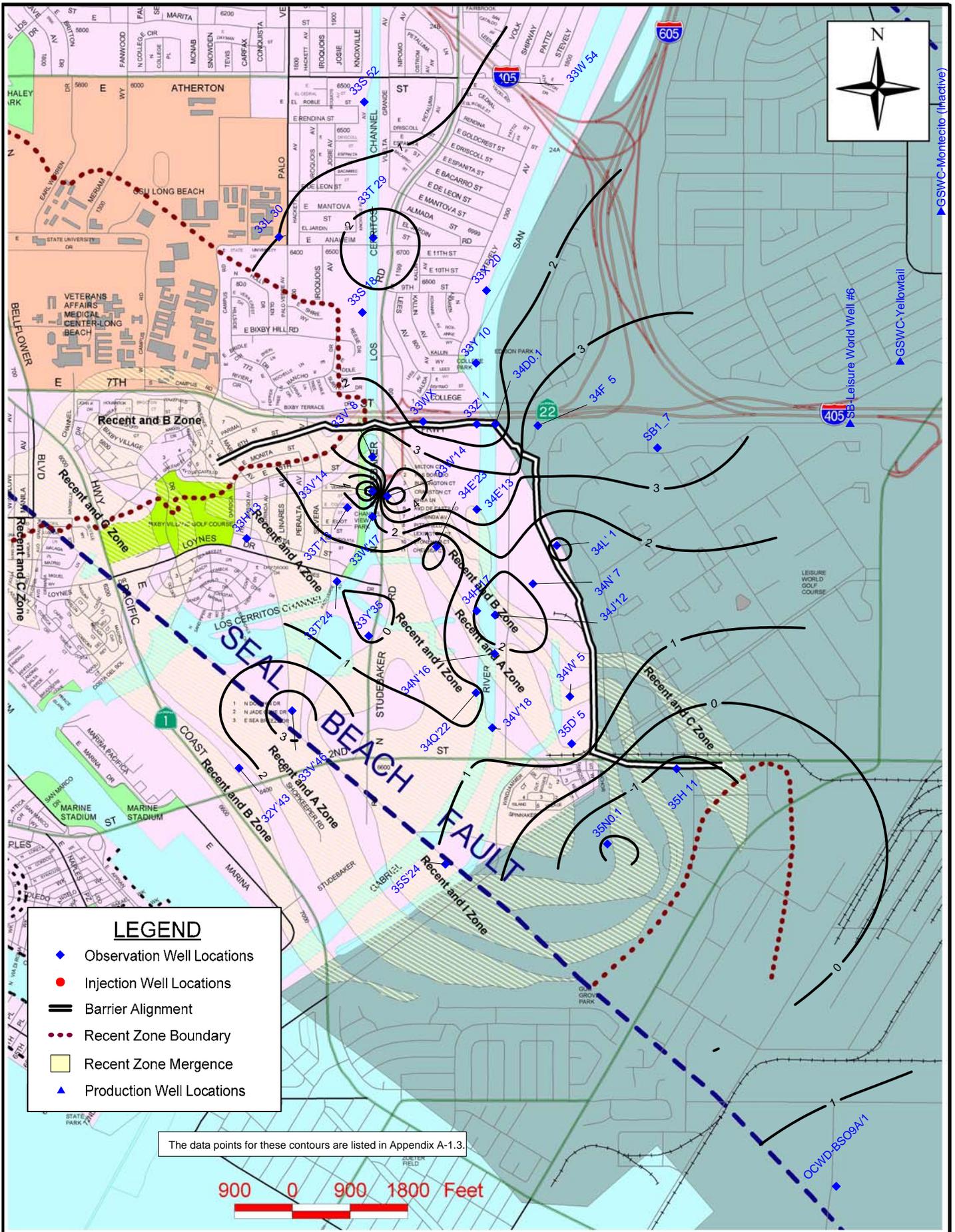
Public Works spent \$1,149,305.14 on multiple capital improvement projects (including contracts and labor), primarily on the wells and facilities condition assessment, the implementation of cathodic protection along the supply line, and the design of 8 new observation wells. However, small amounts were also spent on the injection well assessment project and the ABP modeling project. As agreed at the previous annual JMC meetings, these capital improvement costs (minus the groundwater model and condition assessment contract expenses dealt with per separate agreements) were incorporated into the operation and maintenance costs (i.e., services and supplies) so that OCWD covered a portion of these costs in accordance with the distribution of water delivered (33%). Also, OCWD contributed an additional \$95,644 (shown in Appendix A-21) to cover their FY10-11 share of the cathodic protection contract amount per the agreed upon 32% (based on the 5-year FY00-01 to FY04-05 water distribution average). Therefore, in FY10-11, OCWD was responsible for \$190,047.90 (17%) of LACFCD's \$1,149,305.14 expenses on capital improvement projects (see Appendix A-20).

The actual contract costs for the groundwater model and the condition assessment projects have been, and will continue to be, divided according to the cost-sharing agreements between LACFCD, OCWD, and WRD.

BUDGET

The FY2012-13 budget for the ABP is \$3,438,200. A breakdown of this amount, along with past expenditures per category, is shown in Appendix A-22. Note that amounts for WRD are shown in addition to those for LACFCD and OCWD.

APPENDIX



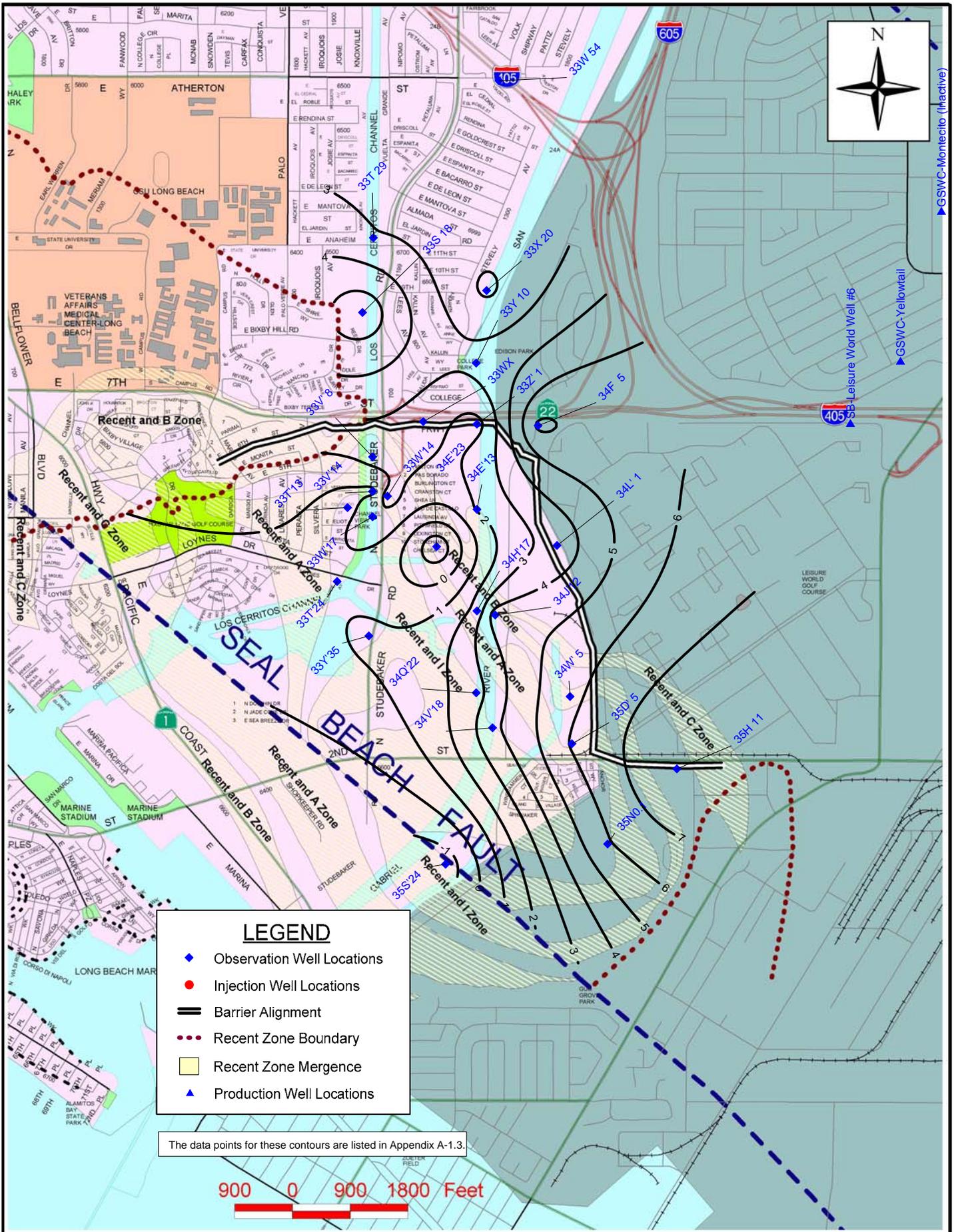
LEGEND

- ◆ Observation Well Locations
- Injection Well Locations
- Barrier Alignment
- ⋯ Recent Zone Boundary
- Recent Zone Mergence
- ▲ Production Well Locations

The data points for these contours are listed in Appendix A-1.3.



Alamitos Barrier Project
R Zone Groundwater Elevation (ft) Contours Spring 2011



LEGEND

- ◆ Observation Well Locations
- Injection Well Locations
- Barrier Alignment
- ⋯ Recent Zone Boundary
- Recent Zone Mergence
- ▲ Production Well Locations

The data points for these contours are listed in Appendix A-1.3.



Alamitos Barrier Project
 R Zone: Change in Elevation(ft), Spring 2010 to Spring 2011

ALAMITOS BARRIER PROJECT
R-Zone
Groundwater Elevation Data for Contours and Tables

POINT	PROJ	FCD	AQUIFER	DATE	FY 10-11 ELEV	P.E. ¹	Δ^2	FY 09-10 ELEV	CHANGE IN ELEV
1	32Y'43	493WW	RECENT	20110310	1.6				n/a
2	33H'13	493YY	R,A	20110214	0.0				n/a
3	33L 30	491G	RECENT	20110214	1.0				n/a
4	33S 18	492AH	RECENT	20110215	1.8			-4.0	5.8
5	33S 52	491J	RECENT	20110216	0.0				n/a
6	33T 29	491D	RECENT	20110302	2.6			-0.5	3.1
7	33T'13	492AU	RECENT	20110302	1.9			1.3	0.6
8	33T'24	493SS	RECENT	20110217	0.0			-1.0	1.0
9	33V' 8	492BY	R,A	20110217	4.0			1.6	2.4
10	33V'14	492KK	RECENT	20110324	-2.1			-2.9	0.8
11	33V'46	493UU	RECENT	20110217	3.8				n/a
12	33W 54	501C	RECENT	20110222	1.2			-0.9	2.1
13	33W'14	492AT	RECENT	20110301	6.1			3.7	2.4
14	33W'17	493PP	RECENT	20110301	1.8			-0.3	2.1
15	33WX	502AZ	RECENT	20110316	1.3	2.0	-0.7	-1.2	2.5
16	33X 20	502L	RECENT	20110314	1.3			-0.5	1.8
17	33Y 10	502BA	RECENT	20110228	1.8			-1.4	3.2
18	33Y'35	493AB	RECENT	20110223	-0.2			-1.4	1.2
19	33Z' 1	502AU	RECENT	20110321	1.2			-0.4	1.6
20	34D0.1	502AX	RECENT	20100923	1.1				n/a
21	34E'13	503AU	RECENT	20110328	4.0			1.9	2.1
22	34E'23	503X	RECENT	20101006	-0.5			1.4	-1.9
23	34F 5	502BT	RECENT	20110328	4.0			-2.2	6.2
24	34H'17	503Y	RECENT	20110328	2.1			-0.3	2.4
25	34J'12	503U	RECENT	20110307	3.1			-1.4	4.5
26	34L' 1	503P	RECENT	20110316	0.7			-2.5	3.2
27	34N' 7	503AE	RECENT	20110420	1.8				n/a
28	34N'16	503W	RECENT	20110331	1.7				n/a
29	34Q'22	503T	RECENT	20110328	0.9			-1.7	2.6
30	34V'18	503V	RECENT	20110307	1.1			-2.7	3.8
31	34W' 5	503AH	RECENT	20110223	1.8			-3.9	5.7
32	35D' 5	503AL	RECENT	20110301	1.7			-4.4	6.1
33	35H 11	514F	RECENT	20110321	-1.3	2.0	-3.3	-9.2	7.9
34	35N0.1	504M	RECENT	20110303	-2.2			-8.1	5.9
35	35S'24	504K	RECENT	20110307	0.9			2.5	-1.6
36	OCWD- BSO9A/1		RECENT	20110310	1.8				n/a
37	SB1_7		RECENT	20110202	3.8				n/a

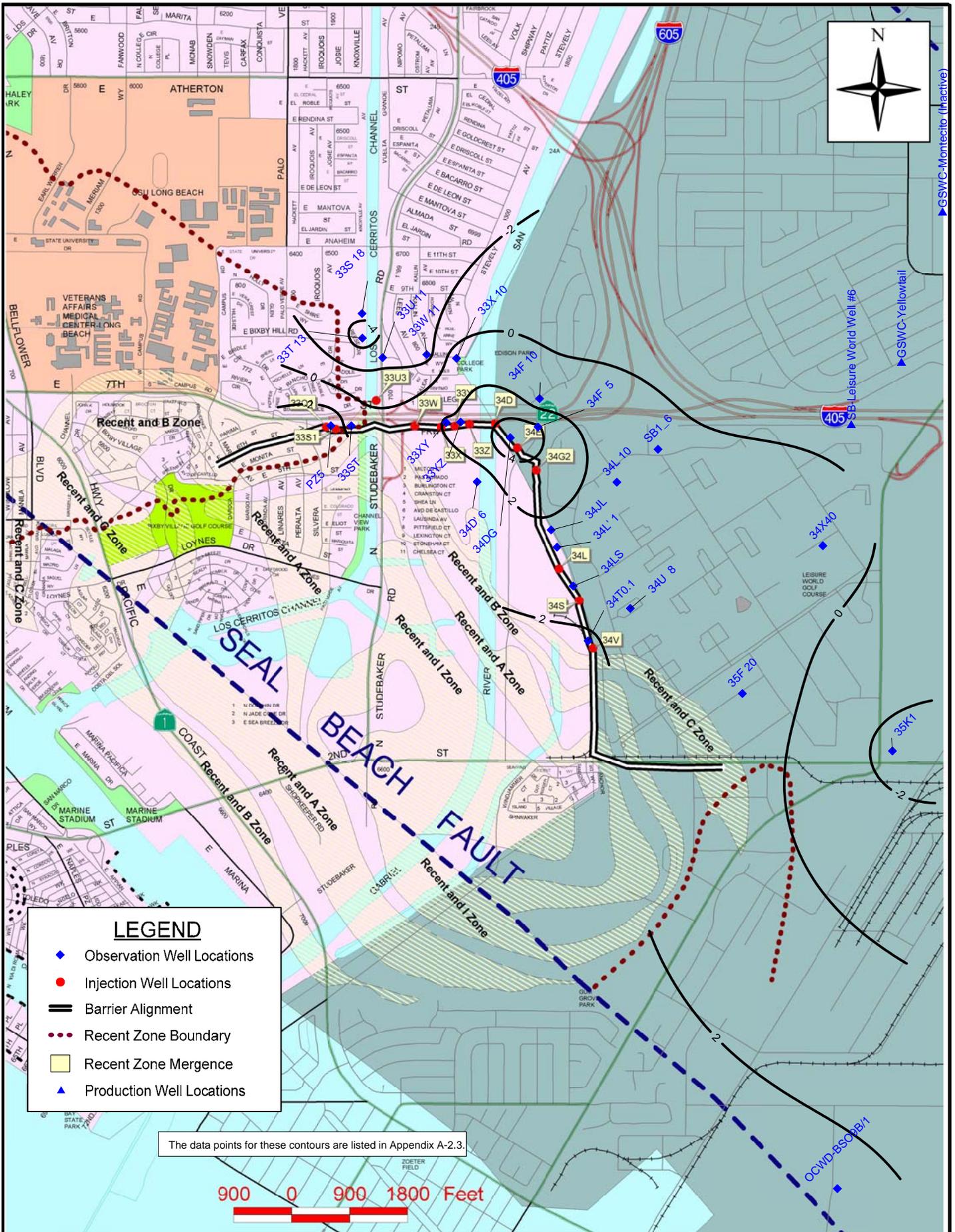
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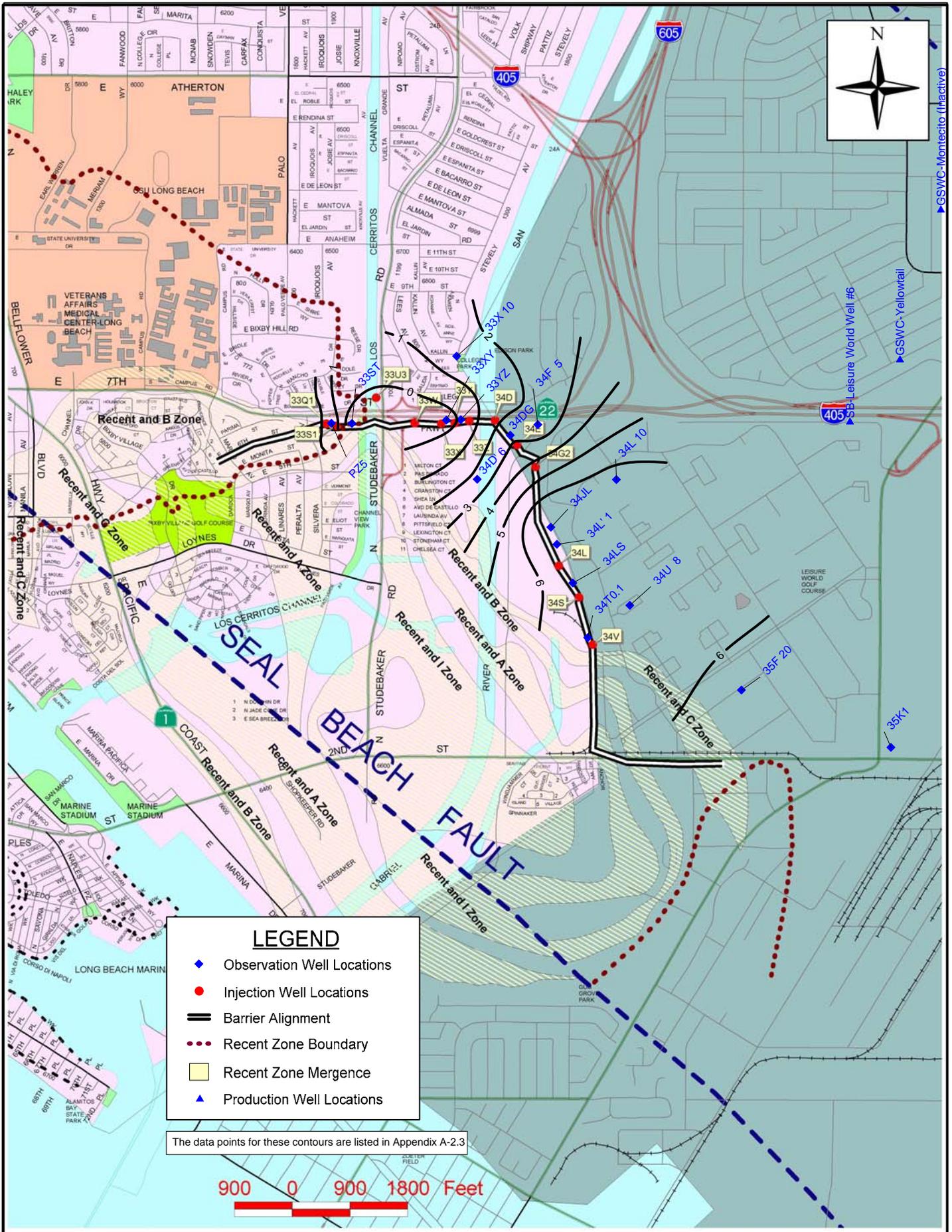
¹ P.E. represents the protective elevations calculated for internodal wells.

² Δ (+/-) represents how much groundwater level is above/below respective P.E.

= A max. or min. elevation during that period.



Alamitos Barrier Project
C Zone Groundwater Elevation (ft) Contours Spring 2011



LEGEND

- ◆ Observation Well Locations
- Injection Well Locations
- == Barrier Alignment
- ⋯ Recent Zone Boundary
- Recent Zone Mergence
- ▲ Production Well Locations

The data points for these contours are listed in Appendix A-2.3



Alamitos Barrier Project
 C Zone: Change in Elevation (ft), Spring 2010 to Spring 2011

ALAMITOS BARRIER PROJECT
C-Zone
Groundwater Elevation Data for Contours and Tables

POINT	PROJ	FCD	AQUIFER	DATE	FY 10-11 ELEV	P.E. ¹	Δ^2	FY 09-10 ELEV	CHANGE IN ELEV
1	33S 18	492AG	C	20110215	-3.6				n/a
2	33ST	492BK	CB	20110314	1.0	0.9	0.1	1.8	-0.8
3	33T 13	492AC	C	20110315	-5.0				n/a
4	33U 11	492AL	C	20110317	-2.5				n/a
5	33W 11	502R	C	20110321	-2.7				n/a
6	33X 10	502BB	C	20110314	1.2			-0.6	1.8
7	33XY	502BL	C	20110316	2.2	5.4	-3.2	2.5	-0.3
8	33YZ	502AB	C	20110317	2.1	5.4	-3.3	2.0	0.1
9	34D' 6	502BF	C	20110328	0.6			-1.7	2.3
10	34DG	502X	C	20110316	5.7	5.4	0.3	2.8	2.9
11	34F 5	502BU	C	20110323	4.2			2.1	2.1
12	34F 10	502AP	C	20110324	0.7				n/a
13	34JL	503AR	C	20110322	1.8	4.2	-2.4	-5.9	7.7
14	34L' 1	503N	C	20110316	1.4			-5.1	6.5
15	34L 10	502AK	C	20110328	1.1			-5.4	6.5
16	34LS	503BF	C	20110316	1.2	4.5	-3.3	-5.0	6.2
17	34T0.1	503AB	C	20110316	2.4	3.6	-1.2	-4.3	6.7
18	34U 8	513D	C	20110328	0.3			-6.5	6.8
19	34X40	513R	C	20110404	0.8				n/a
20	35F 20	513L	C	20110328	1.2			-4.4	5.6
21	35K1	523D	C	20110315	-2.6			-8.4	5.8
22	PZ5	492CH	CB	20110210	3.9			2.0	1.9
23	SB1_6		C	20110202	0.3				n/a
24	OCWD- BSO9B/1		C	20110310	2.6				n/a

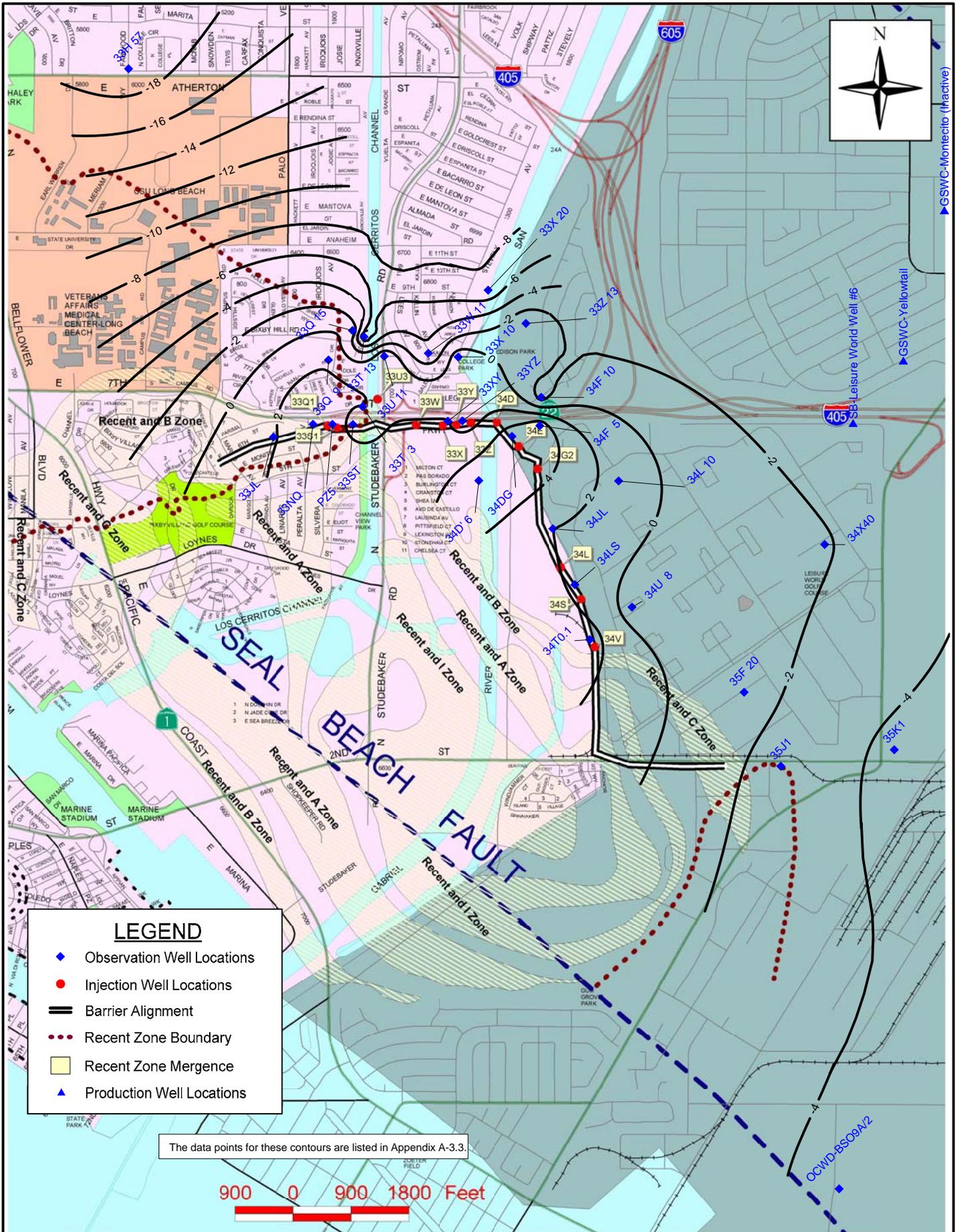
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AVG= -2.1

¹ P.E. represents the protective elevations calculated for internodal wells.

² Δ (+/-) represents how much groundwater level is above/below respective P.E.

= A max. or min. elevation during that period.

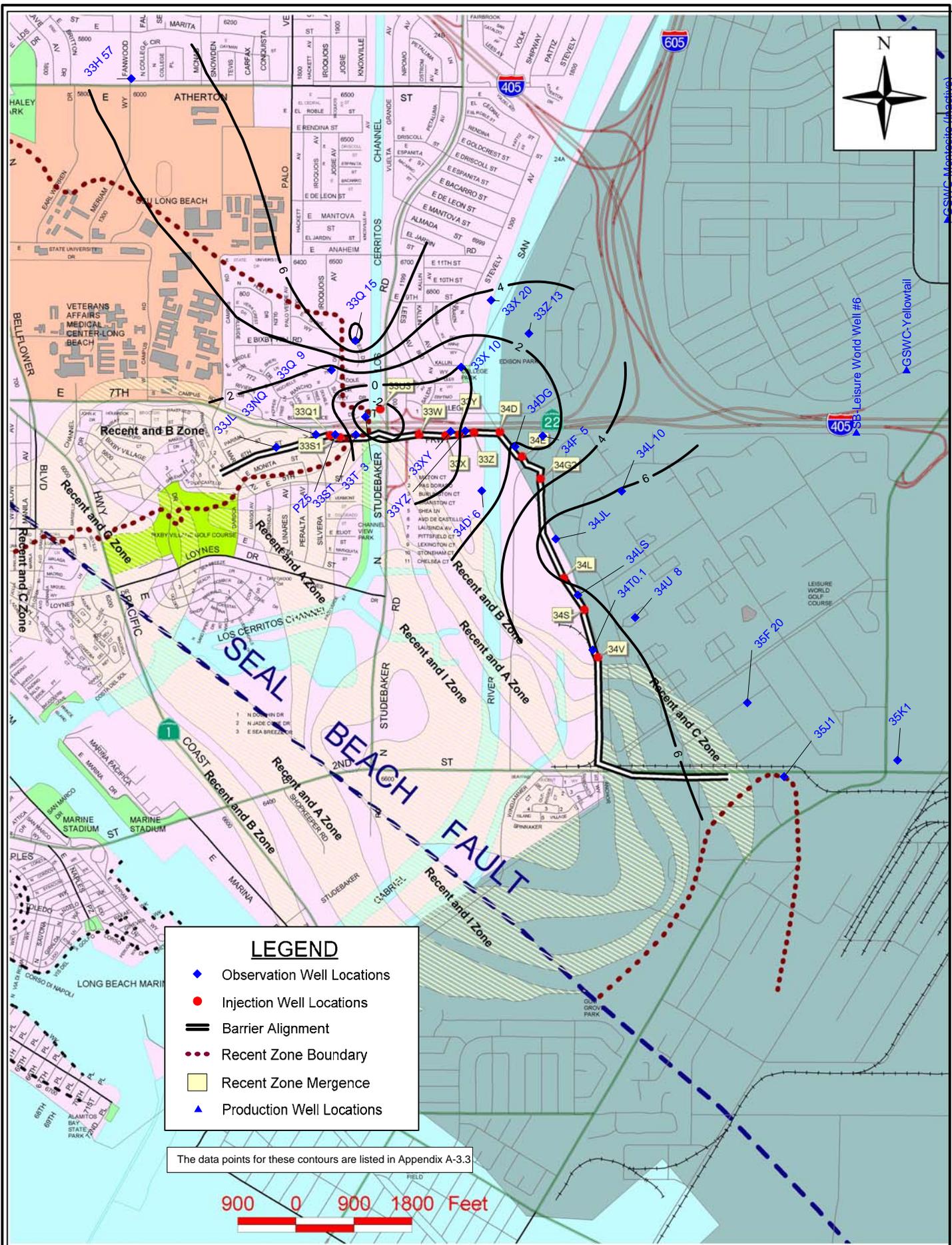


The data points for these contours are listed in Appendix A-3.3.

900 0 900 1800 Feet



Alamitos Barrier Project
B Zone Groundwater Elevation (ft) Contours Spring 2011



LEGEND

- ◆ Observation Well Locations
- Injection Well Locations
- == Barrier Alignment
- ⋯ Recent Zone Boundary
- Recent Zone Mergence
- ▲ Production Well Locations

The data points for these contours are listed in Appendix A-3.3



Alamitos Barrier Project
 B Zone: Change in Elevation (ft), Spring 2010 to Spring 2011

ALAMITOS BARRIER PROJECT
B-Zone
Groundwater Elevation Data for Contours and Tables

POINT	PROJ	FCD	AQUIFER	DATE	FY 10-11 ELEV	P.E. ¹	Δ^2	FY 09-10 ELEV	CHANGE IN ELEV
1	33H 57	481	B	20110324	-19.5			-24.0	4.5
2	33JL	492BQ	B	20110330	1.8	0.9	0.9	1.2	0.6
3	33NQ	492BN	B	20110329	3.7			2.7	1.0
4	33Q 9	492CM	B	20110314	1.7			0.5	1.2
5	33Q 15	492AN	B	20110215	-0.3			-8.8	8.5
6	33ST	492BK	CB	20110314	1.0			1.8	-0.8
7	33T 3	492CL	B	20110314	2.0	5.4	-3.4	6.2	-4.2
8	33T 13	492AB	B	20110315	-7.8	5.4	-13.2		n/a
9	33U 11	492AK	B	20110317	2.0				n/a
10	33W 11	502S	B	20110321	-4.0	5.4	-9.4		n/a
11	33X 10	502BC	B	20110314	1.2			1.3	-0.1
12	33X 20	502K	B	20110315	-7.5			-11.2	3.7
13	33XY	502BM	B	20110315	2.1	4.2	-2.1	2.6	-0.5
14	33YZ	502AC	B	20110315	0.8			0.5	0.3
15	33Z 13	502E	B	20110331	-0.2			-2.7	2.5
16	34D' 6	502BG	B	20110328	4.8	4.5	0.3	4.1	0.7
17	34DG	502Y	B	20110316	5.1	3.6	1.5	2.9	2.2
18	34F 5	502BS	B	20110328	5.3			4.1	1.2
19	34F 10	502AQ	B	20110324	-2.8				n/a
20	34JL	503AQ	B	20110321	2.0			-5.4	7.4
21	34L 10	502AL	B	20110328	1.3			-4.8	6.1
22	34LS	503BE	B	20110316	1.7			-4.0	5.7
23	34T0.1	503AC	B	20110316	2.8			-1.7	4.5
24	34U 8	513E	B	20110328	-0.9			-7.6	6.7
25	34X40	513Q	B	20110404	-1.8				n/a
26	35F 20	513K	B	20110328	-1.1			-8.3	7.2
27	35J1	514M	B	20110321	-2.9			-9.8	6.9
28	35K1	523A	B	20110315	-4.4			-11.7	7.3
29	PZ5	492CH	CB	20110210	3.9			2.0	1.9
30	OCWD-BSO9A/2		B	20110310	-4.5				n/a

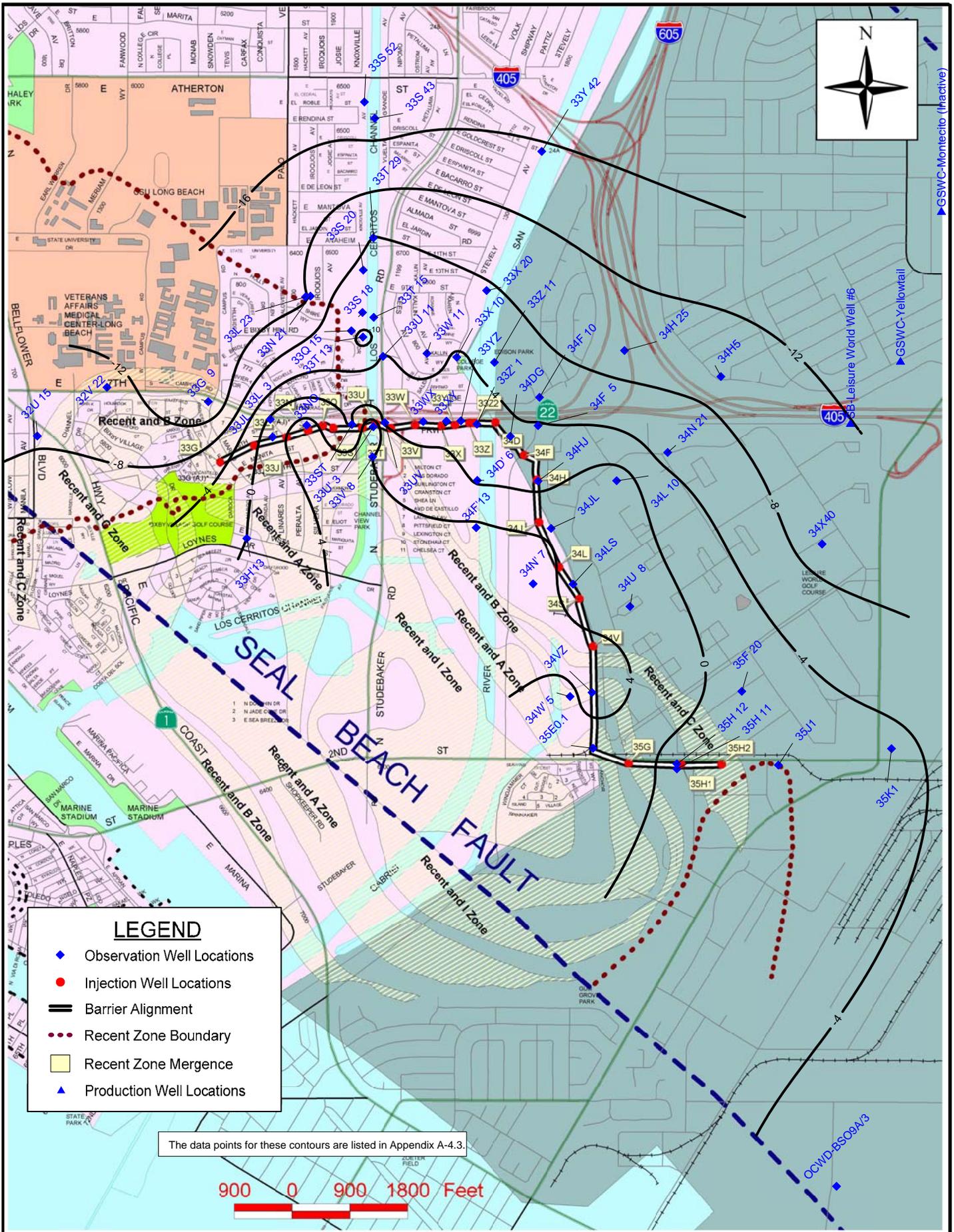
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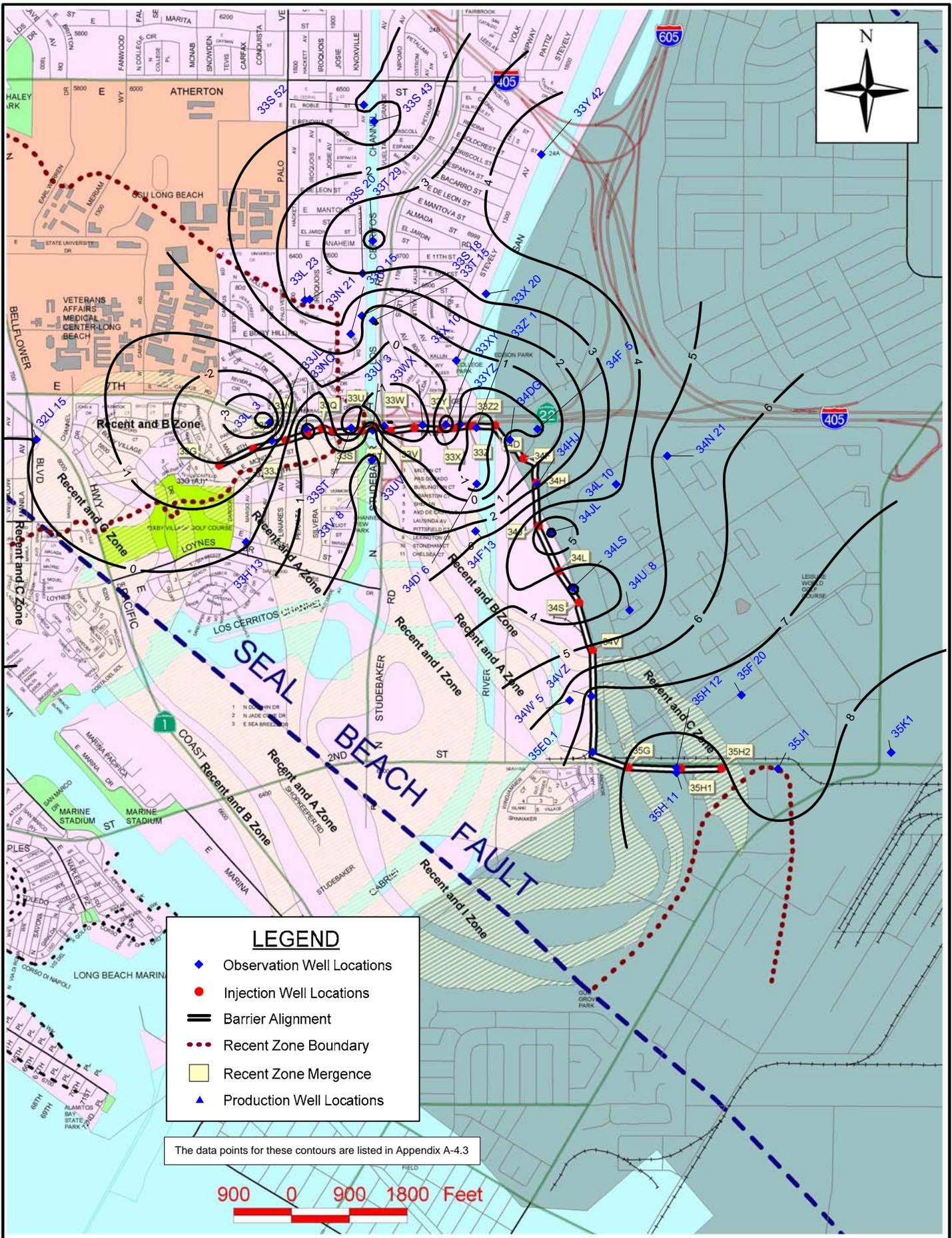
¹ P.E. represents the protective elevations calculated for internodal wells.

² Δ (+/-) represents how much groundwater level is above/below respective P.E.

= A max. or min. elevation during that period.



Alamitos Barrier Project
A Zone Groundwater Elevation (ft) Contours Spring 2011



LEGEND

- ◆ Observation Well Locations
- Injection Well Locations
- == Barrier Alignment
- ⋯ Recent Zone Boundary
- Recent Zone Mergence
- ▲ Production Well Locations

The data points for these contours are listed in Appendix A-4.3



Alamitos Barrier Project
 A Zone: Change in Elevation (ft), Spring 2010 to Spring 2011

ALAMITOS BARRIER PROJECT
A-Zone
Groundwater Elevation Data for Contours and Tables

POINT	PROJ	FCD	AQUIFER	DATE	FY 10-11 ELEV	P.E. ¹	Δ^2	FY 09-10 ELEV	CHANGE IN ELEV
1	32U 15	482M	A	20110210	-8.3			-8.3	0.0
2	32V 22	482P	A	20110210	-10.1				n/a
3	33G 9	482F	A	20110210	-16.1				n/a
4	33H'13	493YY	R,A	20110214	0.0			0.1	-0.1
5	33JL	492BW	AI	20110330	2.6	3.1	-0.5	4.1	-1.5
6	33L 3	492	A	20100915	0.6			5.3	-4.7
7	33L 23	492RR	A	20110214	-13.0			-15.6	2.6
8	33N 21	492BU	A	20110214	-10.1			-12.5	2.4
9	33NQ	492BP	AI	20110329	5.5	3.6	1.9	2.8	2.7
10	33Q 15	492AM	A	20110215	-5.9			-7.9	2.0
11	33S 18	492AE	A	20110215	-5.4			-6.6	1.2
12	33S 20	492BR	A	20110216	-7.4			-10.4	3.0
13	33S 43	491E	A	20100218	-17.7			-17.7	0.0
14	33S 52	491H	A	20110216	-17.1			-18.2	1.1
15	33ST	492BL	A	20110314	-0.5	2.8	-3.3	1.5	-2.0
16	33T 13	492ZZ	A	20110315	-10.2				n/a
17	33T 15	492SS	A	20110310	-5.3			-5.2	-0.1
18	33T 29	491C	A	20110308	-7.9			-12.2	4.3
19	33U 11	492AJ	A	20110317	-3.7				n/a
20	33U' 3	492WW	A	20110302	8.3			6.5	1.8
21	33UV	492BH	A	20110314	-1.4	4.0	-5.4	0.6	-2.0
22	33V' 8	492BY	RA	20110217	4.0			1.6	2.4
23	33W 11	502T	A	20110321	-6.1				n/a
24	33W110	1009K	A	20101006	-52.9			-47.2	-5.7
25	33WX	502AF	A	20110314	-2.9	7.6	-10.5	-0.9	-2.0
26	33X 10	502BD	A	20110314	-3.4			-4.0	0.6
27	33X 20	502J	A	20110315	-7.5			-10.8	3.3
28	33XY	502BN	A	20110329	0.3	8.0	-7.7	-1.8	2.1
29	33Y 42	501A	A	20110308	-15.5			-20.5	5.0
30	33YZ	502AD	A	20110315	-2.0	8.7	-10.7	-1.8	-0.2
31	33Z' 1	502G	A	20110328	-1.1			0.9	-2.0
32	33Z 11	502V	A	20110405	-5.5				n/a
33	34D' 6	502BH	A	20110328	-0.4			1.3	-1.7
34	34DG	502Z	A	20110316	-3.3	8.5	-11.8	-3.7	0.4
35	34F 5	502BR	A	20110323	-3.7			-3.4	-0.3
36	34F 10	502AR	A	20110324	-6.2				n/a
37	34F'13	503Q	A	20110328	4.6			1.9	2.7
38	34H 25	502AH	A	20110324	-10.0				n/a
39	34H5	512E	A	20110330	-8.8				n/a
40	34HJ	502BX	A	20110314	-1.2	8.6	-9.8	-3.0	1.8

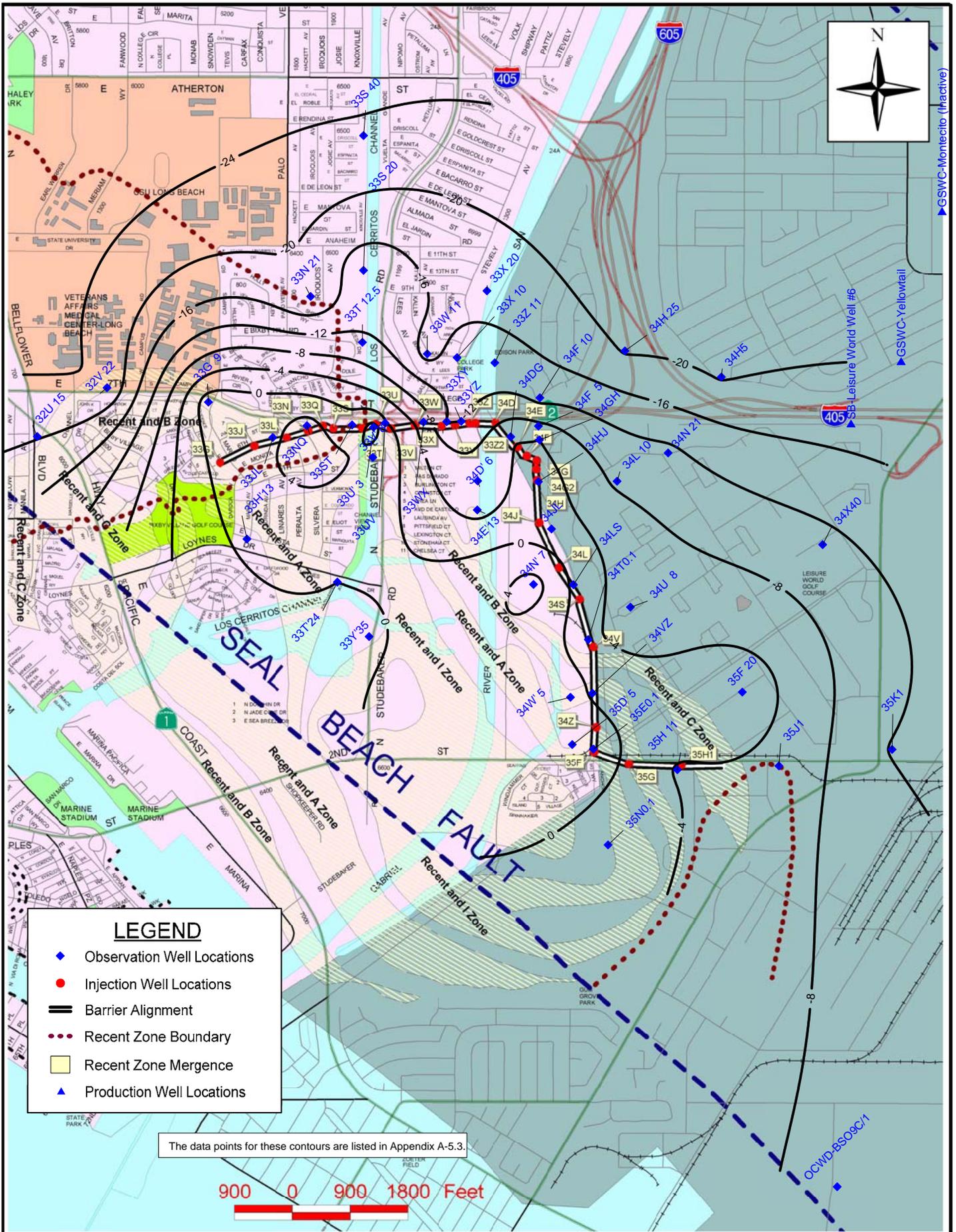
ALAMITOS BARRIER PROJECT
A-Zone
Groundwater Elevation Data for Contours and Tables

POINT	PROJ	FCD	AQUIFER	DATE	FY 10-11 ELEV	P.E. ¹	Δ ²	FY 09-10 ELEV	CHANGE IN ELEV
41	34JL	503AP	A	20110321	3.4	7.8	-4.4	-2.9	6.3
42	34L 10	502AM	A	20110328	2.1			-1.7	3.8
43	34LS	503BD	A	20110316	1.7	7.6	-5.9	-1.1	2.8
44	34N 21	512B	A	20110224	-5.6			-11.2	5.6
45	34N' 7	503AF	A	20110228	7.4				n/a
46	34U 8	513F	A	20110405	2.7			-1.5	4.2
47	34VZ	503BH	A	20110330	6.7	4.4	2.3	-0.7	7.4
48	34W' 5	503AJ	A	20110301	2.6			-3.6	6.2
49	34X40	513P	A	20110404	-9.9				n/a
50	35E0.1	503BK	A	20110329	2.3	2.4	-0.1	-5.1	7.4
51	35F 20	513J	A	20110328	-1.2			-8.6	7.4
52	35H 11	514G	A	20110321	-0.5	3.8	-4.3	-9.1	8.6
53	35H 12	514D	A	20110328	-1.5	2.8	-4.3	-10.1	8.6
54	35J1	514L	A	20110321	-2.4	6.2	-8.6	-9.8	7.4
55	35K1	523B	A	20110328	-3.0	5.8	-8.8	-11.6	8.6
56	OCWD- BSO9A/3			20110310	-5.6				n/a
AVG=					-4.4	AVG=		-6.0	

¹ P.E. represents the protective elevations calculated for internodal wells.

² Δ (+/-) represents how much groundwater level is above/below respective P.E.

= A max. or min. elevation during that period.



LEGEND

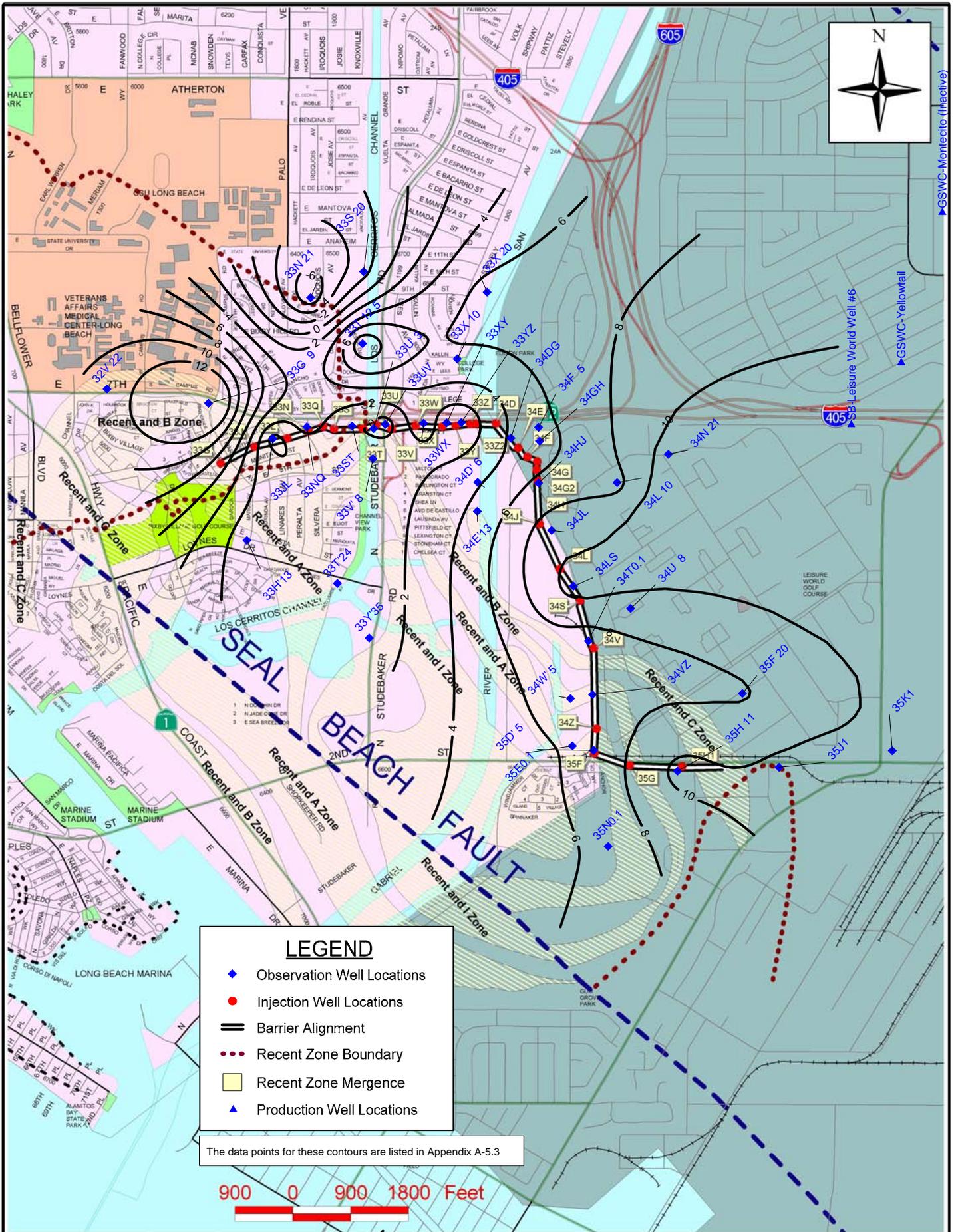
- ◆ Observation Well Locations
- Injection Well Locations
- Barrier Alignment
- ⋯ Recent Zone Boundary
- Recent Zone Mergence
- ▲ Production Well Locations

The data points for these contours are listed in Appendix A-5.3.

900 0 900 1800 Feet



Alamitos Barrier Project
I Zone Groundwater Elevation (ft) Contours Spring 2011



Alamitos Barrier Project
I Zone: Change in Elevation (ft), Spring 2010 to Spring 2011

ALAMITOS BARRIER PROJECT
I-Zone
Groundwater Elevation Data for Contours and Tables

POINT	PROJ	FCD	AQUIFER	DATE	FY 10-11 ELEV	P.E. ¹	Δ^2	FY 09-10 ELEV	CHANGE IN ELEV
1	32U 15	482L	I	20110210	-20.2				n/a
2	32V 22	482N	I	20110210	-23.4			-34.2	10.8
3	33G 9	482G	I	20110210	2.1			-15.2	17.3
4	33H'13	493XX	I	20110214	0.9			0.1	0.8
5	33JL	492BW	AI	20110314	3.4	3.1	0.3	4.1	-0.7
6	33N 21	492BV	I	20110215	-20.1			-12.5	-7.6
7	33NQ	492BP	AI	20110329	5.5	3.6	1.9	2.8	2.7
8	33S 20	492BS	I	20110216	-13.1			-10.4	-2.7
9	33S 40	491F	I	20110216	-23.3				n/a
10	33ST	492BM	I	20110314	1.0	4.2	-3.2	0.9	0.1
11	33T 12.5	492BT	I	20110302	-10.8			-20.7	9.9
12	33T'24	493RR	I	20110217	0.0			-0.1	0.1
13	33U' 3	492QQ	I	20110302	5.6			5.8	-0.2
14	33UV	492BJ	I	20110314	0.3	6.1	-5.8	1.3	-1.0
15	33V' 8	492BX	I	20110217	3.2			1.7	1.5
16	33W 11	502U	I	20110321	-17.2				n/a
17	33WX	502AG	I	20110316	-5.4	10.4	-15.8	-8.9	3.5
18	33X 10	502BE	I	20110314	-14.4			-20.1	5.7
19	33X 20	502H	I	20110315	-16.8			-23.5	6.7
20	33XY	502BP	I	20110316	-12.1	11.0	-23.1	-12.6	0.5
21	33Y'35	493ZZ	I	20110223	-0.7			-1.5	0.8
22	33YZ	502AE	I	20110315	-12.0	11.1	-23.1	-12.3	0.3
23	33Z 11	502W	I	20110405	-13.9				n/a
24	34D' 6	502BI	I	20110328	-7.2			-11.0	3.8
25	34DG	502AA	I	20110329	-4.4	11.1	-15.5	-8.7	4.3
26	34E'13	503AT	I	20110328	-5.2			-9.8	4.6
27	34F 5	502BQ	I	20110328	-7.2			-12.7	5.5
28	34F 10	502AS	I	20110324	-13.1				n/a
29	34GH	502BV	I	20110329	-4.0	11.3	-15.3	-8.8	4.8
30	34H 25	502AJ	I	20110324	-20.3				n/a
31	34H5	512D	I	20110330	-20.3				n/a
32	34HJ	502BW	I	20110329	-2.3	11.0	-13.3	-8.7	6.4
33	34JL	503AN	I	20110322	-2.3	10.5	-12.8	-11.4	9.1
34	34L 10	502AN	I	20110328	-8.7			-16.3	7.6
35	34LS	503BC	I	20110330	-0.6	9.5	-10.1	-11.4	10.8
36	34N 21	512C	I	20110224	-11.0			-21.8	10.8
37	34N' 7	503AG	I	20110420	5.5				n/a
38	34T0.1	503AD	I	20110316	-3.4	8.4	-11.8	-10.4	7.0
39	34U 8	513G	I	20110328	-5.9			-15.0	9.1
40	34VZ	503BG	I	20110329	-0.9	5.9	-6.8	-7.2	6.3

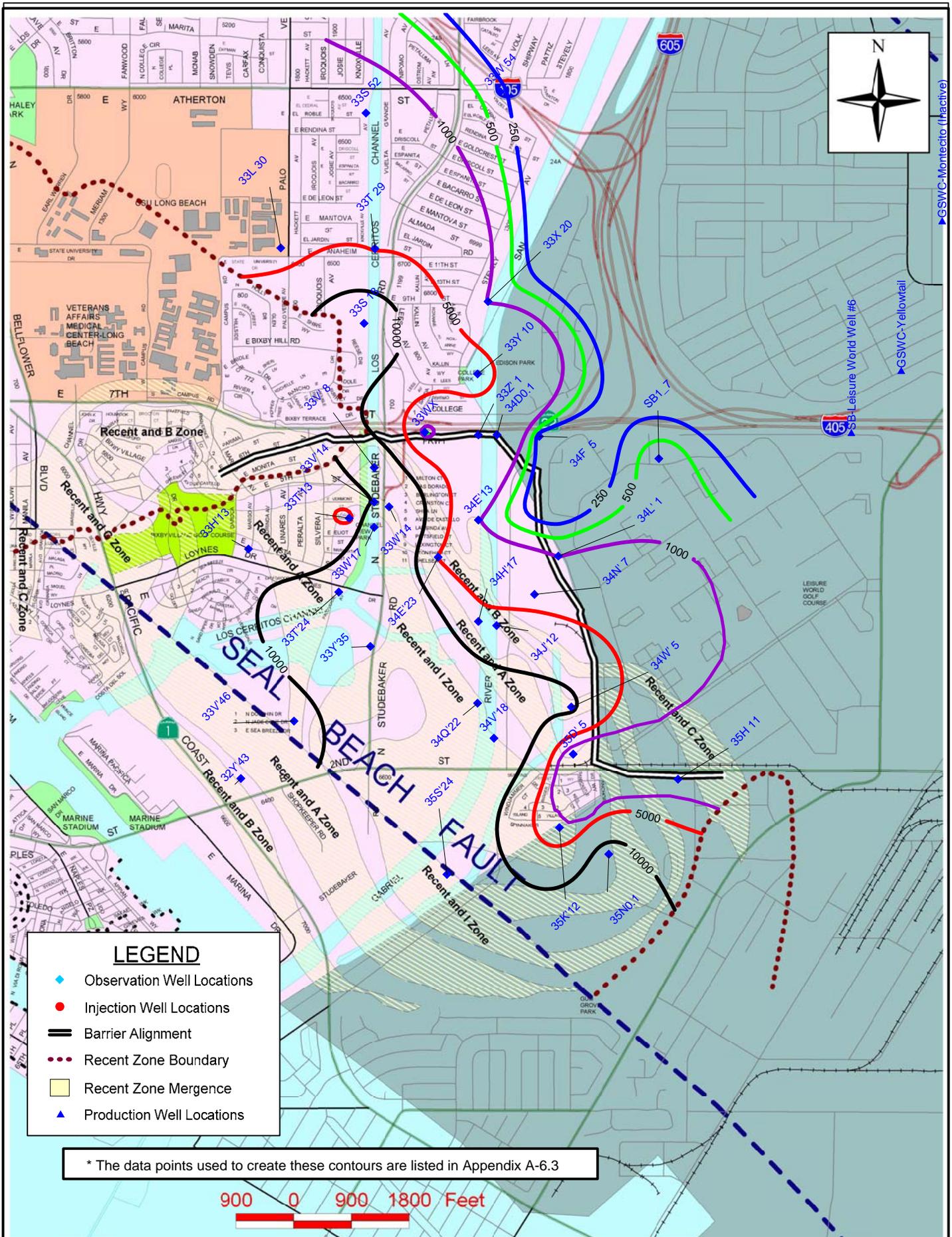
ALAMITOS BARRIER PROJECT
I-Zone
Groundwater Elevation Data for Contours and Tables

POINT	PROJ	FCD	AQUIFER	DATE	FY 10-11 ELEV	P.E. ¹	Δ ²	FY 09-10 ELEV	CHANGE IN ELEV
41	34W' 5	503AK	I	20110301	3.6			-3.6	7.2
42	34X40	513N	I	20110404	-10.8				n/a
43	35D' 5	503AM	I	20110301	1.7			-4.5	6.2
44	35E0.1	503BJ	I	20110329	2.4	3.0	-0.6	-4.5	6.9
45	35F 20	513H	I	20110328	-1.3			-9.2	7.9
46	35H 11	514H	I	20110330	-4.3	5.5	-9.8	-14.8	10.5
47	35J1	513M	I	20110328	-5.3			-15.6	10.3
48	35K1	523C	I	20110328	-12.3			-23.5	11.2
49	35N0.1	504N	I	20110303	-1.7			-8.1	6.4
50	OCWD- BSO9C/1			20110310	-9.0				n/a
AVG=					-6.6	AVG=		-9.8	

¹ P.E. represents the protective elevations calculated for internodal wells.

² Δ (+/-) represents how much groundwater level is above/below respective P.E.

= A max. or min. elevation during that period.



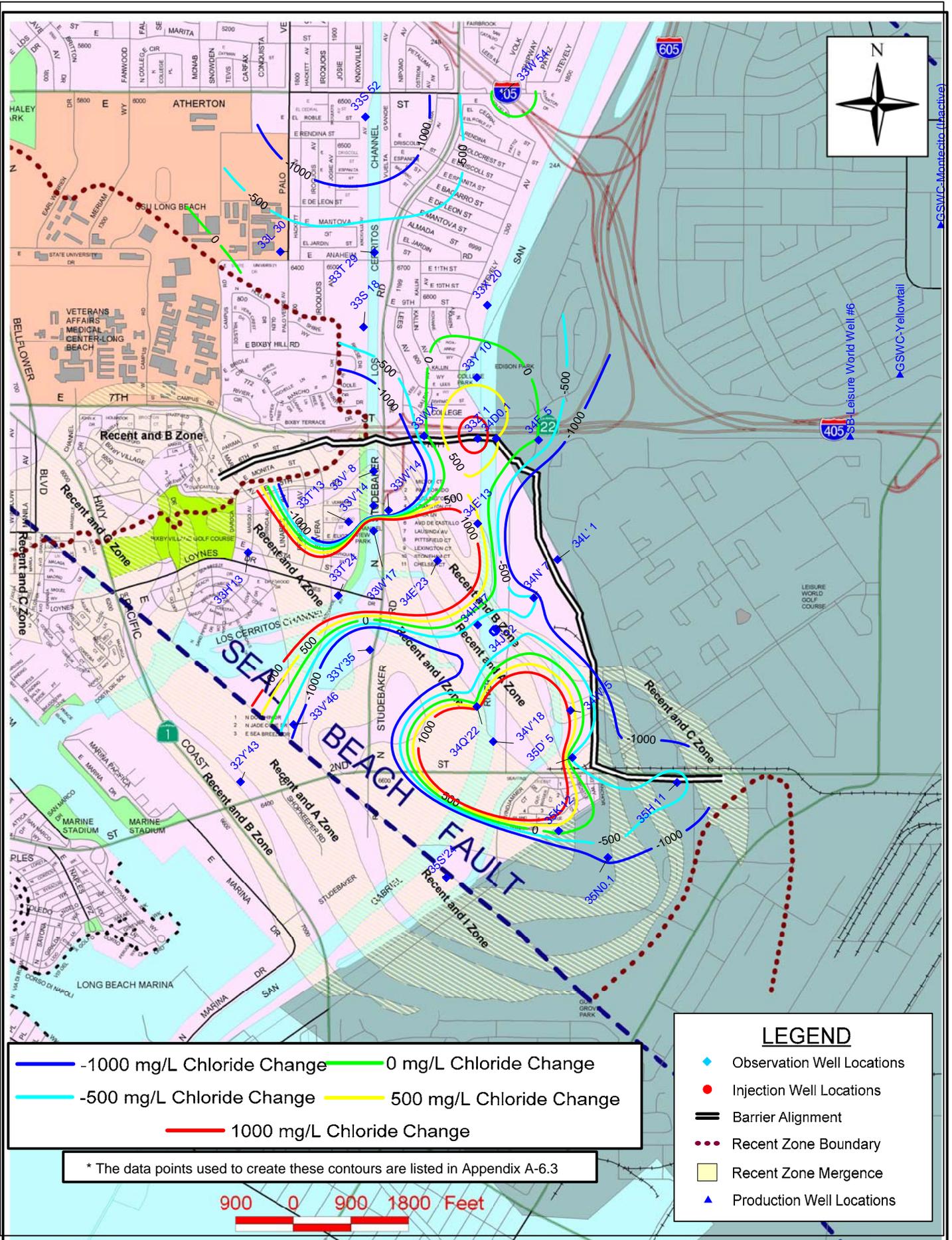
LEGEND

- ◆ Observation Well Locations
- Injection Well Locations
- Barrier Alignment
- ⋯ Recent Zone Boundary
- ▭ Recent Zone Mergence
- ▲ Production Well Locations

* The data points used to create these contours are listed in Appendix A-6.3



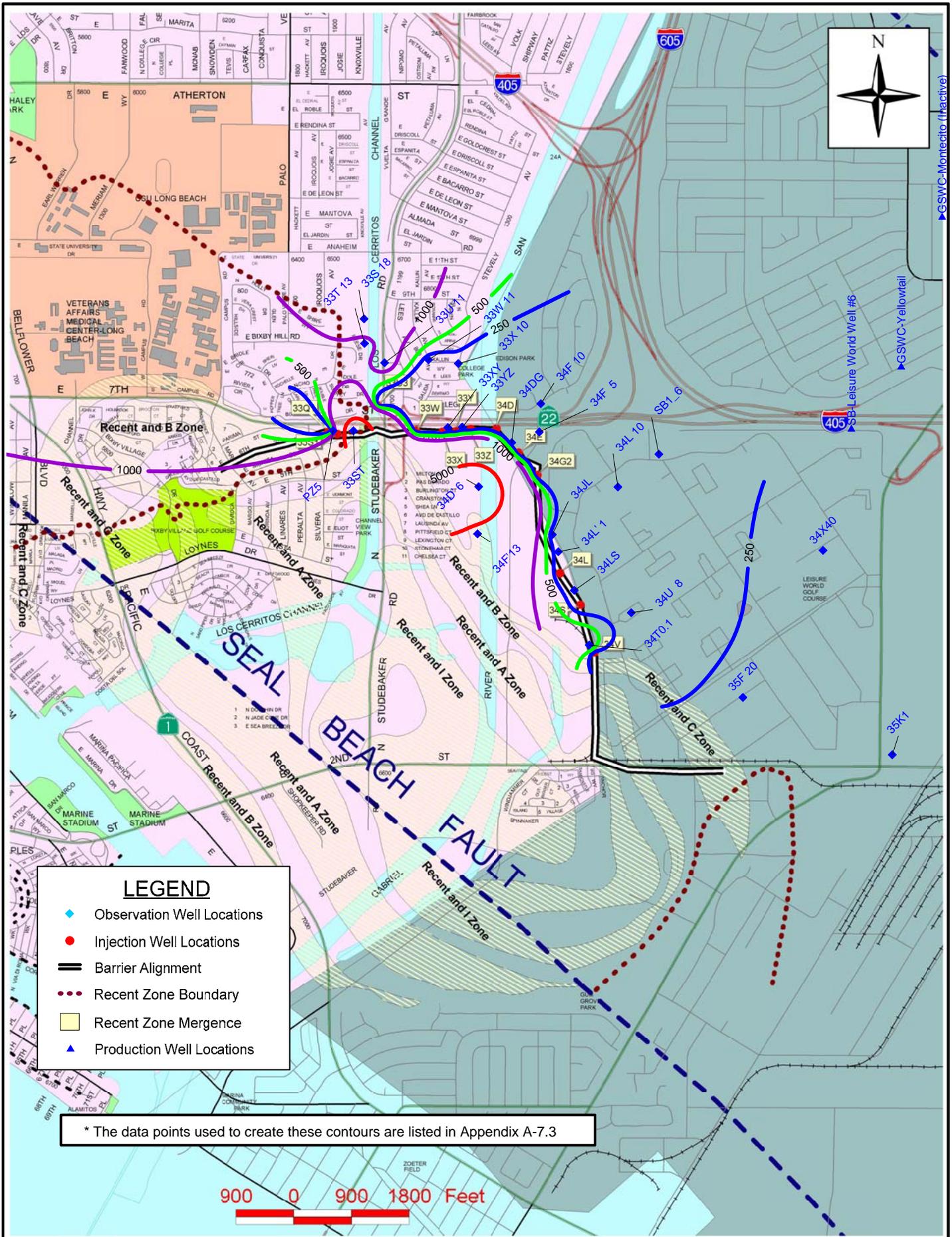
Alamitos Barrier Project
R Zone Chloride Concentration (mg/L) Contours: Spring 2011



Alamitos Barrier Project
 R Zone: Change in Chloride Concentration, Spring 2010 to Spring 2011

ALAMITOS BARRIER PROJECT
R-ZONE CHLORIDE CONCENTRATIONS
 Chloride Data Used for Contours and Cross-Section

No.	PROJ	FCD	DATE	AQUIFER	For Cross-Section (Intermodal Wells in Bold)						For Contours MAX CHL. 10-11	MAX CHLORIDE 09-10	Change in Chloride (FY10-11 - FY09-10)
					ELEV 1 (ft)	CHL 1 (mg/L)	ELEV 2 (ft)	CHL 2 (mg/L)	ELEV 3 (ft)	CHL 3 (mg/L)			
1	32Y43	493WW	20110310	R	-43	9,300					9,300	9,000	300
2	33H13	493YY	20110214	(R,A)	-18	2,730	-38	2,670	-58	-58	9,550	3,000	6,550
3	33L30	491G	20110214	R	-50	3,000					3,000	3,250	-250
4	33S18	492AH	20110215	R	-67	14,700					14,700	14,800	-100
5	33S52	491J	20110216	R	-54	1,550					1,550	3,700	-2,150
6	33T29	491D	20110302	R	-56	4,800					4,800	4,900	-100
7	33T13	492AU	20110302	R	-41	3,750	-51	3,450			3,750	11,100	-7,350
8	33T24	493SS	20110217	R	-17	12,300					12,300	9,600	2,700
9	33V8	492BY	20110217	(R,A)	-24	11,450	-48	14,300			14,300	18,700	-4,400
10	33V14	492JJ	20110217	R	-67	10,300					10,300	18,300	-8,000
11	33V46	493JU	20110217	R	-61	5,700					5,700	6,600	-900
12	33W54	501C	20110222	R	-33	320	-53	200			320	190	130
13	33W14	492AT	20110301	R	-46	17,800	-66	11,450			17,800	21,500	-3,700
14	33W17	493PP	20110301	R	-41	13,150	-51	17,050			17,050	6,300	10,750
15	33WX	502AZ	20110316	R	-45	75					75	180	-105
16	33X20	502L	20110315	R	-62	900					900	1,250	-350
17	33Y10	502BA	20110228	R	-58	1,550	-83	6,700			6,700	6,300	400
18	33Y35	493AB	20110223	R	-36	23,600					23,600	27,700	-4,100
19	33Z1	502AU	20110321	R	-46	3,600	-56	3,100			3,600	2,050	1,550
20	34D0.1	502AX	20110405	R	-53	2,700					2,700	2,200	500
21	34E13	503AU	20110223	R	-19	800	-52	1,050			1,050	425	625
22	34E23	503X	20110307	R	-43	4,800					4,800	100	4,700
23	34F5	502BT	20110323	R	-136	80	-146	75	-156	-156	80	105	-25
24	34H17	503Y	20110303	R	-46	5,950					5,950	6,650	-700
25	34J12	503U	20110307	R	-28	6,550	-36	6,550			6,550	7,650	-1,100
26	34L1	503P	20110331	R	-57	950					950	7,150	-6,200
27	34N7	503AE	20110228	R	-51	1,050	-61	1,700	-70	-70	3,850	4,200	-350
28	34Q22	503T	20110303	R	-42	5,950	-57	12,300			12,300	12,150	150
29	34V18	503V	20110307	R	-48	17,800					17,800	500	17,300
30	34W5	503AH	20110223	R	-51	11,000					11,000	10,250	750
31	35D5	503AL	20110301	R	-57	550					550	1,300	-750
32	35H11	514F	20110330	R	-42	540	-65	600			600	900	-300
33	35K12	504R	20110307	R	-44	1,200	-54	750			1,200	1,000	200
34	35N0.1	504M	20110303	R	-38	5,800	-62	12,800			12,800	13,500	-700
35	35S24	504K	20110307	R	-14	14,450					14,450	28,850	-14,400
36	SB1_7		20110331	R	n/a	760					760	n/a	n/a

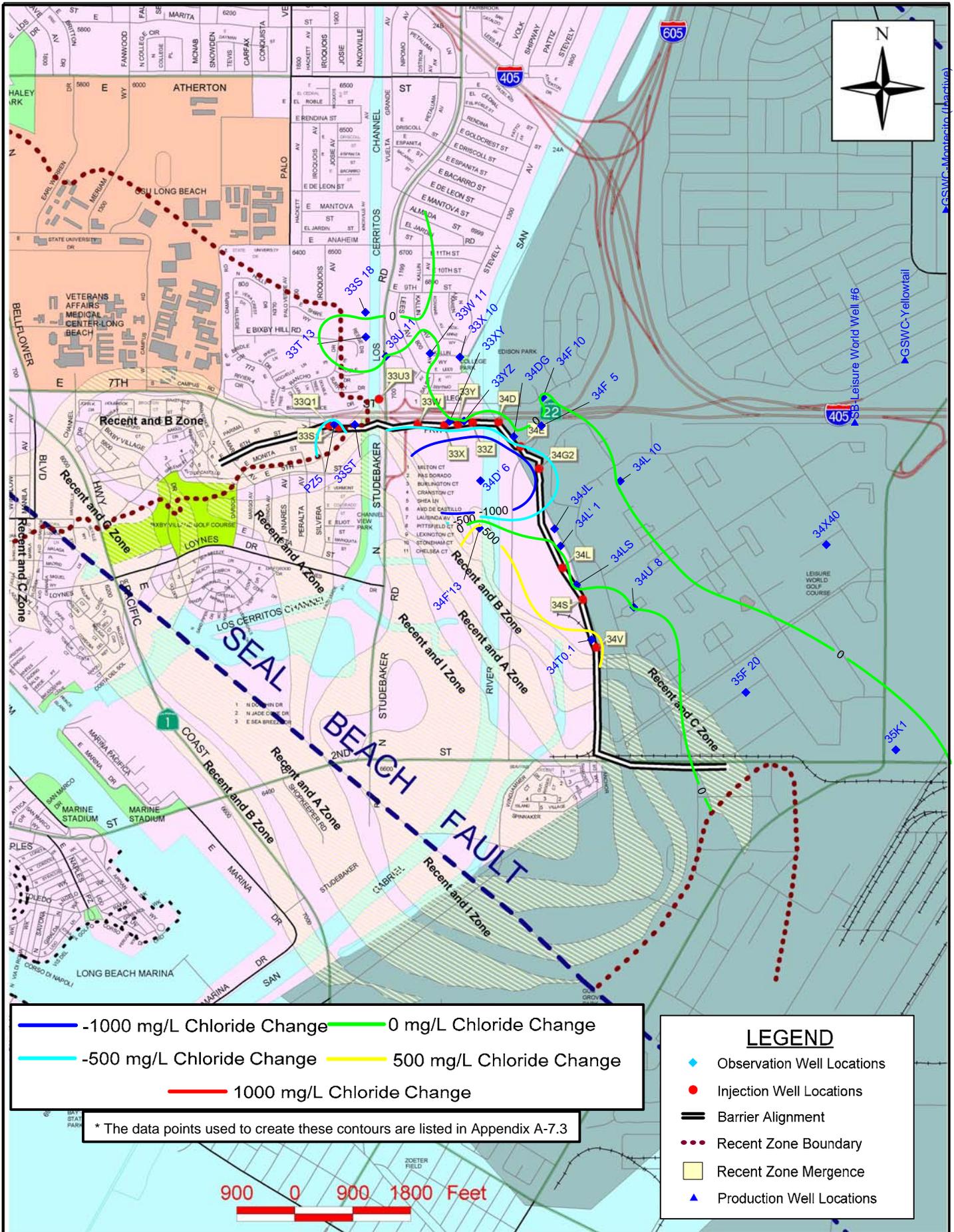


►GSWC-Montecito (Inactive)

►GSWC-Yellowtail

►SBL-Leisure World Well #6





— -1000 mg/L Chloride Change — 0 mg/L Chloride Change
— -500 mg/L Chloride Change — 500 mg/L Chloride Change
— 1000 mg/L Chloride Change

* The data points used to create these contours are listed in Appendix A-7.3



LEGEND

- ◆ Observation Well Locations
- Injection Well Locations
- Barrier Alignment
- ⋯ Recent Zone Boundary
- Recent Zone Mergence
- ▲ Production Well Locations



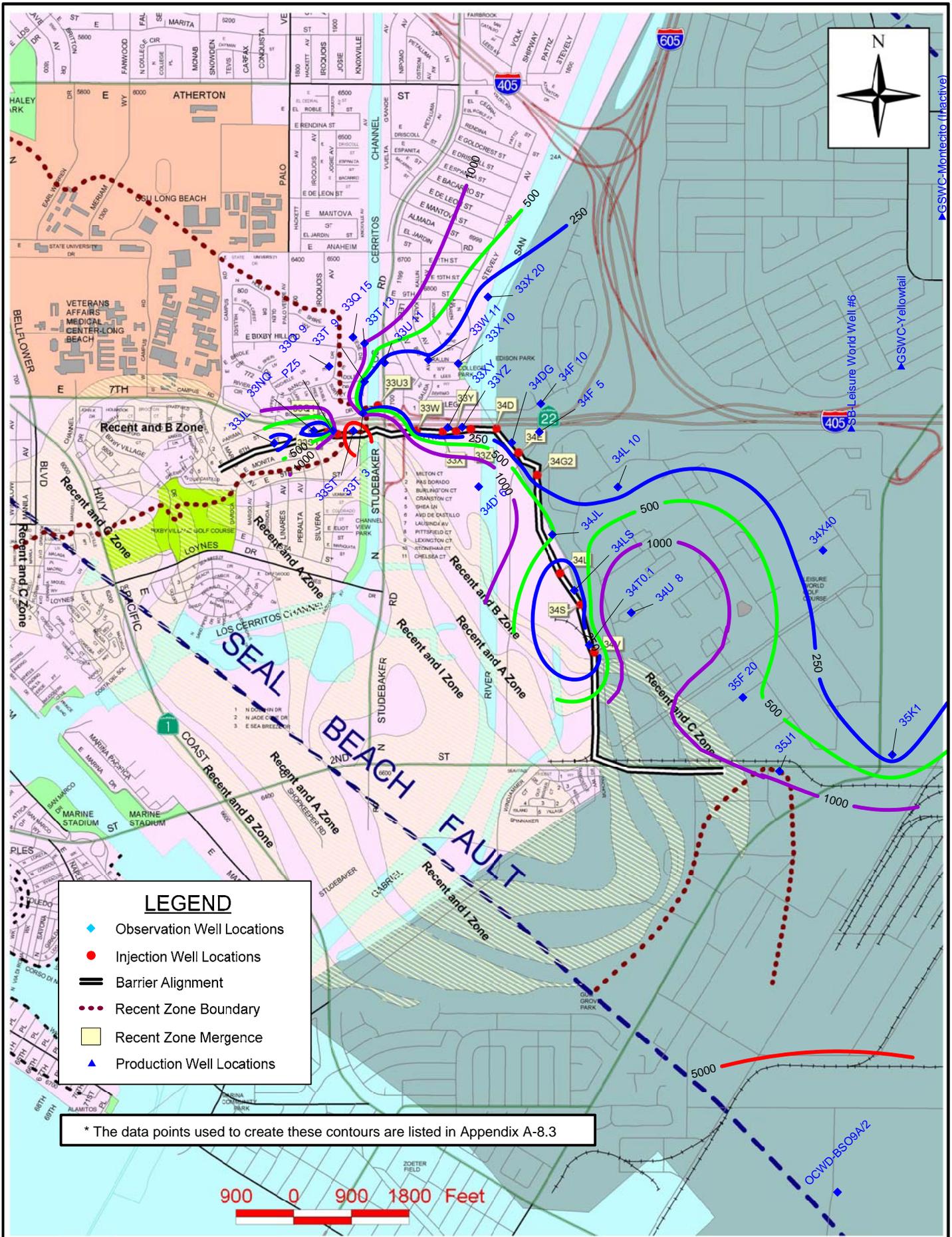
Alamitos Barrier Project
 C Zone: Change in Chloride Concentration, Spring 2010 to Spring 2011

C zone CL.srf

ALAMITOS BARRIER PROJECT
C-ZONE CHLORIDE CONCENTRATIONS
 Chloride Data Used for Contours and Cross-Section

No.	PROJ	FCD	DATE	AQUIFER	For Cross-Section (Intermodal Wells in Bold)				CHL 3 (mg/L)	For Contours MAX CHL. 10-11	MAX CHLORIDE 09-10	Change in Chloride (FY10-11 - FY09-10)
					ELEV 1 (ft)	CHL 1 (mg/L)	ELEV 2 (ft)	CHL 2 (mg/L)				
1	33S 18	492AG	20110215	C	-215	2,150			2,150	2,300	-150	
2	33ST	492BK	20110310	(C,B)	-25	8,800			8,800	9,200	-400	
3	33T 13	492AC	20110315	C	-199	600			600	160	440	
4	33U 11	492AL	20110317	C	-188	1,490			1,490	1,500	-10	
5	33W 11	502R	20110321	C	-183	80	-216	120	120	150	-30	
6	33X 10	502BB	20110223	C	-190	90	-215	160	160	100	60	
7	33XY	502BL	20110316	C	-195	75	-210	70	75	130	-55	
8	33YZ	502AB	20110317	C	-195	105	-210	80	105	100	5	
9	34D 6	502BF	20110222	C	-125	9,300			9,300	14,000	-4,700	
10	34DG	502X	20110329	C	-190	55	-205	80	80	140	-60	
11	34F 5	502BU	20110323	C	-191	90	-201	85	90	130	-40	
12	34F 10	502AP	20110324	C	-210	110			110	130	-20	
13	34F*13	503R	20110303	C	-44	4,050			4,050	3,250	800	
14	34JL	503AR	20110322	C	-161	110			110	170	-60	
15	34L' 1	503N	20110331	C	-162	120			120	150	-30	
16	34L 10	502AK	20110224	C	-166	95			95	75	20	
17	34LS	503BF	20110321	C	-133	90	-151	100	100	150	-50	
18	34T0.1	503AB	20110322	C	-134	905			905	300	605	
19	34U 8	513D	20110405	C	-150	120	-165	90	120	130	-10	
20	34X40	513R	20110404	C	-85	500	-101	38	500	90	410	
21	35F 20	513L	20110324	C	-70	340	-78	360	360	690	-330	
22	35K1	523D	20110315	C	-88	390		400	400	460	-60	
23	PZ5	492CH	20110210	(C,B)	-24	200			200	750	-550	
24	SB1_6	523D	20110315	C	n/a	89			89	n/a	n/a	
25	33Q1								50	50	n/a	
26	33U3								50	50	n/a	
27	33W								50	50	n/a	
28	33X								50	50	n/a	
29	33Y								50	50	n/a	
30	33Z								50	50	n/a	
31	34D								50	50	n/a	
32	34E								50	50	n/a	
33	34G2								50	50	n/a	
34	34L								50	50	n/a	
35	34S								50	50	n/a	
36	34V								50	50	n/a	

DP = Dummy Point with an assumed chloride concentration of 50 mg/L. Placed at wells that were injecting into this zone during this reporting period.



GSWC-Montecito (Inactive)

GSWC-Yellowtail

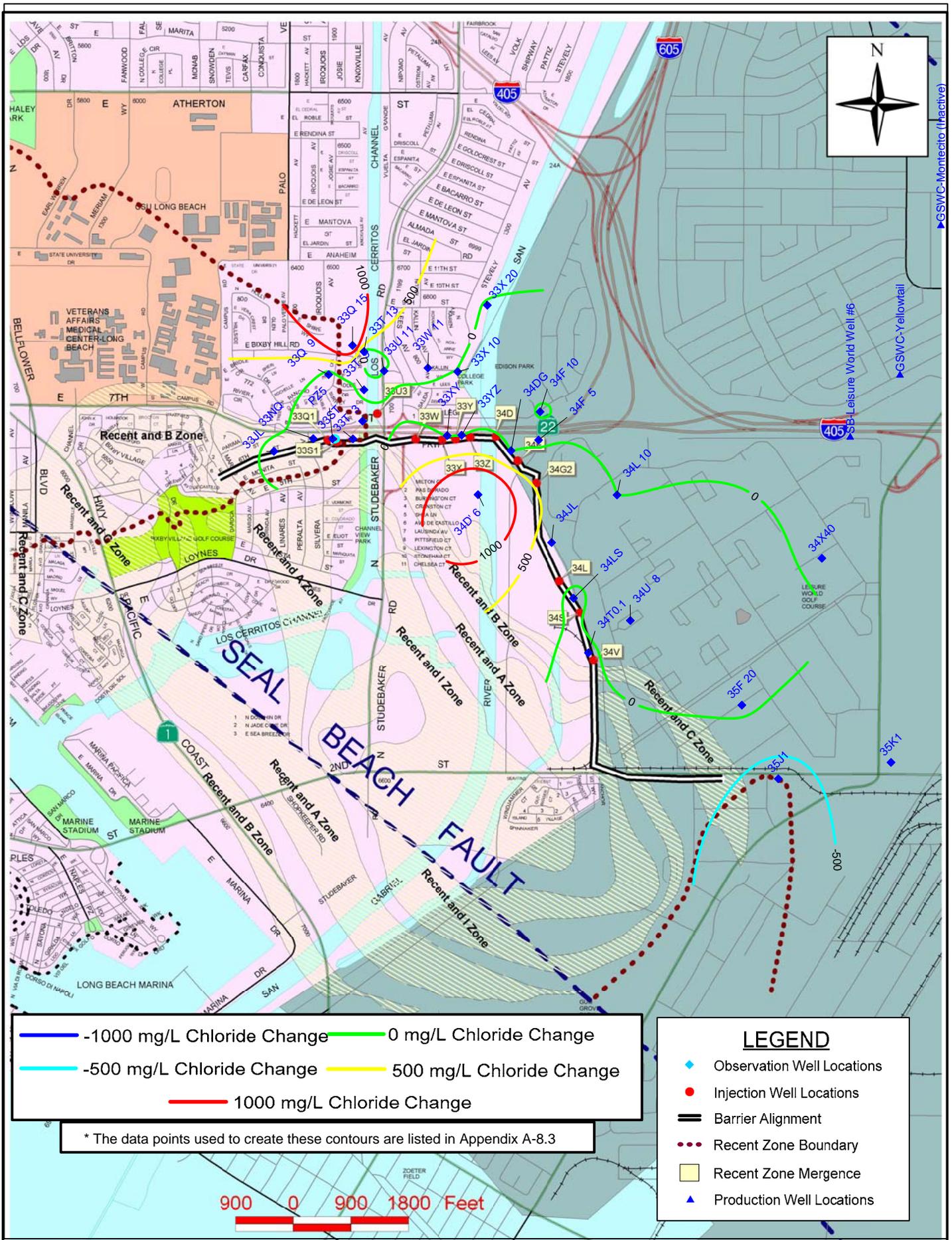
Leisure World Well #6

OCWD-B509A2

B zone CL.srf



Alamitos Barrier Project
B Zone Chloride Concentration (mg/L) Contours: Spring 2011



* The data points used to create these contours are listed in Appendix A-8.3

LEGEND

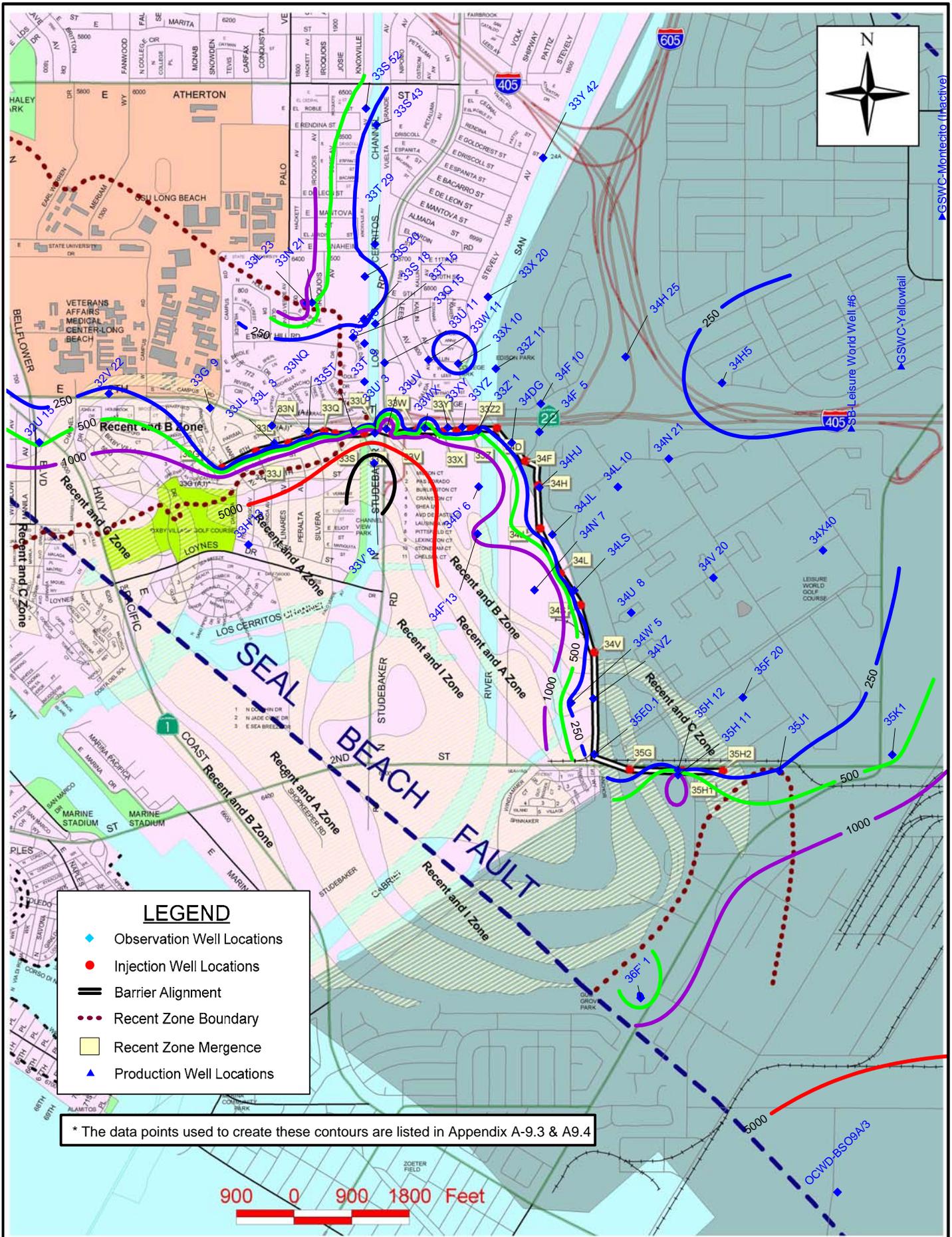
- ◆ Observation Well Locations
- Injection Well Locations
- Barrier Alignment
- ⋯ Recent Zone Boundary
- Recent Zone Mergence
- ▲ Production Well Locations



ALAMITOS BARRIER PROJECT
B-ZONE CHLORIDE CONCENTRATIONS
 Chloride Data Used for Contours and Cross-Section

No.	PROJ	FCD	DATE	AQUIFER	For Cross-Section (Intermodal Wells in Bold)						CHL 3 (mg/L)	For Contours MAX CHL. 10-11	MAX CHLORIDE 09-10	Change in Chloride (FY10-11 - FY09-10)
					ELEV 1 (ft)	CHL 1 (mg/L)	ELEV 2 (ft)	CHL 2 (mg/L)	ELEV 3 (ft)	CHL 3 (mg/L)				
1	33JL	492BQ	20110314	B	3	110	-7	110	110		160	-50		
2	33NQ	492BN	20110314	B	-3	140	-14	120	140		140	0		
3	33Q.9	492CM	20110215	B	-85	150	-95	1,800	4,100		4,250	-150		
4	33Q.15	492AN	20110215	B	-263	3,450			3,450		1,650	1,800		
5	33ST	492BK	20110310	(C,B)	-25	8,800			8,800		9,200	-400		
6	33T.3	492CL	20110216	B	-40	55	-57	160	80		240	-80		
7	33T.9	492YY	20110314	B	-163	180			190		120	70		
8	33T.13	492AB	20110315	B	-254	870			870		1,050	-180		
9	33U.11	492AK	20110317	B	-260	170			170		160	10		
10	33W.11	502S	20110321	B	-241	230	-269	220	230		170	60		
11	33X.10	502BC	20110223	B	-275	95			95		100	-5		
12	33X.20	502K	20110315	B	-266	110			110		140	-30		
13	33XY	502BM	20110315	B	-245	110			110		130	-20		
14	33YZ	502AC	20110315	B	-214	86	-263	85	86		100	-14		
15	34D.6	502BG	20110222	B	-180	2,200	-194	1,300	2,200		110	2,090		
16	34DG	502Y	20110329	B	-232	110	-257	70	110		120	-10		
17	34F.5	502BS	20110323	B	-231	90	-260	80	90		140	-50		
18	34F.10	502AQ	20110324	B	-269	135			135		110	25		
19	34JL	503AQ	20110322	B	-196	35	-211	515	515		310	205		
20	34L.10	502AL	20110224	B	-224	130	-249	120	130		130	0		
21	34LS	503BE	20110321	B	-188	95			95		160	-65		
22	34T0.1	503AC	20110322	B	-174	90	-207	85	90		160	-70		
23	34U.8	513E	20110405	B	-225	2,700			2,700		2,300	400		
24	34X40	513Q	20110404	B	-137	35			35		80	-45		
25	35F.20	513K	20110324	B	-115	550			550		430	120		
26	35J1	514M	20110328	B	-128	775	-143	900	905		1,650	-745		
27	35K1	523A	20110315	B	-127	120	-142	140	150		220	-70		
28	PZ5	492CH	20110210	(C,B)	-24	200			200		750	-550		
29	OCWD-BS09A/2		20110331	B	n/a				7,460		n/a	n/a		
29	33Q1			B			DP1		50		50	n/a		
30	33U3			B			DP2		50		50	n/a		
31	33W			B			DP3		50		50	n/a		
32	33X			B			DP4		50		50	n/a		
33	33Y			B			DP5		50		50	n/a		
34	33Z			B			DP6		50		50	n/a		
35	34D			B			DP7		50		50	n/a		
36	34E			B			DP8		50		50	n/a		
37	34G2			B			DP9		50		50	n/a		
38	34L			B			DP10		50		50	n/a		
39	34S			B			DP11		50		50	n/a		
40	34V			B			DP12		50		50	n/a		

DP = Dummy Point with an assumed chloride concentration of 50 mg/L. Placed at wells that were injecting into this zone during this reporting period.



LEGEND

- ◆ Observation Well Locations
- Injection Well Locations
- Barrier Alignment
- ⋯ Recent Zone Boundary
- Recent Zone Mergence
- ▲ Production Well Locations

* The data points used to create these contours are listed in Appendix A-9.3 & A9.4

900 0 900 1800 Feet



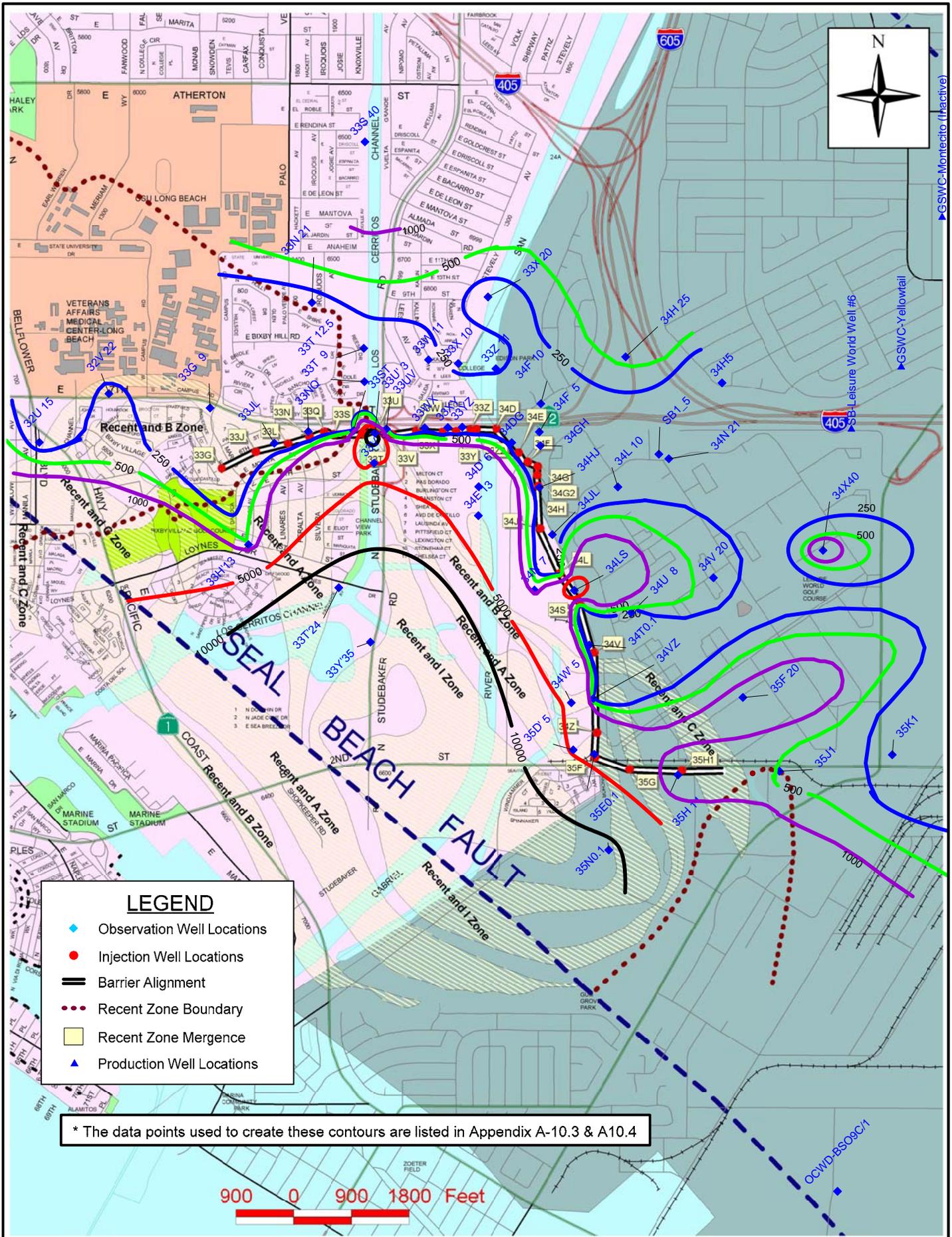
ALAMITOS BARRIER PROJECT
A-ZONE CHLORIDE CONCENTRATIONS
 Chloride Data Used for Contours and Cross-Section

No.	PROJ	FCD	DATE	AQUIFER	For Cross-Section (Intermodal Wells in Bold)						MAX CHLORIDE 09-10	Change in Chloride (FY10-11 - FY09-10)
					ELEV 1 (ft)	CHL 1 (mg/L)	ELEV 2 (ft)	CHL 2 (mg/L)	ELEV 3 (ft)	CHL 3 (mg/L)		
1	32U 15	482M	20110210	A	-17	430				430	380	50
2	32V 22	482P	20110210	A	-11	300				300	95	205
3	33G 9	482F	20110210	A	-3		-23	120		120	240	-120
4	33H13	493YY	20110214	(R,A)	-18	2,730	-38	2,670	-58	9,550	3,000	6,550
5	33JL	492BW	20110314	(A,I)	-41	85	-79	80	-116	85	140	-55
6	33L 3	492	20110222	A	-60	140				140	140	0
7	33L 23	492RR	20110214	A	-344	1,100				1,100	4,100	-3,000
8	33N 21	492BU	20110214	A	-305	300	-330	130	-351	510	450	60
9	33NQ	492BP	20110314	(A,I)	-48	75	-92	75	-136	75	110	-35
10	33Q 15	492AM	20110215	A	-337	140				140	3,400	-3,260
11	33S 18	492AE	20110215	A	-241	310				310	320	-10
12	33S 20	492BR	20110216	A	-317	210	-336	400	-355	210	600	-200
13	33S 43	491E	20110318	A	-333	90	-344	110		110	170	-60
14	33S 52	491H	20110216	A	-284	310	-288	210		310	260	50
15	33ST	492BL	20110310	A	-65	85	-86	100	-100	70	105	-5
16	33T 9	492TT	20100930	A	-262	90				90	150	-60
17	33T 13	492ZZ	20110315	A	-128	255				255	200	55
18	33T 15	492SS	20110310	A	-334	150				150	230	-80
19	33T 29	491C	20110308	A	-327	70				70	160	-90
20	33U 11	492AJ	20110317	A	-348	120				120	520	-400
21	33U 3	492WV	20110302	A	-80	1,850				1,850	3,500	-1,650
22	33UV	492BH	20110314	A	-106	210	-131	3,050	-155	3,050	1,100	1,950
23	33V 8	492BY	20110217	(R,A)	-24	11,450	-48	14,300		14,300	18,700	-4,400
24	33W 11	502T	20110321	A	-321	80	-349	220	-376	120	140	80
25	33WX	502AF	20110316	A	-258	475	-281	820	-297	835	350	485
26	33X 10	502BD	20110223	A	-320	95	-340	215	-356	405	100	305
27	33X 20	502J	20110315	A	-353	100				100	150	-50
28	33XY	502BN	20110315	A	-279	90	-296	115	-311	170	170	0
29	33Y 42	501A	20110308	A	-336	160				160	160	0
30	33YZ	502AD	20110315	A	-296	65	-318	105		105	85	20
31	33Z 1	502G	20110321	A	-320	500				500	400	100
32	33Z 11	502V	20110405	A	-321	90	-346	90		90	130	-40
33	34D 6	502BH	20110222	A	-270	2,550	-303	2,050	-335	300	400	2,150
34	34DG	502Z	20110329	A	-292	65	-324	80		80	130	-50
35	34F 5	502BR	20110323	A	-297	65	-322	140	-347	140	180	-40
36	34F 10	502AR	20110324	A	-311	130	-326	130		130	130	0
37	34F13	503Q	20110303	A	-107	460				460	700	-240
38	34H 25	502AH	20110324	A	-297	70	-312	70	-332	75	-55	130
39	34H5	512E	20110330	A	-298	350	-313	400	-328	300	210	190
40	34HJ	502BX	20110330	A	-301	55	-321	70	-331	60	-60	130

ALAMITOS BARRIER PROJECT
A-ZONE CHLORIDE CONCENTRATIONS
 Chloride Data Used for Contours and Cross-Section

No.	PROJ	FCD	DATE	AQUIFER	For Cross-Section (Intermodal Wells in Bold)						For Contours MAX CHL. 10-11	MAX CHLORIDE 09-10	Change in Chloride (FY10-11 - FY09-10)
					ELEV 1 (ft)	CHL 1 (mg/L)	ELEV 2 (ft)	CHL 2 (mg/L)	ELEV 3 (ft)	CHL 3 (mg/L)			
41	34JL	503AP	20110322	A	-263	85	-288	75	-308	80	85	-45	130
42	34L 10	502AM	20110224	A	-310	90	-330	70	-354	110	110	0	110
43	34LS	503BD	20110321	A	-238	85	-283	85	-354	110	85	-55	140
44	34N 21	512B	20110224	A	-328	110	-354	100			110	5	105
45	34N 7	503AF	20110228	A	-106	150	-144	3,300	-176	3,300	3,300	2,900	400
46	34U 8	513F	20110405	A	-280	100	-310	120			120	-230	350
47	34V 20	513B	20110331	A	-234	200	-252	100	-265	150	200	50	150
48	34VZ	503BH	20110324	A	-146	120	-156	90			120	-20	140
49	34W 5	503AJ	20110301	A	-81	120	-101	160	-119	130	160	-290	450
50	34X40	513P	20110404	A	-202	50	-232	75			75	-15	90
51	35E0.1	503BK	20110315	A	-74	100					100	-30	130
52	35F 20	513J	20110324	A	-129	160	-158	220			220	30	190
53	35H 11	514G	20110330	A	-123	700	-146	1,300			1,300	-4,700	6,000
54	35H 12	514D	20110328	A	-193	120					120	-130	250
55	35J1	514L	20110328	A	-197	80	-208	140	-228	260	260	-740	1,000
56	35K1	523B	20110315	A	-197	35	-212	350	-227	430	430	-40	470
57	36F 1	505D	20110310	A	-86	220					220	-980	1,200
58	OCWD-BSO9A/3		20110331	A	n/a	8,030					8,030	n/a	n/a
59	33G					DP1					50	50	n/a
60	33J					DP2					50	50	n/a
61	33L					DP3					50	50	n/a
62	33N					DP4					50	50	n/a
63	33Q					DP5					50	50	n/a
64	33S					DP6					50	50	n/a
65	33T					DP7					50	50	n/a
66	33U					DP8					50	50	n/a
67	33V					DP9					50	50	n/a
68	33W					DP10					50	50	n/a
69	33X					DP11					50	50	n/a
70	33Y					DP12					50	50	n/a
71	33Z					DP13					50	50	n/a
72	33Z2					DP14					50	50	n/a
73	34D					DP15					50	50	n/a
74	34F					DP16					50	50	n/a
75	34H					DP17					50	50	n/a
76	34J					DP18					50	50	n/a
77	34L					DP19					50	50	n/a
78	34S					DP20					50	50	n/a
79	34V					DP21					50	50	n/a
80	35G					DP22					50	50	n/a
81	35H1					DP23					50	50	n/a
82	35H2					DP24					50	50	n/a

DP = Dummy Point with an assumed chloride concentration of 50 mg/L. Placed at wells that were injecting into this zone during this reporting period.

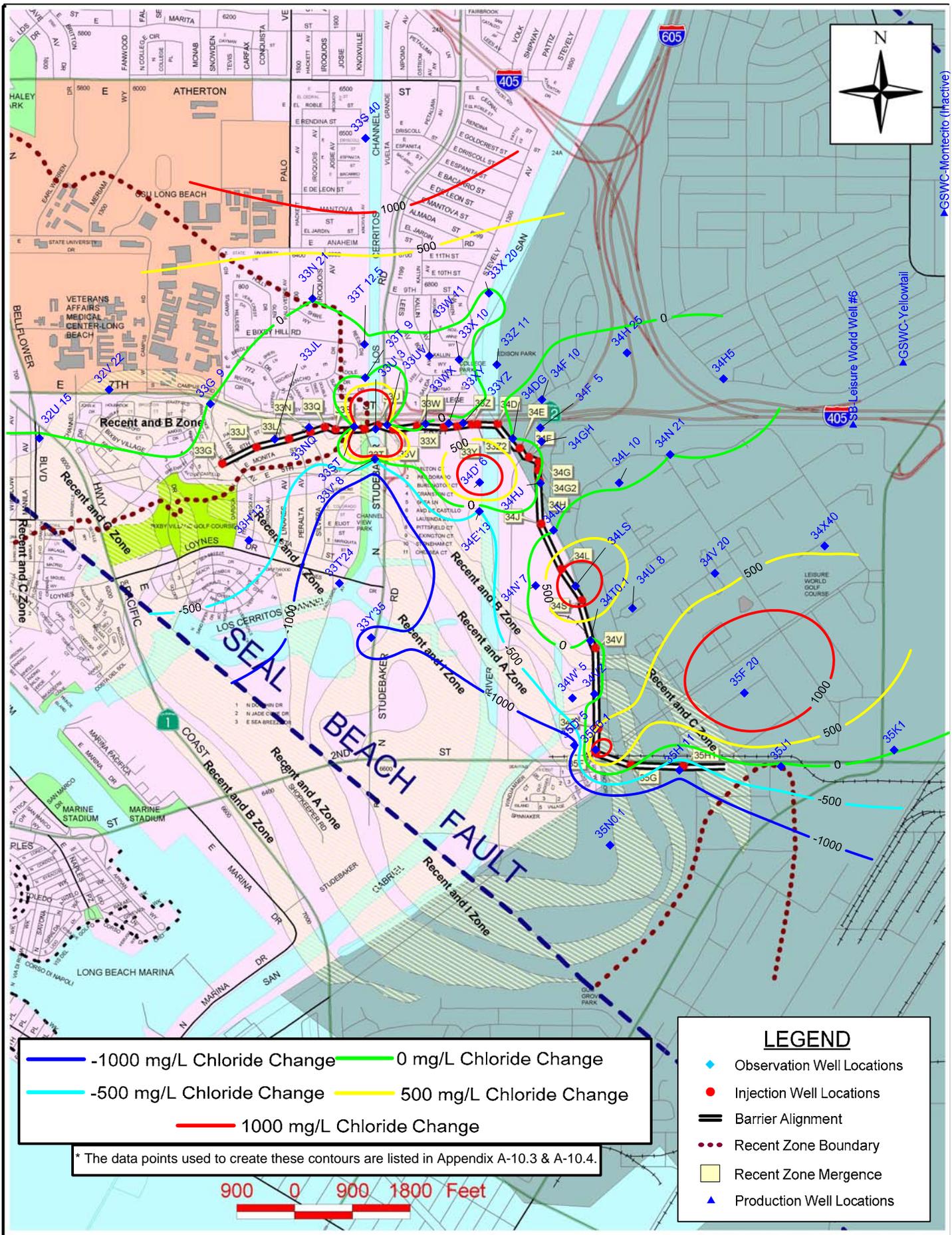


LEGEND

- ◆ Observation Well Locations
- Injection Well Locations
- Barrier Alignment
- ⋯ Recent Zone Boundary
- ▭ Recent Zone Mergence
- ▲ Production Well Locations

* The data points used to create these contours are listed in Appendix A-10.3 & A10.4





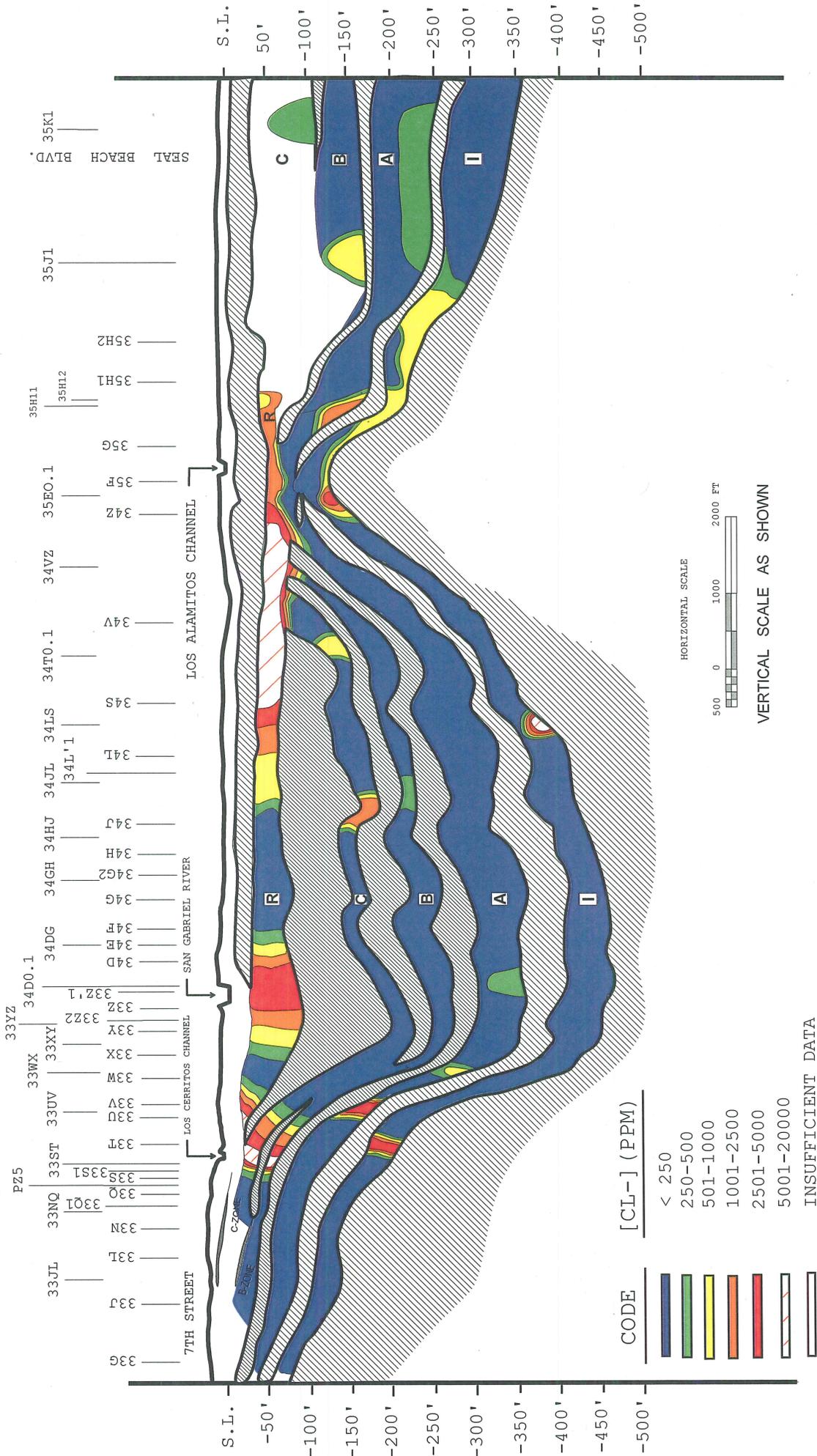
**ALAMITOS BARRIER PROJECT
I-ZONE CHLORIDE CONCENTRATIONS
Chloride Data Used for Contours and Cross-Section**

No.	PROJ	FCD	DATE	AQUIFER	For Cross-Section (Intermodal Wells in Bold)						CHL 3 (mg/L)	For Contours MAX CHL. 10-11	MAX CHLORIDE 09-10	Change in Chloride (FY10-11 - FY09-10)
					ELEV 1 (ft)	CHL 1 (mg/L)	ELEV 2 (ft)	CHL 2 (mg/L)	ELEV 3 (ft)	CHL 3 (mg/L)				
1	32U 15	482L	20110210	I	-74	85					85	100	-15	
2	32V 22	482N	20110210	I	-51	280					280	160	120	
3	33G 9	482G	20110210	I	-84	100	-68	95	-78	145	145	160	-5	
4	33H 13	493XX	20110214	I	-39	550					550	550	0	
5	33JL	492BW	20110314	(A.I.)	-41	85	-79	80	-116	85	85	140	-55	
6	33N 21	492BV	20110215	I	-457	130	-466	130			130	120	10	
7	33NQ	492BP	20110314	(A.I.)	-48	75	-92	75	-136	70	75	110	-35	
8	33S 40	491F	20110216	I	-470	2,300					2,300	310	1,990	
9	33ST	492BM	20110310	I	-130	140	-148	125	-163	115	140	180	-40	
10	33T 9	492XX	20110314	I	-364	130					130	180	-50	
11	33T 12.5	492BT	20110302	I	-423	130	-438	160	-441	130	160	160	0	
12	33T 24	493RR	20110217	I	-52	13,500	-75				13,500	15,050	-1,550	
13	33U 3	492QQ	20110302	I	-115	16,800					16,800	370	16,430	
14	33UV	492BJ	20110314	I	-209	100	-228	160	-246	70	160	140	20	
15	33V 8	492BX	20110217	I	-109	4,100	-130	4,800			4,800	5,300	-500	
16	33W 11	502U	20110321	I	-423	110	-446	90	-468	90	110	130	-20	
17	33WX	502AG	20110316	I	-374	70	-391	75	-405	70	75	50	25	
18	33X 10	502BE	20110223	I	-420	445	-440	230	-460		445	500	-55	
19	33X 20	502H	20110315	I	-442	100					100	130	-30	
20	33XY	502BP	20110316	I	-404	150	-417	215	-422	215	215	120	95	
21	33Y 35	493ZZ	20110223	I	-67	26,600					26,600	27,500	-900	
22	33YZ	502AE	20110315	I	-402	130	-433	125			130	95	35	
23	33Z 11	502W	20110405	I	-417	120	-437	105	-457	290	290	160	130	
24	34D 6	502BI	20110222	I	-400	3,800	-410	3,600	-418	3,500	3,800	1,600	2,200	
25	34DG	502AA	20110329	I	-402	160	-432	160			160	170	-10	
26	34E 13	503AT	20110223	I	-289	2,650	-308	2,650			2,650	3,200	-550	
27	34F 5	502BC	20110323	I	-411	80	-426	80	-441	90	90	140	-50	
28	34F 10	502AS	20110324	I	-416	80	-442	80			80	140	-60	
29	34GH	502BV	20110322	I	-412	80	-427	75	-435	100	100	135	-35	
30	34H 25	502AJ	20110324	I	-407	545	-427	585	-434	575	585	640	-55	
31	34H5	512D	20110330	I	-408	90	-423	110	-443	70	110	310	-200	
32	34HJ	502BW	20110330	I	-407	70	-417	80	-427	80	80	150	-70	
33	34JL	503AN	20110322	I	-383	70	-402	75			75	110	-35	
34	34L 10	502AN	20110224	I	-404	30	-426	38			38	80	-43	
35	34LS	503BC	20110321	I	-338	105	-368	9,450			9,450	7,600	1,850	
36	34N 21	512C	20110224	I	-423	120	-448	100			120	120	0	
37	34N 7	503AG	20110228	I	-221	290	-254	610	-274	500	610	500	110	

ALAMITOS BARRIER PROJECT
I-ZONE CHLORIDE CONCENTRATIONS
 Chloride Data Used for Contours and Cross-Section

No.	PROJ	FCD	DATE	AQUIFER	For Cross-Section (Intermodal Wells in Bold)					CHL 3 (mg/L)	For Contours MAX CHL. 10-11	MAX CHLORIDE 09-10	Change in Chloride (FY10-11 - FY09-10)
					ELEV 1 (ft)	CHL 1 (mg/L)	ELEV 2 (ft)	CHL 2 (mg/L)	ELEV 3 (ft)				
38	34T0.1	503AD	20110322	I	-289	85	-312	90	-334	95	150	-55	
39	34U 8	513G	20110404	I	-360	170	-375	150		170	160	10	
40	34V 20	513C	20110331	I	-386	340				340	90	250	
41	34VZ	503BG	20110324	I	-214	80	-224	130		130	250	-120	
42	34W 5	503AK	20110301	I	-156	4,350				4,350	4,350	0	
43	34X40	513N	20110404	I	-331	2,800	-346	3,600		3,600	3,150	450	
44	35D 5	503AM	20110301	I	-89	4,550				4,550	5,800	-1,250	
45	35E0.1	503BJ	20110315	I	-114	4,100				4,100	2,650	1,450	
46	35F 20	513H	20110324	I	-235	2,000	-245	4,000	-255	4,800	2,500	2,300	
47	35H 11	514H	20110330	I	-203	550				550	1,450	-900	
48	35J1	513M	20110328	I	-261	315	-271	105		130	400	85	
49	35K1	523C	20110315	I	-363	50		80		80	60	20	
50	35N0.1	504N	20110303	I	-71	11,150				11,150	14,100	-2,950	
51	SB1_5		20110512	I	n/a	20				20	20	n/a	
52	OCWD-BSO9C/1		20110331	I	n/a	2,920				2,920	2,920	n/a	
53	33G			I						50	50	n/a	
54	33J			I						50	50	n/a	
55	33L			I						50	50	n/a	
56	33N			I						50	50	n/a	
57	33Q			I						50	50	n/a	
58	33S			I						50	50	n/a	
59	33U			I						50	50	n/a	
60	33V			I						50	50	n/a	
61	33W			I						50	50	n/a	
62	33X			I						50	50	n/a	
63	33Y			I						50	50	n/a	
64	33Z			I						50	50	n/a	
65	33Z2			I						50	50	n/a	
66	34D			I						50	50	n/a	
67	34E			I						50	50	n/a	
68	34F			I						50	50	n/a	
69	34G2			I						50	50	n/a	
70	34H			I						50	50	n/a	
71	34J			I						50	50	n/a	
72	34L			I						50	50	n/a	
73	34S			I						50	50	n/a	
74	34V			I						50	50	n/a	

DP = Dummy Point with an assumed chloride concentration of 50 mg/L. Placed at wells that were injecting into this zone during this reporting period.



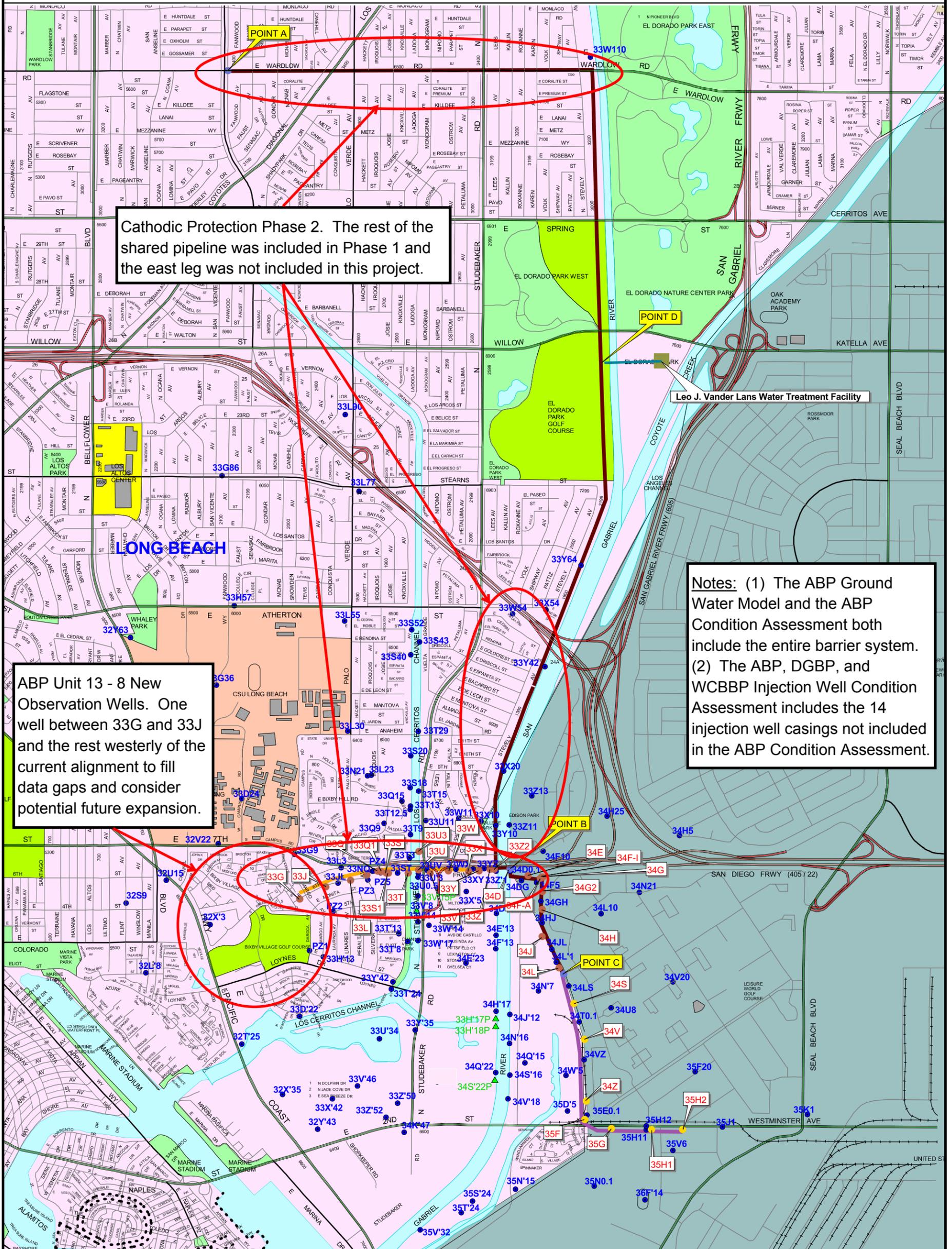
Spring 2011

CHLORIDE SECTION ALONG THE BARRIER

NOTE: The data points used to create this cross section are listed in the Appendix A-6.3, 7.3, 8.3, 9.3, 9.4, 10.3, & 10.4



ALAMITOS BARRIER PROJECT Overview Map



Cathodic Protection Phase 2. The rest of the shared pipeline was included in Phase 1 and the east leg was not included in this project.

ABP Unit 13 - 8 New Observation Wells. One well between 33G and 33J and the rest westerly of the current alignment to fill data gaps and consider potential future expansion.

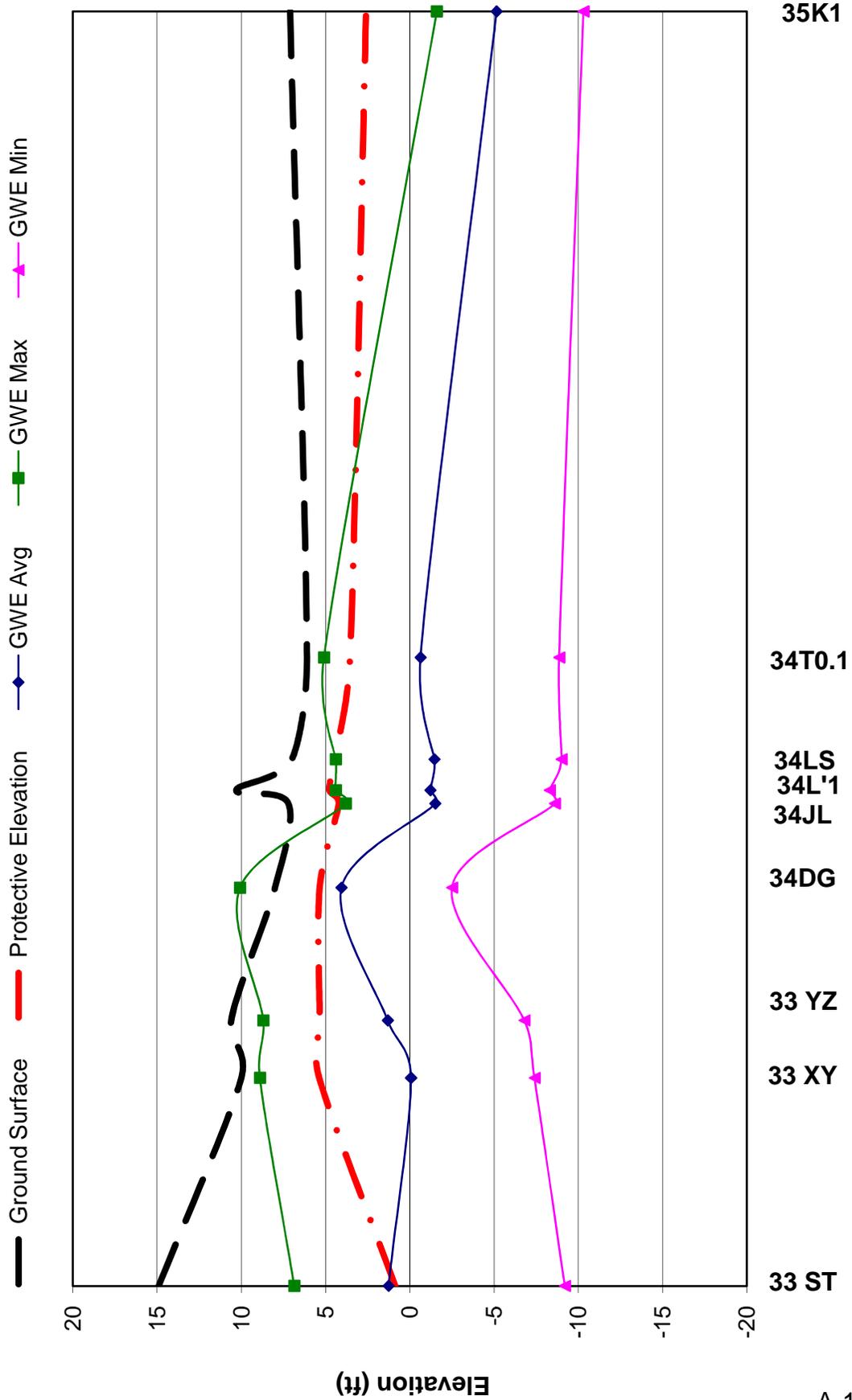
Notes: (1) The ABP Ground Water Model and the ABP Condition Assessment both include the entire barrier system. (2) The ABP, DGBP, and WCBBP Injection Well Condition Assessment includes the 14 injection well casings not included in the ABP Condition Assessment.

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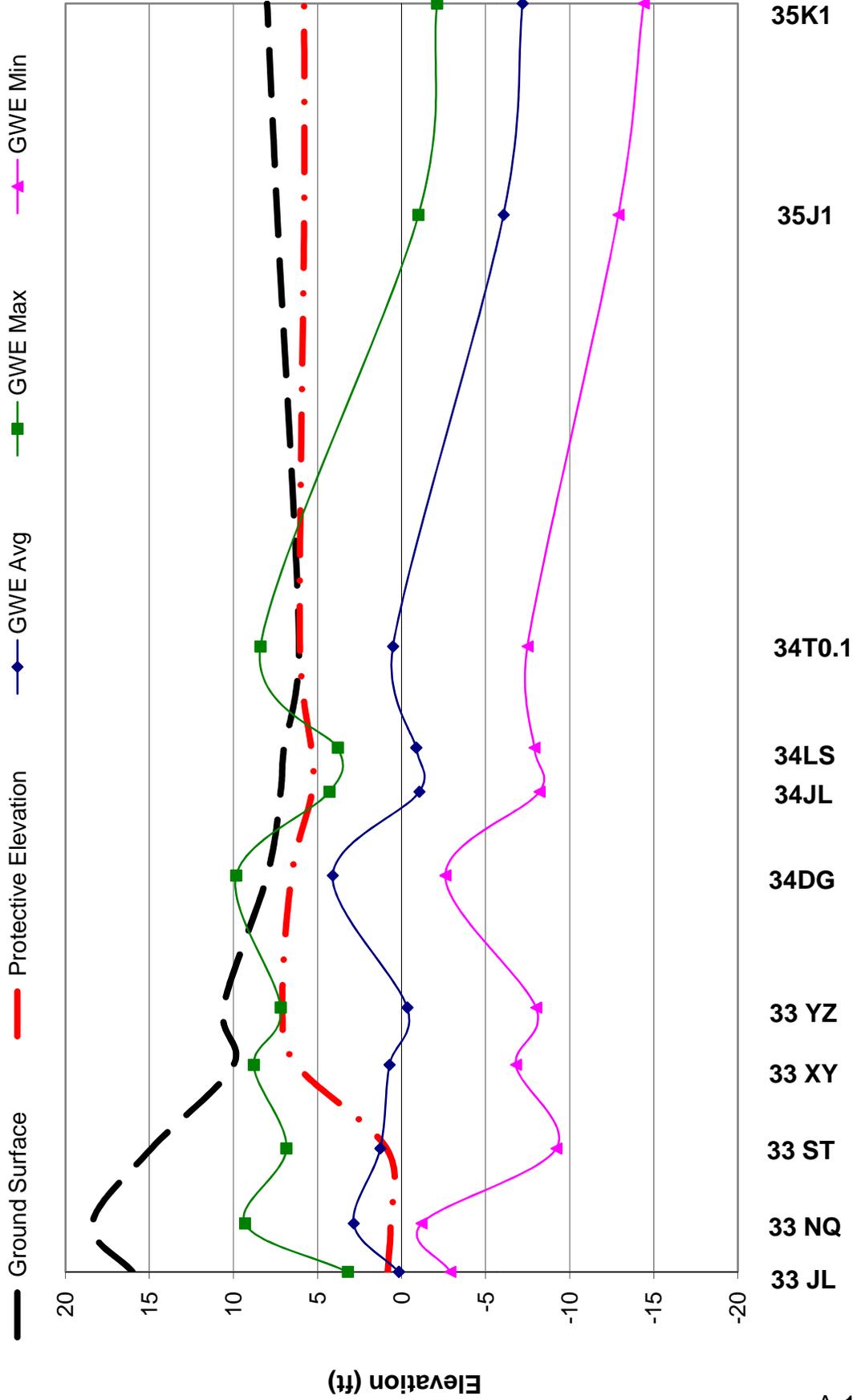
900 0 900 1800 Feet

LEGEND	
	Extraction Well
	Observation Well
	LACFCD Injection Well
	OCWD Injection Well
	ABP Water Supply Line (owner: LACFCD/OCWD)
	ABP Water Supply Line (owner: LACFCD)
	ABP Water Supply Line (owner: OCWD)
	Reclaimed Water Delivery Line (owner: WRD)

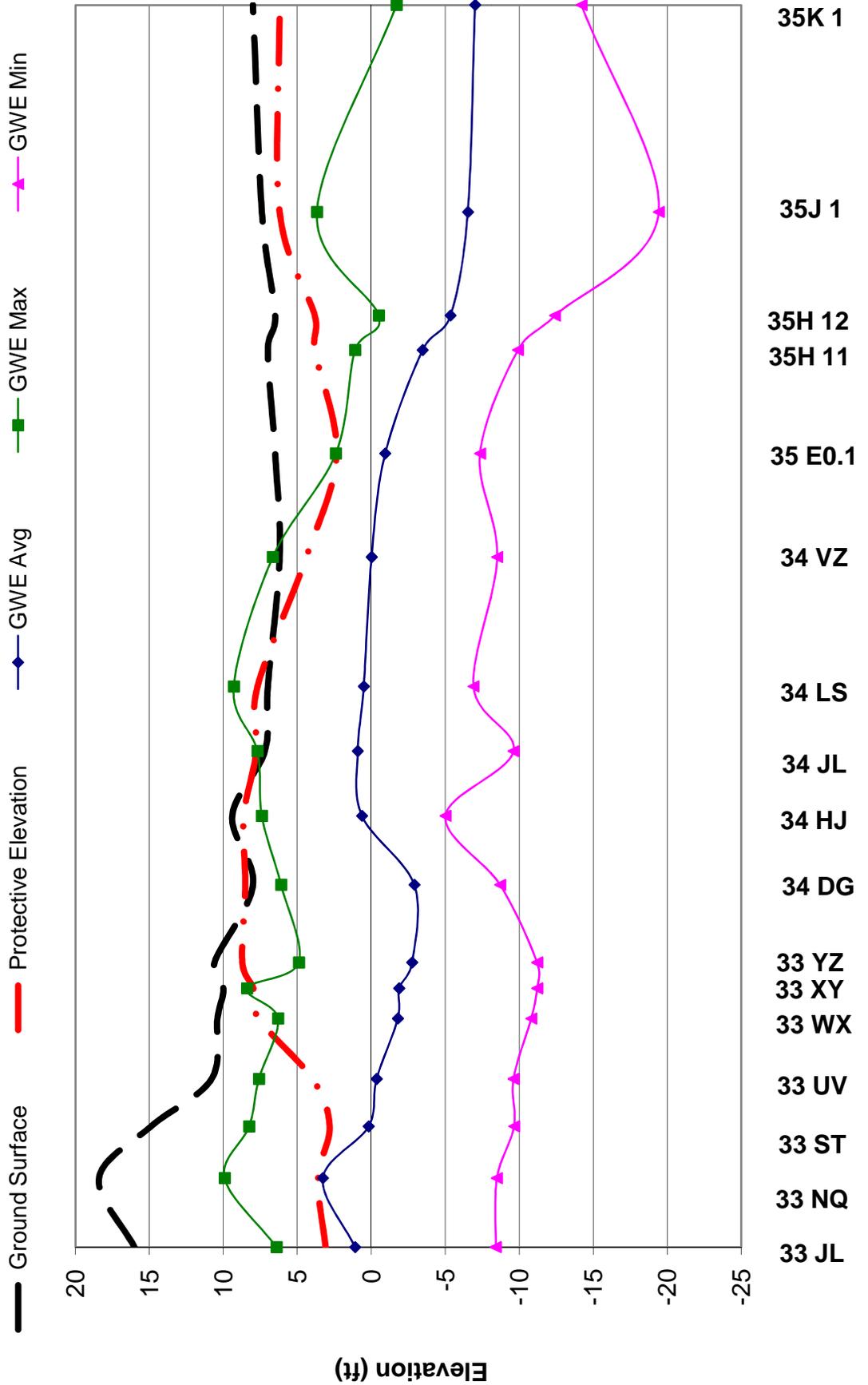
C Zone - Groundwater Elevation (GWE) Along the ABP FY 10-11



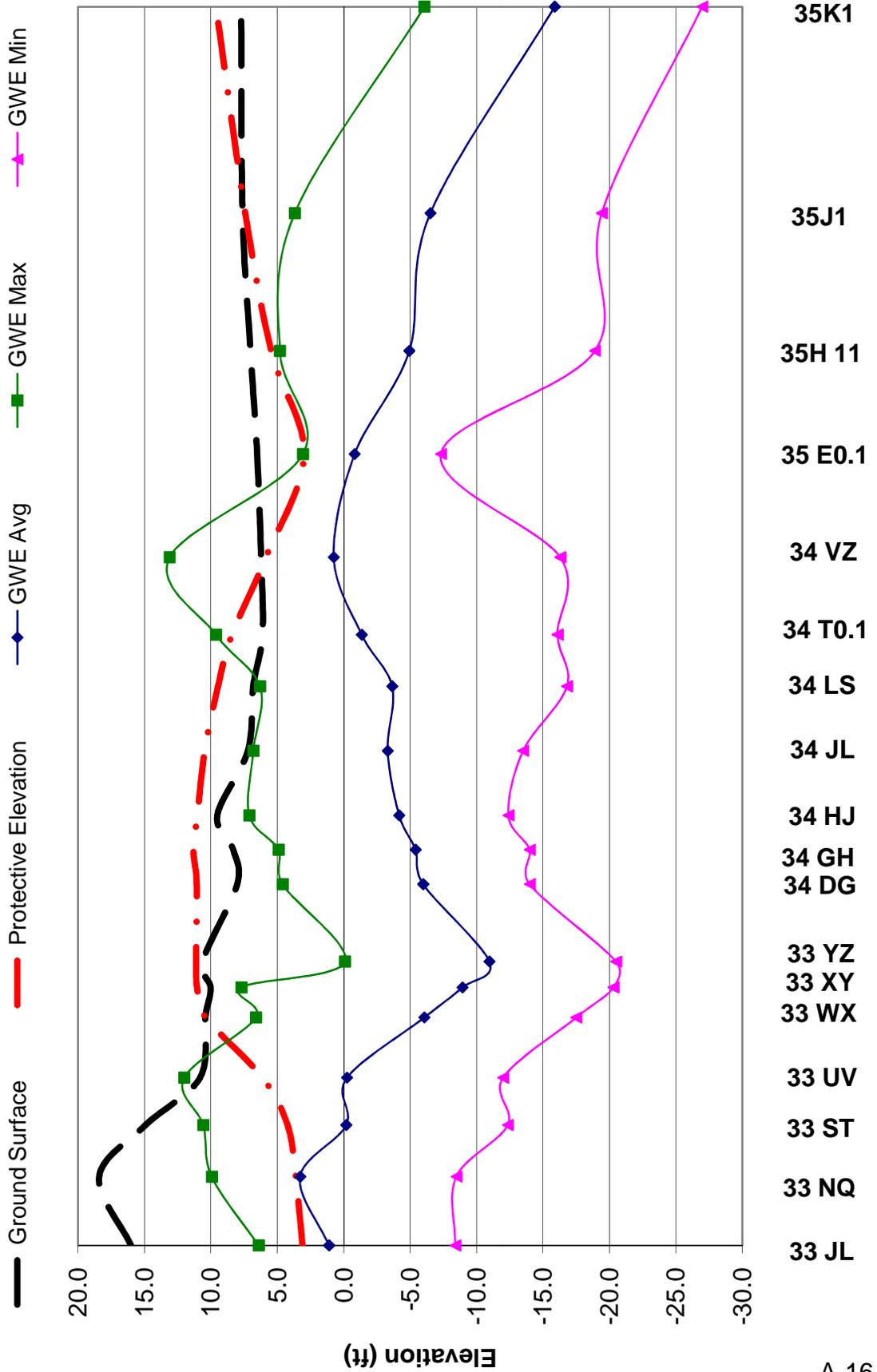
B Zone - Groundwater Elevation (GWE) Along the ABP FY 10-11



A Zone - Groundwater Elevation (GWE) Along the ABP FY 10-11



I Zone - Groundwater Elevation (GWE) Along the ABP in FY 10-11



Current Capital Improvement Projects and Contracts (July 2010 through June 2011)

Board Award Date	Project Title	Description	Contractor	Final Contract Amount	Field Acceptance
03/03/2009	Barrier Water Supply Facilities Improvements ("Cathodic Protection") Phase 2 - ABP	Corrosion protection on portions of ABP supply pipeline	American Construction & Supply, Inc.	\$1,984,701.30 (ABP portion = \$1,262,395.20)	07/27/2010
09/16/2009 by OCWD	ABP Groundwater Model	OCWD managed contract (and cost shared equally with LACDPW and WRD) for development of new model to simulate future potential for seawater intrusion, predict heads to optimize operations (and determine need for new wells), and track flow of injected recycled water.	INTERA, Inc.	\$269,677.59 (\$89,892.53 per agency)	11/10/2010
03/02/2010	Condition Assessment of the ABP Wells and Water Supply Facilities	Assessment of ABP supply line, laterals, appurtenances, and wells (incl. injection, observation, and optionally extraction)	CH2M Hill	\$685,000 [Pending] (\$200,000 each from OCWD & WRD)	November 2011 [Estimated]
06/29/2010	ABP, DGBP, and WCBBP Injection Well Condition Assessment	Assessment of injection wells on all three barriers (including the 14 ABP casings NOT a part of the ABP Condition Assessment)	MWH	\$3M [Pending] (ABP portion = \$320,000)	April 2012 [Estimated]
June 2012 [Estimated]	ABP Unit 13 - Observation Wells	Construction of 8 new observation wells (18 casings total) near west end of the ABP	TBD	\$2.5M [Estimated]	May 2013 [Estimated]

Note: For a full history of improvement projects and contracts on record, please contact LACDPW.

Summary of the Alamitos Barrier Project Shutdowns (July 2010 through June 2011)

Shutdown	Startup	Duration (days)	Impacted Portion of ABP	Reason	Addressed By	Means of Repair/Remediation
04/23/2008	10/21/2010	911	Injection Well 33S1	Surface Leakage	LACDPW	Ultra fine cement grouting was performed in August 2010. Well was turned back online following curing and new parts. No further surface leakage has been observed.
12/14/2009	TBD	TBD	Injection Well 34G	Surface leakage (unable to inject and verify due to missing parts).	LACDPW	Once replacement parts were received, will reassemble and restore flow to identify surface leakage and perform grouting.
09/27/2010	12/02/2010	66	Injection Well 33Z	Surface leakage near 33Z2.	LACDPW	Investigated situation and implemented monitoring, then resumed injection at lower flow rate.
10/21/2010	01/05/2011	76	Injection Well 33Z2	Detached piping and packer discovered at time of well assessment.	LACDPW/MWH	Verified no damage and fished out equipment. Coordinated with MWH to complete assessment and restore well/site. LACDPW resumed flow.
09/07/2010	06/09/2011	275	Injection Well 33T	Series of events: Self-juttering piping fell into well and required special fishing operations, well assessment, redevelopment, missing parts...	LACDPW	Ordered and utilized specialized equipment to fish out the fallen juttering piping. Once received replacements for the parts found missing after redevelopment, reassembled and restored flow.
01/04/2011	01/05/2011	1	East Leg	To remove and clean out propeller for Point C flow meter.	LACDPW	Isolated flow at T-vault and held pressure downstream. Cleaned the meter, reinstalled, and restored flow.
02/24/2011	04/11/2011	46	Injection Well 33S1	Suspected return of surface leakage.	LACDPW	Shut down well and cleared area, confirmed no leakage, and resumed flow at lower rates.
03/14/2011	03/15/2011	1	Entire Barrier	To repair two air release valves (upstream of first isolation valve).	LACDPW	Ordered parts in advance, shutdown barrier when ready, completed repairs, and restored flow the next day. Repairs occurred while the LVL AWTF was already offline.

Notes:

* Routine and/or minor shutdowns of individual wells are not listed here but are included in Table 2 of the Semi-Annual JMC Report.

* For a full history of shutdowns on record, please contact LACDPW.

Summary of Water Distribution Ratios

Monthly	REPORTED		CORRECTED		
	LACFCD	OCWD	LACFCD	OCWD	
200507	71.9%	28.1%	71.9%	28.1%	no correction
200508	66.5%	33.5%	74.9%	25.1%	
200509	73.9%	26.1%	73.9%	26.1%	no correction
200510	82.2%	17.8%	79.7%	20.3%	
200511	81.1%	18.9%	79.3%	20.7%	
200512	75.3%	24.7%	72.5%	27.5%	
200601	73.5%	26.5%	67.4%	32.6%	
200602	75.4%	24.6%	68.4%	31.6%	
200603	77.8%	22.2%	72.5%	27.5%	
200604	87.1%	12.9%	85.0%	15.0%	
200605	0.0%	0.0%	0.0%	0.0%	
200606	72.7%	27.3%	72.7%	27.3%	
200607	0.0%	0.0%	0.0%	0.0%	
200608	49.7%	50.3%	47.0%	53.0%	
200609	49.4%	50.6%	43.9%	56.1%	
200610	0.0%	0.0%	0.0%	0.0%	
200611	49.6%	50.4%	46.2%	53.8%	
200612	49.2%	50.8%	41.8%	58.2%	
200701	48.7%	51.3%	37.6%	62.4%	
200702	48.8%	51.2%	38.0%	62.0%	
200703	64.2%	35.8%	57.1%	42.9%	
200704	86.9%	13.1%	85.6%	14.4%	
200705	73.7%	26.3%	67.0%	33.0%	
200706	72.1%	27.9%	67.0%	33.0%	
200707	86.1%	13.9%	80.6%	19.4%	
200708	80.5%	19.5%	75.2%	24.8%	
200709	81.5%	18.5%	76.8%	23.2%	
200710	71.9%	28.1%	60.7%	39.3%	
200711	79.7%	20.3%	74.5%	25.5%	
200712	59.3%	40.7%	56.1%	43.9%	
200801	76.2%	23.8%	72.8%	27.2%	
200802	70.6%	29.4%	63.7%	36.3%	
200803	69.0%	31.0%	64.0%	36.0%	
200804	76.0%	24.0%	71.0%	29.0%	
200805	73.5%	26.5%	66.1%	33.9%	
200806	75.4%	24.6%	68.5%	31.5%	
200807	74.3%	25.7%	66.9%	33.1%	
200808	74.1%	25.9%	65.5%	34.5%	
200809	72.2%	27.8%	63.0%	37.0%	
200810	68.7%	31.3%	59.6%	40.4%	
200811	71.6%	28.4%	64.1%	35.9%	
200812	78.5%	21.5%	72.5%	27.5%	
200901	78.2%	21.8%	71.7%	28.3%	
200902	75.9%	24.1%	68.6%	31.4%	
200903	73.7%	26.3%	65.2%	34.8%	
200904	72.3%	27.7%	63.6%	36.4%	
200905	73.7%	26.3%	65.6%	34.4%	
200906	69.6%	30.4%	62.0%	38.0%	
200907	79.4%	20.6%	74.2%	25.8%	
200908	65.5%	34.5%	61.6%	38.4%	
200909	64.3%	35.7%	57.4%	42.6%	
200910	77.2%	22.8%	68.1%	31.9%	
200911	75.1%	24.9%	65.2%	34.8%	
200912	71.0%	29.0%	64.7%	35.3%	
201001	84.0%	16.0%	77.6%	22.4%	
201002	89.1%	10.9%	83.2%	16.8%	
201003	83.1%	16.9%	77.9%	22.1%	
201004	78.0%	22.0%	67.9%	32.1%	
201005	77.5%	22.5%	70.7%	29.3%	
201006	76.5%	23.5%	67.8%	32.2%	
201007	81.1%	18.9%	72.7%	27.3%	
201008	80.1%	19.9%	71.9%	28.1%	
201009	78.1%	21.9%	71.1%	28.9%	
201010	73.8%	26.2%	64.8%	35.2%	
201011	60.1%	39.9%	49.6%	50.4%	

By Fiscal Yr	REPORTED		CORRECTED	
	LACFCD	OCWD	LACFCD	OCWD
FY05-06	74.9%	25.1%	74.3%	25.7%
FY06-07	59.2%	40.8%	51.4%	48.6%
FY07-08	74.9%	25.1%	69.0%	31.0%
FY08-09	73.6%	26.4%	65.7%	34.3%
FY09-10	76.5%	23.5%	69.4%	30.6%
FY10-11*	75.3%	24.7%	66.7%	33.3%

* FY10-11 Ratios are only up through November 2010 because original reported numbers are correct from December 2010 onward.

ALAMITOS BARRIER PROJECT COST FOR FY 2010-11

ITEM NO.	DESCRIPTION	JOB NO.	DESCRIPTION	SERVICES AND SUPPLIES	FY 2010-11 BUDGET	% BUDGET FY 10-11	OCWD SHARE 33%	OCWD BUDGET FY 10-11	% OCWD BUDGET FY 10-11	LADPW SHARE	LADPW BUDGET FY 10-11	% LADPW BUDGET FY 10-11	
1.	Analysis and direction of injection operations	H0321551	ANALYSIS & DIRECT OF INJ OPR	59,887.94									
			Subtotal #1	59,887.94	100,000	59.9	19,911.24	40,000	49.8	39,977	60,000	66.6	
2.	Maintenance and repair of injection wells	F6004011 F5064011 H03219011 F54281629 F54329486 F6005170	ABP MAINT INJECTION WELLS INJECT. WELLS-MAINTAIN(ALAMITOS) ABP TELEMETRY SYSTEM MAINTENANCE DRILL & GROUT INJ. WELL, 33S1 - A.B.P. RETRIEVE 6" PIPE - ABP INJECTION WE PRE EMERGENT WEED CONTROL	165,950.64 33,737.70 153,960.67 44,442.00 13,123.45 1,036.42									
			Subtotal #2	412,150.87	150,000	274.8	137,029.84	60,000	228.4	275,121	90,000	305.7	
3.	Operation of injection	F6004000	ABP RECHARGE OPER U/S	25,232.92									
			Subtotal #3	25,232.92	200,000	12.6	8,389.31	80,000	10.5	16,844	120,000	14.0	
4.	Analysis and direction of extraction operations (No cost to OCWD)	H0321555	ANALYSIS & DIR OF EXTR OPER	0.00									
			Subtotal #4	0.00	0	N/A	0.00	0	0.0	-	-	-	
5.	Maintenance, and repair of extraction wells (No cost to OCWD)												
			Subtotal #5	0.00	10,000	N/A	0.00	0	0.0	-	10,000	0.0	
6.	Operation of extraction wells (No cost to OCWD)	F6000090	ELEC UTIL BILL FOR EXT	4,551.93									
			Subtotal #6	4,551.93	5,200	87.5	0.00	0	0.0	4,552	5,200	87.5	
7.	Maintenance and repair of distribution system	H0321569 H0321899 F6001904 F6001907 F6001920 F6004010 F6004012 N0100015 N2420007 F6004013F F6004014F	ALAMITOS BARRIER PROJECT RW Mitigation for Existing ABP Faci CONDUCT QUARTERLY INSPECTION INSPECT CRANE PRGS REDUCE - ABP CONDUCT QUARTERLY INSPECTION ABP MAINT AIR/VAC-BLWOPF U/S MAINT PRS - ABP O&M OF SEAWATER INTRO CONT FAC MISC. SUPPLIES SEAWATER INTRUS. Locate and Mark Barrier Proj u/grnd Locate & Mark Barrier Proj U/ Grnd.	319,656.75 9,981.44 169.26 850.84 98.51 15,100.00 53,341.26 1,143.74 5,238.21 1,490.39 965.65									
			Subtotal #7	408,041.24	350,000	116.6	135,663.49	140,000	96.9	272,378	210,000	129.7	
8.	Maintenance of observation wells	F5064044	OBSERV. WELLS-CLEANOUT(ALAMITOS)	0.00									
			Subtotal #8	0.00	70,000	0.0	0.00	28,000	0.0	-	42,000	0.0	
9.	Collection of groundwater data	H0321552	COLLECTN OF GRNDWTR DATA	144,408.02									
			Subtotal #9	144,408.02	90,000	160.5	48,012.05	36,000	133.4	96,396	54,000	178.5	
10.	Yard Maintenance (Flat Fee from OCWD)	F6003124 F6007021 FFM34107	BUILDING MAINTENANCE - NONRESI LANDSCAPE MAINTENANCE Facility Maintenance Alamitos Yd Fl	4,116.59 0.00 55,778.62									
			Subtotal #10	59,895.21	30,000	199.7	375.00	375	100.0	59,520	29,625	200.9	
11.	Well redevelopment	H0321565 H0321554 F54235420 F54254352 F54277622 F54280774 F54293757 F54301763 F54304465 F54311643 F54311659 F54311660 F54311663 F54314686 F54317462 F54341746 F54363368 F54365359 F54365364 F54365370 F54472766 F54480362 F5064022 F6009118	NDES MONITOR. & REPORT. WELL REDEVELOPMENT REDEVELOP INJ. WELL, 34D - ABP REDEVELOP INJ. WELL, 33V - A.B.P. REDEVELOP INJ. WELL, 33U3 - A.B.P. REDEVELOP INJ. WELL, 33U3 - A.B.P. REDEVELOP INJ. WELL, 33T - A.B.P. REDEVELOP INJ. WELL, 33Q1 - A.B.P. REDEVELOP INJ. WELL, 33Q - A.B.P. REDEVELOP INJ. WELL, 33G - A.B.P. REDEVELOP INJ. WELL, 33J - A.B.P. REDEVELOP INJ. WELL, 33L - A.B.P. REDEVELOP INJ. WELL, 33N - A.B.P. REPAIR INJ. WELL, 33X - A.B.P. REDEVELOP INJ. WELL, 33S1 - A.B.P. REDEVELOP INJ. WELL, 33S - A.B.P. REDEVELOP INJ. WELL, 33V15 - A.B.P.P. REDEVELOP WELL, 33H'17P - A.B.P. REDEVELOP WELL, 34H'18P - A.B.P. REDEVELOP WELL, 34H'22P - A.B.P. REDEVELOP INJ. WELL, 35G - A.B.P. REDEVELOP INJ. WELL, 35F (I ZONE) - Redevelopment of Injection Wells (A Disassemble/Reassemble Wells (ABP)	29,517.25 92,479.37 17,783.69 23,887.38 22,338.62 14,775.03 26,758.03 7,674.89 18,552.95 13,419.16 14,699.98 12,381.54 16,280.92 3,657.62 9,195.28 23,236.54 15,019.22 12,715.14 11,567.92 17,411.00 19,496.85 9,549.43 47,101.42 460.01									
			Subtotal #11	478,959.24	400,000	119.7	159,241.95	160,000	99.5	319,717	240,000	133.2	
12.	Processing of data and preparation of reports	H0321553	DATA PROC. & PREPAR. REPORT	62,497.47									
			Subtotal #12	62,497.47	60,000	104.2	20,778.84	24,000	86.6	41,719	36,000	115.9	
13.	Special Programs (No cost to OCWD unless pre-arranged)	H0321591 H0321590 H0321021 H0321022 X5009642	PLANNING-ABP PLANNING (BARRIER) ABP Modeling (contract by sep. agmt Evaluation of ABP Wells & Facilitie Cathodic protection system Ph.2	22,761.50 520.58 20,614.65 545,861.51 298,886.09									
			Subtotal #13	888,644.33	230,000	386.4	0.00	0	0.0	888,644	230,000	386.4	
14.	Reclaim Water Program	H0321556	RECLAIM WATER PROGRAM	7,141.10									
			Subtotal #14	7,141.10	10,000	71.4	2,374.24	4,000	59.4	4,767	6,000	79.4	
15.	Projects & Studies (Reimbursable amounts include labor expenses, plus contract expenses that are not addressed under a separate agreement (such as the model and Condition Assess)).	H0321021 HF13509001 H0321022 X5009642 EF02610112	Alamitos Barrier Modeling and Updates Injection Well Condition Assessment Evaluation of ABP Wells & Facilitie Cathodic protection system Ph.2 Additional Wells at Alamitos Barrie	12,323.00 7,668.33 37,211.80 49,490.59 177,249.17									
			Subtotal #15	283,942.89	N/A	N/A	94,403.90	N/A	N/A	189,539	N/A	N/A	
			TOTAL	2,835,353.16	1,705,200	166.3	626,179.85	572,375	109.4	2,209,173	1,132,825	195.0	
			Liability Insurance Premium for 2010-11	26,592.00			-13,296.00			13,296			
			Balance due from Orange County Water District				612,883.85						

NOTES:

¹ OCWD share represents 23% of the total costs in all Items except for 4, 5, 6, 10, and 13. The percentage is based on amount of overall barrier injection water provided to Orange County portion of the ABP during this fiscal year.

² Per Agreement No. 8458 between the LACPCD and the OCWD, all costs included in Items 4, 5, 6 and 13 are not reimbursable with respect to OCWD and the OCWD cost for Item 10 is fixed at \$375.00.

TOTAL OPERATION AND MAINTENANCE COST	\$ 2,835,353.16	
OCWD SHARE OF THE OPERATION AND MAINTENANCE COST	\$ 626,179.85	
Less: Los Angeles County's Share of the 10-11 Liability Insurance	\$ (13,296.00)	
Less: Advance Deposit Paid by OCWD (50% of the OCWD FY10-11 budget)	\$ (286,188.00)	
Plus: Remaining Balance Due to Complete OCWD Share of Cathodic Protection	\$ 95,644.00	<< See A-21
BALANCE DUE FROM ORANGE COUNTY WATER DISTRICT	\$ 422,339.85	

\$1,149,305.14 = LAC's total expenses on CI projects (sum of projects in Items 13 and 15)

\$190,047.90 = OCWD's portion of our \$1,149,305 17% project costs

* AS OF FY09-10, SHOWING CAPITAL IMPROVEMENT PROJECTS AS THEIR OWN CATEGORY AND ALSO SPLITTING UP LABOR EXPENSES FROM CONTRACT EXPENSES FOR APPLICABLE PROJECTS (WHERE SEPARATE COST-SHARING AGREEMENTS ARE IN PLACE FOR CONTRACT AMOUNTS)

ABP Cathodic Protection Cost-Sharing

[REVISED BASED ON CORRECTED WATER DISTRIBUTION RATIOS]

X5009457

X5009642

	"Cathodic Protection"			"Cathodic Protection Phase 1"			"Cathodic Protection Phase 2"		
	Total	OCWD	LACFD	Total	OCWD	LACFD	Total	OCWD	LACFD
FY05-06 (25.7% OCWD share)	Budgeted JMC ABP Contract Expense	\$2,124,000	\$672,049	\$1,451,951	-	-	-	-	-
	Budgeted Contract Expense MODIFIED	-	-	-	-	-	-	-	-
	Actual ABP CP CONTRACT Expense	\$0	\$0	\$0	-	-	-	-	-
	Actual ABP CP OTHER Expense	\$159,758	\$41,058	\$118,700	-	-	-	-	-
	Actual ABP CP TOTAL Expense (JMC Item 7)	\$159,758	\$41,058	\$118,700	-	-	-	-	-
	OCWD Invoice 1 Info Inv No. SA003144 - 02/14/06 - \$251,604.0	-	-	-	-	-	-	-	-
	OCWD Invoice 2 Info Inv No. SA003562 - 01/31/07 - \$62,896.02	-	-	-	-	-	-	-	-
	TOTAL INVOICED TO OCWD	\$314,500.02	-	-	-	-	-	-	-
	CP CONTRACT portion of invoice - Planned	\$0.00	-	-	-	-	-	-	-
	CP CONTRACT portion of invoice - Actual	\$0.00	-	-	-	-	-	-	-
FY06-07 (48.6% OCWD share)	Budgeted JMC ABP Contract Expense	\$1,451,951	\$672,049	\$1,451,951	-	-	-	-	-
	Budgeted Contract Expense MODIFIED	-	-	-	\$1,400,000	\$448,000	\$952,000	-	-
	Actual ABP CP CONTRACT Expense	-	-	-	\$0	\$0	\$0	\$0	\$0
	Actual ABP CP OTHER Expense	-	-	-	\$102,128	\$49,634	\$52,494	\$5,973	\$2,903
	Actual ABP CP TOTAL Expense (JMC Item 7)	-	-	-	\$102,128	\$49,634	\$52,494	\$5,973	\$2,903
	OCWD Invoice 1 Info	-	-	-	-	-	-	-	-
	OCWD Invoice 2 Info	-	-	-	-	-	-	-	-
	TOTAL INVOICED TO OCWD	-	-	-	-	-	-	\$883,980.55	-
	CP CONTRACT portion of invoice - Planned	-	-	-	-	-	-	\$0.00	-
	CP CONTRACT portion of invoice - Actual	-	-	-	-	-	-	\$0.00	-
FY07-08 (31.0% OCWD share)	Budgeted JMC ABP Contract Expense	\$1,451,951	\$672,049	\$1,451,951	-	-	-	-	-
	Budgeted Contract Expense MODIFIED	-	-	-	\$1,400,000	\$448,000	\$952,000	\$1,100,000	\$352,000
	Actual ABP CP CONTRACT Expense	-	-	-	\$649,399	\$201,314	\$448,085	\$0	\$0
	Actual ABP CP OTHER Expense	-	-	-	\$145,780	\$45,192	\$100,589	\$445,946	\$138,243
	Actual ABP CP TOTAL Expense (JMC Item 7)	-	-	-	\$795,179	\$246,506	\$548,674	\$445,946	\$138,243
	OCWD Invoice 1 Info	-	-	-	-	-	-	-	-
	OCWD Invoice 2 Info	-	-	-	-	-	-	-	-
	TOTAL INVOICED TO OCWD	-	-	-	-	-	-	\$854,413.82	-
	CP CONTRACT portion of invoice - Planned	-	-	-	-	-	-	\$315,862.87	-
	CP CONTRACT portion of invoice - Actual	-	-	-	-	-	-	\$201,313.69	-
FY08-09 (34.3% OCWD share)	Budgeted JMC ABP Contract Expense	-	-	-	-	-	-	\$150,000	\$39,000
	Budgeted Contract Expense MODIFIED	-	-	-	\$0	\$0	\$0	\$1,100,000	\$352,000
	Anticipated ABP Contract Expense	-	-	-	\$0	\$0	\$0	\$1,189,941	\$408,150
	Actual ABP CP CONTRACT Expense	-	-	-	\$0	\$0	\$0	\$45,294	\$15,536
	Actual ABP CP OTHER Expense	-	-	-	\$0	\$0	\$0	\$226,010	\$77,521
	Actual ABP CP TOTAL Expense (JMC Item 7)	-	-	-	\$0	\$0	\$0	\$271,304	\$93,057
	OCWD Invoice 1 Info	-	-	-	-	-	-	-	-
	OCWD Invoice 2 Info	-	-	-	-	-	-	-	-
	TOTAL INVOICED TO OCWD	-	-	-	-	-	-	\$470,110.50	-
	CP CONTRACT portion of invoice - Planned	-	-	-	-	-	-	\$200,268.00	-
CP CONTRACT portion of invoice - Actual	-	-	-	-	-	-	\$15,535.84	-	
FY09-10 (30.6% OCWD share)	Budgeted JMC ABP Contract Expense	-	-	-	-	-	-	\$150,000	\$34,500
	Budgeted Contract Expense MODIFIED	-	-	-	-	-	-	\$150,000	\$48,000
	Anticipated ABP Contract Expense	-	-	-	-	-	-	\$1,144,647	\$350,262
	Actual ABP CP CONTRACT Expense	-	-	-	-	-	-	\$918,215	\$280,974
	Actual ABP CP OTHER Expense	-	-	-	-	-	-	\$238,846	\$73,087
	Actual ABP CP TOTAL Expense (JMC Item 15)	-	-	-	-	-	-	\$1,157,061	\$354,061
	OCWD Invoice 1 Info	-	-	-	-	-	-	-	-
	OCWD Invoice 2 Info	-	-	-	-	-	-	-	-
	TOTAL INVOICED TO OCWD	-	-	-	-	-	-	\$816,167.56	-
	CP CONTRACT portion of invoice - Planned	-	-	-	-	-	-	\$299,280.73	-
CP CONTRACT portion of invoice - Actual	-	-	-	-	-	-	\$299,280.73	-	
FY10-11 (33.2% OCWD share)	Budgeted JMC ABP Contract Expense	-	-	-	-	-	-	\$150,000	\$34,500
	Budgeted Contract Expense MODIFIED	-	-	-	-	-	-	\$150,000	\$48,000
	Anticipated ABP Contract Expense	-	-	-	-	-	-	\$226,432	\$75,175
	Actual ABP CP CONTRACT Expense	-	-	-	-	-	-	\$298,886	\$99,230
	Actual ABP CP OTHER Expense	-	-	-	-	-	-	\$49,491	\$16,431
	Actual ABP CP TOTAL Expense (JMC Item 15)	-	-	-	-	-	-	\$348,377	\$115,661
	OCWD Invoice 1 Info	-	-	-	-	-	-	-	-
	OCWD Invoice 2 Info	-	-	-	-	-	-	-	-
	TOTAL INVOICED TO OCWD	-	-	-	-	-	-	TBD	-
	CP CONTRACT portion of invoice - Planned	-	-	-	-	-	-	\$0.00	-
CP CONTRACT portion of invoice - Actual	-	-	-	-	-	-	\$95,643.78	-	

Notes: The actual water distribution ratios for FY07-08 and FY09-10 had been lower than the 32% already agreed upon. As a result, OCWD had not paid their 32% share overall (\$611,774). Since the FY09-10 invoice was anticipated to contain all final work/charges, the remaining cost of OCWD's share was calculated (\$18K) and added to FY09-10 invoice.

Notes: Because the ABP cathodic work was under one contract along with DGBP and WCBBP, some of the ABP charges were not paid until work was near completion for the entire project. As a result, there were additional contract charges of which OCWD is responsible for 32%, as well as regular labor charges of which OCWD is responsible for the percentage corresponding to the year's water distribution.

NOTES:

1 During FY05-06, the JMC agreed to split the cathodic protection (CP) contract costs according to the average of the previous 5 fiscal years' water distribution ratio. As this project got delayed and divided, revised estimates were derived, discussed, and budgeted with the JMC. The Budgeted Contract Expenses MODIFIED* row shows the previously budgeted amounts but still divided according to the original 32% OCWD to 68% LACFD ratio, simply to indicate what the corresponding breakdowns would be. The actual invoices for FY07-08 and FY08-09 used their respective years' water distribution ratio, while the FY09-10 invoice used the year's water distribution ratio and then added the remaining due on top.

2 ABP JMC Total Expense sheets (the attachments that go out with each end-of-year billing) for years prior to FY09-10 account for the CP amounts (shown under either Job No. X5009457 (Ph.1) or X5009642 (Ph.2)) within Item 7 (Maint & Repair of Distribution System). For FY09-10 and beyond, these costs are within the newly created Item 15 (Projects and Studies) instead. In all cases, the CP amounts include not just the contract expenses, but all other related costs as well (labor, materials, equipment, and a pro-rated mark-up to cover the general expenses when applicable). These amounts were divided according to the water usage ratio for that particular fiscal year.

	Length of Pipe for CP	Cost Estimate	% of Total
WCBBP LACFCD	3,438 ft	\$110,000	4%
DGBP LACFCD	3,714 ft	\$374,000	12%
ABP LACFCD	4,191 ft	\$392,500	13%
ABP Jointly owned	24,289 ft	\$2,124,000	71%
28,480		ABP Total	84%
		Grand Total	100%

	5yr Water Split	Cost Share	Total Cost
Built into O&M cost proportion... (split by water)	LACFCD	68% \$ 1,451,951	\$1,844,451
	OCWD	32% \$ 672,049	\$672,049
	TOTAL		\$ 2,124,000

Phase	Incl. Length	% of Total	Equiv. Cost
Ph. 1	13,489	47%	\$315,863
Ph. 2	14,991	53%	\$356,186
Total	28,480	100%	\$672,049

Final Ph. 1 Contract:	\$649,399
Final Ph. 2 Contract (ABP):	\$1,262,395
Total Contract Costs:	\$1,911,794
OCWD share (32% of Total):	\$611,774 (less than the anticipated \$672,049)
Anticipated phase 1 portion:	\$315,863 (planned for FY07-08; based on \$672k - shown in gray table)
Anticipated phase 2 portion:	\$295,911 (remainder of adjusted total, planned for FY08-09)
OCWD share (32% of Total):	\$611,774 (less than the anticipated \$672,049)
Incl. ph1 portion (FY07-08):	\$201,314 as invoiced in FY07-08 per 31.0% water distribution
Incl. ph2 portion (FY08-09):	\$15,536 as invoiced in FY08-09 per 34.3% water distribution
Incl. ph2 portion (FY09-10):	\$280,974 as invoiced in FY09-10 per 30.6% water distribution
Incl. ph2 portion (FY09-10):	\$18,307 as invoiced in FY09-10 to total 32% of charges to date
Add'l ph2 portion (FY10-11):	\$95,644 to be invoiced for FY10-11 to complete OCWD share

2011-12 1st Quarter Costs
2012-13 OPERATION AND MAINTENANCE BUDGET

JMC No.	Fiscal Year	LACFCD		OCWD		WRD		TOTAL	
		Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual
1.	Analysis and direction of injection operation (\$)								
	2009-10	90,000	64,976	60,000	19,915			150,000	84,891
	2010-11	60,000	39,977	40,000	19,911			100,000	59,888
	2011-12	65,000	15,921	35,000	4,571			100,000	20,492
	2012-13	58,500		31,500				90,000	
2.	Maintenance and repair of injection wells (\$)								
	2009-10	90,000	260,402	60,000	79,814			150,000	340,216
	2010-11	90,000	275,121	60,000	137,030			150,000	412,151
	2011-12	117,000	69,849	63,000	20,052			180,000	89,901
	2012-13	162,500		87,500				250,000	
3.	Operations of Injection Well Facilities (\$)								
	2009-10	120,000	29,680	80,000	9,097			200,000	38,777
	2010-11	120,000	16,844	80,000	8,389			200,000	25,233
	2011-12	130,000	4,727	70,000	1,357			200,000	6,084
	2012-13	32,500		17,500				50,000	
4.	Analysis and direction of extraction operation (\$)								
	2009-10	0	0					0	0
	2010-11	0	0					0	0
	2011-12	0	0					0	0
	2012-13	0						0	
5.	Redevelopment, maintenance, and repair of extraction wells (\$)								
	2009-10	0	0					0	0
	2010-11	10,000						10,000	0
	2011-12	5,000	0					5,000	0
	2012-13	5,000						5,000	
6.	Operations of Extraction Wells (\$)								
	2009-10	4,200	20,223					4,200	20,223
	2010-11	5,200	4,552					5,200	4,552
	2011-12	5,200	1,180					5,200	1,180
	2012-13	5,200						5,200	
7.	Maintenance and repair of distribution system (\$)								
	2009-10	210,000	246,254	140,000	75,478			350,000	321,732
	2010-11	210,000	272,378	140,000	135,663			350,000	408,041
	2011-12	227,500	39,285	122,500	11,278			350,000	50,563
	2012-13	130,000		70,000				200,000	
8.	Maintenance of Observation Wells (\$)								
	2009-10	42,000	0	28,000	0			70,000	0
	2010-11	42,000	0	28,000	0			70,000	0
	2011-12	65,000	0	35,000	0			100,000	0
	2012-13	32,500		17,500				50,000	
9.	Collection of groundwater data (\$)								
	2009-10	54,000	96,360	36,000	29,535			90,000	125,894
	2010-11	54,000	96,396	36,000	48,012			90,000	144,408
	2011-12	58,500	19,877	31,500	5,706			90,000	25,583
	2012-13	65,000		35,000				100,000	
10.	Yard Maintenance (\$)								
	2009-10	29,625	62,084	375	375			30,000	62,459
	2010-11	29,625	59,520	375	375			30,000	59,895
	2011-12	39,625	9,185	375	375			40,000	9,560
	2012-13	39,625		375				40,000	
11.	Injection Well Redevelopment (\$)								
	2009-10	192,000	565,124	128,000	173,212			320,000	738,336
	2010-11	240,000	319,717	160,000	159,242			400,000	478,959
	2011-12	260,000	81,709	140,000	23,457			400,000	105,166
	2012-13	292,500		157,500				450,000	
12.	Processing of data and preparation of reports (\$)								
	2009-10	48,000	52,223	32,000	16,006			80,000	68,229
	2010-11	36,000	41,719	24,000	20,779			60,000	62,497
	2011-12	39,000	0	21,000	0			60,000	0
	2012-13	45,500		24,500				70,000	
13.	Special Programs (\$)								
	2009-10	235,000	92,548					235,000	92,548
	2010-11	230,000	888,644					230,000	888,644
	2011-12	95,000	3,956	70,000		70,000		235,000	3,956
	2012-13	1,600,000				500,000		2,100,000	
14.	Oversight of Reclaim Water Program (\$)								
	2009-10	4,500	9,323	3,000	2,857			7,500	12,180
	2010-11	6,000	4,767	4,000	2,374			10,000	7,141
	2011-12	6,500	1,107	3,500	318			10,000	1,425
	2012-13	5,200		2,800				8,000	
15.	Projects and Studies (\$)								
	2009-10	0	957,017	205,000	293,329	205,000	69,278	410,000	1,319,624
	2010-11	0	189,539	200,000	94,404	200,000	6,902	400,000	290,845
	2011-12	39,000	55,554	21,000	15,948	0		60,000	71,502
	2012-13	78,000		42,000				120,000	
	Totals - Operations and Maintenance (\$)								
TOTALS	2009-10	1,119,325	2,456,213	772,375	699,619	205,000	69,278	2,096,700	3,225,110
	2010-11	1,132,825	2,209,173	772,375	626,180	200,000	6,902	2,105,200	2,842,255
	2011-12	1,152,325	302,349	612,875	83,062	70,000		1,835,200	385,411
	2012-13	2,552,025		486,175		500,000		3,538,200	
	Volume of Water (ac-ft)								
	2009-10			2,400	1,321	3,600	4,309	6,000	5,629
	2010-11			2,800	1,684	4,200	3,382	7,000	5,066
	2011-12			2,400	262	3,600	912	6,000	1,173
	2012-13			2,100		3,900		6,000	

NOTE: The FY11-12 budget was the first to include the addition of Category 15 (Projects and Studies). All items within Category 15 were previously included in other categories. Starting with FY09-10, budgeted and actual amounts have been redistributed accordingly (but do not impact previous totals). As a result, past amounts shown hereon may not match what is shown on past budget sheets, but reflect the more detailed breakdown of effective costs/budgets. Project-related labor costs and contract costs not governed by separate agreements (i.e., Cathodic Protection) are addressed in Category 15. Contract costs governed by separate agreements are addressed as part of Category 13.