

MEMORANDUM

Date: January 7, 2011
To: Dan Gilmore, P.E., LOCSD General Manager
From: Rob Miller, P.E
Subject: Los Osos CSD 2010 Water Master Plan Capital Improvement Update – Water Distribution System (Technical Memorandum 1 of 2)

The Los Osos Community Services District (LOCSD or District) was approved by the voters in November 1998 and began operations in 1999. In 2002, the District adopted the 2002 Water Master Plan (2002 WMP), prepared by John L. Wallace & Associates (now known as Wallace Group), which provided a discussion on the following:

- Study Area Characteristics
- Water Quality
- Water Demand
- Storage
- Water Supply
- Recycled Water Use Feasibility Study
- Water Distribution System
- Summary of Recommendations and Capital Improvement Program

Since 2002, the District has completed numerous capital improvement projects to their water distribution system. In addition, there have been changes or updates to the current state of the existing and future water demand and water supply for the District as well as the entire community through efforts being completed by the Interlocutory Stipulated Judgment (ISJ) Group's actions. As a result, the District has requested Wallace Group to prepare two focused technical memoranda to update the 2002 WMP, including the following subject areas:

Tech Memo No. 1 – Water Distribution System

- Storage update
- Water Distribution System
- Summary of Recommendations and Capital Improvement Program

Tech Memo No. 2 – Water Supply and Demand

- Water demand – existing and projected future conditions
- Water supply – in conjunction with ISJ Basin Management Plan, including conservation and water efficiency

This technical memorandum will focus on the three topics listed above, and Tech Memo No. 2 will be released in the same general time frame as the Basin Management Plan, which is currently scheduled for the end of March 2011.



CIVIL ENGINEERING
CONSTRUCTION
MANAGEMENT
LANDSCAPE
ARCHITECTURE
MECHANICAL
ENGINEERING
PLANNING
PUBLIC WORKS
ADMINISTRATION
SURVEYING /
GIS SOLUTIONS
WATER RESOURCES
WALLACE SWANSON
INTERNATIONAL

WALLACE GROUP
A California Corporation

612 CLARION CT
SAN LUIS OBISPO
CALIFORNIA 93401

T 805 544-4011
F 805 544-4294

www.wallacegroup.us



WATERWORKS STANDARDS

Since the adoption of the 2002 WMP, the California Department of Public Health (CDPH) has adopted new Waterworks Standards. The Waterworks Standards can be located at <http://www.cdph.ca.gov/certlic/drinkingwater/Pages/Lawbook.aspx>. The Los Osos Community Services District 2010 WMP Update will be based on these updated standards.

CURRENT WATER DEMAND

As noted in the 2002 WMP, water system demands are important characteristics of water systems, as these parameters are used to size pumping, storage and distribution system facilities. Well production by aquifer zone will be summarized in Tech Memo No. 2.

Average Day Demand (ADD). Based on the production records for the past 10 years, the current ADD is 0.92 million gallons per day (mgd). However, the District has been proactive in implementing some water conservation measures, replacing leaking services, and enacting higher water commodity rates over the past 5 years. These efforts have ultimately reduced the water demand within the District. Over the past 5 years (2005-2009), the ADD is 0.82 mgd, or 0.10 mgd less than the 10 year average. With the continued water conservation measures being implemented by the County and under the pending Basin Management Plan, it is anticipated that this lower average will continue to decrease. Therefore, the 5 year average of **0.82 mgd** will be used as the District's current ADD. Future development is addressed in Tech Memo No. 2.

Maximum Day Demand (MDD). Based on a review of actual water production records, the maximum day demand was **1.42 mgd** and it occurred on July 29, 2007. The MDD was 1.73 times greater than the ADD.

Peak Hour Demand (PHD). The PHD is generally determined by calculating the specific demand within the day by monitoring tank levels and pumping records. In many municipal systems, the exact calculation of this parameter is difficult to ascertain. Therefore, based on communities of similar size and climate and past record information, a PHD factor of 3.5 (3.5 times the ADD) was assigned to the LOCSD water system. The PHD for the District is **2.87 mgd**.

Table 2 provides a summary of the existing water demand for the District.



Table 2. Existing Water System Demands

	Existing Demand (mgd)	Peaking Factor	Notes
Average Day Demand (ADD)	0.82	--	Average daily flow between 2005 thru 2009
Maximum Day Demand (MDD)	1.42	1.73	Occurred on July 29, 2007
Peak Hour Demand (PHD)	2.87	3.5	Assumed peaking factor

Current Per Capita Demand

Since 2002, more detailed GIS-based information has been analyzed from the 2000 census and related updates. This information includes a block-by-block estimate of population, which facilitates an improved categorization of the population in each purveyor service area. Given that minimal residential growth has occurred since 2000, the current population within the District is estimated from the 2000 Census at 7,657 persons. Based on an average day demand on 0.82 mgd and this population, the average per capita demand for the District is 107 gpcd.

STORAGE

This section describes the District's existing storage facilities and evaluates the storage needs.

Existing Storage Facilities

The District currently operates three water storage tanks. Two tanks are located on 16th Street north of El Moro. The 16th Street tanks feed both the Main Zone and the Boosted Zone. The third tank is located on 10th Street, south of Los Olivos. This tank feeds only in to the Main Zone. The District's hydro-pneumatic tank was removed from service in 2009 after the completion of the new booster station.

In December 2003, the District's 16th Street Tank #1 (the north tank) was damaged in the San Simeon Earthquake. The District received funds from the Federal Emergency Management Agency (FEMA) to repair the damage, which included replacing the bottom ring of the tank, a new ring foundation, a new fill system, new drain/overflow, and discharge water mains, paint the interior of the tank, and add new safety features to the roof.

In 2004, the District received money from the California Infrastructure and Economic Development Bank (CIEDB) for improvements to the District's water distribution system. A portion of these funds were used on the 16th Street tank site. These improvements, which were completed in 2008, included a new booster station, paint on the exterior of both tanks, paint on the interior of Tank #2 (the south tank), new safety features to the roof of Tank #2, new fill, drain, overflow, and discharge water



mains to Tank #2, new generator, and removal of the old booster station and hydro-pneumatic tank.

In 2010, the District commissioned a formal inspection by ATS, Inc. of the 10th Street Tank, including an inspection of the interior coating and submerged steel. The inspection revealed significant existing corrosion issues, and recommended that the tank be removed from service until repairs could be made. In addition, the report noted that the tank does not meet current seismic guidelines. In discussions with District operations staff, the water tank can be removed from service without compromising daily operations and service pressures, though it would result in the reduction of both fire and emergency storage. A first priority project for tank repairs is described in subsequent sections.

Table 3 provides a summary of the District's existing water storage facilities.

Table 3. Existing Water Storage Facilities

	Date Installed	Date Refurbished	Volume (gallons)	Material	Overflow Elevation, MSL
16 th Street Tank #1 (North)	1986	2008	400,000	Steel	198.0
16 th Street Tank #2 (South)	1986	2008	525,000	Steel	198.0
10 th Street Tank	1962	--	380,000	Steel	177.0
Storage Total	--	--	1,305,000	--	--

Storage Analysis

A municipal water system should have sufficient storage to meet the total demand for emergency, fire and operational needs utilizing only the District's system. If the District's storage is not sufficient to meet these needs, groundwater supply and inter-ties to neighboring water purveyors can be considered for storage. However, the use of these facilities is less reliable than additional storage tanks.

Emergency Storage

Emergency storage is intended to provide for conditions such as extended power outages, line breaks, pump failure, and similar problems. Most water planners accept that during emergencies, supply per capita may be reduced to minimum levels. Typically, on that basis, an emergency storage volume of 50 gpcd for three (3) days is accepted as a reasonable value. The recommended emergency storage is provided in Table 4.



Table 4. Emergency Storage Recommendations

	Estimated Population	Recommended Emergency Storage (MG)
Existing	7,657	1.15
Future Build-out (population increase from 2002 WMP)	8,832	1.32

If adequate capital funds are unavailable for storage tank construction, some communities depend on underground/aquifer storage for emergency supplies. In order for this assumption to be valid, the emergency well should be highly reliable, including dedicated standby power facilities. In order to provide this function, the well should have a capacity equivalent to the daily emergency storage need, or approximately 310 gallons per minute assuming continuous pumping. The District's 8th Street and Palisades wells would both be sufficient for this purpose.

Fire Storage

Fire storage is the volume of water needed to control fire in a building or group of buildings. The determination for this storage is based upon a recommended flow rate, its duration, and minimum residual pressure established by the Uniform Fire Code (UFC). The flow rate and duration for fire flow vary greatly with the type of development, with UFC values ranging from 1,500 to 15,000 gpm for different building types and sizes. The installation of fire sprinklers can provide reductions to these fire flow requirements through waivers from the fire department. To determine the required fire storage in the District, the most stringent fire flow requirement, 3,500 gpm for 3 hours will be used. This fire flow is based on the requirements for Baywood Elementary School and Los Osos Middle School. A fire suppression volume of 0.63 mg is required to meet the fire storage needs.

Operational Storage

Operational storage is the amount of water needed to equalize the daily supply and demand. AWWA M-32 recommends operational storage to be 20 to 25 percent of build-out average day demand for the given zone, or up to 15 percent of the maximum day demand. The recommended operational storage is 0.24 mg.

Summary of Storage Recommendations

Table 5 provides a summary of the existing and future storage needs for the District.

Table 5. Total Storage Recommendations

	Storage Component			Total Required Storage (mg)	Total Available Storage (mg)	Storage Surplus/(Deficit) (mg)
	Emergency	Fire	Operational			
Existing	1.15	0.63	0.24	2.02	1.31	(0.71)
Future Build-out	1.32	0.63	0.24	2.19	1.31	(0.88)

The 2002 WMP recommended the construction of the Highland Tank project at a cost of approximately \$4 million. The project was conceptualized to provide multiple



benefits, including the development of adequate gravity storage. It would have also allowed the District to retire the older 10th Street tank, which was constructed at a lower overflow elevation compared to the main 16th Street tanks. However, the community faces multiple financial challenges, including current District bankruptcy proceedings and a pending community-wide wastewater project. As a result, the current recommendation is to shift the Highland Tank project to a low priority standing, and utilize the groundwater basin for emergency storage. The 8th Street lower aquifer well, with a capacity of approximately 420 gallons per minute, is a good candidate for permanent standby power. The wastewater project is expected to develop a large standby generator at the same location, and electrical capacity for the well would only require a small increase in generator size. The District should work with the County during the design process to implement this recommendation, including identification of the incremental cost.

If the District elects to forego the Highland Tank Project, maintenance and repairs should be made to the existing 10th Street tank. This tank was inspected in 2004 following the San Simeon Earthquake, and corrosion and potential structural problems were noted. According to District staff, the tank is slated for inspection again this fiscal year, and a program of recommended improvements and the associated cost will be published at that time. Since a precise estimate is not currently available, a general tank repair project has been included with the Priority 1 projects. The cost should be updated as soon as the improvements are defined.

The District is also in the process of implementing improvements to an existing inter-tie with Golden State Water Company. The improved inter-tie will have the capacity to convey approximately 500 gallons per minute. This will provide an additional backup to the existing emergency storage available. Given that the proposed inter-tie construction has been budgeted for the current fiscal year, this project will not be listed in the capital improvements. However, the eventual implementation of a second intertie on the east side of the system is still recommended for future funding and has been carried forward.

WATER DISTRIBUTION SYSTEM

Existing Facilities

The District's distribution system is a network of 4-inch to 16-inch pipes, consisting mainly of asbestos cement pipe (ACP) and polyvinyl chloride (PVC) pipe, with some steel and ductile iron. An inventory of the existing pipeline network is summarized in Table 6 and shown on Figure Exhibit 1.



Table 6. Existing Water Distribution Inventory

Diameter [inches]	Material	Length		Percent of System
		Feet	Miles	
2	PVC	255	0.05	0.2%
4	AC	1,250	0.24	0.9%
	PVC	630	0.12	0.4%
	STEEL	850	0.16	0.6%
6	AC	46,620	8.83	32.8%
	PVC	35,850	6.79	25.2%
	STEEL	410	0.08	0.3%
8	AC	8,350	1.58	5.9%
	PVC	5,370	1.02	3.8%
10	AC	21,880	4.14	15.4%
	PVC	13,880	2.63	9.8%
12	AC	330	0.06	0.2%
	PVC	3,480	0.66	2.4%
16	DI	3,100	0.59	2.2%
	TOTAL	142,255	26.94	100.0%

Design Requirements

Design criteria used for analysis of the LOCSD water distribution system are based on the CDPH Waterworks Standards and the District's Standard Plans and Specifications. The design criteria relate primarily to the flow and pressure delivered by the system. Pressures below 20 psi are not acceptable in a municipal system. Ideally, normal operating pressures will be within the range of 40 to 80 psi.

The flow requirements examined in the network model include fire flow, maximum day demand, and average day demand. Peak hour demand is typically used to size pumps and storage reservoirs, and was not evaluated within the hydraulic model. The demands for the LOCSD system for these operating conditions are summarized previously in this report. The flow scenarios analyzed are as follows.

Average Day Demand

This flow condition was used to verify operating pressures for the most common system conditions. The 16th Street reservoirs were modeled at full capacity, and the 10th Street reservoir was modeled as closed.

Maximum Day Demand

The flow condition was used concurrently with fire flow. The 16th Street reservoirs were modeled at ¾ full and the 10th Street reservoir was modeled as closed.

Fire Flow

Residential, commercial, and school fire flow requirements were established based on the 2002 Master Plan. Fire flow was evaluated in conjunction with maximum day demands.

Design Criteria Summary

A summary of the hydraulic design parameters and criteria used to evaluate the LOCSD system are summarized in Table 7.

Operations and Maintenance Considerations

Wallace Group met with LOCSD staff to review current operations and maintenance (O&M) of the distribution system and discuss issues pertinent to ongoing O&M activities. Considerations related to O&M of the system for this Master Plan update include water quality testing, flushing for water quality and sediment removal, maintenance of check valves, and exercising the gate valves in the system.

Water Quality

The District routinely performs water quality sampling at designated locations and flushes mains as necessary for sediment removal and to achieve target chlorine residual levels. Locations of concern for water quality or flushing are as follows.

- Santa Ynez Avenue west of 8th Street. This 4-inch dead end main provides water service to a single house on Santa Ynez Avenue. District staff routinely flush this line to reach target chlorine residuals.





Table 7. Summary of Hydraulic Parameters and Design Criteria

Hydraulic Parameters and Design Criteria	Value	
Fire Flow Requirements	Residential	1,500 gpm
	Commercial	2,500 gpm
	School	3,500 gpm
Maximum Day Demand Factor	2.0 times ADD	
Peak Hour Demand Factor	3.5 times ADD	
Minimum Service Pressure @ ADD	40 psi	
Minimum Service Pressure @ MDD	30 psi	
Minimum Residual Pressure @ MDD and Fire Flow Conditions	20 psi	
Pipeline Velocity @ ADD	< 5 feet per second	
Pipeline Velocity @ MDD	< 10 feet per second	
Fire Hydrant Spacing	At every intersection:	
	Existing Residential	600 feet
	New Residential	500 feet
	Commercial	500 feet
Fire Hydrant	6" Wet Barrel	
	Residential	1-4" and 2-2.5" outlet
	Commercial	2-4" and 1-2.5" outlet
Valving	Placed such that no shut down of greater than 500 feet in commercial/residential areas, or greater than 800 feet for 1 acre or larger lots	

- 18th Street at Paso Robles Avenue. The sampling point at this location is difficult to operate and slated for replacement.
- South end of 5th Street and 6th Street. Both of these dead-end mains have substandard flushing capabilities.
- 7th Street between San Luis and Ramona Avenue. The District recently received a complaint regarding sediment in the water in this location and flushing the line resulted in a significant volume of sand removed from the system.
- 13th Street at Santa Ysabel Avenue. A blow-off was recently installed for the dead-end boosted zone waterline in 13th Street. The shutoff valve for the blow-off is no longer functioning correctly and requires replacement.



Check Valve Maintenance

There are 11 check valves in the District's distribution system, recently installed to separate the gravity zone from the boosted zone. These valves would allow flow to the boosted zone from the gravity zone in case of a pump failure at the 16th Street pump station. These valves are normally closed, creating a dead end condition on either side of the valve. It is recommended that the District perform flushing operations at these valve locations in the same manner as other dead end locations in the system. In addition, it is recommended that the District biannually isolate the check valves from the system, inspect the interior, and remove any sediment that may have settled at the valve location. In some cases, the check valves are located at the bottom of a hill, and sediment may build up on the boosted side of the valve creating a potential blockage that could prevent the valve from fully opening. Another option to accessing the interior of the valve would be to purchase the valve manufacturer's backflow actuator, which would allow District staff to manually operate the valves. However, if sediment becomes trapped inside the valve after operating with the backflow actuator, the valve may not reseal properly and could require further maintenance.

Gate Valve Exercising Program

District staff routinely exercises gate valves in the distribution system at least once annually. Over time, gate valves can become difficult to operate or seize up due to corrosion. Gate valves are a critical component of a distribution system as they are utilized to isolate portions of the system in case of line breaks or other emergencies. Consistently exercising a valve can help to alleviate corrosion and maintain valves in good working order.

The LOCSD valve exercising program takes a two-man crew approximately two months to complete. Through the program, District staff have compiled a list of valves that are difficult to operate or completely inoperable. Of the 558 valves documented in the program, 90 were categorized as difficult to operate, and 5 were slated for replacement due to being completely inoperable. In July of this year, the District had the opportunity to use a valve exercising machine on short-term loan from E.H. Wachs®. Using the valve exerciser District staff were successfully able to operate all 90 of the difficult valves, and operate 3 of the 5 valves slated for replacement. Continued use of the valve exerciser could decrease the force required to operate the problem valves, potentially enabling the District to operate these valves by hand once again.

The greatest benefit of continued use of a valve exercising machine would be more reliable performance from existing gate valves for emergency situations. In addition, the District would require fewer man-hours to complete the valve exercising program. The District estimates that with a valve exercising machine, every valve in the system could be operated in a month with one dedicated staff member. This is an approximate reduction of 75% in man-hours required for the District's exercising program.

Automated Water Meter Reading Technology (AMR)

District staff currently reads each water meter manually on a bi-monthly basis. In the 2002 WMP, the future implementation of AMR technology was identified as a Second Priority capital improvement at a cost of \$1.1 million. Water meters should be replaced on a regular schedule, with an average replacement interval of 15



years. Historically, District staff has performed water meter replacement, and many of the existing meters will be reaching the 15-year threshold by 2014. Based on recent AMR conversion projects for other Districts, it appears that the cost estimate from 2002 is higher than the current per water meter cost. Based on recent bids, the cost per meter is between \$200 and \$275. The total cost of the project including administrative expenses is estimated for this memorandum at \$827,000. This project will continue to a Priority 2 project.

Hydraulic Evaluation

The hydraulic water model developed in Bentley WaterCAD for the 2002 Master Plan was recently recalibrated to account for the water system upgrades installed after the Master Plan was adopted. This recalibrated water model was utilized to analyze the water system performance and make recommendations for improvements.

Water System Performance

Under existing conditions, the LOCSD water system does not fully meet the design criteria as summarized in Table 7. Some areas in the network were found to experience less than desirable pressures during domestic demands and substandard pressure and/or flow under fire flow conditions. A summary of system performance is as follows. Additional description of issues is included within recommended improvement projects.

- *Average Day Demand:* Approximately 17 modeled intersections in the system do not meet the minimum design pressure of 40 psi. These locations are all in the gravity fed zone, and have lower pressure due to elevation with respect to the 16th Street tanks.
- *Maximum Day Demand:* All modeled nodes in the system meet the minimum design pressure of 30 psi.
- *Fire Flow:* Approximately 31 intersections in the system have an available fire flow less than 1,500 gpm. These locations will be addressed by upgrades in the Capital Improvement Plan.

SUMMARY OF RECOMMENDATIONS AND CAPITAL IMPROVEMENT PROGRAM

First Priority Capital Improvements

First priority projects are upgrades that improve fire flow conditions for fire hydrants that are most deficient in flow and/or serve schools or commercial areas of the District, or upgrades that address critical O&M issues. A summary of the recommended improvements is included as Exhibit 1.

Water Service Upgrades

One of the Infrastructure Bank projects completed in 2007/ 2008 was the replacement of older water services, particularly those constructed of Polybutylene. The system includes approximately 2,740 water services, of which 1,149 have been replaced. All Polybutylene services have been replaced. However, a number of non-standard materials still exist within the system, including galvanized steel and schedule 40 PVC. The District standard materials are polyethylene and schedule



80 PVC. Approximately 1,320 services remain that are non-standard. The District is gradually replacing these services in-house with existing staff, and therefore a separately-funded capital improvement project has not been identified.

Blow-off Valve Replacement

It is recommended to replace the inoperable shutoff valve for the blow-off at the 13th Street and Santa Ysabel intersection with a resilient wedge gate valve that meets the requirement of the District's Standard Drawing W-3. It is also recommended to replace the shutoff valve for the blow-off at the 16th Street and Santa Ysabel intersection with a resilient wedge gate valve as a preventative measure.

PRV Adjustment

The PRV station installed at the 10th Street and Ramona intersection is currently set to open at approximately 30 psi, meaning the downstream pressure in the gravity zone must drop below 30 psi before the PRV opens. Based on the most recent calibration of the water model and fire flow testing which monitored pressure at this PRV station, the pressure in the gravity zone is not expected to drop below 30 psi at this location under the majority of operating conditions. It is recommended that the PRV be adjusted to open at approximately 45 psi, which would provide increased pressure to the gravity zone under peak hour and fire flow conditions. It is recommended that a Cla-Val representative assist the District with this adjustment, and demonstrate the adjustment process to District staff so that the District may adjust the PRV as needed in the future. In addition, it is recommended that the District, in coordination with Cla-Val, verify the pressure setting and operational integrity of the PRV located at the 9th Street and Los Olivos intersection. The District completed this recommendation prior to the final version of this technical memorandum.

18th/Paso Robles Loop Upgrade

It is recommended to install approximately 170 linear feet of 10-inch main to connect and loop the two existing 10-inch dead-end mains in 18th Street at Paso Robles Avenue. The addition of this loop creates a continuous 10-inch main in the boosted zone from the 16th Street Tank site to the recently upgraded 12-inch main in Los Olivos Avenue at 9th Street. This significantly increases hydraulic capacity between the pump station and the PRV in Los Olivos Avenue, to provide flow to the gravity zone for fire flow or peak hour conditions.

Ferrell Well Loop Upgrade

The District's Ferrell Well is currently out of service. Disconnecting the well from the distribution system created a dead-end condition on either side of the well. It is recommended to install approximately 50 linear feet of new 10-inch pipe to create a loop in the system through the Ferrell Well yard. This upgrade should include a tee and fittings as necessary for future connection of the well. This upgrade would increase available fire flow in the gravity zone on Ferrell Avenue and 7th Street.

Los Olivos Upgrade

It is recommended to replace approximately 1,000 linear feet of 8-inch ACP with 12-inch PVC, in Los Olivos from 10th Street to 11th Street and in 11th Street between Los Olivos and Santa Ynez Avenue. This project would significantly increase hydraulic capacity from the pump station to the PRV in Los Olivos Avenue, to provide flow to the gravity zone for fire flow or peak hour conditions.



Supervisory Control and Data Acquisition System (SCADA) Upgrade

The District's existing SCADA system was developed by the County in 1995 utilizing then-current technology. The ability of existing technology to track, record, analyze, and alarm various water system conditions is significantly more advanced. In addition, some of the programmable components in the existing system will eventually become obsolete. The 2002 WMP recommended a SCADA improvement project as a Priority 2 capital improvement with a total project budget of \$210,000. Given the District's previously completed I-Bank projects, SCADA has been shifted to a lower-ranked Priority 1 project. The recommended total budget remains at \$210,000. The SCADA project should include advanced well monitoring facilities at the Palisades well to dynamically monitor salt (conductivity) levels and water depth.

10th Street Tank Repairs

As discussed previously, the 10th Street tank may be needed for the foreseeable future as funds are pursued for the Highland Tank project. Based on the funds expended for the 16th Street Tank retrofit project, the scope of the repairs can range from coating and corrosion repairs to a full seismic retrofit or tank replacement. The cost of the project will also vary depending on the scope, with an estimate of approximately \$80,000 for coating and corrosion repairs to over \$200,000 for a full seismic upgrade. An initial capital improvement allowance of \$140,000 has been identified to allow for full repair of the coating and corrosion and incremental strengthening of the foundation system. As a first step in the project, a detailed technical memorandum should be prepared in conjunction with a structural engineer outlining the advantages and disadvantages of a range of repair options.

12th/Santa Paula Dead End Upgrade

It is recommended to replace approximately 820 linear feet of 4-inch steel pipe with 8-inch PVC in 12th Street and Santa Paula Avenue, increasing available fire flow for two deficient hydrants on Santa Paula Avenue.

2nd Street and Santa Ysabel Upgrade

Located in the northwest section of the LOCSD are several commercial properties requiring 2,500 gpm. These properties are currently being served via a 6-inch waterline, incapable of supplying the required fire flow. It is recommended to upgrade 940 feet of 6-inch waterline to 12-inch PVC on 2nd Street, between Santa Ysabel to Santa Maria, and on Santa Ysabel, between 2nd and 3rd Street.

Supplemental Water Wells

The 2002 WMP recommended additional water supplies wells to reduce reliance on the District's Palisades well. Subsequently, the need for additional upper aquifer (Zone C) supplies to balance the groundwater basin also reinforced the need for new wells. This topic will be addressed in Technical Memorandum No. 2, but the related project is expected to be high in priority. The project is expected to include standby power for the 8th Street well as discussed previously.

LOCSD/GSWC Inter-Ties

The LOCSD and Golden State Water Company (GSWC) water distribution systems border each other. The two water purveyors currently share one inter-tie at the intersection of Los Olivos and 11th Street. This inter-tie is currently in design for an



upgrade. This project is already budgeted in this fiscal year. The inter-tie is only used for emergency purposes. With the newly expanded boosted zone, the hydraulic grade lines in both water systems are relatively the same. The upgrade to this inter-tie will include a two-way meter and gate valves that would remain normally closed.

In addition to this inter-tie, it is recommended to construct an additional inter-tie at Santa Ynez and Mountain View. In order for the LOCSD to make this connection, the inter-tie will require 660 feet of 8-inch PVC water main from Santa Ynez to Nipomo on Mountain View. Both inter-ties will provide an emergency connection to either water purveyor's distribution system, without having to boost the pressure to feed into the system. This improvement provides both distribution systems with supply redundancy in case of an emergency.

Santa Maria Loop Upgrade

It is recommended to install approximately 300 linear feet of new 10-inch pipe in Santa Maria Avenue, creating a loop between 17th Street and 18th Street. This project would increase available fire flow and improve water quality on 18th Street between El Moro Avenue and Santa Ysabel Avenue. Currently, a 6-inch dead end main extends from El Moro Avenue north towards Santa Ysabel Avenue, but does not connect through to Santa Ysabel. This project would reduce the length of dead-end main from over 1,000 feet to approximately 350 feet.

15th Street Dead End Upgrade

It is recommended to replace approximately 450 linear feet of 4-inch PVC with 8-inch PVC and install a new fire hydrant at the southerly cul-de-sac of 15th Street. The nearest hydrant is located at the 15th Street and Ramona Avenue intersection, approximately 550 feet away from the home at the end of the 15th Street cul-de-sac. In addition, the District routinely flushes this dead-end main for sediment, and a full size fire hydrant would allow for additional flushing opportunities.

Operations Office

The adequacy of the existing operations office at 8th Street and El Moro has been subject of extensive committee and board discussion since the release of the 2002 WMP, which recommended a two-phase project with a total budget of \$1.2 million. Given the District's financial position, alternative project strategies have recently received stronger consideration. Staff's current recommendation is to make a minimum number of improvements to enhance the utility and extend the useful life of the existing operations facility, while pursuing the following strategies that have a potentially lower cost:

- Consolidation with the operations facilities contemplated with the wastewater project.
- Use of rented space at commercially available facilities such as Sunnyside School.

An interim project is recommended with a first priority budget allocation of \$140,000 to add nominal office space and extend the useful life of the exterior of the existing building. Consideration should be given to forming an ad hoc subcommittee of the Utility Operations Committee to review and present options to the Board prior to funding the project.



Second Priority Capital Improvements

Second priority projects are upgrades that provide redundancy and reliability to the system, and increase flow to fire hydrants that provide marginal fire flow for residential areas (marginal defined as greater than 1,000 gpm but not reaching the recommended 1,500 gpm). The goal of the second priority projects is to create a backbone of 10-inch and 12-inch water mains in both the gravity and boosted zone. The proposed system backbone routes were selected to maximum flow to the schools and commercial areas, and maximize hydraulic capacity to the PRVs in the boosted zone that provide supplemental flow to the gravity zone. A summary of the recommended improvements is included as Exhibit 1.

Ferrell Avenue Loop Upgrade

It is recommended to install approximately 725 linear feet of new 10-inch PVC from the dead-end main on the north end of Ferrell Avenue to the main in 6th Street, to loop the system at this location and increase available fire flow to the hydrant on the north end of Ferrell Avenue.

An easement would be required for the installation of the waterline between Ferrell Avenue and 6th Street, with an approximate easement length of 210 feet. The parcel between the two streets is currently undeveloped, and according to San Luis Obispo County records has an assessed value of \$501,184 for the 2010/2011 tax year (<http://assessor.slocounty.ca.gov/pisa/>, APN 074-229-004). Based on the total property size of 8.58 acres, this results in a 2010/2011 assessed value of \$1.34 per square foot. This project may be best completed as a condition of new development.

7th Street Dead End Upgrade

It is recommended to replace approximately 175 linear feet of 4-inch schedule 40 PVC and approximately 85 linear feet of 6-inch ACP with 8-inch PVC, on 7th Street north of Santa Ysabel Avenue. Schedule 40 PVC is considered a substandard water main material and is prone to breakages. However, there are no fire hydrants connected to this main and the District does not currently have problems with water quality at this dead end.

14th/15th and Santa Paula Upgrade

It is recommended to replace approximately 675 linear feet of 4-inch ACP on 14th Street and approximately 675 linear feet of 6-inch PVC on 15th Street with 8-inch PVC. This upgrade increases available fire flow to the fire hydrants on Santa Paula Avenue.

11th/Santa Maria Upgrade

It is recommended to replace approximately 2,030 linear feet of 6-inch ACP and PVC with 12-inch and 10-inch PVC to increase hydraulic capacity for flow to Baywood Elementary School. This upgrade will also create a portion of the gravity zone backbone.

12th/EI Moro Dead End and Loop Upgrade

It is recommended to install approximately 340 feet of new 8-inch PVC in EI Moro from 11th Street to 12th Street, creating a new loop in the gravity zone, and upgrade approximately 650 feet of 6-inch ACP to 8-inch PVC in 12th Street. This upgrade



increases available flow to the fire hydrant at the 12th Street and Paso Robles intersection. Operationally, the gravity main dead-ends at the 12th Street and Paso Robles intersection, due to the check valve separating the boosted zone from the gravity zone. This upgrade would also increase available flow to the boosted zone through this check valve in the case of pump station failure.

El Moro Upgrade

It is recommended to install approximately 1,330 linear feet of new 10-inch PVC in El Moro Avenue between 8th Street and 4th Street to create a portion of the gravity zone backbone.

3rd/Pismo Upgrade

It is recommended to replace approximately 1,670 linear feet of 6-inch ACP with 10-inch PVC in 3rd Street from El Moro to Pismo Avenue, and in Pismo Avenue from 3rd to 4th Street, to create a portion of the gravity zone backbone.

4th/Ramona Upgrade

It is recommended to replace approximately 1,010 linear feet of 8-inch ACP with 10-inch PVC in 4th Street from Pismo to Ramona Avenue, and in Ramona Avenue from 4th to 5th Street, to create a portion of the gravity zone backbone.

Ramona Upgrade

It is recommended to replace approximately 970 linear feet of 6-inch ACP with 10-inch PVC in Ramona Avenue, from 6th Street to 8th Street, and from 9th Street to 10th Street, to create a portion of the gravity zone backbone.

18th/Ramona Loop Upgrade

It is recommended to install approximately 400 linear feet of new 8-inch PVC pipe to loop the water system between 18th Street and 17th Street on Ramona Avenue. This upgrade increases available fire flow to the hydrant on 18th Street north of Ramona Avenue to reach the recommended 1,500 gpm. It is noted that the District does not currently have issues with water quality at this dead-end location.

8th/Santa Ynez Dead End Upgrade

It is recommended to replace approximately 240 linear feet of 6-inch PVC to 8-inch PVC on 8th Street and Santa Ynez Avenue, to increase available fire flow to the fire hydrant on 8th Street south of Santa Ynez Avenue. This hydrant serves a relatively large number of homes on the south end of 8th Street. In addition, it is recommended to abandon the 4-inch water main in Santa Ynez Avenue west of 8th Street. This water main serves a single home at the west end of Santa Ynez Avenue that could be connected to the water main in 8th Street with a long lateral (required lateral length is approximately 180 feet). District staff routinely flushes this 4-inch line in order to achieve target chlorine residuals due to low flow through the line.

Water Meter Upgrades – AMR System

There are approximately 2,750 service connections and water meters in the District's service area. The District desires to upgrade and replace all of the water meters with state-of-the-art automatic read water meters. These meters will allow drive-by reading of the meters, increase billings and revenue by replacing older meters, and improves the accuracy of meter readings and billings.



It is estimated that the entire change-out of meters will cost approximately \$825,000. This cost includes the cost of each meter replacement, the radio equipment required to read the new meters, and the new software. This cost is estimated at \$275 per meter replacement plus administrative costs.

As District staff encounters faulty meters, they are being replaced with new Badger meters. These meters are compatible with the radio-read type meters, should the District decide to pursue these types of meters in the future.

Fire Hydrant Installation

The 2002 Water Master Plan identified 11 new fire hydrants that are needed to meet the District's fire hydrant spacing criteria. Of the 11 recommended fire hydrants, 6 are able to be installed in conjunction with another capital improvement project and therefore will not have an additional CIP expense. The installation of needed fire hydrants will improve fire fighting capabilities throughout the service area. Since the 2002 Water Master Plan, of the 5 fire hydrants recommended, one has been installed. For future fire hydrant locations, refer to Figure 7-8 of the 2002 Water Master Plan.

Third Priority Capital Improvements

Third priority projects are upgrades that augment the distribution system backbone, and increase hydraulic capacity throughout the system. The Highland Water Tank project has been shifted to Priority 3 as described previously. A summary of the recommended improvements is included as Exhibit 1.

Nipomo Upgrade

It is recommended to replace approximately 300 linear feet of 6-inch ACP with 10-inch PVC in Nipomo Avenue from 12th Street to 14th Street. This upgrade increases hydraulic capacity for the commercial and multi-family developments on Nipomo Avenue.

14th/Ramona Upgrade

It is recommended to replace approximately 1,020 linear feet of 6-inch ACP with 10-inch PVC, in 14th Street from Ramona to Nipomo Avenue and in Ramona Avenue from 14th Street to 15th Street. This upgrade reinforces the boosted zone backbone.

Ferrell/Bush Upgrade

It is recommended to replace approximately 2,950 linear feet of 8-inch ACP with 10-inch PVC to increase hydraulic capacity for the Ferrell Avenue and Bush Avenue pipeline. The system is operationally a dead-end at the Bush Avenue and Los Osos Valley Road intersection due to the check valve that separates the boosted zone from the gravity zone at this location.



4th Street Upgrade

It is recommended to replace approximately 270 linear feet of 4-inch ACP in 4th Street between Santa Ysabel and Santa Paula Avenue with 8-inch PVC.

18th/El Moro Upgrade

It is recommended to replace approximately 660 linear feet of 10-inch ACP with 12-inch PVC in El Moro Avenue between 16th Street and 18th Street to reinforce the boosted zone backbone and increase hydraulic capacity for flow to the Los Osos Middle School.

Dead-end Upgrades

It is recommended to replace dead-end mains in the distribution system with 8-inch PVC, including a full size blow-off if a hydrant is not located near to the end of the main. The multiple locations recommended for this upgrade are illustrated in Exhibit 1 and listed as follows:

- Upgrade 255 feet of 6-inch waterline to 8-inch PVC in 1st Street, from Santa Maria going south.
- Upgrade 400 feet of 6-inch waterline to 8-inch PVC in 5th Street, from Santa Ysabel going north.
- Upgrade 300 feet of 6-inch waterline to 8-inch PVC in 6th Street, from Santa Ysabel going north.
- Upgrade 260 feet of 4-inch waterline to 8-inch PVC in 7th Street, from Santa Ysabel going north.
- Upgrade 245 feet of 6-inch waterline to 8-inch PVC in 8th Street, from Santa Ysabel going north.
- Upgrade 325 feet of 6-inch waterline to 8-inch PVC in 9th Street, from Santa Ysabel going north.
- Upgrade 430 feet of 6-inch waterline to 8-inch PVC in 10th Street, from Santa Ysabel going north.

11th Street Upgrade

It is recommended to replace approximately 2,020 linear feet of 6-inch PVC with 10-inch PVC in 11th Street between Santa Ynez and Ramona Avenue, and replace approximately 330 linear feet of 4-inch ACP on San Luis Avenue between 11th and 12th Street. This upgrade reinforces the boosted zone backbone, and increases hydraulic capacity between the pump station and the southern portion of the boosted zone.

15th/Pismo Upgrade

It is recommended to replace approximately 2,000 linear feet of 6-inch ACP and PVC with 10-inch PVC on 15th Street between El Moro and Pismo Avenue and on Pismo Avenue between 14th and 16th Street, to reinforce the boosted zone backbone.

South Bay Loop Upgrade

It is recommended to install new pipe to loop the distribution system on South Bay Boulevard. This new loop in the system would improve reliability through redundancy and would increase hydraulic capacity to the current dead-end

locations. It is recommended to install 325 feet of 8-inch PVC in South Bay Boulevard, south of Santa Ysabel Street.

Valve Upgrades

In order to meet the District's criteria for valve spacing for pipeline isolation, 129 new isolation valves were identified throughout the system. Since the 2002 Water Master Plan, 5 of these valves have been installed. Figure 7-8 of the 2002 Water Master Plan depicts the locations of these new valves. New valve installation should be scheduled with any scheduled main line replacement, or with a main line replacement in close proximity to a needed isolation valve. Other valve installations should be scheduled year-to-year until all needed valves are installed. The estimated number of new valves (124) does not include those valves that will be installed on upgraded pipelines in the future. It is assumed that isolation valves on new upgraded pipelines are included in the cost for the new pipeline. Since new valve installations are not as critical as up-sizing a main to improve hydraulics, or fire hydrant installations to improve public safety, the schedule for on-going valve installations should be performed on a third priority basis, and consider the following:

- Target valve installations on older water mains not scheduled to be replaced. These water mains may run a higher probability of main breaks.
- Schedule valve installations prior to scheduled pavement projects.

Highland Tank and Water Main Upgrade

As discussed previously, it is recommended that a 1.4 MG water storage facility, to provide adequate system storage to meet existing and future demand. In order to supply the water distribution system, a 16-inch water supply line will be required from the Highland tank, north on Alexander Avenue to Woodland Drive, east on Woodland Drive to Palisades Avenue, north on Palisades Avenue to LOVR. It will connect to the existing 16-inch water main on LOVR. Therefore, it is recommended to upgrade and install 4,070 feet of new 16-inch water main on the route describe above to supply water from the new Highland Tank to the main distribution system.



**Exhibit 1
First Priority Capital Improvement Projects
Los Osos Community Services District**

Project #	Title	Description	Zone	Quantity	Length (Ft)	Old Diameter (in)	New Diameter (in)	Street	Location	Construction Cost (\$)		Subtotal (\$)	Total Project Cost (\$)*	Function
1	Blow-off Valve Replacement	Replace gate valve	Boosted	1	---	4	4	13th	Just south of Santa Ysabel	\$1,500.00	LS	\$1,500	\$2,100	O&M
		Replace gate valve	Main	1	---	4	4	16th	Just south of Santa Ysabel	\$1,500.00	LS	\$1,500	\$2,100	O&M
Blow-off Valve Replacement Total													\$4,200	
2	PRV Adjustment	Adjust PRV pressure setting	Both	1	---	---	---	Ramona	10th Street	\$0	LS	\$0	\$0	Peak hour and fire flow to main zone
		Verify PRV pressure setting	Both	1	---	---	---	Los Olivos	9th Street	\$0	LS	\$0	\$0	Peak hour and fire flow to main zone
PRV Adjustment Total													\$0	
3	18th/Paso Robles Loop Upgrade	New Pipe	Boosted	---	170	---	10	18th	Paso Robles Avenue	\$165.00	LF	\$28,050	\$39,270	Distribution Loop in Boosted Zone
		18th/Paso Robles Upgrade Total												
4	Ferrell Well Loop Upgrade	New Pipe	Main	---	50	---	10	---	Ferrell Well Yard	\$165	LF	\$8,250	\$11,550	Distribution Loop in Main Zone
		Ferrell Well Loop Upgrade Total												
5	Los Olivos Upgrade	Upgrade Pipe	Boosted	---	360	8	12	Los Olivos	From 10th to 11th	\$180	LF	\$64,800	\$90,720	Distribution Loop in Boosted Zone
		Upgrade Pipe	Boosted	---	640	8	12	11th	From Los Oivos to Santa Ynez	\$180	LF	\$115,200	\$161,280	
Los Olivos Upgrade Total													\$252,000	
6	SCADA System Upgrade	Design/Construction of SCADA System	Both	1						\$150,000	LS	\$150,000	\$210,000	Improved operational control
		SCADA Upgrade Total												
7	10th Street Tank Repairs	Design/Construction of SCADA System	Both	1						\$100,000	LS	\$100,000	\$140,000	Structural and seismic repairs - cost to be refined after FY2010/11 inspection.
		10th Street Tank Repairs												

**Exhibit 1
First Priority Capital Improvement Projects
Los Osos Community Services District**

Project #	Title	Description	Zone	Quantity	Length (Ft)	Old Diameter (in)	New Diameter (in)	Street	Location	Construction Cost (\$)		Subtotal (\$)	Total Project Cost (\$)*	Function
8	12th/Santa Paula Dead-End Upgrade	Upgrade Pipe	Main	---	490	4	8	Santa Paula	From 12th Street going West	\$155	LF	\$75,950	\$106,330	Distribution Loop in Main Zone
		Upgrade Pipe	Main	---	330	4	8	12th	From Santa Ysabel to Santa Paula	\$155	LF	\$51,150	\$71,610	Distribution Loop in Main Zone
12th/Santa Paula Dead-End Upgrade Total													\$177,940	
9	2nd/Santa Ysabel Upgrade	Upgrade Pipe	Main	---	645	6	12	2nd	From Santa Ysabel to Santa Maria	\$150	LF	\$96,750	\$135,450	Fire Flow to Commercial Zone
		Upgrade Pipe	Main	---	295	6	12	Santa Ysabel	From 2nd to 3rd	\$150	LF	\$44,250	\$61,950	Fire Flow to Commercial Zone
2nd/Santa Ysabel Upgrade Total													\$197,400	
10	Supplemental Water Wells	New upper zone wells							To be addressed in Tech Memo No. 2					Offset Water Supply Deficit
Supplemental Water Wells Total													Pending	
11	LOCSD/GSWC Inter-Ties	Upgrade Existing Inter-tie	Boosted	1				Los Olivos	At Los Olivos and 11th Street					Budgeted in current fiscal year Emergency Connection
		New Inter-tie connection	Boosted	1				Mountain View	At Mountain View and Santa Ynez	\$30,000	EA	\$30,000	\$42,000	Emergency Connection
		New Pipe	Boosted		660		8	Mountain View	From Santa Ynez to Nipomo	\$90	LF	\$59,400	\$83,160	Emergency Connection
LOCSD/Cal-Cities Inter-Ties Total													\$125,160	
12	Santa Maria Loop Upgrade	New Pipe	Boosted	---	650	---	10	Santa Maria	From 16th Street to 18th Street	\$165	LF	\$107,250	\$150,150	Distribution Loop in Boosted Zone
Santa Maria Loop Upgrade Total													\$150,150	
13	15th Street Dead-end Upgrade	Upgrade Pipe	Boosted	---	450	4	8	15th Street	From Ramona Avenue going South	\$155	LF	\$69,750	\$97,650	Fire Flow to Residential Zone
15th Street Dead-end Upgrade Total													\$97,650	
14	Water Operations Facility Improvements	Maintenance and Repairs for Water Operations Facility	Both	1						\$100,000	LS	\$100,000	\$140,000	
Water Operations Facility Total													\$140,000	
Total													\$1,545,320	

* Total includes construction cost plus preliminary engineering, design engineering, administration construction management and inspection costs

**Exhibit 2
Second Priority Capital Improvement Projects
Los Osos Community Services District**

Project #	Title	Description	Zone	Quantity	Length (Ft)	Old Diameter (in)	New Diameter (in)	Street	Location	Construction Cost (\$)		Subtotal (\$)	Total Project Cost (\$)*	Function
1	Ferrell Avenue Loop Upgrade	New Pipe	Main	---	725	---	10	---	Between Ferrell Avenue and 6th Street/5th Street	\$165	LF	\$119,625	\$167,475	Distribution Loop in Main Zone
15th/Pismo Upgrade Total													\$167,475	
2	7th Street Dead-End Upgrade	Upgrade Pipe	Main	---	160	4 & 6	8	7th	From Santa Ysabel going north	\$155	LF	\$24,800	\$34,720	Dead-end Upgrade
7th Street Dead-End Upgrade Total													\$34,720	
3	14th/15th and Santa Paula Upgrade	Upgrade Pipe	Main	---	675	4	8	14th Street	From Santa Ysabel to Santa Paula	\$155	LF	\$104,625	\$146,475	Residential FF
		Upgrade Pipe	Main	---	675	6	8	15th Street	From Santa Ysabel to Santa Paula	\$155	LF	\$104,625	\$146,475	
14th/15th and Santa Paula Upgrade Total													\$292,950	
4	11th/Santa Maria Upgrade	Upgrade Pipe	Main	---	990	6	12	Santa Maria	From 14th to 11th	\$180	LF	\$178,200	\$249,480	Distribution Loop in Main Zone/School FF
		Upgrade Pipe	Main	---	330	8	12	Santa Maria	From 11th to 10th	\$180	LF	\$59,400	\$83,160	
		Upgrade Pipe	Main	---	710	6	10	11th Street	From Santa Maria to El Moro	\$165	LF	\$117,150	\$164,010	
11th/Santa Maria Upgrade Total													\$496,650	
5	12th/El Moro Upgrade	New Pipe	Main	---	340	---	8	El Moro	From 11th to 12th	\$155	LF	\$52,700	\$73,780	Distribution Loop in Main Zone/Residential FF
		Upgrade Pipe	Main	---	650	6	8	12th	From El Moro to Paso Robles	\$155	LF	\$100,750	\$141,050	
12th/El Moro Upgrade Total													\$214,830	
6	El Moro Upgrade	New Pipe	Main	---	1,330	---	10	El Moro	From 8th to 4th	\$165	LF	\$219,450	\$307,230	Distribution Loop in Main Zone
El Moro Upgrade Total													\$307,230	
7	3rd/Pismo Upgrade	Upgrade Pipe	Main	---	1,330	6	10	3rd	From El Moro to Pismo	\$165	LF	\$219,450	\$307,230	Distribution Loop in Main Zone
		Upgrade Pipe	Main	---	340	6	10	Pismo	From 3rd to 4th	\$165	LF	\$56,100	\$78,540	
3rd/Pismo Upgrade Total													\$385,770	
8	4th/Ramona Upgrade	Upgrade Pipe	Main	---	680	8	10	4th	From Pismo to Ramona	\$165	LF	\$112,200	\$157,080	Distribution Loop in Main Zone
		Upgrade Pipe	Main	---	330	8	10	Ramona	From 4th to 5th	\$165	LF	\$54,450	\$76,230	
4th/Ramona Upgrade Total													\$233,310	
9	Ramona Upgrade	Upgrade Pipe	Main	---	670	6	10	Ramona	From 6th to 8th	\$165	LF	\$110,550	\$154,770	Distribution Loop in Main Zone
		Upgrade Pipe	Main	---	300	6	10	Ramona	From 9th to 10th	\$165	LF	\$49,500	\$69,300	
Ramona Upgrade Total													\$224,070	
10	18th/Ramona Loop Upgrade	New Pipe	Boosted	---	400	---	8	Ramona Avenue	From 17th to 18th Street	\$155	LF	\$62,000	\$86,800	Distribution Loop in Boosted Zone
18th/Ramona Loop Upgrade Total													\$86,800	
11	8th/Santa Ynez Dead-End Upgrade	Upgrade Pipe	Main	---	310	6	8	Santa Ynez	From 9th to 8th Street	\$155	LF	\$48,050	\$67,270	Residential FF and O&M
		Upgrade Pipe	Main	---	240	6	8	8th Street	From Santa Ynez heading South	\$155	LF	\$37,200	\$52,080	
		New Service Lateral	Main	---	180	---	2	Santa Ynez	From 8th Street heading West	\$125	LF	\$22,500	\$31,500	
8th/Santa Ynez Upgrade Total													\$150,850	

**Exhibit 2
Second Priority Capital Improvement Projects
Los Osos Community Services District**

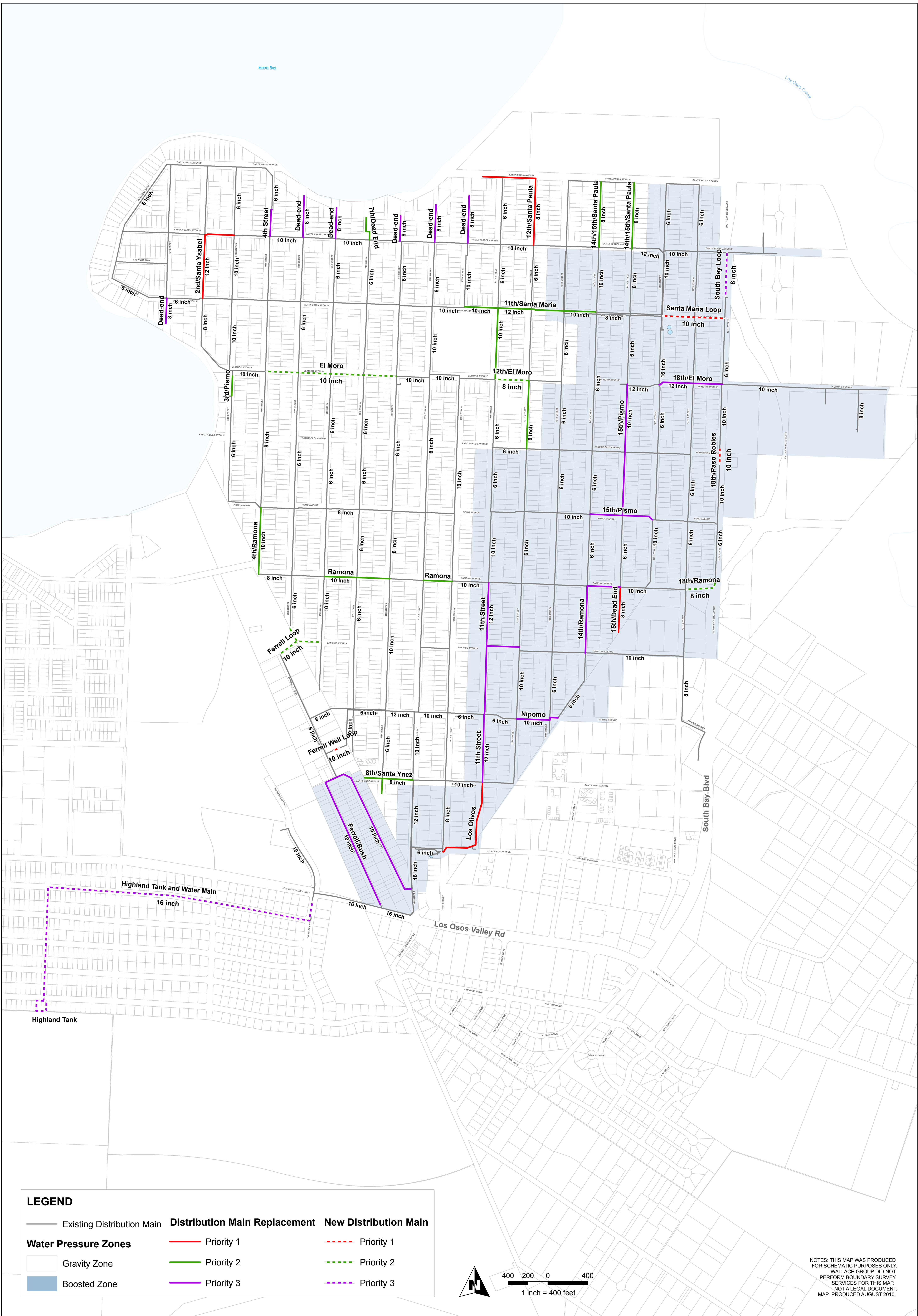
Project #	Title	Description	Zone	Quantity	Length (Ft)	Old Diameter (in)	New Diameter (in)	Street	Location	Construction Cost (\$)		Subtotal (\$)	Total Project Cost (\$)*	Function
12	Water Meter Upgrades - AMR System	Replace water meters	Both	2,734						\$275	EA	\$751,850	\$827,035	Replace Meters and Upgrade to Radio Control
Water Meter Upgrade Total													\$827,035	
13	Fire Hydrant Installation	New Fire Hydrants	Both	4						\$3,500	EA	\$14,000	\$19,600	Fire Hydrants in compliance with Fire Code Standards
Fire Hydrant Installation Total													\$19,600	
Total													\$3,441,290	

* Total includes construction cost plus preliminary engineering, design engineering, administration construction management and inspection costs

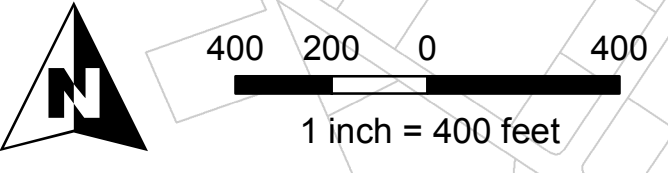
**Exhibit 3
Third Priority Capital Improvement Projects
Los Osos Community Services District**

Project #	Title	Description	Zone	Quantity	Length (Ft)	Old Diameter (in)	New Diameter (in)	Street	Location	Construction Cost (\$)		Subtotal (\$)	Total Project Cost (\$)	Function
1	Nipomo Upgrade	Upgrade Pipe	Boosted	---	600	6	10	Nipomo	From 12th to 14th	\$165	LF	\$99,000	\$138,600	Upgrade for flow to Commercial and RMF
Nipomo Upgrade Total													\$138,600	
2	14th/Ramona Upgrade	Upgrade Pipe	Boosted	---	680	6	10	14th	From Ramona to San Luis	\$165	LF	\$112,200	\$157,080	Distribution Loop in Boosted Zone
		Upgrade Pipe	Boosted	---	340	6	10	Ramona	From 14th to 15th	\$165	LF	\$56,100	\$78,540	
14th/Ramona Upgrade Total													\$235,620	
3	Ferrell/Bush Upgrade	Upgrade Pipe	Boosted	---	2,950	6 & 8	10	Ferrell and Bush	From 9th Street to LOVR	\$165	LF	\$486,750	\$681,450	Upgrade Dead-end lines for FF
Ferrell/Bush Upgrade Total													\$681,450	
4	4th Street Upgrade	Upgrade Pipe	Main	---	270	4	8	4th Street	From Santa Ysabel going north	\$155	LF	\$41,850	\$58,590	Upgrade substandard lines for FF
4th Street Upgrade Total													\$58,590	
5	18th/El Moro Upgrade	Upgrade Pipe	Boosted	---	660	10	12	El Moro	From 16th Street to 18th Street	\$180	LF	\$118,800	\$166,320	Distribution Loop in Boosted Zone
18th/El Moro Upgrade Total													\$166,320	
6	Dead-end Upgrades	Upgrade Pipe	Main	---	255	6	8	1st	South of Santa Maria	\$155	LF	\$39,525	\$55,335	Upgrade Dead-end Lines for FF
		Upgrade Pipe	Main	---	400	6	8	5th	North of Santa Ysabel	\$155	LF	\$62,000	\$86,800	Upgrade Dead-end Lines for FF
		Upgrade Pipe	Main	---	300	6	8	6th	North of Santa Ysabel	\$155	LF	\$46,500	\$65,100	Upgrade Dead-end Lines for FF
		Upgrade Pipe	Main	---	245	6	8	8th	North of Santa Ysabel	\$155	LF	\$37,975	\$53,165	Upgrade Dead-end Lines for FF
		Upgrade Pipe	Main	---	325	6	8	9th	North of Santa Ysabel	\$155	LF	\$50,375	\$70,525	Upgrade Dead-end Lines for FF
		Upgrade Pipe	Main	---	430	6	8	10th	North of Santa Ysabel	\$155	LF	\$66,650	\$93,310	Upgrade Dead-end Lines for FF
Dead-end Upgrade Total													\$424,235	
7	11th Street Upgrade	Upgrade Pipe	Boosted	---	330	4	12	San Luis	From 11th to 12th	\$180	LF	\$59,400	\$83,160	Distribution Loop in Boosted Zone
		Upgrade Pipe	Boosted	---	2,020	6	12	11th	From Ramona to Santa Ynez	\$180	LF	\$363,600	\$509,040	Distribution Loop in Boosted Zone
11th Street Upgrade Total													\$592,200	
8	15th/Pismo Upgrade	Upgrade Pipe	Boosted	---	1,330	6	10	15th	From El Moro to Pismo	\$165	LF	\$219,450	\$307,230	Distribution Loop in Boosted Zone
		Upgrade Pipe	Boosted	---	670	6	10	Pismo	From 14th to 16th	\$165	LF	\$110,550	\$154,770	
15th/Pismo Upgrade Total													\$462,000	
9	South Bay Loop Upgrade	New Pipe	Boosted	---	325	---	8	South Bay Blvd	South of Santa Ysabel	\$90	LF	\$29,250	\$40,950	Distribution Loop in Boosted Zone
Loop Upgrades Total													\$40,950	
10	Valve Upgrades	Upgrade Valves	Both	124	---	---	---	Various	---	\$1,800	EA	\$223,200	\$312,480	Isolate Intersections
Valve Upgrade Total													\$312,480	
11	Highland/Water Main Upgrades	New 1.4MG Tank	Main	1.40	---	---	---	Highland Drive Alexander, Woodland & Palisades	Intersection of Highland Drive and Alexander Ave.	\$1.25	MG	\$1,750,000	\$2,450,000	Supply Storage
		New Pipe	Main	---	4,070	---	16		From Highland Tank to LOVR	\$215	LF	\$875,050	\$1,225,070	Tie Tank to System
Highland/Water Main Upgrades Total													\$3,675,070	
Total													\$6,787,515	

* Total includes construction cost plus preliminary engineering, design engineering, administration construction management and inspection costs



LEGEND		
	Existing Distribution Main	
	Distribution Main Replacement	
	New Distribution Main	
	Water Pressure Zones	
	Gravity Zone	
	Boosted Zone	
	Priority 1	
	Priority 2	
	Priority 3	



NOTES: THIS MAP WAS PRODUCED FOR SCHEMATIC PURPOSES ONLY. WALLACE GROUP DID NOT PERFORM BOUNDARY SURVEY SERVICES FOR THIS MAP. NOT A LEGAL DOCUMENT. MAP PRODUCED AUGUST 2010.

