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LITCHFIELD PARK SERVICE COMPANY

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August 10, 2006

AUG 14 2006

City of Goodyear
Water Resources Department
5424 S. 157th Avenue
Goodyear, Arizona 85338

DOCKETED BY	<i>nr</i>
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Attention: Mr. Shawn Bradford, Water Resources Director

SW
W/S-01428A-05-0022

RE: Capacity Odor Issues at the Palm Valley Reclamation Facility
Response To Your Letter of August 2, 2006

Dear Mr. Bradford,

Litchfield Park Services Company (LPSCO) is owned by Algonquin Water Resources of America (AWRA). LPSCO owns the Palm Valley Water Reclamation Facility (PVWRF). The average daily wastewater flows to PVWRF for 2004, 2005 and 2006 (projected from data up to July 31, 2006) are shown on Schedule A, attached. The data show that at the end of 2006 the average daily wastewater flows will be 3.0 mgd, which is 71% of the design capacity of 4.2 mgd.

Projected growth, based on growth within the LPSCO service area and on agreements currently being negotiated to provide bulk service outside the LPSCO service area, show that by 2010 the required plant capacity will be 8.6 mgd.

LPSCO commissioned Carollo Engineers to prepare a Water and Wastewater System Master Plan. The final report was issued in April 2006, less than 4 months ago. The Scope of Work for that report is attached as Schedule B. Carollo Engineers has been retained to revisit the model for wastewater flows with input of more up-to-date data on planned growth, both within and outside the LPSCO service area, to confirm our projections. A report is expected by August 28, 2006.

Our Engineering and Construction Department, managed by Tom Nichols, P.E., is preparing the scope of work for a consulting engineering firm to study the options for increasing the capacity to treat wastewater. Options being considered include:

1. Expansion of PVWRF
2. Construction of a new plant in the vicinity of our Sarival Lift Station
3. Purchase of a portion of the City of Goodyear water reclamation facility at 157th Avenue

This work will be awarded by August 21, 2006 with a preliminary report due by September 18, 2006 and a final report available by October 16, 2006. Based on this study, a decision will be made and final design for additional wastewater reclamation capacity for LPSCO will

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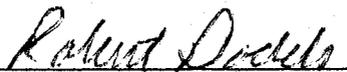
commence. By the end of 2006, final design for required increase of capacity will be underway. The additional capacity is planned to be commissioned in the first quarter of 2008.

With respect to the recent issue of odors, PVWRF operates in compliance with the Maricopa County Air Quality Division requirement of 30 ppb hydrogen sulfide concentration limit at the boundary of the odor easement. However, LPSCO is aware that other non-regulated compounds have been causing unpleasant odors from time to time and significant progress is being made to mitigate those sources of odors at PVWRF. As requested in your letter of August 2, 2006, the long and short terms plans to address the odor issues that have been recently experienced at PVWRF are attached as Schedule C. Schedule C has been updated from a similar schedule you were provided when you recently attended our Community Liaison Committee (CLC) meeting on July 6, 2006.

The CLC meetings will continue to be held, with the next one occurring in September 2006. At these CLC meetings, representatives from the nearby tenants and residents, the City of Goodyear, the Arizona Department of Environmental Quality (ADEQ) and the Arizona Corporate Commission (ACC) will be apprised of the work being carried out by LPSCO to address all operational issues at PVWRC.

Hopefully, this letter adequately addresses the issues raised in your letter of August 2, 2006. Please contact us at their convenience should clarification or further information be required. AWRA takes very seriously its responsibilities to operate all of its water and water facilities in Arizona in accordance with all regulatory requirements while maintaining satisfactory service at the lowest cost to our customers.

Yours very truly,
LITCHFIELD PARK SERVICES COMPANY


Robert B. Dodds, Ph.D., P. Eng.
President

Cc: Commissioner Kristin Mayes, Docket No. WS-01428A-05
Steven S. Cleveland, City Manager
James Nichols, Deputy City Manager
Greg Sorensen, Controller AWS
Matt Garlick, Regional Operations Manager, AWS
Tom Nichols, Manager of Engineering and Construction, AWS

SCHEDULE A

WASTEWATER FLOW HISTORY AND PROJECTIONS

Schedule A
PALM VALLEY WATER RECLAMATION FACILITY
Summary of Effluent Flows ¹
August 2006

	2004 Measured Effluent Flows	2005 Measured Effluent Flows	2006 Projected Effluent Flows ²	2010 Projected Effluent Flows ⁴
Effluent Flow (mgd) ³	2.4	2.6	3.0	8.6
Amount of Increase (mgd) ³	N/A	0.2	0.4	5.6
Percent Increase (%)	N/A	8%	15%	187%

¹ Effluent flow values are average daily flows

² 2006 flow projection based on six months of measured flows

³ mgd = million gallons per day

⁴ 2010 flow projection based on Carollo Engineers Master Plan - April 2006

SCHEDULE B

SCOPE OF WORK
WATER AND WASTEWATER SYSTEM MASTER PLAN
Carollo Engineers, April 2006

INTRODUCTION**1.1 BACKGROUND**

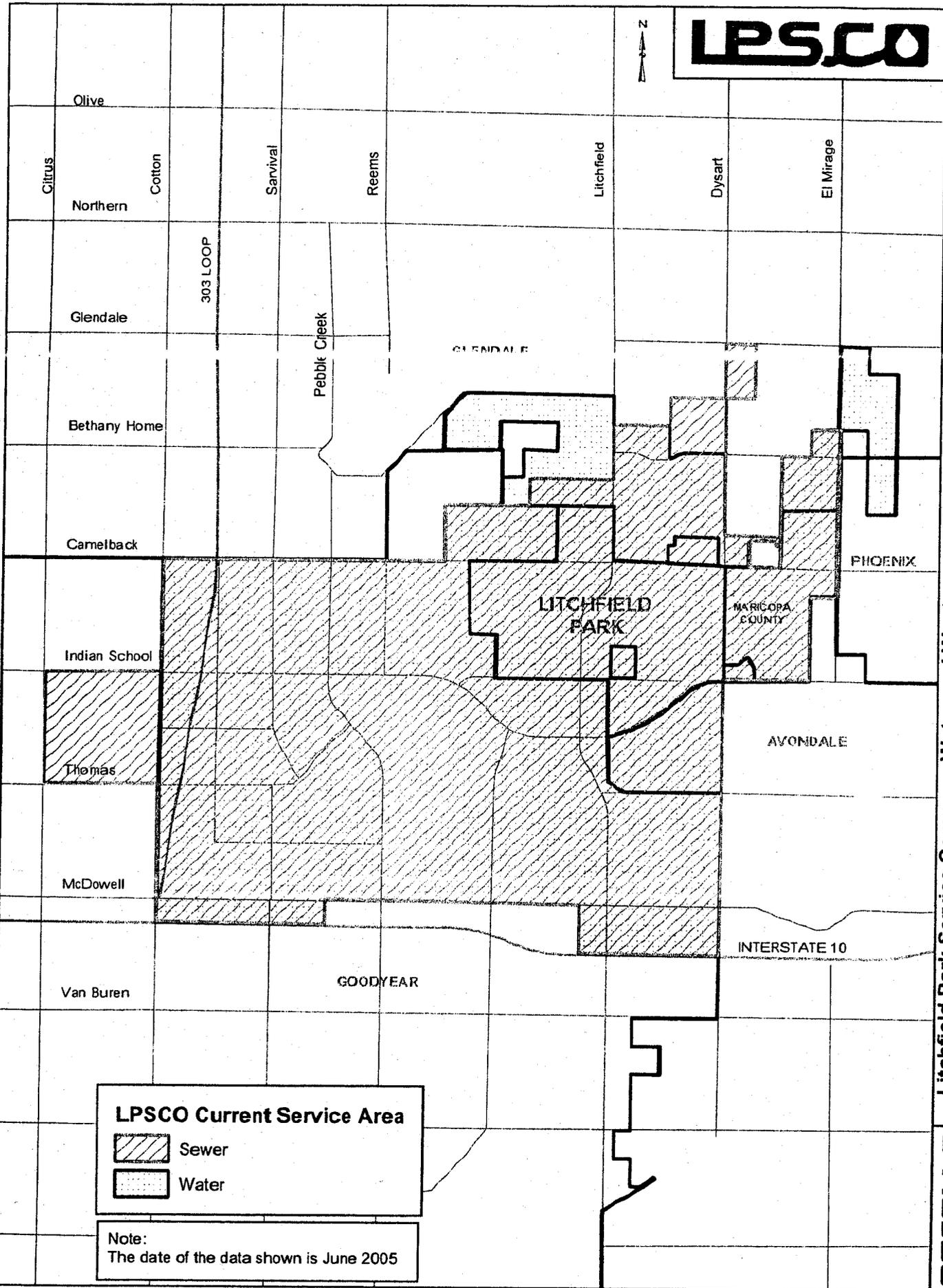
The Litchfield Park Service Company (LPSCO) is a private water company owned by Algonquin Water Services, LLC. LPSCO provides water and wastewater service to all of Litchfield Park and portions of Goodyear, Avondale, Glendale, Phoenix, and unincorporated portions of Maricopa County. The LPSCO water service area covers approximately 20.5 square miles, and the existing sewer service area encompasses approximately 19.6 square miles. Proposed additional wastewater service areas would bring the total wastewater service area to approximately 32 square miles. Figure 1.1 shows the LPSCO service areas in relation to surrounding communities.

The wastewater system currently consists of 234 miles of collection mains that convey wastewater to the Palm Valley Water Reclamation Plant (PVWRP). The collection system also includes the Casitas Bonitas Lift Station and the Litchfield Greens Lift Station that will be retired soon. A new lift station, called the Sarival Lift Station has been constructed to pump wastewater from the western portion of the LPSCO service area to the existing PVWRP until the proposed Sarival Water Reclamation Plant (SWRP) is constructed near the Sarival Lift Station. The collection system service area may expand significantly in the future if two large areas northwest of the existing service area are developed and allowed to be served by LPSCO. LPSCO may be able to provide wastewater services to other developing land areas as well.

The water system also consists of approximately 234 miles of distribution mains, a reservoir, booster station, and eight operating supply wells. LPSCO will need to add additional water production capacity, reservoirs, and transmission mains in order to provide water to the entire service area and to deliver water to meet fire flow requirements. LPSCO has identified several well sites that may provide water in the future. One of the major issues facing LPSCO is the new EPA arsenic rule. Several of LPSCO's wells produce water with arsenic levels that are above the new limit. LPSCO is in the process of planning implementing arsenic treatment at sites where treatment is required.

Development is occurring very rapidly within the LPSCO service area. This growth requires planning to make certain that LPSCO customers continue to receive quality service. The water system will require additional wells, storage, and distribution mains to serve the entire area. The wastewater system will require additional collection mains as well as additional wastewater treatment capacity.

H:\Client\algonquin\6969 a.00 water and wastewater models\reports\FIG1_1.mxd



LPSCO Current Service Area

-  Sewer
-  Water

Note:
The date of the data shown is June 2005

Litchfield Park Service Company Water and Wastewater Master Plan Development
Litchfield Park Service Company Water and Wastewater Master Plan Report



Existing LPSCO Sewer and Water Service Areas

Figure 1.1

In order to complete this project, water distribution and wastewater collection models needed to be created so that the systems could be analyzed to understand existing conditions and plan for future requirements. Data for these models was collected from a variety of paper and digital record drawings. This information was digitized into a Geographic Information System (GIS) so that LPSCO could have a record of mains, manholes, valves, hydrants, and other assets. Now that this information is in the GIS, it can be updated and maintained as new infrastructure is added. The GIS was used to create a set of maps covering the entire service area that is available for use by LPSCO staff. The GIS data was also used to create the models. New maps can be created from this GIS data into the future as this data is maintained.

1.2 AUTHORIZATION AND SCOPE

LPSCO selected Carollo Engineers to undertake this wastewater collection system and water distribution system master plan development study. The project began in July 2004. Major goals of the project included the following:

- Digitize water and wastewater asset data into a GIS system so that maps and hydraulic models could be created using this GIS data. Provide guidance on how this data should be maintained.
- Select software packages that would most effectively meet LPSCO's needs for modeling the water and wastewater systems.
- Develop and calibrate models of the water distribution and wastewater collection systems.
- Develop a GIS based land use plan to identify different types of land use within the LPSCO service area. Use this plan to predict how much growth is expected to occur, and where that growth will be located in planning years 2005, 2010, 2015, and buildout. Use this land use plan to predict water demands and wastewater loads.
- Using the models, evaluate the effectiveness of the existing infrastructure in delivering water and in collecting wastewater.
- Identify, cost, and phase in recommended future improvements to the water and wastewater systems.

After a careful evaluation of the software modeling packages that are currently on the market, H₂OMAP Water and H₂OMAP Sewer by MWH Soft were selected for this project. This software was selected because it had a very good interface with GIS and other information systems, has powerful features, is easy to use, has good customer support, and was competitively priced.

LPSCO's record drawings were digitized to create layers of data for use in the models and for maps. The models were set up to be maintained and updated into the future as the GIS data is updated. Demands and loads were generated for the models by using the land use plan that was developed for this project. The land use plan classified all land areas within the water and wastewater service areas into discrete land use classifications that have consistent water demand characteristics. The rate of development for each of these land areas was estimated by assigning a percent buildout to each land parcel for each 5-year planning period of this study. This land use plan is based on the general plans developed by the cities within the LPSCO service area. The land use plan is stored in a layer of GIS data that can be updated and maintained so that in the future, changes in land use can be updated and the corresponding change will be reflected in the models.

A field test was conducted during the fall of 2004 to monitor flows and pressures throughout the water distribution system. Pressures and flows in the distribution system were monitored to obtain information that was used to calibrate the water model. The model was calibrated successfully using this field data. Flows into the water reclamation plant were used to validate the wastewater model.

Based on the information available at the time the models were developed, the models were set up to predict future demands. These demands were used to predict the adequacy of existing mains and the required size of new mains. Models were created and run for the years 2005, 2010, 2015, and buildout demand and flow conditions. These simulations were used to determine when new infrastructure will be required for each planning period.

Recommended infrastructure improvements were assigned to each planning period, costs of each required improvement were estimated, and improvements were grouped into logical projects that can be designed and constructed. LPSCO can use this information to develop a capital improvement budget for future years in order to fund these improvements.

Model and software training will be provided to LPSCO staff so that the models can be used and maintained into the future, providing additional benefits to LPSCO.

1.3 REPORT ORGANIZATION

This report is based on technical memorandums that were created as a part of the project to explain how the model was created, and to explain some of the underlying assumptions that are built into the models and the study. The following chapters are covered in this report:

- **Chapter 2 Model Development:** This chapter describes the information needed to develop the models, software selection, the land use plan, demand and load development, and ongoing use of the models.
- **Chapter 3 Water System Master Plan:** This chapter describes the water distribution system, water model calibration, performance criteria, evaluation of the existing system, future infrastructure planning, and estimated capital improvement costs.

- **Chapter 4 Wastewater System Master Plan:** This chapter describes the wastewater collection system, model validation, performance criteria, evaluation of the existing system, future infrastructure planning, and capital improvements costs.

1.4 ABBREVIATIONS

ADWR	Arizona Department of Water Resources
CC&N	A CC&N boundary defines the service area of a private water utility.
d/D	pipe depth/diameter
DHI	Danish Hydraulic Institute
du/ac	dwelling units/acre
ENR CCI	Engineering News Record Construction Cost Index
ESRI	Environmental Science Research Institute
ft	feet
fps	feet/second
gal	gallons
GIS	Geographic Information System
gpm	gallons per minute
H ₂ S	hydrogen sulfide
IBC	International Building Code
LPSCO	Litchfield Park Service Company
Max Day	Highest daily water demand on an annual basis
Max Month	Average daily water demand in the highest month of the year
MG	million gallons
mgd	million gallons per day
NAD 83	North American Datum, 1983
PRV	pressure reducing valve
psi	pounds per square inch
PVC	Polyvinyl Chloride
UFW	unaccounted for water
US EPA	US Environmental Protection Agency
VFD	variable frequency drive
WRP	water reclamation plant

SCHEDULE C

SHORT AND LONG TERM PLANS FOR MITIGATION OF ODORS
August 8, 2006

August 8, 2006

UPDATED ODOR CONTROL IMPROVEMENTS FOR LPSCO

Over the last several months, Litchfield Park Service Company (LPSCO) has received various odor complaints from time to time regarding odors being emitted from the Palm Valley Water Reclamation Facility (PVWRF). During this time, LPSCO has taken action to investigate and mitigate any odor complaints.

As part of our continuing effort to reduce plant odors and fugitive emissions to the surrounding community, LPSCO has deployed during the period of July 8 to August 8, 2006 hydrogen sulfide instrument in the down gradient area where emissions were apparently migrating off-site. During this four week data collection period to date, at no time did emissions of hydrogen sulfide exceed the Maricopa County Air Quality Standards of 30 parts per billion (ppb) at the limit of the odor easement. However, even though hydrogen sulfide levels were detected which are below the 30 ppb levels, various odor complaints have still been received.

As previously determined, LPSCO believes that the odors which the community has been experiencing are odors from non-regulated compounds (i.e. organics) which are not scrubbed by a chemical scrubber but do cause unpleasant odors from time to time. Based on this understanding, LPSCO has completed various odor control improvements, process changes and purchased additional monitoring equipment to help aid in identifying the types and sources of these offensive odors.

A list of the continuing efforts is provided below:

Odor Control Unit Improvements Up-Dates for the Month of August, 2006:

- 1.) During the early part of July, 2006, LPSCO established the need to purchase a larger caustic tank. LPSCO purchased and installed this larger capacity tank (1100 gallons) because of the high sulfide loading that was observed from time to time during data collection. This larger capacity tank would give LPSCO extra chemical treatment capacity in the event of prolonged hydrogen sulfide loading.
 - A. Caustic tank installation has been completed. Chemical tank to be filled on-line on August 9, 2006;
 - B. Eye wash and shower installation completed on August 8, 2006.
- 2.) On July 8, 2006, LPSCO installed a Sycamore two-point hydrogen sulfide monitoring system on both the upper and lower odor control scrubbers. This study is designed to observed hydrogen sulfide loading and odor control performance over a 30 day period. Information from this study will be utilized to enhance the odor control performance and or aid in selection of a larger unit, if necessary. This data collection timeframe will be completed on August 8, 2006.
 - A. The raw data from this unit has allowed LPSCO in make operational control decisions on how to best operate the odor control units.

- B. Data obtained from this study has also been distributed to three (3) carbon scrubber manufactures for the purposes of sizing and preparing cost estimates for an additional polishing unit which is designed to remove offensive organics. The removal of the organics will greatly reduce any fugitive odors being emitted from the PVWRF.
- 3.) On August 7, 2006, Carollo Engineering was retained to begin reviewing plant process operations and to carry out engineering design of the future carbon scrubber (polishing unit). This work schedule has been given a short timeframe and will be completed sometime during mid October, 2006. As part of the engineering review, Carrillo will review process operations and make recommendations to process operations, if needed, which will lessen the likelihood of odor generation. Carrillo will also aid LPSCO on the selection process of a carbon scrubber. The permitting and engineering review are anticipated to be completed by mid October, 2006.

Fugitive Site Odor Control Improvements:

- 1.) During the month of July, 2006, LPSCO retro fitted two (2) solids handling bay doors in order to help reduce fugitive odors emitting from the facility during Biosolid bin change-outs. LPSCO installed vertical plastic curtains that would act as a barrier and not allow odors to be emitted when the bay doors are opened. After the initial installation and subsequent use, it was determined that the curtains were causing increased timeframes for the bay doors being opened and likely causing increased odors due to the vertical curtains getting caught on the bins during change outs. LPSCO will remove the existing vertical curtains and replace them with swing out curtains. This is scheduled to be completed by August 24, 2006.
- 2.) LPSCO has expanded its efforts on sewer cleaning in areas where odors have been reported. LPSCO has continued to routinely clean sewers in the general area on a quarterly basis. Completed quarterly or sooner.
- 3.) LPSCO has completed the first portion of the trunk line sewer cleaning along McDowell Road. During this cleaning, various amounts of debris were removed which may have been contributing to the production of hydrogen sulfide odors and various other organic type odors. The second portion of the trunk sewer will be cleaned during the first week of September, 2006.
- 4.) LPSCO has completed the installation of Waste Activated Sludge (WAS) mechanical equipment. Once the automation process has been complete this will also help to reduce raw undigested material from being injected into the aerobic digesters causing the units to emit offensive ammonia type odors. This is scheduled to be completed August 30, 2006.
- 5.) LPSCO has added one (1) addition staff position in order to help with increased plant maintenance and increase diligence with respect to non-regulated odors being emitted from the plant, thus shortening timeframes between any future and odor complaints and mitigation. This position is scheduled to be filled on August 15, 2006.

ID	Task Name	Duration	Start	Finish	Roll Up Task	Roll Up Milestone	External Tasks	Group by Summary
1	Odor Control Unit Upgrades	107 days	Tue 3/14/06	Wed 6/9/06				
2	Install Sulfuric Acid Tank for Odor Control Scrubber	29 days	Mon 5/29/06	Thu 7/6/06				
3	Hydraulic Testing	5 days	Mon 6/5/06	Fri 6/9/06				
4	Install Sulfuric Acid Tank	29 days	Mon 5/29/06	Thu 7/6/06				
5	Add GAC Media to Stand-by Odor Scrubber	10 days	Mon 6/12/06	Fri 6/22/06				
6	Service Odor Control Units and Optimize Performance	21 days	Tue 5/16/06	Wed 6/14/06				
7	Upgrade Electric Tank and Install Eyewash	49 days	Fri 6/2/06	Wed 8/9/06				
8	FWWF Administrative Tasks	180 days	Tue 12/6/05	Mon 8/14/06				
9	Procure all Emergency Spare Parts and Motors for Plant	30 days	Tue 12/6/05	Mon 1/16/06				
10	Hire Additional Plant Staff	31 days	Mon 7/20/06	Mon 8/14/06				
11	Fugitive Site Odor Control Improvements	70 days	Mon 6/5/06	Fri 8/18/06				
12	Standard Operating Procedure to Wash Bioacid Bins On-Site	5 days	Mon 6/26/06	Fri 6/30/06				
13	Install Curtains Over Access Doors for Solids Handling Building	15 days	Mon 6/12/06	Fri 6/30/06				
14	Reloof Curtains to Further Reduce Odor Emissions	15 days	Fri 6/6/06	Thu 6/24/06				
15	Install Passive Carbon Inlets and Manholes On-Site	10 days	Mon 6/5/06	Fri 6/16/06				
16	Clean Main Sewer Trunk Line along McDowell Rd.	40 days	Mon 7/17/06	Fri 8/18/06				
17	Phase 1 - Clean Sewer from Dymall to Palm Valley Blvd	5 days	Mon 7/17/06	Fri 7/21/06				
18	Phase 2 - Clean Sewer from Palm Valley Blvd to Plant	5 days	Mon 8/14/06	Fri 8/18/06				
19	SCADA Adjustment to Lift Station to increase Odor Capture	5 days	Thu 6/22/06	Wed 6/28/06				
20	Automate Waste Activated Sludge (WAS) Process in SCADA	60 days	Thu 6/8/06	Wed 6/28/06				
21	Odor Emissions Data Collection	54 days	Tue 6/27/06	Fri 8/18/06				
22	Purchase and Install Hydrogen Sulfide Gas Sensor	2 days	Tue 6/27/06	Wed 6/28/06				
23	Odor Control Emissions Monitoring and Data Collection	22 days	Fri 7/7/06	Mon 8/7/06				
24	Adjust Odor Scrubber Operation Based on Emissions Data	1 day	Tue 8/8/06	Tue 8/8/06				
25	Extend Emissions Monitoring and Data Collection	23 days	Wed 8/9/06	Fri 8/18/06				

