Assessment of Source Water for the Pescadero Water System - CSA 11

Prepared for:
Department of Public Works
San Mateo County, California

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TODD ENGINEERS

Department of Public Works
San Mateo County, California

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the Pescadero Water System – CSA 11

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Executive Summary

Prior to installing and operating the two County Service Area (CSA 11) water supply wells, the Town of Pescadero relied on small domestic wells, water from surface impoundments, and locally derived groundwater, from wells installed in the low-lying alluvial aquifer of Pescadero and Butano Creeks. In the 1970's and 1980's, these sources were found to contain relatively high concentrations of nitrate and other naturally occurring salts. This prompted the development of alternative groundwater sources located in the Pigeon Point Formation, about one mile west of Pescadero on the top of a northwest trending ridge, and adjacent to the Pacific Ocean. The wells have been operating since 1993. Well 1 was installed in 1983; Well 2, located 300 feet from Well 1, was installed in 1992. At the time of installation the water level elevation at the wells was about 106 feet above mean sea level. The estimated quantity of water used by CSA 11 is about 25 acre feet per year or about 16 gallons per minute.

Since well pumpage began, the depth to water in Wells 1 and 2 have dropped to 90 feet above mean sea level. This is equivalent to a drop in water level of about 1.6 feet per year. The top of the well screens for Wells 1 and 2 are at 70 and 66 feet above mean sea level, respectively. Assuming that the lowering of the water level is linear, then the current wells will fail in 8 to 15 years. The longevity of the aquifer is about 25 years. Groundwater quality has met drinking water standards for Wells 1 and 2 and water quality does not appear to deteriorate with depth.

We recommend that CSA 11 install a new production well in the vicinity of Wells 1 and 2 or at a lower elevation near the distribution tank to reduce overall drilling depth. The well should be drilled to at least 100 feet below mean sea level to take advantage of the overlying potable water. We estimate engineering costs to install a new well and above-ground facilities at about $45,000 to $55,000 and drilling contractor costs at about $150,000. Accordingly, an installed, fully equipped and functional well can be constructed for $200,000 to $250,000. Installation of such a new production well will extend the life of the CSA 11 water supply to at least 38 years.

Introduction

In April 2001, the Department of Public Works (DPW) of the County of San Mateo requested a technical proposal from Todd Engineers addressing the Town of Pescadero water system, specifically the source water. The source water consists of two wells tapping the same aquifer and installed approximately one mile west of Pescadero. The wells have been operating since 1993. Well 1 was installed in 1983; Well 2, located 300 feet from Well 1, was installed in 1992. The DPW maintains and operates the County Service Area 11 (CSA 11) system for Pescadero.

After a preliminary review of existing documents, the proposal was submitted to DPW on April 13, 2001. The proposal consisted of five general tasks: (1) review existing hydrogeologic information, (2) conduct preliminary aquifer testing, (3) conduct optional formal step-drawdown testing, (4) coordinate and conduct constant rate aquifer test, and (5) prepare a technical report. On September 7, 2001 Todd Engineers received official notice from DPW to proceed with the scope of work. This report presents our findings.

The goals of this investigation are to determine and re-assess the long-term sustainability of the aquifer pumped by the CSA 11 water supply wells and to determine the reliability of the wells. To accomplish these goals, Todd Engineers conducted a review of all available and relevant hydrogeologic information in the area to assess the long-term aquifer supply and performed pumping tests to assess well performance.

Figure 1 shows the location of the water supply wells and the geographic setting of the area. The wells are located near the top of a ridge. In general, the project area is triangular-shaped (shown on Figure 1) and is defined by Highway 1 along the west, Pescadero Road on the northwest, and Bean Hollow Road on the southeast. The project area is about 1,042 acres or 1.6 square miles and is located at the extreme north end of a northwest trending ridge. Butano Creek represents the major drainage east of the ridge while Arroyo de los Frijoles, located south of Bean Hollow Road, nearly dissects the ridge.

Topographic elevations for the area range from 0 to 285 feet above mean sea level (msl). The west-facing slopes of the ridge have shallower ground surface gradients (7 percent) than the east-facing slopes (11 percent). The east-facing slopes tend to have

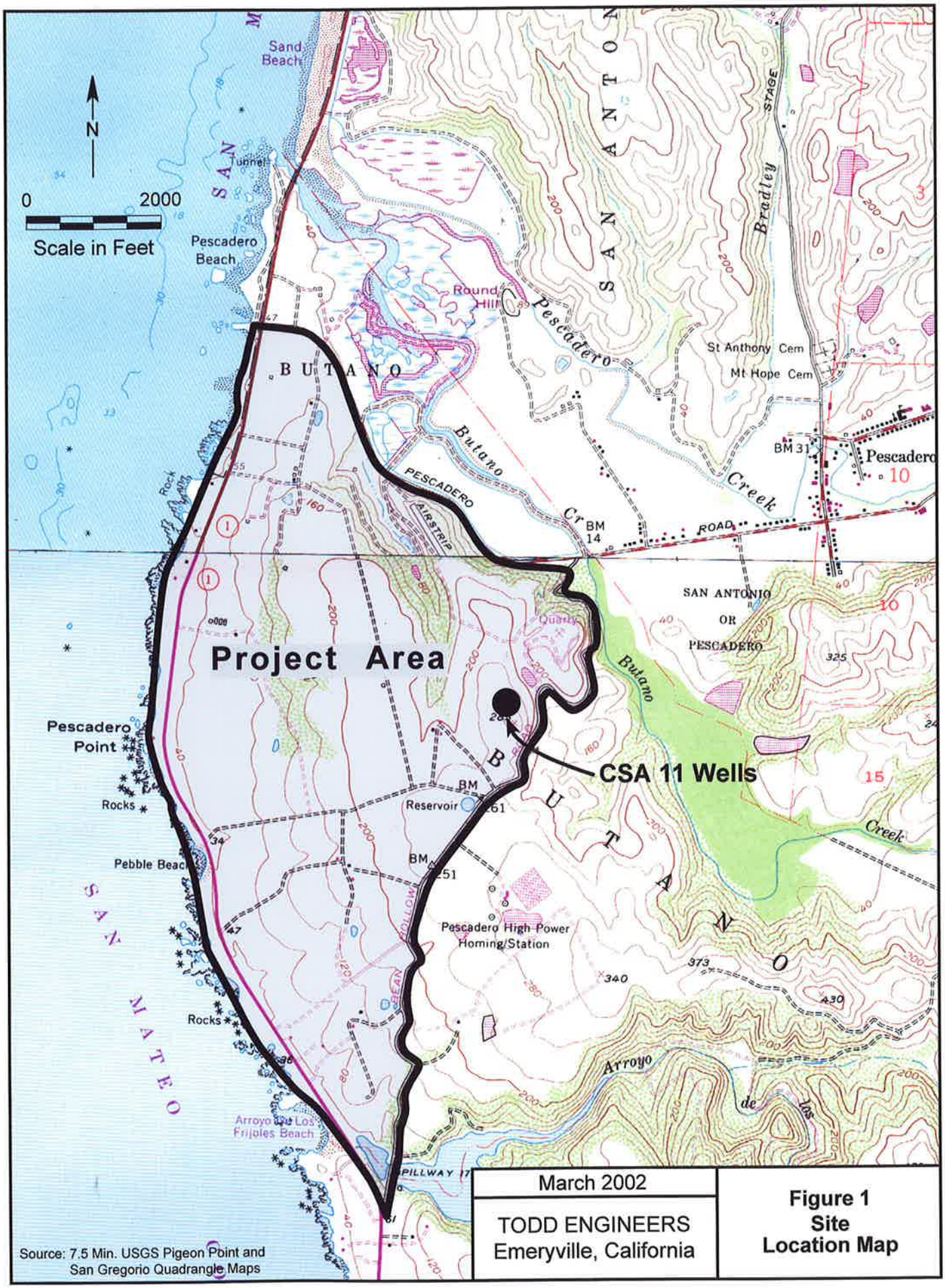

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Figure 1
Site Location Map

more pronounced drainage areas than the west-facing slopes. Pescadero Beach and the Pescadero Creek estuary are located near the northern extent of the project area. Arroyo de los Frijoles and Lucerne Lake are located south of the project area. Average annual rainfall ranges between 20 and 25 inches (Rantz, 1969; Shah and Nahn, 1989).

Prior to installing these CSA 11 water supply wells, the Town of Pescadero relied on small domestic wells, water from surface impoundments, and locally derived groundwater from wells installed in the low-lying alluvial aquifer of Pescadero and Butano Creeks. In the 1970's and 1980's, these sources were found to contain relatively high concentrations of nitrate and other naturally occurring salts. This prompted the exploration and development of alternative groundwater sources in the early and late 1980's (Wood, September 13, 1982; Geoconsultants, May 1983; Kennedy/Jenks/Chilton, September 2, 1987; Todd Engineers, July 14, 1989; and Winzler & Kelly, August 25, 1989).

Based on the history and metered usage of groundwater pumpage between 1993 and 2001, the estimated quantity of water used by CSA 11 is about 25 acre feet per year (AFY) or about 16 gallons per minute (gpm). Annual usage ranges between 17 to 29 AFY (11 to 19 gpm). Therefore, the total amount of water pumped by CSA 11 between 1993 and 2001 is about 200 acre feet (AF).

Well Information and Location

Figure 2 shows the location of all wells available for this hydrogeologic analysis. The project area is located in portions of sections 5, 8, 9, 16, and 17 of Range 5 West, Township 8 South. Forty-four wells were identified in the project area including six wells located in Pescadero Creek alluvium, and eleven wells documented from consultant reports and files. Much of the well information was compiled from the Department of Water Resources (DWR) records, County of San Mateo files and records, and Geoconsultants, Inc. and Todd Engineers files. DWR Water Well Drillers Reports could not be found for nine wells. The location of the wells shown on Figure 1 were obtained from the Drillers Reports and have not been field checked to verify the location.

Table 1 summarizes the construction details for the wells in the vicinity of CSA 11 water supply wells. The table is divided into three categories. From top to bottom they are: probable Pigeon Point Formation wells, probable marine terrace wells, and

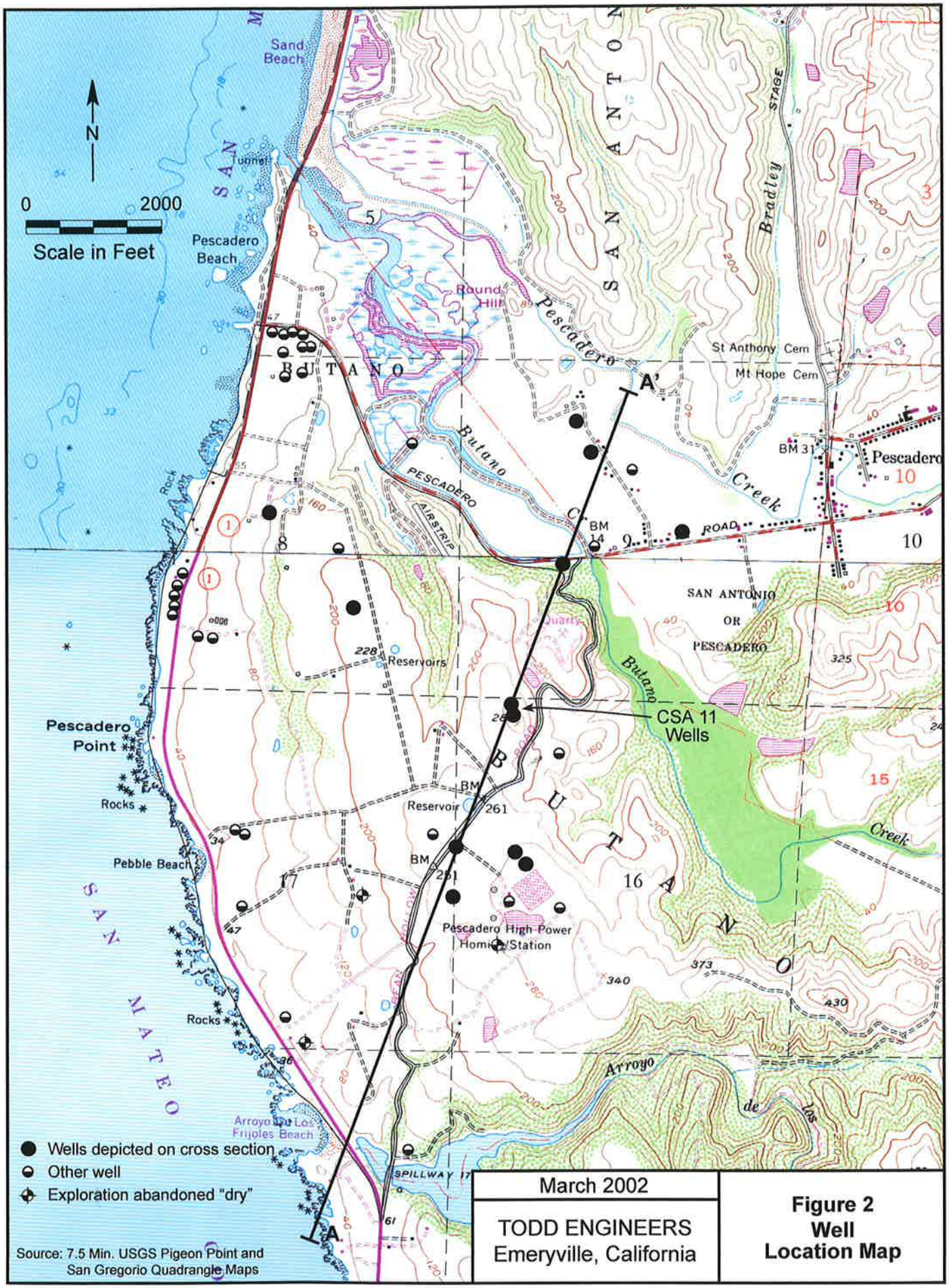

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Figure 2
Well
Location Map

Table 1

Summary of Wells in the Vicinity of the CSA 11 Wells

Name	Date	Elev.	Total Depth	CD	Csg. Diam.	Screen	Slot	SWL	Driller
Probable Pigeon Point Formation Wells									
CSA 11 Wells									
Exp Well	08/82	275	244		Abandoned			~190	Earthflow
Well 1	04/83	277	280	247	6	207 to 247	0.040	170	Earthflow
Well 2	01/92	276	260	260	10	210 to 250	0.040	170	Maggiora
SDF Well	unk	20	unk	68	8	44 to 68 ?	unk	unk	unk
Neighboring Wells									
Well 1	05/91	290	360	350	5	200 to 320	0.032	36	Digges
Well 2	05/91	270	400		Abandoned				Digges
Well 3	06/91	280	355	350	5	90 to 340	0.032	28	Digges
Well 4	01/92	260	700	635	5	228 to 628	0.040	24	Landino
Well 5	06/92	245	805	800	5	260 to 780	0.040	34	Landino
Domestic	unk	unk	unk	unk	unk	unk	unk	unk	unk
Other Wells									
62221	07/61	N/A	100	60	8	unk	unk	32	Digges
119527	02/75	N/A	220	220	5	100 to 220	unk		Maggiora
227086	04/85	N/A	100	100	4	50 to 90	unk	2	Earthflow
208314	10/85	N/A	200	200	4	40 to 180	unk	0	Earthflow
207980	12/86	N/A	100	100	5	80 to 100	unk	35	Earthflow
207981	12/86	N/A	100	100	5	80 to 100	unk	30	Earthflow
207993	06/87	N/A	160	160	5	80 to 160	unk	15	Earthflow
Probable Marine Terrace Wells									
62203	04/60	N/A	24	24	10	12 to 24	unk	6	Digges
62212	02/61	N/A	90	90	6	27 to 90	unk	24	Digges
85178	03/63	N/A	36	35	8	27 to 35	unk	23	Freedom
85178	03/63	N/A	36	35	8	27 to 35	unk	24	Freedom
107515	07/65	N/A	60	56	6	15 to 56	unk	4	Digges
122526	08/66	N/A	60	60	10	12 to 60	unk	18	Digges
122537	08/67	N/A	60	56	10	0 to 56	unk	7	Digges
122546	09/68	N/A	48	44	10	24 to 44	unk	15	Digges
13909	07/69	N/A	60	58	10	12 to 58	unk	6	Digges
13920	05/70	N/A	80	80	10	22 to 80	unk	2	Digges
13923	06/70	N/A	60	56	10	10 to 56	unk	2	Digges
13936	04/71	N/A	60	60	10	12 to 60	unk	4	Digges
13937	04/71	N/A	60	60	10	12 to 60	unk	3	Digges
13938	04/71	N/A	60	60	10	18 to 60	unk	10	Digges
20217	06/73	N/A	60	56	10	12 to 56	unk	8	Digges
20218	06/73	N/A	60	56	10	12 to 56	unk	6	Digges
110201	06/73	N/A	60	56	10	10 to 56	unk	8	Digges
38284	06/78	N/A	60	60	5	10 to 60	unk	6	Digges
38285	06/78	N/A	60	60	5	11 to 60	unk	6	Digges
227085	04/85	N/A	80	80	4	30 to 80	unk	2	Earthflow
Pescadero Creek Alluvium Wells									
107509	03/65	N/A	60	58	8	22 to 58	unk	24	Digges
91108	11/66	N/A	52	52	10	28 to 52	unk	2	Western
13915	12/69	N/A	60	56	8	20 to 56	unk	12	Digges
13925	07/70	N/A	56	56	8	18 to 56	unk	19	Digges
144907	07/76	N/A	27	27	8	12 to 27	unk	unk	Maggiora
144915	07/76	N/A	26	0	unk	unk	unk	dry	Maggiora

Name	Name of Well or State DWR Report Number	Screen	Screened interval in feet
Date	Date well drilled	Slot	Aperture size in inches
Elev.	Elevation feet mean sea level	SWL	Static Water Level in feet at well construction
CD	Completed Depth feet	unk	Unknown
Diam.	Casing (csg.) Diameter inches	N/A	not available

Pescadero Creek alluvium wells. The Pigeon Point Formation wells are further subdivided into CSA 11 wells, neighboring wells, and other wells. Each category is then arranged by date of drilling. With the exception of the State Division of Forestry (SDF) and the domestic well, information is recorded fully in reports and notes for the CSA 11 and neighboring wells. The well names for the remaining wells are the Water Well Drillers Report number.

Well depths range from 24 feet in the marine terrace wells (Well 62203) to over 800 feet (Well 5) in the Pigeon Point Formation. Most of the wells (26 wells) are located on the west-facing slope of the ridge and were drilled for domestic use. Fifteen wells exceed 100 feet in depth, while the remaining 29 wells are drilled to a relatively shallow depth and tap the Pescadero Creek alluvium or the marine terrace deposits. About twenty wells are located within 500 feet of Highway 1 and were drilled for domestic water supplies. Note that with the exception of the CSA 11 wells, the depth to water for all wells ranges between 2 and 35 feet; the CSA 11 wells have water levels of about 170 feet. In general, between 1961 and 2001, the drilled depth of wells becomes progressively deeper in the project area.

Acknowledgements

Todd Engineers acknowledges DPW staff, specifically Mr. Daniel Wang and Mr. Robert Frame, for their assistance in completing this project and coordinating contractor pre-testing activities in order to implement an acceptable pumping test. The contractor, Mr. Ron Parker of Cornerstone Pump of Morgan Hill, California, removed and re-installed the pumps in the CSA 11 wells so that reliable aquifer testing and water levels could be conducted and measured, respectively, on the pumping and the observation wells. We also appreciate the information and well construction reports (Geoconsultants, December 1991 and July 1992) provided to DPW from Geoconsultants, Inc. Discussions with Mr. Jeremy Wire of Geoconsultants, Inc. were very helpful in compiling all available information for the project area.

Hydrogeology

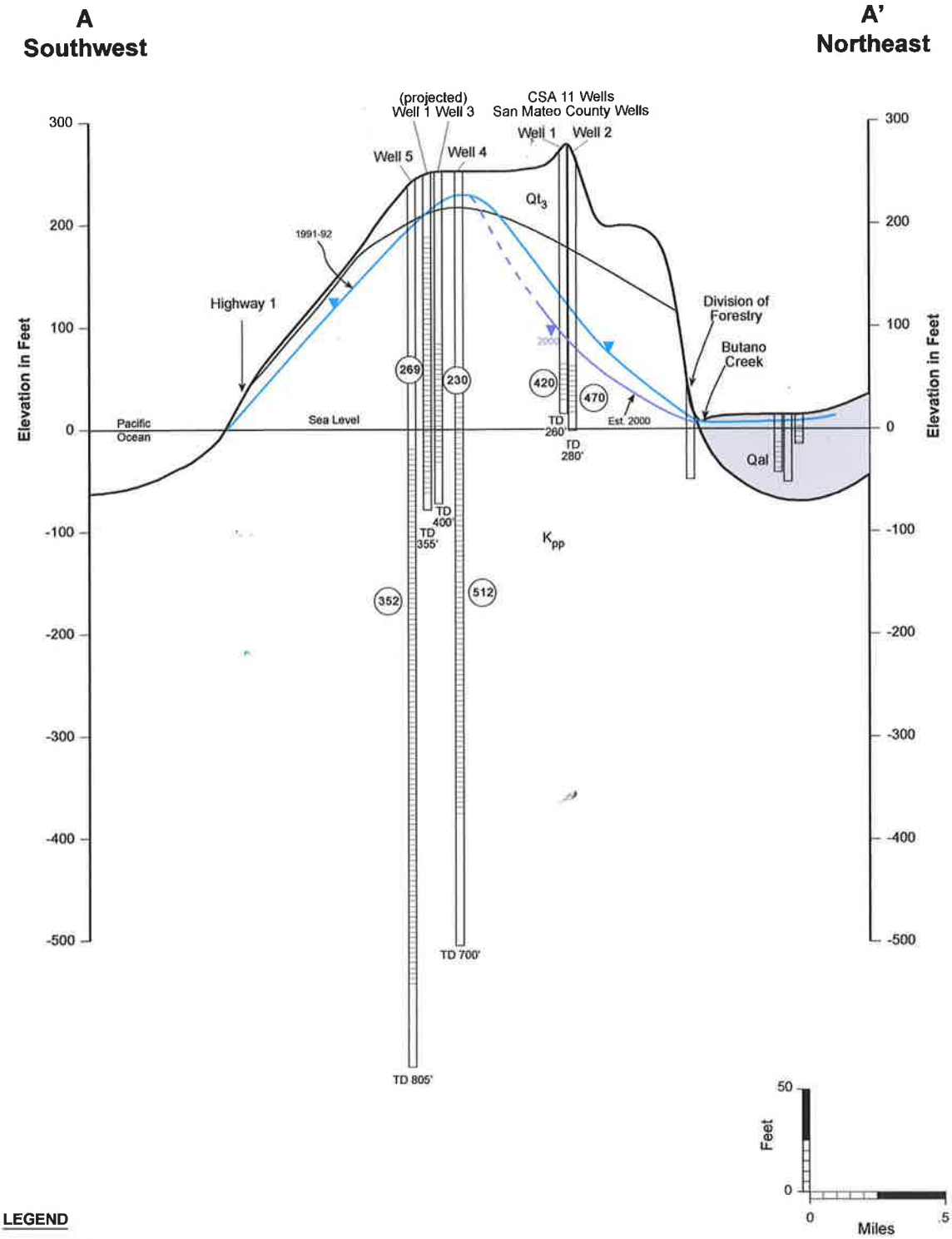
Geology

The hydrogeology of the area consists of essentially two potential moderately yielding aquifers: (1) recent unconsolidated alluvium deposited adjacent to and by Pescadero and Butano Creeks and (2) semi-consolidated to consolidated materials of the Pigeon Point Formation. A third aquifer, marine terrace deposits, exists as a thin veneer overlying the Pigeon Point Formation and is a minor water-bearing unit (low-yield). Nevertheless, these terrace deposits are suitable for domestic use. Groundwater is stored temporarily in the terrace deposits and rapidly drains from these materials.

Recent alluvium deposited by Pescadero and Butano Creeks consists of inter-bedded gravel, sand, silt, and clay. The sand and gravel units are very permeable but thin. The limited areal extent and thickness of these deposits results in a small amount of available aquifer storage. In addition, rapid percolation of surface water and septic tank return flow impacts the quality of groundwater in the alluvium (Geoconsultants, January 1981). Because aquifer storage and groundwater recharge are limited, saltwater migration or intrusion is likely to occur, also resulting in deterioration of groundwater quality.

The Pigeon Point Formation is mainly composed of jointed or fractured sandstone and conglomerate distinctly interbedded with siltstone and mudstone (Wood, September 13, 1982). Although the permeability of the Pigeon Point Formation is significantly lower than the recent alluvium, groundwater storage in the formation is much greater. The saturated portion of the Pigeon Point Formation is at least 800 feet thick. In contrast, the recent alluvium is less than 60 feet thick.

Figure 3 is a hydrogeologic cross section aligned northeast-southwest across the structural grain of the ridge and parallel to Bean Hollow Road; the location is shown on Figure 2. The cross section shows the relationship between the two main aquifers, the alluvium and the Pigeon Point Formation, and also depicts the approximate screened intervals for selected wells and measured static water levels observed in 1991 and 1992. Not much is known about the specific construction details (i.e., no Water Well Drillers Report) of the State Division of Forestry well near the Fire Station at the intersection of Bean Hollow Road and Pescadero Road.



LEGEND

Qal	Alluvium
Qt_3	Terrace Deposits
K_{pp}	Pigeon Point Formation
(352)	TDS
TD	Total Depth

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Figure 3
Hydrogeologic Cross Section

As shown in Figure 3 depth of wells in the alluvial aquifer range from about mean sea level to 50 feet below msl. In contrast, well depth elevations range from 30 feet above msl to 500 feet below msl for the Pigeon Point Formation. Note that the CSA 11 water supply wells are screened above mean sea level at elevations ranging between 20 and 30 feet above msl. This suggests that the CSA 11 wells are not taking complete advantage of the full saturated thickness (i.e., storage) of the Pigeon Point Formation.

Water levels are shown on the cross section for 1991 and 1992. In general, the water table surface parallels the ground surface. High elevation water levels are found near the top of the ridge, while low elevation water levels occur along the base of the ridge; this is referred to as a groundwater mound. The groundwater mound is not oriented in the middle of the ridge with respect to surface topography. This asymmetry may reflect that more groundwater recharge occurs on the west side of the ridge as a result of local precipitation patterns, leakage of surface water storage ponds south of Bean Hollow Road, and/or temporary groundwater storage in the marine terrace deposits.

Weather storms generally arrive at the project area from west to east, thereby releasing a significant portion of rainfall on the west-facing slopes. Precipitation soaks into the terrace deposits and recharges the underlying Pigeon Point Formation and also moves laterally along the terrace deposit and Pigeon Point Formation contact. A significant amount of this water drains down slope along the contact between the two units emerging as springs and seeps. Groundwater storage in the terrace deposits is temporary and may, in most years, be completely drained by mid- or late-summer. This, in part, is the reason that a proliferation of wells exists along the Highway 1 corridor as land owners have sought sustainable water supply (see Figure 2).

The water levels for the CSA 11 water supply wells and neighboring wells are significantly different indicating that groundwater flow diverges from the ridge (see Table 1). The CSA 11 water supply wells had water elevations of about 110 feet above msl compared to neighboring wells with water elevations of about 250 feet above msl. Local groundwater movement is from the neighboring wells near the top of the ridge to the CSA 11 wells.

Also shown on the cross section is an estimate of the current (2000) water table elevation at the CSA 11 water supply wells, which is 16 feet deeper than the 1991 and

1992 elevation. Recent (January 2001) water level measurements from the neighboring wells indicate water levels are at higher elevations than in 1991, suggesting that the drop in water levels at the CSA 11 wells are a local impact rather than a regional impact.

Groundwater Occurrence and Movement

Figure 4 is a water table map for 1991 and 1992. The groundwater contour interval is 25 feet. Water levels from sixteen wells were used to construct this map including three deep exploration wells in the southwest corner of the area reported to be "dry". However, it should be noted that if these "dry" exploration holes were cased and were able to stabilize, water levels would be expected to rise to the elevations shown on the contour map. The time for water to stabilize or seek it's own level in the borehole is related to the borehole/formation interface (i.e., well efficiency) and the permeability of the aquifer. High-permeable aquifers tend to stabilize to the static water level sooner than low-permeable aquifers. Furthermore, clay or drilling mud smeared along the borehole/aquifer interface will reduce the seepage into the borehole and lengthen the time for stabilization.

Diverging radial groundwater flow occurs in the project area and flows from the top to the base of the ridge. Although not shown on Figure 4, the water level contours between the study area and Arroyo de Los Frijoles wrap around to close the groundwater contours. Groundwater contours are also drawn for the alluvial aquifer in the Pescadero Creek and Butano Creek floodplains. Note the significant difference in contour spacing and groundwater gradients between the alluvial aquifer (0.0021 feet/feet) and Pigeon Point Formation (0.077 feet/feet) aquifer. This suggests that the Pigeon Point Formation has a significantly lower permeability than the alluvial aquifer. The permeability is a measure of the relative ease of fluid flow under unequal pressure (Gary et al., 1977).

The CSA 11 water supply wells are located half-way between the top and the base of the ground surface ridge and also the groundwater mound on the east-facing slopes draining to Butano Creek. This specific location and well depth does not take full advantage of the total available groundwater stored beneath the ridge. The significant drop in water levels at the CSA 11 water supply wells implies that total groundwater discharge, both from natural discharge of springs, seeps, and pumpage, exceeds groundwater recharge from rainfall. This may be a local impact caused by low

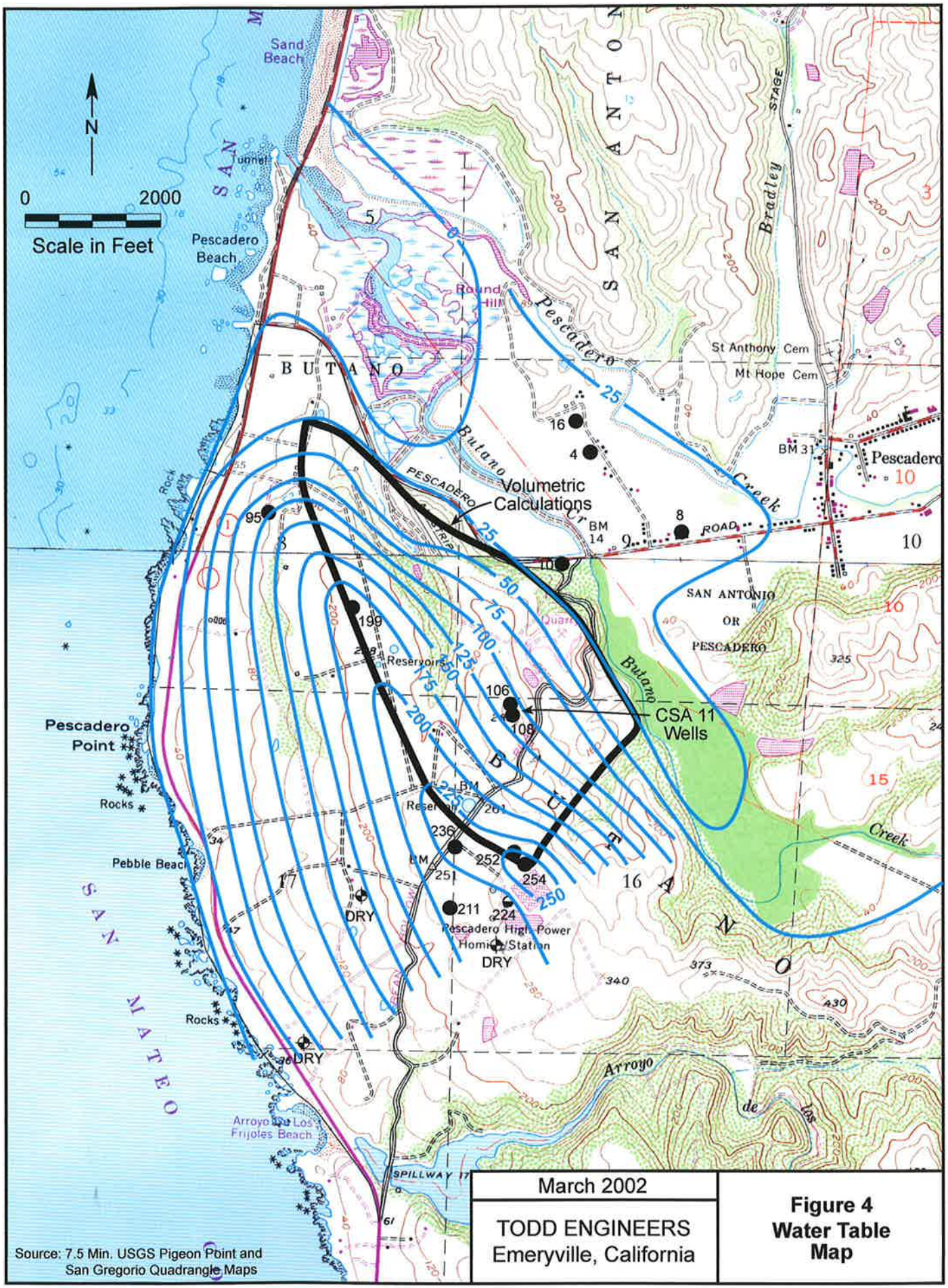

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Figure 4
Water Table Map

permeability materials in the surrounding area and consequently low recharge to the CSA 11 water supply wells or a more regional impact.

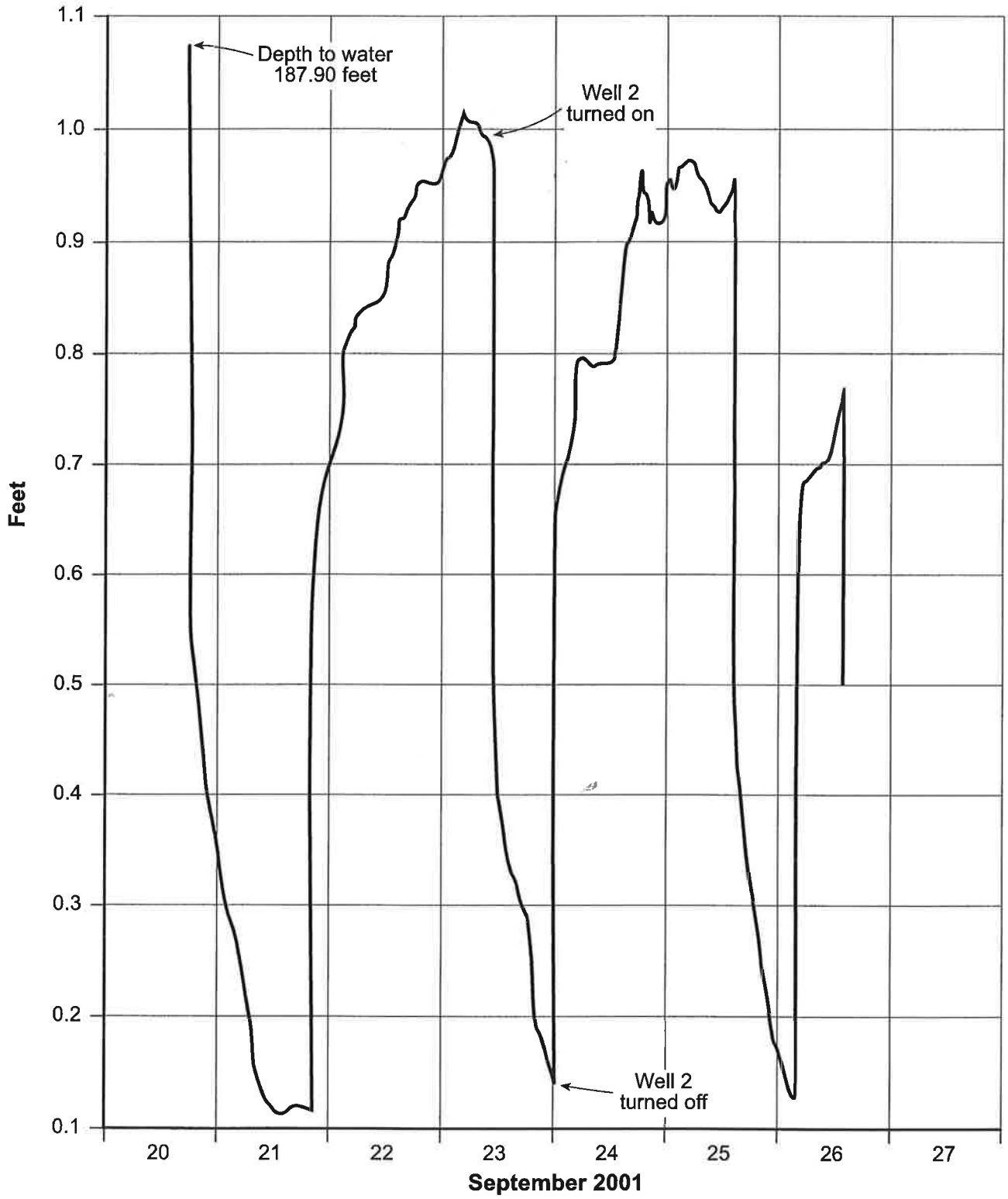
Water Level Fluctuations

Water table elevations fluctuate because aquifer recharge, discharge, and pumpage vary through time. Water level fluctuations in the Pescadero Creek alluvium would be expected to be smaller and less severe than fluctuations in the Pigeon Point Formation. Groundwater in the alluvium benefits from the Pigeon Point Formation groundwater draining to the northeast into Pescadero Creek and Butano Creek alluvium. In addition, the porosity of the Pigeon Point Formation (estimated at five percent) is probably much smaller than the porosity of the alluvium aquifer (estimated at fifteen percent) resulting in greater net groundwater fluctuation in the Pigeon Point Formation. For example, a change in volume of one foot of groundwater in alluvium would be comparable to three feet in the Pigeon Point Formation.

Prior to conducting the pumping tests, Todd Engineers installed a Leopold-Stevens Type F water level recorder in the observation well (or Well 1). The recorder consists of a clock driven mechanism with a horizontal drum covered with removable graph paper for recording water level fluctuations and a float to follow water level changes in the well.

Well 1, also referred to as the "Warheit Well", is 300 feet southwest of Well 2 and about 2,400 feet from neighboring wells. Figure 5 shows a typical response for water level changes observed at Well 1 due to pumpage from Well 2. This particular record was made between September 20 and 26, 2001 after the pumping test was completed on Well 2. The fluctuations in water levels caused by pumping Well 2 at about 25 gpm for several hours is about 0.80 feet. This indicates that the transmissivity (or field permeability) of the Pigeon Point Formation is moderate-low but sufficient for a small water system such as CSA 11. The transmissivity is the rate at which water is transmitted through a unit width under a unit hydraulic gradient (Gary et al., 1977).

The step-graph of Figure 5 shows that the water levels drop rapidly in the observation well when the pumping well is turned on. As pumping continues the water levels drop at a slower rate to drawdown stabilization. A similar, but reversed recovery response occurs when the pump is turned off. From available information, it is unclear



February 2002	**Figure 5**
TODD ENGINEERS Emeryville, California	**Groundwater Hydrograph of Well 1**

the significance of the minor groundwater fluctuations on the graph. Each successive recovery does not return fully to the previous non-pumping water level either because elapsed time of recovery is different or, alternatively, groundwater is being removed from aquifer storage. Additional aquifer testing and long-term groundwater monitoring would be needed to clarify these small fluctuations. Note that the final pumping water level for each step is the same because of mechanical pump constraints (i.e., pump rating curves and decrease in pump yields).

Regular and consistent water level monitoring has not been conducted on the CSA 11 water supply wells. Long-term records will provide the hydraulic information necessary to predict water level and aquifer behavior. Nevertheless, the static water levels in 2001 for Wells 1 and 2 are about 188 and 186 feet below ground surface, respectively, while the top of the screen intervals for the two wells are 207 and 210 feet below ground surface, respectively. Therefore, the vertical distances between the static water level and the top of the screens (referred to as the available drawdown) are 19 and 24 feet. Based on the 16-foot drop in water level over a 10-year period, calculations show that the static or non-pumping water level will reach the top of the screens in 12 years (Well 1) and 15 years (Well 2). A rule of thumb indicates that a well should utilize only two-thirds the available drawdown. This two-thirds rule provides conservatively for unforeseeable factors such as changes in well pump efficiency, seasonal and regional fluctuations in water levels, and impacts from adjacent pumping wells. Using this rule, Wells 1 and 2 can be pumped at current rates for another 8 and 10 years, respectively, before encroaching on the two-thirds rule.

Hydraulic Testing and Analysis

Pumping Tests

On September 13, 2001 a Leopold-Stevens water level recorder was installed on Well 1. Prior to recorder installation, Cornerstone Pump was contracted by DPW to remove the pump from Well 1 and to modify the wellhead of Well 2. The pump in Well 2 was removed and re-installed with a 2-inch diameter sounding tube strapped to the pump column. The pump in Well 1 was removed for the duration of the aquifer test and then re-installed with a 2-inch diameter sounding tube after aquifer testing.

The wellhead for Well 2 was modified to accommodate a tee-valve to shunt water from delivery to the nearby storage tank to open discharge near the well. A low-flow water meter that measured in cubic feet (ft^3) was also installed on the discharge pipe. The 2-inch diameter sounding tube allowed unrestricted manual access with an electric sounder to measure water levels in the well during the pumping test, and use in recommended ongoing water level monitoring.

Because aquifer testing must be conducted with stable or static groundwater conditions and water should be pumped to atmospheric pressure at the wellhead instead of the storage tank, we requested that DPW refrain from using the well for three days prior to our testing. To meet these requirements DPW filled the storage distribution tank so that the CSA 11 system demands could be met for five days with the stored water.

A preliminary pumping test was conducted on Well 2 on September 13 to assess the general performance of the well, operation of the installed monitoring equipment, and magnitude of water fluctuations in the observation well. Unfortunately, the water level sounding probe became stuck in the pumping well at a depth of 30 feet. Instead of the probe being lowered in the 2-inch sounding tube, the sounding probe was inadvertently lowered between the 5-inch diameter casing, the 2-inch diameter sounding tube, and the pump column. No water level measurements could be collected from the pumping well at this time. Cornerstone Pump was called back to the site to correct the problem.

On September 13, 2001, the static water level for the observation well was 187.71 feet below the top of the casing. Because of the inability to measure water levels at the pumping well (Well 2), we decided to abort the pumping test activities. Since the ongoing

operation of the CSA 11 system was necessary, the storage tank was re-filled and a second day of pumping was scheduled seven days later. The recorder on Well 1 was left in place to measure pre-testing water levels.

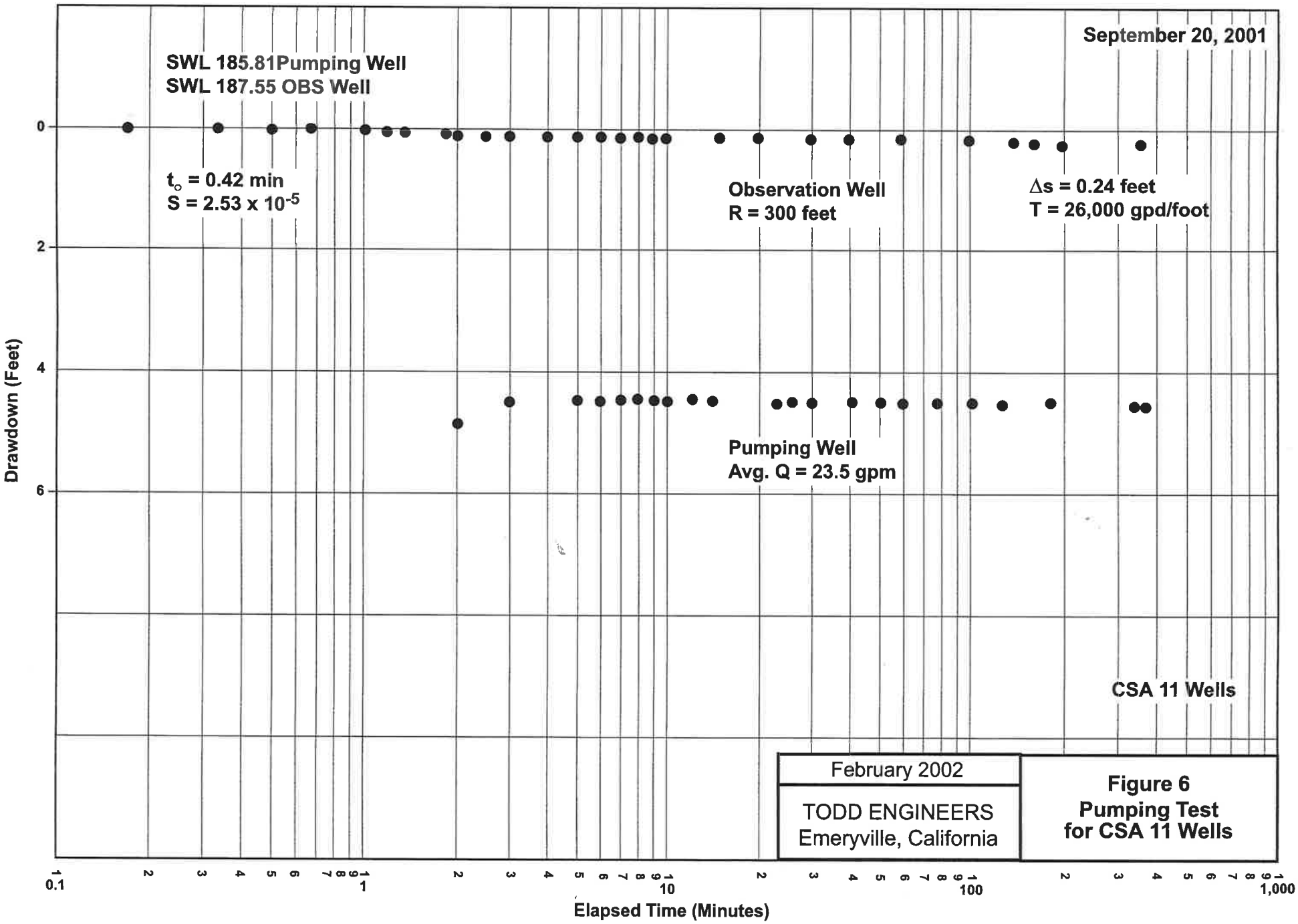
On September 20 a formal pumping test was conducted on Well 2. At 0830 hour the static water levels for Wells 1 and 2 were 187.55 and 185.81 feet below the top of casing, respectively. The pump was turned on at 0920 hour and pumped until 1520 hour (6 hours) at an average discharge of about 23.5 gpm. A five gallon bucket and stop watch was used to measure the pump discharge periodically to verify the flow meter readings. The pump was turned off and two hours of water level recovery were collected to verify drawdown measurements.

Pumping Test Analysis

Figure 6 shows the results of the constant discharge testing. The data are meaningful and internally consistent. The data are analyzed by the Cooper-Jacob semi-logarithmic method (Driscoll, 1986). Drawdown is plotted on the arithmetic scale, time is on the logarithmic scale. Both the observation well and pumping well drawdown curves are shown on Figure 6. The curves are nearly parallel. The pumping well curve is lower than the observation well. Drawdown or the water level change caused by pumping is deepest in the pumping well and systematically smaller with radial distance from the pumping well resulting in an inverted cone referred to as the cone of depression.

Based on the graphs of Figure 6, calculations show that the transmissivity or T-value of the aquifer is about 26,000 gallons per foot (gpd/ft) or 3,484 square feet per day (ft^2/day). The transmissivity of an aquifer is the rate at which water of the prevailing kinematic viscosity is transmitted through a unit width under a unit hydraulic gradient (Gary et al., 1977). High T-values represent more prolific aquifers while low T-values indicate poorer or low-yielding aquifers. Low-yielding aquifers are suitable for domestic water supplies and are typically less than 2,000 to 3,000 gpd/ft. High-yielding aquifers can range between 8,000 to over one-million gpd/ft. The Pigeon Point Formation is a medium- to low-yielding aquifer and can be expected to yield less than 100 gpm or 19,250 cubic feet per day (ft^3/day) depending on the available drawdown.

Because Well 1 is an observation well, calculations can be made to estimate the storativity of the aquifer. The storativity of an aquifer is the volume of water released



February 2002

TODD ENGINEERS
Emeryville, California

Figure 6
Pumping Test
for CSA 11 Wells

from storage in a vertical column of one square foot when the water table or potentiometric surface declines one foot (Gary et al., 1977). The storativity (S-value) indicates whether the aquifer is unconfined or confined. Large S-values (greater than 0.01) indicate water table conditions and values less than 0.005 indicate confined artesian aquifer conditions. A confined aquifer is bounded above and below by impermeable beds or beds of distinctly lower permeability than that of the aquifer itself (Gary et al., 1977). In contrast an unconfined aquifer (or water table) contains water that is not confined under pressure beneath relatively impermeable rocks (Gary et al., 1977). Calculations (Driscoll, 1986) indicate that the S-value for Well 1 is 0.000025 implying the aquifer is confined. Because the discharge for the test was only 23.5 gpm and the observation well was 300 feet from the pumping well, we believe this estimate is too low and may not reflect the true S-value for this aquifer system. The S-value should be verified with additional pumping at higher discharge rates (i.e., 75 to 100 gpm) or, alternatively, wells located closer to the pumping well (i.e., less than 30 feet).

Well Efficiency

Additional calculations indicate that Well 2 is about 40 percent efficient based on the empirical relationship between the measured transmissivity and the well specific capacity. The specific capacity is a normalized term that represents the amount of water in gallons per minute (gpm) that can be pumped from a well per foot of drawdown. The specific capacity is directly related to the T-value and well efficiency. Large specific capacities mean high-yielding aquifers, while small specific capacities mean low-yielding aquifers or low well efficiencies.

The projected 24-hour specific capacity of Well 2 is 4.94 gallons per minute per foot of drawdown (gpm/ft of dd); the theoretical specific capacity at 24 hours is about 13 gpm/ft of dd (see Driscoll, 1986). Therefore, the efficiency of Well 2 is 38 percent (4.94 ÷ 13 x 100). Current specific capacity data are not available for Well 1. Nevertheless, in 1987 the 46-hour specific capacity was 3.80 gpm/ft of dd or a well efficiency of 29 percent.

Well efficiencies are important if the pumping wells are to have optimum life expectancy and performance. Inefficient wells require greater amounts of drawdown,

require more energy to lift the water from the pumping water level, and deeper well screens.

Table 2 summarizes other hydraulic information collected by consultants on the two CSA 11 wells and other neighboring wells. Note that the water table elevations of the CSA 11 and neighboring wells are significantly different even though the wells are located in the same general geologic settings; and note that the specific capacity varies by at least one order of magnitude. This implies that the neighboring wells are located in less permeable material or, alternatively, well efficiencies are lower than CSA 11 wells.

It should be noted that the estimated T-values for the neighboring wells range between 30 and 249 gpd/ft implying that the Pigeon Point Formation is less permable in that area. However, seriously inefficient wells can result in low T-values. Pumping tests on CSA 11 wells have not encountered a change in permeability (i.e., a barrier boundary) with long-term pumping tests. Additional pumping tests on these neighboring wells, especially with an observation well, would be required to verify the T-values and well efficiencies in the vicinity of the neighboring wells.

The specific capacity can be used to estimate the recommended pumping rate provided the drawdown curve shown on Figure 6 does not steepen (i.e., encounter barrier boundaries). Two-thirds of the available drawdown or 100 feet, which ever is less, is used to estimate the recommended pumping rates for Wells 1 and 2. Well 1 and Well 2 have available drawdowns of 19 and 24 feet, respectively; the specific capacity of the wells at 24 hours are about 3.85 and 4.94, respectively. Therefore, the recommended pumping rates for Wells 1 and 2 are 49 gpm and 79 gpm if sufficient drawdown is available. For contrast, the recommended discharge for the neighboring wells ranges between 2 and 17 gpm. Prior to increasing the capacity of the CSA 11 wells, additional testing should be conducted to stress the aquifer and to confirm these estimates.

The transmissivity is also directly proportional to the aquifer thickness and the hydraulic conductivity (a more fundamental measure of permeability). For example, the Pescadero alluvial aquifer is thin (about 60 feet) has a relatively high hydraulic conductivity estimated at about 450 gallons per day per square foot (gpd/ft^2) or 60 feet/day (ft/day). This results in a T-value of 27,000 gpd/ft. In contrast, the Pigeon Point

Table 2

Summary of Aquifer Testing in the Vicinity of the CSA 11 Wells

	Date	GS Elev.	Test Duration	SWL	Q	PWL	Total DD	Q/s	WL Elev.
CSA 11 Wells									
Well 1	04/83	277	24 hour	169.50	22	176.00	6.50	3.38	108
	08/87	277	30 min	168.48	27	175.38	6.90	3.91	109
	08/87	277	30 min	168.48	41	179.28	10.80	3.80	109
	08/87	277	30 min	168.48	45	179.98	11.50	3.91	109
	08/87	277	46 hour	168.54	40	178.94	10.40	3.85	108
Well 2	01/92	276	30 min	170.00	50	182.67	12.67	3.95	106
	01/92	276	30 min	170.00	100	189.00	19.00	5.26	106
	01/92	276	30 min	170.00	150	199.00	29.00	5.17	106
	09/01	276	6 hour	185.81	24	190.26	4.45	5.40	90
Neighboring Wells									
Well 1	06/91	290	8	35.60	9	120.40	84.80	0.11	254
Well 3	07/91	280	5	27.60	4	144.00	116.40	0.03	252
Well 4	01/92	260	22	24.00	35	240.00	216.00	0.16	236
Well 5	06/92	245	24	34.30	37	235.00	200.70	0.18	211
Domestic	06/91	280	3	56.00	4	129.00	73.00	0.05	224

Date	Date of aquifer test
GS Elev.	Ground surface elevation feet
SWL	Static Water Level feet
Q	Discharge gpm
PWL	Pumping Water Level feet
Total DD	Total drawdown feet
Q/s	Specific capacity gpm/ft of dd
WL Elev.	Water Level Elevation feet

Formation is relatively thick (520 feet), with a low hydraulic conductivity (50 gpd/ft^2), resulting in a T-value of 26,000 gpd/ft, the same value as the alluvium.

In summary, the yield of a well is based, in part, on the available drawdown, the specific capacity of the well, the well efficiency, and the aquifer thickness. Therefore, the CSA 11 wells would be more productive if the well screens were at deeper depths providing additional available drawdown and capture of additional regional groundwater.

Assuming that the top of the well screen is placed at mean sea level, allowing approximately 90 feet of available drawdown, and the rate in drop of the water level (1.6 feet per year) remains the same; then the longevity of the aquifer should range between 38 years (utilizing two-thirds the available drawdown) and 56 years. In addition, calculations also show that if such a well has a specific capacity ranging between 3.38 and 5.40 gpm/ft of dd, then the well should be capable of yields ranging between 200 and 300 gpm.

Groundwater Chemistry

Table 3 summarizes inorganic groundwater chemistry for CSA 11 (three samples) and the neighboring wells (five samples). Water quality of the eight samples is similar. Total dissolved solids (TDS), a measure of the total inorganic constituents and an indication of salinity, ranges between 230 and 512 milligrams per liter (mg/l). The State Department of Health Services (DHS) suggests a TDS concentration of less than 500 mg/l for a drinking water supply. Elevated TDS concentrations are not harmful to health but may require treatment to reduce scaling and soap scum. The values of TDS are shown on the cross section (Figure 3). It appears that TDS does not vary significantly with depth in contrast to Wood (September 13, 1982) who suggested that the salinity increases to non-potable saline water below sea level. Groundwater at shallower depths would tend to have lower TDS concentrations than groundwater from deeper depths because of the less time for contact with aquifer materials.

The iron and manganese concentrations for CSA 11 wells are within the suggested drinking water standards. However, elevated iron and manganese concentration in the neighboring wells, while not harmful to human health, will stain fixtures and clothing. DHS recommends that iron and manganese concentration not exceed 0.3 and 0.05 mg/l, respectively. All other inorganic constituents are within the suggested DHS drinking water standards. A groundwater sample for Well 1 of CSA 11 was analyzed for organic constituents which were found below the detection limit. The CSA 11 wells tend to have higher sodium and chloride concentrations than those from neighboring wells, but the sodium to chloride ratios are about the same ranging between 0.52 to 0.63.

We recommend that future inorganic groundwater sampling be conducted annually on the CSA 11 wells to track groundwater quality changes. This tracking will help to identify the long-term reliability of the aquifer. Constituents that should be measured annually include major cations (calcium, magnesium, sodium, and potassium), major anions (bicarbonate, sulfate, and chloride), minor ions (iron, manganese, nitrate, and fluoride), general physical (total alkalinity, total hardness, pH, TDS, electrical conductivity, turbidity, color, and odor), and trace metals (arsenic, barium, cadmium,

Table 3

Groundwater Chemistry for Wells in Vicinity of CSA 11 Wells

	CSA 11 Wells			Neighboring Wells					
	Well 1 04/83	08/87	Well 2 12/95	Well 1 06/91	07/91	Well 3 07/91	Well 4 06/92	Well 5 06/92	DHS DWS
MAJOR CATIONS									
calcium	59	24	25	29	18	20	62	24	
magnesium	18	15	19	11	11	12	52	15	
sodium	62	63	62	41	37	41	65	74	
potassium	-	3	2	-	-	-	-	-	
MAJOR ANIONS									
bicarbonate	79	55	95	130	98	116	122	140	
sulfate	11	10	13	-	7	14	9	9	250
chloride	110	110	120	-	58	66	181	116	250
MINOR IONS									
iron	*	0.12	-	-	0.8	0.6	*	*	0.3
manganese	*	*	-	-	0.1	0.1	*	*	0.05
nitrate	12	9	16	-	11	12	8	6	45
flouride	*	*	0.19	-	-	-	-	-	1.4 to 2.4
GENERAL PHYSICAL PROPERTIES									
alkalinity	-	90	-	-	-	-	-	-	
total hardness	140	120	140	-	-	-	-	-	
pH units	7.6	7.7	7.5	8	6.9	7.1	7.3	8.4	
EC umhos/cm	490	610	520	-	400	420	800	550	900
TDS	420	390	470	230	256	269	512	352	500
MBAS	*	*	*	-	-	-	-	-	0.5
turbidity NTU	-	0.07	-	-	-	-	-	-	0.5
color units	-	*	-	-	-	-	-	-	
odor units	-	1	-	-	-	-	-	-	
TRACE METALS									
arsenic	*	*	*	-	-	-	-	-	0.05
barium	*	*	*	-	-	-	-	-	1
cadmium	*	*	*	-	-	-	-	-	0.005
chromium	0.009	*	*	-	-	-	-	-	0.05
copper	*	*	*	-	0.7	0.1	*	*	1
lead	*	*	*	-	-	-	-	-	
mercury	*	*	*	-	-	-	-	-	0.002
selenium	*	*	*	-	-	-	-	-	0.05
silver	*	*	*	-	-	-	-	-	0.1
zinc	0.11	0.15	0.11	-	0.1	0.1	*	0.1	5
OTHER									
phosporous	-	*	-	-	-	-	-	-	
boron	-	-	-	0.37	*	*	0.07	*	
organic suite	-	*	-	-	-	-	-	-	
SAR	-	-	-	50	2.32	2.67	2.98	4.91	
sodium:chloride	0.56	0.57	0.52		0.64	0.62	0.36	0.64	

* Below instrument detection limit
\- Not analyzed
All concentrations in mg/l except where shown
DHS DWS Department of Health Services Drinking Water Standards

total chromium, copper, lead, mercury, selenium, silver, and zinc).

Salt Water Wedge and Intrusion

The saturated Pigeon Point Formation above sea level is unlikely to experience salt water intrusion. Apparent elevated concentrations of sodium and chloride in the CSA 11 wells are probably caused by natural recharge of sea spray and mist on the west-facing slopes and the lower recharge of groundwater on the east-facing slopes. In general, as long as the pumping water level of a well is above sea level, horizontal salt water intrusion should not be experienced at the well. Inland movement of the salt water wedge will occur if pumpage is not balanced by groundwater recharge. Horizontal movement of the salt water wedge is a balance between the dynamic groundwater head of the water level above sea level and groundwater flow through the aquifer (Todd, 1980). Increased groundwater pumpage will move the salt water wedge inland while increases to groundwater head will move the salt water wedge toward the ocean.

A second method of saltwater contamination to a well can occur from vertical movement of water or upconing. Again, as long as the pumping water level remains above sea level, upconing should not be experienced in pumping wells.

In the project area, water quality data from neighboring deep wells suggest that significant quantities of fresh water occur below sea level. This would be expected since the hydrostatic balance or equilibrium between fresh (1.000 grams/cubic centimeter [g/cm^3]) and salt water (1.025 g/cm^3) is one to forty (1:40) [$1.000 \div (1.025 - 1.000)$]. Fresh water is lighter and tends to float on salt water. This means that if sufficient groundwater storage is available, then one-foot of fresh water above sea level at a well will have 40 feet of fresh water below sea level. This relationship is experienced on ocean islands and is referred to as the Ghyben-Herzberg lens (Todd, 1980).

Volumetric Calculations

The volume of groundwater available to the CSA 11 wells was estimated based on the 1991-92 water table map (Figure 4) and an estimate of the porosity of the aquifer (0.05). Not all water is available to the CSA 11 wells in the project area. We assumed that the northeast half of the ridge (shown on Figure 4) is available to recharge the CSA 11 wells. The area delineated on Figure 4 for the volumetric calculations is 442 acres. However, without additional wells and hydraulic testing in the northern portion of the area, actual water capture would be one-half of this area or 221 acres.

The area between the groundwater contours was measured and multiplied by the average groundwater elevation or the mid-point of the contour interval. This calculation provided the total volume of saturated material beneath this portion of the ridge. The volumes were summed for each interval to provide a total volume of saturated material (43,025 acre-feet [AF]). Assuming a porosity of five percent (0.05), then the volume of groundwater available above sea level is 2,151 AF in 1992. Without additional wells to the north, it is doubtful that Wells 1 and 2 could capture more than one-half this volume or 1,075 AF.

In addition, because Wells 1 and 2 are not screened below sea level, water beneath the screened interval would not be captured. Therefore, the 1,075 AF must be corrected to reflect this unavailable water. The bottom of the wells are screened about 25 feet above sea level and the area of the contribution is 221 acres (442 acres ÷ 2). The volume of groundwater inaccessible to the wells is about 277 AF (221 acres x 25 feet x 0.05) while accessible groundwater to Wells 1 and 2 is about 798 AF (1,075 AF – 277 AF). Currently the CSA 11 water supply pumps an average of 25 AFY. Therefore, the aquifer could last between 32 (current well depth) and 43 years (well depth to sea level) based on 1992 water levels assuming no recharge.

Since 1992 water levels have dropped 16 feet. Assuming that the water levels dropped uniformly across the project area, then the 1992 longevity calculations shown above must be adjusted accordingly. A 16-foot drop is approximately equivalent to 177 AF of water (221 acres x 16 feet x 0.05). This yields a net decrease in available water to the wells of 621 AF (current well depth) or 898 AF if new wells were installed to capture

groundwater to sea level. Therefore, the current estimate of the longevity of the aquifer is between 25 years (current well depth) and 36 years (well depth to sea level). It should be noted that the estimated 177 AF of water removed (18 AFY) in 10 years based on volumetric calculations is similar to the actual annual volumes removed (25 AFY).

Conclusions

Wells 1 and 2 were installed in the Pigeon Point Formation west of the Town of Pescadero for the CSA 11 water supply system in 1983 and 1992, respectively. These wells were installed to replace inadequate water supplies from domestic wells, small impoundments, and wells installed in the Pescadero Creek and Butano Creek alluvium. The wells began to operate in 1993. Average annual pumpage is 25 AFY. The water levels in both wells dropped about 16 feet in 10 years. Assuming linear declines, the wells could fail due to lack of water in 8 to 15 years.

A review of all relevant and available hydrogeologic information indicates that potable groundwater exists throughout the project area in the vicinity of the CSA 11 wells. Groundwater flows radially from the top of the groundwater mound at an elevation near 250 feet above msl to the base near sea level. Deep wells in the area suggest that fresh groundwater exists at depths of at least 400 feet below msl. Volumetric calculations indicate that the Pigeon Point Formation contains less than 621 AF of water (available to Wells 1 and 2) to 898 AF of water (available to wells tapping groundwater below sea level). These volumes correspond to potential aquifer longevity of less than 25 to greater than 36 years, respectively.

Recommendations

1. We recommend that CSA 11 install a new production well in the general vicinity of Wells 1 and 2 and the tank. The well should be drilled to at least 100 feet below msl to take advantage of the overlying potable water. A certified hydrogeologist should prepare well specifications, supervise construction, design the production well, and conduct formal aquifer testing. After well completion, a well construction report should be prepared to document site drilling and construction activities, pumping test analysis, and long-term operation and maintenance of the well. The well could be located at a lower elevation near the distribution tank to reduce overall drilling depth. Alternatively, the well could be located in the vicinity of Wells 1 and 2.

2. We recommend that CSA 11 collect annual groundwater samples for major cations and anions, minor ions, general physical, and trace metal concentrations.

3. We recommend that CSA 11 collect monthly static and pumping water levels on Wells 1 and 2. These data will be used to predict future hydrogeologic conditions.

4. Additional pumping tests to confirm aquifer parameters and aquifer response could be conducted on both Well 1 and Well 2. These tests would be conducted with larger pumps so that the Pigeon Point Formation could be fully stressed and drawdown data would be more defensible.

5. An investigation could be conducted to determine if it is economically feasible to install a storage/recharge pond in the vicinity of Wells 1 and 2. Because of the limited upstream watershed area, the water quality regulatory requirements, and unpredictable rainfall events (particularly in summer) it is doubtful that a recharge/storage pond would be successful or reliable for the CSA 11 water system.

6. With the permission of the well owner, an investigation and fieldwork could be conducted to assess if any of the existing wells in the vicinity of CSA 11 could be utilized to supplement the Town of Pescadero water system. Fieldwork would include verification of well dimensions and formal pumping tests, similar to those conducted on CSA 11 wells.

Estimated Costs

1. Todd Engineers can provide a formal proposal at a later date. Nevertheless, we estimate engineering costs to install a new well to be about $20,000 to $25,000 including technical specifications, onsite drilling, construction, and aquifer testing supervision, and inspection, and well construction report. Drilling contractor costs are estimated to be $150,000. Todd Engineers can provide above ground

engineering costs through an engineering subcontractor for between $25,000 and $30,000. Based on these estimates, an installed, fully equipped and functional well can be constructed for $200,000 to $250,000.

2. We estimate that annual groundwater sampling will cost about $2,000 per year for the laboratory.

3. We estimate that monthly water level measurements including static and non-pumping water levels will be minimal and coordinated with your daily or weekly operations site visit.

4. If additional design, coordination, supervision, analysis, and reporting of pumping tests are conducted, engineering costs may range between $5,000 and $15,000 for each aquifer test depending on the complexity of the testing. This does not include wellhead modifications and any outside contractors.

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Technical Memorandum

HydroScience
Strategic Water Solutions

REGISTERED PROFESSIONAL ENGINEER
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Exp. 06/30/13
CIVIL
STATE OF CALIFORNIA

To: Edelzar Garcia, P.E.
From: Walter Sadler, P.E.
Reviewed By: Curtis Lam, P.E.
Subject: TM #1: Water Supply Reliability
Date: March 19, 2013

Purpose

San Mateo County, County Service Area No. 11 (CSA 11) is a public water system with a production well, standby well, welded steel storage tank, pump house, and distribution system that provides water for domestic use and fire flow to approximately 100 customers in Pescadero, CA. CSA 11's water source is an aquifer located in the Pigeon Point Formation approximately one mile west of unincorporated Pescadero area on the top of a northwest trending ridge adjacent to the Pacific Ocean. Due to the physical location and characteristics of both wells, the long-term sustainability of groundwater has been a concern for the County.

To comply with conditions of approval in the Coastal Development Permit No. 90-62 (CDP 90-62) issued in 1990 for construction of the existing well, the County of San Mateo commissioned an investigation of the groundwater supply by Todd Engineers in 2002, with the intent to identify issues associated with the source water and potential solutions to address those issues. This investigation of the groundwater basin was very thorough and presented a variety of recommendations, one of which was to drill a new and deeper well adjacent to the existing storage reservoir. The purpose of this Technical Memorandum (TM) is to review the existing water supply conditions and provide a recommendation for water supply improvements.

History

The unincorporated area of Pescadero has a history of identifying and studying alternative water supplies for a community water system. One of the first studies to evaluate the use of both groundwater and surface water as a reliable source of supply was the *Community Water Plan for the Town of Pescadero, County of San Mateo* (Koretsky King Associates, September 1976). In this study, aquifers in bedrock and in the alluvium of Pescadero Creek were evaluated. It was determined that the bedrock formations would be marginal in yield and adequate only for small domestic demands and therefore were unsuitable for development as a source of supply for a municipal system. Groundwater aquifers in the valley of Pescadero Creek are extensively pumped for both agriculture and domestic uses. While the hydraulic characteristics of these aquifers are excellent, it was determined that their low storage capacity due to their shallow nature presented problems with regard to developing a long-term and continuous supply. In addition, water quality was a major concern due to the potential for contamination by agricultural practices and septic tank leachate in the basin.

As a result, it was determined that groundwater from the main valley of Pescadero Creek was not a viable long-term source of supply. While other sources including several wells along Butano Creek were also evaluated, the overall conclusion was that groundwater within the creek alluvium was not sufficient to be considered a reliable source of supply for a municipal system.

Several alternatives for diversion and storage of surface water together with required reservoir capacities were considered for Pescadero Creek, Butano Creek, and Little Butano Creek. In addition, issues regarding water rights for existing diverters on the streams were also considered and cost estimates for a surface water project were developed. The project was not advanced to completion due to funding issues. Other studies evaluating the potential for development of groundwater as a source of supply were completed in the early 1980s. These studies are further described below.

The report, *The Water System for Pescadero Rural Service Center, County of San Mateo*, Kennedy/Jenks/Chilton, August 1986, evaluated four water supply alternatives. Alternative A was for surface water only, Alternative B was a conjunctive use project (groundwater and surface water), and Alternatives C and D were based on groundwater only. The report was inconclusive as to a recommendation, although Alternative D assumed that a groundwater supply could be identified that would only need to address iron and manganese removal. As a result of this assumption, Alternative D was by far the least cost alternative for the development of a municipal water supply. The projected monthly cost per residential user was approximately half that of the next less costly alternative.

In a subsequent amendment to the study in 1987, Alternative E was identified that assumed the source of supply to be a new well in the vicinity of an existing 6-inch well, which served as a test well and was named the Warheit Well. This well is located to the southwest of unincorporated Pescadero, in a geographical location that had not been previously considered, on top of a ridge, adjacent to the Pacific Ocean. Further analysis determined that this well had the required capacity and water quality. However, a second well was necessary for redundancy in the event of failure of the first well or pump. Cost estimates for this alternative were even lower per residential user than Alternative D of the original study.

In 1992, the second well (Well No. 1) was constructed approximately 300 feet north of the Warheit Well. The Warheit Well was also developed as a standby well in 1992 and is designated as Well No. 2. Completion details for the two wells are slightly different with Well No. 2 being screened at depths from 215 feet to 249 feet at which point the well is filled with bentonite and sand. Well No. 1 was completed to the depth of 260 feet and is screened at depths from 210 to 250 feet. Both wells were constructed with PVC casing and slotted screen with a gravel envelope. Following the completion of the 140,000 gallon steel storage reservoir, the system was put into operation as the sole source of supply for domestic and fire flow water for CSA 11.

Both Wells No. 1 and 2 are situated in the Pigeon Point formation. When Wells No. 1 and 2 were completed, this formation at this location was saturated from approximately 110 feet above Mean Sea Level (MSL) to well below MSL. Well depths in the Pigeon Point formation extend to well over 500 feet below MSL, suggesting that Wells No. 1 and 2 are not taking full advantage of the full saturated thickness (i.e. storage availability) of the formation.

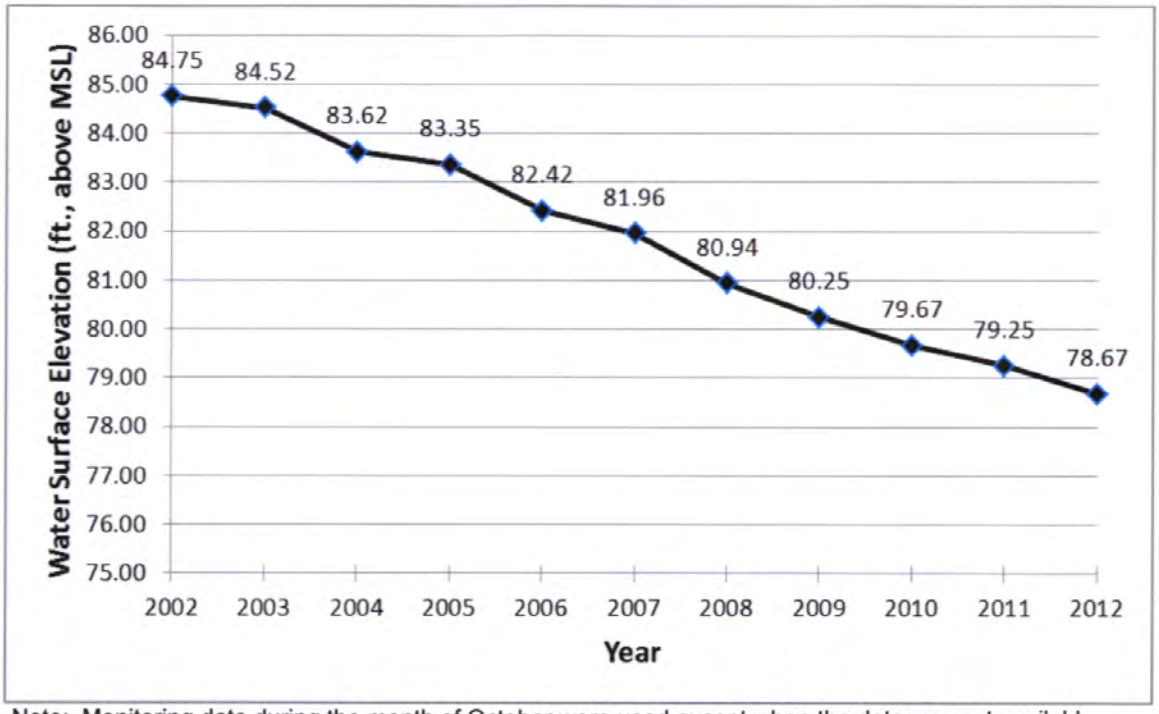
When initially constructed, the static water level in the wells was approximately 106 feet above MSL, whereas by 2002 the level had dropped to approximately 90 feet above MSL (a drop of 16 feet), with the top of the screens for Well No. 1 (the production well) and Well No. 2 (the standby well) at 66 and 70 feet above MSL, respectively. As a result, the County of San Mateo retained Todd Engineers to perform an assessment of the source water for the wells, which was summarized in the *Assessment of Source Water for the Pescadero Water System – CSA 11* ,Todd Engineers, March 2002. In the 2002 study by Todd Engineers (Todd Report), the Warheit Well is referred to as Well No. 1, and the production well is referred as Well No. 2. At some point after the

Todd Report was prepared, the well numbering system was reversed so that the production well became Well No. 1 and the Warheit or standby well became Well No. 2.

The Todd Report identified the rate of decline of the static water level and made a projection of the number of years each well will have before the pumping water level would encroach into the well screen area, thus causing cascading water. This study also presented some physical and operational changes for the water system, including monthly monitoring of static and pumping water levels. It was also recommended that a new production well be constructed at a depth of 100 feet below MSL so that storage in the aquifer can be more fully utilized and remain as the sole source of water supply for CSA 11.

In response to the Todd Report and to comply with Condition No. 4 of CDP 90-62, a monitoring program for water levels was established. Results of the water level monitoring from 2002 to 2012 are presented in Figure 1, below.

Figure 1. Static Water Levels in Well No. 1



Note: Monitoring data during the month of October were used except when the data was not available.

Current Conditions

The current static water surface elevation in Well No. 1 is projected to be approximately 78.5 feet above MSL. This projection is based on the assumption that the water level is continuing to fall at the same rate since the establishment of the monitoring program, as the level could not be measured at the time of this study. During a field visit on January 8, 2013, it was documented that the County's water level recording device had become stuck in the plastic pipe attached to the side of the metal drop pipe and its position precluded inserting another device in the plastic pipe to measure the water level. The projected level demonstrates a significant decline from the original static level of 106 feet above MSL in 1992. The downward trend in water surface elevations, as

shown in Figure 1, demonstrates that the static groundwater level will continue to decline in the long-term in response to pumping.

The significant issue regarding the water surface elevation during pumping is its proximity to the screens. If, during pumping, there is a significant difference between the water level in the well and that in the adjacent aquifer and the screens are exposed, air entrainment can occur. This difference in elevation can cause water to cascade into the well, which in turn will entrain air and cause the pump to cavitate and lose capacity. Ultimately, cavitation can destroy the pump, or the air entrainment will cause the pump to lose prime and cease pumping. While the Todd Report made note of the static water level and the height above the screens, the more significant issue now with the continuing decline in static water levels is the pumping water level.

Currently, Well No. 2 is operating as a standby well in conformance with Condition No. 2 of CDP 09-62. Therefore, to utilize this well, Operations Staff must notify the California Department of Public Health (CDPH) and perform the necessary water quality testing. It was noted that during an emergency condition on August 23, 2011, the pumping rate from Well No. 2 had declined significantly from its historical value of approximately 60 gpm to 6 gpm. This decrease in the production could be due to a variety of factors, such as decreased well efficiency which is reflected in a decrease in the specific capacity of the well (gpm/ft) during draw down. Thus, this increase in draw down will create a higher pumping head which will reduce the output of the pump. In addition, based on the decline in the static level, the pumping water level will be in the screened area of the well which can cause cascading water and thus entrained air and lower pumping rates. This lower pumping level may be responsible for the change in water quality (higher nitrate) as water is being drawn into the well from a different water bearing zone in the formation.

Well No. 1 has a reported specific capacity of approximately 5.4 gpm/ft of draw down, which based on current static water levels of approximately 78.5 feet above MSL and a pump rate of 100 gpm, would put the pumping water level at approximately 60 feet MSL or just below the top of the screens at 66 feet above MSL. If the efficiency of the well has changed over time due to formation or screen fouling, then the pumping water level would be lower and thus further into the well screen. There have been two occasions when the pump for this well needed to be replaced within the last few years, the first occurring in 2009 and the other in August 2011. During the August 2011 failure, CSA 11 had to resort to providing bottled water and other measures to address the short-term water supply needs until the pump could be replaced. Also, upon replacing the well pump in 2011, the pump was set at a deeper depth to address a concern regarding pumping water level and submergence of the well pump.

Water demand during 2012, was estimated to be approximately 24 acre-ft, which is consistent with the historical annual demand. Demand management measures such as low flush toilets, low flow shower heads, and high efficiency washers will reduce demand.

Conclusions

CSA 11 water system's Wells No. 1 and 2 were constructed in the portion of the Pigeon Point formation that is located above MSL. This formation is specific to this location and the saturated portion of the formation is at least 700 feet thick; however, only the portion of the formation that is above MSL is available to Wells No. 1 and 2. Current pumping exceeds the amount of recharge as evidenced by the declining water surface elevation. Continual declines in the water surface elevation will expose more of the screen during pumping and exacerbate the cascading water and associated cavitational impacts on the pumps in both wells It is estimated that at the current rate of water level decline, replacement of the pump will occur much more frequently until the water surface is at a level that it cannot be pumped from the well. It is currently estimated that this condition and thus failure of the well will occur within the next 5 to 7 years at the most.

To alleviate this situation, a new well with the screens located well below MSL will provide for adequate draw down of the pumping water level well above the new screen location. By design, the new well will have the screens located approximately 100 feet below MSL and well below the existing screens in Wells No. 1 and 2. Therefore, the screens in this new well would be well below the current pumping water level. In addition, locating the screens at this depth will allow the well to take advantage of more storage volume within the formation. Assuming the current level of water use and rate of decline of the water surface elevation, it is estimated that this new well will have a longevity of well in excess of 50 years. Reductions in demand due to water conservation together with potential for additional recharge by local stream flow will only lengthen the estimated life of the well.

To further improve the hydraulic performance of Well No. 1, it is proposed to locate the new well approximately 800 feet to the north of Well No. 1, thereby minimizing the mutual interference between the two wells. This greater separation, together with operating the wells in an alternating lead lag scenario, will provide more time for groundwater levels in the vicinity of Well No. 1 to recover.

Well No. 2 has limited capacity and cannot provide the average daily demands for the CSA 11 water system. Rehabilitation of Well No. 2 using standard chemical and physical methods to restore its hydraulic capacity would be difficult if not impossible as PVC casing can be easily damaged or destroyed by these techniques. Therefore, the CSA 11's water supply system does not have the redundancy requirements for supply, as required by CDPH for municipal systems, which at a minimum would require that each well be able to address the maximum daily demands of approximately 20,000 gallons.

In the Memorandum titled, *Pescadero Fire Flow Analysis*, Winzler & Kelly, May 2009, a deficiency in available water storage was identified. The current storage reservoir with a working capacity of 140,000 gallons does not have the capacity required to address fire flow requirements of 1,500 gpm for 2 hours, 180,000 gallons, plus operational and emergency demands. While the exact amount of emergency storage is Agency-specified, it should be well over 100% of Maximum Daily Demand as there is no backup power for the system. Therefore, adding additional storage in the amount of 140,000 gallons for a total of 280,000 gallons is reasonable as demonstrated by the recent failure of Well No. 1 in August 2011. CSA 11 did not have any redundancy of supply and therefore had to resort to bottled water for domestic consumption. In addition there was no fire flow storage.

Recommendations

Based on the review of historical and current information presented above, HydroScience recommends the following to address the long-term water supply reliability for the CSA 11 water system.

1. A new gravel packed well with a 12-inch diameter casing should be drilled adjacent to the existing storage reservoir to provide for maximum separation from the existing Well No. 1 and No. 2. This well should be completed to a depth of at least 100 feet below MSL, total depth approximately 300 feet, with the screens placed at the bottom of the well. This well would take advantage of the overlying storage in the formation and potential recharge from the local creeks in addition to the direct rainfall. Drilling the new well will provide CSA 11 with the redundancy required by CDP 90-62 and CDPH, and a more sustainable water supply.

2. The new well should be constructed to current well construction standards with a steel casing to facilitate any future rehabilitation efforts, a deeper sanitary seal and appropriate pump pedestal and site drainage facilities constructed to CDPH Standards. In addition, downhole pressure transducers should be installed to facilitate the collection of static and pumping water level data to provide for a better understanding of well performance.

3. It is recommended that this well have a steel casing of 12-inch diameter minimum to facilitate future downhole rehabilitation using mechanical and chemical methods, and pump installation with a sounding well attached to the pump column. This well should be designed for a capacity of approximately 100-150 gpm to allow for pumping during non-peak power usage times to reduce operational costs.

4. The pump control system should be configured to allow for the new well and Well No. 1 to alternate back and forth as the sources of supply for the storage reservoir, with Well No. 2 remaining as the emergency standby well. This new pump control system should allow for collection of the various system operational data such as water levels in the wells and reservoirs, flow rates, etc. and transmittal of that data or alarm settings to an appropriate operations center.

5. A second storage reservoir, to be constructed in proximity to the existing storage reservoir, is needed to provide for the additional storage requirements previously identified for operational requirements, fire flow and emergency demands. Both tanks should be hydraulically connected to enhance system operation.

South Westside Basin Groundwater Management Plan

July 2012

South Westside Basin
Groundwater Management Plan

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ACRONYMS AND ABBREVIATIONS

1999 Plan	proposed Westside Basin AB 3030 Groundwater Management Plan
AB	Assembly Bill
Advisory Committee	South Westside Basin GWMP Advisory Committee
AF	acre-feet
AFY	acre-feet per year
Basin Plan	San Francisco Bay Basin Water Quality Control Plan
BMO	Basin Management Objective
CalWater	California Water Service Company
cfs	cubic feet per second
DPH	California Department of Public Health
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EPA	U.S. Environmental Protection Agency
ft	feet
GAMA	Groundwater Ambient Monitoring Assessment
gpm	gallons per minute
GPS	global positioning satellites
Groundwater Task Force	South Westside Basin Groundwater Task Force
GSR	Regional Groundwater Storage and Recovery Project
GWMP	groundwater management plan
Groundwater Model	Westside Basin Groundwater Flow Model
ILPS	In-Lieu Pilot Study
InSAR	interferometric synthetic aperture radar
IRWMP	Integrated Regional Water Management Plan
JPA	joint powers agreement
MCL	maximum contaminant level

mgd	million gallons per day
µg/L	micrograms per liter
mg/L	milligrams per liter
MOU	Memorandum of Understanding
N	nitrogen
NAWQA	National Ambient Water Quality Assessment
NCCWD	North Coast County Water District
NPDES	National Pollutant Discharge Elimination System
NSMCSD	North San Mateo County Sanitation District
PCE	Tetrachloroethylene
Plan Area	area covered by South Westside Basin Groundwater Management Plan
ppm	parts per million
psi	pounds per square inch
RWQCB	Regional Water Quality Control Board, San Francisco Bay Region
SB	Senate Bill
SFIA	San Francisco International Airport
SFPUC	San Francisco Public Utilities Commission
SMCL	secondary maximum contaminant level
SVOCs	semi-volatile organic compounds
TCE	Trichloroethylene
TDS	total dissolved solids
USGS	United States Geological Survey
USDA-NRCS	United States Department of Agriculture Natural Resources Conservation Service
Water Board	California State Water Resources Control Board
Westside Basin	Westside Groundwater Subbasin
Wholesale Water Supply Agreement	Water Supply Agreement between The City And County of San Francisco And Wholesale Customers in Alameda County, San Mateo County, And Santa Clara County

1 INTRODUCTION AND BACKGROUND

1.1 PURPOSE OF THE GROUNDWATER MANAGEMENT PLAN

The purpose of the South Westside Basin Groundwater Management Plan (GWMP), including development of the plan and the plan document itself, is to provide a framework for regional groundwater management in the South Westside Basin that sustains the beneficial use of the groundwater resource. This includes:

- Informing the public of the importance of groundwater and of the challenges and opportunities presented by groundwater supplies;
- Developing consensus among stakeholders on issues and solutions related to groundwater;
- Building relationships among stakeholders within the basin and between state and federal agencies; and
- Defining actions to ensure the long-term sustainability of groundwater resources in the South Westside Basin.

This GWMP provides recommendations that, when implemented, are intended to maintain or enhance long-term groundwater levels and quality and minimize land subsidence.

The goal of the GWMP is to ensure a sustainable, high-quality, reliable water supply at a fair price for beneficial uses achieved through local groundwater management.

1.2 DESCRIPTION OF THE GROUNDWATER BASIN AND PLAN AREA

The South Westside Basin GWMP area (Plan Area) is the portion of the Westside Groundwater Subbasin (Westside Basin), Basin 2-35, as defined by the California Department of Water Resources (DWR), within the boundaries of San Mateo County. The Plan Area is shown in Figure 1.1. Areas within the northern portion of the DWR-defined Westside Basin, in the City and County of San Francisco, are described in the draft *North Westside Basin Groundwater Basin Management Plan* (SFPUC, 2005).

Overlying municipalities, shown in Figure 1.2, include Daly City, Colma, South San Francisco, San Bruno, Millbrae, and Burlingame. Water agencies serving the Plan Area are shown in Figure 1.3 and include Daly City, California Water Service Company (CalWater) – South San Francisco District, San Bruno, Millbrae, and Burlingame. Additionally, the San Francisco Public Utilities Commission (SFPUC) provides retail water service to the Golden Gate National Cemetery in San Bruno and wholesale water to the retail agencies.

Figure 1.1
Plan Area

Legend

- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

Source: Groundwater Basin: DWR, 2003

F:\215 - San Bruno\Figures\Figure 1.1 Plan Area.mxd, March 21, 2011

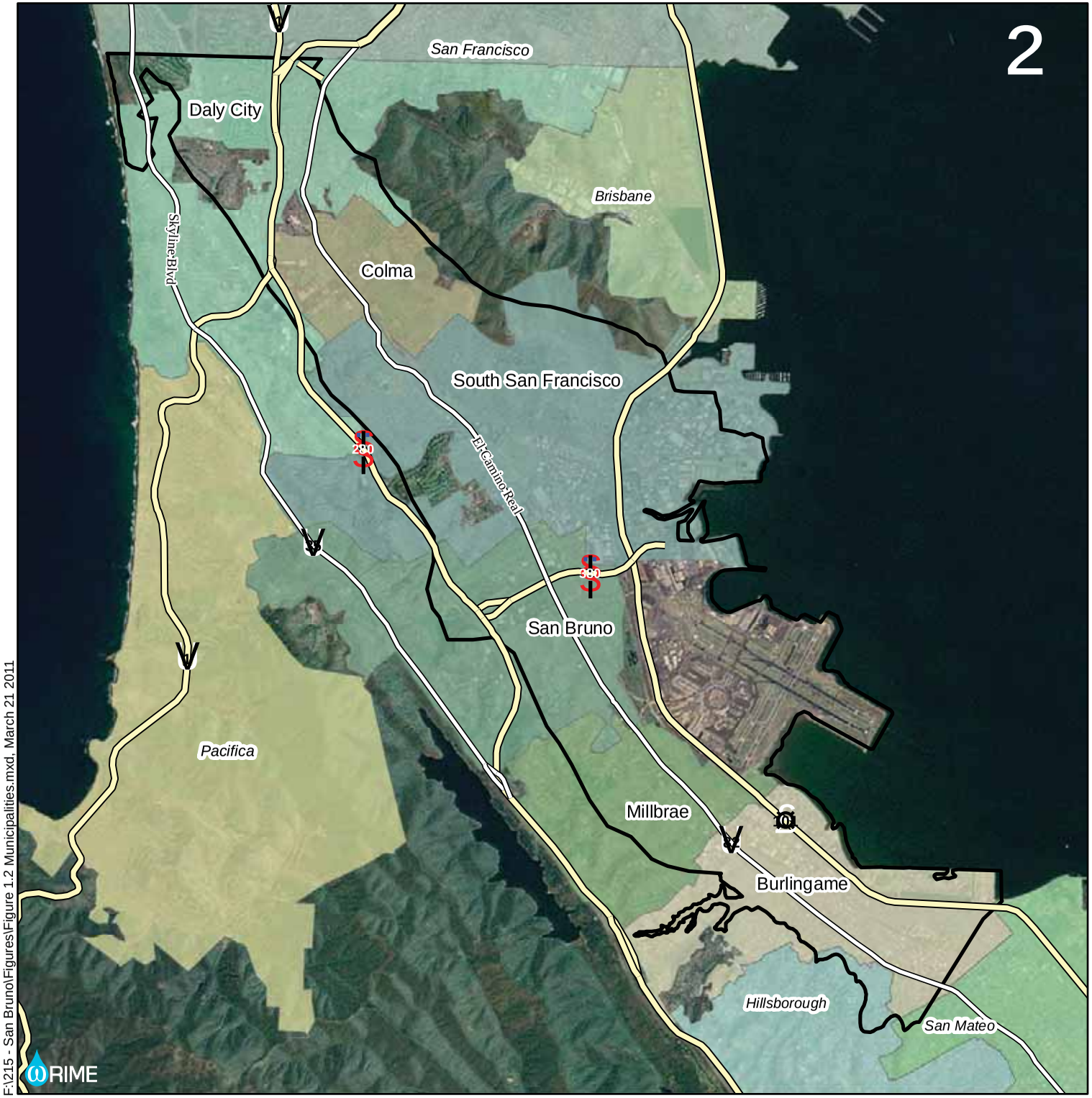

Figure 1.2
Municipalities

Legend

- Highways
- Plan Area

0 0.5 1 2 Miles

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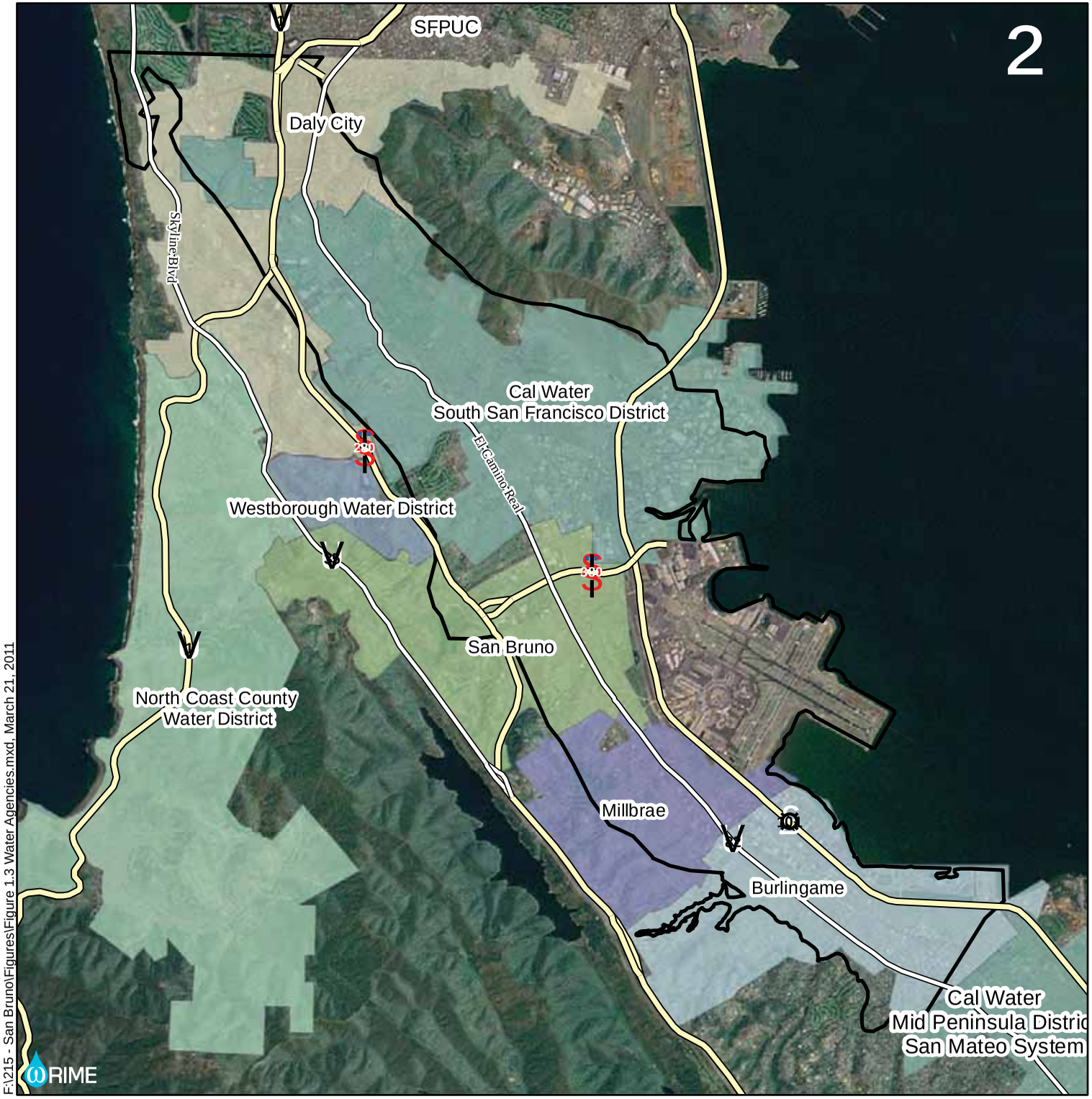

Figure 1.3
Water Agencies

Legend

- Highways
- Plan Area

0 0.5 1 2 Miles

F:\215 - San Bruno\Figures\Figure 1.3 Water Agencies.mxd, March 21, 2011

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1.3 OVERVIEW OF WATER REQUIREMENTS AND SUPPLIES

Located on the San Francisco Peninsula, the South Westside Basin underlies approximately 25 square miles and provides groundwater to Colma, Daly City, San Bruno, South San Francisco, unincorporated areas, cemeteries, golf courses, and several smaller users.

The Plan Area is considered built-out, with very little undeveloped land available for development. Future growth will occur through infill, including increased density on existing developed parcels. Land use in the basin is approximately 80 percent urban; 15 percent irrigated parks, golf courses, and cemeteries; and 5 percent unirrigated open space, as shown in Figures 1.4a and 1.4b. Urban areas include large portions of the cities of Daly City, Colma, South San Francisco, San Bruno, Millbrae, and Burlingame, as well as urbanized unincorporated areas. The total 2010 water demand for the area was approximately 29,000 acre-feet (AF) (Bay Area Water Supply & Conservation Agency [BAWSCA] 2011; SFPUC, 2011).

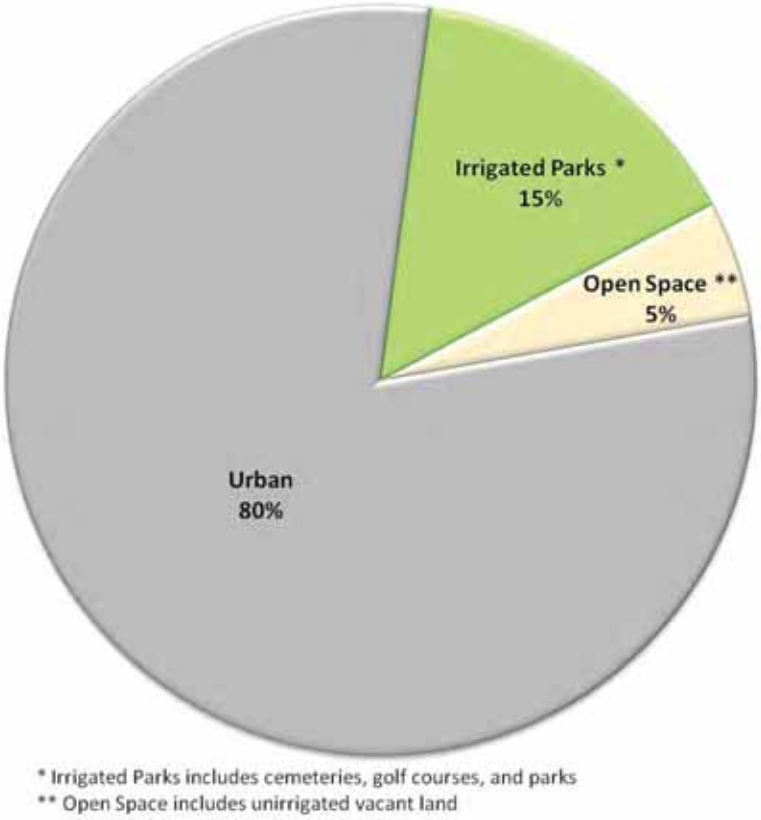


Figure1.4a Current Land Use Summary

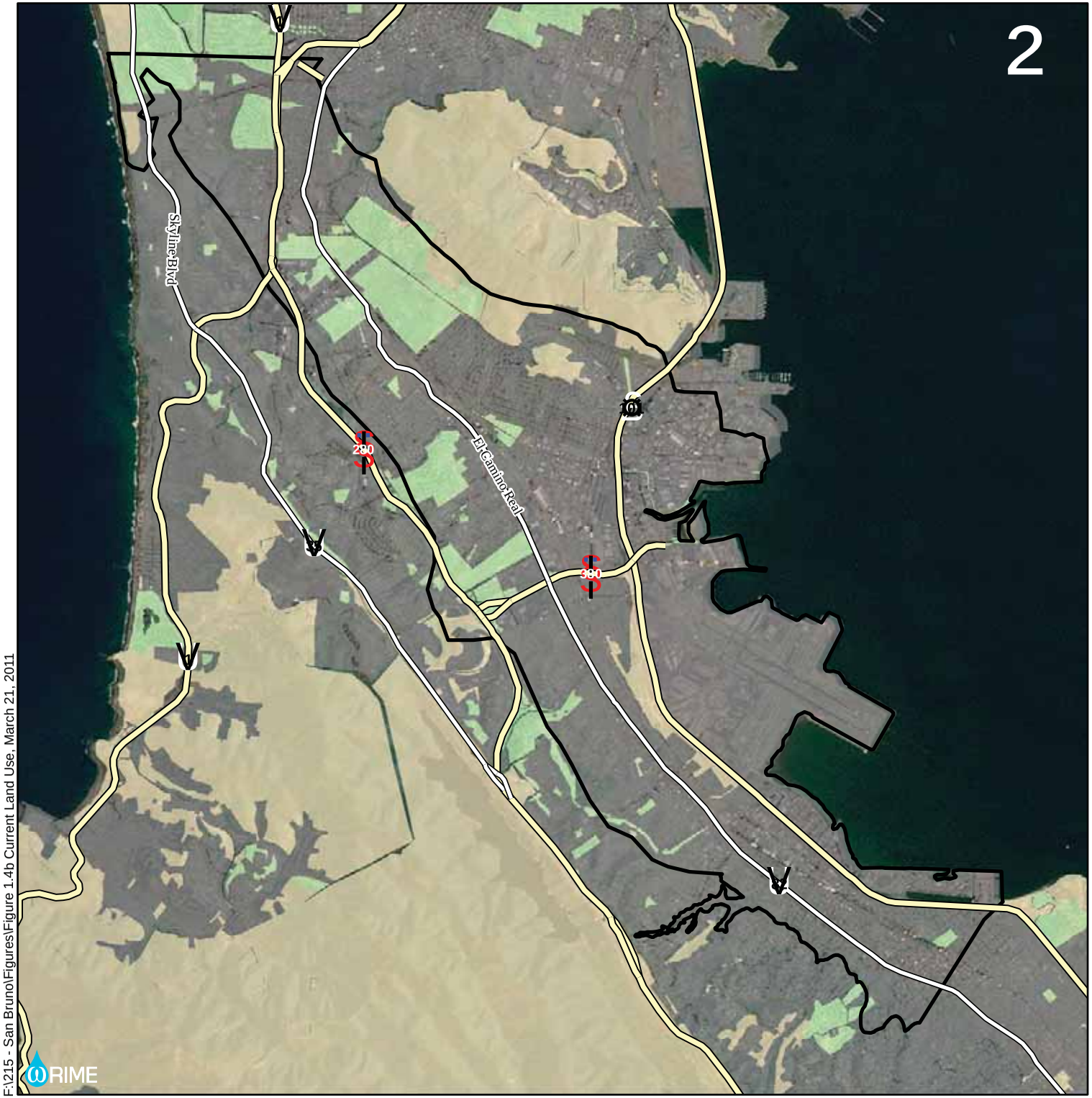


Figure 1.4b
Current Land Use

Legend

- Highways
- Plan Area

Planned Land Use

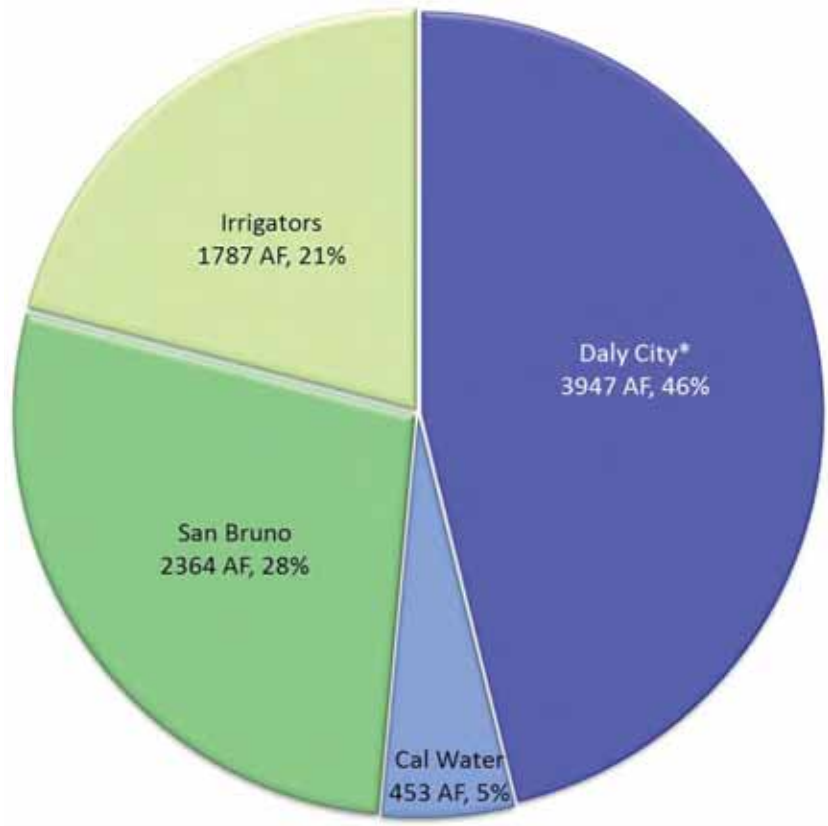
- Urban
- Parks, Cemeteries, Golf Courses
- Open or Vacant Land

0 0.5 1 2 Miles

Source: Land Use - Based on ABAG, 2006

F:\215 - San Bruno\Figures\Figure 1.4b Current Land Use, March 21, 2011

In the South Westside Basin, groundwater plays a critical role, providing up to 50 percent of some localities' water supplies, making it an important resource for the future prosperity and sustainability of the region. Approximately 8,600 AF of groundwater was produced from the South Westside Basin in 2010 (SFPUC, 2011) including 2,200 AF of groundwater banked through in-lieu recharge under the In-Lieu Pilot Study (see Section 1.5.3). Figure 1.5 shows the breakdown of groundwater production by producer for 2010. Imported water from SFPUC's Hetch Hetchy system, along with small quantities of recycled water, provides the remaining supply.



*** Value includes 2,204 AF of banked in-lieu recharge water**

Figure 1.5 Groundwater Production by Entity, 2010

While the Plan Area and surrounding region are largely built-out, additional growth through infill is expected, along with associated increases in water demands. As demands for imported water supplies continue to rise, groundwater will continue to play a key role in delivering a cost-effective and reliable water supply to the South Westside Basin.

1.4 LEGISLATION RELATED TO GROUNDWATER MANAGEMENT PLANS

Groundwater is a resource shared by numerous users; it does not recognize or adhere to jurisdictional lines and cannot be tagged for use by certain users. Groundwater rights have evolved through case law since the late 1800s. Currently, three basic methods are available for managing groundwater resources in California:

- Local agency management under authority granted by the California Water Code or other applicable state statutes (such as through a GWMP);
- Local government groundwater ordinances or joint powers agreements (JPA); and
- Court adjudications.

No law requires that any of these forms be applied within a basin. As such, management is often instituted after local agencies or landowners recognize specific issues in groundwater conditions. The level of groundwater management in any basin or subbasin is often dependent on water availability and demand, as well as groundwater quality.

In an effort to standardize groundwater management, the California Legislature passed Assembly Bill (AB) 255 (Stats. 1991, Ch. 903) in 1991. This legislation authorized local agencies overlying basins subject to critical overdraft conditions, as defined in DWR's Bulletin 118-80 (DWR, 1980), to establish programs for groundwater management within their service areas. Water Code § 10750 et seq. provided these agencies with the powers of a water replenishment district to raise revenue for facilities to manage the basin for the purposes of extraction, recharge, conveyance, and water quality management. Seven local agencies adopted plans under this authority. The South Westside Basin has never been defined by DWR as being critically overdrafted, as such it was not subject to AB 255.

The provisions of AB 255 were repealed in 1992 with the passage of AB 3030 (Stats. 1992, Ch. 947). This legislation greatly increased the number of local agencies authorized to develop a GWMP and set forth a common management framework for local agencies throughout California. AB 3030, codified in Water Code § 10750 et seq., provides a systematic procedure to develop a groundwater management plan by local agencies overlying the groundwater basins defined by DWR's Bulletin 118 (DWR, 1975) and updates (DWR, 1980, 2003). Upon adoption of a plan, these agencies could possess the same authority as a water replenishment district to "fix and collect fees and assessments for groundwater management" (Water Code, § 10754). However, the authority to fix and collect these fees and assessments is contingent on receiving a majority of votes in favor of the proposal in a local election (Water Code, § 10754.3).

By 2003, more than 200 agencies (shown in Figure 1.6) had adopted an AB 3030 GWMP (DWR, 2003). None of these agencies is known to have exercised the authority of a water replenishment district.

Water Code § 10755.2 expands groundwater management opportunities by encouraging coordinated plans and authorizing public agencies to enter into a JPA or memorandum of understanding (MOU) with public or private entities providing water service. At least 20 coordinated plans have been prepared to date involving nearly 120 agencies, including cities and private water companies.

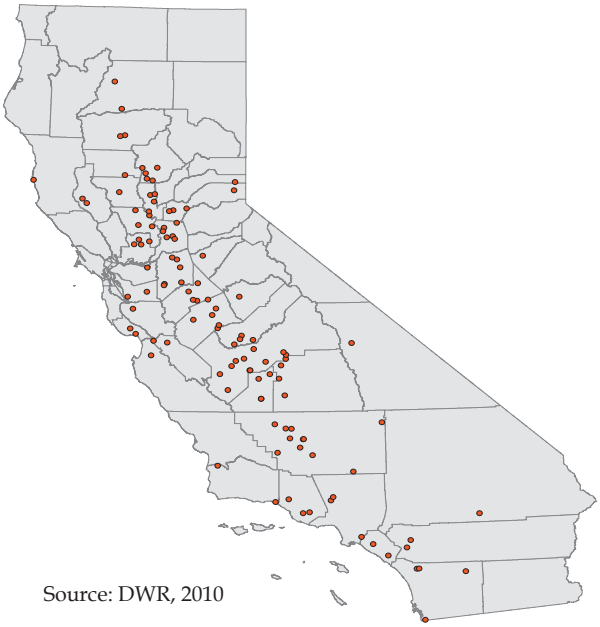


Figure 1.6. Location of areas with groundwater management plans

In 2002, the California Legislature passed Senate Bill (SB) 1938 (Stats. 2002, ch. 603), which provides local agencies with incentives for improved groundwater management. While not providing a new vehicle for groundwater management, SB 1938 modified the Water Code by requiring specific elements be included in a GWMP for an agency to be eligible for certain funding administered by DWR for groundwater projects.

Through AB 3030 and SB 1938, local agencies can now develop GWMPs that guide the sustainable use of the groundwater resource while also providing access to certain DWR funding sources.

1.5 PRIOR AND CURRENT WATER MANAGEMENT PLANNING EFFORTS

The South Westside Basin has an extensive history of management of groundwater and surface water resources. This document builds upon those efforts, described below.

1.5.1 DRAFT WESTSIDE BASIN GROUNDWATER MANAGEMENT PLAN

In 1999, cities and water purveyors overlying much of the Westside Basin (Daly City, CalWater, San Bruno, and SFPUC) cooperatively developed a proposed Westside Basin AB 3030 Groundwater Management Plan (1999 Plan; Bookman-Edmonston, 1999), pursuant to the guidelines in AB 3030. Although not adopted by the cities due to data gaps and other concerns

at the time, the four cities and water purveyors have voluntarily implemented much of the recommendations and other aspects of the 1999 Plan.

The 1999 Plan established a goal of protecting water quality and enhancing water supply reliability in the Westside Basin. This goal was supported by five plan elements:

- **Groundwater Storage and Quality Monitoring –** development of a basin-wide monitoring program
- **Saline Water Intrusion –** use of monitoring data to indicate any occurrence of saltwater intrusion and to provide technical information needed to develop appropriate management responses if intrusion occurs
- **Conjunctive Use –** development of a multi-agency conjunctive use program, including monitoring
- **Recycled Water –** development of a recycled water program for landscape irrigation and other non-potable uses
- **Source Water and Wellhead Protection –** protection of groundwater from contamination from methyl tert-butyl ether (MTBE) and other contaminants through source water assessment methodologies

1.5.2 Regional Groundwater Storage and Recovery Project

The proposed Regional Groundwater Storage and Recovery (GSR) Project is designed to balance the use of both groundwater and surface water to increase water supply reliability during dry years or in emergencies. Located in the South Westside Basin, the proposed project is sponsored by SFPUC in coordination with partner agencies: CalWater, Daly City, and San Bruno. The partner agencies currently purchase wholesale surface water from SFPUC and also independently operate groundwater production wells for drinking water and irrigation.

The project would consist of installing up to 16 new recovery well facilities in the South Westside Basin to pump stored groundwater during a drought. During years of normal or above normal precipitation, the proposed project would provide surface water to the partner agencies to reduce the amount of groundwater pumped. The reduced pumping is estimated to result in the storage of approximately 61,000 AF of water in the long-term. This is estimated to allow recovery of stored water at a rate of up to 7.2 million gallons per day (mgd) for a 7.5-year drought period, if the full 61,000 AF is stored prior to the drought period (MWH, 2007). The storage of water in the basin was analyzed through the In-Lieu Pilot Study (ILPS), which is described in the following section.

The GSR Project is in the design and environmental review phases and is envisioned to coordinate management of groundwater supplies through an Operating Committee. The development of the GSR Project includes extensive study of the hydrogeology of the South

Westside Basin and was documented in the Alternatives Analysis Report (MWH, 2007) and in reports documenting monitoring well installation (Kennedy/Jenks, 2009 and 2010).

The parties are working to develop an operating agreement in connection with the proposed GSR Project. To-date, the SFPUC has installed ten multi-level monitoring wells in the South Westside Basin (each consisting of 4 nested monitoring wells). The Proposed Project Draft EIR is scheduled to be circulated in 2012.

1.5.3 IN-LIEU PILOT STUDY

Beginning in 2002, SFPUC delivered surface water in-lieu of groundwater through the ILPS to Daly City, San Bruno and CalWater - South San Francisco District. The ILPS demonstrated that SFPUC system water can be stored in the Basin through the delivery of in-lieu water to replace groundwater that Daly City, San Bruno, and CalWater refrained from pumping (Luhdorff & Scalmanini Consulting Engineers [LSCE], 2005).

During the ILPS, significant quantities of water were banked as shown in Figure 1.7 and discussed below:

- **Daly City -** Through May 7, 2007, SFPUC delivered 13,077 AF of in-lieu water to Daly City. Beginning in May 2009, SFPUC resumed delivery of in-lieu water to Daly City, resulting in additional banking of water. In 2009 and 2010, 1,921 AF and 2,204 AF of water was banked by Daly City, respectively.
- **CalWater – South San Francisco District -** Between February 1, 2003 and November 1, 2003, SFPUC delivered 802 AF of in-lieu water to CalWater – South San Francisco District. When the ILPS restarted on April 1, 2004, CalWater did not participate and did not resume pumping, but continued to rely on wholesale water for all of its water needs in its South San Francisco service area. This resulted in an increase in basin water levels as if CalWater had continued to participate in the ILPS, and a corresponding increase in stored water of 930 AF between April 1, 2004 and March 1, 2005.
- **San Bruno –** From January 28, 2003 through March 1, 2005, SFPUC delivered 3,915 AF of in-lieu water to San Bruno.

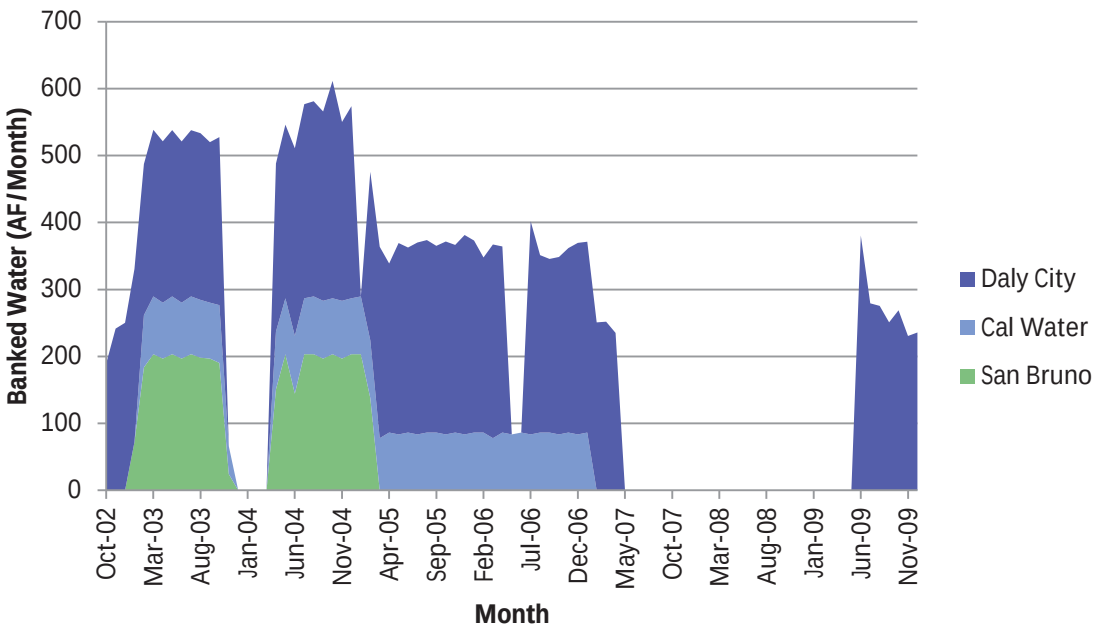


Figure 1.7 Banked Groundwater in In-Lieu Pilot Study

1.5.4 SAN FRANCISCO BAY BASIN WATER QUALITY CONTROL PLAN

The *San Francisco Bay Basin Water Quality Control Plan* (Basin Plan) (California Regional Water Quality Control Board, San Francisco Bay Region [RWQCB], 2010) was developed by the RWQCB to provide positive and firm direction for future water quality control.

The Basin Plan fulfills the following needs:

- Requirements from the U.S. Environmental Protection Agency (EPA) for such a plan to allocate federal grants to cities and districts for construction of wastewater treatment facilities.
- A basis for establishing priorities for disbursing both state and federal grants for constructing and upgrading wastewater treatment facilities.
- Requirements of the Porter-Cologne Act that call for water quality control plans in California.
- A basis for the RWQCB to establish or revise waste discharge requirements and for the State Water Resources Control Board (Water Board) to establish or revise water rights permits.
- Conditions (discharge prohibitions) that must be met at all times.
- Water quality standards applicable to waters of the Region, as required by the federal Clean Water Act.

- Water quality attainment strategies, including total maximum daily loads required by the Clean Water Act, for pollutants and water bodies where water quality standards are not currently met.

While the Basin Plan has a definite focus on surface water resources, groundwater quality is included as well, particularly through the watershed management approach. This approach includes groundwater as well as surface water bodies (e.g., streams, rivers, lakes, reservoirs, wetlands, and the surrounding landscape) in an effort to develop unique, integrated solutions for individual watersheds through a stakeholder process.

As with surface water, the Basin Plan establishes beneficial uses for groundwater throughout the San Francisco Bay Region. For the South Westside Basin, the Basin Plan identifies two areas: Westside C (2-35C), extending from the San Francisco County line to the City of South San Francisco, and Westside D (2-35D), extending from South San Francisco to the southern extent of the South Westside Basin. The designated beneficial uses for groundwater within these areas, and within areas in the North Westside Basin, are shown in Table 1.1.

Table 1.1 Basin Plan Beneficial Uses for Groundwater

Basin Plan Basin	Location	Beneficial Uses			
		Municipal and Domestic Water Supply	Industrial Process Water Supply	Industrial Service Water Supply	Agricultural Water Supply
Westside C	South Westside Basin	Existing	Potential	Potential	Existing
Westside D	South Westside Basin	Existing	Existing	Existing	Potential
Westside A	North Westside Basin	Existing	Potential	Potential	Existing
Westside B	North Westside Basin	Potential	Potential	Potential	Existing

The Basin Plan sets objectives for groundwater, with maintenance of existing high-quality of groundwater being the primary objective. In addition, at a minimum, groundwater shall not contain concentrations of bacteria, chemical constituents, radioactivity, or substances producing taste and odor in excess of the objectives unless naturally occurring background concentrations

are greater. Under existing law, the Water Board regulates waste discharges to land that could affect water quality, including both groundwater and surface water quality. Waste discharges that reach groundwater are regulated to protect both groundwater and any surface water in continuity with groundwater. Waste discharges that affect groundwater in continuity with surface water cannot cause violations of any applicable surface water standards.

For implementation, the RWQCB focuses on 28 groundwater basins and 7 sub-basins in the Bay Area that serve, or could serve, as sources of high quality drinking water. The Westside Basin is one of these basins. The Basin Plan establishes the following groundwater protection and management goals for the Bay Area region:

- Identify and update beneficial uses and water quality objectives for each groundwater basin.
- Regulate activities that impact or have the potential to impact the beneficial uses of groundwater of the region.
- Prevent future impacts to the groundwater resource through local and regional planning, management, education, and monitoring.

1.5.5 San Francisco and Northern San Mateo County Pilot Beneficial Use Designation Project

RWQCB staff, with contributions from local agencies, evaluated existing groundwater protection programs and beneficial uses of groundwater in San Francisco and northern San Mateo County (RWQCB, 1996). Extensive research was conducted and numerous references were compiled to complete the project. The project included the following goals:

- Describe the hydrogeology and groundwater uses for the groundwater basins
- Identify major threats to groundwater and groundwater protection programs
- Identify locations where groundwater is vulnerable to contamination
- Identify locations where groundwater monitoring is needed
- Use GIS to compile complex data sets to use as a decision-making tool for groundwater protection
- Refine beneficial use designations for some groundwater basins
- Identify inactive well locations
- Describe groundwater extraction for municipal, agricultural, and industrial water supply
- Summarize statewide initiatives for groundwater protection and data sharing

- Evaluate special problem areas not typically addressed by groundwater protection programs

The results of the project identified the Westside Basin as a valuable resource deserving of full protection and restoration, including aggressive remediation of contaminated groundwater, enhanced source control and groundwater protection to prevent additional pollution, and groundwater basin management to prevent overdraft.

1.5.6 Groundwater Ambient Monitoring and Assessment Program: San Francisco Bay Study Unit

The Groundwater Ambient Monitoring and Assessment (GAMA) program is a comprehensive assessment of statewide groundwater quality implemented by the Water Board in coordination with the U.S. Geological Survey (USGS) and Lawrence Livermore National Laboratory. The program is designed to help better understand and identify risks to groundwater resources. The South Westside Basin was included in the study through the investigation of the San Francisco Bay study unit, which includes portions of San Francisco, San Mateo, Santa Clara, and Alameda Counties, with sampling from April through June 2007.

Groundwater was sampled from 79 wells within the San Francisco Bay study unit to characterize its constituents and identify trends in groundwater quality through a spatially unbiased assessment of raw groundwater quality. Four grid cell wells (SF-03, SF-04, SF-05, and SF-06) and seven understanding wells (SFM-A1, SFM-A2, SFM-A3 SFM-A4, SFM-B1, SFM-B2, and SFU-01) are located in or near the South Westside Basin. The focus on raw water quality rather than treated water quality and the spatially unbiased nature of the program set it apart from other sampling programs that typically use available data from existing wells that are biased toward better water quality and have data intended to meet regulatory requirements for drinking water supplies.

The test results provide information to address a variety of issues ranging in scale from local water supply to statewide resource management. Full analysis of the results will be included in a future USGS report.

1.5.7 Bay Area Integrated Regional Water Management Plan

The Bay Area Integrated Regional Water Management Plan (IRWMP) (RMC and Jones & Stokes, 2006) was developed through a Letter of Mutual Understanding by San Francisco Bay Area water, wastewater, flood protection, and stormwater management agencies; cities and counties represented by the Association of Bay Area Governments; and watershed management interests represented by the California Coastal Conservancy and non-governmental environmental organizations. The IRWMP outlines the region's water resource management needs and objectives, and presents innovative strategies and a detailed implementation plan to

achieve these objectives, contributing to sustainable water resources management in the Bay Area.

The following are the overall objectives of the Bay Area IRWMP:

1) Foster coordination, collaboration and communication among Bay Area agencies responsible for water and habitat-related issues.
2) Achieve greater efficiencies and build public support for vital projects.
3) Improve regional competitiveness for project funding.

The Bay Area IRWMP identifies regional priority projects, including two in the South Westside Basin: the Lomita Canal / Cupid Row Canal Upgrades at San Francisco International Airport and SFPUC Groundwater Projects (including Lake Merced Project, Local Groundwater Projects, and the Regional Groundwater Storage and Recovery Project).

The Bay Area IRWMP will be going through an update during 2011 – 2012 to ensure that the IRWMP is in compliance with Proposition 84 requirements, including a climate change impact assessment and integrated flood management.

1.5.8 Water Supply Agreement between The City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County

The Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (Wholesale Water Supply Agreement) (July, 2009) defines the agreement for San Francisco to deliver, up to a defined quantity (Supply Assurance), water to the wholesale customers, including the water agencies in the South Westside Basin. The Supply Assurance includes the wholesale customers as a group, while Individual Supply Guarantees are defined for each agency (Table 1.2). These quantities are expressed in terms of daily deliveries on an annual average basis, although San Francisco agrees to operate the system to meet peak requirements to the extent possible without adversely impacting the ability to meet peak demands of retail customers.

The Wholesale Water Supply Agreement includes details on allocation, service areas, permanent transfers, resale, conservation, other supplies, water quality, maintenance, operation, shortages, wheeling, new customers, metering, the proposed conjunctive use program for the South Westside Basin, implementation of interim supply limitations, wholesale revenues, accounting, and other agreements.

Table 1.2 Individual Supply Guarantees

Wholesale Customer	Individual Supply Guarantee (mgd)	Water Purchases Fiscal Year 2009-2010 (mgd)*
California Water Services Company	35.68 (includes South San Francisco and areas outside the South Westside Basin)	32.6 (7.2 mgd for South San Francisco District)
City of Burlingame	5.234	3.9
City of Daly City	4.292	3.2**
City of Millbrae	3.152	2.2
City of San Bruno	3.246	1.5
Town of Hillsborough	4.090	3.0

* BAWSCA, 2011

** Amount shown does not include 1.9 mgd of in-lieu water purchases

1.5.9 URBAN WATER MANAGEMENT PLANS

Urban water management plans (UWMP) include descriptions and evaluations of historical, current, and future sources of water supply; efficient uses of water; demand management measures; implementation strategies and schedules; and other information as required by the Urban Water Management Planning Act. They are important components for the planning process of each agency and values from these plans are used extensively in Section 3, Water Requirements and Supplies, of this GWMP.

A UWMP is required for water agencies with more than 3,000 customers or that provide over 3,000 AF of water annually. Within the South Westside Basin, UWMPs have been developed and adopted by Burlingame, Daly City, Hillsborough, Millbrae, San Bruno, and CalWater. In the North Westside Basin, SFPUC has developed a UWMP.

1.6 PUBLIC PROCESS IN DEVELOPING THE GROUNDWATER MANAGEMENT PLAN

The development of any GWMP is a collaborative process involving all interested stakeholders. Public input is critical to the success of the South Westside Basin GWMP and was a key component of its development.

The public was informed and encouraged to provide input and participate in the development of the GWMP in the following ways:

- GWMP web site: **www.southwestsideplan.com** provided information to the public regarding the GWMP. Details about groundwater management in general and specific to the South Westside Basin were provided. Meeting dates, locations, and materials were posted along with details of the South Westside Basin GWMP Advisory Committee (Advisory Committee) and contact information.
- Newspaper advertisements in the San Mateo County Times gave notice of public hearings.
- Public hearings provided opportunities for personal communications captured in the public record on specific topics, including resolution of intent to draft a GWMP and resolution of adoption of the GWMP.
- Public meetings provided details on the GWMP process and solicited input.
- Advisory Committee meetings provided detailed technical information on the GWMP and solicited input.
- Direct communication by telephone, email, and mail was encouraged at meetings and on the web site. Comments could be sent to the City of San Bruno project manager, local water agency staff, or the consultant project manager.

1.6.1 JUNE 2009 PRESENTATION TO IRRIGATION PUMPERS IN THE SOUTH WESTSIDE BASIN

A presentation on the South Westside Basin GWMP was given on June 25, 2009 to cemetery and golf course interests as part of a SFPUC meeting on the proposed GSR and its potential impacts and benefits for cemeteries and golf courses. The meeting was held at 10:30 a.m. at the Colma Town Hall. The presentation gave an overview of groundwater planning, the proposed GWMP, and the process of developing the GWMP. Attendees were invited to provide contact information and to continue to provide guidance as the GWMP is developed and implemented. Copies of the presentation were provided to interested parties via email. Attendees included representatives from the following:

- Holy Cross Cemetery
- Lake Merced area golf courses
- Town of Colma

- City of Daly City
- City of San Bruno
- SFPUC

1.6.2 PUBLIC HEARINGS

1.6.2.1 Intent to Adopt

A public hearing of Intent to Adopt a Groundwater Management Plan was held at the regular meeting of the San Bruno City Council at 7 p.m. on August 24, 2010 at the San Bruno Senior Center. The hearing was advertised in the *San Mateo Times*, on August 10, 2010 and August 17, 2010. A resolution was adopted by the City Council and subsequently was published in the San Mateo Times on September 8, 2010 and September 15, 2010. The advertisements and the resolution are included in Appendix A.

1.6.2.2 Adoption

A public hearing to adopt the Groundwater Management Plan was held at the regular meeting of the San Bruno City Council at 7 p.m. on July 10, 2012 at the San Bruno Senior Center. The hearing was advertised in the *San Mateo Tim*es twice prior to the hearing. The advertisements and the resolution are included in Appendix A.

1.6.3 PUBLIC MEETINGS

A total of five public meetings were held to inform the public on the development of the groundwater management plan.

1.6.3.1 Background, Components, and Process

Three public meetings were held at locations across the South Westside Basin to provide information on the importance of groundwater as a water supply, the need for management of the groundwater resource, the role of a GWMP, the role of the public in the development and implementation of the GWMP, and the preliminary goals, objectives, and elements of the groundwater management plan.

1.6.3.1.1 San Bruno Presentation

The presentation in the southern portion of the South Westside Basin was given at San Bruno City Hall on Thursday September 9, 2010 at 5:30 pm. The meeting was advertised on San Bruno's cable television station, noticed at City Hall, and advertised in the *San Mateo Times* on September 4, 2010.

1.6.3.1.2 Daly City Presentation

A presentation in the northern portion of the South Westside Basin at was given at Daly City City Hall on Thursday September 23, 2010 at 7:00 pm. The meeting was noticed at City Hall, on the city's web page, and on the city's cable television station. Interviews were provided to a student from San Francisco State University for airing on the campus radio station, KSFS.

1.6.3.1.3 Colma Presentation

The presentation in the central portion of the South Westside Basin was given at Colma Town Hall on Thursday October 13, 2010 at 11:30 am. The meeting was noticed at Town Hall. Extensive personal outreach was conducted to inform the numerous cemeteries that utilize private groundwater wells for their irrigation supply.

1.6.3.2 Draft Plan Presentation

The fourth public meeting was held at Colma Town Hall on May 24, 2011 at 11:30am. The meeting was noticed at Town Hall and outreach was performed to inform the cemeteries. The draft Groundwater Management Plan was presented and stakeholders were provided an opportunity to discuss the draft Plan and provide comments either in person or at a later date.

1.6.3.3 Distribution of Draft GWMP

The draft text of the GWMP was distributed to the public for comment on May 10, 2012. The comment period extended until June 9, 2012. One email was received with comments, which were addressed.

1.6.3.4 Final Draft Plan Presentation

The fifth public meeting was held at San Bruno City Hall on May 23, 2012 at 5:30 pm. The meeting was noticed at City Hall and advertised in the *San Mateo Times* on May 20, 2012. The final draft Groundwater Management Plan and the activities moving forward were discussed.

1.7 SOUTH WESTSIDE BASIN GWMP ADVISORY COMMITTEE

The Advisory Committee was organized to solicit input and direct the development of the GWMP. Agencies and key stakeholders were provided written invitations to send to their representatives to invite them to participate in the Advisory Committee. Other stakeholders were invited to join through the public notification process, hearings, the web site, and public meetings. Table 1.3 lists the Advisory Committee members and their affiliations. Meetings were held from 2009 through 2011 to coordinate stakeholder input and incrementally build the GWMP. Agendas and minutes are included in Appendix A.

During implementation of the GWMP, it is anticipated that most of the members of the Advisory Committee will join the Groundwater Task Force. The Groundwater Task Force will guide the implementation of the GWMP and is described in more detail in Section 6.1.

Table 1.3 Advisory Committee Members

Entity	Representative
Bay Area Water Supply and Conservation Agency	Anona Dutton
City of Brisbane	Randy L. Breault
City of Burlingame	Phil Monaghan
California Water Services Company	Tom Salzano
DWR	Mark Nordberg
Cemeteries	Roger Appleby
Town of Colma	Brad Donohue
City of Daly City	Patrick Sweetland
RWQCB	Kevin D. Brown
City of San Bruno	Will Anderson
SFPUC	Greg Bartow
City of South San Francisco	Terry White
Interested citizens	Robert Riechel

1.7.1 DECEMBER 18, 2009 ADVISORY COMMITTEE MEETING 1

An Advisory Committee meeting was held on December 18, 2009 to coordinate the Advisory Committee, develop a common understanding of basin conditions and groundwater management plans, and to develop a goal or goals for the basin. The meeting was held at San Bruno City Hall and was well attended, including representatives of the following:

- California Water Services Company
- City of Brisbane
- City of Burlingame
- City of Daly City
- City of San Bruno
- RWQCB
- SFPUC
- Town of Colma
- Private citizens
- Cemeteries

The meeting minutes are included in Appendix A.

1.7.2 MARCH 11, 2010 ADVISORY COMMITTEE MEETING 2

The second Advisory Committee meeting was held on March 11, 2010 to discuss Basin Management Objectives (BMOs), both in general and specific to the South Westside Basin. The meeting was held at San Bruno City Hall and was attended by representatives of the following:

- Bay Area Water Supply and Conservation Agency
- DWR
- California Water Services Company
- City of Daly City
- City of San Bruno
- RWQCB
- SFPUC
- Town of Colma
- Cemeteries

The meeting minutes are included in Appendix A.

1.7.3 JUNE 24, 2010 ADVISORY COMMITTEE MEETING 3

An Advisory Committee meeting was held on June 24, 2010 to discuss comments received on the BMOs and to discuss the Elements of the Plan. The meeting was held at San Bruno City Hall and was attended by representatives of:

- Bay Area Water Supply and Conservation Agency
- DWR
- California Water Services Company
- City of Daly City
- City of San Bruno
- SFPUC
- Town of Colma

The meeting minutes are included in Appendix A.

1.7.4 AUGUST 16, 2010 ADVISORY COMMITTEE MEETING 4

An Advisory Committee meeting was held on August 16, 2010 to discuss basin governance and financing of the implementation of the groundwater management plan. The meeting was held at San Bruno City Hall and was attended by representatives of:

- DWR
- California Water Services Company
- City of Daly City
- City of San Bruno
- RWQCB
- SFPUC

- Town of Colma

The meeting minutes are included in Appendix A.

1.7.5 FEBRUARY 3, 2011 ADVISORY COMMITTEE MEETING 5

An Advisory Committee meeting was held on February 3, 2011 to discuss the recent completion of a revision to the Westside Basin Groundwater Flow Model and the utility of the model in the development of the GWMP. The discussion included using the model to estimate the basin yield. The meeting was held at San Bruno City Hall and was attended by representatives of:

- California Water Services Company
- City of Daly City
- City of San Bruno
- SFPUC
- Town of Colma
- Cemeteries

The meeting minutes are included in Appendix A.

1.7.6 APRIL 28, 2011 ADVISORY COMMITTEE MEETING 6

An Advisory Committee meeting was held on April 28, 2011 to update the current status of the Groundwater Management Plan to provide information to focus the review to be performed by the Advisory Committee. Progress toward participation in the CASGEM program was also discussed.

The meeting was held at San Bruno City Hall and was attended by representatives of:

- DWR
- California Water Services Company
- City of Daly City
- City of San Bruno
- SFPUC
- Town of Colma
- Cemeteries

The meeting minutes are included in Appendix A.

1.7.7 APRIL 15, 2011 DISTRIBUTION OF DRAFT GWMP

The draft text of the GWMP was distributed to the Advisory Committee for comment on April 15, 2011. Comments were received from BAWSCA, CalWater, San Bruno, SFPUC, and Steve Lawrence and incorporated into the text as appropriate.

1.8 GROUNDWATER MANANGEMENT PLAN AND CONSISTENCY WITH CALIFORNIA WATER CODE

Groundwater management is the planned and coordinated local effort of sustaining the groundwater basin in order to meet future water supply needs. With the passage of AB 3030 in 1992, local water agencies were provided a systematic way of formulating GWMPs (California Water Code, § 10750 et. seq.). SB 1938, passed in 2002, further emphasizes the need for groundwater management in California. SB 1938 requires AB 3030 GWMPs to contain specific plan components in order to receive state funding for water projects.

The South Westside Basin Groundwater Management Plan is prepared consistent with the provisions of California Water Code § 10750 et seq. as amended January 1, 2003. The South Westside Basin GWMP includes the seven components that are required to be eligible for DWR funds for the construction of groundwater projects or groundwater quality projects. The GWMP also addresses the 12 specific technical issues identified in the Water Code along with the seven recommended components identified in DWR Bulletin 118-03 (DWR, 2003). Table 1.4 lists the required and recommended components and identifies the specific section of this GWMP in which the components are discussed.

Table 1.4 South Westside Basin GWMP Components

Component	GWMP Section(s)
SB 1938 Mandatory	
1. Documentation of public involvement	1.6, 1.7, App. A
2. BMOs	4.3
3. Monitoring and management of groundwater elevations, groundwater quality, inelastic land subsidence, and changes in surface water flows and quality that directly affect groundwater levels or quality	5.2
4. Plan to involve other agencies located in the groundwater basin	5.1
5. Adoption of monitoring protocols	5.2, App. C
6. Map of groundwater basin boundary, as delineated by DWR Bulletin 118, with boundaries of agencies subject to the GWMP	Figures 1.1, 1.2, and 1.3
7. For agencies not overlying groundwater basins, GWMP prepared using appropriate geologic and hydrogeologic principles	n/a
AB 3030 and SB 1938 Voluntary	
1. Control of saline water intrusion	5.4.1
2. Identification and management of well protection and recharge areas	5.4.2
3. Regulation of the migration of contaminated groundwater	5.4.3
4. Administration of well abandonment and destruction program	5.4.4
5. Control and mitigation of groundwater overdraft	5.3.1
6. Replenishment of groundwater	5.3.2
7. Monitoring of groundwater levels	5.2.1, App. C
8. Development and operation of conjunctive use projects	5.3.3
9. Identification of well construction policies	5.4.5
10. Construction and operation of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects	5.5
11. Development of relationships with state and federal regulatory agencies	5.6.1
12. Review of land use plans and coordination with land use planning agencies to assess activities that create reasonable risk of groundwater contamination	5.6.3
DWR Bulletin 118 Recommended	
1. Management with guidance of advisory committee	1.7, 5.1
2. Description of area to be managed under GWMP	1.1, Figures 1.1, 1.2, and 1.3
3. Links between BMOs and goals and actions of GWMP	4, 6
4. Description of GWMP monitoring programs	5.2, App. C
5. Description of integrated water management planning efforts	1.5, 5.6.2
6. Report of implementation of GWMP	5.7
7. Periodic evaluation of GWMP	5.7

F I N A L

Bay Area IRWMP Coordinating Committee

Agreements and Action Items from March 28, 2011 Meeting

1. Roll Call—Appointed FA representatives present

WS-WQ	WW-RW	FP-SW	Watershed	Other
Marie Valmores, CCWD; Molly Petrick, SFPUC Brad Sherwood (SCWA)	Brian Campbell, EBMUD	Mark Boucher, CCCFCD	Harry Seraydarian, NBWA; Jennifer Krebs, SFEP; Matt Gerhart, SCC	Paul Helliker, Chair, MMWD

Others present:

Mitch Avalon, CCCFCD
Jack Betourne (NCFWCD)
Kevin Booker (SVCSD)
Chris Choo (Marin Flood)
Thomasin Grim (MMWD)
Dale Hopkins (SF RWQCB)
Carol Mahoney (Zone 7)
Carl Morrison (M&A, Zone 7, SCWA, StopWaste.Org)
Ben Harwood (Golden Gate NPC)
Gordon Becker (CEMAR)
Renee Weber (SCWA/NBWRA)
Rick Thomasser (Napa County)
Gary Lippner (DWR)
Vivien Maisonneuve (DWR)
Shicha Chander (DWR)
Dave Richardson (RMC)
Joanne Siew (RMC)
Josh Uecker (RMC)

2. Prop 1E Projects – Approve Addition of Projects to the IRWM Plan (Action, led by Chair/Project Screening Subcommittee)

- Brian Campbell gave an overview of the project screening process. There was an additional project suggested for inclusion in the IRWMP after the March 10 subcommittee meeting – Improving Quantitative Precipitation Information for the San Francisco Bay Region (Lead Agency: City and County of San Francisco, Dept. of Public Works, Bureau of Engineering). An email vote was conducted among the Project Screening Subcommittee, and the project received support from several subcommittee members. There were no objections to recommending the project for addition to the IRWMP.
- Mark Boucher provided a summary description of the new project to the CC. The project consists of up facing radars, additional Doppler radar stations, and other equipment to provide improved quantitative precipitation information. One benefit of including the project in the IRWMP now is to show that it has local support by being in the plan, and it will help leverage the project funding support at the national level. Mitch Avalon explained that in terms of water supply benefits, this project will offer valuable information for improving determinations of reservoir levels and release flow planning for flood control.

- The Project Screening subcommittee made a motion to the CC to add the 15 projects into the IRWMP. The motion was seconded by Thomasin Grim from MMWD. The motion was approved by consensus (no objection). The projects were added to the IRWM Plan as of March 28, 2011. Details of the projects are included in Appendix G (Projects added as of March 28, 2011) in the IRWMP.

3. <u>Planning Grant Award Update (Information, led by Chair)</u>

- Vivien Maisonneuve of DWR explained that Planning grant award letters should be coming out in about 2-4 weeks. The contract will be prepared once the letter has been signed and returned to DWR, and all conditions of the award letter have been met.

4. <u>IRWM Plan Update</u>

- Shicha Chander from DWR introduced herself as the contract manager for the Bay Area Planning Grant.
- Paul Helliker queried whether the letter from DWR will reference the proposal evaluation comments. Vivien confirmed that yes, the award letter will ask that DWR's proposal evaluation comments be addressed and reflected in the final Work Plan for the grant agreement, and that as the agreement is being completed other issues can be addressed (especially scheduling and invoicing dates). This process will minimize the need to do an amendment on the contract. DWR can also make some recommendations on where to have a more detailed/less detailed budget and where to shift funds if necessary. The time allowed for response to direction provided in the award letter is typically a 60-day window, but that is not definite yet.
- Paul Helliker commented that there wasn't a lot of detail on outreach to DACs and asked if that is information that should be clarified in the Work Plan. Vivien indicated that the lump sums indicated in the budget should be broken out, and will need to match the contract and invoicing amounts. Vivien added that the Planning grant contract template is now available on the DWR website: http://www.water.ca.gov/irwm/integregio_resourceslinks.cfm
- Paul noted that the attorney for MMWD has reviewed the contract template and has accepted the language. MMWD has an agreement template for subcontractors and will send it out to subcontractors identified in the grant proposal. MMWD will work with the IRWMP CC subcommittees to prepare an RFP seeking consultant assistance for the IRWM Plan update, to be distributed after the grant agreement Work Plan, Budget and Schedule for have been finalized.
- Gary Lippner of DWR clarified that they need to check with management to determine if eligible work performed for reimbursement could take place after the final awards were posted or after the commitment letters are sent.

<u>Website Update</u>

- Brian Campbell announced that Chris Choo has volunteered to be the point person to collate comments and suggestions for the website update. Chris suggested that she could send links to other existing IRWMP websites for interested parties to review as examples and then suggest the features that they would like for the Bay Area website. There was some discussion about who the customer base is for the website and how to determine when and to what extent to incorporate other stakeholder input (aside from IRWMP agencies). It was noted that DACs could have different input than the agencies.
- Paul Helliker suggested waiting until a final group is on board before developing the final scope of the work for the website consultant. David Seiband of Zentral is currently providing website updates and Prop 50 Implementation grant recipients are paying for the maintenance for the website.

ACTION ITEM: Chris Choo will write a short email about the request and send it to Joanne to forward to the CC distribution list. Chris Choo will collect the feedback. **The deadline for providing website comments and input to Chris Choo is April 28, 2011**.

5. **Funding of IRWMP Activities: Cost-sharing among Functional Areas (Discussion, led by BAFPAA/Carol Mahoney)**

- Carl Mahoney reported that it was brought up at the BAFPAA meeting that there is a large disparity between the income for flood control districts and water/wastewater districts, which impacts on their ability to provide equal monetary contributions to the Bay Area IRWMP. Flood control districts usually have fixed income tied to project benefits, and are unable to raise rates. Water supply and wastewater districts typically have more flexibility in raising rates.
- The BAFPAA group has developed a preliminary three-tier contribution framework, which ranges from all agencies paying a fixed cost to different agencies paying variable amounts based on their operating budgets.

BASMAA

- It was also noted that since BASMAA does not really participate in the Bay Area IRWMP process, the burden of financing the IRWMP for the Flood Protection/Stormwater Management Functional Area is solely on the flood protection districts. One of the reasons given for BASMAA's reluctance to participate in the BAIRWMP is that they do not see any funding benefit from being involved since grant funds often cannot be used to offset a permit requirement or for mitigation.
- Jack Betourne responded as a Board Member of BASMAA that BASMAA is currently focused on working on the MRP which has a quick timeline. In addition, BASMAA's membership currently does not include members from all nine counties in SF Bay, and the projects put forward would benefit only 6 out of the 9 counties.
- Jack noted that in June 2011, BASMAA members will be issued the draft Phase 2 permit and will need to implement all TMDLS, and perhaps then the agencies would be more interested in joining the IRWMP. He queried if the CC were to approach BASMAA for funding when that would be – Paul Helliker noted that the CC would need the funding to be made available within the next few months.
- Mitch Avalon noted that since the MRP is for the next 5 years, there would be information on which projects can help meet the requirements and so they should be able to include projects in the Plan for funding. He also noted that this is an opportune time to get BASMAA involved with the IRWMP as part of the Plan update.

Functional Area Contributions

- Paul Helliker outlined the budget (total of $183K) that the four functional areas have agreed to provide as part of the Plan update and CC support:
    - Water agencies: $60K
    - Wastewater: $63K
    - Watershed/Coastal Conservancy: 25K$
    - Watershed/NBWA: $10K
    - Flood and Stormwater/BAFPAA: $25K

- Thomasin Grim indicated that more money may be needed for the IRWMP plan update, potentially as a grant-reimbursable expense to contributors, and is concerned that

MMWD will be caught in a cash flow bind if the functional areas are not able to meet their stated contributions or have capacity for additional contributions beyond the $183K.

Other Comments on IRWMP Financing

- Need to revisit funding framework
- Can financing of the IRWMP and supporting activities be included as a line item in the Work Plan to figure out how to integrate the four functional areas and develop a financial system to figure out cost sharing?
- Development and evaluation of cost-sharing approaches: e.g. cost-sharing based on population, or tiers based on range of operating budgets. It may be helpful as a first step to put together a list of the organizations that are involved, and include operating budgets for those particular functions.
- Carol Mahoney outlined proposals for cost-sharing:
    - All variable – assumed that all 10 agencies would be paying. 60% for larger agencies, 30% for medium agencies and 10% for smaller agencies of what the variable costs would be.
    - Fixed costs – every year, e.g. put $2K in the budget for BAFPAA, second layer of variable costs (e.g. addition $250 for smaller agencies, and $7K for larger agencies).
- Check with the Roundtable of Regions on how other IRWMPs are structuring their financing.
- Brian Campbell outlined how BACWA approaches cost-sharing. BACWA has five principal agencies of approximately equal size that contribute equally, with other agencies that contributing some as well. When it comes to voting on the budget, it's only the 5 principal members.
- Jack Betourne expressed that a structured method of looking at contributions would be preferred by BASMAA.
- Paul Helliker questioned whether it is worth coming up with a complex financing structure for the IRWMP if it ends up being a small amount like $8K per year for future CC support activities.
- Thomasin Grim noted that providing IRWMP support with staff time solely may be more in line with the budget constraints that the CC is facing.
- Chris Choo suggested that perhaps the regional groups should be formed and brought in to contribute their time. Jennifer Krebs supported the idea and indicated that the CC needs to think about regional projects.
- Matt Gerhart suggested that there be some sort of budget analysis for the next meeting, only thinking of what we spent to date as a starting point for budgeting in the future.

6. Next Steps

- Paul Helliker outlined the following actions for the future:
    - Scoping RFP
    - Selecting the consultant
    - Paul also pointed out that the budget for consultant support for CC meetings will probably be maxed out soon, assuming 2 hours of meeting support per month.
- Carl Morrison indicated that there is a need to start thinking about the projects that are desired to be developed to include in the Plan update, and to start engaging sub-regional stakeholders.

7. Announcements

- Gary Lippner provided details on the DWR conference that will be held on May 24-25 on "Integrated Regional Water Management: Working Together for California's Water Future". Details are provided in the attached flyer.

- California Water Plan – public advisory meeting (e-news website). Webinar publicly available for first time on the website. Meeting will discuss State financial plan – better financing of water projects. Next Plan update scheduled for 2013. See attached flyer for details.

- Regional Water Forums – conducted by DWR. Pulling together other departments (e.g. flood, water use and efficiency) for collaboration on Water Plan activities in the future. The Bay Area Regional Water Forum will be the first region. Design teams will be meeting in the next 4-6 weeks and the first forum will be held in May or June. Products coming out from the Regional Water Forum will include a regional report and the CA Water Plan update.

- Mitch Avalon is retiring from County service at the end of March, but will still work on contract with the County for about 6 months.

8. Agenda Items for next CC meeting

The next CC meeting will be held on April 25, 2011, from 1 – 3 pm.

- Scope of work for Planning Grant contract
- Budget review and upcoming expenses
- DWR Award Letter on the Planning Grant
- Update on the Prop 84 Implementation Grant proposal

MEETING SUMMARY

Bay Area IRWMP Coordinating Committee

December 17, 2012 Meeting

1. Roll Call—Appointed FA representatives present

WS-WQ	WW-RW	FP-SW	Watershed	Other
• Thomasin Grim, MMWD • Brad Sherwood, SCWA • Marie Valmores, CCWD	• Brian Campbell, EBMUD • Linda Hu, EBMUD • Cheryl Muñoz, SFPUC	• Mark Boucher, CCCFCWCD • Carol Mahoney, Zone 7 • Brian Mendenhall, SCVWD	• Jennifer Krebs, SFEP/ABAG • Matt Gerhart, SCC • Harry Seraydarian, NBWA	• Ann Draper, Vice Chair, SCVWD (phone) • Steve Ritchie, Chair, SFPUC

Others present:

Kevin Booker, Sonoma CSD
Chris Choo, MCFCWCD
Paul Gilbert-Snyder, EBMUD
Carl Morrison, M&A, Zone 7, SCWA, StopWaste.org
Robyn Navarra, Zone 7
Mike Pimentelli, Pimentelli Mechanical
Anna Roche, SFPUC
Jeff Sharp, Napa County Public Works (phone)
Rick Thomasser, Napa County (phone)
Renee Webber, North Bay Water Reuse

Support staff
Mary Lou Cotton, Kennedy/Jenks (phone)
Ben Gettleman, Kearns & West
Dana Haasz, Kennedy/Jenks

2. Plan Update: December 2012 and January 2013 Activities, Project Schedule

- Dana Haasz provided an update on December 2012 activities and anticipated January 2013 activities.

3. Chapter Updates

- Dana Haasz reviewed the Plan Update chapter development schedule. Dana noted that Chapter 2 (Region Description) and Chapter 4 (Resource Management Strategies) are slightly delayed.

- Dana reported that the comments summary memorandum for Chapter 3 (Objectives) seemed to work well for the PUT, and that she will be using this format for additional chapters moving forward.
- Dana stated that GoogleDocs has not been working properly, and that an alternative program would need to be pursued. The CC recommended pursuing DropBox.
- For Chapter 10 (Finance), Dana recommended selecting project examples from those being submitted for the Prop 84 grant proposal. CC member comments on this topic included:
    - There is sufficient information from the project proposals to include in the Finance chapter.
    - It would be helpful to include a Prop 1E project as a project example. It might be helpful to research projects that EPA has funded to identify a sample watershed project.

Action Item

- Dana will prepare a comments summary memorandum for Chapter 2 (Region Description) and send to the PUT.

Group Decision

- The CC agreed to use Word documents in DropBox for PUT Plus review of draft Plan Update chapters instead of GoogleDocs.

4. Update on Public Workshop #2

- Ben Gettleman presented on planning activities for public workshop #2, which will be held on January 28, 2013. Ben stated that an outreach/workshop subcommittee planning call was held on December 14, 2012. Ben presented the draft agenda for public workshop #2, noting that the main topics will be:
    - 2013 BAIRWMP Projects
    - Financing Sources and Collaboration Strategies
- CC member comments on public workshop #2 included:
    - The discussion on partnership will be valuable; stakeholders will benefit from this.
    - Priorities for BAIRWMP in the coming years should be an agenda topic for public workshop #3.

Action Item

- Kearns & West will make materials for public workshop #2 available following the workshop so subsequent presentations can be provided on the subregional level.

Group Decision

- The CC approved the agenda for public workshop #2.

5. Proposition 84 Round 2 Implementation Grant

- Chris Choo stated that there should be a process for debriefing the project proponents that expressed interest in participating in the Round 2 application. Several CC members agreed and stated that this should be a near-term priority.
- Brian Campbell presented options for the Round 2 grant proposal. Brian stated that up to $20.086 million is available for the Bay Area in the current round. Brian noted that 67 projects initially indicated interest in participating, and that each project proponent with

multiple submittals was asked to prioritize their projects, resulting in 40 projects requesting a total of $60 million.

- Brian Campbell reviewed the following options for prioritizing projects to be included in the proposal
    - Option A: Most integrated
    - Option B: Sub-regional prioritization
    - Option C: Functional Area emphasis
    - Option D: Climate Change emphasis
    - Option E1: Hybrid
    - Option E2: Hybrid
    - Option E3: Hybrid
- Brian Campbell reviewed factors to consider in selecting the preferred option:
    - Fair and equitable allocation of funds throughout Region, Subregions, and Functional Areas
    - Maintain stakeholder engagement throughout Subregions and Functional Areas
    - Efficient use of resources
    - Must meet DWR criteria for grant to assure a successful grant proposal
- Brian Campbell noted that the Project Screening Committee recommended Option E1, and to move forward with the 14 projects in common (between E1 and E3) if a decision could not be made soon.
- Marie Valmores presented a draft list of East Contra County (CC) IRWM projects, and noted that there are four projects in the overlap region between the Bay Area and East Contra CC IRWMs. Marie noted that these four projects are included in the BAIRWM Plan Update but the Pittsburg and DDSD project proponents expressed disinterest in being included in the BAIRWMP Round 2 funding application. She added that these projects went through the process of pursuing the Round 2 grant with the East CC IRWM, but noted that they would not have survived the Bay Area's vetting process because of the requirement for a minimum grant request of $500,000. Two of the projects (CCWD and Pittsburg's) are under the $500,000 minimum and the ECCC IRWM region is still working with DDSD to determine if their projects will still be in the ECCC grant application. Marie suggested that there be a discussion with DWR staff on how best to address this. Comments from CC members on this topic included:
    - This issue is being raised late in the process, and there was an agreement that the projects in the overlapping area would come through the BAIRWMP. These project proponents chose to not participate in the process.
    - CCWD's Rheem Creek project should be removed from the CC's approved list of Round 2 projects if ECCIRWMP doesn't remove from its Round proposal the projects located in the Bay Area region.
    - The overlap issue should be addressed and resolved as it is with other agencies with jurisdictions in more than one IRWMP.
- Jennifer Krebs provided an update on next steps for preparing the Proposition 84 grant application. Jennifer noted that a kick-off meeting will be held on January 10, 2013 which project opponents will attend. Jennifer added that Horizon Water was selected to prepare the application, and that she and Steve Ritchie will serve as the arbiters in the event that the consultant or project proponents are underperforming, or projects need to be removed from the grant proposal.

<u>Action Item</u>

- ➢ Harry Seraydarian and Matt Gerhart will draft a letter that will be sent to the Round 2 applicants explaining the project selection process and how decisions were made.

The draft will be reviewed by the Project Screening Committee, and Steve Ritchie will send the final letter to the applicants.

- Steve Ritchie will contact Contra Costa Water District General Manager Jerry Brown to indicate that CCWD's Rheem Creek project will be removed from the Bay Area's Round 2 proposal if the ECCIRWMP Round 2 proposal includes the projects in the Bay Area region that did not go through the Bay Area project selection process as agreed to after the last round of grants.
- Jennifer Krebs will send emails to the project proponents in Hybrid Option E1 (excluding Rheem Creek) notifying them that they have been chosen to participate in the Proposition 84 grant application. Jennifer will also send an email to the projects on the waiting list with next steps.

Group Decision

- The CC supported the following proposal for the Round 2 grant application:
  - Move forward with Hybrid Option E1 with the provision that the Rheem Creek project will not be included if the East CC BAIRWMP includes in its Round 2 proposal the projects located in the Bay Area region.
  - If the Rheem Creek project is removed it may be replaced with another project.
  - Projects from Hybrid Option E3 will become the pool of potential projects to replace any projects that withdraw or are removed during the grant proposal development process, if needed. The CC Chair would make the decision on the replacement project.

- The CC agreed to not count DAC projects in the total for their respective subregions, and to instead to account for them in the same way as regional projects.

6. Announcements and Next Steps

- The next CC meeting will take place on January 14, 2013 from 12:00 – 3:00 p.m. It will be held in the Hetch Hetchy room at the San Francisco PUC. The meeting will focus on the Proposition 84 grant application.

MEETING SUMMARY

Bay Area IRWMP Coordinating Committee

January 28, 2012 Meeting

1. Roll Call—Appointed FA representatives present

WS-WQ	WW-RW	FP-SW	Watershed	Other
• Thomasin Grim, MMWD • Brad Sherwood, SCWA • Marie Valmores, CCWD	• Brian Campbell, EBMUD • Linda Hu, EBMUD • Cheryl Muñoz, SFPUC	• Mark Boucher, CCCFCWCD • Carol Mahoney, Zone 7 • Brian Mendenhall, SCVWD	• Matt Gerhart, SCC • Jennifer Krebs, SFEP/ABAG • Harry Seraydarian, NBWA	• Ann Draper, Vice Chair, SCVWD • Steve Ritchie, Chair, SFPUC

Others present:

Kevin Booker, Sonoma County Water Agency
Chris Choo, MCFCWCD
Paul Gilbert-Snyder, EBMUD
Alice LaPierre, Rebuilding Together East Bay
Carl Morrison, M&A, Zone 7, SCWA, StopWaste.org
Mark Seedall, CCWD
Bruce Shaffer, DWR
Renee Webber, North Bay Water Reuse Authority

Support staff
Ben Gettleman, Kearns & West
Dana Haasz, Kennedy/Jenks

2. Plan Update: January and February Activities, Project Schedule

- Dana Haasz reviewed the schedule of deliverables for January and February 2013.

3. Chapter Updates

- Dana Haasz provided an update on the development of chapters for the Plan Update. Dana noted that there would be delays with some of the chapters, but that the delays would not impact the overall project timeline. Dana added that the second drafts of the chapters could be turned around more quickly to keep the timeline on schedule.
- Kevin Booker stated that Sonoma County Water Agency will prepare guidance for agencies to reference in preparing salt nutrient management plans, which will be included in Chapter 5 of the Plan Update. Kevin added that the guidance will be

presented to the Regional Water Quality Control Board, and if the Board likes the guidance, it will refer other entities to use it. Comments from CC members included:
    - SCWD's basin is not a priority basin. It should be discussed whether this guidance is relevant for other basins.
    - Some agencies do not have plans to develop salt nutrient plans, and it should be clear that not all agencies need to do this.
- Harry Seraydarian stated that there is a reference to integration in the Proposition 84 Round 2 Implementation Grant proposal. He asked if a broad policy statement should be included in the Plan Update concerning integration. Comments from CC members included:
    - Information can be added to the integration chapter, but this is not in the Kennedy/Jenks team's scope.
    - An objective was developed on integration, and integration was factored into the scoring process. Developing a summary paragraph about integration would be helpful.
- Dana Haasz provided an update on the development of Chapter 8: Performance and Monitoring. Dana requested guidance from the CC on key questions regarding roles for performance and monitoring, including:
    1. Who will be responsible for implementation evaluation?
    2. How often will the Plan/project implementation be evaluated (monthly, semi-annually, annually, etc.)?
    3. How will the data management system (DMS) be tracked and who will be responsible for maintaining it?
    4. How will monitoring results, new data, changes in conditions etc. be incorporated in the plan (adaptive management)?
    5. Project-specific monitoring plans and activities?
        - Who has the primary responsibility?
        - Will the CC set requirements for proponents?
        - At what stage of project development will they be prepared?
- Dana reviewed the DWR guidelines for performance and monitoring, and noted that DWR wants to see that progress towards achieving objectives is monitored. Dana added that DWR does include specific details about how to conduct the monitoring, and that however the CC decides to monitor progress will be captured in the Plan Update. Comments from CC members included;
    - Performance on projects will be monitored by the individual project proponents. This can be rolled up into one report when needed.
    - The CC is the overarching body to produce a potential annual report.
    - In addition to individual project performance, the CC should review the overall Plan and could reference related reports (e.g., SFEP State of the Bay).
    - For project implementation, the monitoring and compliance are the responsibility of the project proponent. Some agencies are not aware that they have to do the monitoring; the CC needs to make sure they understand this.
    - Some of the monitoring results will come through project implementation.
    - Referencing other related plans may not meet DWR's requirements for monitoring. The plans could be used as a tool, but we still need to identify who will be doing the monitoring and how that will relate to the IRWMP objectives.
    - The CC needs to be able to document how implementation of the Plan relates to the overall conditions/impacts referenced in related plans.
    - The CC needs to be able to represent the aggregate effects from implementing the projects. This is challenging to do because it's not clear which projects (of the

list of 300+) will be implemented, and monitoring the comprehensive list presents resource challenges.
  - The data management system (DMS) should be able to help answer monitoring-related questions.
  - In order to make monitoring a requirement for project proponents, the CC should consider including monitoring as a requirement for participating in the next funding round.
  - The monthly CC meetings could be used to report on progress toward achieving objectives; updates could be provided by the Functional Area leads. The CC meeting minutes will constitute the record of progress reported; this can be done without a labor intensive data evaluation process.
  - It seems that there are three levels of monitoring: 1) a project that is funded (there is a built in tracking system for these projects); 2) a survey of projects that were not funded on how they are doing; and 3) reviewing regional efforts that overlap with BAIRWMP Objectives such as SFEP-State of the Bay and SFEI's RMP. All three levels could be included in a workshop every other year to report on progress towards achieving objectives.

Action Items

- Kevin Booker will send the SCWA draft salt nutrient management plan development guidance to Thomasin Grim, who will share with the PUT for consideration.
- Harry Seraydarian will develop a paragraph on integration that will be inserted into the Plan Update (specific location TBD) by February 11, 2013.
- Brian Campbell will meet with Dana Haasz to discuss monitoring for projects and identify next steps.

Group Decisions

- In response to Dana's questions regarding performance and monitoring, the CC decided (in **bold**):
  1. Who will be responsible for implementation evaluation? **The CC will be responsible, and much of this can be conducted through the Functional Areas.**
  2. How often will the Plan/project implementation be evaluated (monthly, semi-annually, annually, etc.)? **The Plan will be evaluated bi-annually. Projects will be evaluated when appropriate at the CC meetings.**
  3. How will the data management system (DMS) be tracked and who will be responsible for maintaining it? **Funded projects will be tracked using the DMS. There will be a simple survey for unfunded projects. The CC is responsible for managing the DMS.**
  4. How will monitoring results, new data, changes in conditions etc. be incorporated in the plan (adaptive management)? **The CC will evaluate this biannually.**
  5. Project-specific monitoring plans and activities? **Project proponents are responsible for monitoring their respective projects.**

4. Update on Public Workshop #2

- Ben Gettleman provided an update on public workshop #2, which was held later the same afternoon of January 28, 2013. Ben reported on the outreach that had been conducted in advance of the workshop, and reviewed the workshop agenda.

5. Proposition 84 Round 2 Implementation Grant

- Jennifer Krebs provided an updated on preparation of the grant proposal, noting that Horizon Environmental was hired to write the grant. Jennifer stated that a meeting was held with the participating project proponents, and that a webinar will be held on January 30, 2013 focusing on economic analysis. Jennifer added that she will be following up with project proponents on missing information.
- Jennifer Krebs requested assistance from CC members to review region-wide text that will be included in the grant proposal.
- Brian Campbell stated that during the December CC meeting there was a discussion about the BAIRWMP overlap with the East Contra Costa IRWMP. Brian noted that since then Jerry Brown (Contra Costa Water District) has met with the East CC IRWMP to try to find a resolution for the projects in dispute. Brian added that Steve Ritchie recommended not taking the East CC projects out of the BAIRWMP grant proposal, and that there should be more coordination in the future.
- Mark Seedall stated that the overlap issue will be outlined in the East CC IRWMP grant application, and that hopefully this will allow projects to be funded without taking funding away from the Bay Area IRWMP.

Action Item

- Steve Ritchie will review region-wide text for the grant proposal.
- Carol Mahoney and Marie Valmores will develop language clarifying how the overlap issue will be addressed moving forward.

Group Decisions

- The CC approved adding Appendix G to the 2006 BAIRWMP which will enable these projects to be eligible for funding.
- The CC approved adding the following three projects to Appendix G: Sewer Lateral Economic Assistance and Construction (SLEAC); South Coombs Area Drainage Improvement Program; and Chabot Dam Seismic Upgrade.

6. BAIRMWP Website Navigation

- Chris Choo provided an update on website improvements. Chris noted that navigation of the BAIRWMP website will be changed, based upon work conducted on a cloned version of the site; the cloned version presents a new format at http://dev.bairwmp.org.
- Chris requested that CC members review the new website format and identify any problems or things that are missing.
- Initial comments from CC members included:
    - The Climate Change library should be placed under the new library menu link.
    - It would be helpful to give users a few different ways of accessing information.
    - A “contact us” link should be added.
    - Including a map and other visual elements would be helpful.

Action Item

- CC members will review the cloned BAIRWMP website and provide feedback to Chris by February 11, 2013.

7. Announcements and Next Steps

- Steve Ritchie will be presenting to the League of Women Voters on February 2, 2013. His presentation will include BAIRWMP.
- The next CC meeting will take place on February 25, 2013 from 1:00 – 3:00 p.m. (note the meeting will be two hours). It will be held at East Bay MUD.

Bay Area IRWMP Plan Update Team

January 15, 2013
1:00 – 2:30 pm

Notes

1. Participation

WS/WQ	WW/RW	FP/SW	Watershed	Other
Present				
Thomasin Grim	Cheryl Munoz	Mark Boucher Robyn Navarra Brian Mendenhall	Harry Seraydarian Chris Choo Jennifer Krebs Matt Gerhart Leigh Sharp	Carl Morrison
Absent				
Brad Sherwood	Linda Hu Brian Campbell	Carol Mahoney		

2. Watersheds – Updated Map and List

The group reviewed the updated "watersheds" map, and the two lists of watersheds (the longer list included with the map excerpt, and a shorter list of USGS HUC areas only.) After lengthy discussion, the group agreed that including detailed watershed lists in the Plan could be confusing, and that determining which to include based upon size or "importance" is problematic. Decision: neither list should be included in the Plan Update. Instead, we should add a note under the map explaining what the purple boundaries represent (that they are USGS HUC areas) and add some additional text regarding watersheds in general.

3. Chapter 2 – Region Description

The group reviewed the Chapter 2 comments memo from KJ, and provided direction as requested.

4. Chapter 3 – Objectives

The group reviewed the Chapter 3 comments memo from KJ, and provided direction as requested. For the Goals/Objectives table, the PUT approach was to leave the language as is, unless there was something really wrong, or something that really needed to be adjusted. Consequently, PUT suggestions for changing Goals/Objectives text are minimal.

5. Action Items

- **a.** Matt to send watersheds language for consideration.
- **b.** Thomasin to provide KJ with PUT direction on comments/issues from Chapters 2 and 3.

6. Next meeting – Tuesday, February 19, 1:00 p.m.

BA IRWMP: Chapter Review Tracker

Chapter		Draft 1 PUT Plus List Comments via Google Drive (where available)		Draft 2 Targeted Reviewers List Comments via FA Leads (Word Doc)			
#	Name	Released	PUT comments due	Released	Targeted Reviewers comments due	FA leads comments due	Notes
1	Governance		April 2012			June 2012	Final draft to be released pending clarification of outstanding governance processes.
2	Region Description		Sept 2012	11/9/12	11/30/12	12/7/12	Final Draft to be released 2/15/13
3	Objectives		6/11/12	11/12/12	11/16/12	11/27/12	Final Draft to be released 2/15/13
4	RMS						
6	Project Review	11/13/12	11/28/12	12/20/12	*1/10/12*	*1/14/12*	Final Draft to be released 2/15/13
7	Impacts & benefits	1/18/13	2/1/13	2/19/13	3/5/13		
8	Performance & Monitoring	2/14/13	3/1/13				
9	Data Management						Zentraal
10	Financing	1/3/13	1/18/13	2/12/13	2/25/13	2/4/13	Preparing Draft 2
11	Technical analysis						
12	Relation to Water planning	2/8/13	2/22/13				
13	Relation to land use planning						
14	Stakeholder	11/19/12	12/7/12				
15	Coordination						
16	Climate change						

GREY – Completed, Yellow – Active Assignment, *Italics – Projected*

2/19/2013

Kennedy/Jenks, Inc. - Invoice Tracker

Task		Labor Invoiced	Comm. Charge Invoiced	Sub Markup	Expenses Invoiced	Task Total Estimated Cost	Amount Invoiced 1/15/13 #70560	#70560 Credit associated with Task 14, Invoice #65661	Amount PAID #70560	Total Amount Previously Invoiced	Total Amount Previously PAID	Total Amount Invoiced to Date	Total Amount PAID to Date	Budget Remaining by Task	Percent Remaining
Task 1	Governance					$4,683	$0.00		$0.00	$12,060.06	$4,683.06	$12,060.06	$4,683.06	$0	0.00%
Task 2	Region Description					$33,094	$0.00		$0.00	$31,847.92	$31,847.92	$31,847.92	$31,847.92	$1,246	3.77%
Task 3	Objectives	$8,360.00				$55,382	$8,360.00		$8,360.00	$34,193.64	$34,193.64	$42,553.64	$42,553.64	$12,828	23.16%
Task 4	Resource Management Strategies					$8,967	$0.00		$0.00	$7,698.94	$7,698.94	$7,698.94	$7,698.94	$1,268	14.14%
Task 6	Project Review Process	$13,913.75				$89,127	$13,913.75		$13,913.75	$43,856.89	$43,856.89	$57,770.64	$57,770.64	$31,356	35.18%
Task 7	Impacts and Benefits					$23,612	$0.00		$0.00	$7,686.64	$7,686.64	$7,686.64	$7,686.64	$15,925	67.45%
Task 8	Plan Performance and Monitoring					$25,844	$0.00		$0.00	$0.00	$0.00	$0.00	$0.00	$25,844	100.00%
Task 9	Data Management and Website					$2,919	$0.00		$0.00	$0.00	$0.00	$0.00	$0.00	$2,919	100.00%
Task 10	Financing	$2,860.00				$13,421	$2,860.00		$2,860.00	$512.50	$512.50	$3,372.50	$3,372.50	$10,049	74.87%
Task 11	Technical Analysis					$13,009	$0.00		$0.00	$0.00	$0.00	$0.00	$0.00	$13,009	100.00%
Task 12	Relation to Local Water Planning	$800.00	$24.00	$41.20		$14,634	$865.20		$865.20	$8,436.59	$8,436.59	$9,301.79	$9,301.79	$5,332	36.44%
Task 13	Relation to Local Land Use Planning					$4,933	$0.00		$0.00	$4,744.79	$4,744.79	$4,744.79	$4,744.79	$188	3.82%
Task 14	Stakeholder Involvement	$15,826.50		$785.83		$113,514	$16,612.33	$2,252.25	$14,360.08	$78,893.61	$78,893.61	$95,505.94	$93,253.69	$20,260	17.85%
Task 15	Coordination				$23.10	$60,231	$23.10		$23.10	$50,822.19	$50,822.19	$50,845.29	$50,845.29	$9,386	15.58%
Task 16	Climate Change	$2,987.50	$89.63	$153.86		$44,715	$3,230.99		$3,230.99	$37,828.33	$37,828.33	$41,059.32	$41,059.32	$3,656	8.18%
Task 17	Preparation of Updated Plan					$14,753	$0.00		$0.00	$2,349.95	$2,349.95	$2,349.95	$2,349.95	$12,403	84.07%
	Total:	$44,747.75	$113.63	$980.89	$23.10	$522,838	**$45,865.37**	**$2,252.25**	**$43,613.11**	**$320,932.05**	**$313,555.05**	**$366,797.42**	**$357,168.17**	**$165,669.83**	**42.78%**

MMWD Miscellaneous Agreement #5090
Task Costs - Invoice #11 - KJ #70560 through October, 2012

Zentraal

Invoice #1484, through January, 2013

	Task Total	Amount Previously Invoiced	Amount Invoice #1484	Total Amount Invoiced	Amount Remaining	Percent Remaining
Task 9 Data Management and Website						
Tasks 1,2,4,5,7	$29,400	$14,888.00	$1,005.00	$15,893.00	$13,507	45.94%
Task 3	$2,000	$80.00	$0.00	$80.00	$1,920	96.00%
Task 6 (web hosting)	$1,200	$823.90	$74.90	$898.80	$301	25.10%
Total:	$32,600	$15,791.90	**$1,079.90**	$16,871.80	$15,728	

Inv #	Amount
1261	$1,059.80
1270	$1,434.90
1268	$1,904.90
1407	$1,289.90
1408	$1,534.90
1420	$1,794.90
1445	$2,967.90
1458	$1,194.90
1463	$1,374.90
1480	$1,234.90
1484	$1,079.90
TOTAL	**$16,871.80**

Bay Area Integrated Regional Water Management Plan

Public Workshop #2

Project Selection, Financing and Collaboration

Monday, January 28, 2013

4:00 – 6:00 p.m.

StopWaste.org

1537 Webster Street, Oakland, CA

Summary of Workshop Participant Input

Communication challenges

- A workshop participant who is also a BAIRMWP project proponent commented that communication regarding submitting projects for the Proposition 84 Round 2 grant application was poor and that he was not receiving updates and information in a timely manner. Steve Ritchie, Chair of the BAIRWMP Coordination Committee (CC), indicated that the CC would follow up on this concern.

Funding Sources and Mechanisms

Following presentations provided by Carol Mahoney (Zone 7), Caitlin Sweeney (San Francisco Estuary Partnership), and Grant Schlereth (Arup) on financing sources and collaboration strategies (see BAIRWMP website for workshop presentations: www.bairwmp.org), workshop participants provided their own examples of funding mechanisms they have used and/or have found to be effective to fund water resource projects. These sources include:

- The California Financing Coordinating Committee hosts regular Funding Fairs that are open to the public and very helpful. The fairs provide opportunities for project proponents to obtain information about currently available infrastructure grant, loan and bond financing programs and options.
    - For more information, visit: http://www.cfcc.ca.gov/funding_fairs.htm.
- Small non-profit organizations are able to work with the Sonoma County Water Agency, which provides small grants for stakeholder engagement and localized involvement in making improvements to the water system. This has led to a number of successful habitat restoration projects.
- Participation in carbon markets for mitigation credits can potentially provide funding for water resource projects. The San Francisco Public Utilities Commission (SFPUC) is exploring this approach and the Point Reyes Bird Observatory is performing work in this area for grasslands and watersheds. In addition, smaller community based watershed groups are beginning to get involved in the carbon credit market. The Bay Area Watershed Network (BAWN) will be hosting a panel on carbon credits in February 2013 to discuss carbon credits and their potential applications.

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    - For more information about the BAWN panel, visit: http://www.sfestuary.org/watershed-network.
- SFPUC provides funding for Alameda County Resource Conservation District staff to work on watershed restoration projects. This support provides the RCD with the resources it needs to implement projects; this has proved to be a very successful partnership.
- Estate planning for land trusts has allowed a number of conservation projects to take place. This is a strategy that should be considered, and it may be applicable for other types of projects as well.
- Santa Clara Valley Water District has a grant program that allows local non-profit organizations to participate in water resource projects. This funding source allows smaller organizations to implement smaller projects, as opposed to the larger infrastructure projects the BAIRMWP prioritizes. BAIRWMP should consider prioritizing funding the larger water resource agencies with funding programs similar to SCVWD because they allow smaller organizations to participate.
- The City of Livermore uses development fees to fund flood improvement projects. Developers also sometimes pay drainage fees to mitigate for stormwater runoff.
- Several local foundations, including the Lucile and David Packard Foundation and the Gordon and Betty Moore Foundation, fund watershed, wetlands and riparian projects.
- The San Francisco Bay Joint Venture funding database is a helpful resource. The database includes federal, state and local agency funding sources as well as private sources such as foundations and educational institutions.
    - For more information, visit: http://www.sfbayjv.org/funding-list.php.
- Non-profit organizations are very creative in identifying resources and finding ways of implementing projects. Some use large teams of volunteers for watershed projects, including Acterra in San Mateo and Santa Clara counties.

Partnership and Participation in BAIRMWP

- It would be helpful to make available a "cost-benefit consultant" to help project proponents, particularly non-profit organizations that often don't have the resources to do this, in this important aspect of the project applications
- To facilitate partnerships between larger public agencies and smaller organizations, it would be helpful if both sides could clearly articulate what they are looking for in a partner and what they aim to achieve. For example, if larger agencies could to clarify what kinds of projects they are prioritizing, the smaller organizations can then develop some ideas on how to create a mutually beneficial partnership. They might consider articulating/sharing this on a central website that is easily accessible.
- A relatively small number of projects included the 2013 BAIRWMP are being led by local cities. The Coordinating Committee should better understand the barriers to participation.
- DWR's requirements for disadvantaged community (DAC) projects to participate in the BAIRWMP, and the DAC boundaries, make it very challenging to participate. The process is complex and DACs have limited staff to work on applications and the intensive reporting and paperwork required.

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BAIRWMP Coordinating Committee
Schedule of Future CC Meetings

Date	Location
February 25, 2013	East Bay MUD, 2nd Floor Training Room
March 25, 2013	East Bay MUD, 2nd Floor Training Room
April 22, 2013	East Bay MUD, 2nd Floor Training Room
June 3, 2013 (*re-schedule of May 27 meeting date – Memorial Day)	East Bay MUD, 2nd Floor Training Room
June 24, 2013	East Bay MUD, 2nd Floor Training Room
July 22, 2013	East Bay MUD, 2nd Floor Training Room
August 26, 2013	TBD
September 23, 2013	TBD
October 28, 2013	TBD
November 25, 2013	TBD
December 23, 2013	TBD

Appendix G

New Projects Added to IRWMP

January 2013

Summary

On January 28, 2013, the Bay Area IRWMP Coordinating Committee (CC) agreed by consensus to add the projects included in Table 1. This version of Appendix G differs from prior versions in that all projects in the 2006 IRWM Plan were given an opportunity to update project descriptions or drop from the list of projects, in addition to adding new projects that were not included in the Plan or earlier versions of Appendix G.

New Projects Added to the IRWM Plan

To develop a new list of all active projects for the Bay Area IRWM Plan and prepare for pending DWR grant solicitations funded by Proposition 84 and 1E, new or updated projects were solicited for consideration. All projects submitted by September 7, 2012 were considered by the Project Screening Committee and evaluated according to an updated scoring system as reflected in meeting minutes of the Bay Area Coordinating Committee (http://bairwmp.org/events/coordinating-commitee-meetings/cc-meetings-2012, See minutes of meetings in Sept – Nov, 2012).

Table 1 includes all projects that were received by the September 2012 deadline and scored by the Screening Committee. The Coordinating Committee approved the final scored list on November 26, 2012 after proponents were afforded an opportunity to review preliminary scoring results and comment on any errors. Further details on each project of Table 1 can be located by using the Project title given in Table 1 and looking up that project at this directory - http://bairwmp.org/projects/queries/active-project-list.

New Proposition 1E Projects Added to the IRWM Plan

Subsequent to the evaluation of all the projects received by September 2012, three additional projects requested to be added to the IRWM Plan solely for the purpose of being considered for Prop 1E grant consideration. The three projects are located in the Bay Area IRWM Region and each meets multiple IRWM objectives and on that basis they are eligible to be added to the Bay Area IRWM Plan. By unanimous consent, the Coordinating Committee on January 28, 2013 approved these projects for addition to the 2006 IRWM Plan. Further details on each project can be located using the web links found on the final page of this Appendix concerning Prop 1E Projects.

Table 1: Projects Added to the Bay Area IRWM Plan (2006)

Proj ID#	Project Name (* Some project titles were updated after project evaluation and scoring, shown in parenthesis)	Sponsoring Agency	Total Score (735 max)
237	North Bay Water Reuse Program (*including 5th Street Pipeline Project)	North Bay Water Reuse Authority (NBWRA)	618
165	Building Climate Change Resiliency Along the Bay with Green Infrastructure & Treated Wastewater (*San Francisco Bay Shoreline Green Infrastructure and Climate Change Pilot Projects for Flood Control and Wastewater Treatment)	San Francisco Estuary Partnership	604
177	Resilient Landscapes Climate Adaptation Strategy: Tools for Designing Sustainable Bay Area Stream, Wetland, and Riparian Habitats	San Francisco Estuary Institute - Aquatic Science Center	600
252	Sonoma Valley Integrated Water Management Program	Sonoma County Water Agency	582
169	Bay-Friendly Landscape Standards for Green Infrastructure Projects: Maximizing Watershed Benefits	Bay-Friendly Landscaping & Gardening Coalition	580
131	Satellite Recycled Water Treatment Plant Project	East Bay Municipal Utility District (EBMUD)	575
233	Napa River Restoration, Bioassessment & Education Project	Napa County Resource Conservation District	572
170	Bay-Friendly Outreach Campaign for Home Gardeners and Nurseries	Bay-Friendly Landscaping & Gardening Coalition	565
171	Bay-Friendly Qualified Landscape Professionals Training	Bay-Friendly Landscaping & Gardening Coalition	545
192	City Watersheds of Sonoma Valley	Sonoma County Water Agency	545
63	East Bayshore Recycled Water Project Phase 1A	East Bay Municipal Utility District (EBMUD)	538
65	East Bayshore Recycled Water Project Phase 1B - Oakland-Alameda Estuary Crossing	East Bay Municipal Utility District (EBMUD)	538
64	East Bayshore Recycled Water Project Phase 1B - Alameda	East Bay Municipal Utility District (EBMUD)	536
82	Lake Chabot Raw Water Expansion Project	East Bay Municipal Utility District (EBMUD)	535
174	Improving Quantitative Precipitation Information for the San Francisco Bay Area	Zone 7 Water Agencies for Bay Area Flood Protection Agencies Asso	535
66	East Bayshore Recycled Water Project Phase 2 (*Oakland-Emeryville East Bayshore Recycled Water Project Phase 2)	East Bay Municipal Utility District (EBMUD)	532
108	Richmond Advanced Recycled Expansion (RARE) Water Project Phase 2	East Bay Municipal Utility District (EBMUD)	532
112	Rodeo Recycled Water Project	East Bay Municipal Utility District (EBMUD)	532
265	Watershed Information Center & Conservancy of Napa County	County of Napa	531
62	Diablo Country Club Satellite Recycled Water Project	East Bay Municipal Utility District (EBMUD)	530
107	Richmond Advanced Recycled Expansion (RARE) Water Project - Future Expansion	East Bay Municipal Utility District (EBMUD)	530
119	San Leandro Water Reclamation Facility Expansion Project	East Bay Municipal Utility District (EBMUD)	530
130	San Ramon Valley Recycled Water Program - Phase 5-6 (DSRSD-EBMUD Recycled Water Authority)	DSRSD-EBMUD Recycled Water Authority	530
167	Bay Area Green Infrastructure Initiative: Scientific support related to planning and implementation of water infrastructure upgrades toward green alternatives	San Francisco Estuary Institute	530
215	Implementing "Slow It, Spread It, Sink It!" in Sonoma and Napa Counties	Southern Sonoma Resource Conservation District	530
216	Implementing LandSmart Plans to Improve Water Quality	Napa County Resource Conservation District	530
240	Petaluma Flood Impact Reduction, Water & Habitat Quality, Recreation, Phase IV (*Petaluma Flood Recution, Water & Habitat Quality, and Recreation Project for Capri Creek)	City of Petaluma, Southern Sonoma County Resource Conservation D	530
128	San Ramon Valley Recycled Water Program - Phase 2A (DSRSD-EBMUD Recycled Water Authority)	DSRSD-EBMUD Recycled Water Authority	528
129	San Ramon Valley Recycled Water Program - Phase 3 - 4 (DSRSD-EBMUD Recycled Water Authority)	DSRSD-EBMUD Recycled Water Authority	526
310	SFPUC Eastside Watershed Green Infrastructure Early Implementation Projects	San Francisco Public Utilities Commission	520
311	SFPUC Westside Watershed Green Infrastructure Early Implementation Projects	San Francisco Public Utilities Commission	520
105	Reliez Valley Recycled Water Project	East Bay Municipal Utility District (EBMUD)	510
193	Collaborative Aquatic Resource Protection in the Watershed Context: Science and Technology to Visualize Alternative Landscape Futures	San Francisco Estuary Institute	510
181	The Students and Teachers Restoring A Watershed (STRAW) Project (*Students and Teachers Restoring a Watershed (STRAW) - North and East Bay Watersheds)	PRBO Conservation Science	506
187	School District Green Infrastructure Capacity Building/Pilot Projects	San Francisco Estuary Partnership	505
166	350 Home and Garden Challenge Bay Area	Daily Acts	500
294	Implementation of High Priority Projects Identified in the Pilarcitos Creek Integrated Watershed Management Plan	San Mateo County Resource Conservation District (RCD)	491
175	Regional Green Infrastructure Capacity Building Program	San Francisco Estuary Partnership	485
50	Contra Costa County LID School Program	The Watershed Project	470
104	Refugio Creek and North Channel Restoration	City of Hercules	468
256	Stinson Beach flood protection and habitat enhancement project	Marin County Department of Public Works	468
217	Implementing TMDLs in the Napa River, Sonoma and Suisun Creek watersheds with the Fish Friendly Farming/Fish Friendly Ranching programs	California Land Stewardship Institute	467
264	Water Supply and Instream Habitat Improvements in Suisun Creek	Ca. Land Stewardship Institute	467

Table 1: Projects Added to the Bay Area IRWM Plan (2006)

Proj ID#	Project Name (* Some project titles were updated after project evaluation and scoring, shown in parenthesis)	Sponsoring Agency	Total Score (735 max)
234	Napa River Restoration: Oakville to Oak Knoll Reach	Napa County	464
59	Decoto District Green Streets Phase 3	City of Union City	462
51	Contra Costa County Low Impact Development Rebate Program	The Watershed Project	460
168	Bay Area Regional Water Conservation and Education Program	Zone 7 Water Agency, San Francisco PUC and Contra Costa Water Di	460
188	Ash Creek Stormwater Management and Wildlife Enhancement Project	Southern Sonoma County Resource Conservation District	455
244	Rindler Creek: Habitat Restoration and Erosion Control	Solano Resource Conservation District	452
219	Lagunitas Creek Watershed Sediment Reduction and Management Project (*Marin Lagunitas Creek Watershed Sediment Reduction and Management Project)	Marin Municipal Water District	449
270	Berryessa Creek Flood Protection Project	Santa Clara Valley Water District	445
243	Richardson Bay Erosional Shoreline Adaptation to Sea Level Rise: Draft Conceptual Designs and Opportunity/Constraints Assessment	Marin County Flood Control and Water Conservation District	442
194	Conserving Our Watersheds (*Marin-Sonoma Conserving Our Watersheds Agricultural BMP Projects)	Marin Resource Conservation District	440
263	Water Conservation and Mobile Water Lab Program	Southern Sonoma Resource Conservation District	440
78	Hayward Marsh Restoration and Enhancement Project	East Bay Regional Park District	437
226	McInnis Marsh Habitat Restoration Project	Marin County Parks	437
251	Sonoma Valley Groundwater Banking Program	Sonoma County Water Agency	437
247	San Geronimo Landowner Assistance Program- Habitat Restoration Projects	Marin County Department of Public Works/SG Planning Group	435
221	LID and Stormwater Management - Lagunitas Watershed	The Watershed Project	432
235	Napa River Rutherford Reach Restoration Project	Napa County	428
157	Water Treatment Plant Improvement Project	City of Pittsburg	427
208	Corte Madera Creek Watershed Sediment Control and Drinking Water Reliability Project	Marin Municipal Water District	426
58	DDSD Recycled Water Distribution System Expansion	Delta Diablo Sanitation District	425
178	San Francisco Bay Livestock and Land Program	Ecology Action	425
180	The Bay Area Creek Mouth Assessment Tool	San Francisco Estuary Partnership	425
195	Corte Madera Bayfront Flood Protection and Wetlands Restoration Project	Marin Audubon Society/Marin Bayland Advocates	425
227	Miller Avenue Green Street Plan	City of Mill Valley	421
305	San Francisco Eastside Recycled Water Project	San Francisco Public Utilities Commission	420
308	San Francisco Westside Recycled Water Project	San Francisco Public Utilities Commission	420
106	Rheem Creek Conservation Project (*San Pablo Rheem Creek Wetlands Restoration Project)	Contra Costa Water District	417
229	Milliken Diversion Dam Flow Control	City of Napa Water Division	417
127	San Pablo Bay South Watershed Community Stewardship Program	The Watershed Project	415
172	Cleaning up trash in the Bay Area's stormwater	Association of Bay Area Governments/SF Estuary Partnership	415
16	Albany Beach Restoration and Public Access Project	East Bay Regional Park District	414
276	Roseview Heights Mutual Water Tanks & Main upgrades (*Roseview Heights Infrastructure Upgrades for Water Quality and Supply Improvements, Santa Clara County)	Roseview Heights Mutual Water Company	414
41	CCCSD Refinery Recycled Water Project	Central Contra Costa Sanitary District	410
43	Central Dublin RW Distribution and Retrofit Project	Dublin San Ramon Services District	410
102	Recycled Water Distribution and Retrofit for County and Federal Facilities	Dublin San Ramon Services District	410
179	San Francisco Bay Tidal Marsh-Upland Transition Zone Decision Support System (DSS)	San Francisco Bay Bird Observatory	410
47	City of Berkeley Watershed Management Plan	City of Berkeley	407
164	Zone 1 Recycled Water- Pleasant Hill Build Out	Contra Costa Sanitary District	406
241	Redwood Creek Restoration at Muir Beach, Phase 5	Golden Gate National Parks Conservancy	405
60	DERWA Pump Station 1 - Phase 2	Dublin San Ramon Services District	402
173	Developing a Conservation Reserve Enhancement Program Proposal (CREP) to improve water quality and protect rangeland habitats in the Bay Area	Defenders of Wildlife	400
17	Alhambra Valley Creek Coalition - Erosion Control and Riparian Restoration Project	Contra Costa County Public Works Dept.	397
161	Wildcat Creek Watershed Erosion and Sediment Control Project	East Bay Regional Park District	397
34	Bay Point Regional Shoreline Wetland Restoration	East Bay Regional Park District	395
158	Western Dublin Recycled Water Distribution Expansion and Retrofit Project	Dublin San Ramon Services District	395
254	Southwestern Solano County Open Space Acquisition and Watershed Assessment	Solano Land Trust	395
196	Corte Madera Creek Headwaters Restoration Plan	Marin County Parks	394
42	CCCSD-Concord Recycled Water Project	Central Contra Costa Sanitary District	390
88	Martinez Adult School Flood Protection & Creek Enhancement	Martinez Unified School District	390

Table 1: Projects Added to the Bay Area IRWM Plan (2006)

Proj ID#	Project Name (* Some project titles were updated after project evaluation and scoring, shown in parenthesis)	Sponsoring Agency	Total Score (735 max)
182	Bay Area Regional Desalination Project (BARDP) - Alternative Analysis Report	EBMUD, CCWD, Zone 7, SCVWD, SFPUC	390
303	Redwood City Recycled Water Project Phase 2 – Central Redwood City	City of Redwood City	387
257	Suisun City Flood Management and Habitat Restoration Project	City of Suisun City	386
261	Upper Napa River Water Quality Improvement and Habitat Enhancement Project	California Land Stewardship Institute	385
307	San Francisco International Airport Industrial Waste Treatment Plant and Reclaimed Water Facility	City and County of San Francisco, Airport Commission	385
189	Bel Marin Keys Phase of the Hamilton Wetlands Restoration	Coastal Conservancy	383
114	Rubber Dam No. 1 Fish Ladder	Alameda County Water District	380
115	Rubber Dam No. 3 Fish Ladder	Alameda County Water District	380
239	Peacock Gap Recycled Water Extension Project	Marin Municipal Water District	379
132	Sausal Creek Restoration Project (*Oakland Sausal Creek Restoration Project)	City of Oakland	378
280	South Bay Salt Pond Restoration Project & South San Francisco Bay Shoreline Study: Early Implementation Activities	California State Coastal Conservancy	377
245	Rush Ranch HQ Storm Water Management, Public Access & Rangeland Improvements	Solano Land Trust	372
287	Butano Creek Stream Course Restoration	California State Parks	370
190	Bolinas Avenue Stormwater Quality Improvements and Fernhill Creek Restoration	Town of Ross	367
57	DDSD Advanced Water Treatment	Delta Diablo Sanitation District	365
148	Total Dissolved Solids Reduction/Salinity Management Project	Delta Diablo Sanitation District	365
248	Sears Point Restoration Project	Sonoma Land Trust	365
160	Wildcat Creek Fish Passage and Habitat Restoration (1135)(#7)	Contra Costa County Flood Control and Water Conservation District	362
231	Napa County Groundwater/Surface Water Monitoring Wells	Napa County	362
255	Spring Branch Creek Tidal Marsh & Seasonal Creek Restoration	Solano Land Trust	362
184	Bay Area Water Supply and Conservation Agency (BAWSCA) – East Bay Municipal Utility District (EBMUD) Short-Term Water Transfer Pilot Project (Pilot Project)	Bay Area Water Supply and Conservation Agency (BAWSCA), East Ba	360
159	Wildcat and San Pablo Creeks Restoration and Management Plan	Contra Costa County Flood Control and Water Conservation District	357
223	Mapping Marin County's Flood Control Levees	Marin County Flood Control and Water Conservation District	357
113	Rossmoor Well Replacement Project	City of Pittsburg	355
134	Shinn Pond Fish Screen	Alameda County Water District	355
246	Salvador Creek Intregrated Flood and Watershed Improvements	Napa County Flood Control and Water Conservation District	355
96	Pacheco Marsh Restoration, Martinez (#111)	Contra Costa County Flood Control and Water Conservation District	354
313	Vista Grande Drainage Basin Improvement Project	San Francisco Public Utilities Commission	354
236	NMWD Gallagher Well and Pipeline Project	North Marin Water District	353
300	Pescadero Water Supply and Sustainability Project	County of San Mateo Department of Public Works and Parks	352
92	Mission Creek Flood Protection and Restoration Project	Alameda County Flood Control & Water Conservation District	351
185	Bay Area Water Supply and Conservation Agency (BAWSCA) Brackish Groundwater Field Investigation Project (Brackish Groundwater Project)	BAWSCA (Bay Area Water Supply & Conservation Agency)	350
97	Parks Floodplain Dedication and Levee Construction (R3-3)	Zone 7 Water Agency	349
80	Holmes Street Sedimentation Basin and Granada/Murrieta Protection and Enhancement Project (R3-4)	Zone 7 Water Agency	347
109	Robertson Park Enhancement Project and Levee Construction (R3-2)	Zone 7 Water Agency	342
286	Bayfront Canal Flood Management and Habitat Restoration Project (*Redwood City Bayfront Canal and Atherton Channel Flood Improvement and Habitat Restoration Project)	City of Redwood City	342
93	Montalvin Manor Stormwater Harvest and Use, Bioretention, and Flood Risk Reduction Project	Contra Costa County	340
230	Montezuma Creek Rehabilitation and Fish Passage Project	Marin County Parks Department	340
238	North Marin Water District Marin Country Club Recycled Water Expansion	North Marin Water District	340
44	Central/Eastshore Pump Station Improvement Project	City of Alameda	339
266	White Slough Flood Control and Improvement Project	Vallejo Sanitation and Flood Control District	338
101	Pinole Creek Habitat Restoration (1135 Project), Pinole (#12)	Contra Costa County Flood Control and Water Conservation District	337
191	Bolinas Lagoon Ecosystem Restoration Project	Marin County Open Space District	337
228	Milliken Creek Flood Reduction, Fish Passage Barrier Removal and Habitat Restoration (*Napa Milliken Creek Flood Damage Reduction and Fish Passage Barrier Removal)	Napa County	337
38	Canal Liner Rehabilitation and Slope Stability at Milepost 23.03	Contra Costa Water District	336
56	DDSD Advanced Wastewater Treatment	Delta Diablo Sanitation District	335
94	Niles Cone Groundwater Basin Monitoring Well Construction Project	Alameda County Water District	330

Table 1: Projects Added to the Bay Area IRWM Plan (2006)

Proj ID#	Project Name (* Some project titles were updated after project evaluation and scoring, shown in parenthesis)	Sponsoring Agency	Total Score (735 max)
304	Regional Groundwater Storage and Recovery Project (* Daly City-San Bruno South Westside Basin Regional Groundwater Storage and Recovery Project)	SFPUC, Cities of Daly City and San Bruno and California Water Servic	329
222	Lynch Canyon Watershed Improvements	Solano Land Trust	328
27	Arroyo las Positas Diversion Project (R5-3)	Zone 7 Water Agency	327
48	City of Hayward Recycled Water Project	City of Hayward	327
49	Contra Costa County Green Street Retrofit Network	Contra Costa County	325
218	Lagunitas Booster Station	Marin Municipal Water District	322
220	Lagunitas Creek Winter Habitat Enhancement Implementation	Marin Municipal Water District	322
283	Palo Alto Recycled Water Project	City of Palo Alto	322
13	Alameda Creek Flood Protection, Fish Passage and Habitat Enhancement Project	Alameda County Flood Control & Water Conservation District	320
150	Upper Alameda Creek Filter Gallery Project	San Francisco Public Utilities Commission	319
292	Fish Passage Improvements at Memorial County Park, San Mateo County	San Mateo County Resource Conservation District	318
61	DERWA Recycled Water Plant - Phase 2	Dublin San Ramon Services District	317
242	Removing Fish Passage Barriers in the Napa River Watershed	Napa County Resource Conservation District	317
282	East Palo Alto Groundwater Supply Conjunctive Use Project	City of East Palo Alto	317
202	Corte Madera Creek Watershed - Memorial Park Detention Basin, San Anselmo	Marin County Flood Control and Water Conservation District	315
288	Cesar Chavez Street Flood and Stormwater Managment Sewer Improvement Project	San Francisco Public Utilities Commission	315
314	Water Dog Lake Sediment Removal	City of Belmont	315
1	ACPWA Low Impact Development Implementation and Demonstration Project: Parking Lot Stormwater Treatment Improvements	Alameda County Public Works Agency	312
293	Hillman Area Improvements Project	City of Belmont	312
37	Breuner Marsh Restoration, Richmond (*Richmond Breuner Marsh Restoration Project)	East Bay Regional Park District	311
100	Pinole Creek Fish Passage Improvements project at I-80 Culverts	Contra Costa RCD	311
260	Upland Transition Zone Mapping for Southern San Pablo Bay (West):	Gallinas Watershed Council/Marin County DPW/marin County Parks	310
277	San José Green Alleys Demonstration Project (San José Green Streets & Alleys Demonstration Project)	City of San Jose	308
289	Daly City Expansion Recycled Water Project	SFPUC, City of Daly City	307
21	Ardenwood Creek Flood Protection and Restoration Project	Alameda County Flood Control & Water Conservation District	305
118	San Leandro Creek Hazard Tree Management and Riparian Habitat Restoration	ACFCWCD	300
183	Bay Area Regional Reliability Interties - EBMUD/CCWD	EBMUD / Zone 7 / CCWD / SCVWD / SFPUC	300
205	Corte Madera Creek Watershed - San Anselmo Creek Improvements	Marin County Flood Control and Water Conservation District	300
210	Corte Madera Creek Watershed: Saunders Fish Barrier Removal	Town of San Anselmo, Friends of Corte Madera Creek Watershed, R	297
81	Laguna Creek Flood Protection and Restoration Project	Alameda County Flood Control & Water Conservation District	295
89	Martinez Water Quality and Supply Reliability Improvement Project	City of Martinez / Contra Costa Water District	295
272	City of San Jose Citywide Storm Drain Master Plan	City of San Jose	295
281	Study of Mercury methylation in South San Francisco Bay in Relation to Nutrient Sources	San Francisco Estuary Institute	295
67	EBMUD - Pretreatment Facilities	East Bay Municipal Utility District (EBMUD)	294
186	EBMUD/ZONE 7 Regional Reliability Intertie	EBMUD / Zone 7 / CCWD / SCVWD / SFPUC	292
253	Soulajule Mercury Remediation	Marin Municipal Water District	292
259	Tomales Bay Watershed Water Quality Monitoring and Improvement Program	Tomales Bay Watershed Council Foundation	292
306	San Francisco Groundwater Supply Project	San Francisco Public Utilities Commission	289
309	San Gregorio Creek Tributary Water Quality and Flow Monitoring	San Gregorio Environmental Resource Center	289
154	Walnut Creek Levee Rehabilitation at Buchanan Field Airport, Concord (#119)	Contra Costa County Flood Control and Water Conservation District	287
19	Altamont and Las Positas Creeks/Springtown Alkali Sink Restoration	Natural Resources Conservation Service, Alameda County	285
198	Corte Madera Creek Watershed - Broadmoor Avenue Bridge Replacement and Creek Bank Restorations	Marin County Flood Control and Water Conservation District	285
176	Regional Sea Level Rise Adaptation Strategy	Bay Area Joint Policy Committee	282
268	Almaden Dam Improvements	Santa Clara Valley Water District	282
278	San José Green Streets Demonstration Project (San José Green Streets & Alleys Demonstration Project)	City of San Jose	281
87	Lower Walnut Creek Restoration Project, Martinez (#110)	Contra Costa County Flood Control and Water Conservation District	280
3	Airway Improvement Project (R5-2)	Zone 7 Water Agency	277
214	Implementation of the Napa River Watershed Assessment Framework	Napa County Resource Conservation District	277
149	Tule Ponds Education Center Rehabilitation	Alameda County Flood Control & Water Conservation District	275
75	Grayson Creek Levee Rehabilitation at CCCSD Treatment Plant, Pacheco (#107)	Contra Costa County Flood Control and Water Conservation District	270
125	San Lorenzo Creek Watershed Stewardship Program	Alameda Flood Control and Water Conservation District	270

Table 1: Projects Added to the Bay Area IRWM Plan (2006)

Proj ID#	Project Name (* Some project titles were updated after project evaluation and scoring, shown in parenthesis)	Sponsoring Agency	Total Score (735 max)
199	Corte Madera Creek Watershed - Fairfax Creek Improvements	Marin County Flood Control and Water Conservation District	270
98	Pine Creek Dam Seismic Assessment, Walnut Creek (#122)	Contra Costa County Flood Control and Water Conservation District	267
211	Corte Madera Creek Watershed: Sedimentation Management	Marin County Flood Control and Water Conservation District	267
206	Corte Madera Creek Watershed - Sleepy Hollow Creek Improvements	Marin County Flood Control and Water Conservation District	265
162	Wildcat Sediment Basin Desilt, North Richmond (#5)	Contra Costa County Flood Control and Water Conservation District	264
26	Arroyo De La Laguna (ADLL) Improvement Project 5 (R10-5)	Zone 7 Water Agency	262
204	Corte Madera Creek Watershed - Nokomis-Madrone Neighborhood Flood Protection	Marin County Flood Control and Water Conservation District	260
213	Goat Island Marsh Tidal Marsh Restoration & Interpretive Nature Trail	Solano Land Trust	259
25	Arroyo De La Laguna (ADLL) Improvement Project 4 (R10-4)	Zone 7 Water Agency	257
55	DA 48C Storm Drain Line at Marina Road, Bay Point (#_)	Contra Costa County Flood Control and Water Conservation District	257
85	Lower Arroyo del Valle Restoration and Enhancement Project (R7-3)	Zone 7 Water Agency	257
155	Walnut Creek Sediment Removal - Clayton Valley Drain to Drop Structure 1 , Concord (#118)	Contra Costa County Flood Control and Water Conservation District	257
95	North Richmond Pump Station - Retrofit and Replumb	Contra Costa County/City of Richmond	255
117	San Leandro Creek Environmental Education Center, Alameda County	Alameda Count Flood Control and Water Conservation District	255
224	Marin County Flood Control Asset Management	Marin County Flood Control and Water Conservation District	253
30	Arroyo Mocho Bypass and Regional Storage at Chain of Lakes (R6-2)	Zone 7 Water Agency	252
46	Chelsea Wetlands Restoration Project	Ducks Unlimited, Inc. and City of Hercules	252
262	Upper York Creek Dam Removal -- St. Helena, Napa River Watershed (*St Helena Upper York Creek Dam Removal Project)	City of St. Helena/U.S. Army Corps of Engineers	251
201	Corte Madera Creek Watershed - Loma Alta Tributary Detention Basin	Marin County Flood Control and Water Conservation District	250
284	San Francisquito Creek Flood Reduction, Ecosystem Restoration and Recreation Project, Highway 101 to El Camino Real	San Francisquito Creek Joint Powers Authority	250
99	Pine Creek Reservoir Sediment Removal and Capacity Restoration, Walnut Creek (#124)	Contra Costa County Flood Control and Water Conservation District	247
122	San Lorenzo Creek Tidal Wetlands Restoration	Alameda County Flood Control and Water Conservation District	245
142	Stivers Lagoon Marsh Project	Alameda County Flood Control and Water Conservation District	245
301	Pilarcitos Creek Equestrian Bridge	California State Parks	245
90	Mercury Reduction Benefits of Low Impact Development	Contra Costa County	242
151	Upper Arroyo de la Laguna (ADLL) Improvement Project (R8-4)	Zone 7 Water Agency	242
200	Corte Madera Creek Watershed - Lefty Gomez Field Detention Basin	Marin County Flood Control and Water Conservation District	240
203	Corte Madera Creek Watershed - Merwin Avenue Bridge Replacement and Creek Bank Restorations	Marin County Flood Control and Water Conservation District	240
225	Marin County Sea Level Rise Land Use Adaptation	Marin County CDA	240
23	Arroyo De La Laguna (ADLL) Improvement Project 2 (R10-2)	Zone 7 Water Agency	237
86	Lower Arroyo Mocho Improvement Project (R8-3)	Zone 7 Water Agency	237
73	Grayson and Murderer's Creek Subregional Improvements, Pleasant Hill (#106)	Contra Costa County Flood Control and Water Conservation District	232
136	South Bay Aqueduct Turnout Construction and Low-Flow Crossings (R3-1)	Zone 7 Water Agency	232
72	Grant Avenue Green Street Water Quality/Flood Protection Demonstration Site	Alameda County Flood Control and Water Conservation District	230
54	DA 48B Storm Drain Line A at Port Chicago Highway, Bay Point (#201)	Contra Costa County Flood Control and Water Conservation District	227
74	Grayson Creek Levee Raising and Rehabilitation, Pacheco (#_)	Contra Costa County Flood Control and Water Conservation District	227
31	Arroyo Mocho Management Plan (R6-1)	Zone 7 Water Agency	222
45	Chabot Canal Improvement Project (R8-2)	Zone 7 Water Agency	222
76	Grayson Creek Sediment Removal, Pacheco (unincorp.)(#109)	Contra Costa County Flood Control and Water Conservation District	222
77	Grimmer Greenbelt Gateway (Line G Channel Enhancement)	Alameda County Flood Control and Water Conservation District	220
249	SEDIMENT MANAGEMENT PLAN FOR THE GRAVEL CREEK WATERSHED	Vedanta Society of San Francisco	219
24	Arroyo De La Laguna (ADLL) Improvement Project 3 (R10-3)	Zone 7 Water Agency	217
29	Arroyo las Positas Multi-Purpose Project (R1-6)	Zone 7 Water Agency	217
124	San Lorenzo Creek Watershed Fisheries Restoration Project - Phase 1	Alameda County Flood Control and Water Conservation District	215
141	Stanley Enhancement and Restoration Project (R3-5a)	Zone 7 Water Agency	214
156	Wastewater Renewable Energy Enhancement	Delta Diablo Sanitation District	214
83	Line G-1-1 Maintenance Plan (R9-6)	Zone 7 Water Agency	212
146	Tassajara Creek Improvement Project (R8-1)	Zone 7 Water Agency	212
103	Recycled Water Facility Renewable Energy System	Delta Diablo Sanitation District	210
290	East Palo Alto Storm Water Conveyance, Tidal Flood Protection, Ecosystem Restoration, and Recreational Enhancement Project	San Francisquito Creek Joint Powers Authority	210
40	Castro Valley Flood Control Improvement Project	Alameda County Flood Control and Water Conservation District	207
135	Sinbad Creek Project (R11-2)	Zone 7 Water Agency	207
120	San Lorenzo Creek Flood Control Project - Phase 1	Alameda County Flood Control and Water Conservation District	206

Table 1: Projects Added to the Bay Area IRWM Plan (2006)

Proj ID#	Project Name (* Some project titles were updated after project evaluation and scoring, shown in parenthesis)	Sponsoring Agency	Total Score (735 max)
53	Cull Canyon Dam and Reservoir Project	Alameda County Flood Control and Water Conservation District	205
111	Rodeo Creek Stabilization near Christie Road, Rodeo (#16)	Contra Costa County Flood Control and Water Conservation District	205
273	Mountain View/ Sunnyvale Recycled Water Intertie Alignment Study	City of Mountain View	205
22	Arroyo De La Laguna (ADLL) Improvement Project 1 (R10-1)	Zone 7 Water Agency	202
145	Sycamore Grove Recharge Bypass Project (R4-1)	Zone 7 Water Agency	202
71	Fish Barrier Removal at Railroad Overcrossing (R3-5b)	Zone 7 Water Agency	200
123	San Lorenzo Creek Watershed Fisheries Restoration Project - Major Fish Passage Barrier Removal (MB-10) Phase 2	Alameda County Flood Control and Water Conservation District	200
68	Estudillo Canal Area/San Leandro Flood Control Improvement Project - Phase 1	Alameda County Flood Control and Water Conservation District	197
35	Bayside Groundwater Project Phase 2	East Bay Municipal Utility District (EBMUD)	195
36	Bockman Canal Area Flood Control Improvement Project	Alameda County Flood Control and Water Conservation District	195
110	Rodeo Creek Sediment Removal, Rodeo (#14)	Contra Costa County Flood Control and Water Conservation District	195
153	Veterans' Court Seawall Reconstruction	City of Alameda	192
302	Portola Redwood State Park Wastewater System	**(unknown)**	192
126	San Pablo Bay South Watershed Awareness and Action Plan	The Watershed Project	190
32	Arroyo Seco Improvements (R2-2)	Zone 7 Water Agency	187
267	Beach Watch Program	Farallones Marine Sanctuary Association	179
15	Alamo Canal/South San Ramon Creek Erosion Control (R9-1)	Zone 7 Water Agency	177
7	Alameda County Healthy Watershed Program	Alameda County Resource Conservation District	175
271	Charcot Storm Pump Station	City San Jose	175
69	Estudillo Canal Area/San Leandro Flood Control Improvement Project - Phase 2	Alameda County Flood Control and Water Conservation District	172
70	Estudillo Canal Area/San Leandro Flood Control Improvement Project - Phase 3	Alameda County Flood Control and Water Conservation District	172
91	Mission Boulevard to Meek Estate Creekside Trail and Habitat Improvements	Alameda County Flood Control and Water Conservation District	172
138	South East Bay Plain Basin Subsidence Monitoring Network	East Bay Municipal Utility District (EBMUD)	170
144	Sulphur Creek/Hayward Flood Control Improvement Project	Alameda County Flood Control and Water Conservation District	170
197	Corte Madera Creek Tidal Marsh Restoration	Friends of Corte Madera Creek Watershed; Marin County Water Cor	170
14	Alamo Canal Flood Control Program (R9-7)	Zone 7 Water Agency	167
39	Capacity Improvement at Arroyo las Positas (R1-7)	Zone 7 Water Agency	167
152	Velocity Control Project (R2-1)	Zone 7 Water Agency	167
121	San Lorenzo Creek Flood Control Project - Phase 2	Alameda County Flood Control and Water Conservation District	166
147	Tice Creek Bypass (Drainage Area 67), Walnut Creek, CA (#117)	Contra Costa County Flood Control and Water Conservation District	157
18	Alkali Sink Management (R1-2)	Zone 7 Water Agency	152
33	Assessment of an urban watershed and implementation of urban stormwater retrofit projects	Friends of Sausal Creek	150
143	Streambank and Habitat Restoration Projects	Alameda County Resource Conservation District	150
84	Line T Crossing Retrofit (R9-4)	Zone 7 Water Agency	147
79	Headquarters Facility - Landscaping	Alameda County Water District	143
6	Alameda County Habitat Easements	Alameda County Resource Conservation District	140
52	Creek Signage	Alameda County Resource Conservation District	140
28	Arroyo las Positas Habitat Enhancement and Recreation Project (R1-5)	Zone 7 Water Agency	137
139	Springtown Golf Course Improvements (R1-4)	Zone 7 Water Agency	137
295	Implementation of Pond Management Plan	Midpeninsula Regional Open Space District	131
5	Alameda County Foothill Blvd. Transportation Stormwater Quality Improvement	Alameda County	130
274	Palo Alto Golf Course Redesign Wetlands Enhancement and Restoration Project	City of Palo Alto	130
20	Altamont Creek Improvement (R1-1)	Zone 7 Water Agency	127
285	San Francisquito Watershed Plan	San Francisquito Creek Joint Powers Authority	125
312	South San Francisco Recycled Water Facility	South San Francisco/SFPUC	124
4	Alameda County Adopt-A-Creek-Spot	Alameda County Resource Conservation District	120
116	San Catanio Creek culvert repair and enhancement	City of San Ramon	120
207	Corte Madera Creek Watershed Infiltration and Storage Assessment	Ross Valley Watershed Program, Friends of Corte Madera Creek Wat	120
140	Springtown Improvements (R1-3)	Zone 7 Water Agency	117
137	South East Bay Plain Basin Groundwater Model Enhancements	East Bay Municipal Utility District (EBMUD)	115
163	Wildcat/San Pablo Creeks Phase II Channel Improvements, San Pablo (#9)	City of San Pablo	115
269	Anderson Dam Seismic Retrofit	Santa Clara Valley Water District	115
10	Alameda County Riparian Invasive Mapping and Removal	Alameda County Resource Conservation District	100
209	Corte Madera Creek Watershed: Barriers to Fish Passage in Sleepy Hollow Creek	Town of San Anselmo, Marin County Department of Public Works	100
232	Napa River Arundo Removal Lodi Lane to Zinfandel Lane	Napa County Flood Control and Water Conservation District	90
133	SCADA System Major Upgrades	Alameda County Water District	89

Table 1: Projects Added to the Bay Area IRWM Plan (2006)

Proj ID#	Project Name (* Some project titles were updated after project evaluation and scoring, shown in parenthesis)	Sponsoring Agency	Total Score (735 max)
9	Alameda County Patterson Pass Road Transportation Stormwater Quality Improvement	Alameda County	80
11	Alameda County Tesla Road Transportation Stormwater Quality Improvement	Alameda County	80
212	Corte Madera Creek Watershed: Smolt Trapping	Friends of Corte Madera Creek Watershed	80
2	Agricultural Riparian Buffer and Habitat Enhancement	Alameda County RCD	75
8	Alameda County Norbridge/Strobridge Road Transportation Stormwater Quality Improvement	Alameda County	75
258	Suisun Valley Flood Management	Solano County Water Agency	75
279	Santa Clara Valley Water District Advanced Recycled Water Treatment Facility Expansion Project	Santa Clara Valley Water District	75
291	Exterior Painting of Skyline Tanks	Westborough Water District	75
296	Installation of a New Seismic Valve at Skyline Tanks	Westborough Water District	75
297	Memorial Park Waste Water Treatment	San Mateo County	75
250	Solano Project Terminal Reservoir Seismic Mitigation	Solano County Water Agency	65
12	Alameda County Vasco Road Transportation Stormwater Quality Improvement	Alameda County	40
275	Permanente Creek Flood Protection	Santa Clara Valley Water District	35
298	New Pressure Reducing Valve (PRV) Station	Westborough Water District	35
299	New Tank Mixer for Skyline Tanks	Westborough Water District	35
315	Westborough Main Pump Station Generator	Westborough Water District	35

Bay Area IRWM Coordinating Committee
Update on Projects to be Proposed for
Proposition 1E Stormwater Round 2 Grants

During the first round of Prop 1E stormwater flood management grants, the Bay Area IRWM Coordinating Committee (CC) received an information update on the projects that would be applying for grant and the CC added several projects to the 2006 IRWM Plan. DWR awarded four Prop 1E grants to projects within the Bay Area IRWM in Round 1.

Similarly, for Round 2 an information item will be presented to the CC on projects that will be proposing for a Prop 1E grant. CC action will be requested to add projects to the 2006 IRWM Plan that were not already added through incorporation of the 2012 Active List of projects.

1. **INFO ITEM.** Up to eight projects will be submitting proposing for Prop 1E consideration as discussed at the January 7, 2013 Project Screening Committee. A verbal update on the projects interested in proposing will be provided at the January 28, 2013 CC mtg. The proposal deadline for Prop 1E Round 2 is February 1st. Most of these projects were included on the 2012 Active List.

2. **ACTION ITEM**. At least two projects interested in proposing for Prop 1E did not submit project templates prior to the Sept 7, 2012 cutoff for Prop 84 (Round 2) IRWM grant consideration. The project template on the website did not establish a deadline for Prop 1E project. The Project Screening Committee discussed this at its January 7, 2013 and did not raise any objection to adding new Prop 1E projects, provided they are located in the Bay Area IRWM region, they are multi-objective, and all projects are treated similarly. CC approval is now requested to add these projects to the 2006 IRWM Plan:

    a. http://bairwmp.org/projects/sewer-lateral-economic-assistance-and-construction-sleac
    b. http://bairwmp.org/projects/south-coombs-area-drainage-improvement-program (Napa County)
    c. http://bairwmp.org/projects/chabot-dam-seismic-upgrade (Alameda Co.)

    If these projects are approved for inclusion in the IRWM Plan, they can be added to the tail end of Appendix G that covers the Active List of projects, or added in a separate appendix. Meeting minutes of the CC meeting would be sufficient to demonstrate to DWR that the projects were approved for addition.