SAN LUIS OBISPO COUNTY
DEPARTMENT OF PUBLIC WORKS
Paavo Ogren, Director

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DATE: May 26, 2010

MEMORANDUM

FROM: Dean Benedix, Utilities Division Manager

VIA: Zone 3 Lopez Water Treatment Plant Efficiency Assessment Team
by Dean Benedix, for Z3LWTPEA Team

TO: Paavo Ogren, Director Public Works Department

SUBJECT: Lopez Plant Efficiency Assessment - Status and Completion Report

PURPOSE

The purpose of this report is to provide the Director of Public Works with a status and summary of the recommendations that were made by each Efficiency Assessment team during meetings held between August and September 2009, and provide follow-up items that will be accomplished in conjunction with the Technical Advisory Committee by District staff. This report also summarizes actions that the County Public Works Department (Public Works) has undertaken to implement the recommended actions. As you can note, several recommendations developed during the assessment, have been or are being implemented. The following recommendations reflects those that are currently being implemented or should be.

Recommendation Summary:

1. Initiate Calcification Assessment Coupon Testing Program.
2. Install new pressure sustaining valve near clear water tank in effluent discharge line.
3. Acquire adjacent property for enhanced security.
4. Install closed circuit video system for enhanced security.
5. Prepare comparative analysis of water quality testing program.
6. Continue periodic review and priority establishment of Capital Improvement Program with Technical Advisory Committee.

BACKGROUND

The Lopez Water Treatment Plant is a 6 million gallon per day (MGD) plant, which treats surface water from the Lopez Reservoir and distributes the treated water to Flood Control Zone 3 agencies and water customers (Zone 3). In 2007, the plant was upgraded to a membrane filtration system. During the first two years of operation, numerous operation and maintenance issues caused frustration for the plant operators. While some problems were expected at start-up of the new plant, we believe the number and extent of the problems were uncharacteristic to "normal" start-up issues. Public Works initially worked with Black and Veach (the design engineers for the plant upgrade) to resolve the problems, and in 2008, hired Kennedy/Jenks Consultants to provide an independent assessment of the plant.

Understandably, concern was expressed by the Zone 3 water contractors over increasing water rates to cover unexpected costs of the new plant. In order to address Zone 3 concerns, Public Works initiated a self assessment of the plant operations infrastructure, program and expenditures. The main objectives of the assessment were to review operational and planning programs, and cost expenditures, to determine if changes could further reduce costs and increase efficiency and effectiveness. Attachment 1 lists references used and developed as a result of this effort. The assessment became a collaborative effort between Public Works staff and Zone 3 representatives. The assessment team was divided into three technical subteams: Engineering, Fiscal, and Operations (See Attachment 2).

Several topics overlap the defined technical fields, so during the various meetings these items were discussed by more than one subteam:

- Capital improvement projects (CIP) schedule and budgeting reserves
- Budget for the operation and maintenance of the plant
- Plant comparison
- Full-time equivalent (FTE) staffing
- Current staffing levels compared to Black and Veach recommendations

In order to facilitate discussions about plant comparison, Public Works gathered comparable information about other similar water treatment plants in California and compiled the data into a table entitled Water Treatment Plant Survey Summary (Attachment 3). While it is difficult to directly compare the Lopez plant to others in the State due to varying plant size, multiple operations, staff responsibilities, water sources, and treatment technologies, the table was viewed as a tool to compare the plants on a more global scale. The Black and Veach 2002 Plant Audit recommended a total staff of one supervisor and between 5 and 10 others, including laboratory staff (Attachment 4).

RECOMMENDATIONS AND STATUS OF IMPLEMENTATION

Engineering Subteam

The Engineering Subteam met twice (between August and September 2010) to discuss the plant upgrade design and specific design adjustments made to the plant since start-up and came up with the following recommendations, in order of priority:

Recommendation	Public Works Efforts
A. Upsizing of the wet well: No further action in the immediate future. The benefit of this retrofit may not be significant, plant operations are stable.	Subteam discussed the recommendation to expand the wet well that came out of the independent assessment of the plant completed by Kennedy Jenks in 2008.
B. pH suppression: 1. PWD should create a plant odor response plan for seasonal odor issues. 2. Obtain additional evaluation from Kennedy Jenks on the best solution for the calcification problem using latest plant data. 3. Determine Process Safety Management (PSM) safety requirements and estimated costs to implement if needed for acid system.	1. Plan has been completed. 2. Kennedy Jenks concurred that coupon test program be instituted and data evaluated after roughly 12 months to make final determination as to next steps. 3. Estimate of PSM costs will be made if a pH suppression system is determined to be required after coupon program is evaluated.
C. Treated water effluent piping: 1. Obtain Kennedy Jenks recommendation for a standpipe/closing line valves/install new pressure sustaining valve (PSV) near clear water tank to eliminate effluent pipe suction problem. 2. Hire Telstar to evaluate instrumentation/SCADA control system to assist with liability assessment issues.	1. Kennedy Jenks recommends relocating the PSV as suggested by Engineering subteam. Installation of a new PSV is more efficient and less costly. 2. Telstar, under contract to address issues as they arise.

D. Potable Water Tank Security on adjacent property: 1. Obtain cost estimate for easement or ownership to secure future access to tank. 2. Obtain cost estimate for security improvements at the tank.	1. Land acquisition cost estimated at $1.5M included in the FY 2017/18 CIP Program Budget. 2. Estimated costs for closed circuit camera/monitoring system in the range of $25k. Address this item with TAC during the coming year to discuss including in CIP program.

Fiscal Subteam

The Fiscal Subteam met once to discuss the financial aspects since start-up of the upgraded plant, including:

- Billing rates and cost allocation
- Charges for water treatment plant, distribution system, dam, laboratory support, overhead, others
- Historic rates, charges and budgets expenditures
- Sinking fund establishment for membrane replacement

There were no recommendations provided by the Fiscal Subteam.

Operations Subteam

The Operations Subteam met twice (between August and October 2010) to discuss the current and future operation practices of the plant and developed the following recommendations and potential cost savings efforts, including:

Recommendation	Public Works Review of Recommendation
1. Check cost of current chemical suppliers, see if competitive.	Cost of chemical suppliers for the plant is competitive. Attachment 5 shows costs of chemicals used and ranges of costs from other suppliers for 2009.
2. Compare cost of power to the best rates from PG&E.	Plant is currently receiving the best rates available from PG&E. Five alternate billing schedules were compared for the period of 8/08 to 8/09. The current bundled rate is the least expensive at a total of $203k for this period, at a savings of approximately $10k minimum to $56k maximum over the highest rate. (See Attachment 6)

3. Compare cost of hiring a full time instrument technician versus the cost of a consultant.	Public Works estimated hiring a full time technician would cost approximately $94,000 annually, significantly more than paying a consultant to visit 3-4 times a year (approximately $12,000).
4. Review staff scheduling for potential to optimize.	Public Works provided a Full Time Equivalent analysis for the period of January to June 2009, which showed that the operators' labor hours have actually decreased since start up of the new plant. Through the second quarter of 2009/2010 fiscal year, labor costs continue to decline.
5. Review the budget to confirm operators' hours are charged to the appropriate project funds.	Public Works provided an organizational chart for Lopez / Zone 3 that portrays staff responsibilities, designation of outside resources, and assignment to allocated budget in order to illustrate current method of allocating budget and project costs (see Attachment 7). Work orders are used to track costs associated with all tasks performed by County staff – a summary of work order tasks is included on Attachment 8.
Public Works staff reviewed the above recommendations in conjunction with subteam members and determined that the current way routine work is conducted is the most efficient. Therefore, no changes in the way current routine work is performed are recommended at this time on these items.	

Recommendation	Public Works Efforts
A. Compare cost of the Public Works Water Quality lab to the cost of other independent labs.	Comparisons of test costs with private testing firms indicate generally comparable costs in a limited number of instances. Concern regarding the test costs was raised by some subteam members. County water quality test costs are generally compared to private commercial firms on an across the board basis; on a five year interval. Due to the operational needs of the plant, immediate need to have test results available, technical assistance provided by laboratory staff in addition to analytical testing, and non-availability of some tests by private companies, a finite comparison of test costs is not possible. If such a comparison is desired, it is recommended that this issue be discussed in detail at the Technical Advisory Committee and presented to the Advisory Committee for consideration and further evaluation.

B. Budgeting and tracking costs appropriately: Water Treatment internal order budget (552R235302): explain why $800,000 expenditures are lumped in to Hydraulic Operation and Planning rather than equipment repair, scheduled maintenance, etc.	Public Works provided a detailed breakdown of work items included in the "Expenditures" budget summary category (Page 2 of Attachment 9). Additional work orders were established and included on Attachment 8 to track costs to specific plant work efforts included in the $800k plant "Expenditures."
C. CIP scheduling: Suggest continuing to report on implementation of special projects/capital improvement projects, including beginning budget, actual costs and whether the solution worked, at complete team meeting.	Reporting on status of CIP projects will continue at monthly and bi-monthly Zone 3 TAC and AC meetings.

FINALIZATION OF EFFICIENCY ASSESSMENT

In order to complete the Lopez Water Treatment Plant Efficiency Assessment so that it may be documented and used as a tool for improving the plant operations, the following steps were identified by the assessment team:

Issue	Status / Action
1. Review of recommendations from each subteam, summarized in this report.	Complete.
2. Schedule assessment team meeting to discuss subteam recommendations.	Complete.
3. Meet to discuss recommendations and identify priorities for improving plant operations.	An ongoing item that will be reviewed and discussed by Zone 3 TAC and Zone 3 AC.
4. Prepare summary report with conclusions determined by assessment team to include operational work and CIP priority and project schedule of implementation.	Work priorities were determined by Public Works Utilities Division Manager in conjunction with Operations Superintendent, Assistant Superintendent, Chief Water Treatment Plant Operator, the Technical Advisory Committee, and confirmed by the Zone 3 finance committee and AC. Public Works has created a schedule for implementation in the 8 year CIP proposal, revised and endorsed by Zone 3 TAC, Finance Committees and Zone 3 AC annually (see Attachment 10)

ATTACHMENTS

Attachment 1 – Plant Efficiency Assessment List of References
Attachment 2 – Plant Efficiency Assessment Subteam Roster
Attachment 3 – Water Treatment Plant Survey Summary
Attachment 4 – Black & Veatch, Lopez Water Treatment Plant Audit Final Report, June 10, 2002, Section 7.20 Recommended WTP Staffing, pages 7-17 and 7-18
Attachment 5 – Chemical Cost Matrix (9-28-09)
Attachment 6 – PG&E Bill Comparison Results
Attachment 7 – South County Staffing: Organizational Chart
Attachment 8 – Zone 3 Operations Work Order Summary
Attachment 9 – Zone 3 Budget – Fiscal Year 2010-11
Attachment 10 – 8 Year Capital Outlay Schedule (revised 1-7-10)

c: Lopez Treatment Plant

File: CF 340.135.01

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Attachment 1
Plant Efficiency Assessment
List of References

All documents may be found electronically at SLOCountyWater.org

- County Public Works Department Organizational Chart
- Water Treatment Plant Efficiency Assessment Subteam Roster
- Zone 3 Draft 7 year CIP Schedule, April 13, 2009
- Kennedy Jenks, Lopez Water Treatment Plant Evaluation Report, July 17, 2008
- Kennedy Jenks, Draft Technical Memo: Carbon Dioxide System and pH control Improvements Lopez Water Treatment Plant, June 11, 2009
- 2009-2010 Zone 3 Proposed Budget
- Black & Veatch, Lopez Water Treatment Plant Audit Final Report, June 10, 2002, Section 7.20 Recommended WTP Staffing, pages 7-17 and 7-18
- County of San Luis Obispo, Memorandum: Solar Energy Evaluation for the Lopez Water Treatment Plant, April 30, 2009
- Lopez WTP Flow Map, June 2009
- Comparison to Other California Membrane Filter Water Treatment Plants

Attachment 2
Plant Efficiency Assessment
Subteam Roster

Engineering Subteam	Agency	Position
John Beaton	County of SLO	Water Quality Lab Manager
Dean Benedix	County of SLO	Utilities Division Manager
Jim Garing	Grover Beach	City Engineer
Diana Haines	County of SLO	Utilities Division Engineer
Craig Kesler	County of SLO	Chief Plant Operator
Mike Linn	Arroyo Grande	Asst. City Engineer
Greg Ray	Pismo Beach	Associate Engineer
John Wallace	CSA 12	Consulting Engineer
Fiscal Subteam	**Agency**	**Position**
Jennie Burnick	County of SLO	Finance Division Staff
Gayla Chapman	Grover Beach	Director of Administrative Services
Will Clemens	County of SLO	Finance Division Manager
Angela Kraetsch	Arroyo Grande	Director of Financial Services
Dwyane Chisom	Pismo Beach	Public Works Director
Operations Subteam	**Agency**	**Position**
Ron Coleman	County of SLO	Plant Superintendent
Mike Ford	Grover Beach	Public Works Superintendent
Brian Henson	Pismo Beach	Public Works Operations Mngr
Courtney Howard	County of SLO	Utilities Division Engineer
Craig Kesler	County of SLO	Chief Plant Operator
Joe Phillips	County of SLO	Asst Superintendent
Shane Taylor	Arroyo Grande	Public Works Supervisor

Attachment 3

Water Treatment Plant Survey Summary

General Information	Microfiltration								US Filter / Memcor				Zenon 500 (Ultrafiltration)	
Name (1)		Yucaipa Valley Water District				LA Dept of Water & Power		Lessalt WTP		Saratoga WTP		Avenue Treatment Plant		Patterson Pass (3)
Location (CA.)		Yucaipa		Bakersfield		Encino Reservoir		Sunnyslope Co.		Saratoga		Ventura		City of Livermore
Contact name		Kevin King		Gary Witcher		Phil Clark		Jim Feles						Darren Greenwood
Contact position				CPO										Water Resource M
Contact phone		(909) 795-2491				(213) 367-0687		(631) 837-4670				(805) 652-4500		(925) 960-8100
Contact email		kking@yvwd.dst.ca.us		gwitcher@calwater.com		steven.sole@LADWP.com								
Plant Designed By		HDR Engineering		Black & Veatch										
Year Plant On-line	2001	2007		2003				2002	1993			2007		2001
Capacity	10.0 mgd	12.0 mgd		22mgd		6.5 mgd		3.0 mgd	5.0 mgd			10.0 mgd		8.0 mgd
CDHS Classification (2)				T5										
Cost (of water) / Acre Foot				286.5/Acre Foot										
Staffing														
Hours Manned / Day	16	10		12										
Hours Unmanned / Day	8	14		12										
Hours Plant On-line / Day	24	24		24				24						Currently Off-line
Stand-By Operator: Y / N	Y	Y		CPO										
Minimum Shifts / Day	1 (10 hour)	1(10 hour)		1 shift/day				3-4 hrs/day						(3) 12 hr shifts / 7 days
Minimum Shift Hrs / Wk	70 Hours	70 Hours		40 Hours										
Total Number of Staff	2	2-3 (2 Operators)		7 (5 OP)				7 total (5 operators)						10 total (8 operators)
Average Staff / Day	2			3 Average										
•Water Treatment Plant	1 Maintenance	1 Maintenance		1 Maintenance				third of operator time on maintenance,						
•Distribution Sys. (O&M) Classification / Miles	1-3	1-3		D3										
•Other Facilities (O&M)	All operators licensed to work on collection, distribution and treatment	All operators licensed to work on collection, distribution and treatment		2 Treatment				All operators licensed to work on collection, distribution and treatment						There are 2 plants on site, operators run both, and responsible for distribution system

1. 48 of 52 State Department of Health Services monitored water treatment plants use chlorine as their primary disinfectant. One uses chlorine dioxide (Lopez), one uses UV and two use chloramines
2. CDHS classifies treatment plants according to:
3. Affects of alkalinity on treatment:
4. Affects of hardness on treatment:
5. Affects of TDS on treatment:
6. Membranes cleaned with caustic soda. Every 7th event is a 2-part cleaning (caustic followed by acid).
7. Filtrate side CIP also performed every 6-months.
9. Discharge to creek
9. Black & Veatch 2002 Plant Audit recommended a total staff of one supervisor and between 5 and 10 other, including laboratory staff

MGD: Million Gallons per Day
CDHS: California Department of Health Services
Alk: Alkalinity
TDS: Total Dissolved Solids
$KMNO_4$: Potassium permanganate
PAC: Powered Activated carbon
CLO_2: Chlorine Dioxide
NaOCL: Sodium Hypochlorite
CO_2: Carbon Dioxide
IT: Integrity Test
EFM: Enhanced Flux Maintenance
CIP: Clean-in-Place

Shop, Polyelectrolyte Room, Activated Carbon Room, and Chlorine Cylinder Room

- For improved efficiency, upgrade lighting fixtures in all rooms and basement of chemical building to T8 type, 32-watt lamps with electronic ballasts.

Basement

- Replace covers on open and abandoned control switches on the east side, south wall of basement. Tag and cover all spare/unused wires inside wireways to prevent accidental touch hazard.
- Provide protection of wires for fire alarm system in accordance with NEC.
- Replace the conduit stub-ups and control stations for domestic water pumps. Pump M-18 may need to be replaced in near future.
- Replace the disconnect switch for the rotodip motor.

7.18 Residuals Handling

It is recommended that the existing sludge ponds be cleaned and upgraded to allow for better sludge storage and ultimate disposal.

7.19 Chemical Feed Systems

Existing chemical feed systems will be modified for the WTP upgrade. No new chemicals, except chlorine dioxide and possibly ferric chloride, will be required in the WTP upgrade. The following chemical systems will be retained:

- Alum - Potential coagulant.
- Sodium Hypochlorite in place of chlorine - Primary and residual disinfection.
- Potassium permanganate for taste and odor control as needed.
- Ammonia.

All chemical areas should be provided with applicable code compliance including curbs and holding capacity around each tank, upgrade of each pumping system for redundancy, and all other safety features like eye wash, showers, etc.

7.20 Recommended WTP Staffing

Based on a WTP staff survey, the total number of staff at a 6 mgd capacity WTP was estimated to be one supervisor and between 5 and 10 staff persons including laboratory staff as shown below. The number of operators should be about 2 to 3. The WTP staffing survey data suggest that the current staffing level for the District is appropriate provided the people are dedicated full time to the WTP.

- WTP Supervisor

- Dedicated operators (at least 2-3)
- 24 hour operation
- Dedicated maintenance staff (1-3)
- Dedicated electrical/instrumentation technician (1-2)
- Dedicated laboratory staff (1-2)

DHS has provided information leading Black & Veatch to the conclusion that the upgrades recommended within this Report will not affect the classification ratings of either the WTP or its distribution system. (Based on discussion with DHS, the WTP will remain at a classification of T4 and the distribution system will remain at a classification of D3.) As such, pursuant to Title 22, Division 4, Chapter 13 of the DHS regulations, the chief operator will be required to maintain a minimum Grade IV certification (T4) and the shift operator will be required to maintain a Grade III certification (T3).

The County should be able to comply with the staffing requirements from DHS. Additional training will need to be included with the design and construction of the recommended facilities. The new facilities will include a higher level of process automation, so reliance on programmable logic controllers (PLCs) will require special training in maintenance and troubleshooting.

7.21 Summary

Black & Veatch anticipates that the District will produce a request for proposal (RFP) for consulting services for the design of the upgraded WTP, as described in this chapter. Black & Veatch recommends that the District initiate some improvements while the design process is ongoing.

7.22 Five-Year Capital Improvement Plan

A schedule and approximate cost for a proposed 5-year capital improvement plan (CIP) are provided at the end of this chapter. These encompass the improvements recommended in this Audit Report. Improvements were prioritized based on input gained from workshops conducted with the District.

Attachment 5

Chemical costs matrix

Date 9-28-2009

This is the most current pricing on plant chemicals.

Item Number	Chemical Name	Chemical supplier	Blanket Number	Cost per unit	Others
1	Sumalchlor 50	Summit Chemical	25003066	.40/lb 17600#/shipment	n/a
2	Ammonia	Brenntag	25002758	.33/lb	One bid
3	Gas chlorine	Jones Chemical	25000059	2000lb cyl 150 lb cyl 250/ton 750/ton	n/a
4	Sodium Chlorite	Dupont	25000362	72k per year- equip & chem. Ask Phil Haley	n/a
5	Carbon	Univar	25002985	0.74	0.72 – 1.10
6	12.5% bulk Hypo	Brenntag	25002757	$1.22/gal	1.10
7	Potassium Permanganate	Brenntag	25003403	$2.75/lb	2.95
Membrane cleaning chemicals Current Pricing					
8	Citric Acid	Brenntag	25003404	$7.12/gallon	n/a
9	Sodium Hypochlorite	Brenntag	25002757	$1.22/gallon	n/a
10	Sodium Hydroxide	Brenntag	25003337	$2.93/gallon	n/a
11	Sodium Bisulfite	Brenntag	25003406	$1.47/gallon	No one I can find carries this as NSF

Item 1: cannot be changed. This is spec'd by Pall Corporation.

Item 4: sole sourced to Dupont. Higher chemical cost keeps us from purchasing equipment.

Item 5: Calgon carbon is 0.74 cents per lb. The last order I placed was with Calgon.

Item 6: Amber chemical is $1.10 per gallon.

Item 8 - 11: Due to safety reasons, county brought in day tanks with containment. This requires a two year bid.

All the chemicals used have to be NSF approved.

Attachment 5

Treatment Chemical use and Cost for 2009
These are monthly totals

Item	JAN			FEB			MAR			APR		
Terminal Res. To Plant MGD	100.97			82.38			116.81			116.85		
Acre Feet Treated	309.89		Ave Feed Rate	252.83		Ave Feed Rate	358.50		Ave Feed Rate	364.76		Ave Feed Rate
Sumalchlor50 lbs	21,852.85	$9,396.73	25.95	35,471.43	$15,252.71	51.63	30,024.91	$12,910.71	30.82	21,939.83	$9,434.13	22.13
Sodium Hypochlorite lbs	3,084.86	$2,986.93	3.66	2,842.10	$2,751.87	4.14	3,612.21	$3,497.54	3.71	4,203.93	$4,070.47	4.24
Potassium Permanganate lbs	352.30	$968.83	0.42	168.47	$463.29	0.25	254.01	$698.53	0.26	213.86	$588.12	0.22
Ammonia lbs	602.51	$239.50	0.72	536.14	$213.91	0.78	763.56	$303.52	0.78	781.47	$310.63	0.79
Carbon lbs	0.00	$0.00	0.00	0.00	$0.00	0.00	0.00	$0.00	0.00	0.00	$0.00	0.00
Sodium Chlorite gal	288.50	$2,477.06		222.80	$1,912.98		437.20	$3,753.80		450.20	$3,866.42	
Chlorine gas lbs	396.90	$666.16		317.10	$529.56		492.10	$821.81		327.40	$546.76	
Total Monthly Cost		$16,735.20			$21,124.31			$21,985.90			$18,815.52	
Chemical Cost per Acre Foot of Water		$54.00			$83.55			$61.32			$51.58	
Total Yearly Cost												

Item	MAY			JUNE			JULY			AUG		
Terminal Res. To Plant MGD	135.14			126.40			127.54			125.55		
Acre Feet Treated	414.76		Ave Feed Rate	387.93		Ave Feed Rate	391.43		Ave Feed Rate	385.32		Ave Feed Rate
Sumalchlor50 lbs	40,367.17	$17,357.88	35.82	33,908.14	$14,580.50	32.17	31,922.65	$13,726.74	30.01	34,394.38	$14,789.58	32.85
Sodium Hypochlorite lbs	3,907.49	$3,783.44	3.47	4,497.15	$4,354.38	4.27	5,472.69	$5,298.95	5.15	4,098.76	$3,968.64	3.91
Potassium Permanganate lbs	383.63	$1,054.98	0.34	356.31	$979.85	0.34	363.51	$999.65	0.34	368.55	$1,013.51	0.35
Ammonia lbs	876.34	$348.35	0.78	767.32	$305.01	0.73	792.74	$315.11	0.75	718.66	$285.67	0.69
Carbon lbs	0.00	$0.00	0.00	0.00	$0.00	0.00	0.00	$0.00	0.00	4,616.00	$5,077.60	4.41
Sodium Chlorite gal	493.50	$4,237.19		467.50	$4,013.96		468.90	$4,025.98		456.30	$3,917.79	
Chlorine gas lbs	684.70	$1,143.45		640.60	$1,069.80		662.60	$1,106.54		599.30	$1,000.83	
Total Monthly Cost		$27,925.29			$25,303.50			$25,472.98			$30,053.63	
Chemical Cost per Acre Foot of Water		$67.33			$65.23			$65.08			$78.00	
Total Yearly Cost												

Jan and mar Coag readings are not right, fixed by mid march

Item	SEP			OCT			NOV			DEC		
Terminal Res. To Plant MGD	135.85			112.13			136.16			76.11		
Acre Feet Treated	416.94		Ave Feed Rate	344.14		Ave Feed Rate	417.89		Ave Feed Rate	233.59		Ave Feed Rate
Sumalchlor50 lbs	36,951.30	$15,889.06	32.61	18,958.00	$8,151.94	20.27	27,987.00	$12,034.41	24.65	16,477.00	$7,085.11	25.96
Sodium Hypochlorite lbs	5,056.84	$4,896.31	4.46	4,310.00	$4,173.17	4.61	6,361.00	$6,159.06	5.60	3,107.00	$3,008.37	4.89
Potassium Permanganate lbs	511.04	$1,405.35	0.45	359.00	$987.25	0.38	310.37	$853.52	0.27	141.50	$389.13	0.22
Ammonia lbs	878.66	$349.27	0.78	597.00	$237.31	0.64	709.21	$281.91	0.62	431.00	$171.32	0.68
Carbon lbs	2,046.38	$2,251.02	1.81	1,070.00	$1,177.00	1.14	1,121.91	$1,234.10	0.99	0.00	$0.00	0.00
Sodium Chlorite gal	234.90	$2,016.85		416.50	$3,576.07		214.50	$1,841.70		94.80	$813.95	
Chlorine gas lbs	313.00	$522.71		599.00	$1,000.33		349.00	$582.83		167.90	$280.39	
Total Monthly Cost		$27,330.57			$19,303.07			$22,987.53			$11,748.27	
Chemical Cost per Acre Foot of Water		$65.55			$56.09			$55.00			$50.29	
Total Yearly Cost											$268,785.77	

Pacific Gas and Electric Company.

Attachment 6

DATE: 10/05/2009

PG&E Bill Comparison Results

Customer Profile

Service ID:	2970528479	Name:	COUNTY OF SAN LUIS OBISPO	DA Code:	FULL SERVICE
Old Account:		Service Address:	2845 LOPEZ DR # A	City:	ARROYO GRANDE
Account:	0367325907	Supply:		Voltage:	SECONDARY
NAICS:	221300	Meter Code:	TOU6-CPLXCOMB W/INTERVAL	RTM:	N
Meter No:	1003874169	Rate Schedule:	E19SV	FTA:	No

Rates are effective ~~10/01/09~~ unless otherwise noted.

Estimated Costs for Bundled Rates

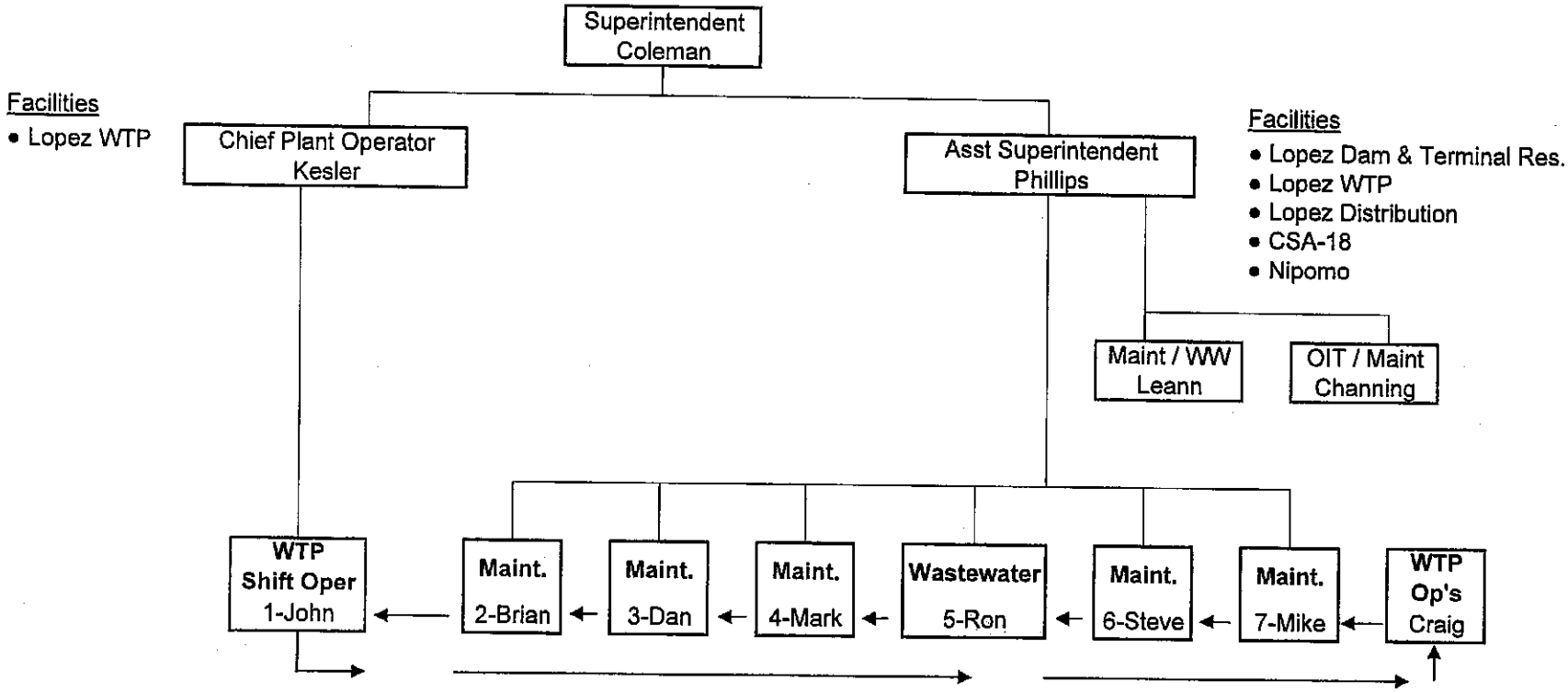
		NOT APPLICABLE		**NOT APPLICABLE**	**Best**	
FROM	TO	A1 Bills	A6 Bills	A10S Bills	E19SV Bills	A10SX Bills
12/17/08	01/16/09	$16,043.24	$14,663.66	$14,136.36	$12,811.23	$13,971.34
01/16/09	02/18/09	$15,009.04	$13,737.99	$13,097.28	$11,832.53	$12,951.21
02/18/09	03/19/09	$13,474.69	$12,427.59	$11,996.19	$11,026.89	$11,907.40
03/19/09	04/20/09	$18,363.69	$16,815.27	$15,865.80	$14,253.72	$15,690.97
04/20/09	05/19/09	$22,081.06	$20,412.63	$18,369.31	$17,258.19	$17,999.55
05/19/09	06/18/09	$25,657.65	$24,234.84	$21,041.93	$20,135.95	$20,555.83
06/18/09	07/21/09	$27,400.63	$25,882.12	$22,278.10	$21,037.65	$21,755.90
07/21/09	08/18/09	$24,215.39	$22,943.29	$20,236.46	$19,721.60	$19,788.50
08/19/08	09/17/08	$25,657.20	$24,055.66	$21,068.79	$20,162.38	$20,559.32
09/17/08	10/17/08	$29,501.30	$28,155.15	$24,082.86	$22,987.19	$23,564.53
10/17/08	11/17/08	$24,107.56	$22,737.61	$20,078.07	$18,587.91	$19,727.82
11/17/08	12/17/08	$17,617.24	$16,185.32	$15,201.50	$13,670.07	$15,057.93
Process Charge						
12 Month Total		$259,128.69	$242,251.13	$217,452.65	$203,485.31	$213,530.30

Usage and Demand Values

FROM	TO	kWh	On kWh	Part kWh	Off kWh	TOU kWh est?	Max Demand	Max dmd est?	On Demand	Part Demand	Off Demand	TOU dmd est?
12/17/08	01/16/09	116100	0	43500	72600	N	306	N	0	264	306	N
01/16/09	02/18/09	108600	0	41400	67200	N	261	N	0	261	219	N
02/18/09	03/19/09	97500	0	40800	56700	N	276	N	0	276	216	N
03/19/09	04/20/09	132900	0	51000	81900	N	297	N	0	297	264	N
04/20/09	05/19/09	124200	14100	36300	73800	N	273	N	270	273	273	N
05/19/09	06/18/09	128100	24300	26700	77100	N	282	N	279	282	276	N
06/18/09	07/21/09	136800	26100	27900	82800	N	282	N	282	267	234	N
07/21/09	08/18/09	120900	23100	25500	72300	N	303	N	294	267	303	N
08/19/08	09/17/08	128100	23700	26700	77700	N	285	N	282	285	279	N
09/17/08	10/17/08	147300	28800	31200	87300	N	315	N	312	315	294	N
10/17/08	11/17/08	144000	13800	40500	89700	N	315	N	312	315	294	N
11/17/08	12/17/08	127500	0	51000	76500	N	282	N	0	282	273	N
Total		1,512,000	153,900	442,500	915,600							

Attachment 7

South County Staffing: Organizational Chart



Staffing	
Superintendent	1
Asst Superintendent	1
Chief Plant Operator	1
Shift Operators	7
OIT / Maint / WW	2

There are 7 shift operators plus Craig.
Shift Operators are on a rotating schedule of two consecutive 4-10's (Wed - Sat & Sun - Wed) plus primary WTP stand-by

Operators rotate weekend duty for CSA-18 plus primary wastewater stand-by **AND** secondary WTP stand-by

Maintenance consist of scheduled **and** non-scheduled repairs at **all** South County water and wastewater facilities.

Attachment 8

Zone 3 Operations Work Order Summary 5/3/2010

Orders	
40035372	Labratory Sample Line Flush
40035378	Grounds and Building Maint.
40035380	System wide maint. '09
40035381	Routine Operations and Inspe
40035385	Brush, Tree and weed control
40035386	Reports and Data gathering,
40035388	LWTP water or other sample t
40035389	Lopez WTP, Chemicals and Del
40045292	chem feed sys: maint, repair
40045304	WQ Stations: maint, repairs,
40045540	PALL MEMBRANE EQUIPMENT WARR
40045807	DAF Saturator, tanks and Inf
40045808	DAF #2 recirculation pump se
40045875	Perform Safety related tasks
40046223	Training: Routine Operations
40046805	Zone 3: WTP: Water Storage T
40046879	Zone 3: WTP: Laboratory Samp
40047105	Zone 3: WTP: CIP System / Ar
40047777	Zone 3: WTP: Water Storage P
40047831	Zone 3: WTP: Laboratory PM
40048060	Routine Operations -- 09/10
40048061	Training: Routine Operations
40048062	Building Maintenance -- 09/1
40048063	Grounds Maintenance -- 09/10
40048064	Chemical Deliveries / Handli
40048065	Flushing Lab Sample Lines --
40048066	WQ Stations: maint / repairs
40048067	Membrane System: maint / rep
40048068	Chemical Feed Systems: maint
40048069	Reports & Data Gathering --
40048070	Safety Related Tasks, Traini
40048071	Efficiency Operations Study
40048072	Misc Materials, Supplies, Pa
40048073	Pall Membrane Warranty Work
40048075	DAF Saturators: Tanks, Valve
40048076	Decommission & Remove JC1679
40048077	Misc Minor Projects / Tasks
40048246	Transducers: Bleed & Block V
40048248	Plant Shut-Down: Telstar Cal
40048536	Membrane Feed Pump Strainers
40048628	Zone 3: WTP: Membrane feed p
40049191	Zone 3: WTP: E.Q. recycle pu
40049192	Zone 3: WTP: Laboratory Samp
40049387	Zone 3: WTP: Standby Generat
40049475	Zone 3: WTP: CIP building ch
40049912	Lopez WTP SCADA system maint
40050007	Membrane Header/Valve Rack P
40050197	Scale Control / Monitoring

Attachment 8

40050293	Zone 3: WTP: Chlorination Sy
40050374	CT and TTHM Evaluation With
40050665	Ammonia Building: Repair Roo
40050725	Sludge Beds / Sludge Handlin
40050726	Plant Shut Down / Re-start
40050730	DAF/Floc Basins: Drain and C
40050922	DAF skimmer drive gear unit
40051020	Zone 3: WTP: Influent others
40051284	Zone 3: WTP: Chlorination Sy
40051871	Zone 3: WTP: Ammonia Syst. 1
40052037	Zone 3: WTP: Water Storage P
40052916	Zone 3: WTP: Laboratory Samp
40052969	CIP area circulation piping
40052989	Zone 3: WTP: E.Q. recycle pu
40053139	Zone 3: WTP: Standby Generat

Flood Control Zone 3
Water Treatment Analysis - 552R235302
Fiscal Year 2010-11 Breakdown of budget

Attachment 9

Description		Amount Budgeted
Labor		1,172,756
Equipment		9,450
Expenditures (see attached for breakdown)		800,000
Turbidmeter Replacement		15,000
PG&E Retro Commissioning		25,000
Units of Production		73,160
Department Overhead		239,938
Division Overhead		87,795
Total FY 10/11 Budget	**$**	**2,423,099**

Attachment 9

Flood Control Zone 3
Water Treatment Analysis - 552R235302
Fiscal Year 2010-11 Breakdown of budget **$ 800,000**
Materials and Vendors Only

1	Chemical Systems	9	0.00%
2	DAF Systems	1,042	0.13%
3	Process Systems	8,637	1.08%
4	Grounds and Building Maintenance	10,171	1.27%
5	Plant Startup	3,952	0.49%
6	Chemicals	346,113	43.26%
7	Sludge Process/Handling	19,127	2.39%
8	Membrane Feed System	-	0.00%
9	Pall Membrane System	8,389	1.05%
10	Reports	15,471	1.93%
11	System Maintenance	-	0.00%
12	WQ Station Maintenance	1,645	0.21%
13	Miscellaneous	-	0.00%
14	Plant Shutdown	9,743	1.22%
15	Safety/Training	24,575	3.07%
16	Instrumentation Maintenance	-	0.00%
17	Scale Monitoring	-	0.00%
18	CT/TJM Trials	-	0.00%
19	CL02 System	-	0.00%
20	Misc Special Projects	-	0.00%
21	Utilities	223,417	27.93%
22	Lab Supplies	8,961	1.12%
23	Special Dept Ext	16,055	2.01%
24	Professional Svs	85,769	10.72%
25	Misc	16,924	2.12%
Total		**$ 800,000**	**100%**

Lopez Water Treatment & Distribution System (FCZ 3)
8 YR - Capital Outlay Schedule

PROJECT	Notes	TOTAL	Expended As of 6/30/09	Approved 2009/10	Request 2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Pipe-Phase II Pigging (Line Cleaning): 5.5 mi of 16" dia.	1	$441,500	$212	$336,288	$105,000							
Pipe-Term. Res. Inlet Cla Valve Remote Control	2	$147,800							$147,800			
Pipe-Washwater Tank Interior Repair & Recoat	3	$273,700									$273,700	
Pipe-Replace AG Ck Waterline Xing - Rodriguez Bridge	4	$969,100	$37,892	$536,208	Rollover	$395,000						
Pipe-Additional Valve Replacement	5	$51,500	$696	$50,804	Rollover							
Pipe-Telemetry Controls at Turnouts and Outlet Works	6	$454,600							$45,000	$409,600		
WTP-Upgrade WTP Sludge Beds	7	$1,292,000	$120,253	$779,747	$392,000							
WTP - pH Suppression System	8	$1,175,000	$18,723	$206,277	Rollover	$110,000	$500,000	$340,000				
WTP-PAC Enclosure	9	$112,600									$112,600	
WTP-Filtered Water Effluent Valve Hydraulic Control	10	$55,000			$55,000							
WTP-Utility Tractor	11	$90,000	$24,952	$65,048								
WTP-Access Road to Domestic Tank	12	$114,700						$114,700				
WTP-Pontoon Boat	13	$28,000			$28,000							
WTP-Adjacent Land Acquisition	14	$1,517,500										$1,517,500
AG Creek-Habitat Conservation Plan	15	$340,000	$15,032	$24,968	Rollover	$50,000	$50,000	$100,000	$100,000			
Term. Res-Perimeter Security Fencing	16	$500,000							$260,000	$140,000	$100,000	
TOTAL		$7,563,000	$217,760	$1,999,340	$580,000	$555,000	$550,000	$554,700	$552,800	$549,600	$486,300	$1,517,500

NOTES:

0 Inflation is 5% per year after original estimate unless noted otherwise

1 Tee and wye were installed in 06-07; remaining funds will cover RFP crafting, retaining pigging contractor and doing the actual pigging. Requested funds include $30K for vault at launch site. See Tom Trott Design Cost Estimate, Dec 2(

2 Operator request; 2006 budget estimate. 5% inflation added per year.

3 Operator request; 2006 budget estimate. 5% inflation added per year.

4 Assumes existing pipe will be supported/protected with rock ramp ($400K cheaper than pipe bridge, $250K cheaper than open cut). Project will also provide fish passage. See Nov 6, 2009 Project Alternative Comparison Estimate.

5 Operator request; budgeted funds should cover all costs

6 Put transmission line in SCADA. 2 year phased project. 2006 budget estimate; 5% inflation added per year.

7 Much needed upgrade of the sludge beds which was not part of the WTP Upgrade Project. Portion of approved funds already used to completely rehab beds 1 and 2. Requested funds are for complete design/construction to upgrade b
3 and 4. Budget does not include funding for complete upgrade construction for beds 1 and 2 ($675K); it is anticipated that this will not be needed after upgrade of beds 3 and 4. See Tom Trott Sludge Beds Upgrade Estimate, 12/23/09.

8 Water Quality Lab to perform coupon testing program to quantify scaling in the plant (reduced scaling observed in last 6 months) during FY10-11. If results warrant project implementation, design and construction will be phased over 3 years. See Tom Trott pH Suppression System estimate, 12/23/09.

9 Dean Benedix budget estimate 1/08

10 Black & Veatch retrofit work, may be covered by Black & Veatch. See 11/12/09 plant operations cost estimate and Tom Trott Filtered Water Effluent Valve Hydraulic Control estimate, 12/23/09.

11 Operator request; will be complete by 6/30/10

12 Dean Benedix budget estimate 1/09

13 Water Quality Lab Estimate, 11/11/08, based on conversations with vendors. No inflation added.

14 Plant security mitigation issue. Estimate based on Phil Acosta estimate, 9/2/09. No inflation added.

15 Budget for implementing HCP per Doug dating back to 2006; no inflation added, Revised by Dean Benedix 1/09

16 Project shown phased over 3 years.