

**LILAC HILLS RANCH COMMUNITY
WASTEWATER MANAGEMENT ALTERNATIVES
FOR CONCEPT APPROVAL BY THE
VALLEY CENTER MUNICIPAL WATER DISTRICT**

~~January 30~~[February 14](#), 2014

**Prepared by:
Dexter Wilson Engineering, Inc.
2234 Faraday Avenue
Carlsbad, CA 92008
(760) 438-4422**

Job No. 806-001

TABLE OF CONTENTS

	<u>PAGE NO.</u>
CHAPTER 1	
INTRODUCTION.....	1-1
PROJECT OVERVIEW.....	1-1
DEVELOPMENT PLAN.....	1-2
Purpose of Study.....	1-2
Regulatory Considerations.....	1-2
CHAPTER 2	
PLANNING AND DESIGN CRITERIA.....	2-1
WASTEWATER FLOW GENERATION FACTORS	2-1
EXTERIOR WATER SUPPLY.....	2-2
Ground Water.....	2-2
Rain Water Harvesting.....	2-3
Grey Water.....	2-3
Reclaimed Water	2-3
CHAPTER 3	
WASTEWATER COLLECTION.....	3-1
ON-SITE COLLECTION SYSTEM.....	3-1
Piping System.....	3-1
Phasing	3-5
Pump Stations	3-5
Permanent Pump Stations	3-5
Temporary Pump Stations	3-5
OFF-SITE COLLECTION SYSTEM.....	3-6
Alternative 1.....	3-6
Alternative 2.....	3-6
Alternative 3.....	3-6
Alternative 4.....	3-6
Preferred Alternative	3-7
CHAPTER 4	
WASTEWATER MANAGEMENT	4-1
PERMANENT WASTEWATER TREATMENT	4-1
Grey Water System Alternative	4-2
Option 1 - Description of On-site Water	
Recycling Plant with Solids Treatment.....	4-2
Influent Screening.....	4-2
Extended Aeration Activated Sludge Process	4-2

TABLE OF CONTENTS

	<u>PAGE NO.</u>
Selector Tanks.....	4-3
First Stage Aeration Tanks	4-3
Second Stage Aeration Tanks	4-3
Clarifiers	4-3
Tertiary Filters	4-3
Chlorine Contact Tank	4-3
Emergency Generator.....	4-6
Plant Drain Pump Station	4-6
Non-Compliant Effluent Storage Tank	4-6
Aerobic Digestion and Dewatering	4-7
Aerobic Digestion	4-7
Dewatering	4-7
Spill Containment System	4-7
Option 2 – Description of On-Site Scalping Water	
Recycling Plant without Solids Treatment	4-7
Description of Treatment Process	4-9
On-site Improvements.....	4-10
Option 3 – Description of Lower Moosa WRF Alternative....	4-10
Option 4 – Description of On-site Water Recycling Plant	
without Solids Treatment for a Portion of the Project	4-11
COMPARISON OF ALTERNATIVES	4-11
Costs	4-12
Option 1 - On-site Water Recycling Plant with	
Solids Treatment	4-12
Options 2 - On-site Water Recycling Plant without	
Solids Treatment	4-13
Options 3 & 4 - On-site Water Recycling Plant without	
Solids Treatment for a Portion of the Project	4-14
Ranking of Options.....	4-15
CHAPTER 5	
RECYCLED WATER USE AND WET WEATHER STORAGE.....	5-1
Recycled Water Use.....	5-1
Wet Weather Storage	5-1
Off-Site Recycle Water Piping	5-2

LIST OF TABLES

	<u>PAGE NO.</u>
TABLE 2-1	ESTIMATED WASTEWATER GENERATION.....2-1
TABLE 2-2	AVERAGE 24 HOUR RECYCLED WATER GENERATION2-2
TABLE 3-1	LILAC HILLS RANCH WASTEWATER GENERATION PHASING SUMMARY.....3-5
TABLE 4-1	LILAC HILLS ON-SITE WATER RECYCLING PLANT WITH SOLIDS TREATMENT MAJOR PROCESS SIZING.....4-5
TABLE 4-2	LILAC HILLS ON-SITE WATER RECYCLING PLANT WITHOUT SOLIDS TREATMENT MAJOR PROCESS SIZING4-9
TABLE 4-3	COMPARATIVE COST FOR ON-SITE TREATMENT WITH SOLID TREATMENT4-12
TABLE 4-4	COMPARATIVE COST FOR ON-SITE TREATMENT WITHOUT SOLID TREATMENT4-13
TABLE 4-5	COMPARISON COSTS FOR ON-SITE TREATMENT WITHOUT SOLIDS TREATMENT FOR A PORTION OF THE PROJECT4-14
TABLE 4-6	COMPARISON OF OPTIONS.....4-15
TABLE 5-1	LILAC HILLS RANCH WATER IRRIGATION USE AND STORAGE SUMMARY – WATER YEAR 20055-3

LIST OF FIGURES

	<u>PAGE NO.</u>
FIGURE 3-1	PHASE 1-5 SEWER SYSTEM WITH ON-SITE TREATMENT 3-2
FIGURE 3-2	PHASES 1-5 SEWER SYSTEM WITH OFF-SITE TREATMENT..... 3-3
FIGURE 3-3	OFF-SITE SEWER COLLECTION SYSTEM 3-4
FIGURE 3-4A	MOUNTAIN RIDGE ROAD UTILITY CROSS SECTION 3-8
FIGURE 3-4B	COVEY UTILITY CROSS SECTION..... 3-9
FIGURE 3-4C1	CIRCLE 'R' LANE UTILITY CROSS SECTION 3-10
FIGURE 3-4C2	CIRCLE 'R' LANE UTILITY CROSS SECTION 3-11
FIGURE 4-1	ON-SITE WATER RECYCLING PLANT WITH SOLIDS TREATMENT 4-4
FIGURE 4-2	ON-SITE WATER RECYCLING PLANT WITHOUT SOLIDS TREATMENT 4-8
FIGURE 5-1	BENEFICIAL RECYCLED WATER USE AREAS 5-4
FIGURE 5-2	RECYCLED WATER SYSTEM 5-5

LIST OF APPENDICES

APPENDIX A	WATER, RECYCLED WATER, AND WASTEWATER DEMANDS
APPENDIX B	WET WEATHER STORAGE CALCULATIONS

EXHIBIT

EXHIBIT A	WATER RECLAMATION PLANT LILAC HILLS RANCH
-----------	---

CHAPTER 1

INTRODUCTION

This report provides information and analysis for municipal wastewater management for the Lilac Hills Ranch Community. Sewer service for the Lilac Hills Ranch Community will be provided by the Valley Center Municipal Water District (District) which will own and operate any necessary facilities Alternatives considered in this report including (1) sending all wastewater to the existing Lower Moosa Canyon Reclamation Facility (Moosa WRF) via a forcemain, (2) construction of a scalping plant on-site that would provide reclaimed water for on-site uses but send solids to Moosa WRF for treatment, (3) construction of a scalping plant on-site to serve the northern portion of the project with the southern portion sent to Moosa WRF, and (4) construction of a full water reclamation facility that would treat all wastewater and solids generated by the project. Should a full water reclamation facility be constructed, it may be done in phases. Should treatment of wastewater or solids at the existing Moosa WRF be selected, this report shows four possible routes for the necessary piping to convey wastewater to the existing plant.

Should on-site treatment be the selected alternative, the initial development within the Lilac Hills Ranch Community may be provided sewer service by means of trucking sewage from a collection point on-site to an existing wastewater treatment plant. This would be a temporary approach to allow sufficient wastewater flows to accumulate prior to the operation of a treatment plant.

Wet weather storage may be needed by the District for increased wastewater flows from the project and other areas of the district. The District will ultimately decide which combination of options and alternatives will be used to provide wastewater disposal services.

PROJECT OVERVIEW

The proposed Lilac Hills Ranch Community is approximately 608 acres and is comprised of approximately 59 contiguous properties. The project is located in northern unincorporated San Diego County approximately 3/4 of a mile east of the Interstate 15 corridor. Access to the property is off of the Old Highway 395 Interchange at West Lilac Road. The project site is located to the south and west of West Lilac Road with State Route 76 to the north, downtown

Valley Center 10 miles to the east, Escondido is seven miles to the south, and Interstate 15 and Old Highway 395 to the west.

The Lilac Hills Ranch Community is located entirely in the Escondido zip code 92026 and is situated primarily within the westernmost portion of the Valley Center Community Planning Area (CPA) and the eastern most portion of the Bonsall Subregional Plan Area. From the northwest project corner, West Lilac Road serves as the northern and eastern boundary of the project site, while Circle R Drive is less than 1/2 mile south of the project boundary. From the southwest project corner, the western boundary of the project runs along Shirey Road and extends to Standel Lane, which serves as the northwestern project boundary.

The project is within Township 10 South, Range 3 West, Section 24, and Township 10 South, Range 2 West, Sections 19 and 30, on the USGS 7.5' Pala and Bonsall quadrangles.

DEVELOPMENT PLAN

The Lilac Hills Ranch Community proposes the development of a new mixed-use master planned community. The proposed Specific Plan includes a maximum of 1,746 homes with varying lot sizes, a neighborhood-serving commercial village center, an active park/village green, retail uses, and a school site. A Rezone is proposed to implement the Specific Plan by changing the existing Use Regulations, Development Regulations, and Special Residential Land Use Designation and the A70 (Limited Agricultural) Zoning. The project would also include the submittal of a Master Tentative Map, Implementing Tentative Map, Site Plan(s), and/or Major Use Permit(s).

Purpose of Study

The purpose of the study is to describe the facilities required to manage, treat, and reuse wastewater (sewage) generated by the proposed Lilac Hills Ranch Community to assist the District granting concept approval. Additional studies may need to complete for the District.

Regulatory Considerations

A Waste Discharge Permit or Master Reclamation Permit will need to be issued for an on-site water reclamation facility by the San Diego Regional Water Quality Control Board. The Moosa WRF has an existing permit.

The Lilac Hills Ranch Community also must comply with State and County Department of Public Health requirements for the use of recycled water, including the California Code of Regulations, Title 22 requirements for unrestricted reuse, unless otherwise limited by State Law.

CHAPTER 2

PLANNING AND DESIGN CRITERIA

This chapter provides the planning and design criteria and estimates the daily volume of wastewater to be generated by the Lilac Hills Ranch Community.

WASTEWATER FLOW GENERATION FACTORS

The District wastewater flow generation factors were used to estimate wastewater flows from the project. Table 2-1 summarizes the projected wastewater flows and recycled water generation. The wastewater flows were then divided between grey water and other wastewater to evaluate wastewater reuse options. The total projected 24 hour peak flow from the project is 348,474356,510 gpd. Note that the projected 24 hour peak flow shown in Table 2-1 represents the peak flow seen on a typical day (i.e. an average day and represents a flow basis of approximately 200 gpd/EDU).

TABLE 2-1 ESTIMATED WASTEWATER GENERATION¹						
<u>Land Use</u>	<u>Acres</u>	<u>Units</u>	<u>Peak 24 hr Sewage Generation</u>		<u>Avg 24 hr Sewage/Recycled Generation</u>	
			<u>Factor</u>	<u>gpd</u>	<u>Factor</u>	<u>gpd</u>
<u>Single Family Detached*</u>	<u>156.9</u>	<u>928</u>	<u>200 gpd/unit</u>	<u>185,600</u>	<u>150 gpd/unit</u>	<u>139,200</u>
<u>Single Family Senior</u>	<u>76.9</u>	<u>468</u>	<u>125 gpd/unit</u>	<u>58,500</u>	<u>90 gpd/unit</u>	<u>42,120</u>
<u>Single Family Attached</u>	<u>7.9</u>	<u>164</u>	<u>180 gpd/unit</u>	<u>29,520</u>	<u>130 gpd/unit</u>	<u>21,320</u>
<u>Commercial/Mixed Use</u>	<u>17.3</u>	<u>211</u>	<u>1900 gpd/ac</u>	<u>32,870</u>	<u>1340 gpd/ac</u>	<u>23,182</u>
<u>Water Reclamation</u>	<u>2.4</u>	<u>-</u>	<u>1000 gpd/ac</u>	<u>2,400</u>	<u>700 gpd/ac</u>	<u>1,680</u>
<u>Recycled Facility/Trail Head</u>	<u>0.6</u>	<u>-</u>	<u>1000 gpd/ac</u>	<u>600</u>	<u>700 gpd/ac</u>	<u>420</u>
<u>Detention Basin</u>	<u>7.9</u>	<u>-</u>	<u>0 gpd/ac</u>	<u>-</u>	<u>0 gpd/ac</u>	<u>-</u>
<u>School</u>	<u>12.0</u>	<u>-</u>	<u>1000 gpd/ac</u>	<u>12,000</u>	<u>700 gpd/ac</u>	<u>8,400</u>
<u>Community Purpose Facility</u>	<u>2.0</u>	<u>-</u>	<u>1000 gpd/ac</u>	<u>2,000</u>	<u>700 gpd/ac</u>	<u>1,400</u>
<u>Group Residential/Care</u>	<u>6.5</u>	<u>-</u>	<u>1000 gpd/ac</u>	<u>6,500</u>	<u>700 gpd/ac</u>	<u>4,550</u>
<u>Institutional</u>	<u>10.0</u>	<u>-</u>	<u>1000 gpd/ac</u>	<u>10,000</u>	<u>700 gpd/ac</u>	<u>7,000</u>
<u>Park</u>	<u>23.6</u>	<u>-</u>	<u>700 gpd/ac</u>	<u>16,520</u>	<u>500 gpd/ac</u>	<u>11,800</u>
<u>Biological Open Space</u>	<u>104.1</u>	<u>-</u>	<u>0 gpd/ac</u>	<u>-</u>	<u>0 gpd/ac</u>	<u>-</u>
<u>Non-Circulating Road</u>	<u>45.7</u>	<u>-</u>	<u>0 gpd/ac</u>	<u>-</u>	<u>0 gpd/ac</u>	<u>-</u>
<u>Circulating Road</u>	<u>37.6</u>	<u>-</u>	<u>0 gpd/ac</u>	<u>-</u>	<u>0 gpd/ac</u>	<u>-</u>
<u>Common Areas/Ag</u>	<u>20.3</u>	<u>-</u>	<u>0 gpd/ac</u>	<u>-</u>	<u>0 gpd/ac</u>	<u>-</u>
<u>Manufactured Slopes/Wet Weather Storage</u>	<u>76.3</u>	<u>-</u>	<u>0 gpd/ac</u>	<u>-</u>	<u>0 gpd/ac</u>	<u>-</u>
<u>TOTAL</u>	<u>608.0</u>	<u>1,771</u>		<u>356,510</u>		<u>261,072</u>

TOTAL, afy				399		292
-------------------	--	--	--	------------	--	------------

¹ Appendix A provides a summary of Water, Recycled Water, and Wastewater demands for the project.

* Includes 25 EDUs for existing homesites and perimeter parcels.

Land Use	Acres	Units	Peak 24 hr Sewage Generation		Avg 24 hr Sewage/Recycled	
			Factor	gpd	Factor	gpd
Single Family Detached	165.4	903	200 gpd/unit	180,600	150 gpd/unit	135,450
Single Family Senior	75.9	468	125 gpd/unit	58,500	90 gpd/unit	42,120
Single Family Attached	7.9	164	180 gpd/unit	29,520	130 gpd/unit	21,320
Commercial/Mixed Use	15.3	211	1900 gpd/ac	28,994	1340 gpd/ac	20,448
Water Reclamation	2.4	-	1000 gpd/ac	2,400	700 gpd/ac	1,680
Recycled Facility/Trail Head	0.6	-	1000 gpd/ac	600	700 gpd/ac	420
Detention Basin	5.5	-	0 gpd/ac	-	0 gpd/ac	-
School	12.0	-	1000 gpd/ac	12,000	700 gpd/ac	8,400
Private Recreation	2.0	-	1000 gpd/ac	2,000	700 gpd/ac	1,400
Group Residential/Care	6.5	-	1000 gpd/ac	6,500	700 gpd/ac	4,550
Institutional	10.7	-	1000 gpd/ac	10,700	700 gpd/ac	7,490
Park	23.8	-	700 gpd/ac	16,660	500 gpd/ac	11,900
Biological Open Space	102.7	-	0 gpd/ac	-	0 gpd/ac	-
Non-Circulating Road	45.7	-	0 gpd/ac	-	0 gpd/ac	-
Circulating Road	37.6	-	0 gpd/ac	-	0 gpd/ac	-
Common Areas/Ag	18.8	-	0 gpd/ac	-	0 gpd/ac	-
Manufactured Slopes	75.2	-	0 gpd/ac	-	0 gpd/ac	-
TOTAL	608.0	1,746		348,474		255,178
TOTAL, afy				390		286

¹ Appendix A provides a summary of Water, Recycled Water, and Wastewater demands for the project.

In order to evaluate wastewater management alternatives, Table 2-2 breaks down the wastewater generation information for grey water and other wastewater.

Land Use	Grey Water	Other Sources ²	Total
Single Family Detached	81,270 ¹	<u>54,180</u> <u>57,930</u>	<u>135,450</u> <u>139,200</u>
Other Sources	0	<u>119,728</u> <u>121,872</u>	<u>119,728</u> <u>121,872</u>
TOTAL	81,270	<u>173,908</u> <u>179,802</u>	<u>255,178</u> <u>261,072</u>

¹ Single Family showers and clothes washing machines.

² Sinks, toilets and dishwashers.

EXTERIOR WATER SUPPLY

The water supply assessment for the Lilac Hills Ranch Community split the water needs for the project into various categories. These categories included interior demand for potable water, exterior demand for potable water, and non-potable water exterior demand. The Lilac Hills Ranch Community is looking at four sources of water to meet the exterior demands for the project including the sources of water which could be used in lieu of potable exterior demand uses. These water types include groundwater, rain water harvesting, grey water, and reclaimed water. Each of these sources and their possible uses will be described below.

The water supply assessment for the Lilac Hills Ranch community estimated the total water need for the project to be 967 AFY. 289 AFY of this use was interior/potable demand, 169 AFY was exterior potable demand, and 510 AFY was exterior non-potable demand. The current total water need is estimated to be 912-935 AFY. 286-288 AFY is interior/potable demand, 160 AFY is exterior potable demand, and 466-486 AFY is exterior non-potable demand.

Ground Water

Nine (9) private existing ground water production wells are operating within the Lilac Hills Ranch Community area at the present time. Six (6) of these wells have been in production for more than 5 years. Based on analysis by the projects hydrogeologist a minimum available ground water supply of 191 AFY will be available. This water could be used to meet both exterior potable demand and exterior non-potable demand.

Rain Water Harvesting

Cisterns and roof collection systems could be utilized on single family dwellings to allow for the storing and irrigation use of rain water on single family homes. This supply could be used to offset potable exterior demands. It is estimated that up to 34 AFY of rain water could be harvested by single family homes in this project.

Grey Water

A grey water system could also be used to offset the potable exterior demand for residential units. Approximately 91 AFY of grey water could be utilized to offset the potable exterior demand.

Reclaimed Water

Approximately ~~286~~288 AFY of recycled water could be generated by the project. This amount would be reduced by 91 AFY if a grey water system was installed. Up to an additional 400 AFY of recycled water could be made available to the project through utilization of water from the Moosa WRF. The Moosa WRF currently does not have tertiary facilities and thus, does not produce recycled water. All water from this plant is disposed of through a percolation pond. Thus a total of up to ~~686~~688 AF of reclaimed water could be made available for non-potable water supply for the project. The reclaimed water could only be used for non-potable exterior uses as defined in the water supply assessment.

CHAPTER 3

WASTEWATER COLLECTION

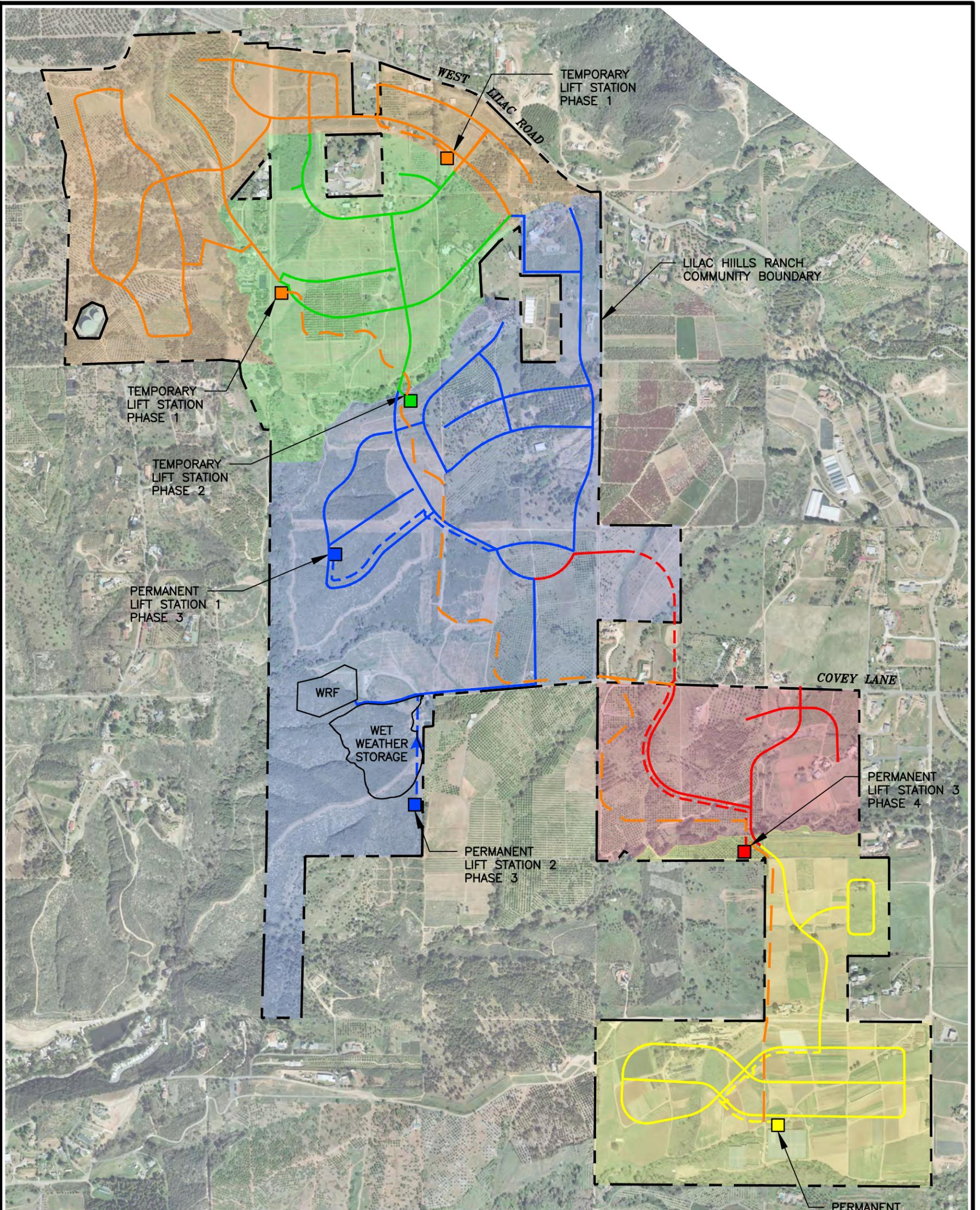
The on-site wastewater collection system will be similar for all wastewater treatment options. An off-site forcemain will be required for wastewater or solids treatment at the Moosa WRF. In this chapter, we will describe the on-site, off-site and phasing of the collection system for the proposed project.

ON-SITE COLLECTION SYSTEM

Figures 3-1 and 3-2 show the proposed on-site collection system. Figure 3-1 shows the system with on-site treatment and Figures 3-2 and 3-3 shows it with off-site treatment. In order to collect all of the sewage to a single spot, four permanent on-site pump stations will be needed. If all treatment for the project is provided at the Moosa WRF, then the four on-site lift stations will pump into a common forcemain. All of the on-site facilities are described below.

Piping System

Figures 3-1, 3-2 and 3-3 show the gravity piping system and forcemains needed to serve the project. As can be seen on these figures, four permanent pump stations are required on the project to convey the sewage to a central point. The piping system must be able to accommodate the various treatment alternatives proposed at this time. Initially, it is thought that all wastewater would be pumped from the project site to the Moosa WRF for treatment and disposal. However, as the Moosa WRF reaches its capacity it may be necessary to build an on-site treatment plant to treat all or a portion of the wastewater generated by the project to provide additional capacity for the District. In order to accommodate these options, the pump stations and on-site collection system will be set up that so that wastewater could either be transferred to the Moosa WRF or transferred to the on-site location.



LEGEND

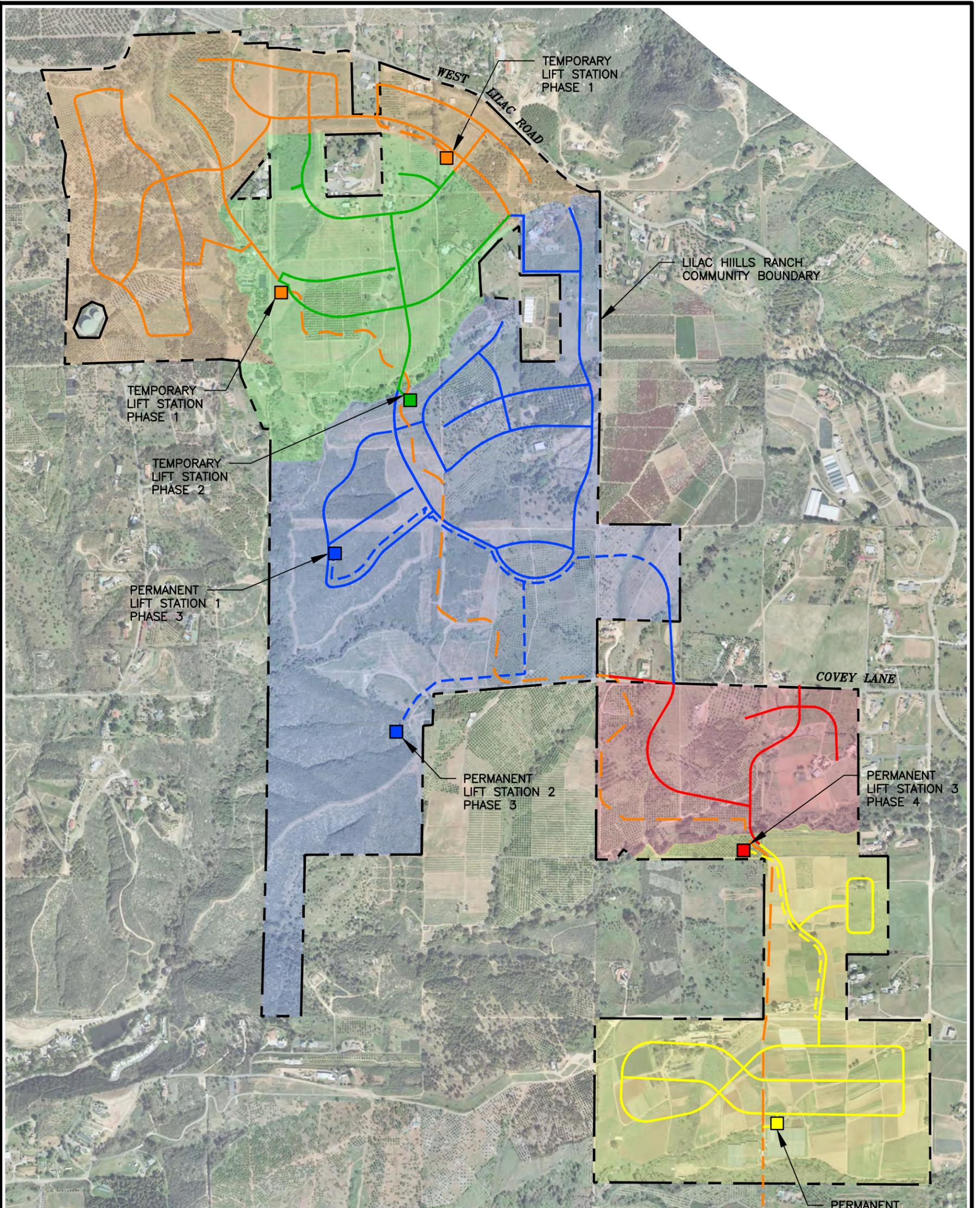
- | | |
|--|-----------------------|
| | PHASE 1 GRAVITY SEWER |
| | FORCE MAIN |
| | TEMPORARY FORCE MAIN |
| | PHASE 2 GRAVITY SEWER |
| | FORCE MAIN |
| | PHASE 3 GRAVITY SEWER |
| | FORCE MAIN |
| | PHASE 4 GRAVITY SEWER |
| | FORCE MAIN |
| | PHASE 5 GRAVITY SEWER |
| | FORCE MAIN |
| | LIFT STATION |



SCALE: 1" = 800'

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

FIGURE 3-1
PHASES 1-5
SEWER SYSTEM WITH
ON SITE TREATMENT
LILAC HILLS RANCH COMMUNITY



LEGEND

- | | | |
|--|--------------|----------------------|
| | PHASE 1 | GRAVITY SEWER |
| | | FORCE MAIN |
| | | TEMPORARY FORCE MAIN |
| | PHASE 2 | GRAVITY SEWER |
| | | FORCE MAIN |
| | PHASE 3 | GRAVITY SEWER |
| | | FORCE MAIN |
| | PHASE 4 | GRAVITY SEWER |
| | | FORCE MAIN |
| | PHASE 5 | GRAVITY SEWER |
| | | FORCE MAIN |
| | LIFT STATION | |



SCALE: 1" = 800'

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

FIGURE 3-2
PHASES 1-5
SEWER SYSTEM WITH
OFFSITE TREATMENT
LILAC HILLS RANCH COMMUNITY

\\PACIFIC\DWG\806001\WASTEWATER\FIGURE_3-3.DWG 12-03-13 10:09:02 LAYOUT: 11X17

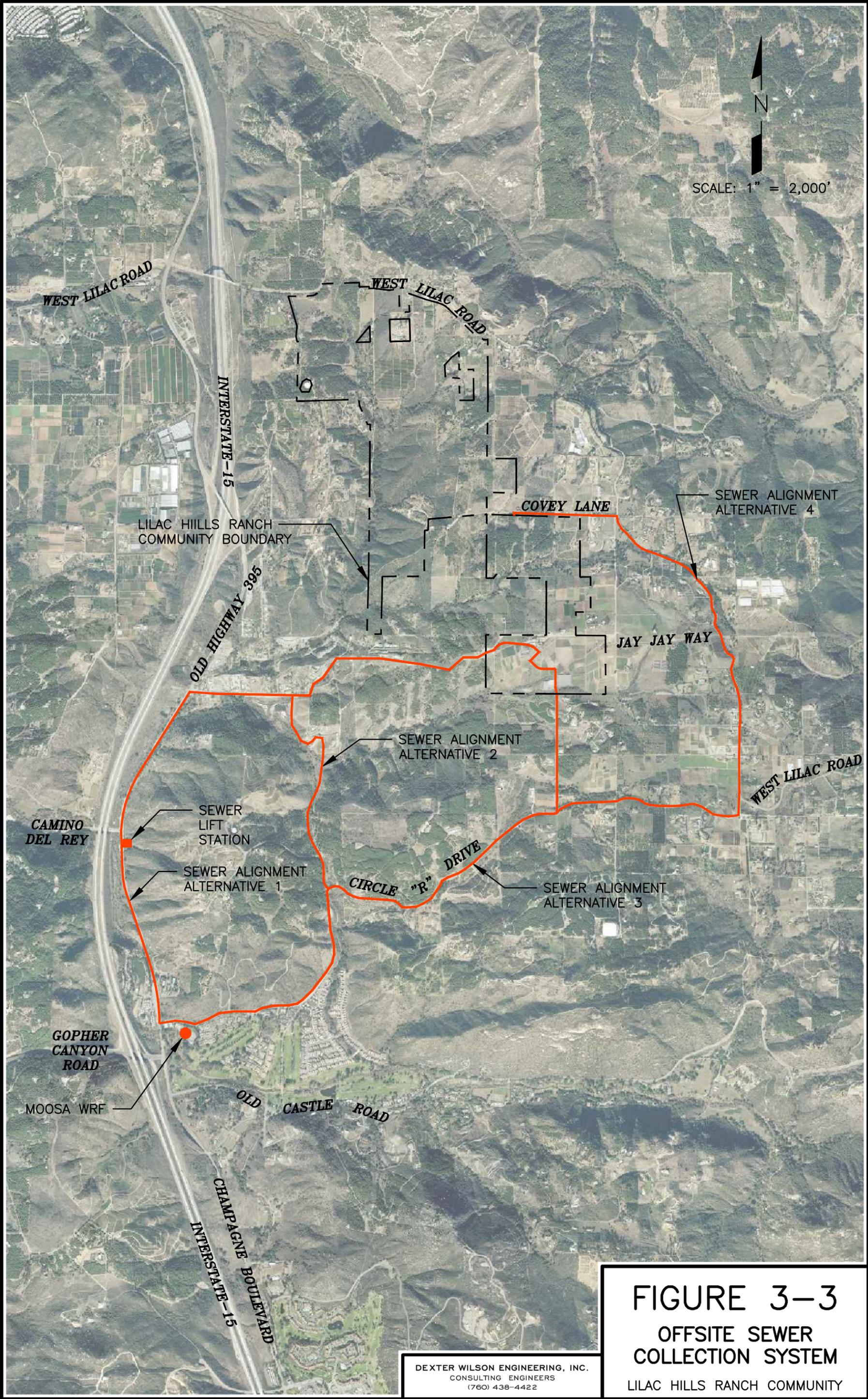


FIGURE 3-3
OFFSITE SEWER
COLLECTION SYSTEM

LILAC HILLS RANCH COMMUNITY

DEXTER WILSON ENGINEERING, INC.
 CONSULTING ENGINEERS
 (760) 438-4422

Phasing

Figures 3-1 and 3-2 also show the project phasing. Generally, the project will phase from north to south. Since the existing sewer treatment disposal facilities are south of the project, a temporary forcemain will be needed through the project to make a connection to the Moosa WRF. If the Moosa WRF is not used for the initial phases of the project, this temporary forcemain will need to feed the on-site treatment plant location. In order to accommodate the phasing for the project, two temporary pump stations will also be required. Table 3-1 provides a summary of the anticipated wastewater flows from each phase of the project.

Phase	Peak 24 hr Sewage Generation		Avg 24 hr Sewage/ Recycled	
	By Phase	Cumulative	By Phase	Cumulative
1	<u>72,240</u> <u>75.3</u> <u>50</u>	<u>72,240</u> <u>75.350</u>	<u>54,100</u> <u>56.4</u> <u>00</u>	<u>54,100</u> <u>56.400</u>
2	<u>79,664</u> <u>83.5</u> <u>40</u>	<u>151,904</u> <u>158.8</u> <u>90</u>	<u>58,132</u> <u>60.9</u> <u>16</u>	<u>112,232</u> <u>117.31</u> <u>6</u>
3	<u>116,050</u> <u>118</u> <u>,100</u>	<u>267,954</u> <u>276.9</u> <u>90</u>	<u>85,350</u> <u>86.8</u> <u>50</u>	<u>197,582</u> <u>204.16</u> <u>6</u>
4	<u>30,465</u> <u>30.6</u> <u>65</u>	<u>298,419</u> <u>307.6</u> <u>55</u>	<u>21,790</u> <u>21.9</u> <u>40</u>	<u>219,372</u> <u>226.10</u> <u>6</u>
5	<u>50,055</u> <u>48.8</u> <u>55</u>	<u>348,474</u> <u>356.5</u> <u>10</u>	<u>35,806</u> <u>34.9</u> <u>66</u>	<u>255,178</u> <u>261.07</u> <u>2</u>
TOTAL	<u>348,474</u> <u>356.5</u> <u>6,510</u>	-	<u>255,178</u> <u>261.07</u> <u>1,072</u>	-

Pump Stations

The requirements for temporary and permanent pump stations are slightly different. In this section, we will discuss the design parameters for the permanent and temporary pump station locations.

Permanent Pump Stations. All permanent pump stations will be equipped with two pumps. Each pump will be able to handle the peak estimated flows for its service area. Emergency storage of six hours of average flow will be provided. Emergency power will also be provided at each location with an automatic transfer switch. Telemetry will be used to tie the pump station into the District's alarm system.

Temporary Pump Stations. All temporary pump stations will be equipped with two pumps. Either pump will be able to handle the expected peak flows from the service area. Six hours of

average flow will be provided for emergency storage. This emergency storage will generally be provided in the collection system through oversizing of piping and manholes. Emergency power generation will be provided with a portable unit. The portable unit will be equipped with an automatic transfer switch. It is anticipated that the portable unit will be sized for the ultimate need and for the initial phases will be oversized.

OFF-SITE COLLECTION SYSTEM

Figure 3-3 shows the four alternatives for an off-site force main and gravity system to connect to the Moosa WRF. All alternatives will be located entirely within existing improved/graded roadways, within public right-of-way and/or VCMWD easements. Each of these alternatives will be discussed below:

Alternative 1

Provides a gravity and pump system which generally flows west from the project to the Old Hwy 395 freeway. The system then flows generally south following Old Hwy 395 to the Moosa WRF.

Alternative 2

This alternative flows west from the site and then turns south before turning west again. This alternative generally follows Shadow Lake Road in the middle and Circle R Drive in the south.

Alternative 3

This alternative flows south from the site along Mountain Ridge Road. Where Mountain Ridge Road connects with Circle R Drive the alignment turns to the west following Circle R Drive to the Moosa WRF.

Alternative 4

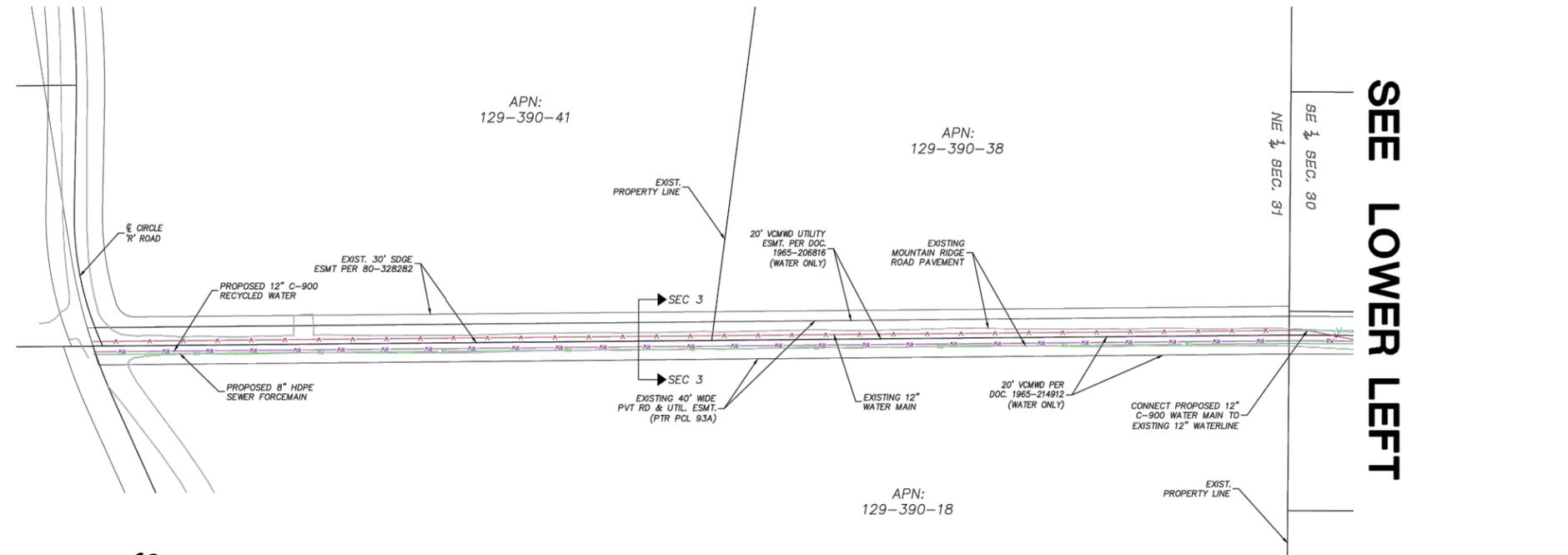
This alternative follows improved, existing roadways, located entirely within public right-of-way from the project to the Moosa WRF. It will be located entirely within Covey Lane to West Lilac. It then follows West Lilac to Circle R Drive to Moosa WRF. For this alternative permanent Lift Station 3 would pump off-site and permanent Lift Station 4 would pump back to permanent Lift Station 3.

Preferred Alternative

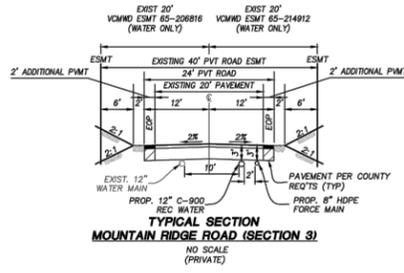
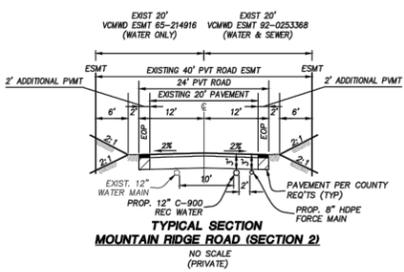
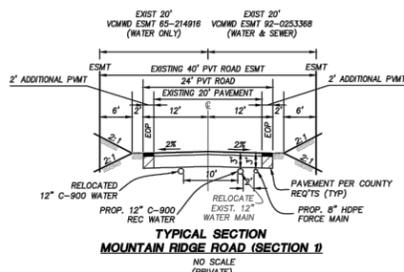
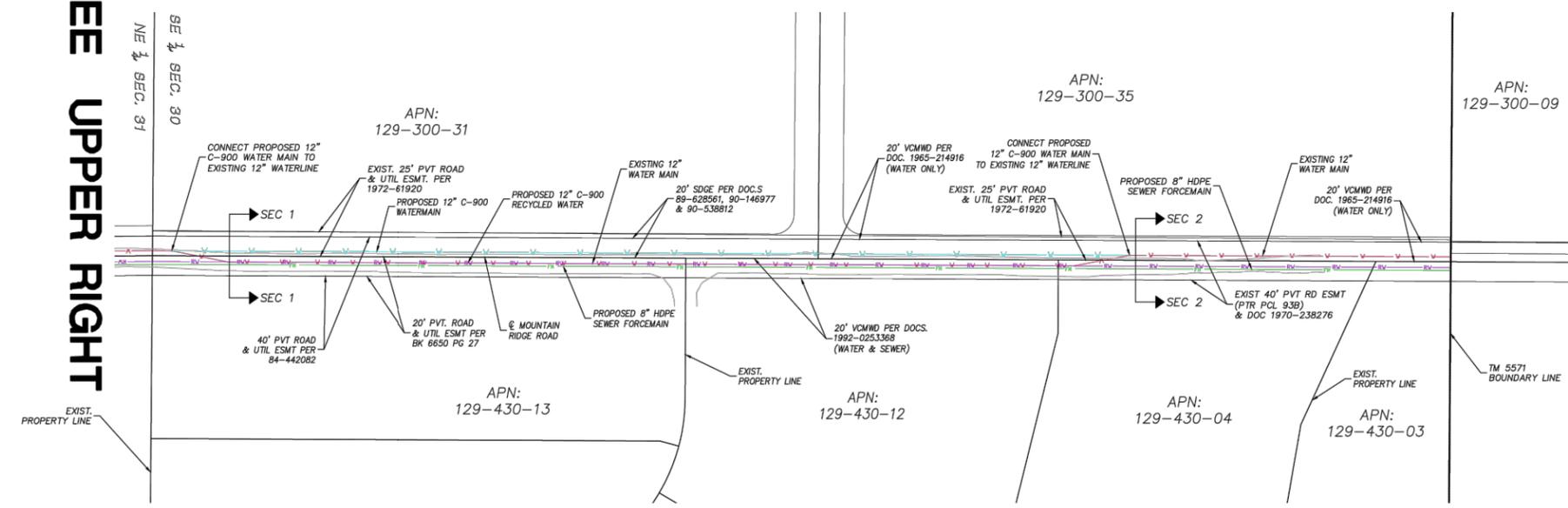
Figure 3-4 shows the proposed piping facility layout within Convy Lane, Mountain Ridge, and Circle R Drive.

MOUNTAIN RIDGE ROAD UTILITIES

SEE LOWER LEFT



SEE UPPER RIGHT



- LEGEND**
- SECTION LINE
 - EXISTING PROPERTY LINE
 - EXISTING EASEMENT
 - EXISTING WATERLINE
 - PROPOSED RECYCLED WATERLINE
 - PROPOSED SEWER FORCEMAIN
 - PROPOSED WATERMAIN

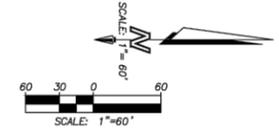
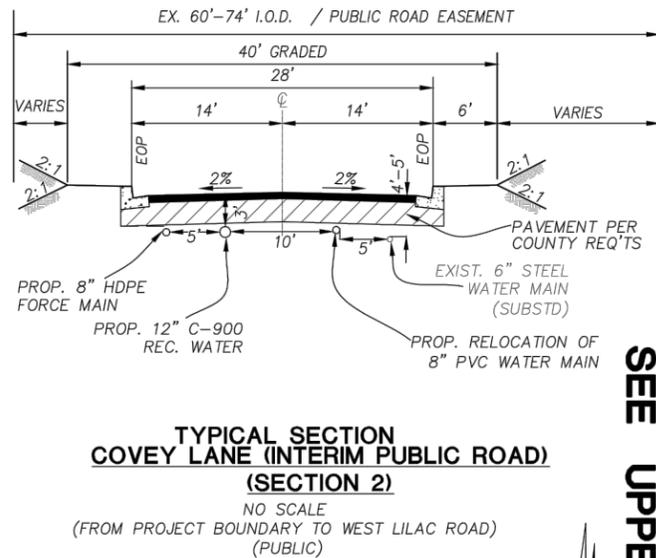
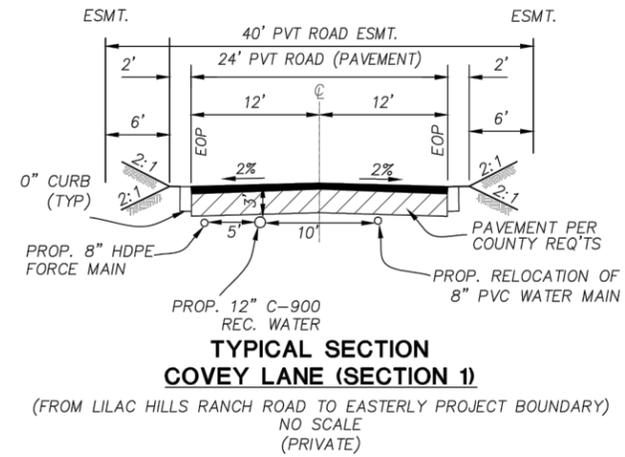


FIGURE 3-4A
MOUNTAIN RIDGE ROAD
UTILITY CROSS SECTION
 LILAC HILLS RANCH COMMUNITY

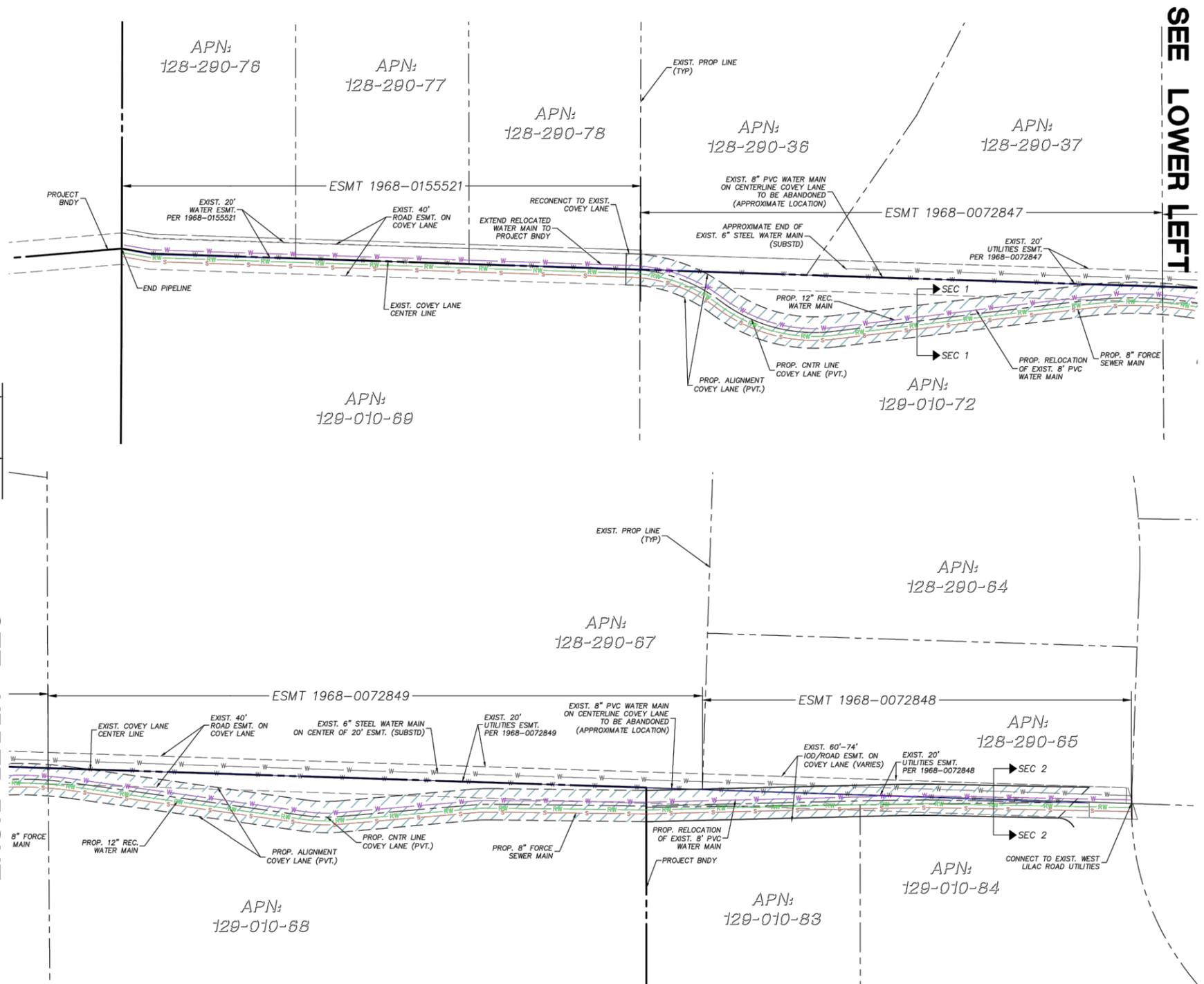
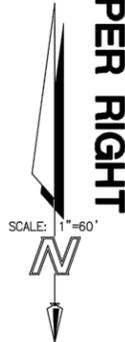
COVEY LANE UTILITIES



- LEGEND**
- PROJECT BOUNDARY
 - EXISTING PROPERTY LINE
 - EXISTING EASEMENT
 - EXISTING WATERLINE
 - PROPOSED WATERLINE RELOCATION
 - PROPOSED RECYCLED WATERLINE
 - PROPOSED SEWER FORCEMAIN



SCALE: 1"=60'

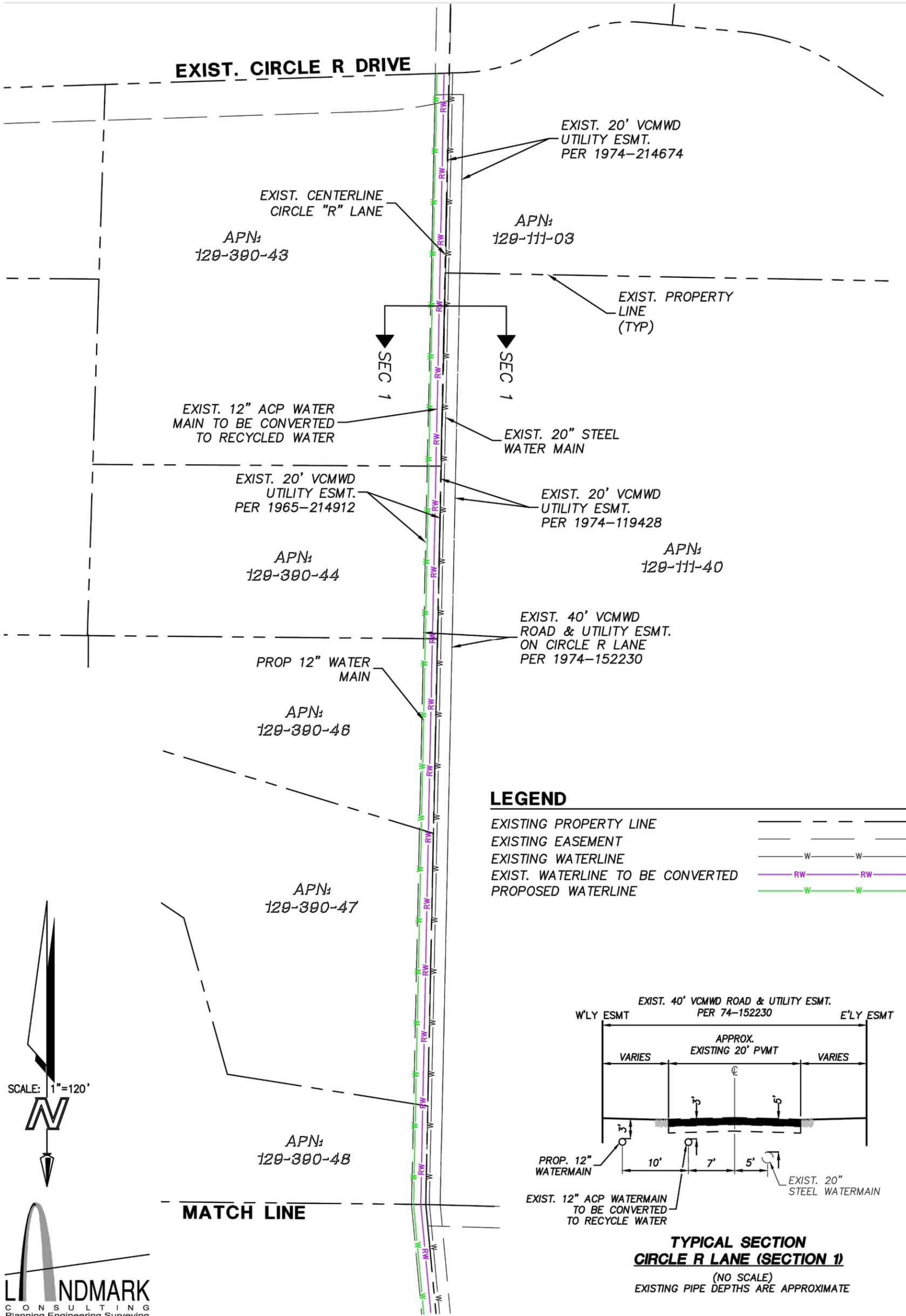


SEE LOWER LEFT

SEE UPPER RIGHT

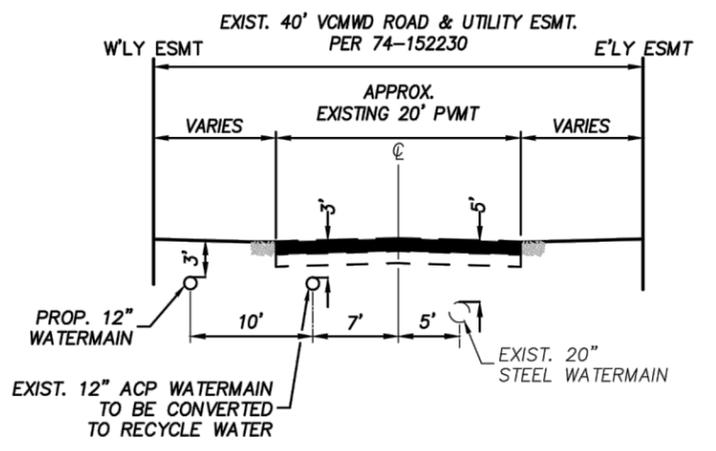
FIGURE 3-4B
COVEY LANE
UTILITY CROSS SECTION
LILAC HILLS RANCH COMMUNITY

CIRCLE R LANE UTILITIES EXHIBIT LILAC HILLS RANCH



LEGEND

EXISTING PROPERTY LINE	---
EXISTING EASEMENT	---
EXISTING WATERLINE	W—W
EXIST. WATERLINE TO BE CONVERTED	RW—RW
PROPOSED WATERLINE	W—W

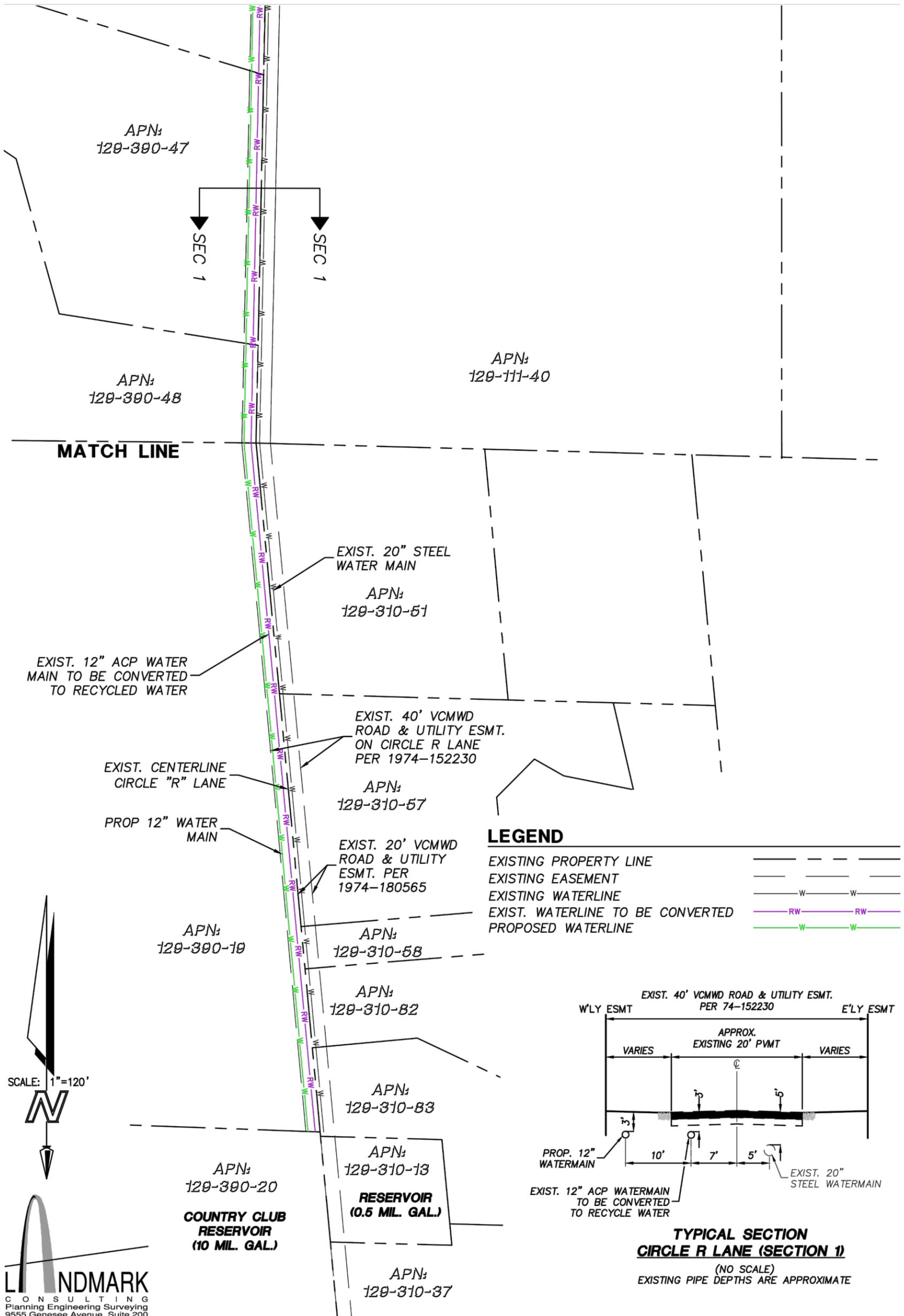


**TYPICAL SECTION
CIRCLE R LANE (SECTION 1)**
(NO SCALE)
EXISTING PIPE DEPTHS ARE APPROXIMATE

LANDMARK
CONSULTING
Planning Engineering Surveying
9555 Genesee Avenue, Suite 200
San Diego, CA 92121, (858) 587-8070

FIGURE 3-4C1
CIRCLE 'R' LANE
UTILITY CROSS SECTION
LILAC HILLS RANCH COMMUNITY

CIRCLE R LANE UTILITIES EXHIBIT LILAC HILLS RANCH



LEGEND

EXISTING PROPERTY LINE	-----
EXISTING EASEMENT
EXISTING WATERLINE	—W—W—
EXIST. WATERLINE TO BE CONVERTED	—RW—RW—
PROPOSED WATERLINE	—W—W—

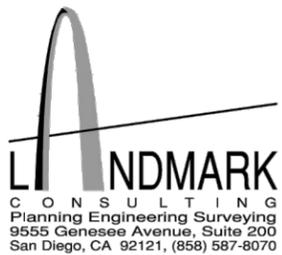
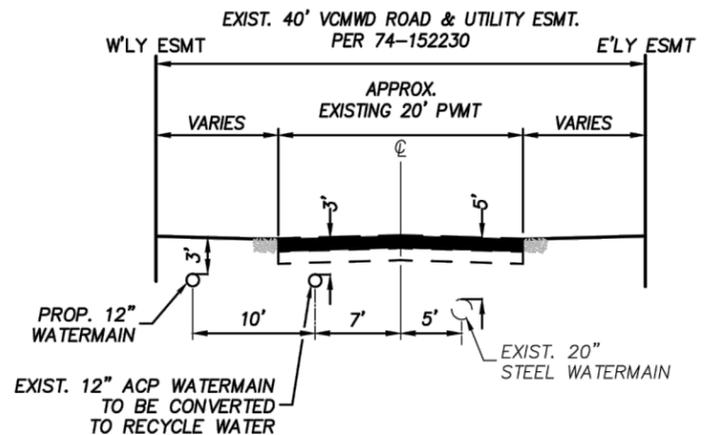


FIGURE 3-4C2
CIRCLE 'R' LANE
UTILITY CROSS SECTION
LILAC HILLS RANCH COMMUNITY

CHAPTER 4

WASTEWATER MANAGEMENT

In this chapter, four permanent wastewater treatment scenarios will be described which could serve the Lilac Hills Ranch Community. Any of these four scenarios could be implemented at the discretion of the District. Chapter 5 will provide more detail on the proposed wastewater reuse options.

If an on-site plant is used, the initial development within the Lilac Hills Ranch Community may be provided sewer service by trucking of sewage from a collection point on-site to an existing wastewater treatment plant. This is necessary due to the fact that a minimum flow is needed to operate a water reclamation facility. This will only be used for on-site treatment alternatives. For an on-site permanent water reclamation facility, trucking would be required for up to the first 100 homes (approximately three truck trips per day) to allow for a sufficient minimum flow to operate the facility. For a smaller on-site interim water reclamation facility the number may be reduced to as few as 25 homes. In either case, as soon as sufficient flows are available, trucking operators will cease.

Disposal of excess effluent would be at the discretion of the District which could use the reclaimed water system to connect to the Moosa WRF disposal system or could send the reclaimed water to an appropriately sized storage facility.

PERMANENT WASTEWATER TREATMENT

Four wastewater treatment alternatives are being considered for this project. The first two alternatives include the construction of an on-site water reclamation plant, the third would utilize the Moosa WRF, and the fourth option is a combination of on-site and off-site treatment.

The on-site water reclamation plant has two alternatives, one with solids treatment and one without.

A grey water system could be used for all alternatives. The alternatives are analyzed without grey water system.

Grey Water System Alternative

Each of the single family homes could be built with a grey water reuse system for individual lot irrigation. These systems are allowed under Appendix G of the California Plumbing Code. Grey water systems do not disinfect or monitor the water quality. The advantage of using grey water systems is that they do allow wastewater reuse on single-family lots without overly restrictive regulatory oversight.

One of the drawbacks to grey water systems for the Lilac Hills Ranch Community would be duplication of costs. Grey water storage systems for Lilac Hills Ranch Community would be designed to overflow to the sewer system when they were full. Thus, the water reclamation plant would have to be designed to treat flows from the grey water system. The grey water system should only be considered if reuse of water on single-family lots is wanted or needed and regulatory approvals for the reuse of higher quality tertiary recycled water cannot be obtained.

Option 1 - Description of On-site Water Recycling Plant with Solids Treatment

The process flow schematic for the proposed on-site water reclamation facility is shown in Figure 4-1. Table 4-1 provides sizing of major facilities. The extended aeration activated sludge process has been chosen for the facility. All treatment processes will be located in concrete tanks. The plant will be designed to meet the reliability requirements in accordance with Title 22 of the California Code of Regulations. The plant will be designed to produce disinfected tertiary recycled water meeting the requirements of Section 60304(a) of Title 22 of the California Code of Regulations. Exhibit A shows the layout of this facility on the water reclamation facility site.

Influent Screening. Influent screening will be utilized prior to the activated sludge process. The forcemain from an influent pump station will discharge directly into one of two stainless steel screens. Each screen will be designed for full plant flow. The screenings from both screens will drop into a bin located at-grade.

Extended Aeration Activated Sludge Process. Aeromod has been selected to provide the equipment for secondary treatment. The process will contain a selector tank, two aeration zones, and clarifiers. The tank volumes and recirculation have been sized for nitrogen removal to 10 mg/l as N. The process will be designed to operate with any tank or piece of equipment out of service. At buildout, four process trains will be provided.

Selector Tanks. Screened sewage will be combined with return activated sludge from the clarifiers in the selector tanks. The selector tanks also serve to split flows between the first stage aeration tanks.

First Stage Aeration Tank. The first stage aeration tank is designed to provide nitrification and BOD removal. The entire length of the tank is aerated. Mixed liquor from the first stage aeration tank is also wasted to the aerobic digester.

Second Stage Aeration Tanks. The second stage aeration tanks will be used to denitrify the wastewater flow. Flow from the first stage tanks will enter the second stage tanks. The air flow to the second stage tank will be periodically turned on and then off to allow denitrification to occur within the tanks. This system of denitrification will allow the total nitrate levels to be reduced to less than 10 mg/l as N. The denitrification will also reduce overall oxygen requirements and reclaim alkalinity.

Clarifiers. The last stage of the Aeromod process is clarification. The clarifiers have no moving parts below the water surface. All parts are constructed of stainless steel, fiberglass, or PVC with the exception of the grating and hand rails which are aluminum. Sludge is collected in hoppers at the bottom of the tank and removed via stationary hydraulic hoods. The sludge is removed from the clarifiers and sent to the selector tanks. Airlift pumps provide the suction needed for the hydraulic hoods. Clarified effluent is removed from the clarifiers through submerged weirs.

Tertiary Filters. Continuous backward, up flow, granular media filters will be used to provide tertiary treatment. The filters will be equipped with influent and effluent turbidity monitors and non-compliant effluent will be automatically diverted to the non-compliant effluent storage. The filters will be limited to a surface loading rate of 5 gpm/ft².

Chlorine Contact Tank. Disinfection at the plant will be accomplished through the use of sodium hypochlorite and a chlorine contact tank. The tank will be designed to meet the requirements of the State of California Department of Public Health. Health Department certification will be required prior to sending treated effluent out of the plant for reuse.

PEAK 24 HOUR FLOW SCENARIO

354,000 gpd

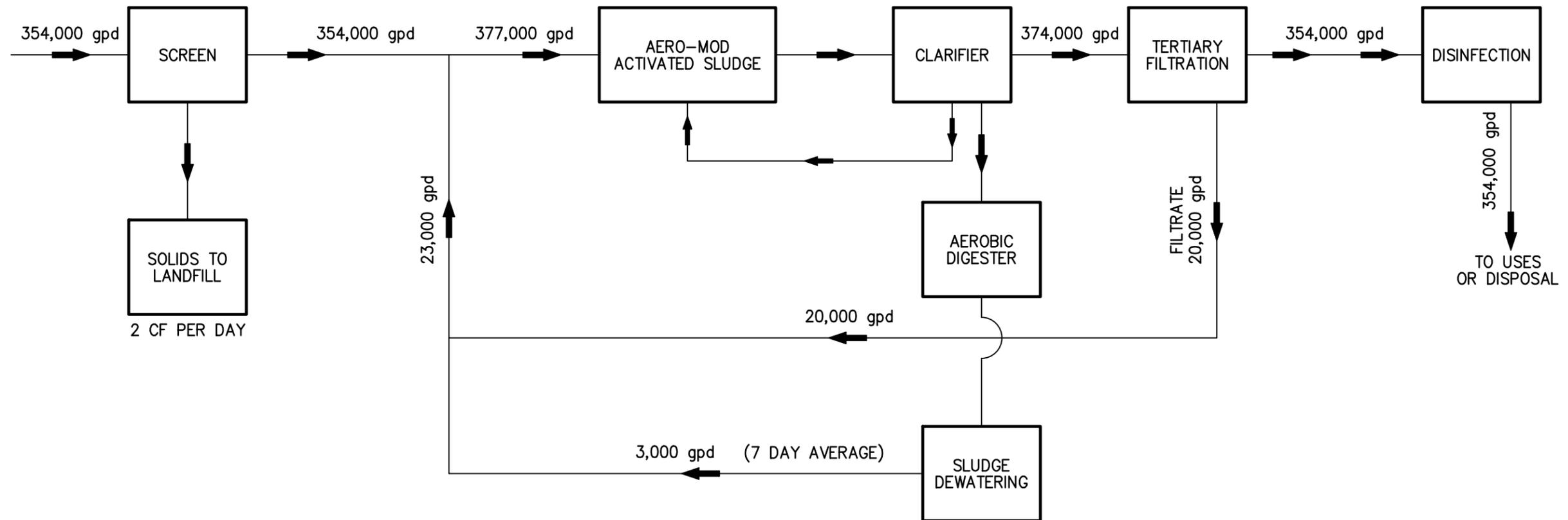


FIGURE 4-1
ON-SITE WATER RECYCLING
PLANT WITH SOLIDS
TREATMENT
PROPOSED LILAC HILLS RANCH
WATER RECLAMATION FACILITY

**TABLE 4-1
LILAC HILLS ON-SITE
WATER RECYCLING PLANT
WITH SOLIDS TREATMENT
MAJOR PROCESS SIZING**

Item	Buildout
Plant Flow	
Peak 24 hour Flow, gpd	352,000 <u>360,000</u>
Preliminary Treatment	
Screening	
Number	2
Hydraulic capacity gpd	704,000 <u>720,000</u>
Secondary Treatment, Aero-Mod	
Tankage	
Selector Tanks	
Number	2
Volume each, gallons	13,000
Total Volume, gallons	26,000
Aeration tanks	
Number of Trains	4
Volume Each, gallons	88,000 <u>90,000</u>
Total Volume, gallons	352,000 <u>360,000</u>
Detention Time (ADF)	
All trains in service, hours	24
3 Trains in service	18
Clarifiers	
Number	4
Surface Area, Each, ft ²	336
Overflow Rate, ADF, gal/day/ft ²	
4 Units	262 <u>268</u>
3 Units	350 <u>358</u>
Filters	
Number	4
Area, each, ft ²	33
Capacity, each @ 5 gpm d /sf, gpd	235,000 <u>240,000</u>
Total Capacity with 3 in Service, gpd	704,000 <u>720,000</u>
Total Capacity with 4 in Service, gpd	939,000 <u>960,000</u>

**TABLE 4-1
LILAC HILLS ON-SITE
WATER RECYCLING PLANT
WITH SOLIDS TREATMENT
MAJOR PROCESS SIZING**

Item	Buildout
Digesters	
Number	4
Volume Each, gallons	45,000
Total Volume, gallons	180,000
Solids Dewatering	
Centrifuge	
Number	1
Off Quality Effluent Storage Tank	
Number	1
Volume, gallons	352,000 360,000
Chlorine Contact	
Number	1
Volume, gallons	24,000

Emergency Generator. A diesel emergency generator sized to operate the entire plant will be provided. Fuel storage will be provided with sufficient capacity to operate the generator at maximum load for 24 hours.

Plant Drain Pump Station. A plant drainage system will be provided to allow all of the process units to be drained. A submersible pump station will be provided to pump the drainage to the influent force main. The drains from the restrooms in the operations building will be conveyed to the pump station.

Non-Compliant Effluent Storage Tank. Twenty-four hours of storage will be provided for non-compliant effluent. The plant flow will automatically divert to this storage based on effluent turbidity. All plant overflows will be directed to this storage. The non-compliant effluent storage will have a high level overflow to the wet weather storage pond. The non-compliant effluent storage will have pumps to pump tank contents back to the secondary treatment process. The spill containment area will also overflow to the non-compliant effluent storage tank.

Aerobic Digestion and Dewatering. Solids from the Aeromod process will be aerobically digested and dewatered.

Aerobic Digestion. Solids from the activated sludge process will be wasted from the first stage aeration tanks into aerobic digesters. The aerobic digesters will provide stabilization of the solids prior to dewatering. The digester equipment will be provided as part of the Aeromod process equipment.

Dewatering. Solids from the aerobic digester will be dewatered through a belt filter press or centrifuge. After the solids have been dewatered they will be placed in a truck or bin and taken to a landfill. The dewatering equipment will be in an enclosed building.

Spill Containment System. The process area of the treatment plant contains piping, equipment and tankage. In order to prevent overflows, pipe breaks or equipment failures, and contain potential spills to prevent them from exiting the site, the process area will drain to a single location. This location will have a normally closed valved connection to the storm drain. Water accumulating in this area will normally flow to the non-compliant effluent storage tank. If it rains, the valve can be opened to direct the runoff to the storm drain.

Option 2 - Description of On-Site Scalping Water Recycling Plant without Solids Treatment

A scalping plant would have fewer facilities and smaller buildings than an on-site plant with solids treatment. The major advantage of a scalping plant is consolidation of all solids treatment at one plant. This lowers capital and operational costs.

Table 4-2 provides sizing of major facilities. The process flow schematic for this option is shown in Figure 4-2. In order to ensure the availability of adequate water reclamation services, a scalping plant may be needed within the Lilac Hills Ranch project. This plant would be located on the 2.4 acre site shown on the Specific Plan Map. An MUP application is included in the package of permits and permissions being sought for this project.

PEAK 24 HOUR FLOW SCENARIO

354,000 gpd

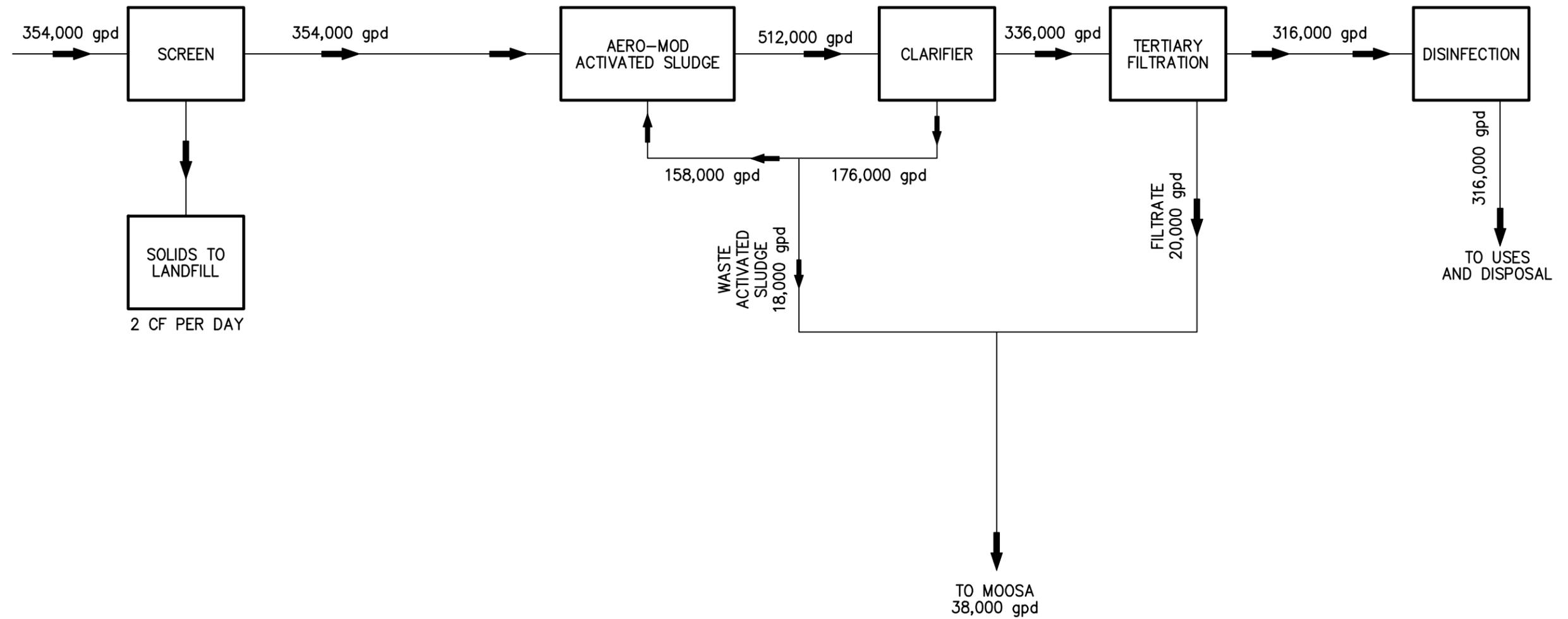


FIGURE 4-2
ON-SITE WATER RECYCLING
PLANT WITHOUT SOLIDS
TREATMENT
PROPOSED LILAC HILLS RANCH
WATER RECLAMATION FACILITY

Description of Treatment Process. This description of this water recycling plant is the same as Option 1 but the dewatering has been eliminated and all solids will be pumped to Moosa WRF for treatment and disposal. The start-up for this plant will also be different. The sludge line will be constructed in the initial phase and used to convey sewage to Moosa WRF for the first homes.

TABLE 4-2 LILAC HILLS ON-SITE WATER RECYCLING PLANT WITHOUT SOLIDS TREATMENT MAJOR PROCESS SIZING	
Item	Buildout
Plant Flow	
Peak 24 hour Flow, gpd	<u>352,000</u> <u>360,000</u>
Preliminary Treatment	
Screening	
Number	2
Hydraulic capacity gpd	<u>704,000</u> <u>720,000</u>
Secondary Treatment, Aero-Mod	
Tankage	
Selector Tanks	
Number	2
Volume each, gallons	13,000
Total Volume, gallons	26,000
Aeration tanks	
Number of Trains	4
Volume Each, gallons	<u>88,000</u> <u>90,000</u>
Total Volume, gallons	<u>352,000</u> <u>360,000</u>
Detention Time (ADF)	
All trains in service, hours	24
3 Trains in service	18
Clarifiers	
Number	4
Surface Area, each, ft ²	336
Overflow Rate, ADF, gal/day/ft ²	
4 Units	<u>262</u> <u>268</u>
3 Units	<u>350</u> <u>358</u>

**TABLE 4-2
LILAC HILLS ON-SITE
WATER RECYCLING PLANT
WITHOUT SOLIDS TREATMENT
MAJOR PROCESS SIZING**

Item	Buildout
Filters	
Number	4
Area, each, ft ²	33
Capacity, each @ 5 gpm/sf, gpd	235,000 240,000
Total Capacity with 3 in Service, gpd	704,000 720,000
Total Capacity with 4 in Service, gpd	939,000 960,000
Off Quality Effluent Storage Tank	
Number	1
Volume, gallons	352,000 360,000
Chlorine Contact	
Number	1
Volume gallons	24,000

On-site-Improvements. A sludge line will need to be constructed to Moosa WRF for this alternative.

Option 3 - Description of Lower Moosa WRF Alternative

The Moosa WRF is located at the southeast corner of the intersection of Old Hwy 395 and Circle R Drive in the northwest area of the District. The Moosa WRF serves the east Interstate 15 corridor from Circle R Drive at the north end to the Lawrence Welk Resort area at the south.

The Moosa WRF provides secondary treatment of wastewater. The plant has a rated capacity of 0.5 mgd; its discharge permit limits the total plant flow to 0.44 mgd. This is the capacity of the existing percolation ponds. Presently the average sewage flow to this treatment facility is approximately 0.35 mgd. Before the plant flows exceed 0.44 mgd the District will have to increase treated water disposal capacity. This could be done by installing tertiary treatment facilities and developing a piping system for recycling the tertiary treated effluent.

The District has estimated that the existing site for the Moosa WRF would accommodate a treatment capacity upgrade to 0.73 mgd tertiary treatment. Site-specific studies and treatment process evaluations would have to be completed to confirm the ultimate capacity potential of the existing site.

Treated effluent from the Moosa WRF is disposed of by way of ground water percolation. The percolation ponds are situated along Lower Moosa Canyon Creek west of Interstate 15 and north of Camino Del Rey. The treated effluent is pumped from the Moosa WRF to the disposal site and distributed into percolation basins where it is allowed to seep into the ground water.

At some point in time, given growth throughout the District, it is likely that the Moosa WRF will reach capacity. The District can address this in a variety of ways including construction of a facility in West Lilac Hills, construction of facilities at other locations in the District, or expansion of the existing Moosa WRF. In order to ensure that adequate wastewater treatment services are available, the Lilac Hills Ranch Community will pay its fair share contribution in fees or other means as determined by the District

Option 4 – Description of On-site Water Recycling Plant without Solids Treatment for a Portion of the Project.

A scalping plant could be constructed to recycle wastewater from a portion of the Lilac Hills Ranch Community. The remaining portion of the project would be treated at the Moosa WRF. All of the project solids would be treated at the Moosa WRF. The initial phases of the project could be served at the Moosa WRF. Then in the future, the scalping plant size would be dictated by the availability of capacity at the Moosa WRF and the treatment needs of the later project phases.

COMPARISON OF ALTERNATIVES

This section compares the two on-site treatment alternatives, Options 1, 2, and 4. The costs for the alternatives will be developed and then ranked and a preferred alternative will be selected. Option 3 was eliminated from further consideration since the existing site is too small to accommodate this project.

Costs

The costs for treatment, off-site conveyance, and operations will be developed for the alternatives. The estimated onsite cost for the gravity conveyance system (\$6,793,400) and onsite recycled water system (\$2,031,000) are excluded from this analyses since it is assumed to be the same for all options.

Option 1 – On-site Water Recycling Plant with Solids Treatment

Table 4-3 provides an estimate for cost of this option. The comparative cost for this option is \$29,515,000.

TABLE 4-3 COMPARATIVE COST FOR ON-SITE TREATMENT WITH SOLIDS TREATMENT	
Item	Cost
Sewer Pump Stations and Forcemains	\$10,380,000
Treatment Plant	
375,000 gpd @ \$30 gallon	\$11,250,000
Start-up Costs	\$1,500,000
Present Worth of 20 years of O&M at 500,000 per year use 5% discount rate (12.77 factor)	\$6,385,000
Subtotal	\$19,135,000
TOTAL	\$29,515,000

Option 2 - On-site Water Recycling Plant without Solids Treatment

Table 4-4 provides an estimate of costs for this alternative. The comparative cost for this alternative is \$26,038,000.

TABLE 4-4 COMPARATIVE COST FOR ON-SITE TREATMENT WITHOUT SOLIDS TREATMENT	
Item	Cost
Sewer Pump Stations and Forcemains	\$10,380,000
Treatment Plant	
375,000 gpd @ \$15 gallon	\$5,675,000
Present Worth of 20 years of O&M at \$250,000 per year	\$3,192,500
Subtotal	\$8,867,500
Solids Conveyance System	
Pump Station	\$1,000,000
Piping	\$2,000,000
Present Worth of 20 years of O&M at \$50,000 per year	\$638,500
Subtotal	\$3,638,500
Moosa WRF Improvements	
Solids 375,000 gpd @ \$5 gallon	\$1,875,000
Present Worth of 20 years of O&M at \$100,000 per year	\$1,277,000
Subtotal	\$3,152,000
TOTAL	\$26,038,000

Option 3-4 – On-site Water Recycling Plant without Solids Treatment for a Portion of the Project

Table 4-5 provides an estimate of costs for this alternative. The comparative cost for this alternative is \$27,538,000. Note that this cost does not include the cost of a recycled water pump station at Moosa WRF to return recycled water to the project.

TABLE 4-5 COMPARATIVE COST FOR ON-SITE TREATMENT WITHOUT SOLIDS TREATMENT FOR A PORTION OF THE PROJECT	
Item	Cost
Sewer Pump Stations and Forcemains	\$10,380,000
Treatment Plant	
375,000 gpd @ \$15 gallon	\$5,675,000
Present Worth of 20 years of O&M at \$250,000 per year	\$3,192,500
Subtotal	\$8,867,500
Solids Conveyance System	
Pump Station	\$1,000,000
Piping	\$2,000,000
Present Worth of 20 years of O&M at \$50,000 per year	\$638,500
Subtotal	\$3,638,500
Moosa WRF Improvements	
Liquids 100,000 gpd @ \$15 gallon	\$1,500,000
Solids 375,000 gpd @ \$5 gallon	\$1,875,000
Present Worth of 20 years of O&M at \$100,000 per year	\$1,277,000
Subtotal	\$4,652,000
TOTAL	\$27,538,000

Ranking of Options

Table 4-6 ranks both options based on costs, odor potential on-site, visual impacts on-site and ease of operation.

TABLE 4-6 COMPARISON OF OPTIONS			
Description	Rank		
	Option 1 On-Site Treatment With Solids Treatment	Option 2 On-Site Treatment Without Solids Treatment	Option 4 Some On-Site Treatment Without Solids Treatment
Cost	3	1	2
Odor Potential Reduced	3	1	1
Visual Impact Reduces	3	2	1
Operation Simplified	3	1	1
TOTAL	11	5	5

CHAPTER 5

RECYCLED WATER USE AND WET WEATHER STORAGE

In this chapter, we will discuss the acreage available within the Lilac Hills Ranch Community for beneficial reuse of tertiary effluent and provide calculations for the needed wet weather storage.

Recycled Water Use

All wastewater generated on the project will be treated to a tertiary level and recycled. Figure 5-1 shows the areas available for beneficial reuse of recycled water in Lilac Hills Ranch. The figure shows a total of 148.8 acres of beneficial reuse area. At an irrigation rate of 3' per year 446.4 acre-feet of recycled water would be needed for irrigation. The estimated recycled water production is between 286-292 AF/yr and 390-399 AF/yr based on Table 2-1. Thus, the on-site irrigation demand of 446.4 AF/yr is greater than the high range of recycled water available and all water generated on site can be beneficially reused on site.

Wet Weather Storage

Wet weather storage is required to impound recycled water during periods of time when irrigation is not needed if no other disposal system is available. The wet weather storage requirement for the Lilac Hills Ranch Community project is based on providing 84 days of storage for the recycled water produced. Based on the average plant flow of 348,474-356,510 gpd, 84 days, and rainfall into the storage basin, a maximum storage amount of 31.4-32.7 million gallons would be needed. This storage amount could be reduced for Lilac Hills Ranch based on the excess beneficial use area.

Table 5-1 provides a more detailed analysis of the storage requirement. Additional calculations related to wet weather storage are provided in Appendix B.

Off-Site Recycled Water Piping

Figure 5-2 shows a recycled water route from Moosa to the project area. It also shows how piping could be connected to the Old Country Club Reservoir if it is converted to recycled water. This piping system will be constructed by the Lilac Hills project if required by the Valley Center Municipal Water District. It is not required for the project development but would provide the Valley Center Municipal Water District with operational flexibility.

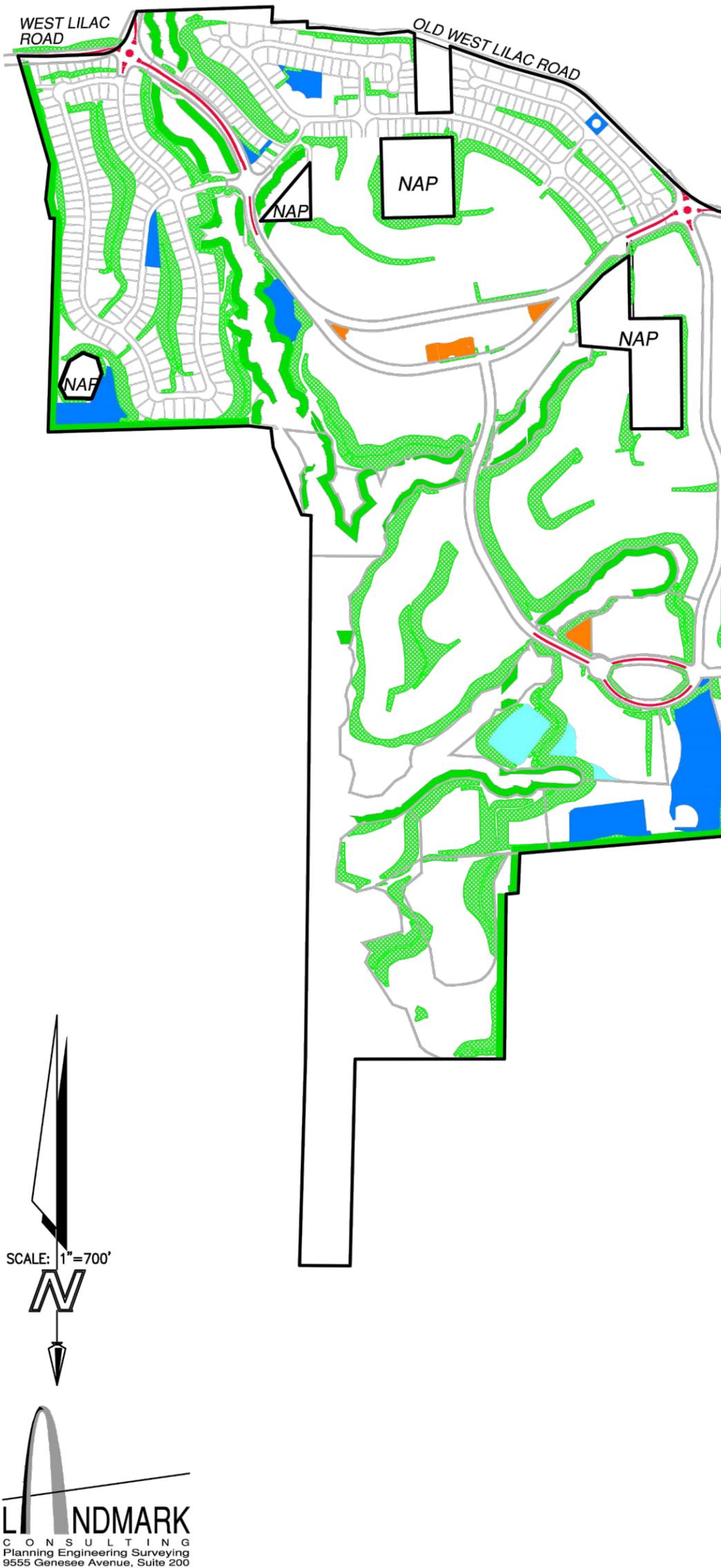
**TABLE 5-1
LILAC HILLS RANCH WATER IRRIGATION USE AND STORAGE SUMMARY - WATER YEAR 2005**

Month	Effluent Production (AF/Month)	Irrigation Need						Rainfall Added to Storage Basin (AF)	Amount Evaporated from Storage Basin (AF)	Increase (+) Decrease (-) (AF)	Amount in Storage at End of Month (AF)	Maximum Amount in Storage During Month (AF)	Supplemental Irrigation Need (AF)
		Monthly Irrigation Need (AF)	Rain (in)	Available Rainfall (AF)	Net Irrigation Need (AF)	Irrigation Efficiency Factor	Total Irrigation Need (AF)						
October	33.9	32.3	4.73	58.7	20.9	0.8	26.1	2.4	1.0	8.4 19.17	12.8 13.19	13.0 13.44	3.7 43.35
November	32.8	25.8	0.50	6.2	22.6	0.8	28.2	0.3	0.8	3.2 74.01	16.0 17.2	16.3 17.2	0.00
December	33.9	19.9	3.19	39.6	13.0	0.8	16.3	1.6	0.6	17.8 418.60	33.9 35.8	33.9 35.8	0.00
January	33.9	21.9	7.64	94.8	7.8	0.8	9.7	3.8	0.7	26.5 627.32	60.4 963.1	60.4 963.1	0.00
February	30.6 29.9	21.5	7.06	87.6	8.4	0.8	10.6	3.5	0.7	22.2 222.91	82.7 186.0	82.7 186.0	0.00
March	33.9 31	29.4	1.67	20.7	16.1	0.8	20.2	0.8	0.9	12.8 613.62	95.5 799.6	96.3 100	0.00
April	32.8	41.4	0.98	12.2	36.8	0.8	46.1	0.5	1.3	14.8 214.08	80.7 585.5	94.8 798.9	0.00
May	33.9	47.5	0.05	0.6	46.9	0.8	58.6	0.0	1.5	26.9 626.2	53.7 959.3	79.8 584.7	0.00
June	32.8	54.3	0.02	0.2	54.0	0.8	67.5	0.0	1.7	37.2 936.46	16.5 922.9	52.5 458.1	0.00
July	33.9	55.1	0.00	0.0	55.1	0.8	68.9	0.0	1.8	37.5 536.78	0.00	15.3 21.7	49.9 13.17
August	33.9	53.2	0.00	0.0	53.2	0.8	66.5	0.0	1.7	35.9 534.29	0.00	0.00	33.3 432.58
September	32.8	44.2	0.00	0.0	44.2	0.8	55.2	0.0	1.4	24.5 423.80	0.00	0.00	23.1 222.38
Total	3999.3	446.5	25.84	320.5	379.1		473.8	12.9	14.3	84.9675.96			80.171.5

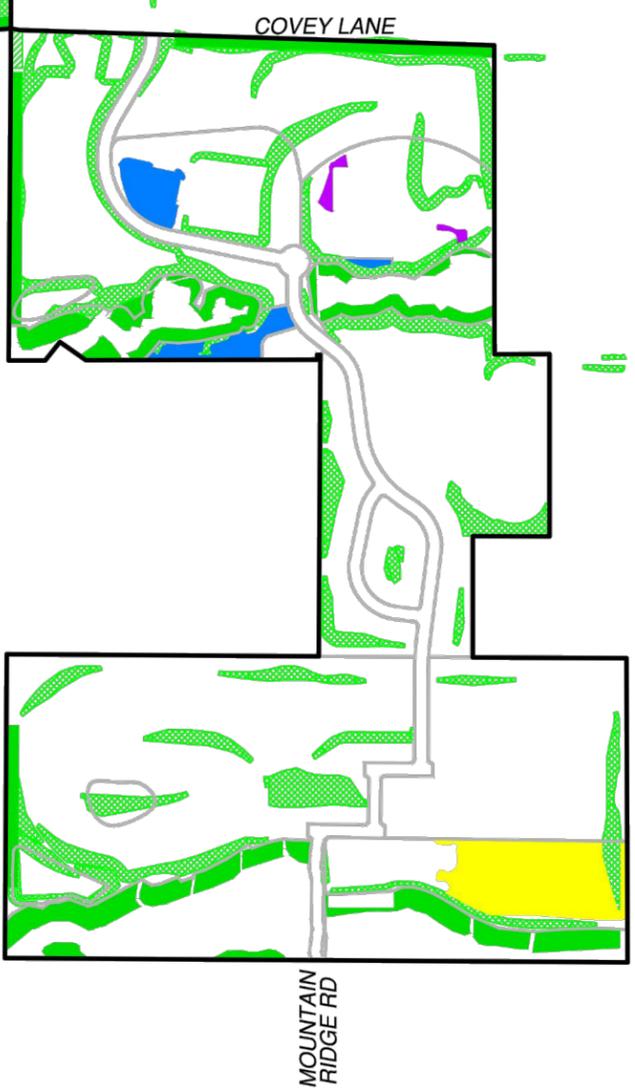
Storage Volume Needed ~~96.3~~100.33 AF
~~31.4~~32.7 MG
~~90.1~~91.7 days
Storage Depth Needed ~~32.1~~33.4 feet

**Supplemental
Irrigation Need**

~~80.471.5~~ AF
~~23.32~~
~~6.1~~ MG



LEGEND	
AGRICULTURE AREA (42.1ac)	
MANUFACTURED SLOPES (82.2ac)	
COMMERCIAL USE LANDSCAPE AREA (1.5ac)	
EDUCATIONAL USE LANDSCAPE AREA (2.4ac)	
PARK LANDSCAPE AREA (14.2ac)	
ROAD MEDIAN LANDSCAPE AREA (0.9ac)	
GROUP CARE FACILITY LANDSCAPE AREA (0.2ac)	
INSTITUTIONAL LANDSCAPE AREA (5.3ac)	
TOTAL BENEFICIAL REUSE AREA: 148.8ac	



SCALE: 1"=700'



FIGURE 5-1
BENEFICIAL RECYCLED
WATER USE AREAS
 LILAC HILLS RANCH COMMUNITY

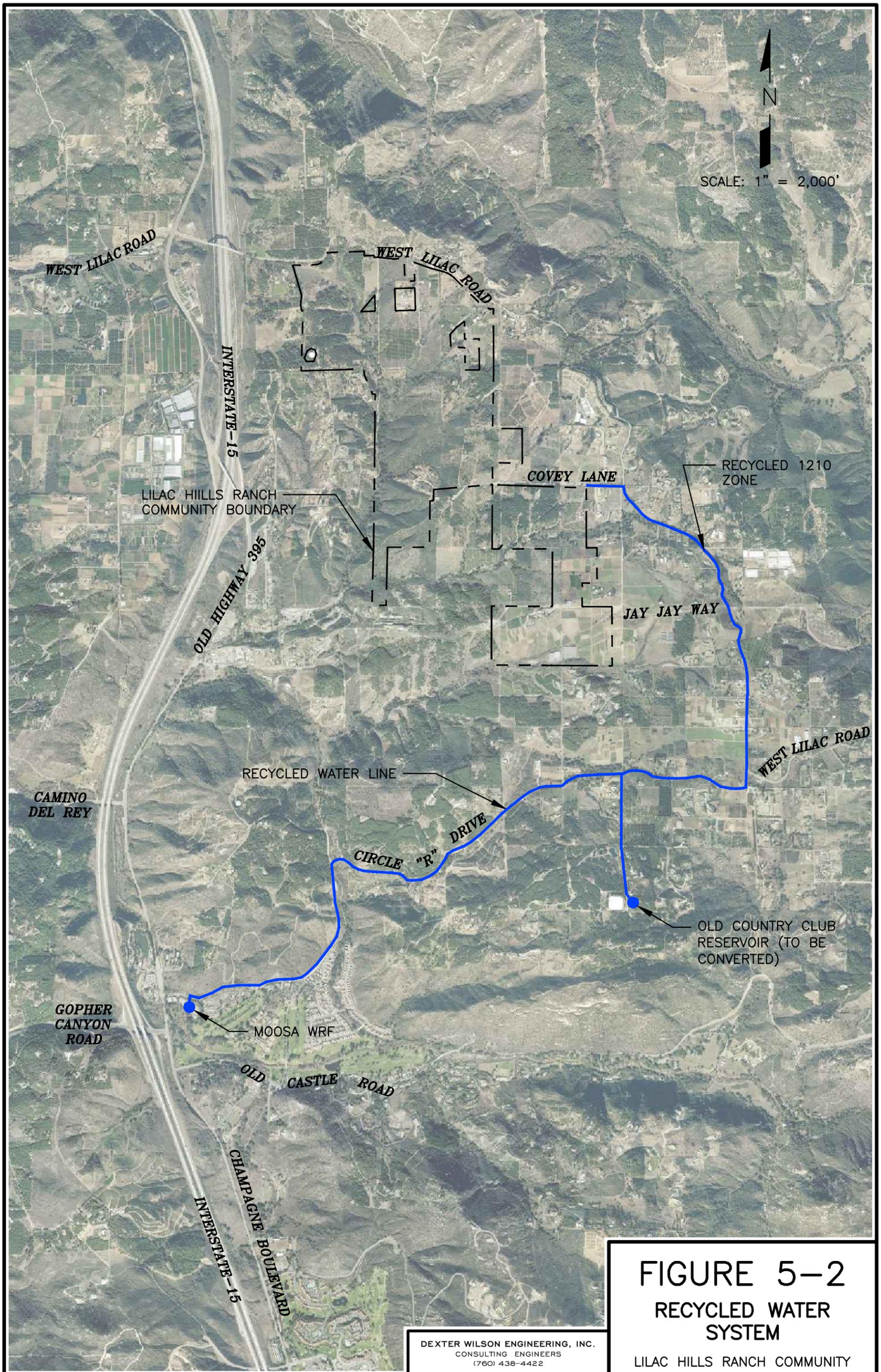


FIGURE 5-2
RECYCLED WATER
SYSTEM

LILAC HILLS RANCH COMMUNITY

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

APPENDIX A

WATER, RECYCLED WATER, AND WASTEWATER DEMANDS

Estimated Water Demands Without Conservation						
Land Use	Acres	Units	Water Use Based on Demand Factors			
			Factor	Use, gpm	Use, gpd	
Single Family Detached	156.9	903	500	gpd/DU	313.54	451,500
Single Family Senior	76.9	468	300	gpd/DU	97.50	140,400
Single Family Attached	7.9	164	433	gpd/DU	49.31	71,012
Commercial/Mixed Use	17.3	211	4,500	gpd/ac	54.06	77,850
Water Reclamation	2.4	-	2,333	gpd/ac	3.89	5,599
Recycled Facility/Trail Head	0.6	-	1,667	gpd/ac	0.69	1,000
Detention Basin	7.9	-	1,667	gpd/ac	9.15	13,169
School	12.0	-	2,333	gpd/ac	19.44	27,996
Community Purpose Facility	2.0	-	2,333	gpd/ac	3.24	4,666
Group Residential/Care	6.5	-	2,333	gpd/ac	10.53	15,165
Institutional	10.0	-	2,333	gpd/ac	16.20	23,330
Park	23.6	-	1,667	gpd/ac	27.32	39,341
Biological Open Space	104.1	-	-	-	-	-
Non-Circulating Road	45.7	-	-	-	-	-
Circulating Road	37.6	-	-	-	-	-
Common Areas/Ag	20.3	-	2,500	gpd/ac	35.24	50,750
Manufactured Slopes/Water	76.3	-	2,500	gpd/ac	132.47	190,750
Total, gpd	608.0	1,746			772.59	1,112,528
Total, afy						1,246

Estimated Water Demands With Conservation						
Land Use	Acres	Units	Water Use Based on Demand Factors			
			Factor	Use, gpm	Use, gpd	
Single Family Detached	156.9	903	500	gpd/DU	235.16	338,625
Single Family Senior	76.9	468	300	gpd/DU	73.13	105,300
Single Family Attached	7.9	164	433	gpd/DU	36.99	53,259
Commercial/Mixed Use	17.3	211	4,500	gpd/ac	40.55	58,388
Water Reclamation	2.4	-	2,333	gpd/ac	2.92	4,199
Recycled Facility/Trail Head	0.6	-	1,667	gpd/ac	0.52	750
Detention Basin	7.9	-	1,667	gpd/ac	6.86	9,877
School	12.0	-	2,333	gpd/ac	14.58	20,997
Community Purpose Facility	2.0	-	2,333	gpd/ac	2.43	3,500
Group Residential/Care	6.5	-	2,333	gpd/ac	7.90	11,373
Institutional	10.0	-	2,333	gpd/ac	12.15	17,498
Park	23.6	-	1,667	gpd/ac	20.49	29,506
Biological Open Space	104.1	-	-	-	-	-
Non-Circulating Road	45.7	-	-	-	-	-
Circulating Road	37.6	-	-	-	-	-
Common Areas/Ag	20.3	-	2,500	gpd/ac	26.43	38,063
Manufactured Slopes/Wet W	76.3	-	2,500	gpd/ac	99.35	143,063
Total, gpd	608.0	1,746			579.44	834,396
Total, afy						935

Estimated Water Demands With Conservation, Phase 1				
Land Use	Acres	Units	Water Use Based on Demand	
			Use, gpm	Use, gpd
Single Family Detached	60.7	352.0	91.67	132,000
Single Family Senior	-	-	-	-
Single Family Attached	-	-	-	-
Commercial/Mixed Use	-	-	-	-
Water Reclamation	-	-	-	-
Recycled Facility/Trail Hea	-	-	-	-
Detention Basin	-	-	-	-
School	-	-	-	-
Community Purpose Facilit	-	-	-	-
Group Residential/Care	-	-	-	-
Institutional	-	-	-	-
Park	4.5	-	3.91	5,626
Biological Open Space	15.6	-	-	-
Non-Circulating Road	13.7	-	-	-
Circulating Road	7.7	-	-	-
Common Areas/Ag	6.2	-	8.07	11,625
Manufactured Slopes/Wet V	13.1	-	17.06	24,563
Total, gpd	121.5	352	120.70	173,814
Total, afy				195

Estimated Water Demands With Conservation, Phase 2				
Land Use	Acres	Units	Water Use Based on Demand Factors	
			Use, gpm	Use, gpd
Single Family Detached	18.3	196.0	51.04	73,500
Single Family Senior	-	-	-	-
Single Family Attached	3.6	59.0	13.31	19,160
Commercial/Mixed Use	16.4	211.0	38.44	55,350
Water Reclamation	-	-	-	-
Recycled Facility/Trail Head	0.6	-	0.52	750
Detention Basin	-	-	-	-
School	-	-	-	-
Community Purpose Facility	-	-	-	-
Group Residential/Care	-	-	-	-
Institutional	-	-	-	-
Park	0.8	-	0.69	1,000
Biological Open Space	12.6	-	-	-
Non-Circulating Road	8.0	-	-	-
Circulating Road	13.6	-	-	-
Common Areas/Ag	0.8	-	1.04	1,500
Manufactured Slopes/Wet V	14.9	-	19.40	27,938
Total, gpd	89.6	466	124.44	179,198
Total, afy				201

Estimated Water Demands With Conservation, Phase 3				
Land Use	Acres	Units	Water Use Based on Demand Factors	
			Use, gpm	Use, gpd
Single Family Detached	77.9	355.0	92.45	133,125
Single Family Senior	-	-	-	-
Single Family Attached	4.3	105.0	23.68	34,099
Commercial/Mixed Use	0.5	-	1.17	1,688
Water Reclamation	2.4	-	2.92	4,199
Recycled Facility/Trail Head	-	-	-	-
Detention Basin	5.1	-	4.43	6,376
School	12.0	-	14.58	20,997
Community Purpose Facility	2.0	-	2.43	3,500
Group Residential/Care	-	-	-	-
Institutional	-	-	-	-
Park	13.5	-	11.72	16,878
Biological Open Space	49.0	-	-	-
Non-Circulating Road	8.2	-	-	-
Circulating Road	8.7	-	-	-
Common Areas/Ag	3.3	-	4.30	6,188
Manufactured Slopes/Wet V	36.1	-	47.01	67,688
Total, gpd	223.0	460	204.68	294,737
Total, afy				330

Estimated Water Demands With Conservation, Phase 4				
Land Use	Acres	Units	Water Use Based on Demand	
			Use, gpm	Use, gpd
Single Family Detached	-	-	-	-
Single Family Senior	29.9	171.0	26.72	38,475
Single Family Attached	-	-	-	-
Commercial/Mixed Use	-	-	-	-
Water Reclamation	-	-	-	-
Recycled Facility/Trail Head	-	-	-	-
Detention Basin	1.0	-	0.87	1,250
School	-	-	-	-
Community Purpose Facility	-	-	-	-
Group Residential/Care	6.5	-	7.90	11,373
Institutional	-	-	-	-
Park	3.7	-	3.21	4,626
Biological Open Space	9.6	-	-	-
Non-Circulating Road	2.8	-	-	-
Circulating Road	3.0	-	-	-
Common Areas/Ag	1.3	-	1.69	2,438
Manufactured Slopes/Wet W	3.7	-	4.82	6,938
Total, gpd	61.5	171	45.21	65,100
Total, afy				73

Estimated Water Demands With Conservation, Phase 5				
Land Use	Acres	Units	Water Use Based on Demand	
			Use, gpm	Use, gpd
Single Family Detached	-	-	-	-
Single Family Senior	47.0	297.0	46.41	66,825
Single Family Attached	-	-	-	-
Commercial/Mixed Use	0.4	-	0.94	1,350
Water Reclamation	-	-	-	-
Recycled Facility/Trail Head	-	-	-	-
Detention Basin	1.8	-	1.56	2,250
School	-	-	-	-
Community Purpose Facility	-	-	-	-
Group Residential/Care	-	-	-	-
Institutional	10.0	-	12.15	17,498
Park	1.1	-	0.96	1,375
Biological Open Space	17.3	-	-	-
Non-Circulating Road	13.0	-	-	-
Circulating Road	4.6	-	-	-
Common Areas/Ag	8.7	-	11.33	16,313
Manufactured Slopes/Wet W	8.5	-	11.07	15,938
Total, gpd	112.4	297	84.41	121,548
Total, afy				136

Lilac Hills Ranch Potable and Non-Potable Water Use With Conservation										
Land Use	Pre-Conservation Water Use	Water Use With Conservation of 25%	Interior Demand %	Potable Water Demand	Exterior Demand %	Potable Water Demand	Non-Potable Water Demand	Total Potable Demand	Total Non-Potable Demand	Project Total Demand
Single Family Detached	451,500	338,625	40	135,450	60	101,588	101,588 *	237,038	101,588	338,625
Single Family Senior	140,400	105,300	40	42,120	60	31,590	31,590 *	73,710	31,590	105,300
Single Family Attached	71,012	53,259	40	21,304	60	9,587	22,369 *	30,890	22,369	53,259
Commercial/Mixed Use	77,850	58,388	40	23,355	60	-	35,033	23,355	35,033	58,388
Water Reclamation	5,599	4,199	40	1,680	60	-	2,520	1,680	2,520	4,199
Recycled Facility/Trail Head	1,000	750	40	300	60	-	450	300	450	750
Detention Basin	13,169	9,877	0	-	100	-	9,877	-	9,877	9,877
School	27,996	20,997	40	8,399	60	-	12,598	8,399	12,598	20,997
Community Purpose Facility	4,666	3,500	40	1,400	60	-	2,100	1,400	2,100	3,500
Group Residential/Care	15,165	11,373	40	4,549	60	-	6,824	4,549	6,824	11,373
Institutional	23,330	17,498	40	6,999	60	-	10,499	6,999	10,499	17,498
Park	39,341	29,506	40	11,802	60	-	17,704	11,802	17,704	29,506
Biological Open Space	-	-	0	-	100	-	-	-	-	-
Non-Circulating Road	-	-	0.0	-	0.0	-	-	-	-	-
Circulating Road	-	-	0.0	-	0.0	-	-	-	-	-
Common Areas/Ag	50,750	38,063	0.0	-	100.0	-	38,063	-	38,063	38,063
Manufactured Slopes/Wet Weather Storage	190,750	143,063	0.0	-	100.0	-	143,063	-	143,063	143,063
Total, gpd	1,112,528	834,396	-	257,358	-	142,764	434,274	400,122	434,274	834,396
Total, afy	1,246	935	-	288	-	160	486	448	486	935

* Non-potable water demand will be part of Common Area Irrigation

Note - Single Family Detached exterior potable water use could be reduced by 34 AFY via rain water harvesting.

	gpd	afy	Phasing Check
Supplied by RW	278,728	312.17	312.17
Supplied by GW	155,546	174.21	174.21

Lilac Hills Ranch Potable and Non-Potable Water Use by Phase										
Constructio n Phase	Project Phase	Potable Demand		Non-Potable Demand					Total	
				Groundwater		Recycled Water		RW Irrigated Acreage		
		gpd	afy	gpd	afy	gpd	afy		gpd	afy
1	1	94,650	106	39,600	44	39,563	44	15	173,814	195
2	4	33,332	37	11,543	13	20,225	23	8	65,100	73
3	5	54,867	61	20,048	22	46,634	52	17	121,548	136
4	2	85,403	96	30,097	34	63,698	71	24	179,198	201
5	3	131,869	148	54,259	61	108,608	122	41	294,737	330
Total		400,122	448	155,546	174	278,728	312	104	834,396	935

* Based upon 3 acre feet per acre per year

This scenario assumes all groundwater is used only on single family homes.

Lilac Hills Ranch Potable and Non-Potable Water Use With Conservation, Phase 1										
Land Use	Demand	Interior Demand %	Potable Water Demand	Exterior Demand %	Potable Water Demand	Non-Potable Water Demand	Total Potable Demand	Total Non-Potable Demand	Project Total Demand	
Single Family Detached	132,000	40	52,800	60	39,600	39,600 *	92,400	39,600	132,000	
Single Family Senior	-	40	-	60	-	- *	-	-	-	
Single Family Attached	-	40	-	60	-	- *	-	-	-	
Commercial/Mixed Use	-	40	-	60	-	-	-	-	-	
Water Reclamation	-	40	-	60	-	-	-	-	-	
Recycled Facility/Trail Head	-	40	-	60	-	-	-	-	-	
Detention Basin	-	0	-	100	-	-	-	-	-	
School	-	40	-	60	-	-	-	-	-	
Community Purpose Facility	-	40	-	60	-	-	-	-	-	
Group Residential/Care	-	40	-	60	-	-	-	-	-	
Institutional	-	40	-	60	-	-	-	-	-	
Park	5,626	40	2,250	60	-	3,376	2,250	3,376	5,626	
Biological Open Space	-	0	-	100	-	-	-	-	-	
Non-Circulating Road	-	0.0	-	0.0	-	-	-	-	-	
Circulating Road	-	0.0	-	0.0	-	-	-	-	-	
Common Areas/Ag	11,625	0.0	-	100.0	-	11,625	-	11,625	11,625	
Manufactured Slopes/Wet Weather Storage	24,563	0.0	-	100.0	-	24,563	-	24,563	24,563	
Total, gpd	173,814	-	55,050	-	39,600	79,163	94,650	79,163	173,814	
Total, afy	195	-	62	-	44	89	106	89	195	

* Non-potable water demand will be part of Common Area Irrigation

Note - Single Family Detached exterior potable water use could be reduced by 34 AFY via rain water harvesting.

	gpd	afy
Supplied by RW	39,563	44.31
Supplied by GW	39,600	44.35

Lilac Hills Ranch Potable and Non-Potable Water Use With Conservation, Phase 2									
Land Use	Demand	Interior Demand %	Potable Water Demand	Exterior Demand %	Potable Water Demand	Non-Potable Water Demand	Total Potable Demand	Total Non-Potable Demand	Project Total Demand
Single Family Detached	73,500	40	29,400	60	22,050	22,050 *	51,450	22,050	73,500
Single Family Senior	-	40	-	60	-	- *	-	-	-
Single Family Attached	19,160	40	7,664	60	3,449	8,047 *	11,113	8,047	19,160
Commercial/Mixed Use	55,350	40	22,140	60	-	33,210	22,140	33,210	55,350
Water Reclamation	-	40	-	60	-	-	-	-	-
Recycled Facility/Trail Head	750	40	300	60	-	450	300	450	750
Detention Basin	-	0	-	100	-	-	-	-	-
School	-	40	-	60	-	-	-	-	-
Community Purpose Facility	-	40	-	60	-	-	-	-	-
Group Residential/Care	-	40	-	60	-	-	-	-	-
Institutional	-	40	-	60	-	-	-	-	-
Park	1,000	40	400	60	-	600	400	600	1,000
Biological Open Space	-	0	-	100	-	-	-	-	-
Non-Circulating Road	-	0.0	-	0.0	-	-	-	-	-
Circulating Road	-	0.0	-	0.0	-	-	-	-	-
Common Areas/Ag	1,500	0.0	-	100.0	-	1,500	-	1,500	1,500
Manufactured Slopes/Wet Weather Storage	27,938	0.0	-	100.0	-	27,938	-	27,938	27,938
Total, gpd	179,198	-	59,904	-	25,499	93,795	85,403	93,795	179,198
Total, afy	201	-	67	-	29	105	96	105	201

* Non-potable water demand will be part of Common Area Irrigation

Note - Single Family Detached exterior potable water use could be reduced by 34 AFY via rain water harvesting.

	gpd	afy
Supplied by RW	63,698	71.34
Supplied by GW	30,097	33.71

Lilac Hills Ranch Potable and Non-Potable Water Use With Conservation, Phase 3									
Land Use	Demand	Interior Demand %	Potable Water Demand	Exterior Demand %	Potable Water Demand	Non-Potable Water Demand	Total Potable Demand	Total Non-Potable Demand	Project Total Demand
Single Family Detached	133,125	40	53,250	60	39,938	39,938 *	93,188	39,938	133,125
Single Family Senior	-	40	-	60	-	- *	-	-	-
Single Family Attached	34,099	40	13,640	60	6,138	14,321 *	19,777	14,321	34,099
Commercial/Mixed Use	1,688	40	675	60	-	1,013	675	1,013	1,688
Water Reclamation	4,199	40	1,680	60	-	2,520	1,680	2,520	4,199
Recycled Facility/Trail Head	-	40	-	60	-	-	-	-	-
Detention Basin	6,376	0	-	100	-	6,376	-	6,376	6,376
School	20,997	40	8,399	60	-	12,598	8,399	12,598	20,997
Community Purpose Facility	3,500	40	1,400	60	-	2,100	1,400	2,100	3,500
Group Residential/Care	-	40	-	60	-	-	-	-	-
Institutional	-	40	-	60	-	-	-	-	-
Park	16,878	40	6,751	60	-	10,127	6,751	10,127	16,878
Biological Open Space	-	0	-	100	-	-	-	-	-
Non-Circulating Road	-	0.0	-	0.0	-	-	-	-	-
Circulating Road	-	0.0	-	0.0	-	-	-	-	-
Common Areas/Ag	6,188	0.0	-	100.0	-	6,188	-	6,188	6,188
Manufactured Slopes/Wet Weather Storage	67,688	0.0	-	100.0	-	67,688	-	67,688	67,688
Total, gpd	294,737	-	85,794	-	46,075	162,867	131,869	162,867	294,737
Total, afy	330	-	96	-	52	182	148	182	330

* Non-potable water demand will be part of Common Area Irrigation

Note - Single Family Detached exterior potable water use could be reduced by 34 AFY via rain water harvesting.

	gpd	afy
Supplied by RW	108,608	121.64
Supplied by GW	54,259	60.77

Lilac Hills Ranch Potable and Non-Potable Water Use With Conservation, Phase 4									
Land Use	Demand	Interior Demand %	Potable Water Demand	Exterior Demand %	Potable Water Demand	Non-Potable Water Demand	Total Potable Demand	Total Non-Potable	Project Total Demand
Single Family Detached	-	40	-	60	-	- *	-	-	-
Single Family Senior	38,475	40	15,390	60	11,543	11,543 *	26,933	11,543	38,475
Single Family Attached	-	40	-	60	-	- *	-	-	-
Commercial/Mixed Use	-	40	-	60	-	-	-	-	-
Water Reclamation	-	40	-	60	-	-	-	-	-
Recycled Facility/Trail Head	-	40	-	60	-	-	-	-	-
Detention Basin	1,250	0	-	100	-	1,250	-	1,250	1,250
School	-	40	-	60	-	-	-	-	-
Community Purpose Facility	-	40	-	60	-	-	-	-	-
Group Residential/Care	11,373	40	4,549	60	-	6,824	4,549	6,824	11,373
Institutional	-	40	-	60	-	-	-	-	-
Park	4,626	40	1,850	60	-	2,776	1,850	2,776	4,626
Biological Open Space	-	0	-	100	-	-	-	-	-
Non-Circulating Road	-	0.0	-	0.0	-	-	-	-	-
Circulating Road	-	0.0	-	0.0	-	-	-	-	-
Common Areas/Ag	2,438	0.0	-	100.0	-	2,438	-	2,438	2,438
Manufactured Slopes/Wet Weather Storage	6,938	0.0	-	100.0	-	6,938	-	6,938	6,938
Total, gpd	65,100	-	21,790	-	11,543	31,767	33,332	31,767	65,100
Total, afy	73	-	24	-	13	36	37	36	73

* Non-potable water demand will be part of Common Area Irrigation

Note - Single Family Detached exterior potable water use could be reduced by 34 AFY via rain water harvesting.

	gpd	afy
Supplied by RW	20,225	22.65
Supplied by GW	11,543	12.93

Lilac Hills Ranch Potable and Non-Potable Water Use With Conservation, Phase 5									
Land Use	Demand	Interior Demand %	Potable Water Demand	Exterior Demand %	Potable Water Demand	Non-Potable Water Demand	Total Potable Demand	Total Non-Potable	Project Total Demand
Single Family Detached	-	40	-	60	-	- *	-	-	-
Single Family Senior	66,825	40	26,730	60	20,048	20,048 *	46,778	20,048	66,825
Single Family Attached	-	40	-	60	-	- *	-	-	-
Commercial/Mixed Use	1,350	40	540	60	-	810	540	810	1,350
Water Reclamation	-	40	-	60	-	-	-	-	-
Recycled Facility/Trail Head	-	40	-	60	-	-	-	-	-
Detention Basin	2,250	0	-	100	-	2,250	-	2,250	2,250
School	-	40	-	60	-	-	-	-	-
Community Purpose Facility	-	40	-	60	-	-	-	-	-
Group Residential/Care	-	40	-	60	-	-	-	-	-
Institutional	17,498	40	6,999	60	-	10,499	6,999	10,499	17,498
Park	1,375	40	550	60	-	825	550	825	1,375
Biological Open Space	-	0	-	100	-	-	-	-	-
Non-Circulating Road	-	0.0	-	0.0	-	-	-	-	-
Circulating Road	-	0.0	-	0.0	-	-	-	-	-
Common Areas/Ag	16,313	0.0	-	100.0	-	16,313	-	16,313	16,313
Manufactured Slopes/Wet Weather Storage	15,938	0.0	-	100.0	-	15,938	-	15,938	15,938
Total, gpd	121,548	-	34,819	-	20,048	66,682	54,867	66,682	121,548
Total, afy	136	-	39	-	22	75	61	75	136

* Non-potable water demand will be part of Common Area Irrigation

Note - Single Family Detached exterior potable water use could be reduced by 34 AFY via rain water harvesting.

	gpd	afy
Supplied by RW	46,634	52.23
Supplied by GW	20,048	22.45

Lilac Hills Ranch Wastewater Generation						
Land Use	Acres	Units	Peak 24 hr Sewage Generation		Avg 24 hr Sewage/Recycled	
			Factor	gpd	Factor	gpd
Single Family Detached*	156.9	928	200 gpd/unit	185,600	150 gpd/unit	139,200
Single Family Senior	76.9	468	125 gpd/unit	58,500	90 gpd/unit	42,120
Single Family Attached	7.9	164	180 gpd/unit	29,520	130 gpd/unit	21,320
Commercial/Mixed Use	17.3	211	1900 gpd/ac	32,870	1340 gpd/ac	23,182
Water Reclamation	2.4	-	1000 gpd/ac	2,400	700 gpd/ac	1,680
Recycled Facility/Trail Head	0.6	-	1000 gpd/ac	600	700 gpd/ac	420
Detention Basin	7.9	-	0 gpd/ac	-	0 gpd/ac	-
School	12.0	-	1000 gpd/ac	12,000	700 gpd/ac	8,400
Community Purpose Facilit	2.0	-	1000 gpd/ac	2,000	700 gpd/ac	1,400
Group Residential/Care	6.5	-	1000 gpd/ac	6,500	700 gpd/ac	4,550
Institutional	10.0	-	1000 gpd/ac	10,000	700 gpd/ac	7,000
Park	23.6	-	700 gpd/ac	16,520	500 gpd/ac	11,800
Biological Open Space	104.1	-	0 gpd/ac	-	0 gpd/ac	-
Non-Circulating Road	45.7	-	0 gpd/ac	-	0 gpd/ac	-
Circulating Road	37.6	-	0 gpd/ac	-	0 gpd/ac	-
Common Areas/Ag	20.3	-	0 gpd/ac	-	0 gpd/ac	-
Manufactured Slopes/Wet Weather Storage	76.3	-	0 gpd/ac	-	0 gpd/ac	-
Total	608.0	1,771		356,510		261,072
Total, afy				399		292

* Includes 25 EDUs for existing homesites and perimeter parcels.

gpd/EDU

201

147.42

Lilac Hills Ranch Wastewater Generation Phasing Summary				
Phase	Peak 24 hr Sewage Generation		Avg 24 hr Sewage/ Recycled	
	By Phase	Cumulative	By Phase	Cumulative
1	75,350	75,350	56,400	56,400
2	83,540	158,890	60,916	117,316
3	118,100	276,990	86,850	204,166
4	30,665	307,655	21,940	226,106
5	48,855	356,510	34,966	261,072
TOTAL	356,510	-	261,072	-
gpd/EDU	201		147	

Includes 25 EDUs for existing homesites and perimeter parcels.

Phase 1 Lilac Hills Ranch Wastewater Generation						
Land Use	Acres	Units	Peak 24 hr Sewage Generation		Avg 24 hr Sewage/Recycled	
			Factor	gpd	Factor	gpd
Single Family Detached*	60.7	361	200 gpd/unit	72,200	150 gpd/unit	54,150
Single Family Senior	-	-	125 gpd/unit	-	90 gpd/unit	-
Single Family Attached	-	-	180 gpd/unit	-	130 gpd/unit	-
Commercial/Mixed Use	-	-	1900 gpd/ac	-	1340 gpd/ac	-
Water Reclamation	-	-	1000 gpd/ac	-	700 gpd/ac	-
Recycled Facility/Trail Head	-	-	1000 gpd/ac	-	700 gpd/ac	-
Detention Basin	-	-	0 gpd/ac	-	0 gpd/ac	-
School	-	-	1000 gpd/ac	-	700 gpd/ac	-
Community Purpose Facility	-	-	1000 gpd/ac	-	700 gpd/ac	-
Group Residential/Care	-	-	1000 gpd/ac	-	700 gpd/ac	-
Institutional	-	-	1000 gpd/ac	-	700 gpd/ac	-
Park	4.5	-	700 gpd/ac	3,150	500 gpd/ac	2,250
Biological Open Space	15.6	-	0 gpd/ac	-	0 gpd/ac	-
Non-Circulating Road	13.7	-	0 gpd/ac	-	0 gpd/ac	-
Circulating Road	7.7	-	0 gpd/ac	-	0 gpd/ac	-
Common Areas/Ag	6.2	-	0 gpd/ac	-	0 gpd/ac	-
Manufactured Slopes/Wet Weather Storage	13.1	-	0 gpd/ac	-	0 gpd/ac	-
Total	121.5	361		75,350		56,400
Total, afy				84		63

* Includes EDUs for existing homesites and perimeter parcels.

Phase 2 Lilac Hills Ranch Wastewater Generation						
Land Use	Acres	Units	Peak 24 hr Sewage Generation		Avg 24 hr Sewage/Recycled	
			Factor	gpd	Factor	gpd
Single Family Detached*	18.3	203	200 gpd/unit	40,600	150 gpd/unit	30,450
Single Family Senior	-	-	125 gpd/unit	-	90 gpd/unit	-
Single Family Attached	3.6	59	180 gpd/unit	10,620	130 gpd/unit	7,670
Commercial/Mixed Use	16.4	211	1900 gpd/ac	31,160	1340 gpd/ac	21,976
Water Reclamation	-	-	1000 gpd/ac	-	700 gpd/ac	-
Recycled Facility/Trail Head	0.6	-	1000 gpd/ac	600	700 gpd/ac	420
Detention Basin	-	-	0 gpd/ac	-	0 gpd/ac	-
School	-	-	1000 gpd/ac	-	700 gpd/ac	-
Community Purpose Facility	-	-	1000 gpd/ac	-	700 gpd/ac	-
Group Residential/Care	-	-	1000 gpd/ac	-	700 gpd/ac	-
Institutional	-	-	1000 gpd/ac	-	700 gpd/ac	-
Park	0.8	-	700 gpd/ac	560	500 gpd/ac	400
Biological Open Space	12.6	-	0 gpd/ac	-	0 gpd/ac	-
Non-Circulating Road	8.0	-	0 gpd/ac	-	0 gpd/ac	-
Circulating Road	13.6	-	0 gpd/ac	-	0 gpd/ac	-
Common Areas/Ag	0.8	-	0 gpd/ac	-	0 gpd/ac	-
Manufactured Slopes/Wet Weather Storage	14.9	-	0 gpd/ac	-	0 gpd/ac	-
Total	89.6	473		83,540		60,916
Total, afy				94		68

* Includes EDUs for existing homesites and perimeter parcels.

Phase 3 Lilac Hills Ranch Wastewater Generation						
Land Use	Acres	Units	Peak 24 hr Sewage Generation		Avg 24 hr Sewage/Recycled	
			Factor	gpd	Factor	gpd
Single Family Detached*	77.9	362	200 gpd/unit	72,400	150 gpd/unit	54,300
Single Family Senior	-	-	125 gpd/unit	-	90 gpd/unit	-
Single Family Attached	4.3	105	180 gpd/unit	18,900	130 gpd/unit	13,650
Commercial/Mixed Use	0.5	-	1900 gpd/ac	950	1340 gpd/ac	670
Water Reclamation	2.4	-	1000 gpd/ac	2,400	700 gpd/ac	1,680
Recycled Facility/Trail Head	-	-	1000 gpd/ac	-	700 gpd/ac	-
Detention Basin	5.1	-	0 gpd/ac	-	0 gpd/ac	-
School	12.0	-	1000 gpd/ac	12,000	700 gpd/ac	8,400
Community Purpose Facility	2.0	-	1000 gpd/ac	2,000	700 gpd/ac	1,400
Group Residential/Care	-	-	1000 gpd/ac	-	700 gpd/ac	-
Institutional	-	-	1000 gpd/ac	-	700 gpd/ac	-
Park	13.5	-	700 gpd/ac	9,450	500 gpd/ac	6,750
Biological Open Space	49.0	-	0 gpd/ac	-	0 gpd/ac	-
Non-Circulating Road	8.2	-	0 gpd/ac	-	0 gpd/ac	-
Circulating Road	8.7	-	0 gpd/ac	-	0 gpd/ac	-
Common Areas/Ag	3.3	-	0 gpd/ac	-	0 gpd/ac	-
Manufactured Slopes/Wet Weather Storage	36.1	-	0 gpd/ac	-	0 gpd/ac	-
Total	223.0	467		118,100		86,850
Total, afy				132		97

* Includes EDUs for existing homesites and perimeter parcels.

Phase 4 Lilac Hills Ranch Wastewater Generation						
Land Use	Acres	Units	Peak 24 hr Sewage Generation		Avg 24 hr Sewage/Recycled	
			Factor	gpd	Factor	gpd
Single Family Detached*	-	1	200 gpd/unit	200	150 gpd/unit	150
Single Family Senior	29.9	171	125 gpd/unit	21,375	90 gpd/unit	15,390
Single Family Attached	-	-	180 gpd/unit	-	130 gpd/unit	-
Commercial/Mixed Use	-	-	1900 gpd/ac	-	1340 gpd/ac	-
Water Reclamation	-	-	1000 gpd/ac	-	700 gpd/ac	-
Recycled Facility/Trail Head	-	-	1000 gpd/ac	-	700 gpd/ac	-
Detention Basin	1.0	-	0 gpd/ac	-	0 gpd/ac	-
School	-	-	1000 gpd/ac	-	700 gpd/ac	-
Community Purpose Facility	-	-	1000 gpd/ac	-	700 gpd/ac	-
Group Residential/Care	6.5	-	1000 gpd/ac	6,500	700 gpd/ac	4,550
Institutional	-	-	1000 gpd/ac	-	700 gpd/ac	-
Park	3.7	-	700 gpd/ac	2,590	500 gpd/ac	1,850
Biological Open Space	9.6	-	0 gpd/ac	-	0 gpd/ac	-
Non-Circulating Road	2.8	-	0 gpd/ac	-	0 gpd/ac	-
Circulating Road	3.0	-	0 gpd/ac	-	0 gpd/ac	-
Common Areas/Ag	1.3	-	0 gpd/ac	-	0 gpd/ac	-
Manufactured Slopes/Wet Weather Storage	3.7	-	0 gpd/ac	-	0 gpd/ac	-
Total	61.5	172		30,665		21,940
Total, afy				34		25

* Includes EDUs for existing homesites and perimeter parcels.

Phase 5 Lilac Hills Ranch Wastewater Generation						
Land Use	Acres	Units	Peak 24 hr Sewage Generation		Avg 24 hr Sewage/Recycled	
			Factor	gpd	Factor	gpd
Single Family Detached*	-	1	200 gpd/unit	200	150 gpd/unit	150
Single Family Senior	47.0	297	125 gpd/unit	37,125	90 gpd/unit	26,730
Single Family Attached	-	-	180 gpd/unit	-	130 gpd/unit	-
Commercial/Mixed Use	0.4	-	1900 gpd/ac	760	1340 gpd/ac	536
Water Reclamation	-	-	1000 gpd/ac	-	700 gpd/ac	-
Recycled Facility/Trail Head	-	-	1000 gpd/ac	-	700 gpd/ac	-
Detention Basin	1.8	-	0 gpd/ac	-	0 gpd/ac	-
School	-	-	1000 gpd/ac	-	700 gpd/ac	-
Community Purpose Facility	-	-	1000 gpd/ac	-	700 gpd/ac	-
Group Residential/Care	-	-	1000 gpd/ac	-	700 gpd/ac	-
Institutional	10.0	-	1000 gpd/ac	10,000	700 gpd/ac	7,000
Park	1.1	-	700 gpd/ac	770	500 gpd/ac	550
Biological Open Space	17.3	-	0 gpd/ac	-	0 gpd/ac	-
Non-Circulating Road	13.0	-	0 gpd/ac	-	0 gpd/ac	-
Circulating Road	4.6	-	0 gpd/ac	-	0 gpd/ac	-
Common Areas/Ag	8.7	-	0 gpd/ac	-	0 gpd/ac	-
Manufactured Slopes/Wet Weather Storage	8.5	-	0 gpd/ac	-	0 gpd/ac	-
Total	112.4	298		48,855		34,966
Total, afy				55		39

* Includes EDUs for existing homesites and perimeter parcels.

APPENDIX B

WET WEATHER STORAGE CALCULATIONS

Based on 2-11-14 LHR Project Demands

Effluent Production

Total RW/Effluent	356,510 gpd	1.09 AF/day
Lilac Hills Irrigation Need	398,580 gpd	446 AF/yr
Additional Irrigated Acreage Need	0 gpd	0 AF/yr

Storage Basin Assumptions

Total Basin Area	6 acres
Water Surface Area	3 acres
Irrigation Efficiency Factor	0.8

Beneficial Use Acreage

at 3 feet per acre	148.8 acres
84 days of storage	91.9 AF

Monthly Irrigation Need

Month	Monthly Demand Factor	Irrigation Demand,
January	0.59	21.9
February	0.58	21.5
March	0.79	29.4
April	1.11	41.4
May	1.28	47.5
June	1.46	54.3
July	1.48	55.1
August	1.43	53.2
September	1.19	44.2
October	0.87	32.3
November	0.69	25.8
December	0.54	19.9
Total		446

* Monthly Demand Factor based on Evapotranspiration data from the California Irrigation Management Information System

Lilac Hills Ranch Potable and Non-Potable Water Use With Conservation												
Land Use	Pre-Conservation Water Use	Water Use With Conservation of 25%	Interior Demand %	Potable Water Demand	Exterior Demand %	Potable Water Demand	Non-Potable Water Demand	Total Potable Demand	Total Non-Potable Demand	Project Total Demand		
Single Family Detached	451,500	338,625	40	135,450	60	101,588	101,588 *	237,038	101,588	338,625		
Single Family Senior	140,400	105,300	40	42,120	60	31,590	31,590 *	73,710	31,590	105,300		
Single Family Attached	71,012	53,259	40	21,304	60	9,587	22,369 *	30,890	22,369	53,259		
Commercial/Mixed Use	77,850	58,388	40	23,355	60	-	35,033	23,355	35,033	58,388		
Water Reclamation	5,599	4,199	40	1,680	60	-	2,520	1,680	2,520	4,199		
Recycled Facility/Trail Head	1,000	750	40	300	60	-	450	300	450	750		
Detention Basin	13,169	9,877	0	-	100	-	9,877	-	9,877	9,877		
School	27,996	20,997	40	8,399	60	-	12,598	8,399	12,598	20,997		
Community Purpose Facility	4,666	3,500	40	1,400	60	-	2,100	1,400	2,100	3,500		
Group Residential/Care	15,165	11,373	40	4,549	60	-	6,824	4,549	6,824	11,373		
Institutional	23,330	17,498	40	6,999	60	-	10,499	6,999	10,499	17,498		
Park	39,341	29,506	40	11,802	60	-	17,704	11,802	17,704	29,506		
Biological Open Space	-	-	0	-	100	-	-	-	-	-		
Non-Circulating Road	-	-	0.0	-	0.0	-	-	-	-	-		
Circulating Road	-	-	0.0	-	0.0	-	-	-	-	-		
Common Areas/Ag	50,750	38,063	0.0	-	100.0	-	38,063	-	38,063	38,063		
Manufactured Slopes/Wet Weather Storage	190,750	143,063	0.0	-	100.0	-	143,063	-	143,063	143,063		
Total, gpd	1,112,528	834,396	-	257,358	-	142,764	434,274	400,122	434,274	834,396		
Total, afy	1,246	934.71	-	288	-	160	486	448	486	935		
* Non-potable water demand will be part of Common Area Irrigation												
Note - Single Family Detached exterior potable water use could be reduced by 34 AFY via rain water harvesting.												
								gpd	afy			
								Supplied by RW	278,728	312.17		
								Supplied by GW	155,546	174.21		

October 2004													
Day	Effluent Production (AF/day)	Irrigation Need						Rainfall Added to Storage Basin (AF)	Evaporation Rate (in/day)	Amount Evaporated from Storage Basin (AF)	Increase (+) or Decrease (-) in Storage (AF)	Amount in Storage (AF)	Supplemental Irrigation Need (AF)
		Daily Irrigation Need (AF)	Rainfall (in)	Available Rainfall (AF)	Net Irrigation Need (AF)	Irrigation Efficiency Factor	Total Irrigation Need (AF)						
1	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	0.00	0.21
2	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	0.00	0.21
3	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	0.00	0.21
4	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	0.00	0.21
5	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	0.00	0.21
6	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	0.00	0.21
7	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	0.00	0.21
8	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	0.00	0.21
9	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	0.00	0.21
10	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	0.00	0.21
11	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	0.00	0.21
12	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	0.00	0.21
13	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	0.00	0.21
14	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	0.00	0.21
15	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	0.00	0.21
16	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	0.00	0.21
17	1.094	1.043	0.50	6.2	0.000	0.8	0.000	0.3	0.000	0.00	1.34	1.34	0.00
18	1.094	1.043	1.11	13.8	0.000	0.8	0.000	0.6	0.000	0.00	1.65	2.99	0.00
19	1.094	1.043	0.67	8.3	0.000	0.8	0.000	0.3	0.000	0.00	1.43	4.42	0.00
20	1.094	1.043	0.00	0.0	0.000	0.8	0.000	0.0	0.166	0.04	1.05	5.47	0.00
21	1.094	1.043	0.20	2.5	0.000	0.8	0.000	0.1	0.000	0.00	1.19	6.67	0.00
22	1.094	1.043	0.00	0.0	0.000	0.8	0.000	0.0	0.166	0.04	1.05	7.72	0.00
23	1.094	1.043	0.00	0.0	0.000	0.8	0.000	0.0	0.166	0.04	1.05	8.77	0.00
24	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	8.52	0.00
25	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	8.27	0.00
26	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	8.02	0.00
27	1.094	1.043	1.95	24.2	0.000	0.8	0.000	1.0	0.000	0.00	2.07	10.09	0.00
28	1.094	1.043	0.30	3.7	0.000	0.8	0.000	0.2	0.000	0.00	1.24	11.33	0.00
29	1.094	1.043	0.00	0.0	0.000	0.8	0.000	0.0	0.166	0.04	1.05	12.39	0.00
30	1.094	1.043	0.00	0.0	0.000	0.8	0.000	0.0	0.166	0.04	1.05	13.44	0.00
31	1.094	1.043	0.00	0.0	1.043	0.8	1.303	0.0	0.166	0.04	-0.25	13.19	0.00
TOTAL	33.9	32.3	4.73	58.7	20.9		26.1	2.4	4.15	1.04	9.17	13.19	3.35

November 2004													
Day	Effluent Production (AF/day)	Irrigation Need						Rainfall Added to Storage Basin (AF)	Evaporation Rate (in/day)	Amount Evaporated from Storage Basin (AF)	Increase (+) or Decrease (-) in Storage (AF)	Amount in Storage (AF)	Supplemental Irrigation Need (AF)
		Daily Irrigation Need (AF)	Rainfall (in)	Available Rainfall (AF)	Net Irrigation Need (AF)	Irrigation Efficiency Factor	Total Irrigation Need (AF)						
1	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.18	0.00
2	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.17	0.00
3	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.15	0.00
4	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.14	0.00
5	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.13	0.00
6	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.12	0.00
7	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.11	0.00
8	1.094	0.859	0.03	0.4	0.487	0.8	0.609	0.0	0.00	0.00	0.50	13.61	0.00
9	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.60	0.00
10	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.59	0.00
11	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.58	0.00
12	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.57	0.00
13	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.56	0.00
14	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.55	0.00
15	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.54	0.00
16	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.52	0.00
17	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.51	0.00
18	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.50	0.00
19	1.094	0.859	0.02	0.2	0.611	0.8	0.764	0.0	0.00	0.00	0.34	13.84	0.00
20	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	13.83	0.00
21	1.094	0.859	0.45	5.6	0.000	0.8	0.000	0.2	0.00	0.00	1.32	15.15	0.00
22	1.094	0.859	0.00	0.0	0.000	0.8	0.000	0.0	0.12	0.03	1.06	16.21	0.00
23	1.094	0.859	0.00	0.0	0.000	0.8	0.000	0.0	0.12	0.03	1.06	17.28	0.00
24	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	17.27	0.00
25	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	17.26	0.00
26	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	17.24	0.00
27	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	17.23	0.00
28	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	17.22	0.00
29	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	17.21	0.00
30	1.094	0.859	0.00	0.0	0.859	0.8	1.074	0.0	0.12	0.03	-0.01	17.20	0.00
TOTAL	32.8	25.8	0.50	6.20	22.6		28.2	0.3	3.31	0.83	4.01	17.20	0.00

December 2004													
Day	Effluent Production (AF/day)	Irrigation Need						Rainfall Added to Storage Basin (AF)	Evaporation Rate (in/day)	Amount Evaporated from Storage Basin (AF)	Increase (+) or Decrease (-) in Storage (AF)	Amount in Storage (AF)	Supplemental Irrigation Need (AF)
		Daily Irrigation Need (AF)	Rainfall (in)	Available Rainfall (AF)	Net Irrigation Need (AF)	Irrigation Efficiency Factor	Total Irrigation Need (AF)						
1	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	17.46	0.00
2	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	17.73	0.00
3	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	17.99	0.00
4	1.094	0.643	0.04	0.5	0.15	0.8	0.184	0.0	0.00	0.00	0.93	18.92	0.00
5	1.094	0.643	0.45	5.6	0.00	0.8	0.000	0.2	0.00	0.00	1.32	20.24	0.00
6	1.094	0.643	0.15	1.9	0.00	0.8	0.000	0.1	0.00	0.00	1.17	21.41	0.00
7	1.094	0.643	0.00	0.0	0.00	0.8	0.000	0.0	0.11	0.03	1.07	22.47	0.00
8	1.094	0.643	0.10	1.2	0.00	0.8	0.000	0.1	0.00	0.00	1.14	23.62	0.00
9	1.094	0.643	0.00	0.0	0.00	0.8	0.000	0.0	0.11	0.03	1.07	24.68	0.00
10	1.094	0.643	0.00	0.0	0.00	0.8	0.000	0.0	0.11	0.03	1.07	25.75	0.00
11	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	26.01	0.00
12	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	26.27	0.00
13	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	26.53	0.00
14	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	26.80	0.00
15	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	27.06	0.00
16	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	27.32	0.00
17	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	27.58	0.00
18	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	27.85	0.00
19	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	28.11	0.00
20	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	28.37	0.00
21	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	28.63	0.00
22	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	28.89	0.00
23	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	29.16	0.00
24	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	29.42	0.00
25	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	29.68	0.00
26	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	29.94	0.00
27	1.094	0.643	0.00	0.0	0.64	0.8	0.804	0.0	0.11	0.03	0.26	30.20	0.00
28	1.094	0.643	0.67	8.3	0.00	0.8	0.000	0.3	0.00	0.00	1.43	31.63	0.00
29	1.094	0.643	1.10	13.6	0.00	0.8	0.000	0.6	0.00	0.00	1.64	33.28	0.00
30	1.094	0.643	0.36	4.5	0.00	0.8	0.000	0.2	0.00	0.00	1.27	34.55	0.00
31	1.094	0.643	0.32	4.0	0.00	0.8	0.000	0.2	0.00	0.00	1.25	35.81	0.00
TOTAL	33.9	19.9	3.19	39.6	13.0		16.3	1.6	2.56	0.64	18.60	35.81	0.00

January 2005													
Day	Effluent Production (AF/day)	Irrigation Need						Rainfall Added to Storage Basin (AF)	Evaporation Rate (in/day)	Amount Evaporated from Storage Basin (AF)	Increase (+) or Decrease (-) in Storage (AF)	Amount in Storage (AF)	Supplemental Irrigation Need (AF)
		Daily Irrigation Need (AF)	Rainfall (in)	Available Rainfall (AF)	Net Irrigation Need (AF)	Irrigation Efficiency Factor	Total Irrigation Need (AF)						
1	1.094	0.706	0.10	1.2	0.00	0.8	0.000	0.05	0.00	0.00	1.14	36.95	0.00
2	1.094	0.706	0.00	0.0	0.00	0.8	0.000	0.00	0.18	0.04	1.05	38.00	0.00
3	1.094	0.706	0.90	11.2	0.00	0.8	0.000	0.45	0.00	0.00	1.54	39.54	0.00
4	1.094	0.706	0.72	8.9	0.00	0.8	0.000	0.36	0.00	0.00	1.45	41.00	0.00
5	1.094	0.706	0.06	0.7	0.00	0.8	0.000	0.03	0.00	0.00	1.12	42.12	0.00
6	1.094	0.706	0.00	0.0	0.00	0.8	0.000	0.00	0.18	0.04	1.05	43.17	0.00
7	1.094	0.706	0.60	7.4	0.00	0.8	0.000	0.30	0.00	0.00	1.39	44.57	0.00
8	1.094	0.706	0.04	0.5	0.00	0.8	0.000	0.02	0.00	0.00	1.11	45.68	0.00
9	1.094	0.706	1.17	14.5	0.00	0.8	0.000	0.59	0.00	0.00	1.68	47.36	0.00
10	1.094	0.706	1.65	20.5	0.00	0.8	0.000	0.83	0.00	0.00	1.92	49.28	0.00
11	1.094	0.706	1.74	21.6	0.00	0.8	0.000	0.87	0.00	0.00	1.96	51.24	0.00
12	1.094	0.706	0.16	2.0	0.00	0.8	0.000	0.08	0.00	0.00	1.17	52.41	0.00
13	1.094	0.706	0.00	0.0	0.00	0.8	0.000	0.00	0.18	0.04	1.05	53.46	0.00
14	1.094	0.706	0.00	0.0	0.00	0.8	0.000	0.00	0.18	0.04	1.05	54.51	0.00
15	1.094	0.706	0.00	0.0	0.71	0.8	0.882	0.00	0.18	0.04	0.17	54.68	0.00
16	1.094	0.706	0.00	0.0	0.71	0.8	0.882	0.00	0.18	0.04	0.17	54.85	0.00
17	1.094	0.706	0.00	0.0	0.71	0.8	0.882	0.00	0.18	0.04	0.17	55.02	0.00
18	1.094	0.706	0.00	0.0	0.71	0.8	0.882	0.00	0.18	0.04	0.17	55.18	0.00
19	1.094	0.706	0.00	0.0	0.71	0.8	0.882	0.00	0.18	0.04	0.17	55.35	0.00
20	1.094	0.706	0.00	0.0	0.71	0.8	0.882	0.00	0.18	0.04	0.17	55.52	0.00
21	1.094	0.706	0.00	0.0	0.71	0.8	0.882	0.00	0.18	0.04	0.17	55.69	0.00
22	1.094	0.706	0.00	0.0	0.71	0.8	0.882	0.00	0.18	0.04	0.17	55.86	0.00
23	1.094	0.706	0.00	0.0	0.71	0.8	0.882	0.00	0.18	0.04	0.17	56.02	0.00
24	1.094	0.706	0.00	0.0	0.71	0.8	0.882	0.00	0.18	0.04	0.17	56.19	0.00
25	1.094	0.706	0.00	0.0	0.71	0.8	0.882	0.00	0.18	0.04	0.17	56.36	0.00
26	1.094	0.706	0.06	0.7	0.00	0.8	0.000	0.03	0.00	0.00	1.12	57.48	0.00
27	1.094	0.706	0.13	1.6	0.00	0.8	0.000	0.07	0.00	0.00	1.16	58.64	0.00
28	1.094	0.706	0.07	0.9	0.00	0.8	0.000	0.04	0.00	0.00	1.13	59.77	0.00
29	1.094	0.706	0.23	2.9	0.00	0.8	0.000	0.12	0.00	0.00	1.21	60.98	0.00
30	1.094	0.706	0.01	0.1	0.00	0.8	0.000	0.01	0.00	0.00	1.10	62.08	0.00
31	1.094	0.706	0.00	0.0	0.00	0.8	0.000	0.00	0.18	0.04	1.05	63.13	0.00
TOTAL	33.9	21.9	7.64	94.8	7.8		9.71	3.82	2.81	0.70	27.32	63.13	0.00

February 2005													
Day	Effluent Production (AF/day)	Irrigation Need						Rainfall Added to Storage Basin (AF)	Evaporation Rate (in/day)	Amount Evaporated from Storage Basin (AF)	Increase (+) or Decrease (-) in Storage (AF)	Amount in Storage (AF)	Supplemental Irrigation Need (AF)
		Daily Irrigation Need (AF)	Rainfall (in)	Available Rainfall (AF)	Net Irrigation Need (AF)	Irrigation Efficiency Factor	Total Irrigation Need (AF)						
1	1.094	0.768	0.00	0.0	0.77	0.8	0.960	0.00	0.16	0.04	0.09	63.22	0.00
2	1.094	0.768	0.00	0.0	0.77	0.8	0.960	0.00	0.16	0.04	0.09	63.31	0.00
3	1.094	0.768	0.00	0.0	0.77	0.8	0.960	0.00	0.16	0.04	0.09	63.41	0.00
4	1.094	0.768	0.00	0.0	0.77	0.8	0.960	0.00	0.16	0.04	0.09	63.50	0.00
5	1.094	0.768	0.00	0.0	0.77	0.8	0.960	0.00	0.16	0.04	0.09	63.60	0.00
6	1.094	0.768	0.00	0.0	0.77	0.8	0.960	0.00	0.16	0.04	0.09	63.69	0.00
7	1.094	0.768	0.06	0.7	0.00	0.8	0.000	0.03	0.00	0.00	1.12	64.81	0.00
8	1.094	0.768	0.00	0.0	0.00	0.8	0.000	0.00	0.16	0.04	1.05	65.87	0.00
9	1.094	0.768	0.00	0.0	0.00	0.8	0.000	0.00	0.16	0.04	1.05	66.92	0.00
10	1.094	0.768	0.00	0.0	0.77	0.8	0.960	0.00	0.16	0.04	0.09	67.01	0.00
11	1.094	0.768	0.71	8.8	0.00	0.8	0.000	0.36	0.00	0.00	1.45	68.46	0.00
12	1.094	0.768	1.32	16.4	0.00	0.8	0.000	0.66	0.00	0.00	1.75	70.22	0.00
13	1.094	0.768	0.14	1.7	0.00	0.8	0.000	0.07	0.00	0.00	1.16	71.38	0.00
14	1.094	0.768	0.00	0.0	0.00	0.8	0.000	0.00	0.16	0.04	1.05	72.43	0.00
15	1.094	0.768	0.00	0.0	0.00	0.8	0.000	0.00	0.16	0.04	1.05	73.49	0.00
16	1.094	0.768	0.00	0.0	0.77	0.8	0.960	0.00	0.16	0.04	0.09	73.58	0.00
17	1.094	0.768	0.00	0.0	0.77	0.8	0.960	0.00	0.16	0.04	0.09	73.68	0.00
18	1.094	0.768	0.61	7.6	0.00	0.8	0.000	0.31	0.00	0.00	1.40	75.07	0.00
19	1.094	0.768	0.77	9.6	0.00	0.8	0.000	0.39	0.00	0.00	1.48	76.55	0.00
20	1.094	0.768	0.11	1.4	0.00	0.8	0.000	0.06	0.00	0.00	1.15	77.70	0.00
21	1.094	0.768	1.75	21.7	0.00	0.8	0.000	0.88	0.00	0.00	1.97	79.67	0.00
22	1.094	0.768	0.30	3.7	0.00	0.8	0.000	0.15	0.00	0.00	1.24	80.91	0.00
23	1.094	0.768	1.24	15.4	0.00	0.8	0.000	0.62	0.00	0.00	1.71	82.63	0.00
24	1.094	0.768	0.05	0.6	0.00	0.8	0.000	0.03	0.00	0.00	1.12	83.75	0.00
25	1.094	0.768	0.00	0.0	0.00	0.8	0.000	0.00	0.16	0.04	1.05	84.80	0.00
26	1.094	0.768	0.00	0.0	0.00	0.8	0.000	0.00	0.16	0.04	1.05	85.85	0.00
27	1.094	0.768	0.00	0.0	0.77	0.8	0.960	0.00	0.16	0.04	0.09	85.95	0.00
28	1.094	0.768	0.00	0.0	0.77	0.8	0.960	0.00	0.16	0.04	0.09	86.04	0.00
TOTAL	30.6	21.5	7.06	87.56	8.4		10.56	3.53	2.76	0.69	22.91	86.04	0.00

March 2005													
Day	Effluent Production (AF/day)	Irrigation Need						Rainfall Added to Storage Basin (AF)	Evaporation Rate (in/day)	Amount Evaporated from Storage Basin (AF)	Increase (+) or Decrease (-) in Storage (AF)	Amount in Storage (AF)	Supplemental Irrigation Need (AF)
		Daily Irrigation Need (AF)	Rainfall (in)	Available Rainfall (AF)	Net Irrigation Need (AF)	Irrigation Efficiency Factor	Total Irrigation Need (AF)						
1	1.094	0.950	0.00	0.0	0.95	0.8	1.187	0.00	0.16	0.04	-0.13	85.91	0.00
2	1.094	0.950	0.00	0.0	0.95	0.8	1.187	0.00	0.16	0.04	-0.13	85.78	0.00
3	1.094	0.950	0.00	0.0	0.95	0.8	1.187	0.00	0.16	0.04	-0.13	85.64	0.00
4	1.094	0.950	0.08	1.0	0.00	0.8	0.000	0.04	0.00	0.00	1.13	86.78	0.00
5	1.094	0.950	0.42	5.2	0.00	0.8	0.000	0.21	0.00	0.00	1.30	88.08	0.00
6	1.094	0.950	0.00	0.0	0.00	0.8	0.000	0.00	0.16	0.04	1.05	89.14	0.00
7	1.094	0.950	0.00	0.0	0.00	0.8	0.000	0.00	0.16	0.04	1.05	90.19	0.00
8	1.094	0.950	0.00	0.0	0.95	0.8	1.187	0.00	0.16	0.04	-0.13	90.06	0.00
9	1.094	0.950	0.00	0.0	0.95	0.8	1.187	0.00	0.16	0.04	-0.13	89.93	0.00
10	1.094	0.950	0.18	2.2	0.00	0.8	0.000	0.09	0.00	0.00	1.18	91.11	0.00
11	1.094	0.950	0.00	0.0	0.00	0.8	0.000	0.00	0.16	0.04	1.05	92.16	0.00
12	1.094	0.950	0.00	0.0	0.00	0.8	0.000	0.00	0.16	0.04	1.05	93.22	0.00
13	1.094	0.950	0.00	0.0	0.95	0.8	1.187	0.00	0.16	0.04	-0.13	93.09	0.00
14	1.094	0.950	0.00	0.0	0.95	0.8	1.187	0.00	0.16	0.04	-0.13	92.95	0.00
15	1.094	0.950	0.00	0.0	0.95	0.8	1.187	0.00	0.16	0.04	-0.13	92.82	0.00
16	1.094	0.950	0.00	0.0	0.95	0.8	1.187	0.00	0.16	0.04	-0.13	92.69	0.00
17	1.094	0.950	0.00	0.0	0.95	0.8	1.187	0.00	0.16	0.04	-0.13	92.56	0.00
18	1.094	0.950	0.00	0.0	0.95	0.8	1.187	0.00	0.16	0.04	-0.13	92.42	0.00
19	1.094	0.950	0.23	2.9	0.00	0.8	0.000	0.12	0.00	0.00	1.21	93.63	0.00
20	1.094	0.950	0.10	1.2	0.00	0.8	0.000	0.05	0.00	0.00	1.14	94.78	0.00
21	1.094	0.950	0.00	0.0	0.00	0.8	0.000	0.00	0.16	0.04	1.05	95.83	0.00
22	1.094	0.950	0.00	0.0	0.00	0.8	0.000	0.00	0.16	0.04	1.05	96.89	0.00
23	1.094	0.950	0.00	0.0	0.95	0.8	1.187	0.00	0.16	0.04	-0.13	96.75	0.00
24	1.094	0.950	0.65	8.1	0.00	0.8	0.000	0.33	0.00	0.00	1.42	98.17	0.00
25	1.094	0.950	0.01	0.1	0.00	0.8	0.000	0.01	0.00	0.00	1.10	99.27	0.00
26	1.094	0.950	0.00	0.0	0.00	0.8	0.000	0.00	0.16	0.04	1.05	100.33	0.00
27	1.094	0.950	0.00	0.0	0.95	0.8	1.187	0.00	0.16	0.04	-0.13	100.19	0.00
28	1.094	0.950	0.00	0.0	0.95	0.8	1.187	0.00	0.16	0.04	-0.13	100.06	0.00
29	1.094	0.950	0.00	0.0	0.95	0.8	1.187	0.00	0.16	0.04	-0.13	99.93	0.00
30	1.094	0.950	0.00	0.0	0.95	0.8	1.187	0.00	0.16	0.04	-0.13	99.80	0.00
31	1.094	0.950	0.00	0.0	0.95	0.8	1.187	0.00	0.16	0.04	-0.13	99.66	0.00
TOTAL	33.9	29.4	1.67	20.7	16.1		20.18	0.84	3.78	0.95	13.62	99.66	0.00

April 2005													
Day	Effluent Production (AF/day)	Irrigation Need						Rainfall Added to Storage Basin (AF)	Evaporation Rate (in/day)	Amount Evaporated from Storage Basin (AF)	Increase (+) or Decrease (-) in Storage (AF)	Amount in Storage (AF)	Supplemental Irrigation Need (AF)
		Daily Irrigation Need (AF)	Rainfall (in)	Available Rainfall (AF)	Net Irrigation Need (AF)	Irrigation Efficiency Factor	Total Irrigation Need (AF)						
1	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	98.98	0.00
2	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	98.31	0.00
3	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	97.63	0.00
4	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	96.95	0.00
5	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	96.27	0.00
6	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	95.59	0.00
7	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	94.91	0.00
8	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	94.24	0.00
9	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	93.56	0.00
10	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	92.88	0.00
11	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	92.20	0.00
12	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	91.52	0.00
13	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	90.84	0.00
14	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	90.17	0.00
15	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	89.49	0.00
16	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	88.81	0.00
17	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	88.13	0.00
18	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	87.45	0.00
19	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	86.77	0.00
20	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	86.10	0.00
21	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	85.42	0.00
22	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	84.74	0.00
23	1.094	1.379	0.02	0.2	1.130	0.8	1.413	0.01	0.00	0.00	-0.31	84.43	0.00
24	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	83.75	0.00
25	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	83.07	0.00
26	1.094	1.379	0.00	0.0	1.379	0.8	1.723	0.00	0.20	0.05	-0.68	82.39	0.00
27	1.094	1.379	0.01	0.1	1.254	0.8	1.568	0.01	0.00	0.00	-0.47	81.93	0.00
28	1.094	1.379	0.95	11.8	0.000	0.8	0.000	0.48	0.00	0.00	1.57	83.49	0.00
29	1.094	1.379	0.00	0.0	0.000	0.8	0.000	0.00	0.20	0.05	1.04	84.54	0.00
30	1.094	1.379	0.00	0.0	0.000	0.8	0.000	0.00	0.20	0.05	1.04	85.58	0.00
TOTAL	32.8	41.4	0.98	12.15	36.85		46.06	0.49	5.31	1.33	-14.08	85.58	0.00

May 2005													
Day	Effluent Production (AF/day)	Irrigation Need						Rainfall Added to Storage Basin (AF)	Evaporation Rate (in/day)	Amount Evaporated from Storage Basin (AF)	Increase (+) or Decrease (-) in Storage (AF)	Amount in Storage (AF)	Supplemental Irrigation Need (AF)
		Daily Irrigation Need (AF)	Rainfall (in)	Available Rainfall (AF)	Net Irrigation Need (AF)	Irrigation Efficiency Factor	Total Irrigation Need (AF)						
1	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	84.71	0.00
2	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	83.84	0.00
3	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	82.97	0.00
4	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	82.09	0.00
5	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	81.22	0.00
6	1.094	1.533	0.05	0.6	0.912	0.8	1.140	0.03	0.00	0.00	-0.02	81.20	0.00
7	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	80.33	0.00
8	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	79.45	0.00
9	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	78.58	0.00
10	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	77.71	0.00
11	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	76.84	0.00
12	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	75.96	0.00
13	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	75.09	0.00
14	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	74.22	0.00
15	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	73.35	0.00
16	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	72.47	0.00
17	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	71.60	0.00
18	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	70.73	0.00
19	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	69.86	0.00
20	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	68.98	0.00
21	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	68.11	0.00
22	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	67.24	0.00
23	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	66.37	0.00
24	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	65.49	0.00
25	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	64.62	0.00
26	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	63.75	0.00
27	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	62.88	0.00
28	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	62.00	0.00
29	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	61.13	0.00
30	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	60.26	0.00
31	1.094	1.533	0.00	0.0	1.533	0.8	1.916	0.00	0.20	0.05	-0.87	59.39	0.00
TOTAL	33.9	47.5	0.05	0.6	46.9		58.61	0.03	6.10	1.53	-26.20	59.39	0.00

June 2005													
Day	Effluent Production (AF/day)	Irrigation Need						Rainfall Added to Storage Basin (AF)	Evaporation Rate (in/day)	Amount Evaporated from Storage Basin (AF)	Increase (+) or Decrease (-) in Storage (AF)	Amount in Storage (AF)	Supplemental Irrigation Need (AF)
		Daily Irrigation Need (AF)	Rainfall (in)	Available Rainfall (AF)	Net Irrigation Need (AF)	Irrigation Efficiency Factor	Total Irrigation Need (AF)						
1	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	58.16	0.00
2	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	56.93	0.00
3	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	55.70	0.00
4	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	54.47	0.00
5	1.094	1.809	0.02	0.2	1.561	0.8	1.952	0.01	0.00	0.00	-0.85	53.63	0.00
6	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	52.40	0.00
7	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	51.17	0.00
8	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	49.94	0.00
9	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	48.71	0.00
10	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	47.49	0.00
11	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	46.26	0.00
12	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	45.03	0.00
13	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	43.80	0.00
14	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	42.57	0.00
15	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	41.35	0.00
16	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	40.12	0.00
17	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	38.89	0.00
18	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	37.66	0.00
19	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	36.43	0.00
20	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	35.21	0.00
21	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	33.98	0.00
22	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	32.75	0.00
23	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	31.52	0.00
24	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	30.29	0.00
25	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	29.07	0.00
26	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	27.84	0.00
27	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	26.61	0.00
28	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	25.38	0.00
29	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	24.15	0.00
30	1.094	1.809	0.00	0.0	1.809	0.8	2.262	0.00	0.24	0.06	-1.23	22.93	0.00
TOTAL	32.8	54.3	0.02	0.25	54.0		67.54	0.01	6.97	1.74	-36.46	22.93	0.00

July 2005													
Day	Effluent Production (AF/day)	Irrigation Need						Rainfall Added to Storage Basin (AF)	Evaporation Rate (in/day)	Amount Evaporated from Storage Basin (AF)	Increase (+) or Decrease (-) in Storage (AF)	Amount in Storage (AF)	Supplemental Irrigation Need (AF)
		Daily Irrigation Need (AF)	Rainfall (in)	Available Rainfall (AF)	Net Irrigation Need (AF)	Irrigation Efficiency Factor	Total Irrigation Need (AF)						
1	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	21.74	0.00
2	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	20.55	0.00
3	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	19.37	0.00
4	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	18.18	0.00
5	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	16.99	0.00
6	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	15.81	0.00
7	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	14.62	0.00
8	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	13.43	0.00
9	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	12.25	0.00
10	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	11.06	0.00
11	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	9.87	0.00
12	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	8.69	0.00
13	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	7.50	0.00
14	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	6.31	0.00
15	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	5.13	0.00
16	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	3.94	0.00
17	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	2.75	0.00
18	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	1.57	0.00
19	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	0.38	0.00
20	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	0.00	0.75
21	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	0.00	1.13
22	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	0.00	1.13
23	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	0.00	1.13
24	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	0.00	1.13
25	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	0.00	1.13
26	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	0.00	1.13
27	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	0.00	1.13
28	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	0.00	1.13
29	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	0.00	1.13
30	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	0.00	1.13
31	1.094	1.779	0.00	0.0	1.779	0.8	2.223	0.00	0.23	0.06	-1.19	0.00	1.13
TOTAL	33.9	55.1	0.0	0.0	55.1		68.93	0.00	7.08	1.77	-36.78	0.00	13.17

August 2005													
Day	Effluent Production (AF/day)	Irrigation Need						Rainfall Added to Storage Basin (AF)	Evaporation Rate (in/day)	Amount Evaporated from Storage Basin (AF)	Increase (+) or Decrease (-) in Storage (AF)	Amount in Storage (AF)	Supplemental Irrigation Need (AF)
		Daily Irrigation Need (AF)	Rainfall (in)	Available Rainfall (AF)	Net Irrigation Need (AF)	Irrigation Efficiency Factor	Total Irrigation Need (AF)						
1	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
2	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
3	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
4	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
5	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
6	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
7	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
8	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
9	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
10	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
11	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
12	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
13	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
14	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
15	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
16	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
17	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
18	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
19	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
20	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
21	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
22	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
23	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
24	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
25	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
26	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
27	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
28	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
29	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
30	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
31	1.094	1.716	0.00	0.0	1.716	0.8	2.145	0.00	0.22	0.06	-1.11	0.00	1.05
TOTAL	33.9	53.2	0.00	0.0	53.2		66.5	0.0	6.83	1.71	-34.29	0.00	32.58

September 2005													
Day	Effluent Production (AF/day)	Irrigation Need						Rainfall Added to Storage Basin (AF)	Evaporation Rate (in/day)	Amount Evaporated from Storage Basin (AF)	Increase (+) or Decrease (-) in Storage (AF)	Amount in Storage (AF)	Supplemental Irrigation Need (AF)
		Daily Irrigation Need (AF)	Rainfall (in)	Available Rainfall (AF)	Net Irrigation Need (AF)	Irrigation Efficiency Factor	Total Irrigation Need (AF)						
1	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
2	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
3	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
4	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
5	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
6	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
7	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
8	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
9	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
10	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
11	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
12	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
13	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
14	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
15	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
16	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
17	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
18	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
19	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
20	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
21	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
22	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
23	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
24	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
25	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
26	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
27	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
28	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
29	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
30	1.094	1.472	0.00	0.0	1.472	0.8	1.840	0.00	0.19	0.05	-0.79	0.00	0.75
TOTAL	32.8	44.2	0.00	0.00	44.2		55.2	0.0	5.67	1.42	-23.80	0.00	22.38

Lilac Hills Ranch Water Irrigation Use and Storage Summary - Water Year 2005

Month	Effluent Production (AF/Month)	Irrigation Need						Rainfall Added to Storage Basin (AF)	Amount Evaporated from Storage Basin (AF)	Increase (+) Decrease (-) (AF)	Amount in Storage at End of Month (AF)	Maximum Amount in Storage During Month (AF)	Supplemental Irrigation Need (AF)
		Monthly Irrigation Need (AF)	Rainfall (in)	Available Rainfall (AF)	Net Irrigation Need (AF)	Irrigation Efficiency Factor	Total Irrigation Need (AF)						
October	33.9	32.3	4.73	58.7	20.9	0.8	26.1	2.4	1.0	9.17	13.19	13.44	3.35
November	32.8	25.8	0.50	6.2	22.6	0.8	28.2	0.3	0.8	4.01	17.20	17.28	0.00
December	33.9	19.9	3.19	39.6	13.0	0.8	16.3	1.6	0.6	18.60	35.81	35.81	0.00
January	33.9	21.9	7.64	94.8	7.8	0.8	9.7	3.8	0.7	27.32	63.13	63.13	0.00
February	30.6	21.5	7.06	87.6	8.4	0.8	10.6	3.5	0.7	22.91	86.04	86.04	0.00
March	33.9	29.4	1.67	20.7	16.1	0.8	20.2	0.8	0.9	13.62	99.66	100.33	0.00
April	32.8	41.4	0.98	12.2	36.8	0.8	46.1	0.5	1.3	-14.08	85.58	98.98	0.00
May	33.9	47.5	0.05	0.6	46.9	0.8	58.6	0.0	1.5	-26.20	59.39	84.71	0.00
June	32.8	54.3	0.02	0.2	54.0	0.8	67.5	0.0	1.7	-36.46	22.93	58.16	0.00
July	33.9	55.1	0.00	0.0	55.1	0.8	68.9	0.0	1.8	-36.78	0.00	21.74	13.17
August	33.9	53.2	0.00	0.0	53.2	0.8	66.5	0.0	1.7	-34.29	0.00	0.00	32.58
September	32.8	44.2	0.00	0.0	44.2	0.8	55.2	0.0	1.4	-23.80	0.00	0.00	22.38
Total	399.3	446.5	25.84	320.5	379.1		473.8	12.9	14.3	-75.96			71.5

Storage Volume Needed 100.33 AF
 32.7 MG
 91.7 days
 Storage Depth Needed 33.4 feet
 Supplemental Irrigation Need 71.5 AF
 23.3 MG

Calculations

Calculations for Water Irrigation Use and Storage

Sample calculations are shown for October 2004.

Net Irrigation Need

$$\text{Net Irrigation Need} = \text{Daily Irrigation Need} - \text{Available Rainfall}$$

The Net Irrigation Need is equal to zero when rainfall exceeds the irrigation need, and for two days after the rainfall event.

Total Irrigation Need

$$\text{Total Irrigation Need} = \text{Net Irrigation Need} / \text{Irrigation Efficiency Factor}$$

Rainfall Added to Storage Basin

The total area of the storage basin is 6 acres. Any rain that falls in this area is added to the storage amount.

$$\text{Rain}_{\text{storage}} = \frac{\text{Rain (in)} \cdot 6 \text{ ac}}{12 \frac{\text{in}}{\text{ft}}}$$

Rainfall	0.5 in
Area	6 ac

Rain to Storage	0.3 AF
-----------------	--------

Evaporation Rate

The monthly evaporation amount was taken from the Evapotranspiration Data excel sheet which was obtained from the California Irrigation Management Information System. This number was divided by the number of days in the month on which rain did not fall to determine the daily evaporation rate.

October 2004 evaporation amount	4.15 in
Days without rain	25 days
Evaporation Rate	0.17 in/day

Amount Evaporated from Storage Basin

An average water surface area of 3 acres was assumed for calculating the amount of water evaporated from the storage basin.

$$\text{Evap}_{\text{storage}} = \frac{\text{EvapRate} \cdot 3 \text{ ac}}{12 \frac{\text{in}}{\text{ft}}}$$

Calculations

Evaporation from storage 0.04 AF/day

Evaporation from storage occurred only on days with no rainfall.

Increase or Decrease in Storage

$$\text{Change in Storage} = \text{Eff. Prod.} - \text{Tot Irri. Need} + \text{Rain to Storage} - \text{Evap. from Storage}$$

For October 17, 2004:

Effluent Production	1.094 AF
Tot Irri. Need	0.0 AF
Rain to Storage	0.25 AF
Evap. from Storage	0.0 AF
Change in Storage	1.34 AF

Amount in Storage

$$\text{Amt in Storage} = \text{Change in Storage} + \text{Amt in Storage from the previous day}$$

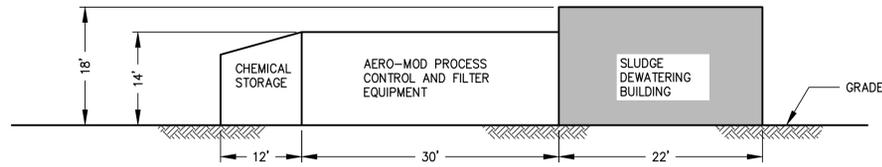
Supplemental Irrigation Need

If the amount of water in storage is equal to zero there is a supplemental irrigation need. If the amount of water in storage is greater than zero there is no supplemental irrigation need. Any supplemental irrigation need is calculated based on the following equation.

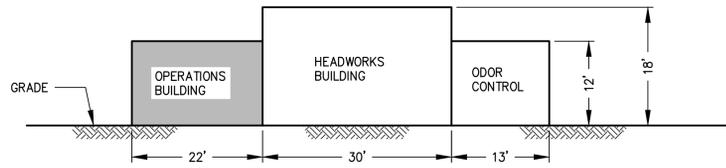
$$\text{Supp Irri. Need} = \text{Tot Irri. Need} - \text{Eff. Prod.} - \text{Amt in Storage from the previous day}$$

EXHIBIT A

**WATER RECLAMATION PLANT
LILAC HILLS RANCH**

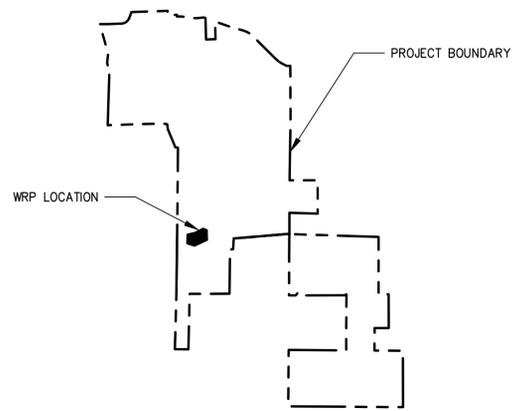


PROCESS CONTROL AND DEWATERING BUILDING
NOT TO SCALE



OPERATIONS/HEADWORKS/ODOR CONTROL BUILDING
NOT TO SCALE

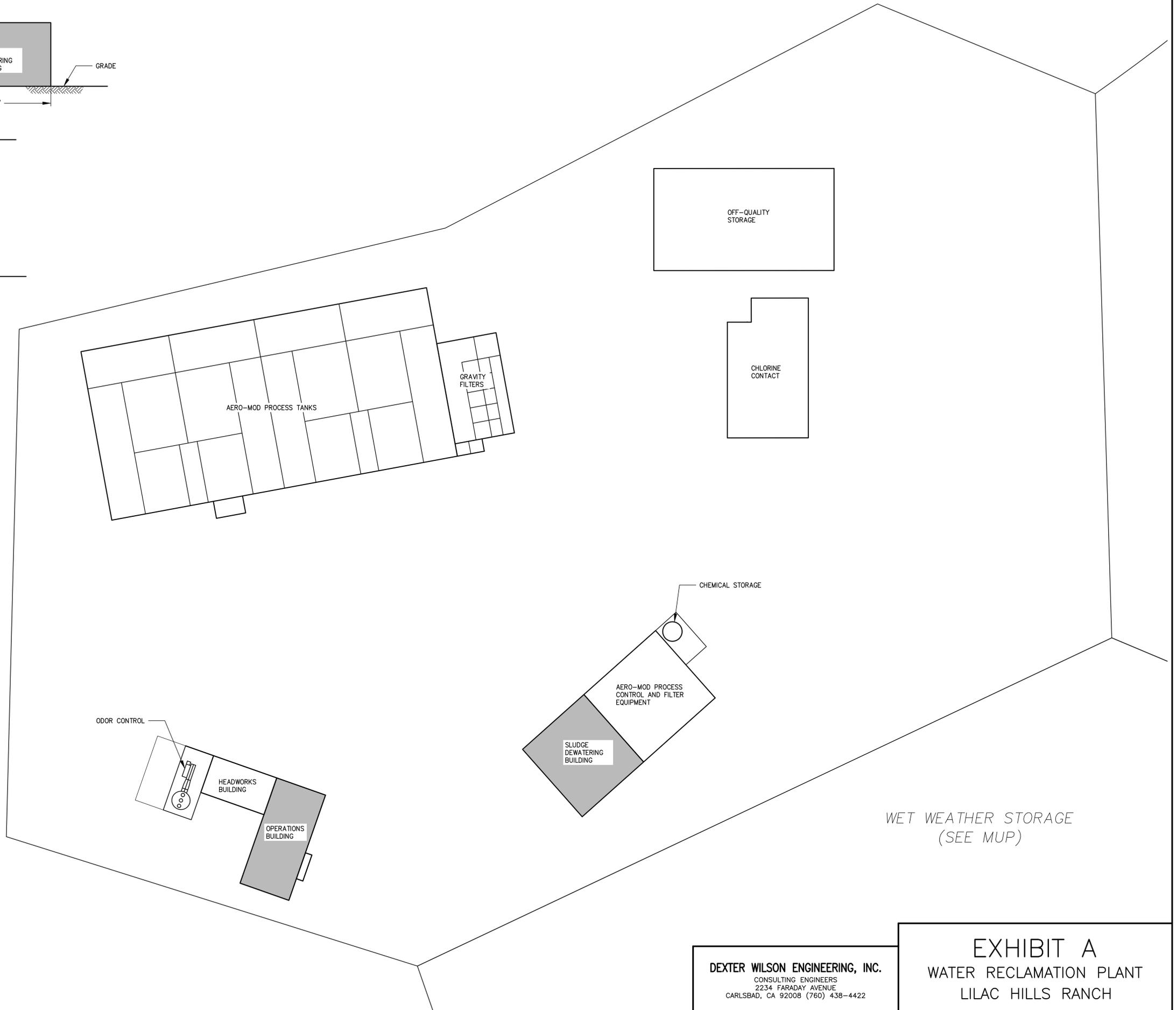
NOT NEEDED FOR SCALPING PLANT



SITE LOCATION MAP
NOT TO SCALE



SCALE: 1" = 20'



DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
2234 FARADAY AVENUE
CARLSBAD, CA 92008 (760) 438-4422

EXHIBIT A
WATER RECLAMATION PLANT
LILAC HILLS RANCH