1. The volumes of septic flows removed from the basin with the LOWWP—in addition to the volume of septic flows not contributing to recharge of the upper aquifer—should be re-analyzed and corrected throughout the report to accurately reflect the potential impacts of the project and to determine appropriate alternatives to avoid or mitigate for the impacts. The DEIR states 957 AFY of septic flows will be eliminated, of which about 600 AFY are recharging the upper aquifer. However, 957 AFY represent the septic flows with the project's conservation element in place (160 AFY) (see Table 5, Appendix 2-D, DEIR). The conservation element is not in effect until project start-up. This is supported by the fact that between 1800 and 2000 AFY of water is used in within the Prohibition Zone (based on the purveyor production shown in County Planning Department's Resource Capacity Study and Table 1 of Appendix D-2 of the DEIR). Since typical indoor use is between 60% and 70% of this in coastal areas, based on studies (e.g., Gleick et. al., *Waste Not Want Not*, p. 67), the total water going to septic systems is closer to 1200 AFY. Further, the *Fine Screening Report* estimates total septic flows at 1120 AFY (p. 2-21). Therefore, a reasonable estimate of total septic flows eliminated with the project is between 1100 and 1200 AFY. Of this, between about 800 AFY and 1050 AFY currently contribute to upper aquifer recharge. The Fine Screening Report states septic flows in the Prohibition Zone recharging the upper aquifer are 850 AFY (p. 2-21). The Yates and Williams 2003 study indicates septic flows contribute about 36% to upper aquifer recharge within the basin after "perching effects" (1267 AFY/3527 AFY) (Table 4). About 36% of 2995 AFY (the total upper aquifer recharge, per Table 8, Appendix D-2, DEIR, p.24) is about 1078 AFY. Both the *Fine Screening Report* and the DEIR indicate that there are only a small percentage of septic systems outside of the Prohibition Zone (less than 10%). Due to the uncertainties inherent in basin groundwater studies, septic return flows recharging the upper aquifer (removed with the project) should be assumed to be as high as 1100 AFY (a safe estimate), and as low as 850 AFY, a minimum estimate. This means a minimum of 250 AFY of inflow should be added to septic flow figures throughout the DEIR, including calculations estimating the impacts of removing septic flows (e.g., Tables 8-10, Appendix D-2.).

The error apparently arises from a failure to adequately account for septic flows in the perched aquifer contributing to upper aquifer recharge (e.g., Tables 8-10 of Appendix D-2 and Table 2 of Appendix C of D-2). Tables 8-10 appear to unreasonably predict that removing septic flows from the perched aquifer will impact Willow Creek outflow by over 90%, while affecting inflows to the upper aquifer by less than 10%. This is not consistent with the Yates and Williams study, which allocates nitrogen in the perched aquifer "to the four pathways in the same proportions as flow" (p. 9). The four pathways include leaks through the clay to other aquifers, lateral movement off the perched aquifer to other aquifers, transpiration, and discharges to Willow Creek. The last two are losses to groundwater flow, according to the study, so the first two contribute to aquifer recharge. Note that Table 2, Appendix C of D-2, omits perched layer inflows to the upper aquifer altogether (i.e., "Leakage/subsurface outflow to upper aquifer" does not appear as inflows to the upper aquifer on the table).

2. Key impact areas (e.g., Sections 5.2, 5.2, and 5.5) should be re-analyzed—using numbers that accurately reflect the potential impacts of removing septic flows from the basin—with alternatives for avoiding or mitigating for these impacts, and a feasibility analysis. <u>The Los Osos Valley Water Basin is in critical overdraft due to seawater intrusion. Therefore, the effects of removing about one-third of the recharge to the basin is likely the most critical environmental factor to be considered in the LOWWP EIR. If removal of septic flows is not adequately mitigated, seawater intrusion could destroy the upper and the lower aquifers, rendering the project a waste of time and money—as well as the primary cause for a more destructive source of aquifer contamination than nitrates—saltwater contamination.</u>

California Beach Closure Report 2000

July 2001

DIVISION OF WATER QUALITY
STATE WATER RESOURCES CONTROL BOARD
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

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INTRODUCTION

California Health and Safety Code Section 115910 requires local health officers to submit to the State Water Resources Control Board (SWRCB) by 15th of each month a survey documenting all beach postings and closures that occurred during the preceding calendar year due to threats to the public health. The law also requires the SWRCB to (1) make available this information to the public by 30th of each month, (2 publish a statewide annual report documenting the beach posting and closure data provided by health officers for the preceding calendar year by July 30, and (3) distribute this report to the Governor, the Legislature, major media organizations, and public within 30 days of publication of the annual report.

The SWRCB staff enters the monthly beach posting and closure data provided by the local health officers on its website (http://www.swrcb.ca.gov) for easy public access. The coastal Regional Water Quality Control Boards (RWQCBs) also post this information on their websites or link to the SWRCB's website.

This annual beach closure report contains beach posting and closure information submitted by local health officers for the year 2000. It also includes a brief description of SWRCB and RWQCBs activities to keep the beaches clean and healthy.

Significance of Beaches

Various statistics have been reported regarding the economic significance of beaches. Nationwide, beaches contribute over $640 billion (85 percent of all tourist revenues) to the United States economy annually. The U.S. Environmental Protection Agency (USEPA) estimates that Americans make a total of 910 million trips to coastal areas each year, spending about $44 billions. According to the U.S. Lifeguard Association, beach usage in California is higher than the other 49 states combined. California's coastline is one of its most important natural features. It extends over 1,000 miles from the rocky cliffs of the north coast to the sandy, sun-drenched beaches in the south. Approximately 80 percent of California's 33 million residents live within a 30-mile drive of its coastline. The coastal areas represent a desirable place to live. Millions of visitors come to see its beauty and play on the shore and in its waters. Southern California beaches attract 175 million visitors each year, who spend more than $1.5 billion during their visits. For instance, according to one estimate Mission Bay in San Diego County is visited each year by approximately three million people and creates over $25 million in revenue for the County. On a typical summer day, some of the more popular beaches attract 75,000 people. On a statewide basis, California beaches generate $17 billion per year in tourism revenue.

Increasingly the public is becoming concerned about beach closures, swimmers' illnesses, and the lack of public confidence due to the up and down nature of posting of warning signs. When a beach is closed due to contamination, the economic effect can be devastating to local business owners. Much attention has been given to the number of beach closures and warnings, especially along the southern California coast, which is a direct result of the very active beach water quality monitoring programs conducted primarily by county health agencies and municipal waste treatment facilities.

Causes of Beach Closures

Beaches are closed due to water contamination by toxic chemicals or pathogens, which can potentially impact the health of the beachgoers when they are exposed to the contaminated water through skin contact (swimming or surfing) or ingestion. Fever, flu-like symptoms, ear infection, respiratory illness, gastroenteritis, cryptosporidiosis, hepatitis, and other illnesses have been associated with waterborne pathogens. Table 1 lists a number of pathogenic bacteria, protozoa, and viruses; their observed effects on exposed population; and the diseases commonly associated with them. A 1996 epidemiological study sponsored by the Santa Monica Bay Restoration Project and partially funded by the SWRCB validated the cause and effect relationship between elevated levels of bacteria in beach water and health problems observed in exposed beachgoers. Beach closures can also result from other events, such as a leaking sewage pipe or an oil spill.

Sources of Beach Pollution

The ocean is the final deposition site for most land-based pollutants entering California's coastal watersheds. Nearshore pollution can result from dumping industrial waste, dredge spoils, agricultural and urban runoff, and municipal sewer discharges. Although this pollution has been controlled to a great extent in recent years, the increases in population and development offer a constant challenge to those agencies responsible for pollution control. As California's coastal population increases, the number and volume of discharges from industrial and municipal facilities into our coastal waters also increase.

Another primary source of coastal water pollution comes from the untreated runoff flowing from the land through storm drains and hundreds of natural stream courses. Runoff from creeks, rivers, and storm drains is a significant source of pollution to the southern California beaches. This runoff may come from roof tops, streets, yards, gardens, open spaces, parking lots, animal yards, construction sites, logging roads, and any other surface exposed to rain or snow. It collects animal waste, oil and rubber residue from cars, asbestos and metals from brake linings, pesticides, silt, and various types of vegetable matter. It may contain high bacterial counts and viruses, may be toxic to marine life, and may carry tons of garbage and silt that litter the ocean and its beaches and kill or injure marine life. Since this runoff does not come from a discrete source, such as a pipe, it is regarded as a "nonpoint source discharge." Some of these types of wastes are collected in urban storm drains. Storm drain discharges are considered "point source" under the federal Clean Water Act's Storm Water Program, and require National Pollutant Discharge Elimination System (NPDES) permits for discharges to surface waters.

SWRCB's Role

One of the SWRCB's primary responsibilities is to protect California's valuable coastal waters by controlling what goes into them. The six RWQCBs bordering the coastline also have primary responsibility for protecting coastal waters. Anyone wishing to discharge waste to the ocean from a pipe or waste facility (a "point source") must obtain an NPDES permit from the RWQCB. The RWQCBs establish monitoring programs to be conducted by the discharger as a way of measuring compliance with permit provisions. The RWQCBs currently issue NPDES permits for

Table 1. Waterborne Pathogens, Diseases they Cause, and their Effects on Exposed Population.

Pathogen		Disease	Effects
Bacteria	Escherichia coli (enteropathogenic)	Gastroenteritis	Vomiting, diarrhea, death in susceptible populations
	Legionella pneumophila	Legionellosis	Acute respiratory illness
	Leptospira	Leptospirosis	Jaundice, fever (Weil's disease)
	Salmonella typhi	Typhoid fever	High fever, diarrhea, ulceration of the small intestine
	Salmonella	Salmonellosis	Diarrhea, dehydration
	Shigella	Shigellosis	Bacillary dysentery
	Vibrio cholerae	Cholera	Extremely heavy diarrhea, dehydration
	Yersinia enterolitica	Yersinosis	Diarrhea
Protozoans	Balantidium coli	Balantidiasis	Diarrhea, dysentery
	Crytosporidium	Cryptosporidiosis	Diarrhea
	Entamoeba histolytica	Amedbiasis (amoebic dysentery)	Prolonged diarrhea with bleeding, abscesses of the liver and small intestine
	Giardia lamblia	Giardiasis	Mild to severe diarrhea, nausea, indigestion
	Naegleria fowleri	Amoebic meningoencephalitis	Fatal disease; inflammation of the brain
Viruses	Adenovirus (31 types)	Respiratory disease	
	Enterovirus (67 types, e.g., polio, echo, and Coxsackie viruses)	Gastroenteritis	Heart anomalies, meningitis
	Hepatitis A	Infectious hepatitis	Jaundice, fever
	Norwalk agent	Gastroenteritis	Vomiting, diarrhea
	Reovirus	Gastroenteritis	Vomiting, diarrhea
	Rotavirus	Gastroenteritis	Vomiting, diarrhea

discharges from municipal storm sewer systems serving a population of 100,000 or more. The SWRCB has also adopted two statewide general storm water permits for industrial and construction activities and a statewide permit to address all road construction activities of the California Department of Transportation. These permits require the storm water dischargers to implement programs to reduce and/or eliminate storm water pollution to the maximum extent possible. If nonpoint source waste causes serious pollution, the RWQCBs may work with the dischargers to require the application of measures to control the waste (known as best management practices or BMPs) and prevent pollution. If those measures are not carried out effectively, the RWQCBs may issue waste discharge permits or take enforcement action.

Beach Closure, Beach Posting (Warning Sign), and Rain Advisory

County health officers can take three discrete actions based on beach water quality monitoring data, sewage spills, and storm events. Beaches, or more precisely the ocean waters adjacent to the beaches, are posted with warning signs or are closed when certain kinds of indicator bacteria are found in the water at levels that are considered a problem. These indicator bacteria imply the potential presence of microscopic disease-causing organisms originating from human and animal wastes. Water samples are collected in the surf zone to determine if recreational waters are contaminated with indicator bacteria (total coliform, fecal coliform, and enterococci). If tests using indicator bacteria show levels above State standards (Table 2), the beach will be posted with warning signs or closure notices to notify the public of the potential health risk. The beach is reopened when further sampling confirms that the density of bacteria in water does not exceed the State standards.

A "Beach (ocean) Closure" occurs as a result of a sewage spill or **repeated** incidences of excedeences of bacterial standards from an unknown source. A closure is a notice to the public that the water is unsafe for contact and that there is a high risk of getting ill from swimming in the water. Closure occurs when health risks are considered greater than those associated with posting that some evidence of monitoring indicates a problem. A beach closure does not result in the closure of the entire beach for recreational activities. In most cases, the ocean is closed to swimming and other water contact recreation while the beach area is open for sunbathing, volleyball, and other activities that do not involve water contact.

A "Beach Warning" sign means that at least one bacterial standard has been exceeded, but there is no known source of human sewage. The posting of warning signs alerts the public of a possible risk of illness associated with water contact. The placement of signs may be short term when a single bacterial indicator standard is exceeded or more permanent where monitoring indicates repeated contamination (e.g., from a storm drain). Warnings may also be posted where sources of contamination are identifiable and can be explained as not of human origin (e.g., resident marine mammals or seabirds).

A "Rain Advisory" is often issued when it rains because it is known from past experience that rainwater carries pollution to the beach. After a rain, indicator bacteria counts usually exceed the State standards for recreational water use. For this reason, county health officials usually recommend that beach users should not swim or surf during rain and three days after a rainstorm. Rain advisories are issued by radio or newspaper during rainstorms to warn people to avoid areas where rainwater flows onto the beach and may not be based on the actual evidence of contamination.

Assembly Bill (AB) 411

Pursuant to AB 411 (Wayne, Chapter 765, Statutes of 1997), DHS adopted procedures that increased consistency in the way county agencies measure beach water quality, post warnings, and close beaches (Sections 115880, 115885, and 115915 of the Health and Safety Code). Beginning in 1999, the law required local health officers to conduct weekly bacterial testing (total coliform, fecal coliform, and enterococci bacteria) between April 1 and October 31 of waters adjacent to public beaches which have more than 50,000 visitors annually and are near storm drains which flow in the summer. If any one of these indicator organisms exceeds the DHS standard (Table 2), the county health officer is required to post warning signs at the beach and make a determination whether to close that beach in the case of extended exceedences. The law also requires the county health officer to establish a telephone hotline to inform the public of all beaches that are closed, posted, or otherwise restricted. Ten coastal counties (San Mateo, Sonoma, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, Orange, Los Angeles, and San Diego) and one city (Long Beach) have reported that they have beaches that meet the AB 411 criteria, i.e., beaches that are near storm drains and are visited by more than 50,000 people annually.

Before AB 411 became law, county health officers had discretion to post or close any beach that violated total coliform standards. Under the new regulations, county health officers are required to post warnings whenever any one of the bacterial standards is violated in areas near storm drains, but they have the discretion to close the beach when appropriate. Many beaches near storm drains (which are covered under the AB 411 regulations) frequently violate at least one of the standards established by the DHS. These violations increase the number of postings regardless of whether there have been changes in water quality from previous years. Information collected under the mandate of AB 411 provides a new baseline against which the number of future beach warning postings and closures could be compared.

Figure 1 shows a suggested protocol for posting and closure based on the results of bacterial monitoring or reported sewage spill. This protocol was developed by the Monitoring and Reporting Subcommittee of the Beach Water Quality Workgroup, an ad-hoc committee of State, federal, and local agency representatives and environmental groups that have a stake in beach water quality programs. The decision tree provides guidance to the county health staff on whether a beach should be posted or closed. AB 411 specifies when to post or close a beach which has input from storm drains. However, there is discretion for posting or closure of beaches in areas away from the influence of storm drains. The key to this discretionary action is whether the county health staff is confident that high levels of bacterial indicators will be detected on a repeated basis (leading to beach closure) or not (leading to beach posting).

Indicator Organisms

Since identification and enumeration of pathogens, such as viruses in water, are difficult, time consuming, and expensive laboratory methods have been developed to measure the presence and density of “indicator” organisms. The indicator organisms may not cause human health impacts, but their presence indicates the potential for water contamination with other pathogens that are harmful, such as bacteria, viruses and protozoa. Indicator bacteria are carried to coastal waters in

a variety of ways. Bacteria typically enter coastal waters from sewage spills; overflows of sewage-treatment plants and sanitary sewers; and storm water runoff from urban, suburban, and rural areas. An ideal indicator would be found only when disease-causing agents were present at densities that could cause problems. Since the coliform bacteria group (total, fecal, E. coli and enterococci) is found in the intestines and feces of warm-blooded animals, their presence indicates that pathogens from untreated or partially treated sewage or contaminated runoff may be present in water. Other advantages of using coliform bacteria group as indicator organisms include: (1) they are easily detected by simple laboratory methods; (2) they are not usually present in unpolluted waters; (3) their concentration in water can be correlated with the extent of contamination; and (4) they are safe to work with in the laboratory.

In 1967, USEPA recommended a fecal coliform water quality criterion for protection of human health. The criterion recommended that the maximum density of fecal coliform not exceed the geometric mean of 200 organisms per 100 milliliter (ml) in recreational waters. Again in 1986, USEPA issued more criteria for bathing (full body contact) in recreational waters based on E. coli and enterococci. In fresh waters, the geometric mean of bacterial densities should not exceed 126 per 100 ml for E. coli, **or** 33 per 100 ml for enterococci. For marine waters, the geometric mean of enterococci should not exceed 35 per 100 ml.

Table 2 presents the California Department of Health Services (DHS) bacterial standards for water-contact sports. The standards are for total coliform, fecal coliform, and enterococci for a single sample or for a 30-day log mean basis. Further, the ratio of total to fecal coliform should not exceed 10 ml when the total coliform density is more than 1,000 ml.

The current indicators are not very precise to assess human health impacts. Rather, these bacteria are produced by many types of animals, and they represent a range of potential risks of disease. For example, birds using wetland areas can excrete indicator bacteria in densities that would suggest a potential risk to human health. However, birds do not carry the same types of pathogens as people. The risk of illness to people is assumed to be lower when the indicator bacteria come from animals instead of humans. Further research is needed in this area.

Beach Mile-Day (BMD)

The BMD is a measure of beach availability for recreation per year. It is a product of the number of miles of coastline and 365 days (the number of days the beach may be available for recreation in California). For instance, if a county has 50 miles of open coast, bay, and harbor beaches, it has 18,250 BMDs available (50 X 365). However, if 15 miles of the beach are closed or posted for 10 days, then 150 BMDs are not available for recreation resulting in 0.8 percent beach impairment (150/18250 X 100). In other words, 99.2 percent of beach usage met the standards.

The BMD is a useful measure for comparing the health of beaches from year to year. The comparison is how much of the year's BMDs has been impaired in a particular county. It is a more meaningful measure of comparison than the number of incidences or the number of days of postings or closures.

Table 2. California Department of Health Services Bacterial Standards for Water-- Contact Sports		
Sample Type	**Bacteria**	**Standard**
		(Organism or Colony forming unit per 100 ml of water)
Single		
	Total Coliform	10,000
	Fecal Coliform	400
	Enterococci	104
	Total to fecal Coliform ratio (when total is 1,000)	10
30-day log mean		
	Total Coliform	1,000
	Fecal Coliform	200
	Enterococci	35

YEAR 2000 BEACH CLOSURE AND POSTING INFORMATION

The information presented in this report is derived from SWRCB's Beach Closure/Posted Warning Database which identifies the beach name and the extent of closures and posted warnings in miles (or yards). This database makes it possible to report beach postings and closures by BMDs. Detailed county reports on individual posted warnings, beach closures, and rain advisories for year 2000 are included in the Appendix of this report in geographical order of counties starting from the north of the State to the south. At the end of each individual county report, the total sum of the incidences of posted warnings/beach closures/rain advisories, days (duration), and BMDs are specified. Each time a portion of a beach was posted or closed, the event was counted as a day. The number of days of posted warnings or closures are mentioned to indicate the magnitude of the posting/closure events.

Beach Warning Postings

Table 3 presents the data on beach warnings posted during year 2000 from the City of Long Beach and 11 counties, ten of which (Sonoma, San Mateo, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego) meet the reporting AB 411 requirement criteria as mentioned previously. San Francisco County also reported these data although the County is not required to do so pursuant to AB 411. The coastal counties of Del Norte, Humboldt, Marin, Contra Costa, and Alameda did not have a monitoring program since these counties do not have beaches that meet the AB 411 criteria. Mendocino County on the other hand reported no posting of beach warnings during year 2000. On a statewide basis, 1,285 beach warnings were posted lasting for a total of 8,133 days. This resulted in approximately 1,100 BMDs of posting. Los Angeles County had the maximum number of incidences (325), and San Diego County had the maximum number of days of postings (2,450). Orange County had the maximum number of BMDs posted (about 596). These three counties along with the County of Santa Barbara and the City of Long Beach accounted for over 85 percent of the posting data. The primary cause of the bacterial contamination leading to postings was either unknown or rainfall resulting in storm events.

Figure 2 shows that statewide the source of 35 percent of all BMDs with warnings posted was contamination carried to the beach through creeks/rivers, and 18 percent was through storm drains and urban runoff. The source was unknown for 42 percent of the BMDs with posted warnings.

Six counties (San Mateo, Santa Cruz, Ventura, Los Angeles, Orange, and San Diego) reported permanent beach postings at certain beaches (Table 4). The majority of these permanent postings are due to storm drains or creeks/rivermouths that enter the ocean. Some counties do not opt for permanent postings at beaches near storm drains if the drains are seasonal. Since there is no uniform reporting system of permanent beach postings among the counties, these data are not included in the beach posting data. SWRCB staff is working with county health staff to improve the reporting system for this category. This is the first time the permanent beach postings are presented in the Beach Closure Report.

As a precautionary measure, people should never swim or surf within 100 yards of any posted storm drain or creek/rivermouth.

Table 3. Beach Warnings Posted in California By County--2000				
County	**Number of Incidences**	**Number of Days**	**Beach Mile-Day Posted**	**Primary Cause(s)**
Del Norte	NM*			
Humboldt	NM			
Mendocino	NP**			
Sonoma	12	29	2.7	Rain, Unknown
Marin	NM			
San Francisco	13	31	49	Rain
Contra Costa	NM			
Alameda	NM			
San Mateo	17	387	21.5	Unknown
Santa Cruz	7	44	19.8	Unknown
Monterey	16	42	13.8	Unknown
San Luis Obispo	6	16	2.2	Rain
Santa Barbara	152	1,296	73.5	Rain, Unknown
Ventura	72	237	13.4	Unknown
Los Angeles	325	1,150	126.1	Unknown
Long Beach (City)	99	161	4.6	Unknown
Orange	290	2,055	595.8	Unknown
San Diego	274	2,450	168.9	Bacteria Levels Exceed Standards
TOTAL	1,283	7,898	1,091.3	

*** No monitoring**
**** No postings**

Figure 2. Sources of Contamination Resulting in Warnings Posted--2000
(Based on Beach Mile-Days)

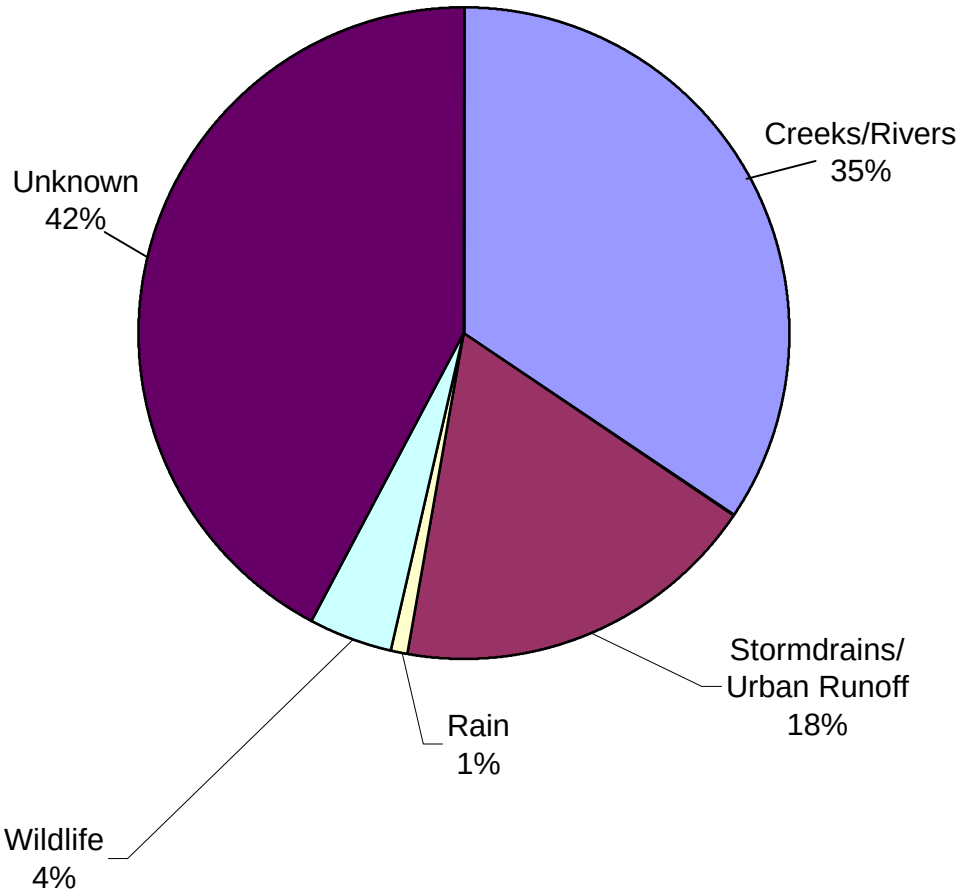

Table 4. Permanent Beach Postings By County--2000

County	Permanent Postings
San Mateo	Half Moon Bay @ San Pedro Creek
	Half Moon Bay @ San Vicinidi Creek
Santa Cruz	Monterey Bay @ San Lorenzo Rivermouth
	Twin Lakes Beach @ Schwan Lagoon
	Capitola Beach @ Soquel Creek
	Rio Del Marr Beach @ Aptos Creek
	Cowell Beach @ Neary Lagoon
Ventura	Rincon Parkway North
	Faria County Park
	Solimar Beach (Cypress Tree)
	Surfer's Point (Mouth of Ventura River)
	Promenade Park @ Figueroa St., Redwood Apts., Oak St., & California St.
	San Buenaventura State Beach @ Karlorama St.San Jon St.,Dover Lane, Weymouth Lane
	McGrath State Beach @ McGrath Lake Drain
	Oxnard State Beach @ Falkirk Ave
	Channel Islands Harbor Beach Park @ Kiddie Beach
	Ormond Beach @ Oxnard Industrial Drain
	Sycamore Cove Beach
	County Line Beach
Los Angeles	Santa Monica Canyon Creek
Orange	Dana Point Harbor @ North side of the East Basin at K-O Docks
	Newport Bay @ Harbor Marina, 33rd St. Channel, & 43rd St. Beach
	Sea Beach/Surfside @ San Gabriel River
	Huntington City Beach @ Storm Drains 1rst St., 7th St., 13th. St., and 23rd St.
	Huntington State Beach @ Talbert Channel and Santa Ana River
	Newport Beach @ Santa Ana River and Buck Gully
	Crystal Cove State Park @ Pelican Point Creek, Waterfall Creek, Los Trancos Creek, Muddy Creek, & El Moro Creek
	Emerald Bay @ Emerald Bay Drain
	Laguna Beach @ Broadway Creek
	Laguna Beach @ Storm Drains at Heisler Park, Cleo St., Bluebird Canyon, Dumond St., Lagunita/Blue Lagoon, South Coast Highway at Hospital, Thalia St., Oak St., Irvine Cove, Crescent Bay, Laguna Ave., Ocean Way, West St., & Table Rock Circle
	Aliso Beach @ Aliso Creek
	1000 Steps County Beach @ 1000 Steps Drain
	Monarch Beach @ Salt Creek
	Salt Creek Beach @ Dana Strand and Salt Creek Service Rd.
	Doheny State Beach Park @ North Beach and San Juan Creek
	Capistrano County Beach @ Capo Beach Storm Drain
	Poche Beach @ Poche Drain
	San Clemente City Beach @ Storm Drains at Pico, Lifeguard Headquarters, under pier, El Portal stairs, Mariposa Linda Lane, South Linda Lane, Trafalgar Canyon, La Ladrea, Riveria Beach, Salem Tressel, & Cypress Shores
San Diego	La Jolla Community Beach @ Casa Beach Children's Pool

Beach Closures

Table 5 presents the calendar year 2000 beach closure data from nine coastal counties. The Counties of Del Norte, Humboldt, Marin, Contra Costa, and Alameda had no monitoring programs. The counties of San Francisco, Santa Cruz, and Santa Barbara along with the City of Long Beach reported no beach closures. There was a total of 117 incidences of beach closures which lasted for 772 days statewide. Approximately 324 BMDs were closed in the State in 2000. San Diego County had the maximum number of closures reported--47 beach closures, 310 beach closure days, and 187 BMDs closed. This County accounted for over 40 percent of the total number of beach closure incidences and days and over 50 percent of BMDs closed statewide. The primary causes of the beach closures were sewer line overflow, breakage, and blockage.

Figure 3 shows that statewide creeks/rivers and sewer lines accounted for almost all the BMDs of closures. It should be noted that counties are not specific and consistent in their reporting of the sources and causes of beach closures. Some counties may report sewer lines as source of beach closures while others may report them as the cause of beach closures. In either case, problems with sewer lines, such as line breaks, blockages due to grease, roots, or rocks, and pump failure, have led to a significant number of beach closures.

Figure 4 shows the contribution of pollution sources when beach postings and closures are combined. Creeks/rivers account for 37 percent, sewer lines and storm drains/urban runoff account for 12 percent each, and the cause for beach posting or closure is unknown for a little over one-third of the cases (37 percent).

Rain Advisories

Six counties (Monterey, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego) reported issuing a total of 129 rain advisories during year 2000 lasting for a total of 737 days (Table 6). Ventura County has the highest number of rain advisories (103) and the duration (571 days). This is a result of different reporting methods used by counties. Ventura County reported a separate rain advisory for each beach in the County, while the other counties reported the number of rain advisories that are issued for all beaches in the counties.

Data Evaluation

California beaches have the most stringent set of public health standards, and they are monitored more than anywhere in the nation. For these reasons, there are more beaches posted or closed in California than anywhere else. The year 2000 beach posting and closure data are not comparable with the year 1999 data set. Since the AB 411 regulations were not officially adopted until July 1999, the beach posting and closure data included in the SWRCB's year 1999 Beach Closure Report did not cover the entire testing period required by law. Consequently, there were only over 5,000 days of postings and closures during 1999 compared to over 8,000 days in year 2000. This should not be interpreted as a worsening trend in beach water quality. As the monitoring baseline is improved, the data will be comparable and will be able to demonstrate the trend.

Table 5. Beach Closures in California By County--2000				
County	**Number of Incidences**	**Number of Days**	**Beach Mile- Day Closed**	**Primary Cause(s)**
Del Norte	NM*			
Humboldt	NM			
Mendocino	1	15	2.6	Sewer Main Break
Sonoma	2	4	0.4	Unknown, Other
Marin	NM			
San Francisco	NC**			
Contra Costa	NM			
Alameda	NM			
San Mateo	9	217	41.9	Rain
Santa Cruz	NC			
Monterey	6	16	3.9	Line Break, Sewer Manhole Overflow
San Luis Obispo	1	1	0.1	Sewer Overflow at Residence
Santa Barbara	NM			
Ventura	4	12	0.7	Blockage
Los Angeles	7	45	33.6	Sewer Main Break, Blockage due to different sources
Long Beach (City)	NM			
Orange	40	152	53.4	Blockage due to different causes
San Diego	47	310	187	Sewage
TOTAL	117	772	323.6	

*** No monitoring**
**** No closures**

Figure 3. Sources of Contamination Resulting in Beach Closures--2000.
(Based on Beach Mile Days)

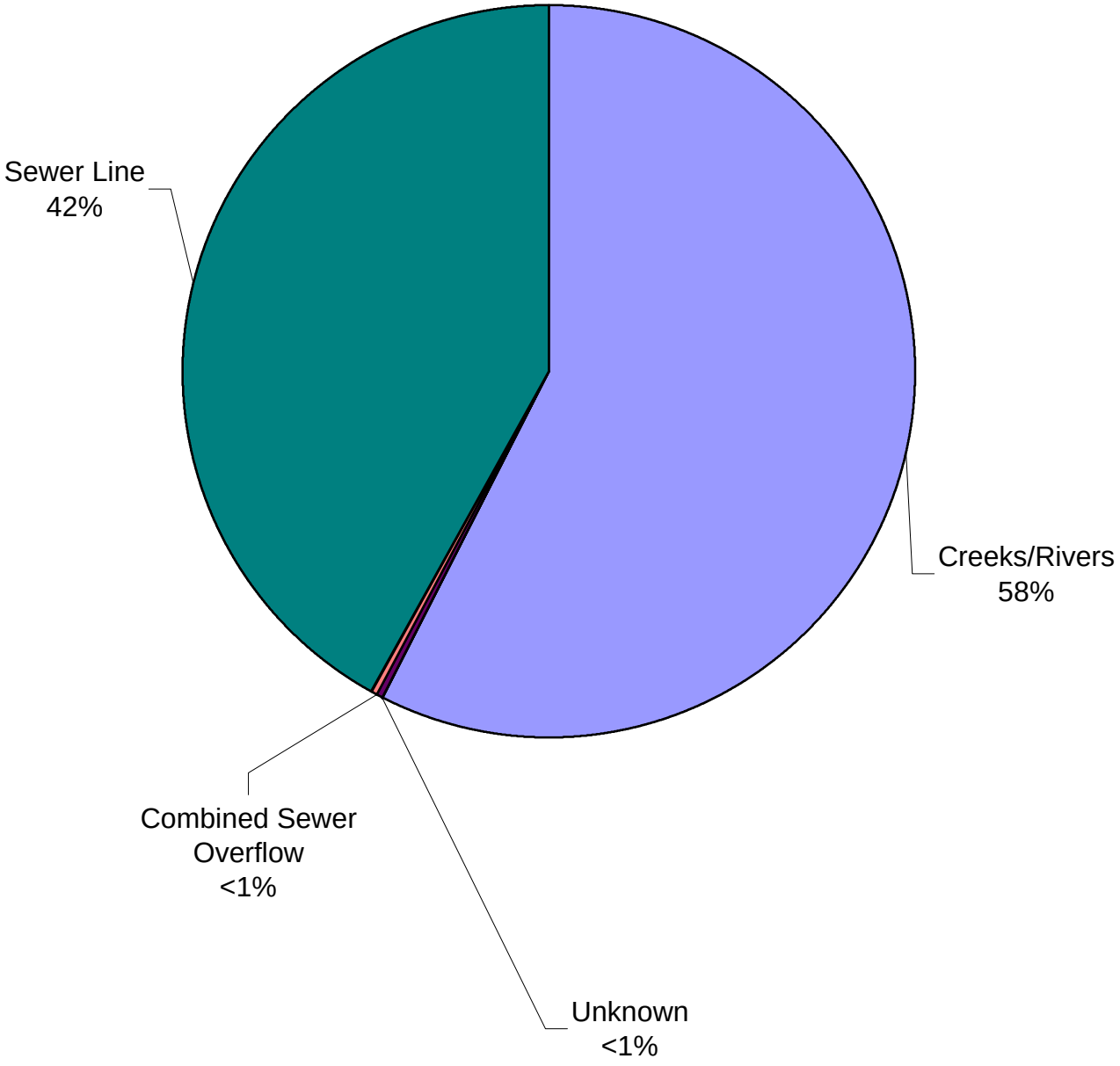

Figure 4. Sources of Contamination Resulting in Warnigs Posted and Closures Statewide--2000.
(Based on Beach Mile Days)

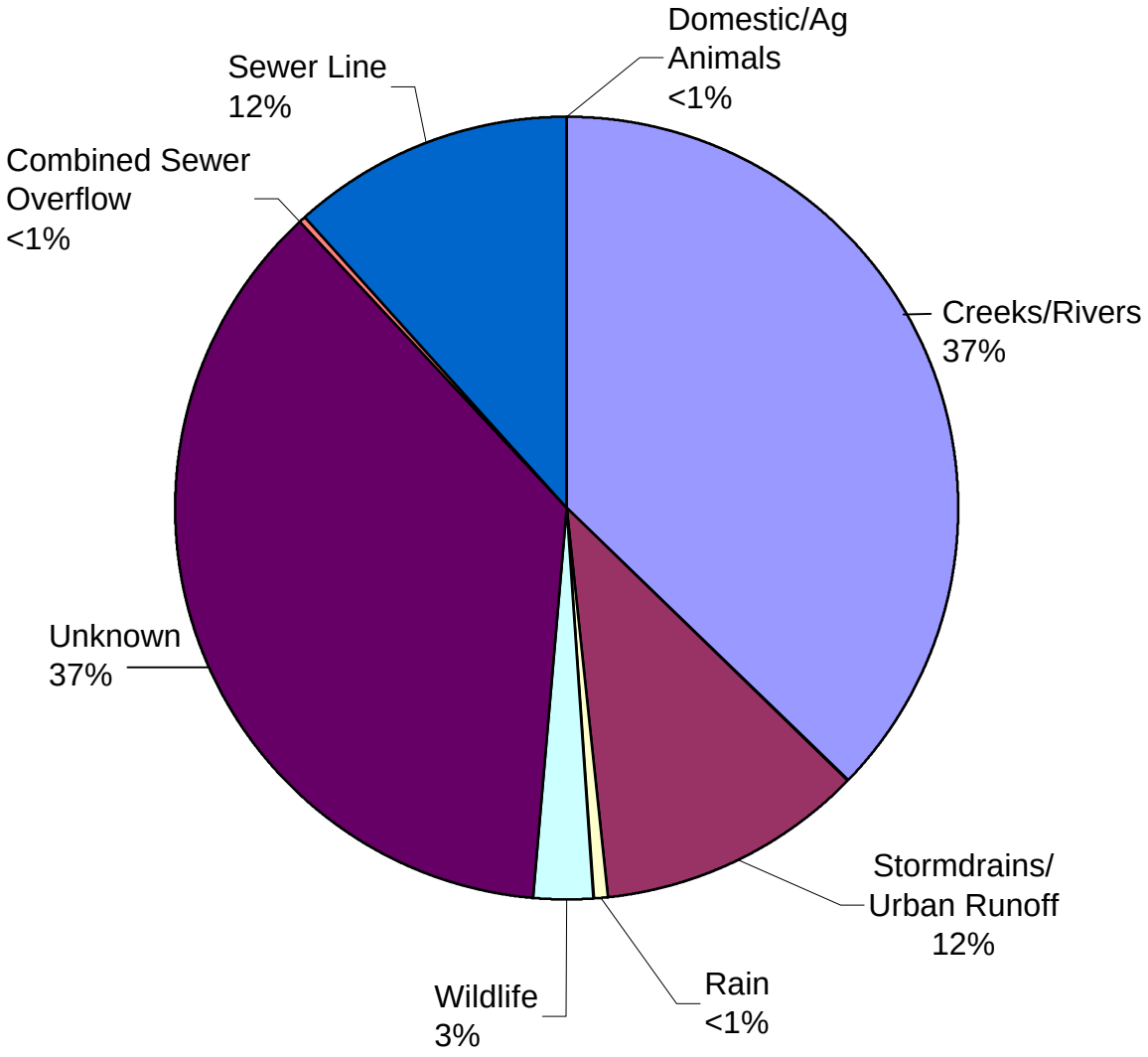

Table 6. Beach Rain Advisories by County--2000		
County	**Rain Advisories**	**Duration of Advisory (Days)**
Monterey	2	11
Santa Barbara	3	10
Ventura	103	571
Los Angeles	9	49
Orange	6	58
San Diego	6	38
TOTAL	129	737

According to the extensive research of Heal the Bay, an environmental advocacy group, the majority of California beaches are clean and safe during dry weather. Heal the Bay's 2000-2001 Beach Report Card evaluated 375 Southern California beaches from Point Conception in Santa Barbara County to the Mexican Border and assigned A-F grades based on daily and weekly bacterial pollution levels in the surf zone in correlation to the risk of adverse health effects to humans. Some of their findings are:

- Over 60 percent of southern California beaches (234 of 375) received an "A" grade during dry weather.
- Over 80 percent of open beaches (i.e., locations not within an enclosed bay, harbor, or marina and not impacted by a storm drain) received an "A" grade.
- Over 90 percent of the 21,100 beach sample days during dry weather met State bathing water standards for all bacterial indicators.

Heal the Bay's report documents the disparity in the beach water quality during the dry and wet seasons. Southern California beaches are impacted by rain events through untreated storm drain runoff, which carries bacteria, motor oil, animal wastes, pesticides, yard waste, and trash to the beaches. Close to 70 percent of monitored beaches received an "F" grade during inclement weather conditions as compared to a little over 11 percent during dry weather. The complete report can be accessed at Heal the Bay's website (http://www.healthebay.org).

In July 2000 the USEPA released the results of its third annual National Health Protection Survey of Beaches. State and local environmental and public health officials voluntarily returned information on 1,891 beaches. The survey showed that 459 beaches (24 percent of the reported beaches) were affected by at least one posting or closure. Complete results of this survey are available at the USEPA's Beaches Environmental Assessment, Closure and Health (BEACH) Watch website (http://www.epa.gov/OST/beaches).

It is difficult to conduct an inter-county comparison of beach posting and closure data even with the implementation of AB 411. The reason for this is that some counties have year round monitoring, which is not required by AB 411. Counties may have different sampling

locations with respect to storm drains. For instance, Los Angeles County has monitoring stations 50 yards from a flowing storm drain whereas San Diego County monitors at the point of discharge. In general, open ocean beaches are cleaner than beaches adjacent to storm drains and beaches located within enclosed bays which have poor water circulation.

It should be noted that beach posting and closure data collected under the requirement of AB 411 may not be an accurate measurement of beach water quality for the following reasons:

1. As mentioned earlier, the indicator bacteria may not be the right indicator of pathogens in shoreline waters.

2. The indicator bacteria assay takes 18 to 36 hours or longer to complete. During this time, the beachgoers may be exposed to harmful pathogens. By the time a beach is posted based on monitoring data, the indicator bacteria may not be present in the shoreline waters. Thus a beach may be open when it is contaminated and posted when it is clean. There is a need for rapid, simple, and inexpensive assays of beach water quality to mitigate this problem.

3. There are many sources of variablity in shoreline bacteria monitoring. According to research conducted by the Southern California Coastal Water Research Project, different laboratories reported different bacterial counts for the same sample (inter-laboratory variability). Water samples collected from very close locations in the surf zone had different bacterial counts (spatial variability). Further, water samples collected from the same location but at different times of the day had different bacterial counts (temporal variability).

However, with all these shortcomings, a monitoring program for indicator bacteria remains the best available choice for assessing beach water quality and making posting or closure decisions.

GOVERNOR'S CLEAN BEACH INITIATIVE AND SWRCB'S IMPLEMENTATION PLAN

In January 2001 Governor Gray Davis proposed a "Clean Beach Initiative" to combat the problem of contaminated ocean water and beach postings/closures. The initiative will enable State and local agencies to address this contamination, making California beaches safer and ensuring the economic vitality of coastal areas.

The proposed activities of the initiative include assistance to local agencies in areas that have chronic beach contamination problems and high beach usage, leveraging ongoing strong support from local communities. Measures to curb urban runoff include the diversion of dry weather flows from storm drains, construction of infiltration basins, catch basin inserts, as well as isolating controllable sources of pollution. Construction and restoration of wetlands should decrease the amount of pathogens reaching beaches. The initiative will also provide funding for research to develop rapid, inexpensive methods for detecting and analyzing bacteria and pathogens. This will result in timely beach postings or closures and also will assist in source identification which will allow regulators to more quickly track pollution sources and mitigate the problem.

One of the key projects in the SWRCB's 2001 draft Strategic Plan deals with the implementation of the Governor's Clean Beach Initiative. The SWRCB's Clean Beach Project will develop and implement a comprehensive plan incorporating a watershed approach and involving all SWRCB and RWQCB pertinent water quality programs. A detailed road map will be developed to coordinate the efforts of the SWRCB's regulatory and local assistance functions with the efforts of local, State and federal agencies. The project will have detailed specific actions and milestones. The goal of the project is to significantly and steadily decrease beach closures and postings over the next ten years. The SWRCB has designated a Clean Beaches Coordinator to oversee the development and implementation of the Clean Beach Project and to track and report its progress.

SWRCB staff has taken the lead in scheduling and organizing the meetings of the ad-hoc Beach Water Quality Workgroup. The Workgroup includes representatives from organizations responsible for the protection and reporting of beach water quality including SWRCB, coastal RWQCBs, county environmental health departments, DHS, California Coastal Commission, USEPA (Region 9), sewage treatment plants, Heal the Bay, and other environmental groups. The Workgroup provided valuable input to the SWRCB staff in the development of the beach water quality database. One of the objectives of the SWRCB's Clean Beach Project is to develop capability to share beach closure information through the geographical information system.

As part of the Governor's Clean Beach Initiative, funds will be made available for beach water quality improvement projects. A number of loans and grant programs, such as the SWRCB's Cleanup and Abatement Account (CAA), federal Clean Water Act Sections 205(j) and 319(h) allocations, and Propositions 12 and 13 resources will be tapped for this activity.

For instance, in July 2001, the SWRCB allocated approximately $1 million to the San Diego RWQCB from the CAA to fund the identification of the presence and source(s) of pathogenic viruses and bacteria in the recreational waters of Mission Bay and associated threats to human health.

On March 7, 2000, California voters passed Proposition 12 (Safe Neighborhood Parks, Clean Water, Clean Air, and Coastal Protection Bond Act) and Proposition 13 (Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Bond Act). Proposition 12 provides funding to the State Coastal Conservancy for coastal protection programs. This includes an allocation of $25 million to the Santa Monica Bay Restoration Project to fund grants to public entities and nonprofit organizations to implement storm water and urban runoff pollution prevention programs, habitat restoration, and other priority activities specified in the Santa Monica Bay Restoration Plan.

Proposition 13 provides funding for coastal nonpoint source programs to improve water quality and environment of coastal waters, estuaries, bay and nearshore waters, and groundwater. Grants of up to $5 million per project are available for projects to improve water quality at public beaches and to make improvements for the purposes of ensuring that coastal waters adjacent to public beaches meet the State's indicator bacteria standards for water recreation; improvements to existing sewer collection systems and septic systems for restoration and protection of coastal water quality; storm water and runoff pollution reduction and prevention programs for restoration and protection of coastal water quality; and comprehensive capability for monitoring, collecting and analyzing ambient water quality, including maintenance technology that can be entered into a statewide information base with standardized protocols;, and sampling, collection, storage and retrieval procedures.

SWRCB will also apply for federal funding that became available this year exclusively for beaches pursuant to the Beaches Environmental and Coastal Health (BEACH) Act of 2000 (Public Law 106-284, October 10, 2000). During this first year, $2 million in development grants will be made available to coastal and Great Lakes states to improve monitoring and public notification of human health risks at beaches. It is anticipated that in the future this grant program will have a full authorization of $30 million per year to fund states' clean beach implementation programs.

SWRCB staff has been actively working on other beach related projects. In January 2001, staff submitted a report to the Legislature on a comprehensive coastal water quality monitoring program pursuant to AB 1429 (Chapter 899, Statutes of 1997). Staff is working with the University of California to develop protocols for use in source investigations of storm drains that produce chronic exceedences of bacterial standards in adjacent beach waters, cost to implement these investigations, and a timeline for completion. A report of this information will be submitted to the Legislature by December 1, 2001 as required by Water Code Section 13178.

APPENDIX

County Closure, Posted Warnings, and Rain Advisory Reports
In Geographical Order from North to South

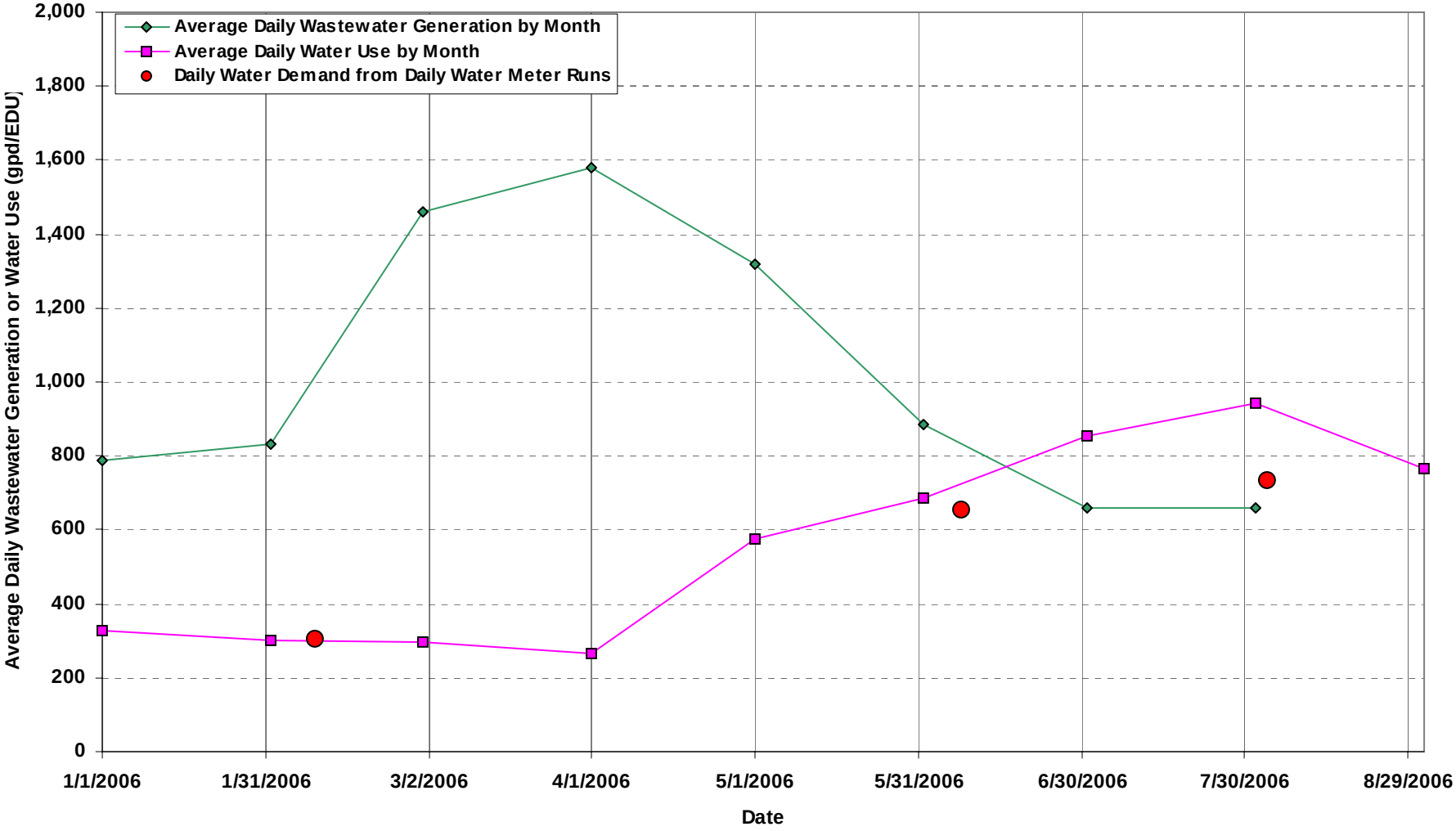

Figure 4
Average Daily Water and Wastewater Rates Per EDU Per Month – Basin 4

California Regional Water Quality Control Board
Central Valley Region

26 January 2006

ITEM: 3

SUBJECT: Executive Officer's Report

DISCUSSION:

1. NEW YEAR'S STORM

Heavy rainfall hit central California over the New Year's holiday weekend. Record rainfalls fell at many locations. Sustained periods of heavy rainfall generally cause problems for wastewater collection and treatment facilities, and this series of storms was no exception. Such problems include:

Stormwater, particularly from flooded streets and homes, can flow into the sewers causing local overloading of the sewer pipes and overflow of sewage from the collection system. This type of discharge generally subsides quickly after the rain stops and flooding ebbs.

High sewage flows entering a treatment plant can disrupt the treatment process, can hydraulically overwhelm the plant causing the bypass of partially or untreated sewage around the treatment system, and can sometimes physically damage the treatment plant. Damage to the sewage treatment facilities is more serious because it may take days or weeks to get the treatment plant fully operational, during which time discharged wastewater may not be adequately treated.

Flood waters can directly inundate treatment plants, pump stations and other infrastructure. Flood waters can also keep treatment plant and maintenance staffs from reaching equipment needing attention. Erosion can damage collection and treatment facilities. Power outages are common during storms, and backup power is not always available or functioning.

Dischargers experiencing compliance problems, particularly spills of raw sewage, are required to notify Board staff within 24 hours of knowledge of the problem and submit a written report generally within 5 days. Large spills are also reported to the State Office of Emergency Services. Not all dischargers report promptly, sometimes forgetting the need to report, and sometimes they are just too busy dealing with an emergency to call. Waste Discharge Requirements mandate that dischargers minimize the extent and severity of any violations, and collect monitoring data to assess the impact of the spills.

Regional Board staff is heavily involved in response to storm problems. Several staff are 24-hour contacts for the Office of Emergency Services and received numerous calls at home over the weekend. Staff contacts dischargers to assess problems, assure that reasonable steps to correct and contain the problems are being taken, and verify appropriate notification of potentially impacted downstream parties. Following the immediate crisis, staff contacts dischargers we have not heard from, continues telephone and field contact to followup on known problems, and begins documenting and prioritizing problems for possible enforcement. If there are severe water quality or public health problems that are not being dealt with, the Executive Officer can quickly issue a Cleanup and Abatement Order to responsible parties. That has not been needed as of this writing. Evaluation of each discharge will be conducted, including review of the written reports submitted by the dischargers, to determine whether: no regulatory action is needed: further information must be submitted (pursuant to California Water Code Section 13267); minor operational or physical improvements are needed (generally dealt with using Notices of Violation); major, long-term corrective action is needed (generally handled with a Cease and Desist Order, Cleanup and Abatement Orders, and Time Schedule Orders); or Administrative Civil Liability Complaints should be issued. Evaluation and enforcement followup from these storms will continue for several months.

The following is a list of currently known problems organized by county. The list is not complete as staff is still contacting dischargers and the list is growing. As of this writing (5 January) staff's priority is identifying and responding to significant ongoing discharges. We anticipate having a more complete listing of storm-related problems available by the Board meeting.

ALPINE COUNTY

The Bear Valley Water District reported that excessive rain on the snow pack flooded the main sewage pump station for nearly 24-hours on 1/1/2006. Up to 200,000 gallons of raw sewage was released into Bloods Creek.

EL DORADO COUNTY:

El Dorado Irrigation District discharged greater than 4200 gallons of raw sewage into Deer Creek from an overflowing manhole.

El Dorado Irrigation District discharged 3.8 million gallons of blended wastewater and stormwater into Carson Creek from overwhelmed storage ponds from the El Dorado Hills Wastewater Treatment Plant.

El Dorado Irrigation District discharged greater than 10,800 gallons of raw sewage into Deer Creek in Cameron Park from a collection system manhole.

El Dorado Irrigation District discharged raw sewage from three lift stations, New York Creek, Alleghany Road and Malcolm Dixon Road into Deer Creek, Webber Creek and New York Creek. A threatened fourth lift station failure, at the Marina-1 pumping plant near Folsom Lake, was not confirmed.

The City of Placerville discharged an unknown volume of partially treated wastewater from their wastewater treatment plant to Hangtown Creek due to excessive flow. The discharge consisted of a mixture of tertiary and secondary disinfected wastewater from the outfall along with overflow from the primary clarifiers.

FRESNO COUNTY
Heavy rains and road landslides forced Southern California Edison to bypass tertiary treatment units and discharge 5000 gallons of secondary, undisinfected wastewater to Big Creek, a tributary to the San Joaquin River.

KERN COUNTY
Excessive infiltration and inflow at the City of Tehachapi WWTF caused overflow from the primary clarifier that was contained and pumped into a storage pond.

LAKE COUNTY
The City of Lakeport Municipal Sewer District No. 1, reported that on 12/31/06 approximately 500 gallons of untreated wastewater discharged from a sewer main at north main and 11th street in Lakeport into a drainage culvert that leads to Clear Lake. The City did not contact State OES.

The Clearlake Oaks County Water and Sanitation District reported a spill to OES on 12/31/05 of approximately 100 gallons of raw sewage from a pump station that surged due to a power failure. The wastewater entered a storm drain that leads to Clear Lake.

The Lake County Sanitation District, Southeast Wastewater Treatment Facility, notified OES of a spill on 12/31/05 of approximately 5,500 gallons of raw sewage from manholes located across from Burns Valley Road in Clearlake. The spill resulted from a sewer collector surcharge due to a pump station control failure. The wastewater drained into a flooded channel that leads to Clear Lake.

The Lake County Sanitation District, Southeast Wastewater Treatment Facility reported a second spill to OES on 12/31/05 of approximately 10,000 gallons of raw sewage from three manholes on Meadowbrook Drive and Bay Street in the Highlands Harbor subdivision in Clearlake. The wastewater drained into storm drains that lead to Clear Lake.

The Lake County Sanitation District, Northwest Wastewater Treatment Facility notified OES of a spill on 12/31/05 of approximately 5,000 gallons of raw sewage from two manholes and a floor drain in business located along Lakeshore Drive in Lakeport. The manhole overflows discharged into Clear Lake. The wastewater discharge from the floor drain was contained within the business bathroom.

Lake County reported on 1/1/06 a release of leachate from the Eastlake Landfill. Leachate was seeping from the active face of the landfill due to the heavy rainfall (reportedly 15 inches) in the area over the previous weekend. The County reported that a temporary pond was constructed to capture the leachate to prevent it from flowing offsite into Molesworth Creek, and that the leachate was being pumped from the temporary pond into the onsite Class II surface impoundment. The County reported that an unknown quantity of leachate had flowed offsite into the creek prior to the construction of the temporary pond. (WLB)

NEVADA COUNTY:
City of Grass Valley spilled approximately 1-million gallons of raw sewage from their wastewater treatment plant to Wolf Creek when their primary clarifiers overflowed.

The City of Nevada City discharged blended secondary and tertiary wastewater due to high water flows.

The Lake Wildwood wastewater treatment plant bypassed filtration of approximately 120,000 gallons of secondary quality effluent to Deer Creek.

The Lake Wildwood collection system discharged greater than 3,000 gallons of raw sewage into Little Deer Creek.

PLACER COUNTY:
Placer County Sewer Maintenance District No.3's sludge dry beds were inundated with stormwater and overflowed into Miners Ravine. The facility also bypassed filtration due to high stormwater flows, discharging secondary quality effluent.

Placer County Sewer Maintenance District No.1 bypassed primary treated, undisinfected wastewater due to flooding, followed by a blend of filtered and unfiltered wastewater during much of 12/31/05 to Rock Creek.

Placer County Sewer Maintenance District No.1 discharged raw sewage into surface waters when a lift station and 2 manholes overflowed.

The City of Auburn discharged an unknown volume of raw and partially treated sewage into Auburn Ravine when storage ponds were inundated and flood water volumes overwhelmed the treatment plant.

The City of Roseville discharged an undisclosed amount of raw sewage to Dry Creek from an overflowing manhole.

The City of Roseville discharged an unknown amount of raw sewage into Dry Creek when emergency storage ponds at the wastewater treatment plant were inundated with floodwater.

The Donner Summit wastewater treatment bypassed a blend of filtered and unfiltered wastewater for approximately 18 hours due to high flow rates.

Placer County's Applegate Wastewater Treatment Facility spilled approximately 1,000 gallons of raw sewage from two temporary storage tanks that are used to handle additional storage during the winter months. The spill was contained and did not enter surface waters.

SACRAMENTO COUNTY:
The City of Folsom spilled 1000 gallons of sewage from a manhole, but contained it and cleaned it up.

The City of Galt discharged sewage to a storm drain from a pump station failure.

The County Service District 1 (CSD-1) reported many sewage spills during the storms. An interceptor surcharged on Mira Del Rio Dr, and flooded 4 homes with a large quantity of raw sewage. CSD-1 also reported multiple manholes in the vicinity of Elk Grove-Florin and Tiogawoods Dr were discharging an unknown quantity of raw sewage. A large release was also reported from manholes on Florin-Perkins Road and Fruitridge Road into the storm drain and then Morrison Creek. CSD-1 also reported spills from various locations on Manger Way and Linda Creek Court in Citrus Heights to surface waters. A spill of unknown quantity of sewage was reported on Island View Way in Walnut Grove.

Sacramento Regional County Sanitation District (District) also reported several spills and releases. Due to a newly constructed interceptor being inundated with water from Laguna Creek, and plugs in the interceptor failing, the sewage treatment plant was inundated with excessive influent. Influent flows reached 550 million gallons per day (MGD), which exceeds the peak wet weather capacity by 200 MGD. The District discharged partially treated effluent to the river until repairs could be made.

The District also reported a break in a pipeline on-site that resulted in almost 1 million gallons of chlorinated secondary effluent (chlorine residual was 9.5 mg/L) being discharged to Laguna Creek.

The District also reported the release of 700,000 gallons of raw sewage near Kilgore Ave. in Rancho Cordova due to the failure of an interceptor plug at a construction site.

The City of Sacramento reported a 46,000-gallon raw sewage outflow on 10th Av. and a 1,500-gallon outflow on 35th Ave. and Park Way from the combined wastewater collection system due to excessive rain.

SHASTA COUNTY
City of Redding's Sewage Collection System and Clear Creek Wastewater Treatment Plant.On 3 January 2006, the City's Clear Creek Wastewater Treatment Plant began discharging partially treated wastewater to the Sacramento River at a rate of approximately 20 million gallons per day. The spilled wastewater was a combination of bypassed raw influent and bypass out of the primary clarifiers. The wastewater filled and traveled through a series of ten emergency storage ponds that collectively hold approximately 240 million gallons prior to overflowing to the river. At this time it is estimated that the bypass discharge will continue for a total of three to seven days, depending on additional rainfall intensity and patterns. Spills from the City's sewage collection system also occurred at several locations.

SIERRA COUNTY
The City of Loyalton experienced a discharge of secondary treated wastewater into Smithneck Creek that is expected to continue for approximately one week, and a raw sewage was discharge to Smithneck Creek as a result of a pump failure at the headworks. The Discharger is unable to estimate the volume of wastewater from either spill event.

SUTTER COUNTY:
Yuba City's wastewater ponds, located within the Feather River floodplain, were inundated with river water.

YUBA COUNTY
The City of Wheatland reported on 1/3/06 that the Bear River rose above the wastewater infiltration bed levees and spilled into the infiltration beds. The river level continued to rise until the wastewater infiltration beds were completely inundated. An estimated maximum of 270,000 gallons of wastewater, mixed with river water, flowed into the Bear River until the river levels dropped below the infiltration bed levees.

The City of Marysville reported on 12/31/05 that the Feather River had risen and flooded five of the wastewater percolation ponds. An unknown volume of wastewater, mixed with river water, flowed into the Feather River

ENFORCEMENT

2. Status Report On Humboldt Road Burn Dump
The responsible parties and counsel met with Regional Board staff and counsel to discuss the following issues: Regional Board Staff's direction from Board, Amendments to or revision of Cleanup and Abatement Orders, City's position regarding use of partially completed disposal cell, status of permitting efforts by property owners to assure remediation in 2006, and status of pending ACL Complaint and continuation of November hearing.

The Simmons and Drake parties have indicated they are cooperating to obtain necessary permits for cleanup in Summer 2006. The City of Chico representatives stated their position that the City is not a responsible party and does not intend to participate directly, but may contribute funds towards cleanup of Area 8. Staff discussed proposed revision of the 2003 Cleanup and Abatement Order and the acting Executive Officer is considering further action with respect to administrative civil liability.

3. Cleanup and Abatement Order, Markley Cove Resort, Napa County
On 6 December 2005, the Executive Officer issued a Cleanup and Abatement (C&A) Order to Markley Cove Resort, Inc. and the United States Department of Interior Bureau of Reclamation (Discharger). The C&A Order was issued as a result of wastewater being detected in Coleman Spring, which is on the hillside below the facility's percolation/evaporation ponds. Approximately 14,197 gallons of spring water containing wastewater was discharged into a surface water drainage leading to Lake Berryessa before the Discharger constructed a collection sump. The C&A Order requires the Discharger to continue collecting the water from the Coleman Spring and transporting it to the wastewater collection system. This activity must continue until a tracer dye test confirms that the wastewater ponds have been adequately sealed to prevent the discharge of wastewater to the spring. In addition, the Discharger is required to submit the following reports: (a) a report describing the visual inspection of the pipeline between the lift station and the wastewater ponds for signs of leaks, (b) a Pond Reconstruction Completion Report describing the repairs made to the wastewater ponds, (c) a Water Balance Report demonstrating whether or not the wastewater ponds contain adequate storage and disposal capacity to ensure full compliance with the WDRs, (d) a Dye Test Report describing the results of the dye test, and (e) quarterly progress reports describing the status of the pond reconstruction project. (GJC)

4. Anderson Landfill, Inc., Notice of Violation, Shasta County
On 22 December 2005, Redding staff issued an NOV to Anderson Landfill, Inc. (ALI) for discharges of waste to surface waters, failure to install erosion and sediment control structures, and failure to maintain containment and control facilities in accordance with Waste Discharge Requirements. Late season construction with inadequate erosion and sediment control structures resulted in waste and sediment discharges to surface waters during the month of December 2005. Additionally, storm water intrusion into the active waste disposal Unit at the site has resulted in flooding of the Unit's leachate collection and removal system sump area. ALI has historically submitted facility design plans late into the construction season resulting in construction activities occurring during the wet weather season. Additional enforcement including an ACL is being considered. (DPS)

5. Cleanup and Abatement Order, Circle Oaks County Water District, Napa County
On 16 December 2005, the Executive Officer issued a Cleanup and Abatement (C&A) Order to the Circle Oaks County Water District. The C&A Order sets forth a specific scope of work and enforceable time schedule for the Discharger to make the necessary repairs to the wastewater system and come into compliance with Waste Discharge Requirements, and to install groundwater monitoring wells. The C&A Order requires the Discharger to submit the following reports: (a) a Revenue Plan

that describes the costs associated with implementation of all tasks in the C&A Order, (b) a workplan describing methods that will be used to provide an assessment of those segments of the collection system known to exhibit significant inflow and infiltration (I/I), (c) a report that provides results of the survey to determine the thickness and volume of sludge in each of the ponds, (d) a Revised Sludge Management Plan that includes at a minimum a detailed program and schedule for periodic pond cleanout and disposal of biosolids removed during pond cleanout, (e) a Groundwater Monitoring Well Installation Report of Results, (f) an I/I Assessment Report, and (g) quarterly progress reports describing the completed work. (GJC)

6. Issuance of Administrative Civil Liability Complaint and Proposed Settlement Agreement, Mokelumne Rim Vineyards, San Joaquin County

On 1 November 2005 the Executive Officer issued an Administrative Civil Liability Compliant (ACLC) in the amount of $30,000 for Rodney and Gayla Schatz, Mokelumne Rim Vineyards for incomplete self-monitoring reports, violations of the Waste Discharge Requirements (WDRs), and incomplete or non-submitted technical reports required by the WDRs. The Discharger subsequently met with staff to discuss settling the ACLC, and provided information regarding its ability to pay the liability. The Executive Officer subsequently offered to agreed to settle the ACLC by payment of $20,000, while holding the remaining $10,000 in abeyance pending satisfactory submittal of technical reports that consist of: Groundwater Well Installation Report of Results (by 17 February 2006), Salinity Reduction Study (by 28 February 2006), Abbreviated Report of Waste Discharge (by 30 March 2006), and Background Groundwater Quality Study Report (by 30 March 2007). The Discharger has agreed to the terms of the Executive Officer's settlement agreement. (TRO)

7. Bonzi Landfill Owners to Pay Fine in Settlement of Water Pollution Violations

The Stanislaus County District Attorney's Office and the Regional Board's Executive Officer have reached a $1.95 million settlement with Ma-Ru Holding Company and Bonzi Sanitation Landfill for failure to comply with the permit and enforcement orders issued by the Regional Board.

The Bonzi Sanitation Landfill is on Hatch Road near Carpenter Road, and has been in operation since the late 1960's. The majority of the landfill is not constructed to today's standards, and a portion of the wastes are in contact with the shallow groundwater. The landfill has created a plume of groundwater pollution, which must be contained and treated through a groundwater extraction and treatment system. On 29 April 2005, the Regional Board issued a Cease and Desist Order (CDO) to the Bonzi Landfill for numerous violations of its Waste Discharge Requirements. Although the operator complied with a few aspects of the CDO, it did not comply with the majority of the requirements, as evidenced by the seven Notices of Violation that have been issued since the CDO was adopted.

In September 2005, the District Attorney and the Water Board began a joint enforcement action against the landfill. The District Attorney's complaint alleged that Bonzi has failed to comply with numerous requirements of the CDO, including failing to demonstrate that the groundwater detection and extraction system is adequate for site conditions and failing to post financial assurances for corrective action, closure, and post closure maintenance activities at the landfill. In addition, Bonzi has failed to provide a least one foot of interim soil cover on two of the landfill units and has allowed un-permitted waste to be deposited in the active unit. Of gravest concern to the neighbors living next to the landfill, Bonzi failed to operate the groundwater extraction and treatment system for at least one year, from March 2004 through March 2005.

The parties agreed to a Stipulated Judgment, which has now been filed with the Superior Court of Stanislaus County. Terms of the stipulated judgment include: Payment of $450,000 to the Stanislaus County District Attorney's Office and the State of California; payment of $1.4 million in penalties have been stayed contingent upon Bonzi's satisfactory completion of 21 studies and improvements to the landfill. These tasks must be completed by the timelines described in the judgment; and payment of $100,000 if Bonzi violates Penal Code Section 115 at any time in the next three years.

The stipulated judgment does not relieve the landfill owners and operators from the need to comply with all aspects of their Waste Discharge Requirements and the CDO, nor does it prohibit the Water Board from taking additional enforcement actions for items not addressed in the judgment. (WSW)

8. Lakeshore Resort, Fresno County

On 6 December a 13267 Order required Technical Reports from the owner/operator of Lakeshore Resort. The Lakeshore Resort is a restaurant and resort at Huntington Lake in Sierra National Forest with a package aeration plant, percolation pond, and leachfields. Violations include: unreported sewage spills potentially tributary to Huntington Lake, treatment bypass, inadequate containment capacity, and late and incomplete self-monitoring reports. The Order is requires technical reports describing corrective measures. (HA)

9. Morning Star Packing Company, Merced County

On 21 November, a NOV was issued to Morning Star Packing Company for discharging tomato processing wastewater to land not authorized by the WDRs, incomplete self-monitoring reports, and threatened conditions of pollution and nuisance. The NOV requires several technical reports describing corrections actions. (JKW)

10. Riverdale Public Utilities District, WWTF, Fresno County

In January a NOV was issued to Riverdale PUD for discharging sludge to an unlined pond, exceeding the daily maximum BOD5 effluent limit, and threatening nuisance and groundwater pollution. The NOV requires several technical reports describing correction actions. (JKW)

11. City of Modesto, Sanitary Sewer Overflow, Stanislaus County

On 19 December 2005 the Executive Officer issued an Administrative Civil Liability Complaint (ACLC) in the amount of $152,000 to the City of Modesto in response to the October 2004 raw sewage overflow to Dry Creek in Stanislaus County. The approximately 1.2 million-gallon sewage overflow resulted from a dislodged pressure plate on a section of the force main sewer line that runs from a lift station under Dry Creek. The cause of this sewer overflow was originally reported as a suspected act of vandalism, and referred to the Modesto Police Department. Subsequent investigations concluded that bolts that retained the pressure plate failed as a result of corrosion fatigue. The City has until 18 January 2006 to decide whether to pay the civil liability and waive a hearing before the Regional Water Board, or to contest the ACLC and proceed to a hearing. (JME)

12. Cleanup and Abatement Order Issued to AmeriPride Services, Inc., 4620 Wilbur Way, Sacramento, Sacramento County

A 1,800-foot long and 200-foot deep PCE plume emanates from the AmeriPride property on Wilbur Way. Prior to 1982, an industrial dry cleaning facility polluted the soil and groundwater beneath the AmeriPride site. AmeriPride purchased the property in 1983 and though it did not operate a dry cleaning operation, it is a responsible party for cleanup of the polluted soil and groundwater. On 25 April 2003, Regional Board staff issued a Cleanup and Abatement Order (CAO) to AmeriPride and previous owners which required cleanup of the polluted soil and groundwater, and replacement water supply for three water supply wells which were closed due to PCE pollution. One well adjacent to the AmeriPride site is owned by California-American Water Supply (Cal-Am), and two wells in the toe of the plume are owned by Huhtamaki. In August 2003, AmeriPride began soil vapor extraction beneath the facility and, in December 2005, began groundwater extraction and treatment in the source area below and immediately downgradient of its site. However, AmeriPride did not believe it was responsible for replacing water supply lost to Cal-Am or Huhtamaki, nor for cleaning up the entire plume.

Over the last two years, AmeriPride petitioned State Board and the Superior Court of California challenging the 2003 CAO. State Board denied the petition. On 2 November 2005, Regional Board staff met with AmeriPride representatives in mediation to discuss noncompliance with the existing CAO. In this meeting, the two parties agreed: 1) to several actions and dates that Regional Board staff would include in a revised CAO; 2) that AmeriPride would withdraw its petition to the Superior Court, which it did following the mediation meeting; and 3) that AmeriPride would not challenge the new CAO. In September 2005, in a separate lawsuit, AmeriPride settled with Cal-Am and agreed to pay Cal-Am $2,000,000 for water supply replacement.

On 21 December 2005, the Water Board issued a new CAO that requires AmeriPride to provide in-kind replacement water for the industrial and drinking water supply lost to the Huhtamaki facility, and to properly abandon the polluted supply wells. The CAO also requires cleanup of the entire PCE plume. By September 2006, AmeriPride is required to have replaced the water supply for Huhtamaki and provide a work plan for remediating the entire plume. By January 2007, AmeriPride is required to start up an extraction and treatment system to capture and clean up the toe of the plume.

13. Cleanup and Abatement Order Issued to Bureau of Land Management for Mercury Mine Cleanups, Colusa County

A Cleanup and Abatement Order was issued to the Bureau of Land Management for two abandoned mercury mines located in Colusa County in December 2005. Water Quality objectives for mercury are exceeded during storm runoff events. C&A Order objectives require a 95% load reduction to Cache Creek and its tributaries. This load reduction is required to meet the TMDL requirements for Cache Creek and its tributaries. BLM mines are Rathburn and Rathburn-Petray, which are located in the Bear Creek watershed. The BLM was provided a draft Order but declined to comment. The Order requires BLM to submit a Work Plan By 1 March 2006 describing the methods that will be used to establish background levels of mercury in the soil and surface water at each mine site, and the means and methods for determining the vertical and lateral extent of waste piles, mining waste and soil and sediment contaminated with mercury at each mine site. The Work Plan must describe the sampling rationale that will be used, how runoff calculations will be determined, address the slope stability of each mine site and assess the need for slope design and slope stability measures. The Work Plan must also describe how the hydrogeologic regime at each mine site will be determined, and propose a surface water and ground water monitoring plan. The Work Plan shall also propose time schedules for implementation of the Site Evaluation and completion of an Engineering Evaluation/Cost Analysis to evaluate cleanup options. (CLC)

WASTE DISCHARGES TO LAND

14. E. & J. Gallo Winery Waste Characterization Efforts, Merced County

In 2004, a NOV was issued to E & J Gallo Winery (Gallo), Livingston Winery, in part, for degrading groundwater with salt. Gallo as been systematically evaluating its wine production process to identify and characterize high salinity waste streams and will propose processing improvements to reduce discharge salinity. In November, Gallo submitted a status report that describes

processing improvements it has implemented to improve discharge quality, such as replacing sodium-based cleaners with potassium-based cleaners, modifying sanitation activities, implementing water conservation, and improving equipment efficiency. (ARP)

15. Merced County Regulation of Onsite Systems

Recent staff letters that comment on several proposed rural subdivisions in Merced County reliant on onsite wastewater treatment systems (OWTS) indicated their potential to adversely impact groundwater quality for nitrate. In response, Merced County Department of Environmental Health proposed a model to determine the minimum lot size for OWTS-reliant development. After staff indicated the model was insufficiently conservative to preclude groundwater pollution for nitrate, the County modified the approach to require all major OWTS-reliant subdivisions to install systems capable of reducing total nitrogen to 10 mg/L, and to form "zones of benefit" for the operation and maintenance of the new OWTSs. (JLK)

TMDLs

16. Pesticide TMDL CEQA Scoping Meetings and Public Workshops

CEQA scoping meetings and public workshops on a Central Valley Pesticide TMDL and Basin Plan amendment currently under development will be held on 2 February 2006 in Modesto, on 8 February 2006 in Chico and on 9 February 2006 in Rancho Cordova. The TMDL and Basin Plan amendment are being designed to establish water quality objectives and a program of implementation for pesticides that are impacting or could potentially impact aquatic life uses in surface waters and benthic sediments. The public announcement for the meeting is available online at:
hhtp://www.waterboards.ca.gov/centralvalley/programs/tmdl/pest-basinplan-amend/ceqa-public-notice-att-1.pdf

LAND DISPOSAL

17. Empire Mine State Historic Park, Nevada County

Regional Board staff in the NPDES, Storm Water, and Land Disposal Programs are coordinating with staff at DTSC to oversee environmental remedies at the Empire Mine State Historic Park in Grass Valley. Deltakeeper sued the Department of Parks and Recreation for storm water and tunnel discharges without NPDES permits. The Park is the site of one of the oldest, largest, and richest gold mines in California. The park contains many of the mine's buildings, the owner's home and restored gardens, as well as the entrance to 367 miles of abandoned and flooded underground mine workings. The park covers over 800 acres, including forested backcountry and eight miles of trails.

The park's environmental issues are associated with wastes from the historic mining and milling operations that contain arsenic minerals and metals. Areas of concern include a large tailings impoundment and a drain tunnel discharge. Controlling dust exposure for trail users and storm water pollution from the tailing impoundment is a major focus of the current effort. Park staff and others are investigating the drain tunnel and possible remedies for the discharge that is tributary to Wolf Creek. (SER)

DAIRIES

18. Update on Dairy Industry Response to Board Request for Reports of Waste Discharge

The November 2005 Executive Officer's Report included an item which summarized the dairy industry's response to staff's 8 August 2005 request that all owners and operators of existing milk cow dairies submit a Report of Waste Discharge (RWD). Staff has continued to process the RWDs received and follow up with dairies that did not submit a RWD by the 17 October 2005 deadline. The table below is an updated summary of RWDs received and shows that 98 % of the existing dairies in the Region have submitted a RWD as of early January 2006. Staff will continue to follow up with those dairies that have not submitted a RWD. (PAL, CMH, DAS)

Regional Board Office	County	Number RWDs Requested	Number RWDs Received	% RWDs Submitted
Fresno	Tulare	305	304	100
	Kings	152	151	99
	Fresno	110	110	100
	Kern	53	52	98
	Madera	48	48	100
Sacramento	Merced	318	305	96
	Stanislaus	293	283	97
	San Joaquin	138	138	100
	Glenn	51	50	98
	Sacramento	45	45	100

	Solano	4	4	100
	Yuba	4	4	100
	Yolo	3	3	100
	Placer	1	1	100
	Sutter	1	1	100
Redding	Tehama	16	22	138
	Butte	6	2	33
	Shasta	2	1	50

CEQA REPORTING

19. Riverside Motorsports Park Draft Environmental Impact Report, Merced County

In December staff commented on the draft EIR for the Riverside Motorsports Park, a proposed 1,180 acre regional recreation facility near the City of Atwater that features motorsport venues (e.g., NASCAR speedway with permanent seating for 50,000). The project's water supply would be provided by Merced County, and its sewage would be treated by an onsite wastewater treatment facility, with effluent disposal by percolation and recycling on project landscaped areas. The draft EIR lacked sufficient technical information to support its determination that the project will not significantly impact groundwater. Staff recommended the project connect to the City of Atwater municipal sewer, and indicated that if the project's report of waste discharge did not provide sufficient information to justify the discharge as consistent with Regional Board plans and policies, a discharge prohibition may result. (ARP)

20. Old Sugar Mill Specific Plan, Draft Environmental Impact Report, Yolo County

On 19 December 2005, staff provided comments to the revised DEIR for the Old Sugar Mill Specific Plan. The proposed project consists of converting a former sugar mill to a wide range of commercial and industrial uses, and constructing residences on other parts of a 106-acre site in Clarksburg, a town directly adjacent to the Sacramento River. The project would include a domestic wastewater treatment facility (WWTF) to serve the development. While the domestic WWTF would be owned and operated by a County Services Agency (CSA) to be formed by Yolo County, management of industrial wastewater would be the responsibility of the individual business owners. Staff's comments expressed concern that: industrial uses allowed are not compatible with the proposed wastewater management plan because no land is designated for disposal of industrial wastewater. Staff recommended that the project include either a POTW designed to accommodate all domestic and industrial wastewater from the proposed development, or connection to the Sacramento Regional Wastewater Treatment Plant (SRWTP). The DEIR appears to rule out connection SRWTP based on capital costs alone. Staff recommended that this alternative be more fully explored in light of the Basin Plan's preference for regionalization versus multiple small treatment plants. Groundwater at the project site is very shallow and subject to major changes due to high river levels, which the DEIR acknowledged could cause failure of the proposed subsurface effluent disposal system. Finally, staff recommended that the CSA be formed prior to submittal of the Report of Waste Discharge to ensure that the CSA is a full, decision-making participant in the system design and WDR permitting process. (ALO)

21. Borden Ranch Surface Mine Rezone and Use Permit, Draft Environmental Impact Report, Sacramento County

On 21 December 2005, staff provided comments to the Draft EIR for the proposed Borden Ranch Surface Mine in southeastern Sacramento County. The proposed project would create a 330-acre gravel mine on agricultural land that is bounded by Dry Creek on the north and a tributary of Dry Creek on the south. The site is underlain by a shallow perched aquifer that drains into Dry Creek approximately one mile downstream of the site. Approximately fifteen feet of soil would be removed and sold as fill. Subsequent removal of approximately twenty feet of sand and gravel would expose the shallow water table, creating a 200-acre lake that would remain after site reclamation. Staff expressed concern about the following potentially significant impacts: The inadequate levees surrounding the site do not provide 100-year flood protection, and levee failure could result in major sediment discharges to Dry Creek and deposition of contaminated runoff into the groundwater exposed in the lake.
Based on groundwater modeling, Dry Creek will lose approximately 1,700 acre-feet per year to the perched aquifer once mining is complete. A pond would be used to capture storm water runoff from the site, bringing storm water contaminants in very close proximity to the shallow water table. Sediments from upstream mining may have been deposited within the stream channels, and flooding may transport mercury-contaminated sediments into the lake. Sacramento County staff plans to revise and recirculate the DEIR. Staff recommended that additional site-specific technical studies be completed to better characterize the threat to water quality, and that additional mitigation measures be developed prevent those impacts. (ALO)

22. Baldwin Hallwood Mine Expansion, Draft Environmental Impact Report, Yuba County

On 12 December 2005, staff provided comments to the Draft EIR for the proposed Baldwin Hallwood Mine Expansion in Yuba County. The project would expand an existing sand and gravel mining operation by 200-acres. Staff expressed the following concerns: 1) Because the processing of material from the proposed project may cause significant changes to the Baldwin Hallwood aggregate processing operation and/or the discharge from it, revision of WDR Order No. 5-00-101 may be required to reflect those changes. 2) Although it has been reported that historical dredging has never been conducted on the project site,

the potential exists that other historical practices, such as the tilling of dredge waste fines into agricultural soils, could have introduced mercury at levels of concern onto the project site, and therefore it is necessary to determine whether mercury is present in the source material at levels that could adversely affect surface water, groundwater, or human health. 3) The existing aggregate processing facility must be evaluated to demonstrate whether it contains adequate treatment and storage capacity for the existing facility plus the expansion. 4) The nature of the hydraulic connection between the wastewater ponds, surface water and groundwater should be evaluated and the potential for any impact from the facility on surface water and groundwater identified. (MRL)

23. Notice of Preparation for Sacramento County GreenCycle Project, Sacramento County

On 3 January 2006, staff provided comments to the Sacramento County Department of Environmental Review and Assessment on a Notice of Preparation (NOP) for the proposed Sacramento GreenCycle project. The NOP stated that the County currently exports its green waste to facilities outside of the county, and identified four potential Sacramento County locations for this project that will compost green waste outdoors. Staff's stated that the County must submit a Report of Waste Discharge so the staff can prepare waste discharge requirements (WDRs). Staff also informed the County that draft general WDRs for discharges of green waste within the Central Valley Region will soon be distributed for review and comments, and that the notice will be sent to the County. Staff anticipates that the facility should be able to obtain coverage under the general WDRs, if and when they are adopted by the Board. (WLB)

GRANTS & FUNDING

24. Integrated Regional Water Management Grant Program Update

The Integrated Regional Water Management Grant Program has two components: a Planning grant and an Implementation grant.

The preliminary evaluation results for the Planning Grants were posted on the Department of Water Resources (DWR) and State Water Board websites on September 16th. The preliminary funding list was presented to the State Water Board during its 20 October 2005 meeting. For the Planning grants there is approximately $12 million available during this first funding cycle with a maximum funding limit per grant of $500,000. The DWR Director has not given final approval to the Integrated Regional Water Management Planning grant funding list at this time. If approved there will be up to 11 Planning grants awarded within Region 5 totaling approximately $5 million.

Step 1 Implementation Grant proposals have gone through technical reviews and senior level reviews and are now being reviewed at the management level. A total of 18 grant applications were submitted within Region 5 for a total funding amount requested of $64.6 million. Following the completion of the management level reviews, staff anticipates that DWR and State Board will be developing a preliminary Call Back List for the Step 2 full proposals in late-January 2006; at which time DWR and State Water Board will hold a public meeting to discuss the results of the Step 1 review effort. DWR and State Water Board are revising the Step 2 Proposal Solicitation Package (PSP) to address many of the concerns expressed during the public comment period and to address issues identified during the Step 1 review process. The Step 2 PSP will be released concurrently with the Call Back List. (PDB)

25. Dairy Water Quality Grant Program Update

This program provides grants for projects that reduce threats to, or impairment of, surface or ground waters from dairy operations. The Selection Panel was comprised of representatives from the following agencies: Regional Water Quality Control Boards; State Water Board; California Dairy Quality Assurance Program; US Environmental Protection Agency; Sacramento-Yolo Mosquito Vector Control District; and the California Bay-Delta Authority. The Selection Panel finalized the Recommended Projects List at a 16 December 2005, meeting. The Recommended Projects List will be presented to the State Water Board at its 4 January 2006 meeting. Applicants with projects on the Recommended Projects List will be offered funding in the priority order of the Recommended Projects List until all available funds are committed. There are three projects within Region 5 that may be funded for a total of $3,680,000. (PDB)

26. 2005-06 Consolidated Grants Program Update

The 2005-06 Consolidated Grants Program integrates and coordinates related grant programs for Watershed Protection, Water Management, Agricultural Water Quality, Drinking Water, Urban Storm Water, and Non-Point Source (NPS) Pollution Control. A total of approximately $142 million will be made available from eight interrelated grant programs administered by the State Water Board's Division of Financial Assistance.

Staff continues to work with the State Water Board's Division of Financial Assistance on the development of the 2005-06 Consolidated Grants Program. Staff are attending regular meetings and reviewing and providing comments on drafts of the concept proposal questionnaire, concept proposal review criteria, full proposal evaluation criteria, the grant program guidelines, and participated in testing of the online grant application system, Financial Assistance Application Submittal Tool (FASST).

Draft Program Guidelines were posted for public comment until 5 December 2005. Following the public comment period the program guidelines will be presented at the 4 January 2006 State Water Board meeting for adoption. Once the program guidelines have been adopted, the State Water Board will announce the request for "Concept Proposals" in mid January 2006. A Concept Proposal workshop has been scheduled for 17 January 2006 in Sacramento at the CalEPA building. (PDB)

SPILLS NOT RELATED TO NEW YEAR'S STORMS

27. Notice of Violation for Wastewater Spill, City of Escalon, San Joaquin County

On 30 December 2005 a Notice of Violation (NOV) was issued to the City of Escalon for a 100,000-gallon wastewater spill. The cause of the wastewater spill was attributed to animals burrowing through a wastewater pond berm; the wastewater discharged to an adjacent almond orchard that had already been harvested. The wastewater percolated into the orchard soil. By 15 March 2006, the Discharger is required to submit a technical report describing the condition of all exterior berms and recommendations for improvements as needed to prevent future spills. Staff will then evaluate additional enforcement actions. (TRO)

28. Wastewater from UST Excavation Discharged Without Permit, Former USA Service Station #93, Shasta County

In December 2005, the Former USA Service Station #93 began UST removal and over excavation of petroleum contaminated soils. Although City of Redding staff had provisionally allowed USA to discharge of tank pit water into the sanitary sewer, heavy rains prompted the City to disallow further discharge. With insufficient aboveground storage tanks on-site to accommodate excavation dewatering, the Discharger requested Redding staff approve discharge to surface waters without a permit. Instead of obtaining the necessary permit or securing additional aboveground storage for the wastewater, on 28 December 2005, USA discharged up to 3,000 gallons of wastewater into Calaboose Creek, a tributary of the Sacramento River. Additional enforcement including an ACL is being considered. (EJR)

29. Multiple Raw Sewage Spills By Tuolumne Utilities District, Tuolumne County

The District reported multiple sewage spills for the last two months; one spill in November and two spills in December. The November spill occurred on the 9th from a collection line plugged by roots and debris; involved an estimated 400 to 500 gallons; and an unknown volume reached the nearby Sonora Creek. The District unplugged the line. Two December 5th spills occurred due to grease blockage, involved 75 gallons and 150 gallons, and were contained. The District removed the grease. The District has scheduled the line for camera, root treatment, and flushing. For all three spills, the District vacuumed the spills, disinfected the immediate area, and notified County Health. The District also sampled the creek near the spills after the first and third incident and results are pending. Regional Board staff is not considering enforcement actions at this time. (HA)

30. CDC Sierra Conservation WWTP Spills Wastewater, Tuolumne County

On 6 November, the California Department of Corrections (CDC) reported a disinfected secondary treated effluent spill of 66,000 gallons from a "tertiary filtration unit" at its WWTP southwest of Jamestown. The majority of the spill and was contained onsite. Staff requested more information on the measures CDC implemented to prevent any future similar spills. (HA)

SITE CLEANUP

31. Latest Remedial Activities at Iron Mountain Mine Significantly Reduce Metal Discharges to Sacramento River, Shasta County

The Slickrock Creek Retention Reservoir was designed to collect surface water contaminated with heavy metals from a large mineralized portion of Iron Mountain Mine and route the water to the treatment facilities at the base of the mine. The reservoir has been in operation for over a year and has resulted in an additional 50 percent reduction of copper and zinc discharged to Keswick Reservoir and the Sacramento River. The overall reduction of copper and zinc resulting from all remedial activities at Iron Mountain Mine are now greater than 95 % and 98 % respectively. Where copper concentrations in the discharge to Keswick Reservoir, prior to the Slickrock Creek Reservoir, had been over 400 ppm, the current maximum discharge is just above 200 ppm. Zinc has shown similar reductions; past discharges could exceed 1,000 ppm and are currently in the 500 to 600 ppm range. During the recent storm periods, the concentrations were even lower, often under 100 ppm for copper and under 300 ppm for zinc. This reduction has resulted in no increases in discharges from Shasta Dam for dilution purposes in order to meet the downstream water quality objectives below Keswick Reservoir. (PVW)

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Kenneth D. Landau
Acting Executive Officer
26 January 2006

Addenda that follow:

1. Personnel and Administration
2. Completed Site Cleanups (UST)
3. Public Outreach
4. Irrigated Lands Update
5. Waste Discharge Requirements Program Report

Attachments:

1. Summary Report
2. Line Item Report
3. Fund Report

Addendum 1

EXECUTIVE OFFICERS REPORT
PERSONNEL AND ADMINISTRATION
December 2005 – January 2006

PERSONNEL

Total Positions	Vacancies	Gained	Lost
258.3	42.5	2	4

Gains:

Dan Warner	SEA	Redding
Jeff Pyle	WRCE	Fresno

Separations:

Lisa Gymer	ES	Fresno
Ray Bruuns	WRCE	Redding

Internal Transfers:

Bryan Smith	SWRCE	Redding
George Day	SWRCE	Redding
Linda Bracamonte	RAII	Sacramento

Retirements:

Dennis Westcot	EPMI	Sacramento
Tom Pinkos	EO	Sacramento

RECRUITING

Recruiting is on-going for the positions that the State Water Resources Control Board has approved for filling. We are working with State Board to try and expand our candidate pools. Given the current economic environment within California our current pay scale is not very competitive.

TRAINING

Course Names	# of Attendees
Aquatic Ecological Assessment Workshop Part 2	2
CLE ESA and HCP Annual Conference	1
Defensive Drivers Training	2
Forum on Public Health on Fish Contamination	2
GIS Applications in Watershed Management Part 2	1
GIS Data Development and Integration	1
Hardware Troubleshooting A+	1
Hazwopper Refresher Training	4
Health and Safety Refresher Training	2
Introduction to Project Management-Pilot	1
Leading Change	4
Pesticide Regulatory Update	1
Sexual Harassment Prevention Training	4
Tahoe and Beyond: International Erosion Control	1
Technical Report Writing #625	5
Technical Writing- Being Clear and Concise	21
TMDL Program Management Training	1

Addendum 2

COMPLETED SITE CLEANUPS

No Further Action Required - Underground Storage Tanks (UST)
Following are sites where Board staff determined that investigation and remediation work may be discontinued and that no further action is required. Further, any residual hydrocarbons remaining do not pose a threat to human health and safety or anticipated future beneficial uses of water. This determination is based on site-specific information provided by the responsible party, and that the information provided was accurate and representative of site conditions. Article 11, Division 3, Chapter 16, Title 23 of the California Code of Regulations requires public notification when the Board determines that corrective actions have been completed and that no further action is required at a leaking underground storage tank site. This document serves to provide public notification.
For more information regarding a site, the appropriate office personnel should be contacted: Fresno (559) 445-5116, Redding (530) 224-4845, and Sacramento (916) 464-3291.

FRESNO OFFICE

Fresno County
Gas 4 Less, 3076 E. Gettysburg Ave. Fresno - In January 1998, three 12,000-gallon gasoline USTs and one 8,000-gallon diesel UST, associated dispensers, and product lines were excavated and removed from the site as part of a station remodeling project. Soil sampling conducted at the time of removal revealed a release of petroleum hydrocarbons occurred at the site and resulted in the degradation of the underlying soils. The extent of impacted soils was subsequently evaluated and the underlying groundwater was monitored for potential impacts. The impacted soils were remediated to the extent feasible and practical using SVE technology. The results of monitoring and sampling events conducted for the site reveal that the underlying groundwater has not been significantly impacted. The residual petroleum hydrocarbons in the underlying soils will naturally degrade and are not anticipated to pose a public health risk or pose a threat to the beneficial use of groundwater in the area. Closed 15 November 2005. (DAM).

Martens Chevrolet, 1760 11th Street, Reedley - Three gasoline USTs were removed from the site during June 1990. Soil beneath the USTs was found to contain relatively high concentrations of gasoline constituents. Subsequent investigation found that gasoline extended to groundwater, which ranged from 50 to 60 feet, and that groundwater was significantly impacted. Floating product was detected in one of the on-site monitoring wells. A municipal supply well is within a 250 feet of the release, however, impacted groundwater did not migrate offsite. Soil vapor extraction commenced during March 2001 and air sparging commenced during March 2004. Concentrations of gasoline in the extracted vapor were as high as 4700 parts per million but reduced to 15 parts per million by June 2005. Only low concentrations of gasoline and trace concentrations of VOCs were detected in groundwater from November 2004 through April 2005, and do not pose a threat to human health or beneficial uses of the groundwater. An estimated 57,000 pounds of gasoline were removed from the site. Residual gasoline concentrations will degrade with time and the site closed on 22 November 2005. (JWH)

Madera County
Pines Marina, 54250 Road 432, Bass Lake - Three gasoline USTs were removed during July 1999. Gasoline constituents were detected in soil. Groundwater monitoring wells were installed and groundwater was found to be impacted. The site is on the north shore of Bass Lake and the depth to water ranged from 12 to 21 feet. Soil vapor extraction was performed at the site during periods of lower groundwater elevations, December 2003 through March 2204; and again from December 2004 through January 2005. Sampling performed during March 2005 did not detect any gasoline constituents in groundwater. The remedial activities were successful and the site closed on 21 November 2005. (JWH).

Merced County
Santico Station, 5150 E. Broadway Ave., Atwater - Three USTs were removed in February 1990 and gasoline constituents were detected in one soil sample under one UST. Merced County referred the subject case to the Regional Board because of owner non-compliance. Following the 2003 sale of the property, the new owner established a business at the site and provided a report upon which our closure evaluation is based. A soil boring completed in March 2005 within a few feet of the original detection of gasoline constituents identified only traces of TPHg and MTBE. No groundwater was encountered and no groundwater monitoring wells were installed. There are no water supply wells on the property and the surrounding area is on a community water supply. The nearest community water supply well shows no detections of volatile organic compounds of concern. A relatively small mass of petroleum hydrocarbons was released and residual concentrations should attenuate with time. Closed on December 2005. (WWG)

REDDING OFFICE

Shasta County
Formerly Gary's Exxon, Pine Grove 76, Shasta Lake – In March 1996, the Central Valley Regional Water Quality Control Board became lead agency after Shasta County Division of Environmental Health found BTEX and fuel oxygenates in shallow groundwater during tank removals. However, pollutants have attenuated following related soil removal. Data indicate no potential threat to nearby Salt Creek or other receptors. (EJR)

Plumas County
Unocal Fuel Star, 106 Crescent Street, Quincy, – While the Plumas County Environmental Heath Department reported no threats to water quality, staff requested a preliminary site investigation due to the facility's proximity to the Norton Municipal Well, a water supply well with historical MtBE. Preliminary groundwater samples show dilute MtBE and BTEX, and no reasonable threat to the Norton Well. (EJR)

SACRAMENTO OFFICE

Placer County
705 A Street, Lincoln - A single 650-gallon underground storage tank, installed before 1938, was excavated and removed from the site on 12 December 2002. Although hydrocarbon concentrations were detected in the initial soil and groundwater investigation, subsequent quarterly groundwater monitoring indicates that only minor hydrocarbon concentration remain in groundwater beneath the site. No detectable concentrations of benzene or MTBE were ever detected in any of the site's seven groundwater monitoring wells, and only minor concentrations of TPH-D have been detected in groundwater during the last two quarterly sampling events. Furthermore, the closest sensitive receptor is located over 800 feet cross gradient, the residual mass is limited in its extent, and has not migrated any significant distance. Therefore, the remaining hydrocarbon mass is expected to attenuate without migrating any significant distance or posing a threat to human health or waters of the state. (PRS)

Sutter County
Harley Jarrel Property, 730 Kiley Street, Yuba City - The Harley Jarrell property in Yuba City, was formerly used as a county maintenance garage. In March 1998, one gasoline underground storage tank (UST) was removed from the site. Impacted groundwater and soil has been adequately defined and delineated, based upon data submittals and Regional Board staff evaluations of all data. Several quarters of monitoring have shown the plume to be stable, limited in extent, and declining. A letter of "No Further Action Required" for this site is appropriate and warranted. The letter was issued 12 December 2005. (BPK)

Local Agency UST Closures with Concurrence of Board Staff Review

San Joaquin County
Sunwest Liquors, 2449 W. Kettleman Lane, Lodi

Solano County
Rio Vista high School Bus Garage, 410 S. 7th Street, Rio Vista

Sacramento County
CalTrans Fruitridge Maint Station, 5521 34th Street, Sacramento
Former PDF Park and Gas, 1200 F Street, Sacramento
Arco Station #6168, 222 Jibboom Street, Sacramento
Former 76 Service Station # 7257, 5001 Madison Avenue, Sacramento

Local Agency UST Closures Independent of Board Staff Review

Merced County
Dan's Import Auto Service, 1790 Yosemite Parkway, Merced, Remedial Action Completion Certification letter dated 27 October 2005

Fresno County
Consolidated Freightways, 2737 S. East Ave., Fresno, Certification of Response Action issued 9 November 2005
Jura Farms, Inc., 5545 W. Dakota Ave., Fresno, Certification of Response Action issued 15 December 2005
Smith Tank Lines, 2999 S. Orange, Fresno, Certification of Response Action issued 15 December 2005

Addendum 3

PUBLIC OUTREACH

On 1 November, Karen Larsen and Holly Grover attended the Central Valley Drinking Water Policy Workgroup meeting. The group discussed comments on the draft organic carbon conceptual model and development of the water quality monitoring plan.

On 7, 8 and 9 November Lori Webber and Holly Grover attended the Third Biennial Non-point Source Conference in Sacramento. The theme of the conference was "Measuring Water Quality Improvements". The oral and poster presentations focused on efforts to control non-point sources of pollution from agriculture and urban sources, among others.

On November 7, Dan Little met with the Project Oversight Committee of the Laguna Creek Watershed Grant Project (Prop 50 Watershed Program). Topics on the agenda included watershed assessment updates regarding the Watershed Assessment Plan and Stakeholder Input, public outreach, education updates for the primary and secondary school programs, and a preview of the new website which has since been officially launched.

On 14 November, Karen Larsen attended a public meeting on the decline of pelagic organisms in the Sacramento-San Joaquin Delta. Presenters summarized studies completed in 2005 and the development of work plans for 2006. Among the participants was a scientific review panel charged with providing input to investigators regarding 2005 conclusions and 2006 studies.

On 17 November and 9 December, Anne Olson participated in two industry outreach meetings hosted by CMAC. The purpose of the meetings, which were held in Fresno and Redding, was to inform CMAC members about proper management of concrete wash water at ready mix concrete plants and the planned General WDRs. (ALO/MRL)

On 21 November, Karen Larsen met with City of Sacramento Utilities Department staff to brief them on the development of the Central Valley Drinking Water Policy.

On 6 December, Betty Yee attended a meeting of the recently formed Sacramento-San Joaquin Delta Chapter of the California Clean Boating Network. The focus of the meeting was on abandoned vessels and the legislation and programs to address this issue.

On 7 December, Wendy Wyels, Mark List, and Anne Olson attended the third of several planned working group meetings with members of the Construction Materials Association of California (CMAC). CMAC previously requested that staff delay the Regional Board's consideration of the General Waste Discharge Requirements (WDRs) for temporary storage and/or recycling of concrete wash water. In the interim, CMAC has conducted industry outreach meetings, and plans to perform additional concrete wash water characterization, complete bench scale and pilot testing to assess the effectiveness of concrete admixtures and sealants to minimize seepage from concrete sumps, and develop standardized plans and specifications for such sumps. The culmination of these efforts will be revision of the tentative General Order, which staff plans to present to the Regional Board for its consideration in 2006.

On 13 December, Michelle Wood and Patrick Morris attended a meeting of the Delta Tributaries Mercury Council. Michelle presented information on the Delta methylmercury TMDL and staff's proposals for a control program.

On 15 December, Michelle Wood, Chris Foe, and Melanie Medina-Metzger attended a meeting at the Delta Protection Commission to discuss the Delta methylmercury TMDL. Michelle presented the TMDL information and staff's proposals for a control program. Staff is planning to present the Delta methylmercury control program to various stakeholder groups that may be affected by a methylmercury Basin Plan amendment.

On 16 December, Gail Cismowski attended the regular monthly meeting of the Grassland Basin Drainers Steering Committee in Los Banos. This group is responsible for operating the Grassland Bypass Project.

On 16 December, Betty Yee attended a meeting of the Watershed Subcommittee of the California Bay Delta Authority to continue discussion of the structure of a statewide watershed program.

On 16 December, Karen Larsen and Holly Grover attended the Central Valley Drinking Water Policy Workgroup meeting. The group discussed augmenting the Department of Water Resources delta and upstream tributary volumetric and water quality modeling and the schedule for developing policy alternatives.

Addendum 4

Irrigated Lands Conditional Waiver Program
EO Report January 2006

Status of Conditional Waivers
At the 28 November 2005 Central Valley Water Board meeting, staff presented a tentative Irrigated Lands Conditional Waiver Orders (2005 Tentative Orders) for consideration of adoption, proposed to become effective on 1 January 2006. The Central Valley Water Board did not adopt the 2005 Tentative Orders but voted to extend Resolution No. R5-2003-0105 by six months beyond the expiration date of 31 December 2005 and directed staff to continue to collaborate with stakeholders to address major issues associated with the following proposed waiver conditions:

- Coalition Group Water Quality Plan Submittal,
- Coalition Group Membership Lists Submittal,
- Monitoring and Reporting Program (MRP) Order Revisions, and
- "Triggers for Monitoring Follow-up Requirements (Table 1 of Attachment A)

Staff is proposing to conduct professionally facilitated meetings with stakeholders within the first few months of 2006. The goal of these meetings is to discuss and potentially reach agreement on the major issues listed above. The Irrigated Lands Program Technical Issues Committee (TIC) will discuss the technical issues associated with the MRP Order revisions and provide recommended language. Staff will evaluate all TIC recommendations to confirm that they are reasonable, feasible, protective of water quality, and in compliance with State and federal law. The schedule for the TIC meetings is discussed later in this EO Report.

Staff proposes to circulate the tentative Conditional Waiver documents for public comment in April 2006 and provide a public workshop during the Central Valley Water Board's 4/5 May 2006 meeting. Staff will review and respond to comments received during the public comment period and the May 2006 workshop and revise the tentative documents as appropriate. The proposed revised Conditional Waiver package will then be placed on the Central Valley Water Board's 22/23 June 2006 meeting agenda for the Central Valley Water Board's consideration and adoption.

Monitoring and Reporting Program Revisions
On 6 December 2005, the TIC developed the schedule for discussions of topics relevant to the Tentative MRP Orders that some members believe warrant a review. The TIC will develop and provide recommendations to Central Valley Water Board staff for their consideration in revising the Tentative MRP Orders for Coalitions Groups, Individual Dischargers and Water Districts. Staff will incorporate TIC recommendations, as appropriate, and release draft MRP Orders for a 30-day public comment period. The revised orders will then be provided to the Central Valley Water Board Executive Officer (EO) for approval or included with the Conditional Waiver package and placed on the Central Valley Water Board's 22/23 June 2006 meeting agenda for consideration of approval.

Three proposed TIC meetings are scheduled on the following dates to provide information, discussion and potential technical recommendations on the following items:

24 January 2006:	Proposed "triggers" for follow-up monitoring requirements, resampling requirements, and compliance monitoring;
14 February 2006:	Reporting requirements, required follow-up procedures for exceedences to Basin Plan objectives, and phased and long-term monitoring strategies;
14 March 2006:	Summary of first two meetings, update of discharger MRP Plans and other reporting and administrative items.

TIC Focus groups will be meeting throughout this period to provide initial information and preliminary recommendations for further discussion and approval of recommendations at the TIC meetings.

De Minimis Conditional Waiver
Staff is drafting a De Minimis Conditional Waiver to address comments from rural counties, small growers and other parties who believe that their discharges from irrigated lands pose no, or insignificant, effects on water quality. This proposed De Minimis Conditional Waiver is intended to serve as an alternate regulatory option for dischargers who implement management practices for erosion control, nutrient management, irrigation management, and pesticide management to specifically protect surface water quality.

Potential dischargers who may be regulated by a De Minimis Conditional Waiver was the focus of numerous staff discussions with stakeholders during the last seven months. Proposed criteria for dischargers to qualify for a De Minimis Conditional Waiver may include, but not be limited to, owners and/or operators of irrigated lands that (1) do not discharge to surface water during the irrigation season, (2) show documented evidence (via a Farm Water Quality Plan) of implementing approved water quality management practices as specified in the State Water Board's Nonpoint Source Implementation and Enforcement Policy, and (3) do not apply pesticides that contain organophosphates, organochlorines, carbamates, or pyrethroids.

Staff has considered elements of the "Low-Risk Discharge Classification" of the Los Angeles Water Board's newly adopted Conditional Waiver for Dischargers from Irrigated Lands. Thus, the criteria in the proposed De Minimis Conditional Waiver may be similar to the criteria in the Los Angeles Region Low-Risk discharge classification.

In Spring 2006, staff proposes to hold additional stakeholder meetings, complete the draft De Minimis Conditional Waiver and corresponding Mitigated Negative Declaration documents, and circulate the tentative documents for public review. Upon completion of these tasks, staff will schedule an Information Item to discuss the proposed De Minimis Conditional Waiver with the Central Valley Water Board.

Environmental Impact Report
The contract with Jones and Stokes Associates (JSA) for an Irrigated Lands Program Programmatic Environmental Impact Report (EIR) includes the development of an Existing Conditions Report (ECR) to describe the existing regulatory setting, surface and groundwater conditions, and management practices within the Central Valley Region. The ECR will be used to develop a long-term water quality regulatory program (Long-Term Program) to address discharges of waste from irrigated agriculture within the Region.

Staff provided comments to JSA on the administrative draft ECR in November and December 2005. Staff tentatively plans to release the draft ECR for public review in January or February 2006, followed by stakeholder outreach meetings to explain and receive comments on the draft ECR.

After completion of the final ECR, JSA will begin development of the Long-Term Program, which also will be subject to stakeholder outreach meetings and public comments. Finally, program alternatives will be evaluated in an EIR.

Coalition Membership List Request
To assist Irrigated Lands Program staff with enforcement duties, on 26 August 2005 the EO issued a request for submittal of membership documents to nine coalition groups. The membership list submittal due date, per the EO's 15 September 2005 follow-up letter, was 1 November 2005. Four coalition groups submitted alternative information (or a detailed plan to provide alternative information) per their discussion with staff. These coalition groups include the Westside San Joaquin River Watershed Coalition, the East San Joaquin Water Quality Coalition, the San Joaquin County and Delta Water Quality Coalition, and the Sacramento Valley Water Quality Coalition (The Sacramento Valley Water Quality Coalition proposes submittal of membership information by 31 January 2006.)

The five remaining coalition groups did not submit membership information or an approvable plan for alternative information that addresses staff's enforcement needs. The Southern San Joaquin Valley Water Quality Coalition submitted a letter stating that the representatives will meet later with staff to further develop alternative information. This response was left open-ended with no proposed plan or schedule for submittal of information. The San Luis Water District Coalition and Westlands Water District Coalition submitted letters stating that they will not submit any information per the EO's request. The Goose Lake Coalition emailed Program staff a partial list of members (names only, no contact information) after the due date and followed up with a letter stating that they can not force

any growers in their district to provide anything more than voluntary information. Lastly, the Root Creek Water District Coalition submitted no response to the EO request. Staff will continue working to resolve pending issues surrounding the submittal of Coalition membership information be contacting these five coalitions to schedule further discussion.

Staff is concerned that the accountability of the Irrigated Lands Conditional Waiver Program is jeopardized by unresolved issues associated with the submittal of coalition group membership information, as demonstrated by the overall response to the EO's request for information. Therefore, staff continues to emphasize the need for firmer membership list submittal requirements as a Board-adopted condition of the proposed conditional waivers, tentatively scheduled for consideration of adoption in June 2006.

Phase II Monitoring Contract (Phase II) – UC Davis John Muir Institute and California Department of Fish & Game Laboratories

Sample collection for the Phase II study of water quality in agriculturally dominated waterways in the Central Valley Region is continuing through the final year of funding. The report that is scheduled for completion by December 2006 will include an assessment of monitoring data from two irrigation seasons (2004 and 2005), and from two storm seasons (2004/05 and 2005/06). Sample locations that have been utilized in the study include sites from within six Coalition boundaries, encompassing 16 different counties. Irrigation season sampling is conducted at two-week intervals, up to five times each. During storm sampling, sites were sampled up to three times a day during rain events. To date, 262 samples have been analyzed for water column toxicity from 60 locations. Sampling will continue during storm events in January and February of 2006.

Out of the 262 samples collected, four samples were marginally toxic to fathead minnow and 26 samples (10%) were significantly toxic to water flea. Toxicity to algae with significantly reduced growth was observed in about 30% of the samples from the 2004 irrigation season and 2004/2005 storm season. In contrast to that, only one sample from the 2005 irrigation season was toxic to algae.

Organophosphate pesticides were determined to be the primary cause of toxicity to water flea in 25 of the 26 samples. Eight organophosphate insecticides and two carbamate insecticides, alone or in combination, are implicated in virtually all the toxicity to water flea that has been observed in the study so far. These specific compounds are Chlorpyrifos, Diazinon, Dimethoate, Disulfoton, Malathion, Dichlorvos, Parathion-methyl, Azinphos-methyl, Methomyl and Carbaryl. Although the final report has not yet been prepared, results from the study thus far suggests that adequate control of this relatively small group of products would greatly reduce or possibly eliminate toxicity to the water flea test species in field samples.

The toxicity results for algae are more difficult to interpret, and further evaluation of the results is pending. One factor that complicates the evaluation process is that test samples often exhibit enhanced growth when compared to control samples. This could be the result of fertilizers and other nutrient products from agriculture. On the other end of the spectrum, measurements of reduced growth in algae test species indicate the presence of a herbicide, metal or other toxicant.

Ninety-four sites have been analyzed for sediment toxicity to date, including samples collected in summer of 2004, spring of 2005, and summer of 2005. Twenty percent of these resulted in significant toxicity. The information that has been developed thus far implicates the pyrethroids Esfenvalerate, Bifenthrin, lambda-Cyhalothrin, and Cypermethrin, as well as organophosphate Chlorpyrifos. Pyrethroids adhere strongly to particulate matter and are seldom detected in the water column.

The Phase II data assessment will be completed in June 2006, after 2005/2006 storm season sampling and analysis is completed. A final Phase II report is scheduled for completion by December 2006. Two status reports detailing the results of analyses were recently revised and will be posted on the Irrigated Lands website.

December 2005 Coalition Group Monitoring Reports

The August 2005 approval of Monitoring and Reporting Program Order No. R5-2005-0833 (Order) changed the monitoring report frequency requirements for all Coalition Groups, with the exception of the California Rice Commission. Reports had previously been required once per year and are now required two times per year. Irrigation season monitoring reports are to be submitted by 31 December and dormant season monitoring will be due

on 30 June of each year. Coalition groups had been fully advised of this change in reporting date prior to approval of the Order in August via the comment period of the Tentative Order, and through discussions at the PAC and TIC meetings. Additionally a letter was sent in mid-December to all Coalition Group representatives reminding them of the 31 December 2005 requirement.

As of 4 January 2006 monitoring reports were received from six of the ten approved Coalition groups. Two additional groups, Westlands Coalition and San Luis Water District, submitted written information indicating that they did not have any irrigation water runoff during irrigation season and monitoring was not conducted. The Southern San Joaquin Valley Water Quality Coalition and the Root Creek Water District Coalition have not submitted monitoring reports.

Review of the reports that have been received has begun, and staff will provide summary reports of the findings as soon as they are available. (DCM)

Waste Discharge Requirements Program
PROGRAM REPORT

Overview
The Waste Discharge Requirements (WDR) Program regulates all point source discharges of waste to land that do not require full containment (which falls under the Land Discharge Program), do not involve confined animal facilities, and involve no discharge of a pollutant to a surface water of the United States (which falls under the NPDES Program), but does include discharges to surface waters not subject to the NPDES Program. Each point of potential release of waste constituents, whether a feature for waste storage, treatment, disposal, or recycling, must be evaluated separately to determine under what program it must be regulated. Waste discharge requirements adopted under the WDR Program protect surface water by either proscribing discharge of a pollutant to waters of the U.S. or prescribing requirements for discharge to surface waters not waters of the U.S., and they protect groundwater by prescribing waste containment, treatment, and control requirements. Over 1200 discharges in this Region are regulated by orders adopted under the WDR Program.

Laws
A person discharging waste or proposing to discharge waste (other than into a community sewer system) that could affect the quality of waters of the State must file a report of waste discharge. Filing of a report of waste discharge requires a fee, standard forms, and supporting technical information. The Water Code allows up to 140 days to adopt waste discharge requirements for discharge once a filed report of waste discharge has been determined complete, and more time when CEQA documents must be prepared. The Water Code requires that all possible steps be undertaken to encourage water recycling and any person who proposes to produce or use recycled water must file a report and obtain water reclamation requirements or a master reclamation permit.

Each waste discharge requirements order contains conditions intended to ensure the discharge conforms to the Water Code. Multiple factors must be considered in determining reasonable conditions of discharge and the quality that should be maintained in groundwater, including the relevant water quality control plans and water quality objectives. Where a group of discharges are similar, use similar treatment, and occur under similar conditions, a general order containing waste discharge requirements for everyone within the group can be adopted. Compliance with requirements is monitored under authority to conduct investigations and require technical and monitoring reports.

Waste classification determines whether a waste discharge to land must be regulated under the WDR Program or Land Disposal Program (except for sewage, fertilizer, and radioactive material, which are always regulated under the WDR Program). Title 27, California Code of Regulations, section 20005, et seq., contains the regulations that establish the waste classification system. If any constituent in or derived from a waste requires that it be classified as designated waste, the waste must be fully contained unless it qualifies for exemption and regulation of the discharge falls under the Land Disposal Program. If a waste is not subject to Title 27, regulation of the discharge falls under the WDR Program.

Any authorization to discharge is a revocable privilege, use of waste assimilative capacity of groundwater can be limited, and waste discharge requirements may be reviewed and revised at any time. Orders containing discharge requirements have review periods of five, ten, and fifteen years to ensure they are effective in precluding unauthorized water degradation and nuisance, and waivers must be reviewed at least every five years and require renewal.

Laws governing the WDR Program include statewide plans and policies of the State Water Resources Control Board (State Water Board) and Regional Board plans and policies. The plans and policies of the State Water Board applied most frequently in the WDR Program are the "Antidegradation" Policy; the "Reclamation" Policy; the "Cleanup and Abatement" Policy; and the "Water Quality Enforcement Policy." The policies of the Central Valley Water Board are set forth in the *Water Quality Control Plan for the Tulare Lake Basin, Second Edition;* and the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition.*

Discharges Regulated Under the WDR Program
Sources: WDR Program discharges are the most diverse of the three core regulatory programs and include:

- Discharge of sewage from municipal treatment plants, private utility treatment plants, small private treatment plants and larger septic tank/ leachfield systems serving commercial, industrial, and residential developments.
- Production of recycled water from municipal sewage and the distribution and use of recycled water by various types of users.

- Treatment and discharge of domestic sewage sludge and biosolids.
- Discharge of processing wastewater from sand and gravel and other mining operations not involving navigable surface water and not subject to Title 27.
- Discharge of industrial wastewater from power plants, oilfield production, etc.
- Discharge of wastewater, waste residuals, treated sludge, and recycled water from food processing plants and operations (packing, cooling, peeling, dicing, fermenting, brining, canning, etc.) for milk, cheese, tomatoes, olives, wine, and many other fruits and vegetables, etc.
- Discharge of wastes from minor surface water dredging projects and all discharges in addition to dredging that occur to surface waters not waters of the United States.
- Discharge of wastes from water supply treatment plants.
- Discharge of treated water supplies for aquifer storage and recovery projects, and similar disposition of untreated water supplies and storm water used for groundwater replenishment and as water banking projects.
- Discharge of treated groundwater from remedial actions at leaking underground tank and other spill sites.

Irrigated Lands. As discharges of runoff from irrigated lands are exempt from the NPDES Program, they are subject to WDR Program requirements. In 2002, a separate Irrigated Lands Program was created with funding taken from the WDR Program. In Fall 2005, some of these positions were restored to the WDR Program but continue to work on irrigated land discharges.

Discharge Methods. Incidental release occurs from collection systems, sumps, treatment units, and surface impoundments (evaporation ponds) of varying construction and integrity, and from surface applications and impoundments of recycled water. Intentional discharge occurs from disposal ponds, seepage pits, leachfields, from spreading or spraying onto the land surface, and direct injection into groundwater.

Means of Regulation

Individual WDR. Individual waste discharge requirements orders for specific projects are the most common means of regulation due to the many variables and factors that must be considered in establishing conditions of discharge and ensuring accountability.

General Orders. Similar treatment and discharge conditions have allowed development and use of several general orders. General orders currently available or soon to be available in this program are for:

- Discharges to Land by Small Domestic Wastewater Treatment Systems, State Water Board Order No. 97-10-DWQ
- Discharge of Biosolids to Land for Use as a Soil Amendment in Agricultural, Silvacultural, Horticultural, and Land Reclamation Activities, State Water Board Order No. 2004-012-DWQ.
- Dredged or Fill Discharges to Waters Deemed by the U.S. Army Corps of Engineers to be Outside Federal Jurisdiction, State Water Board Order No. 2004-0004-DWQ.
- Dredged or Fill Discharges, State Water Board Order No. 2003-0017-DWQ.
- Discharges to Land with a Low Threat to Water Quality, State Water Board Order No. 2003-0003-DWQ
- Sewer Collection System Agencies, State Water Board (pending)
- Discharge of Groundwater or Surface Water from Cleanup of Petroleum Pollution, Order No. R5-2003-0044.

Water Reclamation (or Recycling) Requirements and Master Reclamation Permits. Water recycling requirements are determined by the DHS as necessary for the public health, safety, or welfare and, if a project will not affect water quality, are imposed through a water reclamation requirements order. Master Reclamation Permits allow the permit holder to control recycling by individual users, and they contain waste discharge requirements as necessary to implement effluent limitations and other requirements for protection of groundwater.

Standard Conditions. Many discharge requirements are applicable to to major groups of dischargers and rarely change. As established standards, these are listed separately in a document incorporated by reference into each adopted order.

Individual Waivers. An individual waiver of waste discharge requirements can be adopted if appropriate.

General Waivers. General waivers apply to categories of waste discharges. In some cases they waive submittal of a report of waste discharge and in other cases they allow staff to administratively determine, based on the filed report of waste discharge, whether a specific discharge meets the conditions for waiver of waste discharge requirements previously established by the Central Valley Water Board. General waivers currently in effect for this program are:

- Pesticide Applicators and Retail Fertilizer Facilities, Resolution No. R5-2002-0147
- Various Minor Discharges, Resolution No. R5-2003-0008 (e.g., air conditioner, cooling, and elevated temperature waters; drilling muds; Inert solid wastes; swimming pool discharges; agricultural commodity wastes).
- Small Food Processors, Including Wineries, Resolution R5-2003-0107

General waivers can also be granted to individual dischargers based upon regulatory oversight by a local public entity that administers a program at least as stringent as the Central Valley Water Board's. Historically, this has included waiver of reports of waste discharge and waste discharge requirements for individual sewage disposal systems for persons in all counties, and for land application of biosolids and of food processing solids residuals in certain cities and counties. General waivers of this nature include biosolids projects under oversight of Merced County (expired and pending renewal) and land application of food processing waste solids under oversight of Stanislaus County (currently pending).

Funding and Staffing

Annual fees provide all the funding allocated to the WDR Program. The Region received a $3.28 million budget to start FY 2005-2006, which supports the equivalent of 24.3 staff. For perspective, over 116 staff would be necessary to sustain an effective WDR Program within the Central Valley.[1]

From 1999 to 2001, the WDR Program received a short-term resource supplement to process backlogged waste discharge requirements. In 2002, the WDR Program was reduced to pre-supplement funding levels, and some lost positions were shifted into the newly created Irrigated Lands Program. The position reduction created an unequal workload among the technical staff remaining. Work of Stanislaus and Tuolumne Counties and Musco Family Olive Company was shifted to the Fresno office, and work of Glenn County was shifted to the Redding Office. This FY, attrition created work imbalances again and an opportunity to shift cases back to the Sacramento Office, but the shifts remain pending due to protracted delays in filling vacant positions. In December, a supplement increased the budget sufficient to support 29.8 staff but the increase is misleading as it supports continuing work in the Irrigated Lands Program. Current distribution of program personnel funds is shown below:

Line	Staff	Sacramento	Fresno	Redding	Total
1	Total number of staff using program funds	39	29	12	80
2	Total number of staff charging > 3 months to WDR Program	19	13	7	39
3	Technical staff in Line 2 that are Supervisory (in PYs)	3.3	2.7	.8	6.8
4	PYs in Line 2 allocated to Line technical staff	10.7	7.7	2.3	20.5
5	PYs in Line 4 where positions are vacant	2.5	3	1	6.5
6	PYs in Line 4 doing Irrigated Lands work	4.8	0	0	4.8

Issues

Consistency – Implementation of the basin plans for all waste releases to land has not always been consistent, particularly with respect to application of the Antidegradation Policy and Title 27 Regulations. Similar waste discharged under similar circumstances should be subject to similar waste discharge requirements fully consistent with the basin plans. Staff has been working over the past several years to improve consistency among the offices and programs in application of policy, strategy, documents, and goals. The manager and seniors of the WDR Program regularly participate in meetings of the Region's Consistency Program, the statewide WDR Program roundtable, and internal program and enforcement roundtables. The program manager and assigned attorney receive a copy of all draft WDR and enforcement orders for review, and management and legal both must approve tentative orders prior to Regional Board consideration. Improvements have been necessary to ensure consistency with respect to waste classification, Title 27 exemption, containment requirements, adequate liner designs, effective land treatment, and evaluation of impacts on soil and groundwater, and changes have been incorrectly perceived by many dischargers to be new regulatory requirements.

[1] The estimate is based upon 1999 workload standards that lack any estimate for: CEQA reviews, new responsibilities added by law since then for waivers, work related to or resultant from the AB885 requirement for statewide regulations for septic tank systems, and review of technical reports.

Staffing – The WDR Program supports in part 80 staff, but just 39 of them work in it more than three months a year. Funding currently supports 29.8 equivalent full-time positions. Staff-equivalents assigned budget for technical work total 27.3 PYs (2.5 PYs are for administration and support personnel). Of these, 15.7 PYs are line technical staff (exclusive of supervisory staff and line technical staff assigned to irrigated lands), which causes on average each person to manage a caseload of 76 sites. As 8.6 PYs must be expended performing nondiscretionary tasks, such as caseload management (e.g., investigating complaints and responding to discharger requests for regulatory advice or actions, etc.) and data entry, less than one-half the resources are actually available to produce measured work results (e.g., staff inspections, informal and formal enforcement actions; updated or new WDRs, etc.). 6.5 PYs of these line technical staff positions are currently vacant, and have been for months.

The State Water Board's "Compliance Assurance and Enforcement Strategy" of 1998 indicated that this Region's WDR Program received only 60% of the statewide average funding per regulated WDR site. Similarly, the report showed that the WDR Program received 38% and 25% of what the NPDES and Land Disposal Programs in this Region received per site. The NPDES Program subsequently received a resource supplement that continues essentially intact and has been supplemented with contracted help. The caseload is one factor that contributes to the difficulty of retaining staff in the WDR Program.

Backlogged Applications and WDR Updates – The WDR update backlog was the original reason for a short-term program resource supplement that occurred from 1999 through 2001. With an update backlog of 320 orders in 1999 and additional updates coming due in succeeding years, it would have taken an annual renewal rate of 125 orders (18.3 PYs) over six years to eliminate the backlog by now, and an update rate of 105 orders (15.3 PYs) annually to maintain a zero backlog thereafter. Thus, the two-year supplement of 11 PYs temporarily slowed but did not reduce the increasing backlog, which has continued to increase. Only 1.9 PYs are allocated this FY to address backlogs.

Self-Monitoring Reports – The primary means of Regional Board staff, as well as dischargers, to monitor compliance with waste discharge requirements is through review of self-monitoring reports. Unfortunately, some dischargers do not submit the required information, or they submit the required information erratically or only when specifically reminded. The reports typically receive only cursory review by staff until a site inspection occurs. The 2.4 PYs allocated this FY are considerably less than the 18.1 PYs that would be required to perform the effective level of review described by procedures. Hence, this regulatory tool is ineffective and adversely affects other program areas.

Inspections – Validation of conditions described by self-monitoring data must be done through periodic inspection, and inspection is the only means to evaluate system maintenance and observe unreported activities. Adhering to the inspection schedule identified as the minimum necessary to be effective by the State Water Board would require 19.1 PYs. The FY allocation for this program component is 2.5 PYs. Lack of inspection capability adversely affects other program areas.

Enforcement – The Enforcement Policy emphasizes timely, fair, firm, and consistent enforcement as critical to the success of water quality programs. However, formal enforcement inevitably requires diversion of resources from other program functions already operating at subsistence levels. As illustrated by the recent enforcement action against Hilmar Cheese Company, enforcement action against contentious dischargers can consume significant program resources. Even with enforcement a priority, 0.7 and 2.9 PYs are allocated for informal and formal enforcement, respectively, this FY. This is 10% of the resources the State Water Board projected as necessary to sustain effective enforcement in the Region's WDR Program.

Land Treatment Systems – Historically adopted waste discharge requirements allow application of untreated or partially treated food processing or winery waste onto land for additional treatment and for "reuse" benefits, typically as proposed in a waste management plan. These land treatment systems have historically been tacitly and informally exempted from waste classification that would place them under Title 27. A major assumption supporting the historic waste discharge requirements for land treatment systems, and the Title 27 exemption, was that residual waste constituents were effectively attenuated within the soil column before reaching groundwater. Title 27 requires a site-specific pilot demonstration as a prerequisite for each land treatment site to develop design and operating parameters that protect groundwater, but nothing comparable has been required of agricultural waste applied to land though it usually will qualify as designated waste. Monitoring data and inspections indicate that few dischargers have adhered to the proposed waste management plans and many have either significantly degraded or polluted groundwater. The attenuation process itself is not scientifically documented or adequately monitored for process control. Since staff's initial report in March 2000 about groundwater problems caused by the land treatment of winery and food processing waste, both the California League of Food Processors (CLFP) and Wine Institute have worked toward documenting sound design and operating criteria for land treatment to provide to their members. This has meant additional staff workload for meetings, participation in conferences, and technical

reviews not associated with specific discharges. The Wine Institute has thus far developed incomplete hypotheses regarding the science and controlling parameters of land treatment (that failed a formal peer review) and only in 2005 did it begin to specifically address control of inorganic salts. CLFP revised its manual of good practice and in 2005 committed to address remaining deficiencies in the revised manual, and began that revision process just recently. Because of lack of a scientifically sound design, historical regulatory practices, inadequate monitoring, historically poor operational control, discharger contentiousness, no required pilot demonstration, and political factors, regulation of land treatment in the WDR Program is not reliable or effective and several polluted sites exist. No remediation is occurring at most these sites, but this will be the expectation as sites are addressed by staff. Compared to regulation by effluent limitations, land treatment systems are high risk and consume disproportionately high resources.

Monitoring – During review of the effectiveness of older orders, it became evident that historical monitoring, particularly of groundwater, has not been sufficient for early detection of degradation and prevention of pollution. Deficiencies include inadequate monitoring well construction and networks, and inadequate monitoring with respect to frequency and monitored constituents. These monitoring deficiencies have been addressed as encountered by staff. Inconsistencies of older monitoring and expense of recent monitoring have been the basis of criticism. Similar monitoring under similar circumstances, and monitoring sufficient to address all appropriate constituents of potential concern is our objective and staff is working toward consistency in this area.

Best practicable treatment or control (BPTC) – No defined procedures exist to ensure thorough and objective evaluation of what alternative treatment technologies and control methods can be considered the "best efforts" intended by the Antidegradation Policy. No statewide or regional guidance exists to instruct staff and direct a discharger on what demonstration must be made for a selected treatment or control alternative to qualify as the best efforts. Economic feasibility tends to receive disproportionate weight in discharger arguments when in actuality it is but one factor of many that must be weighed and balanced by the Regional Board. Guidelines and procedures on determining what constitutes BPTC, and appropriate perspective on economics, would improve efficiency of staff in permitting and ensure effectiveness of requirements in minimizing degradation and protecting groundwater.[2] Work is currently underway by several major Tulare Lake Basin municipal dischargers (e.g., Cities of Fresno, Porterville, Bakersfield, Hanford, etc.) to perform comprehensive BPTC evaluations of their waste source control, and wastewater collection, treatment and disposal systems. Once complete, these evaluations will ensure all reasonable and effective municipal wastewater treatment technologies and control methods are implemented and that the highest water quality attainable by reasonable measures is maintained. Historically, few private entities have been required to make a similar study and demonstration, but this will be the expectation as sites are addressed.

Treatment and Disposal Capacity – Strategies in the 1970s included generous federal and state financial assistance in upgrading, expanding, and consolidating public wastewater treatment and disposal systems for the purpose of achieving performance standards and meeting water quality objectives. Since then, Title 23 has specified that public facilities begin planning for additional capacity at least four years in advance of when it will be needed and then either insure the capacity is in place before needed or restrict growth until the expansion is in place. Standard requirements applied to all dischargers also specify a duty to: perform proper operation and maintenance, halt or reduce any activity as necessary to maintain compliance with waste discharge requirements, notify the Regional Board of noncompliance problems, take all reasonable steps to assess and minimize impacts that result from noncompliance, and accept consequences if violations are caused from a failure to do so. Another standard requirement states that any material change must be preceded by a report of waste discharge. Too many dischargers ignore these performance expectations.

Indirect Dischargers – Over the last several years, categorical and significant industries have relocated from large cities in other regions to small communities in the Central Valley. Although a standard provision for years has identified addition of a significant indirect discharger as a material change that must be reported and result in re-evaluation of terms of discharge, this circumstance is rarely reported. Consequently, the controls by the small community are typically inadequate, and the WDR orders and their monitoring and reporting requirements are inadequate to effectively regulate the altered character of waste. USEPA has taken enforcement against a couple of these indirect dischargers.

Consolidation – The "State Policy for Water Quality Control" requires consolidation of wastewater collection and treatment facilities where feasible and desirable to implement sound water quality management programs. In general, consolidation provides capital and operational savings, increased reliability, and opportunities for recycling that are otherwise not feasible.

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[2] For example, the State of Washington developed a Permit Writer's Manual that instructs technical staff on how to evaluate and implement it's "BPTC. "

Growth in the Region has created an increasing number of large development projects that propose separate community systems, including projects near existing municipal sewage collection systems. New projects must be consistent with this principle.

Septic Systems – Regulation of discharges from residential septic tank-leachfield systems was conditionally waived (informally and formally) to the 38 counties within this Region in the 1970s with the expectation that they implement criteria at least as stringent as that in the basin plans. In the years since some counties have deviated from the basin plan minimums. In addition, the formal waiver expired and renewal has been postponed pending the expected promulgation of statewide regulations in response to AB885. The regulations are still pending. In the meantime considerable rural residential development reliant on septic tank-leachfield systems is occurring throughout the Region.

Groundwater Quality – When evaluating whether a discharge has caused or will cause groundwater degradation, the point of reference is 1968, the year the Antidegradation Policy went into effect. Data from this era is limited and general, but good enough for a reasonable perspective of baseline quality and essential to consider in correct application of policies. Discharge requirements must protect the highest quality groundwater that will be in hydraulic continuity with the discharge. Both must be factored into future analyses of appropriate waste discharge requirements, which will continue to consider more recent and site-specific data and subsequent influences on groundwater quality.

Discharge Points – Historically regulation has focused on only the declared and obvious discharges, such as a pond or land disposal area. Each point of potential release (sumps, tanks, storage ponds, etc.) and intended release (percolation pond, disposal area) must be evaluated for consistency with policies.

Science and engineering – Historically, authorization for discharge has been based upon poor data for many aspects of a waste discharge, particularly for land discharge of non-domestic waste. The scientific and engineered rigor of project analysis must increase. Each waste constituent that is released or may be released must be evaluated for its potential to degrade or pollute groundwater and then subjected to rigorous analysis as to variability and technically feasible methods of treatment and control to minimize the degradation. If treatment and control is not sufficient to ensure resultant degradation of groundwater will be acceptable, the constituent must be fully contained or it must be scientifically demonstrated that the constituent will be attenuated within the upper zone of the soil profile. Concentrations that must be achieved at the point of release to ensure achievement of the predicted result must be quantified. Documentation of the baseline and extant condition of groundwater and the engineered design of the project must be provided by the discharger.

Uncontrollable Factors – Authorization to discharge a waste constituent to groundwater that already exceeds a water quality objective for the constituent is acceptable in just three situations. It may occur where no designated beneficial uses are involved and thus no objective applies. It may occur if the exceedance results from controllable factors if the discharge will not contribute to the exceedance. And, it may occur if the exceedance results from “uncontrollable factors,” and the discharge will not make the existing quality worse. Uncontrollable factors are factors not influenced by human activities. The Central Valley has many areas where shallow groundwater exceeds one or more water quality objectives due to human activities, beneficial uses remain designated, and adopted orders are based upon no degradation of the degraded quality. Instead, it should be determined whether control of all factors could restore the aquifer, a less stringent water quality objective may be reasonable, or de-designation of the impacted beneficial use is appropriate.

Salt – Inorganic salt is the single greatest pollutant group affecting the San Joaquin River and Tulare Lake Basins and it adversely affects both surface water and groundwater. Both basins are accumulating salt from importation of materials containing salt and from importation of vast quantities of surface water that contain salt. The salt issue affects numerous and varied stakeholders and multiple programs and agencies. An overview of the broader salt issue was described in a 2005 Regional Board status report and will be the subject of a State Water Board workshop in January 2006. Point sources of salt contribute to the broader salt issue, but reasonable controls have been defined by a regulatory framework reliant on waste classification and on technology and controls to preclude degradation of groundwater quality beyond (or to require its restoration to) the highest quality that can reasonably be maintained or restored that does not exceed water quality objectives. Some domestic and non-domestic waste discharges are currently inconsistent with the framework.

Blending – Historically some projects have been approved that blend wastewater with freshwater to the point that a crop can be successfully grown with the blend, with little analysis of whether the waste could or should be classified and contained, whether waste constituent concentrations could and should first be reduced with BPTC, and whether the consequential affect on groundwater quality (accounting for application methods, evaporative effects, and leaching factors) is acceptable. Use of freshwater for dilution of waste is both wasteful and unreasonable if for the purpose of avoiding feasible waste treatment and control methods and where it results in impacts inconsistent with other water quality policies.

Water treatment wastes – The quality of available water in some geographical areas requires removal of certain constituents to be potable, such as radioactivity, nitrates, inorganic salts, and arsenic. This occurs for both community water supplies and individual water supplies, and the most common treatment method is reverse osmosis, which creates a reject with concentrated amounts of the waste constituent and other constituents. The reject of RO is designated waste and thus expensive to dispose of properly. Other treatment methods generate similar wastes. Nothing is being done to control this at the individual level, and at the community level the common proposals are to return the reject to groundwater by means of the community sewage and/or by blending it with an irrigation supply where the relative volumes ensure it does not significantly alter the chemical character of the irrigation supply. The former essentially returns the removed constituent to where it would be if not removed. The latter simply dilutes it. Both methods have supportive arguments, but all release constituents where they are already a problem and over the long term will exacerbate the condition. The rate of incidence is expected to increase as dwindling water supplies force users to tap poor quality groundwater to meet population needs.

Reclamation and water conservation – While policies are clear that recycling should be encouraged in water-short areas, historic encouragement has resulted in approval of non-municipal "reclamation" projects that have economically unsustainable yields and that are inconsistent with other applicable policies, particularly those concerning waste classification, degradation, and pollution. Encouragement of municipal reclamation projects has resulted in turning private land into public land and cultivation of new land, which may not extend the water supply, be of maximum public interest or cause least impact on water quality. Neither reclamation nor conservation justifies inconsistency with other water quality policies. Support of reclamation and conservation must be limited to projects that both extend the water supply and are consistent with water quality policies.

Soil Amendments – Benefit to soil is only realized from decomposable and nutritive waste constituents. Historically, approval of reuse of a waste has focused too much on potentially beneficial constituents and ignored the potentially harmful, and typically more mobile, waste constituents. Waste classifiable as designated waste due to non-decomposable, non-nutritive waste constituents does not qualify for exemption from Title 27 despite the soil benefits and should not be authorized as a soil amendment. Similarly, the benefits to soil from any non-designated waste must be balanced against the adverse affects caused by non-beneficial waste constituents consistent with the Antidegradation Policy.

Indirect reclamation – Three recent project proposals include a system for extraction of groundwater beneath or near wastewater treatment facilities to control groundwater mounding and to take advantage of the natural filtration of the unsaturated soil column to meet Title 22 criteria for recycled water. Groundwater limitations implement the water quality objective for bacteria, but DHS does not consider the naturally filtered groundwater that meets bacterial limitations as suitable for unrestricted uses without disinfection due to other potential contaminants, such as viruses. DHS requires the extracted groundwater to be disinfected to Title 22 criteria. Thus, infiltration of un-disinfected, unfiltered wastewater in the view of DHS does not adequately protect the beneficial uses of domestic water supply and agricultural water supply. Well-established technology is defined in Title 22 for unrestricted use, and the sole benefit of the proposed projects over the established Title 22 technology is the cost savings from not providing filtration.

Priorities

Enforcement and consistency have been the two highest priorities the last three years. Applications, backlogged applications, WDR updates, complaints, self-monitoring report review, database maintenance, enforcement, public outreach, CEQA review, consistency, prioritization itself, etc., are all considered important and each requires subsistence level resources. As no area has resources significantly above the subsistence level to direct onto a priority activity, establishing any area as high priority for redirection of discretionary resources cannot have a dramatic effect on measured outputs in that area but can cause problems if the area from which resources are taken this area significantly falls below subsistence levels.

Performance

Performance typically meets or exceeds commitments made in work plans when compared in proportion to resources expended, but the mix of measured outputs usually varies from work plan projections as circumstances change during the year.

California Regional Water Quality Control Board, Central Valley Region

Fiscal Report Based on November Expenditures
(An average of 42% should have been expended to date)

PERSONAL SERVICES

Our personal services budget was $24.4 million. We have spent 38% of our personal service budget. We continue to recruit for all vacant positions.

OPERATING EXPENSES

As of November we spent 37% of our operating expense budget.

FUND ISSUES

Key Fund Sources	Percent Expended
General Fund	39.2%
Federal Funds	38.6%
Waste Discharge Permit Fund	38.8%
Prop 13, 40 & 50 Bond	57.8%

FY 05/06 UPDATE

Contract negotiations resulted in our Engineers receiving a 7% raise that was effective 7/1/05. Additional funds to cover this increase were provided. A decreasing technical adjustment of approximately $500,000 was also made to our budget by State Board.

FISCAL MANAGEMENT SYSTEM
Expenditures By Object / Line Item
for the month ending November 04/05

ORGANIZATION -- Region 5

PERSONAL SERVICES	POSITIONS/PYS BUDGETED	$ BUDGETED	$ EXPENDITURES EXPENDED	BALANCE	% EXPENDED
Authorized Positions					
Permanent Positions	246.6	16,150,614	5,783,309	10,367,305	36 %
Temporary Help	0.0	0	0	0	0 %
Overtime		0	577	(577)	0 %
Board Stipend		12,000	3,500	8,500	29 %
Total Authorized Positions	246.6	16,162,614			
Salary Increases		0			
Workload & Admin. Charges	0.0	0			
Proposed New Positions	0.0	0			
Partial Year Positions	0.0	0			
Total Adjustments	0.0	0			
Total Salaries	246.6	16,162,614			
Salary Savings	(12.7)	(748,524)			
Net Total Salaries	233.9	15,414,090			
Staff Benefits		5,060,125	1,949,021	3,111,104	39 %
TOTAL PERSONAL SERVICES(PS)	233.9	20,474,215	7,736,407	12,737,808	38 %
LINE ITEM OPERATING EXPENSES & EQUIPMENT DETAIL					
General Expense		265,755	36,587	229,168	14 %
Printing		47,421	50,967	(3,546)	107 %
Communications		159,729	34,962	124,767	22 %
Postage		43,907	6,468	37,439	15 %
Travel In-State		230,162	18,469	211,693	8 %
Travel Out-Of-State		3,160	0	3,160	0 %
Training		97,653	12,403	85,250	13 %
Facilities Operations		1,151,297	380,958	770,339	33 %
Utilities		226,578	38,586	187,992	17 %
Contracts - Internal		653,630	1,416,840	(763,210)	217 %
Contracts - External		4,593,982	954,945	3,639,037	21 %
Consolidated Data Center		0	0	0	0 %
Central Adm.Serv. - Prorata		0	0	0	0 %
Central Adm.Serv. - SWCAP		0	0	0	0 %
Equipment		83,500	0	83,500	0 %
Other		0	61,479	(61,479)	0 %
TOTAL OPERATING EXPENSE & EQUIPMENT(OEE)		7,556,774	3,012,664	4,544,110	40 %
TOTAL PS & OEE		28,030,989	10,749,071	17,281,918	38 %
Indirect		5,289,588	1,858,142	3,431,446	35 %
GRAND TOTAL		33,320,577	12,607,213	20,713,364	38 %

Organization - Region 5 for the month ending November 04/05

Fund Source		$ Allotment	$ Expenditures	% Expended
NPS Pollution Contral Program-Prop 13 -- (00BOND-NPSC)	=	441,221	117,796	26.7
Watershed Protection Program -- (00BOND-WPP)	=	282,460	25,680	9.1
Cleanup & Abatement Account-Management -- (CAA)	=	5,548,915	2,129,560	38.4
F(104B3) Aquatic Pest Monitoring -- (F(104B3))	=	151,234	62,437	41.3
NPDES -- (F(106))	=	712,265	218,022	30.6
205(J) Phase XVI -- (F(205J-XVI))	=	0	648	0.0
Non-Point Source -- (F(319H))	=	1,053,490	471,463	44.8
DoD Cost Recovery -- (F(DOD-CR))	=	135,871	38,556	28.4
Lawrence Livermore - Site 300 -- (F(LL300))	=	98,414	29,509	30.0
Sacramento River Toxic Program -- (F(SRTP))	=	215,111	92,473	43.0
General -- (G)	=	3,692,436	1,447,234	39.2
Indirect Distributed Cost -- (IDC)	=	0	0	0.0
-- (IDC-D)	=	0	0	0.0
Integrated Waste Mngmt Acct (AB 1220) -- (IWMA)	=	1,605,923	655,638	40.8
Proposition 50 -- (PROP 50)	=	318,688	141,391	44.4
Proposition 40/2002 -- (PROP40)	=	203,195	160,463	79.0
Aerojet Gen Corp Oversight of Cleanup -- (R(AEROJET))	=	186,429	44,085	23.7
Basin Plan Amendments - Drinking Water -- (R(BASIN-DW))	=	242,236	85,804	35.4
DTSC Brownfield Coordination -- (R(BROWNFIELDS))	=	22,709	5,539	24.4
CALFED Cooperative Program -- (R(CALFED))	=	939,770	175,775	18.7
Redevelopment Agency Reimbursements -- (R(REDEVEL))	=	12,258	333	2.7
R (Dept of Defense Cleanup Oversight) -- (R(SLCDOD))	=	968,166	373,030	38.5
Westley and Tracy Tire Facilities -- (R(WESTLEY))	=	295,833	2,900	1.0
Surface Impoundment Assessment Account -- (SIAA)	=	183,245	72,540	39.6
State/Federal Revolving Fund-Federal -- (SRFFED)	=	11,289	0	0.0
Tobacco Tax -- (TBT)	=	146,915	76,731	52.2
Underground Storage Tank Cleanup Fund -- (UTSCF)	=	2,408,950	954,749	39.6
Waste Discharge Permit Fund -- (WDPF)	=	13,443,531	5,211,825	38.8
Water Rights Fund -- (WRF)	=	0	13,032	0.0
TOTAL		33,320,554	12,607,213	37.8 %

Supplement to Executive Officer's Report
26 January 2006

1. ***Hilmar Cheese Administrative Civil Liability Complaint Settlement Negotiation Update***
   The parties are negotiating toward a revised settlement agreement, consistent with the Board's direction on November 29, 2005, and intend to bring a revised settlement agreement to the Board for consideration at its March Board meeting.

2. ***Tehama Market Associates, LLC, Administrative Civil Liability Complaint, Butte County***
   The Executive Officer issued a $100,000 Complaint to Tehama Market Associates for stormwater construction violations at the Linkside Place Subdivision development near Oroville.

3. ***New Year's Storm Spill Update***
   Attached is a spreadsheet providing an update on spills related to the New Year's storms

4. ***Future Board Activities***

The following are significant Board meeting actions anticipated for the next few months. This is not a complete listing of all Board meeting items. This listing is tentative and subject to change for many reasons. The listing is intended to give a longer-range view of planned Regional Board activities.

January 31, 2006 – Joint State Board/Central Valley Region Salinity Workshop

February 8, 2006 – Staff Workshop on San Joaquin River Salt and Boron Standards Upstream of Vernalis, Modesto

March 2006 Board Meeting

- Basin Plan Triennial Review
- Irrigated Lands De Minimis Waiver Information Item
- City of Tracy NPDES Permit
- Hilmar Cheese ACL Settlement Proposal
- Stanislaus County Reuse of Solid Food Processing Waste Waiver

May 2006 Board Meeting

- Irrigated Lands Waivers Renewal Workshop
- Clear Lake Nutrient TMDL Workshop

Waste Discharge Requirements Under Consideration

- Aerojet General Corporation, Sacramento Facility
- Alturas WWTP
- Atwater WWTP
- Barrel 10 Winery, San Joaquin County

- Bell Carter Olive Company Inc
- Biggs WWTP
- Brentwood WWTP
- Burney Forest Products, Burney Sawmill/Cogeneration
- Ca Dept Of Corrections-Jamestown Sierra Conservation Ctr-WWTP-2
- California Milk Producers, Inc., Tipton Plant
- Calmat Of Central California, Sanger Plant
- Canada Cove L.P., French Camp Golf & RV Park
- Cedar Ridge, Amador County
- Chevron Texaco Inc., Produced Water Reclamation Project
- City of Angles WWTP,
- Clear Creek CSD WTP
- Clovis WWTP
- Colfax STP
- Copper River Ranch
- Cutler-Orosi Joint WWTP
- Dark Horse WWTP, Nevada County
- Dunsmuir STP
- Euhlers Estate Winery, San Joaquin County
- French Camp Recreational Vehicle Park, San Joaquin County
- Galt WWTP
- Glenn Oaks Mobile Home Park, Placer County
- Grizzly Lake Resort Imp Dist, Dellecker WWTP
- Grizzly Ranch WWTP
- Hidden Valley Sand & Gravel, Lake County
- Indian Springs School District Geothermal Project
- Jackson WWTP
- Kinder Morgan Energy Partners, LP, Elmira Remediation Project
- Kinder Morgan Energy Partners, LP, Fox Rd Pipeline Release Site
- Klondike California Mining Corp, Klondike, Dutch & Telegraph
- Linda County Water District Wastewater Treatment Plant
- Lodi White Slough Water Pollution Control Plant
- Los Banos Milk Processing Facility
- Malaga CWD
- Manteca Pretreatment Program Approval, San Joaquin County
- Mariposa PUD WWTP
- Mirant Delta LLC, Contra Costa Power Plant
- Modesto WQCF
- New Chaparral Petroleum, Inc., Poso Creek Oil Field
- Oxy USA, Inc , Kern Front Field
- Pace Diversified Corporation, McVan Area, Poso Creek Oil Field
- Placer Co Facility Services 1 SMD No 3 WWTP
- Plumas County, Lake Davis WTP
- Port of Stockton Dredging WQ Certification, San Joaquin County
- Rio Vista WWTP
- Roseville Dry Creek Wastewater Treatment Plant

- Roseville Pleasant Grove Wastewater Treatment Plant
- Sacramento Co DPW-Goethe Rd Kiefer Landfill GW Treatment
- Sacramento Regional WWTP
- Saddle Creek Golf Course
- Secor International Inc., Purity Oil Sales Site
- Shasta Lake WWTP
- Sierra Pacific Industries, Sierra Pacific, Burney Division
- Steele Canyon Landfill, Napa County
- Stockton Cogeneration Facility
- Tricor Refining LLC, Oildale Refinery
- Tuolumne UD/Jamestown WWTP
- Turlock WWTP
- UC Davis Aquatic Center/Animal Science
- US Dept Of Agriculture, UCD Aquatic Weed Laboratory
- Vacaville Easterly Sewage Treatment Plant
- Valley Waste Disposal Co., Cawelo Reservoir
- Visalia WWTP
- Williams WWTP
- Willows WWTP
- Yuba City WWTP

Wastewater Collection and Treatment Facility Spill Summary

General Information						Notice/Reporting			Nature of Spill					Follow up				
															If No	If Yes		
County	Spill Date	Agency	Facility	RB Office	Sr.	Notify RB in 24 hrs?	Notify OES?[1]	Submit Written Spill Report?[2]	Waste Type	Total Volume Spilled (gallons)	Duration of Spill (hours)	Discharged to	Reason for Spill	**Follow up?**	Rationale	Description	Rationale	Timeline
Alpine	1/1/06	Bear Valley Water District		S	MRL	Yes	Yes	Yes	Raw sewage	200,000	~24	Bloods Creek						
Amador	12/31/05	Jackson, City of	Collection system	S	RPM	Yes	Yes	Yes	Raw sewage	?	?	Jackson Creek		No	Cannot trace/confirm			
El Dorado	1/3/06	El Dorado Irrigation District	Deer Creek collection system	S	RPM	Yes	Yes	Yes	Raw sewage	4,200	2.5	Deer Creek	Excessive rain uncovered a manhole	Yes		13267 to determine storm return frequency	Need more information to determine appropriate response	
El Dorado	12/31/05	El Dorado Irrigation District	El Dorado Hills WWTP	S	RPM	Yes	Yes	Yes	Groundwater, filter backwash, rainwater, possibly some secondary effluent	5.3 million	17	Carson Creek	Pond overflowed	Yes		13267 to determine storm return frequency and protection of pond from flooding	Was this or was this not a 100-year storm event? Was appropriate flood protection provided?	
El Dorado	1/1/06	El Dorado Irrigation District	Deer Creek collection system	S	RPM	Yes	Yes	Yes	Raw sewage	10,800		Deer Creek	Log knocked off a manhole causing a release	No	Probably outside discharger's control			
El Dorado	12/31/05	El Dorado Irrigation District	Collection system	S	RPM	Yes	Yes	Yes	Raw sewage			Deer, Webber and New York Creeks	Storm caused lift stations to spill	Yes		13267 to determine storm return frequency and design capacity of system	Was this or was this not a 100-year storm event?	
El Dorado	12/31/05	Placerville, City of	Hangtown Creek WWTP	S	RPM	Yes	Yes		Tertiary plus secondary			Hangtown Creek	Heavy rains in previous 24 hrs	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
El Dorado	12/31/05	Placerville, City of	Hangtown Creek WWTP	S	RPM	Yes	Yes		Raw sewage/ primary		12	Hangtown Creek	Heavy rains in previous 24 hrs	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	

Wastewater Collection and Treatment Facility Spill Summary

General Information						Notice/Reporting			Nature of Spill					Follow up				
															If No	If Yes		
County	Spill Date	Agency	Facility	RB Office	Sr.	Notify RB in 24 hrs?	Notify OES?[1]	Submit Written Spill Report?[2]	Waste Type	Total Volume Spilled (gallons)	Duration of Spill (hours)	Discharged to	Reason for Spill	**Follow up?**	Rationale	Description	Rationale	Timeline
Fresno	1/3/06	Southern CA Edison	Big Creek Powerhouse No. 1 WWTF	F	WDH	Yes	Yes	Yes	Secondary, undisinfected wastewater	5,400	10	Big Creek	Rainfall overwhelmed collection system	No	SCE has an emergency plan to haul excess wastewater offsite and responded appropriately. Plan implementation was overwhelmed by record rainfall (9.5 + in.), overturned truck, and landslide.			
Kern	1/1/06	City of Tehachapi	City of Tehachapi WWTF	F	DKP	Yes	NA	Yes	Raw sewage	0		Contained	Surge in flow caused bypass of primary clarifier. No wastewater was actually spilled.	No	All wastewater was contained			
Lake	12/31/05	City of Lakeport	Municipal Sewer Dist. No. 1	S	MRL	Yes	Yes	TBD	Raw sewage	500		Culvert leading to Clear Lake						
Lake	12/31/05	Clearlake Oaks County Water and Sanitation Dist.		S	MRL	Yes	Yes	TBD	Raw sewage	100		Clear Lake						
Lake	12/31/05	Lake County Sanitation District	Southeast WWTF	S	MRL	Yes	Yes	Yes	Raw sewage	5,500		Channel leading to Clear Lake						
Lake	12/31/05	Lake County Sanitation District	Southeast WWTF	S	MRL	Yes	Yes	Yes	Raw sewage	9,000		Streets to storm drains leading to Clear Lake						

Wastewater Collection and Treatment Facility Spill Summary

General Information						Notice/Reporting			Nature of Spill					Follow up				
															If No	If Yes		
County	Spill Date	Agency	Facility	RB Office	Sr.	Notify RB in 24 hrs?	Notify OES?[1]	Submit Written Spill Report?[2]	Waste Type	Total Volume Spilled (gallons)	Duration of Spill (hours)	Discharged to	Reason for Spill	**Follow up?**	Rationale	Description	Rationale	Timeline
Lake	12/31/05	Lake County Sanitation District	Northwest WWTF	S	MRL	Yes	Yes	Yes	Raw sewage	5,500		Clear Lake						
Lake	1/1/06	Lake County	Eastlake Landfill	S	SER	No	No	Yes	Leachate	UNK	~ 3 days	Molesworth Creek	Seepage through cover	Yes		Evaluating measures discharger has undertaken		
Nevada	1/1/06	Donner Summit PUD	WWTP	S	RPM	No	No		Filtered and unfiltered wastewater	UNK	18	South Yuba River	Heavy rains in previous 24 hrs	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Nevada	12/31/05	Grass Valley, City of	WWTP	S	RPM	Yes	Yes	Yes	Raw sewage	1 million		Wolf Creek	Primary clarifiers were overwhelmed by flows and overflowed.	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Nevada	12/27/05	Nevada County SD	Cascade Shores WWTP	S	RPM	No	No	Yes	Filtered and unfiltered secondary	48,000		Gas Canyon Creek	Filter capacity insufficient for flows received; heavy rains; I/I	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Nevada	12/28/05	Nevada County SD	Cascade Shores WWTP	S	RPM	No	No	Yes	Filtered and unfiltered secondary	48,000		Gas Canyon Creek	Filter capacity insufficient for flows received; heavy rains; I/I	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Nevada	12/29/05	Nevada County SD	Cascade Shores WWTP	S	RPM	No	No	Yes	Filtered and unfiltered secondary	59,000		Gas Canyon Creek	Filter capacity insufficient for flows received; heavy rains; I/I	Yes		13267 to determine storm return frequency.	Was this or was this not a 100-year storm event?	
Nevada	12/30/05	Nevada County SD	Cascade Shores WWTP	S	RPM	No	No	Yes	Filtered and unfiltered secondary	59,000		Gas Canyon Creek	Filter capacity insufficient for flows received; heavy rains; I/I	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Nevada	12/31/05	Nevada County SD	Cascade Shores WWTP	S	RPM	No	No	Yes	Filtered and unfiltered secondary	44,000		Gas Canyon Creek	Filter capacity insufficient for flows received; heavy rains; I/I	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	

Wastewater Collection and Treatment Facility Spill Summary

General Information						Notice/Reporting			Nature of Spill					Follow up				
															If No	If Yes		
County	Spill Date	Agency	Facility	RB Office	Sr.	Notify RB in 24 hrs?	Notify OES?[1]	Submit Written Spill Report?[2]	Waste Type	Total Volume Spilled (gallons)	Duration of Spill (hours)	Discharged to	Reason for Spill	**Follow up?**	Rationale	Description	Rationale	Timeline
Nevada	12/31/05	Nevada County SD	Lake Wildwood WWTP	S	RPM	Yes	Yes	Yes	Secondary, disinfected	120,000	4	Deer Creek	Heavy rains in previous 24 hrs	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Nevada		Nevada County SD	Lake Wildwood Collection System	S	RPM	Yes	Yes	Yes	Raw sewage	3,000		Little Deer Creek	Grease and debris blocked a sewer main in storm	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Placer		Placer County	Sewer Maintenance Dist. No. 3	S	RPM	Yes	Yes	Yes	Sludge, unfiltered secondary	UNK	12.5	Miner's Ravine	Heavy rains in previous 24 hrs	Yes		13267 to determine flood protection provided, and to determine storm return frequency and flood stage	Permit requires facilities to be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.	
Placer	12/31/05	Placer County	Sewer Maintenance Dist. No. 1	S	RPM	Yes	Yes	Yes	Primary (filtered and unfiltered) and secondary (filtered and unfiltered)	13,500	1.5	Rock Creek	Heavy rains in previous 24 hrs	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Placer	12/31/05	Auburn, City of	WWTP	S	RPM	Yes	Yes	Yes	Tertiary plus filtered, disinfected primary	14.93 million	140	Auburn Ravine		Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Placer	12/31/05	Auburn, City of	collection system; manhole near WWTP entrance	S	RPM	Yes	Yes	Yes	Raw sewage	68,400	9.5	Auburn Ravine		Yes		Discharger plans to isolate manhole to determine if blockage exists		
Placer	12/31/05	Auburn, City of	collection system; 588 High Street	S	RPM	Yes	Yes	Yes	Raw sewage	2,400	2	Storm drain to Auburn Ravine?	Blockage in line removed; spill cleanup infeasible due to 'deluge'	No				

Wastewater Collection and Treatment Facility Spill Summary

General Information						Notice/Reporting			Nature of Spill					Follow up				
															If No	If Yes		
County	Spill Date	Agency	Facility	RB Office	Sr.	Notify RB in 24 hrs?	Notify OES?[1]	Submit Written Spill Report?[2]	Waste Type	Total Volume Spilled (gallons)	Duration of Spill (hours)	Discharged to	Reason for Spill	**Follow up?**	Rationale	Description	Rationale	Timeline
Placer	12/31/05	City of Roseville		S	RPM	Yes	Yes	Yes	Raw sewage	3.8 million	10	Dry Creek	Surcharging of collection system due to flooding	Yes		13267 to determine flood protection provided, and to determine storm return frequency and flood stage	Permit requires facilities to be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency	
Placer	1/4/06	City of Roseville		S	RPM	No	Yes		Raw sewage	UNK	>48	Dry Creek	Discovered after flood waters receeded	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Placer	12/31/05	Placer County	Applegate WWTF	S	MRL				Raw sewage	1,000		Spill was contained						
Sacramento	12/31/05	City of Folsom	Manhole	S	PHL	Yes	Yes	Yes	Raw sewage	1,000		Spill was contained	Manhole overflow	No	Small spill			
Sacramento	12/31/05	City of Galt	Manhole	S	PHL	Yes	Yes	No	Raw sewage	<1,000			Manhole overflow	No	Small spill			
Sacramento	12/31/05-1/2/06	Sacramento County CSD-1	Walnut Grove	S	PHL	Yes	Yes	Yes	Raw sewage	250,000	48+	Unnamed	Manhole overflow	Yes		Inspected		
Sacramento	12/31/05	Sacramento County CSD-1	Manger Way	S	PHL	Yes	Yes	Yes	Raw sewage	>1,000	>7	Storm drain	Manhole overflow	Yes		Inspected 1/5/06		
Sacramento	12/31/05	Sacramento County CSD-1	Linda Creek Ct	S	PHL	Yes	Yes	Yes	Raw sewage	>1,000	>6	Drainage ditch	Manhole overflow	Yes		Inspected 1/5/06		
Sacramento	12/31/05	Sacramento County CSD-1	Fruitridge Rd	S	PHL	Yes	Yes	Yes	Raw sewage	560,000	>12	Drainage ditch, street, property	Manhole overflow	Yes		Inspected 1/5/06		
Sacramento	12/31/05	Sacramento Regional County Sanitation Dist.	Mira del Rio Station N-16	S	PHL	Yes	Yes	Yes	Raw sewage	15 million		Street, homes, American River	Manhole overflow	Yes		Inspected 1/5/06		
Sacramento	12/31/05-1/3/06	Sacramento Regional County Sanitation Dist.	SRCSD WWTF	S	PHL	Yes	Yes	Yes	Chlorinated secondary effluent	1 million		Laguna Creek	Line breakage	Yes		Inspected 1/5/06		

Wastewater Collection and Treatment Facility Spill Summary

General Information						Notice/Reporting			Nature of Spill					Follow up				
															If No	If Yes		
County	Spill Date	Agency	Facility	RB Office	Sr.	Notify RB in 24 hrs?	Notify OES?[1]	Submit Written Spill Report?[2]	Waste Type	Total Volume Spilled (gallons)	Duration of Spill (hours)	Discharged to	Reason for Spill	**Follow up?**	Rationale	Description	Rationale	Timeline
Sacramento	12/31/05	Sacramento Regional County Sanitation Dist.	Elk Grove/Florin Road	S	PHL	Yes	Yes	Yes	Raw sewage	650,000		Drainage channel	Manhole overflow	Yes		Inspected 1/5/06		
Sacramento	12/31/05	Sacramento Regional County Sanitation Dist.	Kilgore/ Sunrise Site	S	PHL	Yes	Yes	Yes	Raw sewage	700,000		Contained on construction site	Failed plugs	Yes		Inspected 1/6/06		
Sacramento	12/31/05	Sacramento Regional County Sanitation Dist.	Bradshaw 6B Project	S	PHL	Yes	Yes	Yes	Raw sewage	<10,000		Contained on construction site	Failed plugs	Yes		Inspected 1/6/06		
Sacramento	12/31/05	City of Sacramento		S	PHL	Yes	Yes		Combined wastewater	46,000		Street	Excess storm flow	No				
Sacramento	12/31/05	City of Sacramento		S	PHL	Yes	Yes		Combined wastewater	1,500		Street	Excess storm flow	No				
San Joaquin		City of Ripon	Industrial sewer disposal fields	S	MRL	Yes		Yes				Industrial disposal field inundated due to rising river levels on the Stanislaus River						
Shasta	1/3/2006	City of Redding	Clear Creek WWTP	R	BJS	Yes		Yes	Partially treated and diluted wastewater	20 million per day at worst	3-5 days	Sacramento River and small tributary creeks	Excess I/I due to storm intensity and duration. May be other Discharger contributing factors	Yes		Inspected WWTP and collection system overflow sites; waiting on WQ samples of effluent and receiving water; requested data on contributing factors	Other local WWTPs did not have same degree of problem	
Sierra	12/31/05	City of Loyalton		S	MRL	Yes	Yes	TBD	Raw sewage/ rain water mix	4000		Smithneck Creek						

Wastewater Collection and Treatment Facility Spill Summary

General Information						Notice/Reporting			Nature of Spill					Follow up				
															If No	If Yes		
County	Spill Date	Agency	Facility	RB Office	Sr.	Notify RB in 24 hrs?	Notify OES?[1]	Submit Written Spill Report?[2]	Waste Type	Total Volume Spilled (gallons)	Duration of Spill (hours)	Discharged to	Reason for Spill	**Follow up?**	Rationale	Description	Rationale	Timeline
Sierra	12/31/05	City of Loyalton		S	MRL	Yes	Yes	TBD	Secondary treated wastewater mixed with stormwater/ groundwater	4 million		Smithneck Creek						
Sutter		Yuba City, City of	WWTF	S	RPM	Yes	NA	NA	Reportedly empty disposal ponds were overtopped by Feather River	NA		Feather River	Inundation of disposal ponds inside levee	No	Addressed through permitting process - permit requires closure of ponds within floodplain			
Yuba	1/3/06	City of Wheatland	WWTF	S	MRL	No	Yes		Wastewater mixed with river water	270,000	15	Bear River	Bear River toppled levee and spilled onto infiltration beds					
Yuba		Linda County Water District	WWTF	S	RPM	No	No	No	Secondary treated wastewater	UNK		Feather River	River level rose and inundanted ponds	No	Addressed through permitting process - proposed permit renewal requires closure of ponds within floodplain			
Yuba	12/31/05	City of Marysville		S	MRL	Yes	Yes	Yes	Wastewater mixed with river water			Feather River						

[1] The "reportable quantity" for notification of OES is 1000 gallons (CWC section 13271 and 23 CCR section 2250). This field is not applicable for spills of less than 1000 gallons.

[2] Spill report due in 5 days for NPDES Program; spill report due in 14 days for WDR Program.

NA = Not applicable TBD = To be determined UNK = Unknown at this time

Executive Summary

This plan outlines a conservation-reuse-recharge element for implementation concurrent with the Los Osos Wastewater Project (LOWWP) that will enable the County of San Luis Obispo to address the Level III of Severity water shortage, stop seawater intrusion, and balance the Los Osos Valley Water Basin shortly after start up of the project.

To achieve this goal—vital to the coastal ecosystems, the people, and the economies of the area—the plan applies a sustainable development approach, using green and appropriate technologies, in a manner that maximizes water-use efficiency, the beneficial uses of water sources, and the natural rainwater recharge of the Los Osos water basin.

By focusing on water-use efficiency, water quality improvement, and environmental stewardship—the plan aligns with the California Water Plan and the missions of key environmental agencies, organizations, and programs, including the state and local water boards, the Sierra Club, Surfrider Foundation, and the National Estuary Program. As a result, it optimizes grant opportunities offered by these agencies and groups. Further, it provides the most cost-effective and reliable option for achieving basin sustainability.

The plan achieves its goals in two phases: First it calls for a retrofit and leak repair program to begin immediately that applies the latest high-efficiency fixtures and appliances, targeting a 25% reduction in indoor residential water use. This is combined with an outdoor residential conservation-reuse program using xeriscape, graywater reuse, and/or rainwater harvesting, targeting a 50% reduction in potable outdoor water use. To promote water use awareness and program effectiveness, the first phase provides a professional water auditor to explain the program to homeowners and identify the most cost-effective, site-specific strategies. The plan also allows a portion of Phase I funding to go to non-residential strategies if they produce greater benefits.

The plan's second phase, calls for an ag exchange and urban reuse program implemented when the project goes on line to reduce pumping of the aquifers and pollution of the Los Osos watershed and Morro Bay National Estuary from nitrate fertilizer use.

The plan's first and second phases provide multiple benefits. In addition to reducing seawater intrusion, the first phase recharges the aquifers with clean rainwater, reduces energy use related to water and wastewater pumping, prevents stormwater pollution of Morro Bay Estuary, supplies aquatic and terrestrial ecosystems with freshwater flows, supports local businesses, and provides attractive landscaping features within the community. The second phase ensures Los Osos remains independent of imported water, and the basin stays healthy long-term.

The seawater intrusion mitigation benefits of this plan and its costs are as follows:

<u>Phase I (conservation-onsite reuse-aquifer recharge)</u>
Seawater intrusion mitigation=261 AFY (.55 x 474 AFY) ***Cost*=$9.6 million**
<u>Phase II (ag exchange and urban reuse)</u>
Seawater intrusion mitigation = 395 AFY (.55 x 718 AFY) ***Cost*=$3-4 million**
<u>Total</u> *Seawater intrusion mitigation* = 656 AFY (.55 x 1192 AFY) ***Cost=$12.6-13.6 million***

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The costs of the plan would be shared among water users in the basin, with about one-third going to Prohibition Zone residents. Additionally, costs would be reduced by grant funding, rebates, impact fees (for future development) and a reduction in the size, energy use, and related costs of the LOWWP—potentially covering the entire cost of the plan (see "Potential for Cost Reductions").

The LOWWP *Fine Screening Report* estimates the mitigation needed to stop seawater intrusion with implementation of the project is 550 AFY (Carollo Engineers, p. 2-3). This plan achieves that with a margin of safety. Thus, it builds water reserves and system resiliency in preparation for climate change impacts. The Governor's Executive Order S-13-80, signed November 14, 2008, requires project planning to account for the impacts of climate change, recognizing the particular threat sea level rises pose for coastal communities (see http://gov.ca.gov/executive-order/11036/). This plan prepares for those impacts.

Preserving the Los Osos Valley Water Basin long-term requires immediate and concerted action (see Appendix J for the progress of seawater intrusion). This plan offers a cost-effective way to halt seawater intrusion and begin preparing for the future, saving an invaluable resource for this and future generations, while setting a standard for sustainable development in the state and nation. The opportunity should not be wasted.

Introduction

The Los Osos Wastewater Project (LOWWP) affords a unique opportunity to address the Level of Severity III water shortage in the Los Osos Valley Water Basin—through an integrated planning approach that addresses water, wastewater, and stormwater all at once. Virtually all authorities and agencies in the fields of water basin management, environmental protection, and sustainable development emphasize the need for integrated, whole-systems planning to achieve sustainable watersheds and long-term water supplies.

Currently, basin recharge at Broderson (448 AFY) represents the entire reuse plan for the project, while basin planning is proceeding in a separate basin planning process, involving area water purveyors and the County. Meanwhile, most of the recycled water from the project is slated to be disposed of in spray fields outside of the basin, and the project's planned conservation element targets a 10% reduction, far under what is achievable with current water-saving technologies.

This plan offers an integrated solution that ensures seawater intrusion will stop within a few years of start up of the LOWWP. Consistent with sustainable development guidelines, it achieves this vital goal by applying appropriate technologies, green, and low impact development (LID) strategies in ways that maximize their benefits for the environment, the community of Los Osos, and the economy of the region. The plan also emphasizes the California Water Plan's three Foundational Actions for achieving sustainable water supplies: 1) Use water efficiently, 2) Protect water quality, and 3) Support environmental stewardship (CDWR, 2005 & 2008)

Calling for an integrated conservation-onsite reuse-recharge element as a first phase to start immediately, and an ag exchange-urban reuse element to begin when the LOWWP goes on line; it provides the most efficient and cost-effective way available to halt seawater intrusion.

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Development of the LOWWP represents a unique opportunity to preserve the Los Osos Valley Water Basin, while making Los Osos a model of 21st Century sustainable watershed planning. Given the increasingly severe water shortages in California and worldwide, this opportunity must be optimized.

Current Water Use

This plan assumes daily indoor water use in the Prohibition Zone is 60 gallons per capita per day (gpcd). The estimate is lower than the per capita daily use assumed in the LOWWP *Fine Screening Report* and *Technical Memorandum: Flow and Loadings* (66 AFY gpcd), but it is consistent with the 2002 landmark study on California water use, *Waste Not, Want Not*, as well as studies done for the USEPA in 2003 and 2004 (Gleick et al., Mayer, et al.). Furthermore, the *Fine Screening Report* and TM estimates are based on Los Osos Community Services District (LOCSD) monthly charges, which include non-residential users.

The 60 gpcd figure reflects a conservative estimate for two reasons: 1) The 2002 LOCSD *Master Water Plan* estimate 14, 233 for the Prohibition Zone (used in the plan) most likely overstates the actual population of Los Osos (Note: The 2000 Census showed a total population for Los Osos of 14, 351. The Prohibition Zone represents less than 90% of the population of Los Osos, and a building moratorium has been in place since the census.); and 2) this plan intentionally chooses a low domestic water use figure, relative to the *Fine Screening Report's*, to avoid overestimating water savings and seawater mitigation benefits. If actual water use proves to be higher, this plan achieves greater benefits.

Based on studies of other coastal communities, this plan assumes outdoor use is about one-half of indoor use or one-third (33%) of total usage (30 gpcd), and based on the 2007 *Resource Capacity Study* for the basin, the plan assumes non-residential use in the Prohibition Zone is between 400 and 600 AFY (Gleick et al., SLO). (Note: The estimated total Prohibition Zone water use of 2000 AFY may not reflect the latest water use and/or may include relatively high amounts of leakage from the system. The LOCSD has been repairing leaks in the utility-owned distribution lines; leaks may now be concentrated onsite.)

Prohibition Zone Water Use

Indoor residential = 957 AFY (60 gpcd x 14, 233)
Outdoor residential = 479 AFY (30 gpcd x 14, 233)
Total residential = 1436 AFY
Class II (non-residential) = between 400 and 600 AFY
Total= approximately 2000 AFY (SLO)

Water Use Targets

Residential Indoor Targets

Gleick el al., in *Waste Not, Want Not*, estimate average water use per capita in California can be reduced from 60 gpcd to 37 gpcd without inconveniencing water customers. This is achieved by retrofitting homes with indoor water-saving fixtures and appliances (water-efficient toilets, washers, dishwashers, shower heads and faucets), while also fixing leaks (Gleick et al.). The studies done for the USEPA by Mayer et al. confirm indoor retrofits will cost-effectively reduce water use to around 40 gpcd, with homeowners giving high approval ratings to newly-installed fixtures (2003, 2004).

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Since the Gleick and Mayer studies, high-efficiency fixtures have become even more water efficient, with consumer satisfaction seeing similar gains (Gauley, Veritec & Keoller). The Mayer et al. studies used ultra low-flow (ULF) toilets averaging about 1.5 gallons per flush (gpf); whereas, high-efficiency toilets (HETs) today use under 1.28 gpf. At least one toilet on the market (the one recommended in this plan), a Caroma Smart 305 dual-flush, uses of about 1 gpf on average (.8 gpf/1.28 gpf) (http://www.caromausa.com/smartRFP, EPA *Water Sense*).

Substituting the Caroma Smart toilets for toilets used in the Mayer et al. studies reduces total water use with conservation to under 40 gpcd (assumes the established average of about five flushes per day per person) (USEPA *Water Sense*). If high-efficiency clothes washers are excluded (because they're not included in this plan's basic retrofit package), average use is still under 45 gpcd (Mayer et al., 2003 & 2004). Thus, this plan sets a target of 45 gpcd, without high-efficiency washers.

To ensure the target is achievable the plan provides funds for 100% implementation within the Prohibition Zone (100% saturation), while allowing for less than full homeowner participation. It does this by 1) recommending money is allocated where it will do the most good, 2) enabling some homeowners to exceed targets, and 3) providing the services of a water auditor to promote the program and strategically apply strategies.

The plan's basic retrofit package includes two HETs, low-flow showerheads, faucet aerators, leak repairs, and auditing services; however, homeowners could also chose from a supplemental package of hotwater recirculators, high-efficiency washers, and/or toilet-lid sinks, if these achieved greater savings. Retrofit funding schedules and distribution policies would be determined on the basis of water savings potential.

Homeowners, working with water auditors, would decide how funding is best used once a basic level of water savings is achieved (i.e., high-use toilets are replaced and leaks are repaired). For instance, homeowners with 1.6 gpf toilets might decide to keep them, applying funding—allocated on the basis of potential water savings—to other options (e.g., hotwater recirculators or high-efficiency washers). Customers who can achieve the greatest water savings per capita (e.g., large families currently using a low-efficiency washers) would receive the largest funding incentives to reduce water use..

The plan also allows for funding to be allocated as rebates (or incentives) if greater savings can be achieved. Further, the plan recommends a tiered rate structure and a local conservation and/or landscape ordinance implemented concurrently with the plan. Rebates and ordinances can potentially reduce per capita use to an average of 40 gallons per day within the Prohibition Zone, exceeding plan targets and/or reducing allocated funding.

Residential Outdoor Targets

The plan's outdoor potable water use target (an average of 15 gpcd, down from 30 gpcd) is achieved through xeriscape, graywater reuse, and rainwater harvesting strategies. Gleick et al. indicate xeriscape can reduce water use up to 80% with plant selection and up to 50% with installation of drip systems, while rainwater and/or graywater systems can eliminate potable use altogether (pp. 71 & 73). Since rainwater and graywater recycling systems provide a new outdoor water source, they can allow total outdoor use to remain at, or near, current levels.

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Residential Potable Water Use Reduction Targets

Indoor reduction 25% (from 60 gpcd to 45 gpcd average)
Outdoor reduction 50% (from 30 gpcd to 15 gpcd average)
Total reduction 33% (from 90 gpcd to 60 gpcd average)

Class II and Community Option

Finally, the plan allows for a portion of the funding for outdoor strategies to go to Class II (commercial/institutional/industrial) uses within the Prohibition Zone and/or to neighborhood rainwater harvesting, LID, and other reuse strategies—if they produce greater benefits. Upon closer examination of water use patterns (e.g., with water audits), it may be determined funding is best spent using green and appropriate technologies and strategies at schools and businesses, or in community rights of way and open spaces. If so, money can be directed to these sites (see "Class II Applications and Community Rainwater Harvesting").

Plan Description and Costs

Residential Indoor Strategies

***Water auditor*:** The services of a professional water auditor are provided to help homeowners understand the program (including the need for it), assess inefficient water use, and identify the best onsite strategies for achieving plan goals. In a recent phone conversation, Jamie Lean, Conservation Manager with the Atascadero Mutual Water Company, indicated that studies consistently show water auditing services reduce total water use in a community by 20%. She related that auditors for the Atascadero water company check both indoor and outdoors uses, often correcting problems at the time of the visit (e.g., replacing emitters in drip irrigation lines). While the auditors usually identify ways customers can significantly reduce water use, Jamie believes their most important function is customer relations. She says homeowners appreciate the personal service they receive, often don't realize they're wasting water, and are happy to make changes to benefit the community and environment. An important role of the auditors with this plan would be to convey the seriousness of seawater intrusion and the benefits of stopping it in the near future. Jamie estimates the average cost for a routine audit is about $150, which covers the company's costs for the auditor's time, training and other expenses. Auditors can typically complete about five audits per day on smaller properties (phone conversations, October 23 and December 8, 2008).

Leak Repair*s:* The Gleick et al. and other studies (e.g., the AWWARF study, 1999; Mayer et al. 2003 & 2004) point out that most leaks can be fixed relatively inexpensively by adjusting fixtures, appliances, and connections rather than replacing them. They also note that the majority of leaks occur in toilets (replaced in this plan), while leaks tend to be concentrated in a relatively small percentage of homes (AWWARF, Gleick, et al.). For these reasons, $100 per home is allocated in the plan, or $480,000 total ($100 x 4800 homes), to be used as needed.

***Indoor retrofits*:** This plan's basic retrofit package (two dual-flush HETs, low-flow shower heads, low-flow faucet aerators, leak repairs, and auditing services) provides the maximum water saving benefits for the money (Gleick, et al., Lean, Mayer et al.). The supplemental package includes hotwater recirculators, front-loading washers, and toilet lid sinks. (Toilet lid sinks are available

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January 2009 for the Caroma 305 Smart toilet, per a phone conversation with John Garza, Caroma representative, November 20, 2008).

Purchased in bulk (i.e., orders of $6000 or more) a Caroma 305 Smart dual-flush toilet costs about $150 (for a round front model) (see Appendix D). This plan assumes the costs of low-flow shower heads and aerators for a typical home are about $50 total, based on the cost of a low-flow showerhead offered through Real Goods at $12 (www.realgoodscatalog.com).

The cost for installing the basic package is about $300, plus $50 for disposal of old toilets (per a conversation with a sales rep at Home Depot in San Luis Obispo. (Note: This is the cost for a retail customer having two toilets installed. It does not include travel costs, assumed to be incidental if installers perform several installations at a time, as proposed in this plan.). Installation of shower heads and aerators is assumed to be done by homeowners or as part of the toilet installation costs. Thus, the total cost of the basic retrofit package for this plan is $1000 ($ 700 for two toilets, low-flow shower heads, and faucet aerators, with installation and old fixture disposal; $150 for auditor services; $100 for leak repair; and a 5% contingency).

Homeowners with 1.6 gpf toilets would be able to install front-loading washers, recirculators, and/or toilet-lid sinks in lieu of toilets to achieve or exceed targets. As with toilets, the latest front-loading washers are more efficient than models used in the Gleick et al. and Mayer et al. studies, i.e., about 18 gallons per load (gpl) for a full-size washer as opposed to 22-24 gpl (per a phone conversation with a sales representative at Idler's Appliances in San Luis Obispo, November 19, 2008).

The cost for a hotwater recirculator is about $200, with professional installation assumed to be about $100, for a total of about $300. The cost for a toilet-lid sink is $89 (plus tax and shipping), and professional installation is not required (www.realgoodscatalog. com). The cost for a high-efficiency washer ranges from about $600 to $1500 (http://shopping.yahoo.com).

Residential Outdoor Strategies

Outdoor strategies include the full range of xeriscape techniques (native and drought tolerant plants, moisture retaining soils and mulches, maintenance and care techniques, drip irrigation and timers, low-flow hose nozzles, etc.). The California Department of Water Resources' (CDWR) "Landscape Water Use Conservation Methods" are provided in Appendix A, any of which can be used for this plan. Strategies also include graywater reuse and two types of rainwater harvesting, with tank storage and with earthworks retention and infiltration systems.

The plan allots an average of $1000 per home for outdoor strategies. Like funding for indoor measures, the money is allocated to achieve the greatest benefits (i.e., an average of 15 gpcd throughout the Prohibition Zone). Because plan allotments for outdoor measures don't cover full costs for several outdoor strategies in this plan, they must be applied as stipends or rebates.

Water auditors (provided as part of the indoor conservation package) will assess outdoor use, recommend strategies, and determine what percentage of the $1000 allotment to offer individuals, based on funding/rebate schedules, developed according to potential water savings.

This plan assumes the vast majority of homeowners in the Prohibition Zone will take advantage of outdoor rebates (also indoor rebates, if implemented) since rebates will be very generous (especially

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with supplemental grant funding). Also, auditors will promote the program as they help homeowners identify effective strategies. Tiered rates and/or ordinances will provide incentives to homeowners, while its cost-effectiveness (e.g., relative to imported water or building desalination plant) should motivate homeowners to participate in the program (see "Implementation").

***Xeriscape*:** The water auditor will be able to help homeowners determine the best xeriscape techniques to use. Assuming a conservative average of two people per home in Los Osos (the 2000 Census indicated 2.4 per household) and reducing outdoor use to 15 gpcd, provides 30 gallons of water per day (210 per week and about 850 per month) for outdoor watering.

Per the 1995 State of California *Graywater Guide* issued by the Californa Department of Water Resources (CDWR), 210 gallons per week will irrigate about 1000 square feet of "low water using" vegetation, 600 square feet of "medium water using" vegetation, and 400 square feet "high water using" vegetation (CDWR). These square footages are measured as plant canopies or total plant coverage; therefore, 1000 square feet of coverage, even 500 square feet, with hardscape (patios) and other landscaping features (e.g., rock gardens), provide adequate vegetation to create attractive yards at most homes in Los Osos. The average-sized lot is 50 feet by 125 feet or 6250 square feet, with the house, garage, and driveway taking up about half. This leaves about 3000 square feet for landscaping; thus, low water-using vegetation would cover about one-third of an average-sized yard, and cover 100% of a smaller lot (e.g., 25 feet wide).

Currently, I use about 75 gallons per week to water my backyard landscaping. I have about 75 plants altogether, about 75% of which are drought tolerant, and I water with a standard drip system. If I double that amount to include my front yard (not yet planted), I'd be using well under 30 gallons per day (210 per week and 850 per month). My lot is average-sized for Los Osos (50' by 125'). Therefore, using a drip line and mostly drought tolerant plants allows the vast majority of Prohibition Zone homeowners to easily meet target reductions.

One of the most intensive uses of outdoor water is turf or lawns. Replanting these with drought-tolerant shrubs or grasses—or removing a portion of them—will greatly reduce outdoor water use (Gleick et al.) The $1000 allotment per home will cover a site design, materials, and possibly some installation, based on the installation estimates for the installation estimates for the integrated xeriscape-rainwater-graywater systems below.

***Graywater Systems**:* While xeriscape reduces outdoor water use, graywater and rainwater systems provide a substitute water source, allowing homeowners to meet plan goals without substantially reducing outdoor use.

According to Barry Tolle, of the San Luis Obispo County Planning Department, two basic systems are permittable in the county: those connecting just to the washing machines and those connecting to all graywater sources (bathroom sinks, tubs, showers and/or showers) (phone conversation, December 8, 2008). Since graywater may contain pathogens, systems are subject to the Uniform Plumbing Code, with enforcement falling to the County (in the case of Los Osos). According to Barry, graywater systems remain legal in the Prohibition Zone despite a zero-discharge designation by the water board.

Basic washer systems will provide between 10 and 30 gallons per day (gpd) for a two-person household (depending on the efficiency of the washer) (Asano et. al., Gleick et al., Mayer et al.).

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Systems connecting to sinks, showers, tubs, and washers will produce over 50 gpd for a two-person household (Asano, et al.; Mayer et al.). Thus, the basic washer system will achieve plan goals (i.e., reduce outdoor potable water use to a 15 gpcd average), and more extensive systems will exceed targets by 200% or more.

Most homeowners in the Prohibition Zone will likely select a washer system over the more extensive systems for several reasons: 1) they're less expensive and easier to install (enabling more homeowners to install the systems themselves), 2) they don't require pumps (reducing costs and allowing more options for where graywater can be applied); and 3) their permits are less expensive and less hassle (i.e., $124 for an over-the-counter process versus about $625 for a process requiring on-site inspection) (conversation with Barry Tolle, December 8, 2008).

One obstacle to a basic washer system is the extensive code requirements for distributing water to landscaping. Barry Tolle explained that irrigation systems require installing a 3" leach line in a trench 96 feet long by one-foot wide, filled to a depth of one-foot with leach field rock (3/4 to 1 ½ inch in diameter). The leach line must be covered with 10 inches of soil, and specific setbacks apply, e.g., 5 feet from property lines, 10 feet from water lines, 10 feet from leach fields, 3 feet from ground water, 8 feet from building foundations, and 100 feet from water courses, streams, creeks, or lakes (Planning@co.slo.ca.us).

"Appendix J" of the "Graywater System Standards"—included as part of the 1995 *Graywater Guide* issued by the California Department of Water Resources (CDWR)—describes a "mini-leachfield" or "irrigation field" (assumed to be the system Barry describes). "Appendix J" sets trench depths at 17 to 18 inches, trench widths at 6 to 18 inches, and maximum allowable grades at three inches per 100 feet. Setback requirements vary slightly from those on the County website, e.g., 50 feet from streams and lakes, 5 feet from on-site domestic water lines, and 8 feet from foundations (2 feet with a water barrier approved by the "Administrative Authority") (CDWR, 1995, pp. 224.8 and 224.9—available at Planning@co.slo.ca.us).

Basic washer systems—with irrigation lines ("mini-leachfields"), permitting, and homeowner installation—are assumed be under $500 (based $40 per yard for 3.5 yards of rock and a conservative doubling of the costs for washer system and mini-leachfield materials in the 1995 *Graywater Guide*) (CDWR). Professional installation is assumed to be around $1000, based on the installation estimates for the integrated xeriscape-rainwater-graywater systems below, for a total cost of about $1500.

The cost for a graywater system connected to bathroom fixtures (plus a washer) is about $1500, including drip system materials, but not including installation or a permit fee (based on a doubling of costs in the 1995 *Graywater Guide)*. A commercially-produced 40-gallon BRAC system with a pump costs about $1900 (http://www.bracsystems.com). Drip system materials are assumed to be about $300 (based on a doubling of the costs in the 1995 *Graywater Guide*) (CDRW). Installation is assumed to be between $1500 and $2500 (based on the costs for installing the xeriscape-rainwater-graywater systems below and the cost to install a BRAC system (see Appendix C). With a permit fee of about $625, the total project costs for the above systems would be between $3600 and $4600 for the non-commercial system and $4300 to $5300 for the commercial system.

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Note on innovative graywater systems: *The code requirements for a washer irrigation field (96 feet of trench, 3.5 yards of rock, numerous setback requirements, etc.) undoubtedly will limit the use of the systems, especially on small lots. At a recent local event sponsored by SLO Greenbuild, Art Ludwig of Oasis Design in Santa Barbara—one of the world's foremost authorities on graywater—highlighted the need to update graywater codes in California to bring them more in line with the codes of states like Arizona, which do not require permits for basic graywater systems as long as they meet basic criteria. Given California's water shortages and high energy demand from water and wastewater pumping, Art's concerns are well taken. Recently the California Legislature enacted SB 1258 (Lowenthal) calling for the relaxing of California's graywater regulations, reinforcing Art's point.*

To offer solutions in the short-term, Art suggested local authorities implement innovative programs and policies to promote graywater use. The Uniform Plumbers Code allows the "Administrative Authority" some discretion in how it implements standards (i.e., Under "Special Provisions"it states…"Other collection and distribution systems may be approved…")(CDWR, 1995, Appendix J, p. 224.8—available at Planning@co.slo.ca.us) Art mentioned a low-cost washer system he'd designed for Santa Barbara County (that, I believe, simplifies and/or reduces some of the requirements above). One suggestion he had is the issuance of blanket permits for a community like Los Osos with serious water shortages. Implementation of a standardized design with blanket permitting should be seriously considered for Los Osos. The LOWWP process offers an excellent opportunity to implement an innovative community-wide water-saving program. The integrated xeriscape-rainwater-graywater concept of Josh Carmichael (below) may be ideally suited for such program (see Appendix I).

Rainwater Harvesting Tank Systems*:* Rainwater tank systems will provide as much irrigation water as desired, limited only by tank capacity. An average roof in Los Osos will provide about 10,000 gallons of water per year with 12 inches of rain (HUD, Lancaster). Los Osos has about 16 inches of rain on average (Yates and Williams). Loomis Tanks, in Arroyo Grande, sells a complete 300-gallon gravity rainwater system for about $800, which can be expanded by adding tank capacity (see Appendix B). A 1500 gallon system from Loomis would cost about $1300 and a 2500 gallon system about $1800. These attach to rain gutter downspouts, and most homeowners would be able to install the systems themselves. A 2000 gallon gravity system installed would cost about $3200, and the same system with a pump would be about $4400 (see Appendix C). Combining a 2000 gallon system with xeriscape would meet plan goals.

Having space for rainwater storage onsite can pose a problem for some homeowners in Los Osos. Several solutions are possible. When homeowners connect to the wastewater system, they may be able to retain existing septic tanks, using them as cisterns for storage (usually 1000 gallon capacity). Homeowners can also have an underground tank installed. A complete rainwater filtering and pumping package for an underground tank is $1699, available through RainHarvest Systems (http://www.rainharvest.com). Also, "pillow" tanks, designed for installation below decks and in crawl spaces under homes, are available, e.g., through Rainwater Collection Solutions Inc. Complete systems cost about $4000, and the company furnishes complete do-it-yourself installation instructions on its website (http://www.rainwaterpillow.com/).

Rainwater Harvesting with Earthworks: In his book *Rainwater Harvesting*, Brad Lancaster provides a complete list of earthworks strategies. Some of these include berms, basins, terraces, swales, and French drains. Earthworks harvesting features are designed to capture, retain, and

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percolate rainwater onsite (2008). Despite the sandy soils in Los Osos, during storms runoff from roofs, driveways, and other impervious surfaces collect and run off properties, often polluting the Estuary. Earthwork features capture the stormwater, optimize its benefits for trees and plants, filter and treat the rainwater via natural processes (e.g., microbial action in the soil) and allow the rainwater to percolate, eventually recharging the aquifers. They can reduce water use in Los Osos by enriching the sandy soil with organic materials (mulch). This promotes rainwater retention and infiltration, slows evaporation, spreads percolation, and ensures more complete water use by plants (Lancaster). Because they help prevent pollution of the Estuary, recharge aquifers, improve groundwater quality, and ensure adequate uncontaminated subsurface freshwater flows to sensitive ecosystems; they are particularly valuable for a Los Osos water basin management plan.

The $1000 allotment for outdoor strategies would cover professional consultation for homeowners, materials (e.g., stones, plants, mulch, and piping), and some installation (based on the Josh Carmicheal estimate for the combined system below). Homeowners would be responsible for the remainder of the installation.

***Integrated Xeriscape-Rainwater-Graywater Systems*:** This plan also recommends a bioswale design that combines xeriscape, rainwater harvesting, and graywater reuse in one feature, to achieve plan goals. Josh Carmichael of Carmichael Environmental has designed earthworks rainwater harvesting features at all scales (onsite and community), which also disperse graywater via a subsurface distribution systems similar to the washer irrigation fields mentioned above (see Appendix I).

Combining all of the outdoor strategies into one well-designed system can save money, time and space. These features add value by supplying an automatic flushing mechanism for the graywater system (periodic flows of rainwater) and a cost-effective alternative for yard restoration after installation of onsite wastewater components. Properly designed and installed, they should be a permittable option for homeowners in Los Osos to address the Level of III severity water shortage and help avoid or mitigate for the impacts of the project.

Josh estimates the systems will cost about $800 for site-specific designs and materials, and another $800 for installation, for a total of about $1600 (conversation, December 11, 2008). The cost of materials and installation for connecting the washer to the system is assumed to be less than $400 (a conservative estimate that doubles the materials price from the 1995 *Graywater Guide*, adding $250 for professional installation) (CDWR).

Summary of Residential Costs (Without Reductions)

Indoor strategies = $1000 per home average or $4.8 million total ($1000 x 4800 homes)
Outdoor strategies = $1000 per home average or $4.8 million total ($1000 x 4800 homes) (To be used as rebates toward full system costs.)
Total for both programs = $2000 per home average or **$9.6 million**

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Class II Applications and Community Rainwater Harvesting
(including an alternative for the Broderson site)

Class II Strategies

This plan allows some of the funding to go for Class II applications (schools, institutions, or industry) if these strategies achieve greater overall benefits. With the high percentage of small lots in the Prohibition Zone, the level of conservation awareness, the widespread use of drought-tolerant plants, and reduced outdoor water use due to the LOCSD tiered rate structure—it is likely many water users in the Prohibition Zone are already meeting plan targets.

Distinguishing between residential and non-residential water use, currently, is difficult based on available data (e.g., LOCSD water use); thus, as water auditors evaluate current use during Phase I of this plan, they may find the most cost-effective approach for improving water use efficiency is retrofitting schools or other non-domestic sites—and/or encouraging xeriscape, graywater reuse, or rainwater harvesting among Class II customers (possibly through rebate programs).

Some non-residential water customers likely use more than 50% of their water out of doors (e.g., schools with large turf areas), while others (restaurants and retail stores) may have very high indoor use (e.g., public restrooms), multiplying the benefits of water-saving retrofits. Gleick et al. found the greatest potential for outdoor water conservation to be among Class II users, while the Association for Water Efficiency (AWE) reports large water savings are possible by retrofitting Class II customers. Furthermore, rebates for Class II users, in many cases, are more generous than for domestic customers, e.g., the $400 per toilet CUWCC rebate (CUWCC).

Community Strategies and Broderson Alternative

Outdoor funding might also be applied to the installation of community rainwater harvesting or LID features, strategically placed in a passive stormwater collection and infiltration system. Rainwater harvesting/LID systems can often be installed at very low cost, producing considerable benefits. Josh Carmichael estimates that a landscaped bioretention system on several blocks of the undeveloped portions of Pismo Street—designed to prevent stormwater run off to the Estuary, infiltrate the rainwater, restore habitat after installation of a section of the wastewater collection system, and provide a community parkway (see Appendix H)—would cost about $10,000 to install (conversation, December 11, 2008).

Brad Lancaster and other authorities emphasize that watershed management and runoff control should start at the top of the watershed where runoff originates. Stopping run off onsite is one way to do this, but stormwater also originates in public rights-of-way and on other public lands. If community/neighborhood systems are constructed to capture overland run off or overflows from onsite systems in key locations during heavy storm events, it may be possible to stop virtually all stormwater pollutants from entering the Estuary.

Well-designed community and neighborhood systems, strategically located and designed to achieve the dual benefits of preventing runoff and maximizing groundwater recharge, will potentially achieve both water quality goals and recharge goals more effectively than any other approach—including the centralized effluent recharge strategy at Broderson (see "Benefits of this Plan over Recharge at

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Broderson"). Furthermore, they can do it much more cost-effectively, as indicated by the Pismo Street plan mentioned above.

If the Broderson site were used as a rainwater recharge site instead of an effluent recharge site, capturing overland runoff from the hills above the site and allowing stormwater to infiltrate and percolate to the groundwater, several goals would be achieved: 1) stormwater runoff would be controlled before it becomes a greater problem downhill, 2) ground water would be recharged with clean rainwater (rather than recycled wastewater containing trace contaminants), 3) the site could be used to mitigate for habitat loss at the Midtown site, 4) the planned replacement of the Broderson leach fields every 5-10 years and resulting habitat destruction would be avoided (Carollo Engineers, 2007, p. 2-24), 5) the high energy costs for pumping recycled water uphill to the Broderson site would be avoided, and 6) the Broderson site would remain community owned (an integral part of a water-wastewater-stormwater project), providing open space, passive recreation opportunities for the community, and a buffer between urban development and surrounding habitat.

This solution for Broderson would be a fraction of the cost for Broderson leach fields (in the tens to hundreds of thousands of dollars, rather than $ 3-5 million), and it would save the $160,000 per year in estimated energy costs, not counting periodic leach field replacement costs and the monitoring wells needed for the project (Carollo, 2007, pp.2-11, 2-12 & Table A1).

A rainwater harvesting system, either a tank or earthworks system (e.g., a constructed wetlands) might also be constructed or installed at the Midtown site to capture and infiltrate runoff from curb-and-gutter neighborhoods above the site. This would beautify the area, create recreational opportunities, increase natural habitat, and help restore the original vision for the site.

Also, the run off that collects on 2nd Street in Baywood could be routed into neighborhood raingardens and/or rainwater harvesting tanks to be infiltrated for groundwater recharge or used by the two inns in the area. Currently, large volumes of stormwater drain into the bay, even in moderate storms, through culverts near the 2nd Street pier. If the rainwater were captured and infiltrated—or used for irrigation at the inns in drier months—both the bay and ground water would significantly benefit.

The 2001 *Los Osos Drainage Feasibility Report* recognized the considerable potential for improving stormwater control and beneficial uses of rainwater in many areas of the community, including the Broderson recharge site. Instead of using the Broderson site for leach fields, it suggested creating a rainwater detention/infiltration basin (Natural Systems International, LLC.).

The *Feasibility Report* provides an excellent analysis and many practical community/neighborhood rainwater harvesting solutions. These community systems, as part of an integrated mitigation approach for the project, would help avoid harm to the basin from removal of septic flows and restore habitat after installation of LOWWP. They would do so cost-effectively, adding value with their many co-benefits. For the price of Broderson leach fields, multiple rainwater harvesting/community green spaces could be constructed, helping to restore the basin's natural hydrology and providing sustainable solutions for recharge of the basin.

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Ag exchange and Urban Reuse

Ag Exchange

This plan calls for ag exchange and urban reuse as a second phase to maximize the benefits of recycled water from the LOWWP. Of these two options, ag exchange will produce the greatest benefits for several reasons: 1) it has the potential to offset more seawater intrusion cost-effectively (Carollo Engineers, January 2008), 2) effluent treatment levels for many agricultural uses are lower than for urban reuse reducing treatment requirements and costs Carollo Engineer, April 2008), and 3) applying nutrient-rich water on ag lands will decrease the use of nitrogen and phosphate fertilizers in the watershed, reducing pollution of groundwater and surface waters (e.g., the Estuary). Ag exchange also reduces the cost of fertilizers for farmers, as well as their energy use for pumping groundwater, providing them strong incentives to participate in the program.

The first phase of this plan reduces wastewater flows through indoor conservation to about 718 AFY (.75 x 957 AFY). When combined with the indoor non-residential use (at least 200 AFY, or half of the most conservative estimate for total non-residential use in the Prohibition Zone), it represents the approximate amount of recycled water available for ag exchange and urban reuse (about 920 AFY). This amount would be reduced by the amount of graywater reuse occurring in the Prohibition Zone because graywater use redirects indoor water outside, decreasing total septic flows. Applying only the recycled water from residential sources (718 AFY), ag exchange mitigates 395 AFY of seawater intrusion (0.55 x 718 AFY). This, combined with the mitigation from the indoor and outdoor strategies above, should completely stop seawater intrusion, with a margin of safety, within a few years of start up of the project (Carollo, 2007; Cleath & Associates, 2005; Ripley; SLO).

The remainder of the 920 AFY of recycled water (about 200 AFY) can be used for urban reuse, an ag project at the treatment site to sequester carbon. It can also be used to allow a very favorable exchange rate for farmers to encourage their participation in the programs. Whether ag exchange occurs inside or outside the basin, it will benefit ground and surface waters by reducing pumping of the aquifers and the use of applied fertilizers in the basin (Ripley).

Present and past basin planning has identified the Creek Compartment (the basin east of Los Osos Creek) as a likely source of potable water to offset lower aquifer pumping in ag exchange programs (e.g., Cleath and Associates, 2005). The LOWWP *Technical Memorandum: Effluent Reuse and Disposal Alternatives* estimates there is a potential to reuse from 460-690 AFY of recycled water in the basin (almost all in the creek compartment); thus, a large percentage of the recycled water under this plan could be reused within the basin.

Although the Creek Compartment has less influence on seawater intrusion than reduced pumping of the Western Compartment, seawater intrusion mitigation can be enhanced if more water is provided to farmers in the basin than is pumped. Therefore, if some ag reuse is implemented along with ag exchange, additional seawater intrusion mitigation will be achieved (especially long-term—since water from this part of the basin eventually affects seawater intrusion) (Cleath & Associates, 2005).
The *Fine Screening Report* estimates the cost of ag wells is about $.75 million and the cost of a return line for recycled water is about $1 million (assumed to be equal in cost to a line to spray fields) (Table 1). Ag exchange storage is estimated to be $1-$2 million, based on the cost of spray field ag storage in Table 1 (adjusted for smaller total flows resulting from this plan) (Carollo, 2007). These minimal costs would likely make ag exchange the most cost-effective alternative to mitigate seawater

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intrusion (if project costs are not counted), even if the water from ag wells requires treatment before distribution (i.e., 395 AFY for a capital cost of less than $4 million).

Note: The relatively low cost for ag exchange is one reason it is recommended in this plan. However, experts agree (e.g., Gleick et al. and AWE) that conservation is the most reliable and cost-effective way to extend water supplies, in part due to its energy saving benefits. Therefore, the most cost-effective approach may be to extend the conservation and onsite reuse components of this program to the entire community, relying more on water efficiency and less on ag exchange. The approach may also allow for more rapid implementation of the plan and a quicker end to seawater intrusion.

In any case, negotiations with farmers, inside and outside the basin, should begin immediately. The Ripley Pacific Los Osos Watewater Management Plan Update estimates 392 AFY of recycled water can be used on ag lands within five years of start up of the project. If negotiations begin now, and initial offers are very attractive (e.g., high-quality water at exchange rates that favor the farmers), it is likely a substantial percentage the 392 AFY e.g., 100 to 200 AFY, could be negotiated by project start up. With 392 AFY of ag exchange added to the Phase I seawater intrusion mitigation achieved by this plan, present seawater intrusion can be stopped with a margin of safety (i.e., allowing for limited buildout) (see "Seawater Mitigation"). The very strong incentives for participation should be emphasized: a reduction (possibly the elimination of nitrate fertilizer use), a substantial reduction in energy consumption required to pump groundwater, and a way to comply with Regional Water Quality Control Board regulations aimed at reducing nitrates in the area. If the treatment site for the project is at Tonini, farming operations nearby would allow for convenient (possibly gravity flow) distribution of recycled water. Also, the Tonini site itself provides a source of ground water that can either be pumped back to the community or blended with recycled water to improve its quality for ag use.

Urban Reuse

Urban reuse will also provide seawater intrusion benefits. The *Fine Screening Report* and *Technical Memorandum: Effluent Reuse and Disposal Alternatives* estimate about 60 AFY of outdoor potable water use can be offset at sites west of Los Osos Creek, with another 50 AFY applied at the cemetery. Note that this estimate (i.e., the potential for in-town use of recycled water by large users) seems low, relative to estimated outdoor use for non-domestic customers (see "Current Water Use"). These estimates should be reviewed. Nevertheless, a purple pipe system for the largest urban users may be cost-effective. On the other hand, recycled water for urban reuse must be treated to high standards, and residents may object to its use for applications such as schools; thus, a more environmentally, socially, and economically feasible approach may be to allow large users to develop upper aquifer wells (staying within aquifer safe yields) as part of an overall basin management plan. Another possibility—consistent with sustainability guidelines—is for large users (e.g., schools) to have their own satellite wastewater treatment facilities, recycling water to tertiary standards for onsite outdoor use.

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Potential Cost Reductions

1) This plan's emphasis on conservation and integrated water-wastewater-stormwater management optimizes opportunities for grants and other private and governmental incentive programs (e.g., low interest loans).

State and federal grants focus on integrated watershed planning and water-use efficiency, as well as LID and other sustainable strategies that save energy and multiply benefits. This plan achieves many of the goals and initiatives of various groups (e.g., the National Estuary Program and Central Coast Regional Water Quality Control Board) through an integrated approach

2) Established rebate programs are available to support this program.

The California Urban Water Conservation Council (CUWCC) offers rebates for Best Management Practices, BMPs, many of which are the strategies and practices proposed in this plan (i.e., up to $100 for HETs and $200 for high-efficiency washers. PG&E offers rebates on front-loading washers because they save the energy needed to heat a pump water for washing. Note that the County or water purveyors would have to be CUWCC members and participate in a rebate program for users to qualify for rebates. Among local water purveyors and agencies, Golden State Water Company is the only member, but it does not appear on the CUWCC website listing participating rebate program members (http:// www.cuwcc.com/smartrebates-utilities.aspx.).

3) A rebate approach for this plan may achieve goals at lower total costs.

If a rebate strategy is used effectively, it can save 25% or more of total costs. The conservation program recommended in the DEIR ($1 million for a 10% reduction in water use by buildout) assumes homeowners will pay for the installation of toilets; thus, it does not plan to fully fund a retrofit program. The DEIR indicates homeowners may be mandated to install the toilets as a condition of hook up to the wastewater project. This plan recommends an ordinance is enacted to encourage participation. In combination with generous rebates, an ordinance may achieve benefits equivalent to fully funding the retrofits (Carollo Engineers, 2007). *(Note: A good way to determine the potential effectiveness of conservation rebates is to include related questions on the LOWWP Community Survey.)*

4) A percentage of LOWWP funding allocated for the repair and restoration of yards and street rights-of-way disturbed by the project can go to this plan.

Project money that would go to repairing yards or street rights-of-way where wastewater lines are installed can go toward onsite or neighborhood rainwater harvesting features, which also provides a community green spaces. Also—rather than septic tanks being crushed—they can be used for rainwater storage for landscape irrigation.

5) If Los Osos has a relatively high percentage of inefficient fixtures (e.g., 5-7 gpf toilets) or leaks in homes, this plan will achieve water reduction targets with less that the estimated costs.

6) Project costs, especially long-term O&M costs, can be offset with "work trade" programs.

These programs would allow area residents to earn "water credits" toward payment of their water bills in exchange for helping to maintain community amenities such as rainwater harvesting/parkway features (conversation with Josh Carmichael, December 11, 2008).

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7) The LOWWP costs for Broderson leach fields ($2-4 million), the $1 million for conservation, and some of the spray field-related expenses (e.g., some of the cost for land acquisition, maintenance machinery, and O&M—$1-3 million) can be applied to offset the costs of this plan.

(Also see Appendices F & G for grant programs, innovative programs, and internet links.)

Dividing and Covering Plan Costs

Dividing Plan costs

The cost of this plan may be apportioned among various groups of water users in the community on the basis of the how much seawater intrusion each must mitigate to offset its impacts (i.e., how much each group benefits). The total water use in the Western Compartment of the basin, where seawater intrusion is occurring, is 2520 AFY (including all water supplied by water purveyors and private domestic water use (SLO). Seawater intrusion is occurring at a rate of 460 AFY (Carollo Engineers, 2007; SLO), and the percentage of water used by the Prohibition Zone is 57%, or 1436 AFY (per this plan) of the 2520 AFY currently pumped. When this plan's total seawater mitigation potential is divided by total costs (656 AFY/$13.6 million—see "Seawater Intrusion Mitigation"), the cost per acre foot of mitigation is $20, 732. Thus, plan costs can be divided as follows:

Residential—Prohibition Zone = 262 AFY (57% of 460) *$5.4 million*
Class II—Prohibition Zone = 73 to 106 AFY (15.8-23% of 460 AFY) *$1.5 to $2.2 million*
Residential & Rural Residential—outside Prohibition Zone=97 AFY (21% of 460 AFY) *$2 million*
Future Development —inside and outside Prohibition Zone=about 190 AFY, *about $ 4 million*

> (Note: For the purposes of this plan, total seawater intrusion at buildout (i.e., necessary mitigation) is assumed to be about 600 AFY, with 56 acre feet of additional mitigation to provide a margin of safety (i.e., bank water in the aquifers). Future development is shown as paying for the margin of safety in calcuations; whereas, the margin would likely be spread evenly. The calculations also assume the costs of rainwater harvesting/LID strategies called for in this plan costs are equally divided and mitigate for removing septic return flows.)

Covering Plan Costs

Prohibition Zone Costs (residential and non-residential)*:* The costs for the Prohibition Zone can be added to the cost of the project—less grant funding and other cost reductions, e.g., elimination of Broderson leachfields. Deducting the $2-4 million for Broderson leach fields leaves total costs well under $5 million. With other cost reductions, e.g., related to reduced spray field use, water storage, and wastewater pumping, the Prohibition Zone's share shrinks further, possibly becoming cost neutral or a net reduction in LOWWP costs.

***Residential & Rural-Residential—outside Prohibition Zone*:** These costs can be covered by grants or low interest loans obtained by either the County or the water purveyors. The loans will be repaid via water rate increases and/or assessments.

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***Future Development —inside and outside Prohibition Zone*:** All the costs for future development will either be paid via Proposition 218 assessments (e.g., for undeveloped properties inside the Prohibition Zone) or impact fees collected with building permit fees. To achieve plan goals by startup of the project, the County or water purveyors would cover costs with grants or loans, repaid as building occurs.

Plan Benefits/Cost Effectiveness

Capital Costs of This Plan Compared to Capital Costs for Imported Water

This plan:
Phase I = *$20, 253/AF* ($9.6 million/474AFY)
Phase II = *$5,571/AF* ($ 4 million/718 AFY)
Total plan = *$11,409/AF* ($13.6 million/1192 AFY)

Imported water:
Nacimiento = *$22,000/AF*
State water = *$40,000/AF*

The above costs for Nacimiento and state water are based on the LOWWP *Technical Memorandum: Imported Water* (pp. 12 & 17). They include capital costs (plus buy-in costs for state water) only. They do not include the costs of imported water per acre-foot (AF) per year, which the TM states is $1180 or about $.56 million per year for 474 AFY. The County *Resource Capacity Study* estimates the cost for desalinated water is $4000/AF (2007, p. 12).

The Gleick et al. study provides a complete cost analysis of various conservation and outdoor water-efficiency measures, with energy savings and water savings calculated over the life of each fixture or measure. The study concludes that all residential conservation measures, including leak repairs and outdoor "irrigation management measures" (i.e., the same ones recommended in this plan) are cost effective when the cost of water is $580 acre feet or more (p. 118). Other studies (e.g., the 2003 Mayer et al. and 2008 Veritec & Koeller studies) conclude indoor conservation measures (toilets, shower heads and washers) are cost-effective.

Of course, the capital costs for the ag exchange called for in this plan do not include the costs of negotiating contracts or obtaining permits. However, this is also true for imported water and desalination, both of which must clear many permitting and approval processes before they are implemented—in fact, many more than for ag exchange. The *Technical Memorandum: Imported Water* points out, the legal costs and difficulties of negotiating water rights with the City of San Luis Obispo, etc., for both Nacimiento and state water could be significant. Further, the costs of imported water do not reflect the potential unreliability of both water sources as climate change impacts them. Recently, communities contracting for state water were told they would receive only 15% of their allotments. Lake Nacimiento water levels and quality are also likely to be impacted by global warming in the future, while the source is bound to experience greater use impacts as local communities shift reliance away from state water.

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Seawater Intrusion Migitation

Phase I (by start up of the project):

Reduced pumping of aquifers = 474 AFY (33% x 1436 AFY)
Seawater intrusion mitigation = 261 AFY (.55 x 474 AFY)

Phase II (within 2-5 years of start up of the project)*:*

Reduced pumping of the aquifers = 392 AFY
Seawater intrusion mitigation = 216 AFY (.55 x 392 AFY)
Total for Phases I & II =477 AFY

Seawater Intrusion Migitation (cont.)

Phase II (within 10 years of start up of the project) **(includes the first 2-5 years of Phase II)**:

Reduced pumping of the aquifers = 718 AFY (Ajusted downward by graywater reuse)
Seawater intrusion mitigation = 395 AFY (.55 x 718 AFY)

Total of Phases I & II**:**

Reduced pumping of aquifers = 1192 AFY (474 AFY + 718 AFY)
Seawater intrusion mitigation = 656 AFY (.55 x 1192 AFY)

The *Fine Screening Report* estimates about 550 AFY of mitigation is needed to stop seawater intrusion when the project goes on line, with about 681 AFY of mitigation needed at buildout (p. 2-3). Thus, this plan should stop seawater intrusion, with a margin of safety. The margin of safety allows water banking (building water reserves in the aquifers) to prepare for climate-related impacts, such as sea level rises (which requires raising aquifer levels). The eventual expansion of this program to other parts of the community and/or expanded ag exchange should fully balance the basin at buildout with a margin of safety.

Note: This plan emphasizes ag exchange (Phase II) to mitigate for the portion of seawater intrusion resulting from future water use outside of the Prohibition Zone, in part due to the cost effectiveness of ag exchange. However, ag exchange will take longer to implement than conservation, and is not as reliable a source of water. Therefore, conservation measures may need to be emphasized to a greater extent than presented here for these users to achieve basin balance with a margin of safety (e.g., to keep pace with any development that occurs after start up of the project. Also, the conservation ordinances recommended in this plan, if implemented, could result is less need for ag exchange water to balance the basin and the possibility of using water to generate revenue for the community (see "Future.")

Building in a margin of safety—along with immediate implementation of measures, including negotiations with farmers—is essential to successful basin management plan, given the uncertainties of climate change. Governor Schwartzenegger on November 14, 2008 signed into effect Executive Order S-13-08 requiring new projects (and recommending projects under development) to "consider a range of sea level rise scenarios for the years 2050 and 2100 in order to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise" (Item No. 5) (see http://gov.ca.gov/executive-order/11036/).

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Other plan benefits

1. ***Reduces LOWWP costs and energy use***—reduces wastewater pumping, energy use, and GHG production.
2. ***Reduces community and farm water costs and energy use***—reduces potable water heating, pumping, and GHG production .
3. ***Protects costal ecosystems***—Reduces surface water pollution from runoff and ensures ample water clean supplies to sensitive area ecosystems, e.g., the Estuary, creeks, and terrestrial habitats.
4. ***Improves Water quality efficiently***—Increases the rate at which the water quality of the upper aquifers improves by recharging it with clean rainwater, rather than recycled water, and protects the quality of the unpolluted upper and pristine lower aquifers by reducing total aquifer pumping, allowing longer residence time for water (i.e., slower turnover rates)
5. ***Maximizes the beneficial uses of water sources*—**Allows maximum use of the lower aquifer for drinking, the upper aquifer and recycled water for urban and ag irrigation, and rainwater for aquifer recharge.
6. ***Supports the health of the Watershed*—**Reduces nitrate pollution entering the ground water and surface waters by reducing fertilizer use, with recycled and/or blended (recycled and upper aquifer water) with nitrate levels for optimal for ag exchange and urban reuse.
   Note: The Morro Bay National Estuary Program (NEP) and Central Coast Regional Water Quality Control Board (CCRQCB) fund a variety of projects supporting the health of the local watersheds and Morro Bay Estuary

(**Also see Appendix K for a list plan benefits for the three major systems affected by the project: environmental, social, and economic.**)

Implementation

The goals of this plan will likely be best achieved with concurrent enactment of two ordinances, one requiring indoor retrofits and the other requiring outdoor conservation-reuse measures. Both could require compliance as a condition of hook up to the LOWWP and/or trigger rate increases (or other consequences) for non-compliance.

Prior to the previous Los Osos Project, the LOCSD approved a conservation ordinance aimed at a 20% reduction is indoor water use (see Appendix D). The ordinance (# 2004-01) cited reduced groundwater pumping and reduced effluent flows to the treatment plant as justifications. Compliance was a condition of hook up to the wastewater project, with increases in sewer service charges resulting from non-compliance, barring a hardship exemption . It was funded with a grant from the State Water Resources Control Board (SWRCB).

Currently, all reuse alternatives for the LOWWP include a 10% conservation toilet retrofit program. While it is not certain how this will be implemented, the most reliable mechanism is to condition compliance on hook up to the wastewater system. Clearly the same conditions can apply to this plan.

A number of communities have developed outdoor water use efficiency ordinances (see example in Appendix E), and state law requires an outdoor ordinance by 2009 (AB 2717 and Article 10.8 of the California Government Code). An outdoor efficiency ordinance targeting a 50% reduction (as

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recommended in this plan) is more ambitious than other ordinances, but it sets a standard other communities in California are likely to emulate in the future.

The nexus between a conservation-reuse-recharge plan and the LOWWP is clear. Indoor conservation will reduce wastewater flows; therefore, it has a direct effect on the cost and size of the project. Further, outdoor measures are needed because the project will remove water from the basin, necessitating mitigations to reduce seawater intrusion, enhance basin recharge, and ensure subsurface flows to sensitive ecosystems. Since the exact effects of the LOWWP are not known (e.g., the effects of removing septic return flows from the basin, on seawater intrusion and the Estuary), erring on the side of caution is prudent and justified. Furthermore, this plan recognizes the reality that seawater intrusion, caused by human impacts on the environment, is polluting a natural fresh freshwater source and threatening its beneficial uses at a faster rate than nitrate pollution (Cleath and Associates, 2005; Yates and Williams). The approximately $14 million dollars it will take to address this source of pollution, makes it the most cost-effective component of the project relative to beneficial impacts on groundwater pollution.

Finally, the County is able to implement measures to effect basin balance as the lead agency in charge of managing the basin (per conversations with Paavo Ogren, Public Works Director, and John Ogren, Project Engineer). Further, AB 2701 specifically grants the County the right to implement this plan. Referring to the County's implementation of the project, AB 2701 states: "These efforts may include programs and projects for recharging aquifers, preventing saltwater intrusion, and managing groundwater resources to the extent that they are related to the construction and operation of the community wastewater collection and treatment system" (emphasis added) (Government Code, Section 25825.5 c).

Reasons for concurrent implementation with the LOWWP

1. Stops seawater intrusion and balances the basin as soon as possible (i.e., saving as much of the most valuable water in the basin as possible, the lower aquifer—3000-7000 year old water not affected by modern contaminants.)

2. Enables the considerable resources assembled for the LOWWP (both financial and human, including consultants and lobbyists) to achieve greater benefits more cost-effectively (e.g., seek grant funding at state and federal levels for conservation and beneficial reuse).

4. Ensures all impacts from the project are avoided or safely mitigated, i.e., the project will not harm the resources and ecosystems it is meant to protect.

5. Reduces total water management costs (i.e., for water, wastewater, and stormwater) through integrated planning and implementation (e.g., avoids duplicated costs).

6. Begins to capture the environmental and cost benefits of stormwater management and conservation immediately (e.g., reduced energy use from pumping and heating potable water and reduced pollution of the Estuary).

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7. Provides an effective mechanism for implementation of the plan (i.e., homeowners would implement strategies as a condition of hook up to the project).

The conservation plan and ordinance proposed prior to the previous project had this condition, and the current conservation plan apparently does also, per the LOWWP DEIR.

8. Avoids the possibility of a protracted ISJ process that may not ultimately balance the basin.

Historically, water purveyors have not been inclined to take dramatic steps to lower production via strong conservation and reuse measures; therefore the primary cause of seawater intrusion (overdraft of the aquifers) is not likely to be addressed immediately (LOCSD). Instead, Broderson recharge will likely be the focus of current basin planning efforts to enable purveyors to continue a relatively high level of production by shifting it to the upper aquifer—although the strategy won't achieve basin balance (see "Benefits of this plan over recharge at Broderson"). The Golden State Water company, along with several agencies and organizations e.g., the CUWCC and Pacific Institute) signed a letter to the California Public Utilities Commission (CPUC) in 2006, explaining the disincentives for water purveyors to aggressively pursue conservation. It suggests decoupling rates from water use and financial incentives, for water purveyors, including the ability to finance conservation measures with bonds. Through grant funding and integrated implementation, this plan should enable the profitability of the program for purveyors. Another approach is to define conserved water a new water source, as Sonoma County did, to enable water purveyors to adjust water rates accordingly (Hulme). Conserved water, stored for the future when the cost of water will be higher, is a good investment for water companies and citizens. In the future, water companies, the LOCSD, and County will undoubtedly have to assume greater responsibility for conservation, in order to sustain water supplies. Forward-looking companies and agencies are making conservation a centerpiece of their operations by implementing the CUWCC's Best Management Practices (BMPs) and hiring water-use efficiency/conservation experts, such as Jamie Lean of the Atascadero Mutual Water Company.

Benefits of this plan over recharge at Broderson

1) The specific benefits and potential harm of a Broderson recharge strategy are not known (e.g., for the upper aquifer, lower aquifer, the Estuary, or nearby homes).

Jeffrey Mosher, director of the National Water Research Institute (NWRI) related in a phone conversation on November 1, 2008, that NWRI panel members were not convinced Broderson would achieve either of its intended purposes: recharge the upper aquifer or mitigate seawater intrusion in the lower aquifer. Studies of the Broderson option have raised questions about its benefits, as well as its potential harms to homes and ecosystems downhill from the site, while its construction and periodic leach field replacement will harm coastal dune habitat on the site itself (Carollo Engineers, 2007, p. 2-24). The 2005 *Draft Water Management Plan* highlighted the lack of certainty of a Broderson strategy by recommending upper aquifer water downhill from the site is tested "to determine the actual production and water quality constraints on the upper aquifer use for potable supply," adding that "supplemental water sources for up to 560 AFY (should be) actively pursued" (Cleath and Associates, 2005, p. 10). Even with Broderson operating at full capacity per the previous project (about 900 AFY of recharge), and other recharge sites recharging another 500 AFY or so, the *Draft Plan* states "255 afy of supplemental water" (i.e., imported water) will be needed at build out" (p. 21). The Yates and Williams study in 2003 (predicting the previous project's affects on nitrate levels in the

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groundwater) found recharging at Broderson with recycled water would slow the rate of nitrate reduction in the basin due to the relatively high nitrate levels in the recycled water (7mg/l required for the previous project) (p. 20; Carollo Engineers, 2007, p. 2-23). It also projected groundwater levels in upper water zones would drop 10 feet, completely drying up in some locations (p. 18). These facts show that a plan relying on Broderson has significant risks, while it will not ultimately balance the basin. Implementing the LID recharge strategies in this plan, in combination, with the significant reductions in lower aquifer pumping via strong conservation measures, is much more likely to balance the basin without the need for imported water.

2) This plan provides the most direct and certain way to stop seawater intrusion and balance the basin—reduced pumping of the basin.

The relative benefit of reduced pumping (with conservation and reuse) versus Broderson recharge is clearly reflected in the mitigation factors assigned to each in the *Fine Screening Report*—a 0.55 for conservation/reuse versus a 0.22 factor for Broderson recharge (p. 2-4). The 0.22 factor is based on scientific analysis and hydrogeologic modeling with a substantial level of uncertainty; the 0.55 factor appears to be based on a more direct calculation of how much will be pumped from westside wells where seawater intrusion is occurring versus wells on the eastern side of the Western Compartment when pumping is reduced (Carollo Engineers, 2007, p. 2-4). Logically, when all the pumping from westside wells stops, seawater intrusion should stop. Given the basin's complex hydrogeology (i.e., five distinct aquifer zones functioning independently and interdependently, divided by clay layers of varying thicknesses), the 0.22 factor (not explained in the *Fine Screening Report*) is likely based on several estimations (e.g., the approximate percentage of septic flows recharging the upper aquifer multiplied by the percentage of lower aquifer recharge from the upper aquifer). These estimates would be estimates of total recharge when sources are distributed throughout the basin (as it is now); thus, 0.22 could easily overstate the benefits of a centralized recharge strategy at Broderson (Cleath and Associates, 2005; Yates and Williams).

3) This plan provides greater flexibility in how potential project impacts to the upper and lower aquifers can be avoided; Broderson recharge relies on shifting production from the lower aquifer to the upper to protect the basin—a strategy that may not work (Cleath & Associates, 2002, 2005).

Shifting production to the upper aquifer, ultimately does not balance the basin, and it can cause over drafting of the upper aquifer resulting in seawater intrusion. The upper aquifer's safe yield, with septic return flows, is 1150 AFY (in the Western Compartment). About 800 AFY is currently being pumped (DEIR). Therefore, shifting 900 to 1000 AFY of production to the upper aquifer (enough to stop all pumping from the western-most lower aquifer wells) will overdraft the upper aquifer (Carollo Engineers, 2007, p.2-5). Cleath and Associates reports that the upper aquifer is only "relatively stable" with the potential for seawater intrusion "during extended drought periods" (2005, p. 27). Further, the upper aquifer's safe yield will go down when septic return flows are eliminated (Carollo Engineers, 2007, p. 2-5). The *Fine Screening Report* estimates septic return flows for the Prohibition Zone contribute about 850 AFY of recharge to the upper aquifer (Carollo Engineers, 2007, p. 2-21). This represents 28% of upper aquifer recharge (2995 AFY), based on total aquifer inflow estimates from the LOWWP Draft EIR (DEIR) (see Appendix D-2, Table 8). The Yates and Williams study estimates septic return flows are closer to 36% of basin recharge (Table 4). Since these reports/studies are based on modeling, with a level uncertainty, it is prudent to err on the high side (i.e. 900-1100 AFY) when estimating the total septic flows contributing to upper aquifer balance. If about one-third

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of the upper aquifer recharge to the basin is removed, it is very possible the current levels of pumping will exceed the upper aquifer safe yield post septic systems (even if Broderson recharges the upper aquifer at 448 AFY). (Note: The DEIR appears to have underestimated septic return flows to the upper aquifer at 600 AFY. When upper aquifer balance estimates (e.g., Appendix D-2, Tables 9 & 10) are reduced by 250-500 AFY (i.e., the inflow from septic systems apparently not counted), the upper aquifer appears to be out of balance with Broderson recharge (DEIR). Thus, a plan like this that reduces pumping of the entire basin to well within safe basin yields—and also allows the flexibility to reduce pumping from the upper aquifer if necessary—is needed to prepare for the impacts of an LOWWP. It is worth noting that Cleath and Associates had to revise its 2002 basin safe yields down about 300 AFY in 2005 because seawater intrusion was progressing faster than expected (SLO). Therefore, a margin of safety must be built into safe yields to protect the basin—also to bring water tables up in preparation for sea level rises.

4) This plan will likely provide a more cost- and environmentally-effective means of recharging the upper aquifer and maintaining essential freshwater flows to sensitive ecosystems via natural rainwater recharge.

If rainwater harvesting and LID features are strategically planned and constructed on individual properties and in public spaces throughout out the community, they will provide an inexpensive and sustainable solution for capturing the large amounts of rainfall now lost to the bay during moderate and heavy storms. A substantial percentage will percolated to the upper aquifer, eventually to the lower aquifer, recharging both aquifers. Spreading these systems around the community will help to restore the natural hydrology of the area ensuring greater benefits to the basin as a whole.

5) This plan will provide more rapid improvement of basin water quality, in part by avoiding use of recycled water to recharge the aquifer, which contains trace contaminants.

Recycled water has relatively high nitrate levels compared to naturally filtered and infiltration rainwater, and much higher levels of emerging contaminants, including by-products of the disinfection process of wastewater (Cleath & Associates, 2006; Yates and Williams). Potentially harmful emerging contaminants have already been found in the upper aquifer at reportable levels, and the potential for adding further contaminants should be avoided (Cleath & Associates, 2006).

6) This plan allows the basin to be balanced upon implementation of the LOWWP; whereas a Broderson plan may delay basin balance for years—possibly until it is too late to save the basin.

Commiting resources to Broderson leach fields puts that expenditure at risk and puts the County and community on a path that will most likely lead to more expenditures. The energy and maintence costs are relative high for Broderson compared to the options presented in this plan—while the options in this plan provide many co-benefits.

(Also see Appendix F for a comparison of this plan with LOWWP reuse/disposal Project 2a, recommended by the DEIR, and Project 3a designed to balance the basin under current conditions.)

The Future

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This plan will provide Los Osos enough water to cover all future water needs if water is used wisely. With careful planning, it will further allow its most pristine water source, the ancient lower, aquifer—unaffected by modern contaminants—to be used for drinking only; with recycled and upper aquifer water used primarily for farming and outdoor urban applications. With community-wide implementation of conservation and reuse, it may even be possible for Los Osos to become a water exporter in the future, supplying Morro Bay a portion if its water.

A word of caution is warranted. Because implementation of this conservation-reuse-recharge element will enable the building moratorium to be lifted and development to begin again in the area, caution should be taken to ensure that a vicious cycle of water overuse leading to the current basin overdraft does not repeat itself. Therefore, ordinance language, ISJ agreements, statues and/or special legislation should be enacted to ensure that the water saved through this plan first goes to balance the basin, with an adequate margin of safety to protect against future uncertainties such as droughts and sea level rises.

Furthermore, land use policy must be consistent with prudent and wise use of water in the future. The California Coastal Commission's report on climate change estimates sea levels will rise about one foot by mid century. This is a conservative estimate compared to some predictions. The IPCC warns that coastal aquifers will experience increased seawater intrusion due to sea level rises. To prepare for these pressures and ensure a sustainable water supply for future generations, additional water must be stored in the aquifers to gradually bring up aquifer levels.

Ordinances, agreements, statutes and/or special legislation should also ensure water is not exported until the basin is fully balanced, with a margin of safety.

Finally, the community of Los Osos—and the local and regional economies—should benefit first from this conservation plan. Ordinances, agreements, statutes and/or legislation should ensure local businesses provide a significant percentage of the goods and services needed to implement and maintain this plan.

Conclusion

The County of San Luis Obispo has the opportunity to halt seawater intrusion in the Los Osos Valley Water Basin and save a precious water source by implementing an integrated conservation-reuse-recharge plan concurrent with development of the LOWWP.

This plan, which raises overall project costs only slightly (if at all), outlines how it can be done with a sustainable development approach maximizing benefits for all the systems that depend upon the resource.

The opportunity to preserve a rare and ancient natural groundwater, treasured coastal ecosystems depending on it, and the vital social and economic resources of an area all at once—does not come along often. The opportunity should not be wasted.

References

Alliance for Water Use Efficiency (AWE) (website) (http://www.allianceforwaterefficiency.org)

 © K. Wimer, 2008. All rights reserved. Please contact Keith Wimer, kwimer1@gmail.com, for use permission.

Asano, Takshi et al. *Water Reuse: Issues, Technologies, and Applications.* New York: McGraw Hill, 2007

American Water Works Association Research Foundation (AWWARF). *Residential Water Use Summary.* 1999 (http://www.aquacraft.com/Publications/resident.htm).

California Coastal Commission. *Overview of Sea Level Rise and Some Implications for Coastal California*. June 1, 2001 (http://www.coastal.ca.gov/climate/SeaLevelRise2001.pdf)

California Coast Keeper Alliance. *Water Recycling: Using Recycled Water to Protect Water Quality and Ensure a Reliable Water Supply (webpage) (*http://www.cacoastkeeper.org/water-recycling.php)

California Department of Water Resources (CDWR). *Graywater Guide*. January 1995.

_____"Resource Management Strategies." Volume 2. California Water Plan 2005 and Update 2008 (http://www.waterplan.water.ca.gov/previous/cwpu2005/index.cfm)
California Urban Water Conservation Council (CUWCC) (website). 2008 http://www.cuwcc.com

_____Environmental Benefits of Urban Water Conservation. Prepared by the Lawrence Berekley National Laboratory. April 3, 2007 http://www.cuwcc.com

Carollo Engineers. *Viable Project Alternatives: Fine Screening Analysis*. San Luis Obispo County Wastewater Project. August 2007. (http://www.slocounty.ca.gov/PW/LOWWP)

_____ *Technical Memorandum: Flow and Loadings*. San Luis Obispo County Wastewater Project. February 2008. (http://www.slocounty.ca.gov/PW/LOWWP)

_____*Technical Memorandum: Imported Water*. San Luis Obispo County Wastewater Project. March 2008. (http://www.slocounty.ca.gov/PW/LOWWP)

_____*Technical Memorandum: Effluent Reuse and Disposal Alterntatives.* San Luis Obispo County Wastewater Project. April 2008. (http://www.slocounty.ca.gov/PW/LOWWP)

Carpenter, Susan. "Gray water: A do-it-yourself installs a rerouting system," *Los Angeles Times: Living Green Section.* September 27, 2008.

Cleath & Associates. "Safe Yield Analysis of the Los Osos Ground Water Basin," July 2002, Appendix B. *LOCSD Water Master Plan*. August 2002

_____*Water Management Plan for the Los Osos Valley Ground Water Basin (Draft)*. July 2005

_____*Sea Water Intrusion Assessment and Lower Aquifer Source Investigation of the Los Osos Valley Ground Water Basin, San Luis Obispo County*, July 2005. (http://www.slocounty.ca.gov/AssetFactory.aspx?did=15869)

 © K. Wimer, 2008. All rights reserved. Please contact Keith Wimer, kwimer1@gmail.com, for use permission.

Gleick, Peter, et al. *Waste Not, Want Not: The Potential for Urban Water Conservation in California,"* Pacific Institute. November 2003. (http://www.pacinst.org/reports/urban_usage/)

Gualey, Bill. High efficiency toilets in commercial applications. (Water Smart Innovations Conference, Southern Nevada Water Authority, Vegas Nevada). October 8, 2008

Hulme, Lynn. *Demand Management Methodology for Regional Water conservation Implementation*. Sonoma County Water Agency. 1998.

Intergovernmental Panel on Climate Change (IPCC), "Impacts, Adaptation, and Vulnerability" (Technical Summary), *Fourth Assessment Report, Working Group II*. 2007.

Kiparsky, M. & P. Gleick. "Climate Change and California Water Resources: A Survey and Summary of the Literature" 2003 (Published in the California Water Plan Update 2005).

Lancaster, Brad. *Rainwater Harvesting for Drylands and Beyond* (Volume 2). Rainsource Press: Tuscon. 2008.

Los Osos Community Services District (LOCSD). *Water Master Plan*. (Prepared by John L. Wallace & Associates with Cleath & Associates). August 2002. http://www.losososcsd.org/library/index.html

Ludwig, Art. *Create an Oasis with Greywater*. (5th Edition). Oasis Design. 1991-September 2007.

Natural Systems International, LLC., *Los Osos Drainage Feasibility Report*. November, 2001 (available at the LOCSD office in Los Osos)

Ripley Pacific Company. *Los Osos Wastewater Management Plan Update*. July 28, 2006.

PG&E. "Reduce Energy Use in Water and Wastewater Facilities Through Conservation and Efficiency Measures." *Flex Your Power*. 2007.

San Luis Obispo (SLO) County Department of Planning and Building. *Resource Capacity Study: Water supply in the Los Osos Area*. February, 2007.

SLO Greenbuild's Appropriate Technology group. *Low Impact Development (LID).* www.slogreenbuild.org.

Veritec & Koeller and Co. *Maximum Performance (MaP): Testing of Popular Toilet Models*, 12th Edition, June 2008

U.S. Department of Housing and Urban Development (HUD). *The Practice of Low Impact Development*. July 2003.

USEPA. *Water Sense* (website). Updated October 23, 2008. http://www.epa.gov/watersense/specs/het_spec.htm

 © K. Wimer, 2008. All rights reserved. Please contact Keith Wimer, kwimer1@gmail.com, for use permission.

Yates, Gus, D. Williams. *Similated Effects of a Proposed Sewer Project on Nitrate Concentrations in the Los Osos Valley Groundwater Basin*. Novermber 6, 2003.

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ACHIEVING A SUSTAINABLE LOS OSOS VALLEY WATER BASIN
(DRAFT)

An integrated conservation-reuse-aquifer recharge plan for concurrent implementation with the Los Osos Wastewater Project, using low impact development (LID) and appropriate technologies

Prepared by Keith Wimer
Los Osos Sustainability Group
Los Osos, CA 93402

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Los Osos Wastewater Project (LOWWP) Team May 6, 2008
C/O County Public Works Department
County Government Center
San Luis Obispo County

Subject: EIR Recommendations and Goals for a Sustainable LOWWP

Project Team:

We appreciate your decision early in the LOWWP process to make sustainability a chief goal with the following commitment stated in the project's mission statement:

> "To evaluate and develop a wastewater treatment system for Los Osos, in cooperation with the community water purveyors, to solve the Level III water resource shortage and groundwater pollution, in an environmentally sustainable and cost effective manner, while respecting community preferences and promoting participatory government, and addressing individual affordability challenges to the greatest extent possible."

We commend your team and the Board of Supervisors for recognizing the reality that declining resources and other environmental pressures—locally, statewide, nationally, and worldwide—require that sustainability is the new development paradigm—and we congratulate you for taking a proactive, leadership role to ensure that present and future residents of our county enjoy a healthy environment and thriving economy.

The US Environmental Protection Agency Office of Research and Development has stated, "achieving sustainable environmental outcomes must be a long-term national environmental goal" ("Sustainability Research Strategy," October 2007), and the California State Water Resources Control Board has declared sustainability a "core" value, defining it as "balancing environmental, economic and social factors in an equitable manner to maintain and protect the water resources needs of the present generation without compromising the ability of future generations to meet their own water resources needs" (SWRCB Meeting, Division of Financial Assistance, January 2005). In June 2006, the Board of Supervisors endorsed "Building Principles of Smart Growth," adopting sustainable development principles, which balance "economics, the environment, and social equity (the three E's) to create sustainable growth" ("Smart Growth Criteria for Development Projects," SLO County Planning & Building, September 2006).

We encourage the Board to continue in this direction, emphasizing the 3E's of sustainable development, Economy, Environment, and Equity, often referred to as the "Triple Bottom Line." Consistent with this approach, we urge the Project Team to apply the criteria for sustainable development we've compiled, along with the American Planning Association (APA) guidelines for wastewater infrastructure (see Attachment #2). To maximize project outcomes, we suggest that Brandman Associates and the Project Team develop a sustainability matrix for evaluating and optimizing benefits to the environment, the economy, and the people.

We also believe that the following must be part of the EIR process for the LOWWP to be a sustainable project. We understand that some of the alternative analyses and principles listed were already named in the Notice of Preparation, but we want to reinforce their importance.

Recommended alternatives for review in the EIR

1. A review of water conservation alternatives within the discussion of Water Supply Alternatives and other pertinent areas, including an analysis of conservation at various levels of reduction, up to a 30% reduction in current use, for their beneficial impacts on water resources, energy use, sustainability, etc. (Note that the current per capita indoor use for Los Osos is estimated to be about 67 gpd, whereas greater use of water saving appliances and devices can reduce water use to under 50 gallons per day—see Attachment #1, Item 1 for additional justification for the 30% target.)
2. A detailed analysis of project alternatives' contribution to the generation of greenhouse gasses, which factor in the goals of AB 32 (e.g., to reduce and eliminate a project's carbon footprint and to promote sustainable energy technologies) and a review of renewable clean energy alternatives (solar and wind) to power various project alternatives.

3. A review of project alternatives for their potential impacts on archeological sites, with the emphasis on which technologies and construction methods best honor the traditions and customs of the cultural groups likely affected (e.g., the Chumash).
4. An analysis of how the project will support an integrated water/wastewater plan for the Los Osos Valley Basin—aimed at the long-term sustainability of water resources—which integrates storm-water runoff control; groundwater balance, protection, and restoration; surface water and habitat protection and restoration; and projected future impacts from global warming and rising sea levels.
5. An analysis of treatment-collection-reuse project configurations, with a focus on how the components can be most effectively combined in a system to achieve the greatest environmental, economic, and social benefits.
6. A review of disposal/reuse/recycling alternatives—with the focus on short- and long-term resource sustainability, life-cycle costs, and impacts to sensitive habitat when septic systems no longer contribute to subsurface flows and aquifer recharge (including a review of purple pipe systems for on-site and urban reuse, constructed wetlands, on-site and community storm water retention/percolation strategies, a community owned ag project, and ag reuse/exchange.
7. A review questioning the viability of the Broderson site disposal alternative with the same focus as #6 above.
8. A detailed review of the feasibility of project alternatives, based in part on a detailed review of community affordability data generated as part of the EIR process or parallel to the EIR process.
9. A review of nature-based treatment systems and systems using bio-mimicry, including greenhouse technologies as well as surface- and subsurface constructed wetlands, e.g., systems by Todd Ecological and Lombardo and Associates.
10. A review of beneficial uses of recycled water and solids—with an analysis of beneficial impacts on energy use, carbon footprint, etc.—e.g., application to community- or privately-owned redwood, switch grass, or algae cultivation for carbon sequestering, resale, and/or bio-diesel production.
11. A long-term analysis considering global warming and sea-level rise impacts, taking a precautionary approach, with a review of options best suited for future adaptability, e.g., the purchase of land/water rights out of the basin or trading water for future water rights.
12. A review of STEP/STEG collection system alternatives, including cluster systems with 2-12 homes per tank and tanks located in public utility easements; also a system with the STEG (gravity) component of STEP/STEG system included in the estimates (i.e., to show truer system costs and impacts).
13. A review of a decentralized alternative with 2-6 treatment sites within the Prohibition Zone, using nature-based treatment systems and systems using bio-mimicry, with the facilities designed for multiple uses, e.g., landscaped and developed as open-space, parks, and/or eco-tourist destinations (see # 9 above).
14. A review of an on-site system alternative operated under a centralized, on-site maintenance program.
15. A review of a phased approach to project implementation, in which a first phase would include a decentralized system serving homes near the bay and in high ground-water areas, with on-site system enhancements and a maintenance program, followed by a later phase in which more homes would be connected to a community system as needed (e.g., if water quality improvements do not occur).
16. A review of a conventional gravity collection alternative—and a combined conventional gravity-low pressure alternative—for potential impacts to the environment, stemming from I/I, exfiltration, sewer overflows, grinder pumps and vault installation, fusion welding gravity pipes, enhanced maintenance to reduce the potential for I/I, etc.,—in addition to the potential for illegal discharge and fines.

Additionally, we wish to highlight the following goals and objectives the project and EIR should work to achieve:

1. A key objective that the project will be sustainable—producing win-win-win solutions for the environment, people, and economy.
2. A goal or objective to strive for a zero or negative carbon footprint for the project.
3. Reduce water use by at least 25% (easily achievable with available technologies, according to authorities).
4. Relative affordability for ratepayers.

We look forward to partnering with your Board and the County Project Team to create a truly sustainable LOWWP that will be a showcase for sustainable development in the county, state, and country. Thank you for integrating these essential elements into the LOWWP EIR.

(See Attachments #1 & #2 for scoping recommendation detail and sustainable development criteria and guidelines.)

January 6, 2009
San Luis Obispo County Board of Supervisors
County Government Center, San Luis Obispo

RE: SUSTAINABLE LOS OSOS WASTEWATER PROJECT CRITERIA AND RECOMMENDATIONS

Honorable Board of Supervisors:

The Los Osos Sustainability Group has prepared sustainable project criteria and project recommendations. We appreciate the opportunity to present them to you today.

To arrive at our recommendations, we first did an extensive review of literature related to sustainable development and the project, including the following:

1) Definitions, principles, and guidelines of recognized authorities, agencies, and organizations in the fields of sustainable planning, environmental protection, and water/wastewater management (see Appendix A for excerpts).

2) The "EIR Recommendations and Goals for a Sustainable LOWWP" we submitted on May 6, 2008, and the "Statement of Key Environmental Issues" we submitted with the San Luis Bay Chapter of Surfrider Foundation, SLO Green Build, Santa Lucia Chapter of the Sierra Club, the Terra Foundation, The Northern Chumansh Tribal Council on September 9, 2008 (see Appendix B for excerpts).

3) The Los Osos Valley Water basin studies and basin plans (see Appendix C for a summary of research and references)

4) LOWWP documents since 2006, including staff updates to the Board of Supervisors, the NWRI reports, and the Draft EIR with appendices (see Appendix C2).

Our survey of this literature yielded the following key sustainability principles and conclusions, sustainability project criteria, and recommended wastewater projects.

Key Principles and Conclusions

I. Sustainable development requires balancing and maximizing benefits for all systems.

Sustainable development implies coexistence and equity among major systems: environmental, social, and economic. By definition, it requires balancing benefits for these systems, ensuring no system is harmed and all systems survive and thrive (see Appendix A). In terms of the Los Osos Project, it means no family should have to leave the community due to project costs, and that water balance should not be harmed in the effort to achieve improved water quality. Further, it means we should not put a burden on future generations by bequeathing them a project that requires intensive energy use and costly maintenance and repairs. For the LOWWP to be sustainable it must maintain the social fabric of the community, all ecosystems and subsystems, and the economic health of the community now and in the future.

II. Sustainable development requires integrated, whole-systems, long-term planning and solutions.

For the LOWWP to be sustainable, it must be part of an integrated water-wastewater-stormwater management plan for the basin that avoids the negative impacts of the project and maximizes its benefits long term. Unless the project avoids, or adequately mitigates for, removal of septic return flows (about one-third of the recharge of the basin), it could increase seawater intrusion in the lower aquifer, start seawater intrusion in the upper aquifer, and harm sensitive ecosystems by drying up subsurface freshwater flows. In fact, a lack of whole-systems planning could render the project a waste of time and money by speeding the demise of the freshwater basin from seawater intrusion. This would require Los Osos to spend another $30-100 million for a desalination plant or imported water—neither of which is feasible. The current reuse-disposal plan for the project removes water from the basin and wastes recycled water on spray fields. It also relies almost solely on Broderson leach fields to avoid negative impacts from the project. This puts most of the eggs in one basket, betting on a strategy that is risky, inefficient, and energy intensive. What is needed is an integrated conservation-reuse-recharge plan, with a range of strategies, flexible enough to address the major hydrological changes coming to basin. A well-designed plan would maximize benefits for all systems and begin to prepare for climate change impacts, including sea level rises predicted to increase seawater intrusion in coastal aquifers. (We have provided a blueprint for such plan, based on the three Foundational Actions of the California Water Plan and emphasizing appropriate technologies, entitled "Achieving a Sustainable Los Osos Valley Water Basin").

III. Sustainable development requires a new approach and new thinking to avoid the mistakes of the past.

So far, the LOWWP process is leading us toward the kind of project advocates of sustainable development warn against: an oversized, energy-intensive, centralized project, vulnerable to earthquakes and climate change. To enable a sustainable project, a strong conservation program must be implemented concurrently to help avoid the viscous cycle of water overuse that has led to the Level III of severity water shortages. The process must also ensure green, small-scale, nature-based solutions are incorporated into the project to reduce energy use, life-cycle costs, and environmental impacts. Finally, market-driven solutions should be used in innovative ways to achieve and support sustainable development. In terms of the LOWWP, this means the selection process should include onsite and decentralized system alternatives, constructed wetlands and greenhouse treatment technologies, a dedicated low pressure and hybrid low pressure-vacuum collection system, and appropriate technologies. The project should also be sized 15-30% smaller than currently planned, with a strong conservation element using water-saving technologies currently on the market. Finally, the best-value design-build process should be used to its full potential, providing sustainable development performance criteria to potential bidders, along with a cap on project costs set at affordability levels for the community, that allows bidders to present innovative and integrated options to achieve sustainability goals. Currently, the LOWWP Request for Qualifications and DEIR restrict project alternatives, competition, innovation, and the potential for overall project sustainability.

Criteria for a Sustainable LOWWP

I. Balances and maximizes benefits to all systems

Sub-criteria:

- Meets affordability guidelines now and in the future (without the need for grants and special funding) (e.g., by using sustainability criteria, encouraging sustainable alternatives, and setting cost limits in a best-value design-build process).
- Uses a small-pipe sealed collection system to promote clean, renewable energy use (solar) and avoid and/or minimize construction impacts and environmental damage (e.g., damage from sewer overflows, exfiltration, and deep trenching, including impacts to archeological sites and infrastructure).
- Minimizes burdensome operation, maintenance and repair procedures and costs for future generations (i.e., is easy and inexpensive to operate, repair and/or replace), e.g., with the use of nature-based ponding or constructed wetlands treatment

II. Uses a whole-systems long-term planning approach.

Sub-criteria

- Is part of an integrated conservation-reuse-recharge plan that offsets the potential impacts of the project with a margin of safety and maximizes benefits to all systems.
- Is designed to minimize environmental damage and repair/replacement costs due to flooding and earthquakes (e.g., uses shallow, small-diameter, flexible piping and nature-based and redundant systems)
- Considers full life-cycle costs looking out 60 years or more (i.e., the life of the longest-lasting components of the system).
- Prepares for climate change impacts (sea level rises, increased storm intensity and/or longer dry periods between storms) (e.g., by using a sealed pipe system to avoid overflows, depletion of groundwater and seawater contamination of wastewater via I/I.)

III. Uses conservation and decentralized, small-scale, nature-based solutions to reduce or offset costs, energy use, and GHG production—also to reduce or eliminate waste and toxic by-products.

Sub-criteria

- Incorporates a conservation plan for project sizing and to mitigate for impacts
- Uses ponds, constructed wetlands, and/or greenhouse technologies for centralized and cluster system treatment.
- Consideres cradle-to-grave materials costs and environmental impacts (e.g., using HDEP piping and other components to reduce or eliminate toxins
- Employs clean, renewable energy use (e.g., solar power and wind generation) to operate onsite and major system components.
- Uses recycled water in a manner that optimizes its benefits and reduces (e.g., ag exchange) and for crops that sequester carbon or offset GHG.

System Recommendations

(See Appendix D for further detail)

I. Centralized System:

Brief description: A centralized system, using the best-value, small-pipe, sealed collection system (e.g., STEP/STEG, a dedicated low-pressure, or a hybrid low-pressure-vacuum system) with Air Diffusion System (ADS) treatment at a site out of town, integrated with the conservation-reuse-aquifer-recharge plan attached.

Benefits: A small-pipe sealed system has lower capital costs than a hybrid gravity collection system. (Note: A dedicated low pressure system or hybrid low-pressure-vacuum system may be as little as one-half current collection system cost estimates—based on company representative estimates at a presentation in Los Osos in November of 2008). Sealed, small-pipe systems also provide several environmental benefits over a hybrid gravity system for Los Osos. The area's hilly terrain, sandy soils, proximity to the Estuary, and location in an active earthquake zone make the gravity system—known to leak more than a sealed-pipe system—more susceptible to overflows and seeps that will pollute the bay and groundwater. (See the Appendices C for related research, including an account or overflows during one storm event in the Central Valley in 2006.) Furthermore, the shallow, flexible pipes of a sealed system are less vulnerable to earthquakes and easier and less expensive to repair when damaged. An integrated conservation-reuse-recharge element avoids project impacts to the basin with a measure of safety, reduces energy requirements and GHG's, and prepares for sea level rises—while the ADS ponding system, a nature-based system, requires minimal energy and sludge handing.

Considerations: A centralized system, with a treatment site out of town, will require a significant amount of conventional energy initially, resulting in significant GHG production. This can be reduced by maximizing wind and solar power use for major system components, and by encouraging the solar operation of on-site pumps with photovoltaics (possibly through rebates from grants or project funding). GHG's can also be avoided and reduced via an ag reuse/exchange program or community farming project designed to sequester carbon or produce biodiesel. Also, the integrated conservation-reuse-recharge plan will reduce project GHG's.

II. Decentralized system, with all septic systems eliminated

Brief description: A decentralized system, using the best-value, small-pipe, sealed collection system (e.g., STEP/STEG, a dedicated low-pressure, or a hybrid low-pressure-vacuum system) with two (2) in-town treatment sites, using constructed wetlands or greenhouse technology, and the integrated conservation-reuse-recharge plan attached.

Benefits: With treatment located in town, this system would reduce project costs for pipeline construction and energy use for pumping wastewater, helping meet project affordability guidelines. The conservation-reuse-recharge plan, which reduces wastewater flows, would reduce the size and costs of the decentralized alternatives presented in the LOWWP *Technical Memorandum: Decentralized Treatment*, while helping to avoid impacts to the basin and reduce

overall energy use. Constructed wetlands or living-machines (greenhouse treatment) solutions would provide co-benefits for the environment and community, e.g., additional habitat and attractive green spaces. This system also reduces the growth inducement potential of the project.

Considerations: Initial resistance to in-town treatment sites could be minimized with appropriate placement and design of treatment sites, along with community and agency outreach. (See Appendix F for an example of a constructed wetlands, landscaped to provide an attractive community green space.)

III. Decentralized system, with upgraded septic systems

Brief description: A decentralized system, using the best-value, small-diameter sealed system (e.g., STEP/STEG, dedicated low-pressure system, or a hybrid low-pressure-vacuum system), with constructed wetland treatment at one in-town location, and a cluster system serving sites with the potential to pollute the bay (approximately 1000 sites in relatively close proximity to the bay) with the remainder of sites in the Prohibition Zone receiving septic system upgrades. This would be combined with a basin-wide nitrogen management program and the integrated conservation-reuse-recharge plan attached.

Benefits*:* This solution would be the least costly, use the least energy, and cause the fewest impacts to basin hydrology from the project. Collecting wastewater from homes near the bay would prevent the potential for seeps to the bay, while the basin-wide nitrate management plan would reduce basin nitrate loading improving groundwater quality (see Appendix A1—II.A.3).

Considerations: This alternative may be necessary, if the costs or environmental impacts of other alternatives fail to meet affordability levels for the community or they are determined to pose too great a risk to the basin.

Conclusion

The Los Osos Sustainability Group appreciates the County's commitment to pursuing sustainable development. As we've mentioned in previous presentations, the LOWWP offers your Board and the County a unique opportunity to create a model of sustainable development for the state and nation. We hope this information and these recommendations will help in developing that project,

Sincerely,

Los Osos Sustainability Group (LOSG)

Some critical areas that will need to be re-analyzed, in order to avoid serious potential harm to the environment are the following:

a. Potential impacts on upper aquifer water levels, including the ability to pump from the upper aquifer at current levels post-septic systems without causing seawater intrusion or impairments to water quality. The Hopkins Groundwater Consultants report (Appendix D-2, Tables 8, 9, &10) will no longer show the upper aquifer is balanced once adjustments are made. With a minimum of 250 AFY of inflows removed, outflows to the bay and the lower aquifer are likely to decrease, and/or current well production will overdraft the aquifer. This requires an analysis of potential impacts and ways to avoid or mitigate for them. Potential impacts include seawater intrusion (i.e., saltwater contamination) in the upper aquifer due to over pumping, in addition to potential harm to estuarine ecosystems due to reduction in "Subsurface Outflows" (see Tables 9 & 10, Appendix D-2, DEIR). The latter would change the balance of freshwater and seawater inflow into the Estuary, negatively impacting ecosystems. Possible alternatives to avoid or mitigate for these impacts would include reduced production levels from the upper aquifer, greater levels of conservation, securing imported water, and a plans for desalination—which should be evaluated (also see # 10 below).

b. Potential impacts on the lower aquifer resulting in increase rates of seawater intrusion. Upper aquifer leakage has been found to be the single largest source of lower aquifer recharge (about 68% of the freshwater recharge per the Seawater Intrusion Assessment, Cleath and Associates, 2005, p. 76). Thus, seawater intrusion will increase without alternatives that avoid or mitigate for the beneficial recharge effects septic systems currently provide.

c. Potential impacts on surface water features due to reduction in subsurface flows, e.g., Willow and Los Osos Valley Creeks, Baywood Marsh, and Sweet Springs. Septic flows now provide 46% of the flows to the perched aquifer (per Appendix D-2, Tables 8-10) and much of the flows to aquatic ecosystems around the bay (Overflows from the upper aquifer supply these ecosystems, and significant reductions in flows, in addition to those already occurring with Projects 2a and 2b (i.e., about 150 AFY—see " "Subsurface Outflow," Appendix 2-D, Tables 8, 9 & 10) will cause negative impacts.

d. The potential benefits of the reuse/disposal element including Broderson recharge (i.e., Projects 2a and 2b). In several places, the DEIR indicates Projects 2a-2c will provide "a beneficial" impact" (e.g., 5.2-19) However, a downward adjustment in basin inflows of at least 250 AFY results in Projects 2a-2c potentially increasing seawater intrusion in the lower aquifer and/or causing seawater intrusion in the upper aquifer (see Table 10, Appendix D-2, DEIR).

3. The analysis of recharge sources to the basin should be revised to be clear, consistent, and understandable to the reader (e.g., Section 5.2 and Appendix D). Vineyard Area Citizens v. Rancho Cordova (2007) found that information had to be consistent in EIR analyses and intelligible to readers.
Currently, the DEIR is inconsistent in identifying recharge amounts and sources of water for various aquifers, as well as sources supplying sensitive ecosystems. For instance, on Page 5.2-2 of the DEIR and Page 6 of Appendix D-2, different amounts of inflow are reported. These sources and amounts are inconsistent with sources and amounts on Tables 8-10 of Appendix D-2, while the sources and amounts on Tables 8-10 are inconsistent with Appendix C of D-2 (e.g., Table 2) (even though it is the supporting study for Appendix D-2). Both of these reports are inconsistent with sources of recharge to the basin reported in the Yates and Williams study (even though it is the supporting study for Appendix C of D-2). The Yates and Williams study (the source document for Appendix C of D-2), makes it very clear there are only three significant sources of recharge to the aquifers (rainwater, irrigation return flows, and septic return flows), adding that water sources from outside the basin are a "…minor part of the overall water budget" (p. 4). The inconsistencies effectively confuse the reader and tend to obscure and downplay the potential negative impacts of removing septic flows from the basin. <u>The DEIR should use consistent</u>

recharge labeling and numbers, list fewer recharge sources, and be very clear about the three primary sources of recharge to the basin, to clearly represent the potential negative impacts of removing septic return flows from the basin.

4. The DEIR should acknowledge and discuss the level of uncertainty of information, findings, and mitigations presented, and it should analyze a reasonable range of alternatives to address uncertainties, along with mitigations and the feasibility of alternatives and mitigations. Vineyard Area Citizens v. Rancho Cordova (2007) found that EIRs had to acknowledge uncertainties and provide alternatives when mitigations were uncertain.

Some of the uncertainties not acknowledged in the DEIR are the following

a. The DEIR consistently states and implies Broderson leach fields are certain to recharge the upper aquifer and fully mitigate for the removal of septic flows, at times indicating the leach fields will provide net benefits to the basin (e.g., p. 5.2-19 ; Table 7-8, pp. 7-60 through 7-6; and Appendix D-2, pp. 18 & 40). In fact, the potential for Broderson to mitigate for the project and provide benefits is not certain.

The DEIR states,

> "…the disposal component of the project (Broderson leach fields) would ensure that there would not be a net loss in groundwater recharge to the aquifers that support overlying beneficial land uses and associated impacts would be less than significant. Furthermore, the proposed disposal of treated effluent at Broderson would reduce the current rate of seawater intrusion into the lower aquifer, thus resulting in a benefical impact" (p. 5.2-19).

Later, the DEIR reiterates,

> " The study results indicate that Broderson disposal will provide beneficial impacts that restore groundwater recharge and maintain a balance in the hydrologic budget that provides outflows for local well production and freshwater features (marshes and springs) around the bay" (p. 5.2-19).

These statements do not accurately represent Broderson leach field capability nor the uncertainty associated with Broderson leach fields. For one thing, "the study" referred to in the second quote (which is not provided or specifically cited in the DEIR) undoubtedly has a substantial margin of error (as do all basin studies, e.g., 10% or more, since they rely on steady-state groundwater models). Further, it is not possible for Broderson leach fields, discharging at a rate of 448 AFY, to provide all of the benefits of approximately 1150 AFY of septic flows discharged to septic leach fields. Aquifer balance calculations (Tables 8-10, Appendix D-2) illustrate this point (i.e., outflows must equal inflows). Thus, with 448 AFY at Broderson replacing 606 AFY of septic flows (by the current calculations in the DEIR), outflow to sensitive ecosystems and the lower aquifer will be reduced (see "Subsurface outflow," Tables 9 & 10). As pointed out in #1 above, the actual reduction in flows to aquifers and ecosystems will likely be even greater, although the exact effects of removing septic system flows from the basin's hydrologic system are not known.

Further, the 2005 *Draft Basin Management Plan* by Cleath and Associates recommended that 560 AFY of imported water was "actively pursued" as a "place holder" to stop seawater intrusion when the prior project went into effect (p. 10). The prior project provided for even more recharge at Broderson (about 900 AFY vs. 448 AFY). That plan also called also for testing the upper aquifer water quality "…to determine the actual production and water quality constraints on upper aquifer use for potable supply" and it recommended evaluating the feasibility of water sources other than the upper aquifer (e.g., ag exchange) (p. 10). Clearly, the Draft Plan did not consider Broderon's benefits to be a sure thing. At one point, the DEIR implies the uncertainty, indicating that much less than the 448 AFY planned for recharge will be dispensed at Broderson initially, to allow testing to see if Broderson leach fields perform as expected.

On one table (Table 14, Page 40 of Appendix D-2), the DEIR appears to (inconsistently) suggest that Broderson leach fields might result in upper aquifer levels dropping to dangerous levels (i.e., drop from "0 to -5.") The lowering of water tables by five feet would induce seawater intrusion in the upper aquifer. Nevertheless, directly below Table 14, the DEIR states "…Broderson discharge effectively replenishes the B and C zones beneath the perching layer…" The DEIR should acknowledge the uncertain benefits, and even potentially negative impacts of Broderson leach fields, and analyze alternatives to Projects 2a-2c to avoid impacts or mitigate for them—and to adequately inform decision makers of the potential impacts and range of alternatives. These include imported water, reduced upper and lower aquifer well production, ag reuse and exchange, and higher levels of conservation. The Los Osos Sustainability Group recommends that the conservation-reuse-recharge plan, which integrates several of the these options (see Achieving a Sustainable Los Osos Valley Water Basin attached).

b. The DEIR represents that Broderson leach fields are safe and will not cause impacts to homes due to liquefaction or landslides, and that it will not result in water surfacing downhill causing harm to homes or ecosystems. However, soil science experts such as Dr. Tom Rhuer and Larry Raio have contradicted this claim (see Geology analysis submitted by LOCAC). At one point, the DEIR discusses returning water pumped to the Broderson site to spray fields (possibly in tankers). However, this is not a mitigation, as it does not mitigate for the project's negative impacts on aquifer balance. This reinforces the need to analyze alternatives to Broderson leach fields.

c. The DEIR consistently refers to the required level of treatment for recycled water discharged at Broderson leach field as secondary, and the Waste Discharge Requirements (WDR) for Broderson discharge as identical to the prior project's WDR; however, both of these assumptions are uncertain. One of the primary objectives of the project is "RWQCB Waste Discharge Requirements (WDR)," explained as the same discharge requirements issued by the RWQCB for the prior project in 2001 (pp. 3-8 & 3-9). However, the California Department of Public Health (CDPH) has since proposed stricter wastewater recycling guidelines, and the RWQCB has not set the WDR for this project. Further, Broderson is clearly intended for indirect potable reuse, rather than simply disposal, so discharging recycled water treated to secondary standards at the site has potentially negative impacts on the drinking water supply. The potential for stricter treatment requirements is reinforced by the potential for Broderson leach fields to allow water to percolate relatively rapidly to the upper aquifer and/or the potential for the vadose zone to become saturated and less effective at removing contaminants. This uncertainty should be acknowledged in the DEIR and alternatives to treating recycled water for Broderson to secondary standards should be analyzed along, along with their potential impacts and relative feasibility. Some of these include treating the water to tertiary standards, treating it using advanced treatment such as oxidation and reverse osmosis (RO) treatments. Further, an option that does not use

Broderson leach fields at all should be analyzed e.g., one that uses greater levels of conservation and also ag exchange to mitigate for project impacts (see the alternatives in "a" above).

d. The DEIR consistently represents that the LOWWP is certain to have beneficial impacts on water quality in the basin by reducing nitrates. This assumption is based on one study, the Yates and Williams study in 2003, which found that nitrate levels would potentially decrease by 19% in 30 years. However, at the beginning of the study, its authors recommend "…a major overhaul and recalibration of the model to achieve a reasonable confidence in its results," which they say is not feasible in the present study. The authors go on to state, "…the greatest limitation of the present analysis is the use of steady-state rather than transient simulations. Steady-state calibration fails to make use of historical fluctuations and trends in water levels and nitrate concentrations, which provide much more information about the hydrogeologic system than single, averaged values" (pp. 2-3). Accurately representing the uncertainty of benefits from the project is needed for informed decision making.

e. The DEIR implies certainty regarding basin safe yields and the amount of recharge required to balance particular aquifers and the basin (e.g., Tables 8-10, Appendix D-2). All findings related to basin balance and basin safe yields (e.g., those stating the inflows required to offset well production and other outflows from the basin) are based on steady-state models, which have a relatively large margin of error. The 2005 Draft Basin Management Plan recommended converting the "…the steady state model into a transient model, with stress period intervals and overall simulation periods appropriate for solute transport simulation and long-term impacts analysis (p. 11). Cleath and Associates had to revise their 2002 basin safe yield estimates down by about 300 AFY after its Seawater Intrusion Assessment in 2005, and, over the years, basin safe yields have ranged from 1300-1800 AFY in 1974 to 3560 AFY in 2002 to 3250 AFY currently, showing the uncertainty of safe yield estimates (Source: SLO Planning Department Los Osos *Resource Capacity Study*, 2007). The DEIR should add a margin of safety to basin safe yields/aquifer balance estimates, using estimates 10-20% lower than current estimates, to ensure adequate mitigation for addressing potential project impacts.

f. The DEIR represents that the installation of the hybrid gravity collection system designed for the prior project will be feasible, technically and economically. However, the DEIR states or implies in several places (e.g., p. 5.2-19) that the exact location and movement of high groundwater is not known. A local soil scientist, Larry Raio, who's drilled water test wells in the area, confirms the unpredictability of high groundwater (see "Geology" comments submitted by LOCAC). If extensive high groundwater is encountered during construction of a gravity system, the costs of the system could become prohibitive, and/or the ability to mitigate for the impacts of deep trenching on infrastructure and sensitive ecosystems (e.g., the bay if large volumes of contaminated water are encountered) could make gravity system installation technically and economically infeasible. Further, if I/I is much greater than predicted by the DEIR, due to high groundwater or other factors, the LOWWP system's capacity could be exceeded as soon as it's built. <u>The above uncertainties should be acknowledged and alternatives discussed, along with their mitigations and feasibility.</u>

5. Where impacts to area ecosystems can be reasonably assumed, the DEIR should provide mitigations and discuss their feasibility, per CEQA, Section 15126.6 (b). In several places, the DEIR asserts that the impacts of removing septic flows from the basin on "surface water features is speculative" (e.g., Appendix D-2, p. 44). If roughly one-half of the perched layer inflow is septic return flows (per Appendix D-2, p. 24, and Appendix C of D-2); then it can be reasonably assumed the removal of septic return flows will cause significant impacts. It can also be reasonably assumed Broderson leach fields will

not mitigate for many of these effects, including impacts to Baywood Marsh and Willow Creek, since the Broderson leach fields are located some distance away from these ecosystems. It should also be noted that Appendix D-2 (Tables 9 & 10) estimates flows to Willow Creek will be reduced by almost 100% or about 500 AFY (although a more accurate estimate of the distribution of septic flows may reduce this number,—see #1 above). Surely stopping most of the flow to a creek system will cause a significant impact. Further, the impacts are known with a level of certainty at least equal to the certainty on which other groundwater-related conclusions are based. Willow Creek supplies Los Osos Creek, which supplies Los Osos Creek Estuary, which supplies the State Marine Reserve. No doubt, impacts to aquatic ecosystems (e.g., creeks and marshes) in the basin will be significantly impacted with removal of septic flows. These impacts must be analyzed, and alternatives to avoid or mitigate for the impacts discussed.

6. Water use estimates in DEIR for the Prohibition Zone, and the estimated wastewater flows (which provide the basis for calculating project capacity, treatment requirements, energy needs, storage capacity, and other project elements) should be re-evaluated to ensure an accurate analysis of potential project impacts, and ways to avoid or mitigate them—including potential growth inducement from the project. Current and future water use figures and wastewater flow estimates derived from these figures are overstated in the DEIR (e.g., pp. 3-19 & 20). The estimates are based on LOCSD water use figures cited in the Fine Screening Report and Technical Memorandum: Flow and Loads for winter months when outdoor water use is assumed to be minimal. However, there is likely to be some outdoor use during this time. The estimates also do not take into account recent indications that water use has gone down due to the tiered rate structure implemented by the LOCSD (per John Schempf, LOCSD General Manager, in a report to the Los Osos Community Advisory Committee on January 22, 2009). Further, buildout water use figures are based on what is very likely an inflated population number. With the current total Los Osos population very near what it was for the 2000 Census (14, 351) due to the building moratorium in place, with the Prohibition Zone population about 85% of the total; the current Prohibition Zone population is about 12,200. The build out estimate used to establish wastewater flows in the DEIR is 18,500 (DEIR, p. 3-20), whereas, the 2002 LOCSD *Water Master Plan* estimated potential infill within the Prohibition Zone would add 25% to the population (p. ES-2). Whereas, the Master Plan assumes buildout in the Prohibition Zone to be 17,803, adding 25% to estimate based on the 2000 Census would make the population would closer to 15, 250 than 17, 803 or 18, 500, indicating the DEIR may overestimate buildout population by as much as 3, 250, or over 20%. This results in a 20% oversizing of the system. Current and future population numbers should be analyzed, and the project appropriately sized. A smaller project will reduce impacts including the energy needed for pumping and treating wastewater and the land needed for effluent storage and disposal. An oversized facility will tend to create a vicious cycle of water overuse and/or over-development of the area. Excess facility capacity can (and undoubtedly will) be used to justify both.

7. The DEIR should provide a complete analysis of the significant potential negative environmental impacts of the hybrid gravity collection system (versus the STEP/STEG system and other flexible, small-pipe sealed systems) with regard to its potential for leaks and pollution of ground and surface waters—along with ways to avoid or mitigate for the impacts. The DEIR finds that Alternative 4, using a hybrid gravity collection system, is the environmentally preferred option. However, gravity systems are known to have more I/I than sealed systems. I/I is inflow (water leaking into a system from the surface) and infiltration (water leaking in to a system from underground.) I/I is the primary cause of sanitary sewer overflows (SSOs) known to be the leading cause of pollution and environmental harm from wastewater systems. An EPA study entitled *Exfiltration in Sewer Systems* (attached) states, "SSOs are overflows from sanitary sewer systems usually caused by infiltration and inflow (I/I) leading to

surcharged pipe conditions" (p. 1). The *California Beach Closure Report 2000*, published by the State Water Resources Control Board (July 2001) (attached), states "The primary causes of beach closures were sewer line overflow, breakage, and blockage" (p. 13). The State Water Resources Control Board (SWRCB) issued a state-wide Waste Discharge Requirements (WDR) for sewer systems in 2006 (SWRCB Order No. 2006-0003) due to wide-spread pollution and health risks caused by sewer overflows in California. That WDR is responding to the widespread destruction caused by gravity collections systems, rather than STEP/STEG or other sealed pipe systems—a conclusion drawn for three main reasons: 1) few STEP/STEG (and sealed-pipe) systems exist in California, 2) STEP/STEG and sealed pipe systems generate relatively little I/I, and 3) three of the most important causes of overflows cited in the WDR are common only to gravity collection systems, e.g., "manhole structure failures, pump station mechanical failures…excessive storm or ground water inflow/infiltration,…" (p. 1). Note that most all grease remains in a STEP/STEG tank, so does not clog the lines.

In one storm in January of 2006 in the Central Valley, hundreds of thousands of gallons of raw or partially treated sewage were released due to SSO's (attached). The California Men's Colony's wastewater system, with a gravity collection system, has overflowed several times during rainstorms sending many thousands of gallons of sewage into Morro Bay Estuary.

A gravity system in Los Osos would be particularly prone to overflows for two reasons 1) gravity pipes laid in sandy soil are more likely to shift or wash out causing leaks in bell and spigot joints (e.g., due to ground movement, exfiltration, and/or underground water flows), and 2) many gravity pipes are likely to be laid in high groundwater areas (i.e., unmapped perched water zones throughout the basin), so they will likely take on water even during non-wet-weather periods (unless they are sealed—not a part of the plan for a gravity system alternative). This fact suggests the I/I estimates, focused only on wet-weather flows, for a gravity system are low. Los Osos is particularly vulnerable to overflows that will pollute surface waters for a couple of reasons: 1) It has a hilly terrain requiring the gravity system to have a relatively high number of lift stations for the acreage served; pump stations and manholes are points in the system vulnerable to breeches and overflows, and 2) overflows from many locations in town will flow downhill reaching Morro Bay Estuary or one of the sensitive ecosystems along the bay.

The gravity system in Los Osos will also likely leak more raw sewage out of a system than a STEP/STEG system. The EPA study on exfiltration attached points out that it results from the same cause as I/I—leaks in the system (p. 3). Thus, a system more prone to I/I is more prone to exfiltration. According to the study, exfiltration "…can result in discharges of pathogens into residential areas; cause exceedances of water quality standards (WQS) and/or pose risks to the health of the people living adjacent to the impacted streams, lakes, ground water, sanitary sewers, and storm sewers; threaten aquatic life and its habitat; and impair the use and enjoyment of the Nation's waterways" (p. 1). The EPA study states "Areas with significant portions of the system above, but in close proximity to, the groundwater table are probably at greatest risk" (p. 25). For this reason, Los Osos may be particularly vulnerable to ground water pollution from exfiltration because, in many locations, groundwater levels are likely to be in close proximity to the gravity pipes.

One reason, gravity systems are more likely to have greater negative impacts over time is that leaks in pipes are more difficult to detect than in small-pipe, pressurized systems (e.g., STEP/STEG systems) while repairs, including digging up and replacing pipes, are much more costly, reducing the likelihood a community will perform timely repairs (even when leaks are detected). Further, higher I/I into systems

robs groundwater recharge, instead sending it to the treatment facility, adding pumping and treatment costs, also reducing the efficiency of the treatment process.

The *Fine Screening Report* states, "Properly installed bell-and-spigot sewers will be watertight at first, and then slowly lose their integrity as the surrounding soils shift, compressing the pipes, and compromising their seals at the joints" (p. 1-9). The Report goes on to state that the water tightness of a gravity system can be "preserved if a maintenance program is conducted on an ongoing basis to detect and repair leaks…"; however, it adds "This program would add to the cost of a gravity sewer compared to a STEP/STEG sewer with similar levels of I/I" (p. 1-9). The Report also finds that gravity collection system will have flows almost 20% greater in wet weather due to more leaks [i.e., 1.4 million gallons per day versus 1.2 mgd for a STEP/ STEG system] with an even greater difference in peak flows during wet weather (2.5 versus 1.7 mgd).

The *Fine Screening Report* indicates I/I estimates for gravity systems are conservative, but the report's estimates are based on standards (or recommended tolerances) for newly installed systems (p. 1-10), not older systems. In fact, even new systems can have very high levels of I/I, especially in high ground water areas such as Los Osos. In Lathrop, California, for instance, a system built only a few years ago experiences flows in wet weather double those of dry weather flows, due to I/I (see attached graph of water and wastewater use for the city dated November 2006).

In a phone conversation with Keith Wimer of the Los Osos Sustainability Group on September 19, 2007, Dr. George Tchobanoglous, a well-known authority on wastewater management, indicated that gravity pipes in Los Osos should be sealed or "butt welded" in high ground water areas and along the bay, where they might be impacted by seawater from rising sea levels in the future. Dr. Tchobanoglous added that saltwater contamination of wastewater could prevent the water from being used for beneficial purposes or require reverse osmosis at considerable addition cost. He added that gravity systems will never be as watertight as STEP/STEG systems, even with aggressive maintenance, which, he said, rarely happens, pointing out that San Francisco spends about $1 million annually on maintenance for its $2 billion system, but it would have to spend 1% or $20 million annually to do the job right.

In a 2007 textbook entitled *Water Reuse*, Dr. Tchobanoglous and other leading authorities in the field of wastewater, compare gravity and small-pipe sealed collection systems:

> "In addition to the high installation costs of centralized collection systems (gravity systems), issues with nonwatertight joints and damaged sections result in potentially high volumes of inflow and infiltration, or exfiltration in the collection system. Infiltration can more than double the flowrate and dilute wastewater constituents concentrations arriving at treatment facilities in extreme cases. Long-term infiltration into a collection system can also lower groundwater levels. Exfiltration from collection systems may result in groundwater or surfacewater contamination. While large centralized collection systems are not intended to leak, the nature of large rigid pipes buried in various soils results in more leaks and damage to pipe sections over time. Further, it is costly to identify and repair sections of damaged underground collection system, especially when located below roads and buildings in developed urban areas. Piping used for decentralized facilities (STEP/STEG, etc.) is mostly small diameter flexible plastic pipes, typically of polyvinyl chloride (PVC) with solvent welded joints or medium density polyethylene (MDPE) with compression joints which can be designed for high pressures or vacuum where alternative collection systems are used. Flexible

> plastic piping is much less likely to leak under normal bedding conditions. These pipes can be installed easily in narrow trenches or by directional drilling that results in minimal disturbance to property and roads" (p. 769).

In a 1998 textbook entitled *Small and Decentralized Wastewater Management Systems* by Drs. Tchobanoglous and Crites, point out that gravity sewers can also limit conservation measures:

> "In some areas the use of gravity sewers is becoming counter productive because the use of water conservation devices continues to increase. The minimum flows required for gravity-flow sewers to operate make them problematic where development occurs slowly in a large development or where water conservation reduces the wastewater flows significantly. In many cases, the water used to flush conventional gravity-flow collection systems for the removal of accumulated solids far exceeds the water saved through water conservation measures" (p. 8)

Dr. Tchobanoglous was a member of both National Water Research Institute (NRWI) peer reviews of proposed projects for Los Osos, the first the Ripley STEP/STEG plan in 2006 and the second a review of the current LOWWP recommended alternatives. The panel endorsed use of a STEP/STEG collection system (in the first and second reports) and a gravity collection system (in the second report). In the second, it also supported the principles stated in the *Key Environmental Issues Statement* (KEIS) on collections systems presented by a number of local not-for-profit groups. , which recommended STEP/STEG as the environmentally preferred system for Los Osos. Two principles of the KEIS supported by the NWRI were "1) Provide the greatest possible protection against overflows and other releases of partially treated or untreated wastewater from the system, which could pollute Morro Bay Estuary and other sensitive coastal ecosystems (e.g. Sweet Springs Nature Preserve), and 2) Provide the greatest possible protections to the groundwater of the Los Osos water basin." Although the panel did not state its position directly on the I/I and exfiltration issues discussed here—given its endorsement of the KEIS principles, the well-established fact gravity systems have greater I/I, and the statements of Dr. Tchobanoglous to Keith Wimer, which leads to increased chances of overflows—it is reasonable to conclude the NWRI panel endorsed a gravity system for Los Osos if the system was sealed, in particular in high groundwater areas and along the bay (e.g., to avoid seawater contamination in the future). The panel may not have realized that the low pressure component of the hybrid system (5 %) is intended only to pump water uphill when homes are located below the level of mainlines, as indicated in the Fine Screening and project design-build Request for Qualifications (RFQ). The panel may have also have assumed a gravity system would have the special, on-going maintenance program in place to minimize I/I and exfiltration (i.e., the program mentioned in the Fine Screening Report to detect and repair leaks at an added expense compared sealed small-pipe systems). This is a reasonable understanding of the NWRI panel's intent when it endorsed the KEIS principles. <u>If necessary, the EIR process should clarify the panel's intent when it approved the hybrid gravity system, obtaining its input on the need for sealing the system, maintenance, relative feasibility, and other aspects of the gravity system (e.g., its potential construction impacts on roads and infrastructure, especially in sandy soils and high groundwater), including a written response from the NWRI panel in the final EIR.</u> (Note: When a local not-for-profit group offered to pay for the NWRI panel to return to clarify its statements, County staff rejected the proposal).

A summary of the potential negative impacts of a gravity-hybrid system compared to the STEP/STEG system (or another small pipe sealed system) include:

a. Significantly greater chance of overflows and pollution of surface waters—due to greater I/I, higher peak flows, more likelihood of blockages from fat, oils, and grease (FOGs)(retained in a STEP/STEG tank), and the inherent vulnerability of system design (e.g., manholes and the relatively limited number of pump stations susceptible to power outages and failure, in addition to the limited inability of the system to equalize flows). A gravity system is expected to handle at least 180% of its design capacity during storms (2.5 mgd vs. 1.4 mgl), with very limited capacity to absorb sudden inflows in the collection system. Manholes have some capacity in manholes but it this is relatively limited compared to system flows and manholes are often a source of inflow during wet weather. A STEP/STEG system (and to a lesser extent low pressure and vacuum systems) have reserve capacity in STEP/STEG tanks, allowing sudden inflows to be taken in and distributed through the collection system over time, equalizing flows. A STEP/STEG system also has remote monitoring capabilities to coordinate the release of wastewater into the collection system and to enable detection and elimination of onsite I/I. Finally, it is easier and less costly to detect and repair shallow, small-pipe, pressurized systems (e.g., STEP/STEG systems) making it more likely a community will have the resources to perform timely repairs.

b. Significantly greater potential for exfiltration and pollution of groundwater: The EPA study entitled *Exfiltration in Sewers* (2000) points out that exfiltration results from the same causes as I/I—leaks in the system (p. 3). Therefore, because a gravity system is more prone to I/I, it is more prone to exfiltration. (Note: The DEIR is inaccurate when it indicates that small-pipe sealed systems will have greater exfiltration, e.g., in Table 7-5, (pp. 7-23 through 7-25) (see quote from *Water Reuse* above). The EPA study cited above states, "Exfiltration can result in discharges of pathogens into residential areas; cause exceedances of water quality standards (WQS) and/or pose risks to the health of the people living adjacent to the impacted streams, lakes, ground water, sanitary sewers, and storm sewers; threaten aquatic life and its habitat; and impair the use and enjoyment of the Nation's waterways" (p.1)

c. Signficantly more prone to earthquake damage and costlier to repair and replace. Los Osos lies in an earthquake-prone area close to many active faults. The chances of a serious earthquake occurring within the life of the wastewater project (50-100 years) are very high. Applying the rule of reason, the level of damage and the cost of repairs will be significantly greater for a gravity collection system than a STEP/STEG or other sealed-pipe system. This is because 1) gravity systems use rigid pipes, have a greater number of vulnerable connections (manholes, etc.), and rely on exact gradients and specifications to function properly (i.e., any ground movement that affects pipes will likely require extensive repairs); whereas, small pipe-sealed systems use flexible pipes, are fused, and have fewer vulnerable connections, to they are less likely to break or separate with ground movement); 2) detection and repairs of leaks will be more difficult and time-intensive due to the depth or gravity pipes, the size of pipes, and the infrastructure affected (e.g., streets and utility lines); whereas, leaks from a shallow, pressurized system, installed of pavement at the edges of streets, will more likely show at the surface and be easier to access and repair, and 3) potential impacts on the environment will be greater due to larger volumes of wastewater in a gravity collection system and the potential for it to flow downhill into the bay; whereas, most of the wastewater in a STEP/STEG system will be retained in the tanks**,** less vulnerable to leaking in an earthquake. The DEIR acknowledges Los Osos soils are subject to liquefaction, but it calls for a study, which does not quality as mitigation. Further, more mitigation will be required for a gravity system than a STEP/STEG or other sealed piped system. Sewer lines in the Los Angeles area are still being repaired from the Northridge Earthquake that struck in 1994. A similar-size quake hitting Los Osos—if a gravity system were installed—would cost a tremendous amount to repair (likely more than it

costs to install the gravity system initially), with an inestimable amount of damage to vital ecosystems in the area.

d. The potential to reduce the use of conservation measures in Los Osos: As indicated in the quote from *Small and Decentralized Wastewater Management Systems* above, a gravity system can require greater use of water, effectively preempting strong conservation measures in Los Osos, which not only will save water but also energy. Given the severe imbalance of the basin, it is likely a strong conservation effort will be needed. This constitutes a potentially signficant impact caused by this system.

e. Significantly greater potential to deplete the groundwater: Based on the flow differences of the two systems in the *Fine Screening Report*, a gravity system in Los Osos will take in 50-100 AFY more rainwater as I/I than a STEP/STEG system during peak and wet-weather flows, potentially reducing groundwater recharge by as much. (Note: This difference is not reflected in groundwater balance estimates, e.g., Tables 9 & 10 of Appendix D-2, so the basin will be even more out of balance with a gravity system than shown in #1 above).

8. Upgrades to the proposed gravity hybrid system should be discussed, along with mitigations for potential impacts and feasibility. The *Fine Screening Report* indicates that an active maintenance program or fusion welding the pipes in a gravity system will reduce I/I and exfiltration to levels closer to those of a STEP/STEG system—however, the Fine Screening Report indicates these measures add to costs compared to a STEP/STEG system. These additional costs were not elaborated on in the *Fine Screening Report* nor the DEIR, nor was their feasibility, nor the potential beneficial and negative impacts. The DEIR should analyze in some detail what is required for a maintenance/repair program or fusion welding to reduce the I/I-exfiltration of a gravity system closer to that of a STEP/STEG or other sealed system (i.e., avoid or mitigate for the system's impacts). Further, the EIR should analyze the potential impacts of the mitigations (e.g., flushing the system). Finally, the feasibility of repairing each system after a serious earthquake should be evaluated. Increased potential for I/I, overflows, exfiltration, and earthquake-related damage and costs clearly distinguish the two collection systems, making the gravity system potentially more impactful to the environment and less feasible. <u>Analyzing these upgrades to the gravity system is the only way to adequately compare the two systems (i.e., for the EIR to be a co-equal analysis).</u>

9. Several project alternatives should be analyzed (which have not been) to assure a reasonable range of alternatives, sufficient to make informed choices and determine the most feasible, environmentally preferred project.

These include the following:

a. A collection system alternative that includes a dedicated (100%) low-pressure system using grinder pumps or a collection system using a hybrid low-pressure-vacuum system. Both of these systems provide most of the environmental benefits mentioned in #7 above for STEP/STEG systems since they are sealed small-pipe system. However, these systems did not receive adequate consideration in the project screening or DEIR processes (e.g., consideration of environmental benefits and feasibility). The DEIR indicates that they are Level C alternatives, rejecting them for their high energy use and maintenance costs (p. 7-21). The analysis is inadequate to make this finding, and the DEIR cannot rely on the project screening process (e.g., the *LOWWP Technical Memorandum: Low-pressure Collection*). The LOWWP TM update assumes grinder pumps to be 2hp pumps, while the E-One pumps—possibly the

most widely-used pumps for low pressure systems in the world—are 1 hp. Further, E-One pumps generate considerable hydraulic head, so they may alleviate the need for lift stations and booster pumps, potentially making the system less energy intensive than a gravity collection system. Because a low pressure (grinder pump) system moves the entire wastewater stream, including solids, to the treatment facility via a pipe system; they alleviate several environmental impacts associated with STEP/STEG systems, including energy use for pumping septic tanks and the methane (GHG) production from STEP/STEG tanks. Further, wastewater systems using low pressure collection don't require an additional source of carbon (e.g., methanol) in the treatment process to achieve nitrate levels (although less environmentally impactful substitutes exist for STEP/STEG systems as well). Finally, the price for a complete system, estimated by company representatives (at a presentation in the Los Osos Community Center in November of 2008) showed the systems to be one-half or less the current cost estimates for collection system alternatives. Given the potential beneficial impacts of these systems, including their potential for being more economically feasible than other options (of major importance to the community), the EIR should review this alternative to provide an adequate range of alternatives for the public and decision makers to make an informed choice.

Another system with similar benefits, including the potential for greater economic feasibility, is the vacuum collection system. It uses very few pumps and much less energy overall that all the systems. Its total costs, too, can potentially be half or less of the systems currently under consideration in the DEIR, according to company representatives. While vacuum collection systems have slope limitations, theycan be effectively combined with low-pressure system components in steep areas to serve all of Los Osos, according to company representatives (at a presentation in the Los Osos Community Center in November of 2008). The vacuum system was brought forward from the LOWWP *Rough Screening Report* and recommended in the first NWRI peer review along the bay, but it was dropped without explanation from further analysis. Vacuum collection should also be reviewed to address high groundwater issues and to allow informed choices by decision makers and the public.

b. An integrated conservation-reuse-recharge plan using appropriate technologies and low impact development as an alternative for the Project 2a-2c reuse/disposal options. A sample plan is attached entitled "Achieving a Sustainable Los Osos Water Basin." It is designed to be installed concurrently with the project and to fully mitigate for its impacts. It emphasizes conservation, onsite reuse, and ag exchange to reduce pumping from the aquifers and mitigate for seawater intrusion impacts of the project. By enabling a significant reduction in pumping by the startup of the project, the plan provides greater flexibility in how potential environmental impacts are addressed (i.e., to the upper, lower aquifers, and sensitive ecosystems). It also provides for an integrated onsite-community low impact development and rainwater infiltration system to recharge the aquifers, support sensitive ecosystems, and reduce stormwater run off. By relying enhancing rainwater recharge of the basin, the plan increases the rate at which the water quality of the upper aquifer improves. The cost for Prohibition Zone residents would be approximately the same cost as the cost of the conservation and Broderson leach field components of Projects 2a-2c (see conservation-reuse-recharge plan attached, entitled *Achieving a Sustainable Los Osos Valley Water Basin*).

c. A decentralized system that with only two treatment sites, using the integrated conservation-reuse-recharge plan referenced in "b" above.

d. A partial system alternative that includes a sealed, small-pipe system serving homes near the bay or and other homes where septic systems may pose an unusual threat to ground water (possibly 20%

of homes in the Prohibition Zone), which combines a basin-wide nitrate management program, an indoor and outdoor conservation program (using appropriate technologies), and an LID program (focused on recharging the aquifers, supporting sensitive ecosystems, and stopping stormwater pollution). Most of the vital environmental systems in the basin are now in equilibrium, except for the lower aquifer which is being overdrafted. Nitrates in the upper aquifer are in equilibrium (i.e., not going to get worse), according to the 2005 Cleath and Associates nitrate study, while inflows to the upper aquifer and freshwater flows to sensitive ecosystems (the estuary and creeks) are keeping these systems in balance. The LOWWP will cause a major hydrologic disruption to the basin by removing about one-third of the recharge. Due to the complex interrelations of basin systems, the consequences of upsetting basin equilibrium is unpredictable and may cause seawater intrusion will get worse. Seawater intrusion, in fact, is a more serious groundwater contamination problem than nitrate because it is destroying drinking water in the basin at a faster rate. The nitrates in the upper aquifer remain at about drinking water standards on average (per the DEIR), allowing that source to be cost-effectively pumped for drinking with nitrogen treatment (now occuring). On the other hand, a growing number of community wells are being contaminated by seawater intrusion—rendering the water unusable without expensive desalination. The cost estimate of the Nipomo desalination plant is $100 million (according to The Tribune), and the cost estimate for importing water (if it is available) is at least $30 million (according to the LOWWP *Technical Memorandum: Imported Water*. Therefore, careful consideration must be given to upsetting the equilibrium of the basin, established over the past 30 years. One approach is to implement a partial plan, designed not to remove all septic systems in the basin. A conservative cost estimate for the entire system would be around $50 million.

(For descriptions of the above two projects, see recommendations submitted to the SLO Board of Supervisors by the Los Osos Sustainability Group on January 6, 2009—attached).

10. The DEIR should have a more in depth energy and GHG analyses, in which clean and renewable energy options are discussed in detail for powering various system components, which includes an analysis of alternatives for offsetting or reducing GHG production with carbon sequestering, biodiesel, algae production/cultivation, and co-generation. Currently, these options are inadequately evaluated. The analysis should assess how the system can be carbon neutral and even restorative, in order to help the region reach AB 32 carbon reduction goals.

11. The DEIR should re-analyzed treatment sites, e.g., Toninni as the preferred site doing, a more in-depth analysis of energy use, potential for growth inducement, and impacts on limited farmland in the Los Osos Valley. These impacts were not adequately addressed, and they are key to determining the environmental impacts and sustainability of the project. The energy needed for pumping wastewater to the various sites and recycled water back, or to receiving locations such as farms, should be compared for various sites, using a life-cycle analysis. Also, the potential for growth trend that impact limited farmland in the Los Osos Valley and growth inducement should be analyzed for various sites. Paavo Ogren suggested that a conservation easement might need to be established for a pipeline to the Toninni site to prevent future connections to the system. This and other alternatives should be discussed, along with mitigations and feasibility.

12. The impacts associated with displacing a relatively large percentage of the Los Osos community and the issue of whether the project itself is feasible should be analyzed with alternatives to avoid the impacts of citizen displacement. The estimated project costs ($250 per month per household) exceed the affordability level for 90% of the homeowners in the community. Affordability guidelines are

based on mean household incomes. Thus, it can be reasonably assumed that a relatively large percentage of homeowners will not be able to sustain the costs and will have to move from the community shortly after the full assessment takes effect or at a future date when the financial burden becomes too great. An affordability study recently completed and provided to LOCAC found that the presently-estimated cost of the LOWWP would exceed affordability levels for over 60% of the community, and about 35% of residents would have to move. The relocation of a percentage of the community has primary environmental impacts (e.g., relocating increases vehicular trips and GHC production). It also causes secondary impacts on the services and the infrastructure of other communities. These potentially significant impacts should be analyzed. The DEIR and CEQA (Section 15126.6) state that "economic viability" is among the factors that may be taken into account when addressing feasibility. Referencing CEQA Guidelines in Section 15364, "feasible" (for CEQA processes) means "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." The County would not be capable of completing the project without Proposition 218 assessment funding, and a project or mitigation would not normally be considered feasible if it caused a company or an individual responsible for project severe financial hardships. Many Los Osos residents paying the assessment will not be able to sustain $250 per month without either relocating or undergoing severe personal hardship. The percentage of people likely to move and/or the level of hardship people will face are factors in determining the feasibility of this project. They should be analyzed and discussed. Grants and low-cost funding may reduce potential environmental impacts and increase project feasibility, but they have not been secured at this point. These and other alternatives should be discussed within the context of feasibility and as mitigations to avoid the impacts of relatively large-scale migration of people out of the community. Finally, it should not be assumed that the passage of a Proposition 218 assessment implies the ability of homeowners' to pay for the project because residents were under the threat of a Notice of Violation from the Central Coast Water Quality Control Board prior to the assessment. Homeowners' willingness to comply with an order that carries possible $5000 dollar per day fines does not reflect their ability to pay.

13. The DEIR should include a substantive climate change impact analysis, including a discussion of the potential impacts related to sea level rises. Governor Schwarzenegger signed Executive Order S-13-80 into effect on November 14, 2008 requiring project planning to account for the impacts of climate change and recognizing the particular threat sea level rises pose for coastal communities (see http://gov.co.gov/executive-order/11036/). This requires public projects after that date to include climate change planning, and it recommends that projects in the works also prepare those plans. The Intergovernmental Panel on Climate Change and the State of California (e.g.,, Department of Water Resources California Water Plan) report that the potential for seawater intrusion in coastal aquifers will increase with sea level rises. In order to avoid seawater contamination of the septic effluent (requiring expensive reverse osmosis to decontaminate the water for reuse), the EIR will have to consider alternatives for preventing seawater contamination of wastewater in the system near the bay (e.g., sealing the gravity collection system or using a sealed, small-pipe system in vulnerable locations). Further, the DEIR should analyze the long-term potential impacts on aquifers from sea level rises, predicted to increase seawater intrusion in coastal aquifers (e.g., ways to begin bringing aquifer levels up).

11. The DEIR should include an analysis of green and appropriate technologies for their energy saving benefits and co-benefits, as well as a sustainability (triple bottom line) analysis determine the highest value system for citizens long-term. Sustainable development is the accepted planning paradigm of the 21st Century advocated by every state and federal agency involved in resource management and public infrastructure planning. Many EIR's have "sustainability" sections. A good

example is an EIR prepared by the City of Lodi for the Reynolds Ranch Project in 2002. That EIR provides a thorough analysis of sustainable energy use, including the potential for alternative energy use and generation. Michael Brandman Associates included a section for the San Ramon City Center EIR, which discussed water use efficiency "intended to promote sustainability through trip reduction and energy and water conservation" which included the use of a number of green and appropriate technologies to improve the project's sustainability. Darla Inglis, the Director of a new Low Impact Development (LID) Center in the region, related in a recent meeting with Mark Hutchinson and local environmental groups, that all public projects in Seattle now require a triple bottom line "asset management analysis," to determine project alternatives with the highest environmental, social, and economic value for customers long term. The EIR Scoping recommendations the Los Osos Sutainability Group submitted with other groups to the SLO Board of Supervisors on May 6, 2008 includes sustainability criteria for wastewater projects, plus suggested sustainable project alternatives for review. Also attached is the sustainability criteria and sustainable project recommendations we recently submitted to the SLO Board of Supervisors on January 6, 2009. <u>The DEIR should identify a range of green and appropriate technologies and processes, as well as a project that produces the greatest value long-term, for a sustainable project that design-build teams could then integrate into specific, innovative project proposals to achieve project goals.</u>