LAFCO

Santa Barbara Local Agency Formation Commission
105 East Anapamu Street ◆ Santa Barbara CA 93101
805/568-3391 ◆ FAX 805/568-2249
www.sblafco.org ◆ lafco@sblafco.org

April 5, 2018 (Agenda)

Local Agency Formation Commission
105 East Anapamu Street
Santa Barbara CA 93101

Consider Execution of the Certificate of Completion for LAFCO File 17-01: Formation of the Los Olivos Community Services District

Dear Members of the Commission

RECOMMENDATION

1) It is recommended that the Commission Execute the Certificate of Completion for LAFCO File 17-01: Formation of the Los Olivos Community Services District.

DISCUSSION

Following your Commission's approval of the Formation of the Los Olivos Community Services District on April 13, 2017 and a protest hearing with less than a majority vote held on June 21, 2017, the district formation was set for a mailed ballot election to be held on January 30, 2018. On February 8, 2018, Joseph E. Holland, County Clerk-Recorder-Assessor, certified the canvass of the returns of votes cast and determined the value of the votes as follows: 265/73.4% in favor and 96/26.6% against. The election required a two/thirds vote because of the levying of a special tax. The Board of Supervisors declared the results of the election on February 27, 2018.

Although the Cortese-Knox Hertzberg Act allows the Executive Officer to prepare and record the Certificate of Completion for most changes of organization, for changes that are approved at an election, Government Code Section 57176 reads in pertinent part as follows:

"The commission shall execute, within 30 days of the canvass of the election, a certificate of completion confirming the order of the change of organization or reorganization if a majority of votes cast upon the question are in favor of the change of organization or reorganization in any of the following circumstances: (a) At an election called in the territory ordered to be organized or reorganized".

any of the following circumstances: (a) At an election called in the territory ordered to be organized or reorganized".

Staff has included a proposed Certificate of Completion for the Commission's review and approval **(Exhibit A).** The Certification of the Canvass of the January 30, 2018 Election Results is attached to the Certificate.

Exhibits:

Exhibit A Certificate of Completion

Please contact the LAFCO office if you have any questions.

Sincerely,

Paul Hood

PAUL HOOD
Executive Officer

Recording Requested By:

LAFCO

Santa Barbara Local Agency Formation Commission

Return via interoffice mail to:

LAFCO
105 East Anapamu Street Rm. 407
Santa Barbara CA 93101
805-568-3391 FAX 805-568-2249

No Fee Per Government Code § 6103

CERTIFICATE OF COMPLETION

In the matter of the formation of the Los Olivos Community Services District, the Santa Barbara Local Agency Formation Commission approved formation on April 13, 2017 through Resolution of Approval No. 17-05. Pursuant to Government Code section 57176, the Commission shall execute, within 30 days of the canvass of the election, a certificate of completion confirming the order of the change of organization or reorganization if a majority of votes cast upon the question are in favor of the change of organization or reorganization in an election called in the territory ordered to be organized or reorganized. With the completion of the confirmation election, the Commission finds that no other conditions imposed by the Commission on the formation of the District are required to be satisfied prior to formation.

The Commission ordered the formation of the District subject to a two-thirds vote cast upon the question of formation were in favor of the change of organization. (See Attachment A.) This condition has been met as of February 8, 2017, when County Clerk/Registrar Joseph E. Holland certified the results of the formation election and determined the measure was approved by over two-thirds of the registered voters residing within the boundaries of the proposed District.

The Commission hereby determines and finds that this certificate of completion is complete and in accordance with Resolutions No. 17-05. Further, the Commission finds and determines:

1. The short-form designation of the proceeding is: "17-05: Formation of the Los Olivos Community Services District."

2. The District is located in the Santa Ynez Valley and is comprised of 302 acres.

3. Commission Resolution of Approval No. 17-05 is made a part of this certificate by reference and said Resolution sets forth the boundaries of the new District. (See Attachment B.) The terms and conditions of approval, as authorized and mandated by the Community Services

District Law, Government Code section 61000 et seq., and the Cortese Knox Hertzberg Act, Government Code section 56000 et seq., are as follows:

a. The name of the district shall be the "Los Olivos Community Services District."
b. The District shall be governed by a five-member Board of Directors elected at large. Terms of office of the District directors shall be as set forth in the Community Services District Law, Government Code section 61000 et seq.
c. The District shall have those powers and responsibilities set forth in the Community Services District Law, Government Code Section 61100(b), which is to collect, treat, or dispose of sewage, wastewater, recycled water, and storm water, in the same manner as a sanitary district, formed pursuant to the Sanitary District Act of 1923, Division 6 (commencing with Section 6400) of the Health and Safety Code. In the case of any conflict between that division and this division, the provisions of this division shall prevail. All other powers of Community Services District shall be considered latent and shall require LAFCO approval to become active.
d. The District shall be authorized to levy and collect a special tax, as approved by the voters, as follows:
    i. The maximum annual special tax authorized for the District shall be Two Hundred Thousand ($200,000) and shall increase automatically each fiscal year thereafter by the percentage change in the Consumer Price Index for the Los Angeles/Long Beach area for the prior 12 months.
    ii. The actual tax to be levied for any fiscal year shall be determined by a majority vote of the board of directors of the District on the basis of the actual revenues estimated to be required by the District to pay its reasonable and necessary expenses for such year.
    iii. The method of tax collection shall be the regular county assessment roll.
    iv. The tax shall be applied to each legal lot within the District, except that unimproved property may be taxed at a lower rate than improved property.
    v. The District's authority to levy the tax shall terminate once the District successfully adopts an assessment pursuant to Article XIII D Section 6 of the California Constitution (Proposition 218) to generate revenue sufficient to fund its administrative costs through charges other than the tax.
e. Should the Board of Directors levy any of the "Proceeds of Taxes," described above, it will establish an Appropriations Limit. The "provisional appropriations limit of the district" shall be set at $250,000. This assumes the maximum special tax levy of $200,000, plus a 25 percent buffer. Pursuant to subsection (c), the permanent

appropriations limit of the district shall be set at the first district election that is held following the first full fiscal year of operation.

f. The District shall adopt an assessment pursuant to Article XIII D Section 6 of the California Constitution to generate revenue as necessary to fund the wastewater treatment facilities for the area, including the California Environmental Quality Act and other planning analysis, assessment study and necessary election. The Commission may otherwise extend such deadline, if other Commission approved arrangements are made for funding such construction.

4. The effective date of formation of the District shall be the date of the recordation of this Certificate of Completion.

This Certificate of Completion is hereby approved by the Commission on April 5, 2018 in Santa Barbara, California.

AYES:

NOES:

ABSTAINS:

Dated: ______

____
Chair
Santa Barbara Local Agency
Formation Commission

ATTEST

____
Jacquelyne Alexander, Clerk
Santa Barbara Local Agency Formation Commission

CERTIFICATE OF THE COUNTY CLERK-RECORDER-ASSESSOR OF RESULTS OF CANVASS OF ALL VOTES CAST AT THE LOS OLIVOS COMMUNITY SERVICES DISTRICT FORMATION ELECTION JANUARY 30, 2018

I, Joseph E. Holland, County Clerk, Recorder, and Assessor of the County of Santa Barbara, do hereby certify that pursuant to law I did canvass the returns of the votes cast at the above referenced election, and that the following Statement of Votes Cast shows the number of votes cast for and against Measure P2018, and for the candidates for Director, are full, true and correct.

STATEMENT OF VOTES CAST

LOS OLIVOS COMMUNITY SERVICES DISTRICT FORMATION ELECTION

January 30, 2018

Number of Registered Voters: 486

Number of Ballots Cast: 363

Precinct: 30-3670

Measure P2018

Los Olivos Community Services District Formation and Tax — Votes Cast / %

YES	265 / 73.4%
NO	96 / 26.6%

Director

Vote for no more than 5 — Votes Cast / %

Thomas Fayram	256 / 20.4%
Michael E. Arme	247 / 19.7%
Lisa Palmer	246 / 19.6%
Brian A. O'Neill	243 / 19.4%
Julie Kennedy	240 / 19.2%
Write-in votes	21 / 1.7%

I hereby set my hand and official seal this 8th day of February, 2018.

JOSEPH E. HOLLAND, County Clerk-Recorder-Assessor

ATTACHMENT A

RESOLUTION OF THE LOCAL AGENCY FORMATION COMMISSION OF THE COUNTY OF SANTA BARBARA, STATE OF CALIFORNIA

DIRECTING THE BOARD OF SUPERVISORS TO DIRECT COUNTY ELECTIONS TO CONDUCT THE NECESSARY ELECTIONS ON BEHALF OF THE PROPOSED LOS OLIVOS COMMUNITY SERVICES DISTRICT

RECITALS

Whereas, on April 13, 2017, the Commission approved the formation of the proposed Los Olivos Community Services District for the purpose of providing a funding mechanism for the building and operation of facilities necessary to collect, treat, and dispose of sewage, wastewater, recycled water, and storm water in the unincorporated territory known as the Los Olivos Community subject to the terms and conditions specified in Commission Resolution 17-04.

Whereas, pursuant to Government Code section 57002 the Executive Officer conducted a protest hearing on June 21, 2017 regarding the formation of the proposed Los Olivos Community Services District.

Whereas, the Executive Director has caused the names on the protest forms to be compared with the voters' register in the office of the registrar of voters and ascertained the value of the protests filed and not withdrawn and found that there were 80 valid protests against the formation of the proposed Los Olivos Community Services District and that there were 488 registered voters residing in the proposed formation area at the close of business on June 21, 2017.

Whereas, on August 3, 2017, the Executive Officer reported to the Commission that a majority protest to the formation of the Los Olivos Community Services District did not exist.

ATTACHMENT B

NOW, THEREFORE, THE COMMISSION HEREBY RESOLVES AS FOLLOWS:

1. Pursuant to Government Code section 61014(e)(2)(B), the Commission hereby orders the formation of the Los Olivos Community Services District and the special tax be subject to the approval of the voters.

2. The affected territory is the unincorporated area of Santa Barbara County known as Los Olivos as approved by the Commission on April 13, 2017 and as shown on Attachment A.

3. The purpose of the special tax shall be to fund the reasonable and necessary expenses of the proposed District and such proceeds shall be applied only to such purpose.

4. The ballot question for the formation of the district and the special tax shall be approved by a two-thirds vote of the voters voting in the election on the issue. Pursuant to Government Code section 61014(c), if the voters do not approve the special tax, the proposed district shall not be formed

5. The method of tax collection shall be the regular county assessment roll.

6. The tax proceeds shall be deposited into a special account and the District shall prepare an annual report pursuant to Government Code section 50075.3.

7. The Commission hereby approves the proposed ballot question for the formation of the District and approval of the special tax as set forth in Attachment B.

8. The Commission hereby directs the Board of Supervisors to direct County Election Officials to conduct the necessary elections on behalf of the proposed Los Olivos Community Services District including election of a board of directors.

//

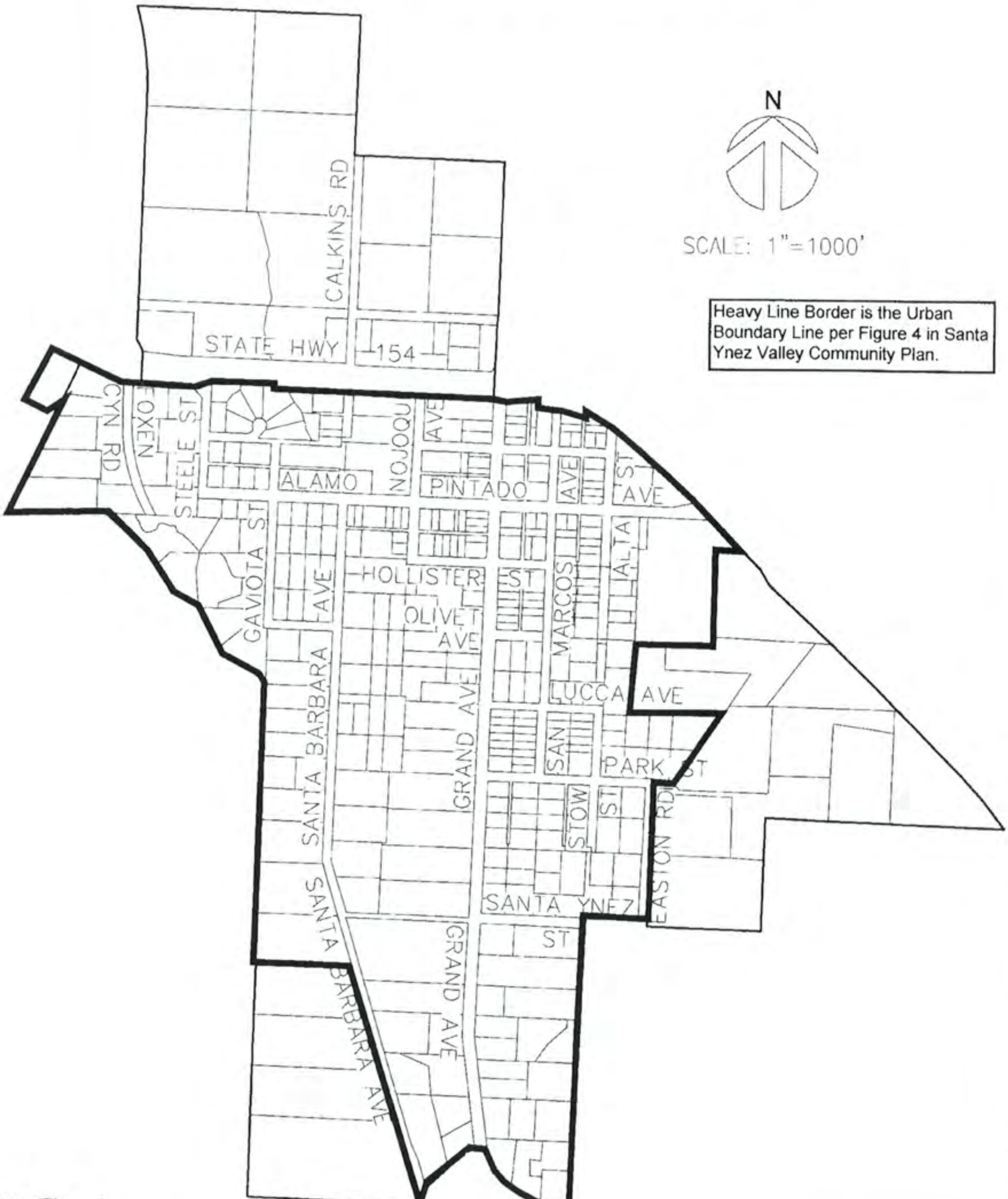
Santa Barbara LAFCO
Resolution No. 17-05

Attachment A

Map of the Affected Territory Approved by the Commission on April 13, 2017

ATTACHMENT B

Proposed Formation of the Los Olivos Community Services District



MNS ENGINEERS INC
201 N. Calle Cesar Chavez, Ste 300
Santa Barbara, CA 93103
805.692.6921 Phone

ENGINEERING
PLANNING
SURVEYING
CONSTRUCTION MANAGEMENT

LOCSD.160586.00 * ANX MAP dwg * 11/16/2016 * RCS * E-FILE

Prepared April 11, 2017
Number of Assessor's Parcels = 390
Total Area within Formation Boundary = 302 Acres

EXHIBIT A

ATTACHMENT B

Attachment B

BALLOT QUESTION

MEASURE X2018
LOS OLIVOS COMMUNITY SERVICES DISTRICT FORMATION

Shall the order adopted on April 13, 2017 by the Santa Barbara County Local Agency Formation Commission ordering the formation a community services district in the unincorporated territory known as Los Olivos be approved subject to such terms and conditions, including authorization of an annual special tax not to exceed $200,000 which shall increase automatically each fiscal year thereafter by the percentage change in the Consumer Price Index, all as more particularly described and set forth in the order?

YES ____ NO ____

PASSED AND ADOPTED by the Commission in Santa Barbara, California, on September 7, 2017 by the following vote:

AYES: Commissioners Geyer, Hartmann, Moorhouse, Richardson, Stark, Wolf and Aceves

NOES:

ABSTAINS:

Dated: September 7, 2017.

Roger Aceves, Chair
Santa Barbara County Local Agency Formation Commission

ATTEST:

Jacquelyne Alexander

Jacquelyne Alexander, Clerk
Santa Barbara County Local Agency Formation Commission

ATTACHMENT B

Water

Submitted to
Santa Barbara County
Environmental Health Services
225 Camino Del Remedio
Santa Barbara CA 93110

Submitted by
AECOM
1194 Pacific St., Ste. 204
San Luis Obispo CA 93401
Date: January 8, 2013

Los Olivos Wastewater System Preliminary Engineering Report

Water

Submitted to
Santa Barbara County
Environmental Health Services
225 Camino Del Remedio
Santa Barbara CA 93110

Submitted by
AECOM
1194 Pacific St., Ste. 204
San Luis Obispo CA 93401
Date: January 8, 2013

Los Olivos Wastewater System Preliminary Engineering Report

January 8, 2013

Prepared By Eric Casares, P.E.

REGISTERED PROFESSIONAL ENGINEER
ERIC TIMOTHY CASARES
No. 73351
Exp. 12/31/2012
CIVIL
STATE OF CALIFORNIA

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1 Introduction

Santa Barbara County Environmental Health Services has directed the development of this Preliminary Engineering Report (PER) in a continuing effort to address and recommend long-term solutions for the wastewater disposal issues in the Los Olivos Special Problems Area (SPA) of the Santa Ynez Uplands Groundwater Basin.

This PER provides technical recommendations to develop a communal wastewater treatment system for the community of Los Olivos as recommended in the Los Olivos Wastewater Management Plan[1] (LOWWMP). This Background and Introduction highlights and updates some important information from the LOWWMP and lends context and understanding to the goals, objectives and approach of this PER.

1.1 Site Location and Setting

The community of Los Olivos is located in the Santa Ynez Valley, north of the City of Santa Barbara along State Highway 154 and has a permanent population of approximately 1,000 residents. Due to the popularity of the area as a tourist destination, the community's population increases by two to three times this amount during weekends and holidays.

The study area contains approximately 418 parcels, 340 of which are located in the township of Los Olivos. The Santa Ynez Valley 2009 Community Plan Environmental Impact Report (2009 EIR)[2] identifies 400 existing residential units in Los Olivos and 228,990 square feet (sf) of developed commercial area. Many of the commercial businesses are located in the downtown area and consist of restaurants, hotels, wine tasting rooms and retail shops that support the high tourism the town experiences.

As displayed in Figure 1.1, the topography in the Los Olivos area slopes from north to south and towards Alamo Pintado Creek which runs north to south through the community. The soil types in the area can generally be described as relatively impermeable silts and clays. Groundwater depths vary but can be as shallow as 5 feet during wet winter months.

1.2 Background and Summary of Key LOWWMP Issues

1.2.1 History

The Los Olivos Special Problems Area designation was established in 1974. The limits of the SPA are shown on Figure 1.2. The SPA designation requires an additional review for development projects to mitigate any threats to public health. In addition, the Central Coast Regional Water Quality Control Board (RWQCB) has imposed wastewater flow restrictions on each parcel thereby limiting the owner's use of the property. There are currently ten "Special Problems Areas" in the County of Santa Barbara, with Los Olivos being the first management plan prepared to address onsite wastewater issues. More and more areas of California with increasing onsite wastewater effluent loads are identifying groundwater quality issues and are adopting management plans to address the problem.

[1] Santa Barbara County Los Olivos Wastewater Management Plan (Environmental Health Services, September 2010)
[2] Santa Ynez Valley Community Plan Environmental Impact Report (County of Santa Barbara, September 2009)

There are a number of factors that make the use of onsite wastewater treatment systems (OWTS) a problem in the Los Olivos Special Problem Area. These factors include:

- A high groundwater table exists seasonally in many areas of Los Olivos resulting in an inadequate separation of groundwater to existing leach fields and dry wells. In some cases, septic system effluent is being discharged directly into the shallow groundwater table.
- Many small lots in the Los Olivos SPA have inadequate area for proper sizing or set-backs for leach fields. The RWQCB has historically determined that a developed residential lot of less than one acre in size is insufficient for a competent leach field, and new State standards require 2.5 acres for new subdivisions using OWTSs.
- The age of many septic systems in the Los Olivos area exceed the expected life of septic tanks and/or dispersal systems. Many of these are no longer treating the wastewater or leaching effectively.
- Many of the existing systems are not designed to current codes and requirements. A number of existing systems were installed under antiquated design standards under marginal site conditions.
- The number of marginal or ineffective systems is exacerbated by the high density of OWTSs in Los Olivos. Based on the average annual rainfall of the Santa Ynez Valley, and the calculated effluent from the existing OWTS in the Special Problems Area, approximately 50% of the current groundwater recharge contributed by the surface rains directly over the Special Problem area is from area septic system effluent.

1.2.2 Water Quality Issues

The LOWWMP documents the upward trend of nitrates in both the shallow and deep aquifers, describes the issues with existing septic systems, and presents alternatives and recommendations for resolving the upward trend of this contamination and gradually improving ground water quality. The LOWWMP also recommends development of a community wastewater treatment system for the downtown core, and other lots that do not meet current or anticipated Onsite Wastewater Treatment System (OWTS) design requirements.

A great deal of information is presented in the LOWWMP on the water quality data from well testing performed in the Los Olivos area. Shallow wells in and around the problem area, and deeper wells immediately under or adjacent to the problem area, are most influenced by the nitrate contamination.

Since the LOWWMP was published, new water quality data has been obtained from 2011 and the first half of 2012 for various municipal wells down gradient or in the immediate vicinity of the Los Olivos Special Problem Area. Measured nitrate levels from 2011 and the first half of 2012 are generally consistent with earlier reported levels.

1.2.3 Community Wastewater Treatment System

As identified in the LOWWMP, there is currently some support within the business community to implement a community wastewater system for the benefit of the downtown commercial area as soon as feasible. This support stems from the fact that as substandard systems fail, there are few options for repair and replacement of these systems because of the small, compact lots in the downtown area. This condition also limits the extent that the businesses may be able to do business as they desire, or develop to the highest zoned use, add restrooms, wash facilities or sinks, or engage in high water use activities. There is also a desire by the business community to be able to construct public restrooms. Options for funding and operating are discussed in the PER. Key concerns for the community are local control and reasonable costs. One goal is to offset high initial capital improvement costs by tapping into grants, low-interest loans, and possibly other agencies.

Options for a package or expandable system are analyzed in greater technical detail in this PER than presented in the LOWWMP.

1.2.4 Centralized Sewer Option and Connection to the Solvang WWTP

The alternative of a centralized sewer collection and treatment system, including the option to pipe untreated wastewater to the Solvang Wastewater Treatment Plant (WWTP) is presented in a summary fashion in the LOWWMP. It is updated here, to give the option some discussion in this PER. A rigorous investigation of this option was not pursued for several reasons:

- Initial community comments during development of the LOWWMP,
- Policies of the Santa Ynez Valley Community Plan[3] (SYVCP), adopted during the preparation of the LOWWMP that limit sewer extensions across jurisdictional boundaries, and
- Preliminary capital improvement cost estimates non-competitive to other options, assuming Solvang WWTP improvements.

1.2.4.1 Wastewater Treatment

The Solvang wastewater treatment plant lies down-gradient approximately 6 miles from Los Olivos. There have been no formal discussions with the City of Solvang regarding the possibility of connecting to their plant, although the concept has been informally discussed within the Los Olivos community since the formation of the SPA in the 1970's.

The City of Solvang WWTP collects and treats wastewater from within the Solvang city limits and the Santa Ynez Community Service District (SYCSD) service boundary. The plant has a capacity of 1.50 million gallons per day (mgd) that is contractually allocated between the City of Solvang (1.20 mgd) and SYCSD (0.30 mgd). A small amount of the SYCSD allocation is used by the Chumash Reservation.

The Solvang WWTP is currently operating at an average daily flow of approximately 0.72 mgd. Additional capacity is allocated for future build-out of the Skytt Mesa subdivision, as well as by some development infill on various underdeveloped or undeveloped lots in the City. There could be as many as 464 future residential units built as projected in section 5.13 of the Water System Master Plan Update EIR[4] (based on January 2011 accounting of dwelling units) and there is a potential for approximately 260,000 gpd in additional water consumption. Wastewater return is between 60-90% of water demand, thus the increase in wastewater would be between 0.16-0.23 mgd.

Typically the RWQCB requires reporting and planning activities leading plant capacity improvement once 80% of the average dry-weather flow design capacity of the plant is exceeded. This means that significant plant capacity improvements would need to be considered once the plant reaches 80% of capacity, or 1.2 mgd. Any detailed analysis of this option would need to consider this fact, and consider if flows from Los Olivos would cause plant capacity to exceed a total of 1.2 mgd at the time of completion or within projected build-out of the City and SYCSD. Potential plant improvements may need to be studied, planned, or implemented if this were the case.

If this option were to trigger capacity improvements at the Wastewater Treatment plant, modifications may be needed to primary and secondary treatment systems, solids drying and handling facilities, and may also trigger the imposition of the addition of tertiary treatment processes by the RWQCB sooner than otherwise required.

[3] Santa Ynez Valley Community Plan (County of Santa Barbara, October 2009)
[4] City of Solvang Water System Master Plan Update EIR (Meridian Consultants, June 2012)

It is unknown what the cost may be to increase the capacity of the Solvang WWTP. Also, operations and maintenance cost will be billed as customer use. There will be no co-ownership agreement between Solvang and Los Olivos if they were to connect to the Solvang WWTP.

Regional wastewater treatment has some advantages. They include cost sharing in the development of treatment improvements as future wastewater regulatory requirements for tertiary treatment are imposed by the RWQCB, a more efficient use of land for treatment, reducing land purchase costs, and a consolidation of O & M costs.

1.2.4.2 Wastewater Collection and Pipeline to Solvang

In addition to possible treatment plant modifications, a 6.7 mile long “carrier main” pipeline would be required which could be a separate main to the lift station at the Santa Ynez River, or may include up to a half mile of replacement of existing Solvang Trunk Mains if a common main through town is used. This would be in addition to the local collection system in the Los Olivos community.

The existing Lift Station at the Santa Ynez River and force main are relatively new, but the capacity of this facility at build-out would need to be evaluated to determine if modifications would be required to accommodate the additional flows from Los Olivos. Improvements required could range from wet-well capacity improvements to full system replacement.

The estimated cost of construction for this collection system and carrier main is presented in the LOWWMP, but is updated below based on increasing construction costs as represented also in the PER:

Table 1.1 – Cost to Pipe Los Olivos Effluent to Solvang

Item	Estimated Cost ($ Millions)
32,700 ft. 15” trunk main (includes project development costs)	12.1
2,280 ft. 24” and 30” Main Replacement	0.96
Total	**13.1**

1.2.4.3 Joint System With Ballard

Both the option to connect to Solvang, and connecting to a joint system with Ballard conflict with the Santa Ynez Valley Community Plan (SYVCP) policy WW-SYV-3, which discourages annexation or extension of sewer lines into other jurisdictions due to its growth-inducing impacts. Therefore, this option would require an amendment to the SYVCP or a Board of Supervisors’ finding that the existing conditions constitute a threat to public health. In addition, a LAFCO action could be required or a non-contiguous service agreement between agencies may have to be developed.

1.2.4.4 Cost Considerations

In general, the following is a summary of cost considerations for this option. (A detailed study would be necessary to assign a detailed numerical estimate):

- Collection system costs would be similar to other options, or about $8.3 million.
- Carrier main project development and construction costs, at about $13.1 million.

- Operations and Maintenance costs of both the collection system as well as contributions to O&M at the WWTP. These costs could range as high as $250K-$300K annually.
- Administrative Annexation & Cooperative Agreement Costs.
- Potential cost to increase capacity at the Solvang WWTP, if determined that the Los Olivos WW contributes to the 80% capacity “trigger” at Solvang SYCSD build-out.
- Potential cost to modify existing lift station and force main, if required.
- Environmental studies and EIR development.
- Design and construction management and inspection costs for any non-pipeline elements.

1.3 New State Policies on OWTS from the SWRCB

Since the LOWWMP was published in the fall of 2010, the State Water Resources Control Board (SWRCB) has adopted new policy as a result of Assembly Bill 885 establishing criteria for the siting, installation and operation of OWTS throughout the State. The new standards contained in the policy are stricter than those that currently exist and make a community treatment facility more desirable. The new statewide standards for wastewater systems are organized by “tier”. A basic description of each tier follows:

Tier 0- Systems in this tier are existing previously permitted systems that are functioning as designed. These OWTS will remain in tier 0 until their status changes due to failure. The OWTSs on parcels of an acre or more in the Los Olivos area will be considered as Tier 0 until they are in need of repair. OWTS that are located on the small township lots are unlikely to remain in the Tier 0 category and will subject to the requirements of a Local Area Management Plan (LAMP).

Tier 1- These OWTS are considered “low risk” and the standards contained in tier 1 apply for all areas in California that do not have a Local Area Management Program. This tier establishes the requirement that all new and replacement systems be engineered and requires additional setbacks from water bodies, establishes vertical separation from groundwater and prohibits the use of seepage pits (drywells). This Tier also specifies other engineering requirements, application rates and minimum lot sizes of 2.5 acres for subdivisions proposing to use OWTSs. These requirements would certainly apply to entire County of Santa Barbara as well as Los Olivos unless a Local Area Management Plan is developed and adopted.

Tier 2- This is the “Local Area Management Plan” or LAMP tier that is a custom crafted, county wide plan that addresses the siting, installation and repair of OWTSs. Because the LAMP is written to reflect local conditions, it does not have to follow the Tier 1 requirements. However, it has to be approved and overseen by the RWQCB and it is certain that areas such as Los Olivos with substandard lots and groundwater concerns would have supplemental treatment requirements. If standards are proposed that are less stringent than the Tier 1 statewide requirements, an explanation must be provided to the RWQCB explaining how the lesser standards are as protective to groundwater and surface water. Any Local Area Management Plan would certainly impact Los Olivos.

Tier 3- This tier is specifically for impacted area where a Total Maximum Daily Load (TMDL) for contaminants has been established by the RWQCB or special provisions established within an approved Local Area Management Plan. These are the requirements for supplemental treatment which include installation, monitoring and maintenance. These standards will impact Los Olivos and could contain requirements for an operating permit, mandatory maintenance and a maintenance district.

Tier 4- These are repair standards which will impact all OWTSs countywide.

OWTS located in Los Olivos could not be considered as “low risk” due to the constraints previously noted. Therefore the OWTS could only be considered in a Tier 2 or Tier 3 wastewater program and would require that OWTS effluent be treated with supplemental treatment to remove constituents of concern.

1.4 Purpose and Scope

The purpose of this Preliminary Engineering Report (PER) is to discuss, evaluate, and make recommendations for a community wastewater collection, treatment and disposal system for the downtown core, as well as other parcels in the Los Olivos Special Problem Area.

The PER builds on the recommendations of the Los Olivos Wastewater Management Plan (LOWWMP). The LOWWMP provides recommendations to reduce septic system usage and address nitrate levels in groundwater. This PER further explores wastewater collection, treatment and disposal alternatives discussed in the LOWWMP. An assessment of two types of collection systems, four treatment system options, and four effluent disposal alternatives is provided. These alternatives were selected based on discussions with County staff, anticipated wastewater permit requirements, and AECOM’s understanding of the community’s needs.

In addition to collection, treatment, and disposal alternatives, preliminary evaluation criteria for siting a Wastewater Treatment Plant (WWTP) and disposal facilities are provided. Evaluation criteria include acreage requirements, zoning, and potential impacts to adjacent uses.

For discussion purposes, an Engineer’s Opinion of Construction Cost is presented and analyzes the costs of treatment, effluent disposal, and collection system components for the most likely project. Operations and maintenance costs were also estimated. To better understand the financial impact to the community, a preliminary estimate of the anticipated cost range per user is also provided. A brief discussion is provided on the formation of a managing body, such as a district that will be necessary to oversee the funding, operation and maintenance of the assumed WWTP and disposal facilities.

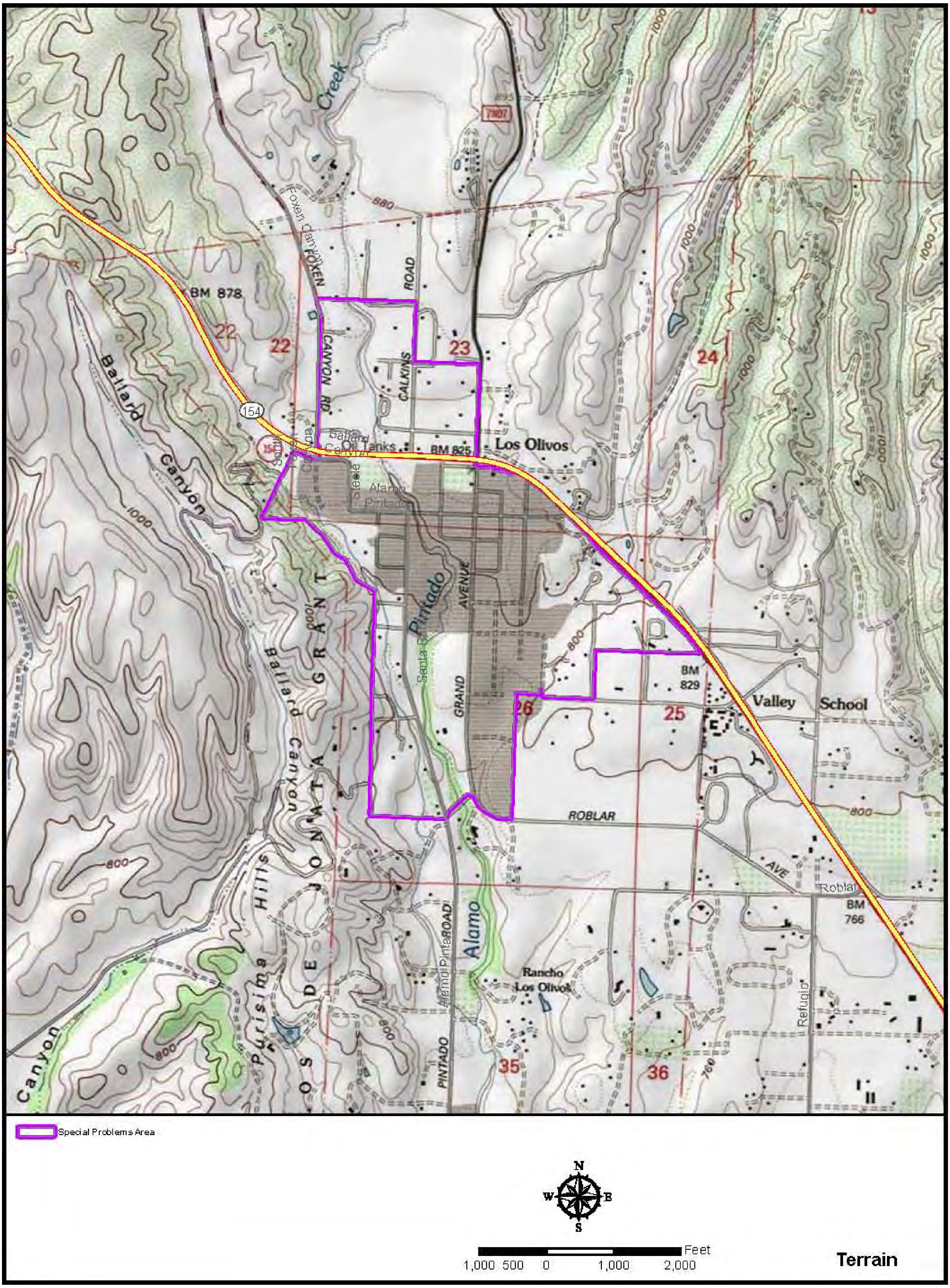

Figure 1.1 Area Topography

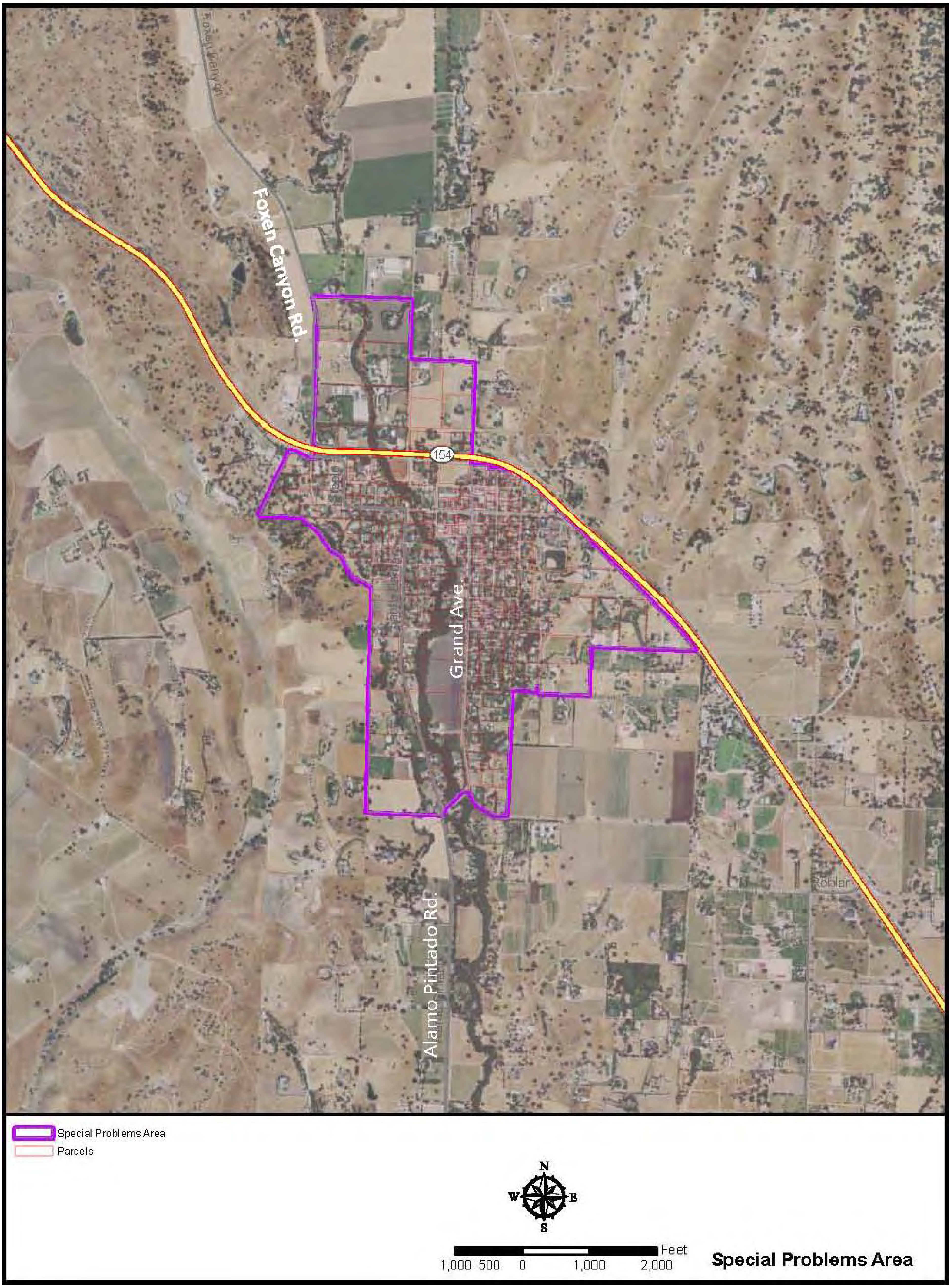

Figure 1.2 Special Problems Area

2 Project Phasing

The collection system and WWTP for the Los Olivos SPA may be implemented in one, two or three distinct phases. In this study it is assumed the collection system and WWTP would be developed in three (3) phases, although phase 1 and 2 can be combined if it would improve the affordability of the first phase, and if it is desired by the County. As discussed in the LOWWMP, the initial focus of the project will be on the largely commercial downtown core and in the future, facilities may be expanded to include more existing residential users as well as future residents and businesses. The specific phasing approach for the project is discussed in detail below.

2.1 Overview

Several factors have contributed to the specific focus on the downtown core including:

- Number and concentration of small lots;
- Higher water use per system connection; and
- Shallow groundwater table

In addition to these key factors, commercial business owners have been prevented from fully developing their property and adding sufficient public restroom facilities to support tourist traffic during the weekends. Implementation of a new centralized system will alleviate the wastewater impacts to the underlying groundwater basin and remove the restriction to expansion of local businesses.

2.2 Phase I (Existing Commercial and Select Residential)

The focus of the initial phase (Phase I) of the Los Olivos WWTP is the existing commercial area within the downtown core as shown in Figure 2.1. Estimates of the existing commercially developed area were obtained from the 2009 EIR. As part of the 2009 EIR, AECOM evaluated estimated water demands and wastewater generation factors for the communities located within the Santa Ynez Valley, including Los Olivos. The 2009 EIR was adopted by the Board of Supervisors (BOS) in October 2009. In addition to commercial development, a small number of residential lots will be included in Phase I due to their location and the convenience extending service to them while primarily serving the commercial area. Descriptions of the Phase I residential and commercial components are provided below.

2.2.1 Residential Component

According to County staff, there are a small number of residential parcels located near the downtown core that are less than a half-acre. Within this report, these lots will be referred to as substandard lots. Due to their small size and lack of sufficient area for adequate treatment and disposal of wastewater, significant challenges are present when upgrades to the onsite wastewater treatment systems (OWTSs) are required.

County staff has estimated there are a total of 40 substandard residential lots in the northern portion of the community near the downtown core. Of these, up to 25 are located on the east side of Alamo Pintado Creek contiguous to the downtown area. Therefore, for the purpose of this report, the capacity to serve 25 of these residences will be added to Phase I of the project. This additional capacity has been assumed since the property owner for a substandard residential parcel located adjacent to the downtown core's new collection system alignment may opt to connect to the community wastewater system rather than upgrade their existing OWTS.

2.2.2 Commercial Component

According to the 2009 EIR, there are currently 228,990 sf of commercially-developed area within the Los Olivos downtown area. This area, along with the wastewater generation factors developed in the 2009 EIR, will be used to develop the flow and loading contributions from the commercial component for the Phase I project. A discussion of the flows and loadings determinations is provided in Section 3 of this PER.

2.3 Phase II (Build-Out Commercial and Select Residential)

Like Phase I, Phase II of the Los Olivos WWTP will be primarily focused on the commercial component of the downtown core. Information obtained from the 2009 EIR was used to develop estimates for the commercial component of Phase II.

2.3.1 Residential

The residential component of the Phase II project will not change from Phase I.

2.3.2 Commercial

According to the 2009 EIR, the downtown core has a build-out capacity of approximately 1,018,000 sf. This figure, along with the wastewater generation factor developed in the EIR, is used to develop the flow and loading contributions from the commercial component for the Phase II project.

2.4 Phase III (Build-Out Commercial and Build-Out Residential)

Phase III of the project as shown in Figure 2.1 represents the ultimate build-out phase of the WWTP, and will add the capacity to treat the wastewater generated by the remaining local residences.

2.4.1 Residential

The 2009 EIR estimates the total residential units in Los Olivos at 400. The Phase III project will have the capacity to treat the wastewater generated by these 400 units or connections. Since 25 substandard residential lots were already accounted for in Phase I and II, Phase III will add capacity to serve the remaining 375 residences.

2.4.2 Commercial

Since Phase II of the project represents the build-out of the downtown core, the commercial component of the Phase III project remains unchanged from Phase II.

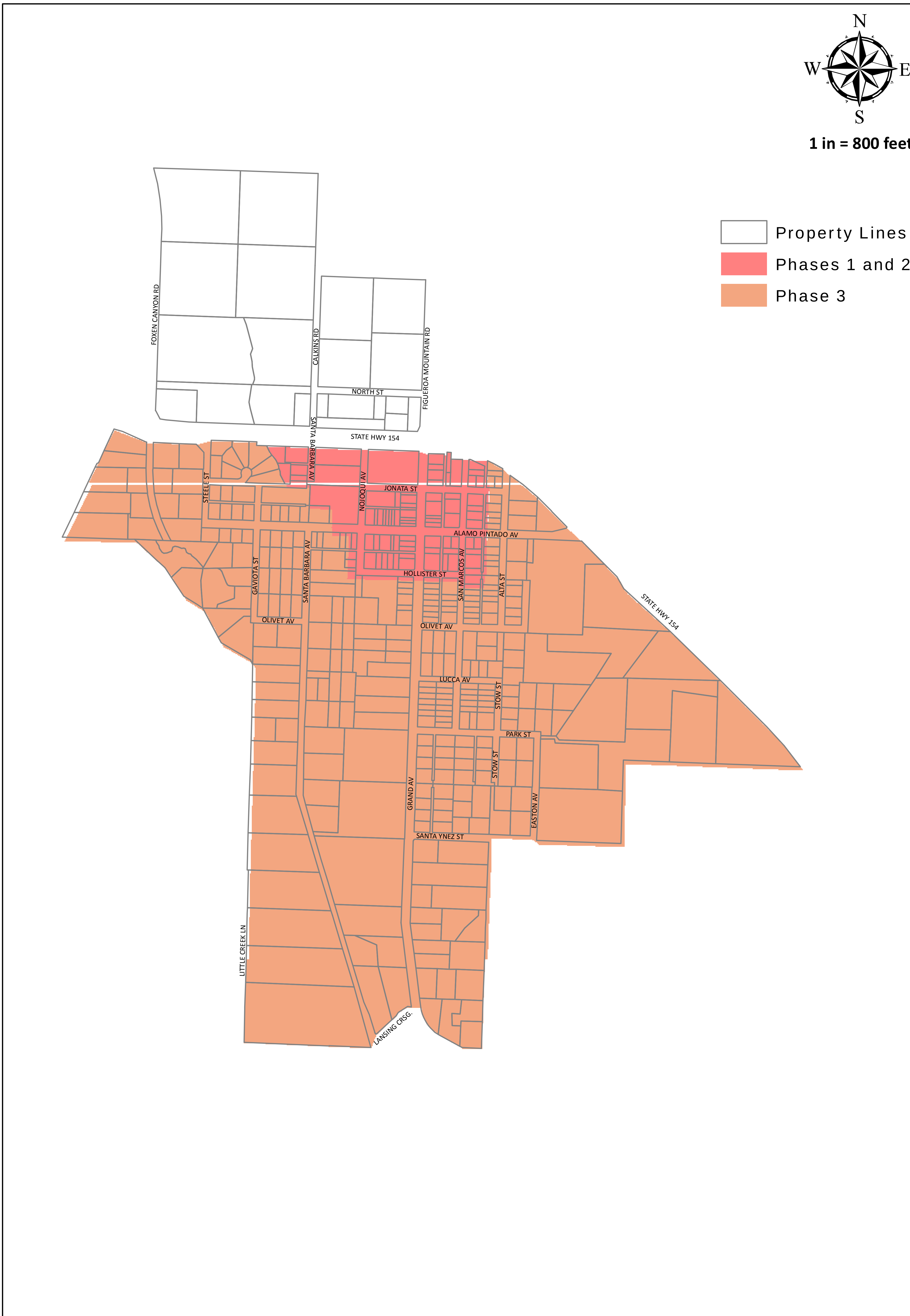

Figure 2.1 Project Phasing

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3 Flows and Loadings

The purpose of this section is to summarize the projected wastewater flows and loadings from commercial and residential development within Los Olivos. Estimates for average and peak flow conditions were previously provided in the LOWWMP. As described below, these flows and loadings have been refined in this report to develop design criteria for the treatment alternatives and properly size the components of the collection system.

3.1 Flow Projections

Wastewater estimates were previously developed in the LOWWMP and the 2009 EIR. The flow projections in the LOWWMP were developed using a method based on assumed septic tank volumes and a percentage of anticipated potable water usage. Based on this method, a maximum daily flow (MDF) of 323,000 gallons per day (gpd) and an associated average daily flow of 180,000 gpd were determined.

The 2009 EIR estimated residential wastewater flows using a factor of 215 gpd per connection. Commercial wastewater flows were estimated based on a factor of 0.056 gpd per sf of commercially-developed area. This commercial wastewater duty factor was determined in the EIR using 1,050 gpd per parcel divided by the average area of a commercial parcel in the Santa Ynez Valley.

3.1.1 Annual Average Flow

For the purposes of this PER, AECOM has revised the flow projection methods from the LOWWMP to make the annual average daily flow (AADF) consistent with the 2009 EIR. Rather than utilizing septic tank volumes and potable water usage to estimate wastewater flows, flow factors per residential unit and commercially-developed square footage are used in this PER.

3.1.1.1 Residential Flow Determination

In order to be consistent with the 2009 EIR, residential wastewater flows were determined using a factor of 215 gpd per connection. According to the Land Use Element of the Santa Barbara County Comprehensive General Plan[5], the approximate household size for urban areas with one unit per acre in the Los Alamos-Garey-Sisquoc area is 3.0 residents per household. Assuming a similar dwelling size for Los Olivos, the resulting per capita wastewater generation factor is 72 gpd. This factor is consistent with typical residential wastewater generation in the Central Coast of California.

3.1.1.2 Commercial Flow Determination

The method for determination of the commercial component of the Los Olivos wastewater flows is also adapted to be consistent with the 2009 EIR, and uses a factor of 0.056 gpd per sf for commercial development.

[5] County of Santa Barbara Comprehensive General Plan Land Use Element (Republished May 2010)

3.1.2 Summary

Based on the proposed phasing scheme and wastewater generation factors described previously, a summary of the AADF per phase is provided in Table 3.1.

Table 3.1 – Projected Average Annual Daily Flows

	Residential			Commercial			
Phase	**Cumulative Connections**	**Factor (gpd/connection)[1]**	**AADF (gpd)**	**Area (sf)**	**Factor (gpd/sf)[1]**	**AADF (gpd)**	**Total[2] (gpd)**
I	25		5,400	228,990		12,800	**19,000**
II	25	215	5,400	1,018,071	0.056	57,000	**63,000**
III	400		86,000	1,018,071		57,000	**143,000**

Notes:
1. Residential and commercial flow factors adapted from the Santa Ynez Valley Community Plan Environmental Impact Report adopted by the Board of Supervisors in October 2009.
2. Totals are rounded up.

3.1.3 Average Day Maximum Month Flow

The design of a WWTP is generally based on the average day maximum month flow (ADMMF). To calculate the ADMMF, a factor is applied to the AADF. For the purposes of this PER, a factor of 1.1 has been assumed. This factor is typical for a community with a high volume of tourist traffic such as Los Olivos. For example, a historical ADMMF factor of 1.1 has been observed for the City of Morro Bay/Cayucos Sanitary District WWTP located in the neighboring County of San Luis Obispo[6]. A summary of the ADMMF conditions is provided in Table 3.2.

Table 3.2 – Projected Average Day Maximum Month Flows

	AADF (gpd)				ADMMF (gpd)		
Phase	**Residential**	**Commercial**	**Total**	**ADMMF: AADF Factor[1]**	**Residential**	**Commercial**	**Total[2]**
I	5,400	12,800	19,000		5,900	14,100	**20,000**
II	5,400	57,000	63,000	**1.1**	5,900	62,700	**69,000**
III	86,000	57,000	143,000		94,600	62,700	**158,000**

Notes:
1. ADMMF factor typical of communities with large volumes of summer tourist traffic.
2. Totals are rounded up

3.1.4 Maximum Daily Flow

To estimate the MDF for the Los Olivos SPA, AECOM reviewed collection system master plans for nearby communities with a similar size and demographic. Based on this review, a MDF factor of 3.2 has been assumed for this PER. For example, this factor is consistent with the San Simeon Community Service District (SSCSD)[7]. The SSCSD has a population less than 1,000 people, and much like Los Olivos, experiences large numbers of tourists during the summer months. A summary of the MDF values for Phase I, II, and III of the Los Olivos WWTP are included in Table 3.3.

[6] City of Morro Bay/Cayucos Sanitary District WWTP Draft Facility Master Plan (Carollo, September 2007)
[7] San Simeon CSD Water System Master Plan and Wastewater Collection System Evaluation (Boyle, November 2007)

Table 3.3 – Projected Maximum Daily Flows							
	AADF (gpd)			MDF: AADF Factor[1]	MDF (gpd)		
Phase	Residential	Commercial	Total		Residential	Commercial	Total[2]
I	5,400	12,800	19,000		17,300	41,000	**59,000**
II	5,400	57,000	63,000	**3.2**	17,300	182,400	**200,000**
III	86,000	57,000	143,000		275,200	182,400	**458,000**

Notes:
1. MDF factor typical of communities with large volumes of summer tourist traffic.
2. Totals are rounded up.

3.1.5 Peak Hour Flow

The peak hour flow (PHF) is used as the design criteria to size the collection system, headworks facilities, process pipelines, meters, and other critical hydraulic appurtenances. Usually, wastewater flows increase during wet weather periods due to the influence of inflow and infiltration (I/I). Like determination of the MDF, the PHF is estimated using the AADF and an appropriate peaking factor.

Based on the existing population estimate of 1,000 residents for Los Olivos, the assumed peaking factor for this report is 4.5. For comparison, Wastewater Engineering: Treatment and Reuse (Metcalf & Eddy)[8] recommends using a peaking factor of 4.0 for communities with populations less than 4,000. A peaking factor of 4.5 is recommended to account for the large volume of tourists the downtown area can experience. A summary of the PHF conditions is provided in Table 3.4.

Table 3.4 – Projected Peak Hour Flows							
	AADF (gpd)			PHF:AADF Factor[1]	PHF (gpd)		
Phase	Residential	Commercial	Total		Residential	Commercial	Total
I	5,400	12,800	19,000		24,300	57,600	**82,000**
II	5,400	57,000	63,000	**4.5**	24,300	256,500	**281,000**
III	86,000	57,000	143,000		387,000	256,500	**644,000**

Notes:
1. PHF factor typical of communities with large volumes of summer tourist traffic.

[8] Metcalf & Eddy – McGraw-Hill (March 2002)

A summary of the various flow and peaking factors used to project flows for each phase of the Los Olivos WWTP project are summarized in Table 3.5.

Table 3.5 – Summary of Flow Projection Factors

Flow Condition	Flow Projection Factor
Average Residential Wastewater Flow per Connection per Day (gpd/connection)	215
Average Commercial Wastewater Flow per Square Foot per Day (gpd/SF)	0.056
Average Annual Daily Flow (AADF)	1.0
Average Day Maximum Month Flow (ADMMF)	1.1
Maximum Daily Flow (MDF)	3.2
Peak Hour Flow (PHF)	4.5

These flow and peaking factors were used in conjunction with the residential connection and commercially developed square footage information from the Santa Ynez EIR to yield the various flow conditions for each phase of the project, summarized in Table 3.6.

Table 3.6 – Projected Flows Summary

Phase	AADF (gpd)	ADMMF (gpd)	MDF (gpd)	PHF (gpd)
I	19,000	20,000	59,000	82,000
II	63,000	69,000	200,000	281,000
III	143,000	158,000	458,000	644,000

3.2 Loadings Projections

Generally, wastewater strength is defined by its five-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and nitrogen content. Design loadings for a WWTP are typically determined by the ADMMF and the influent BOD, TSS, and nitrogen concentrations selected, as described below. These values are used to develop design criteria for the treatment process alternatives presented in this report.

3.2.1 Biochemical Oxygen Demand

The BOD concentration is described as the amount of oxygen required, over a five-day period at 20 degrees Celsius, by bacteria while stabilizing decomposable organic matter under aerobic conditions. In the absence of existing data, assumptions regarding the relative strength of the wastewater were made for this report. Due to the variances between residential and commercial wastewater, separate projections were developed for each source.

3.2.1.1 Residential

In order to develop organic loading projections for the residential component of the Los Olivos WWTP, recommendations from Metcalf & Eddy (2002)[1] were used. According to the text, the average BOD concentration for moderate-strength domestic wastewater is 190 milligrams per liter (mg/L). This value, along with the flows determined in Section 3.1 of this PER, was used to develop the design organic loading for each phase of the WWTP. As mentioned previously, often the ADMMF is used to size the biological components of a treatment facility. For the purposes of this PER, design loadings for each phase have been determined using the ADMMF and average constituent concentrations for BOD, TSS, and TKN.

3.2.1.2 Commercial

In order to dissect the anticipated organic loading from the commercial component of the wastewater flow, concentrations for both retail and non-retail/commercial wastewater dischargers were developed. A flow-weighted average was then used to determine a composite BOD concentration for the total commercial flow. The Santa Ynez EIR provides a breakdown of the total build-out commercial area of 1,018,071 sf between retail and non-retail/commercial, which is 48 and 52 percent respectively. With a BOD concentration of 650 mg/L for retail and 950 mg/L for non-retail/commercial, the weighted average is 810 mg/L. This concentration along with the ADMMF is used to determine the organic loading from the downtown core for each phase of the WWTP project.

3.2.1.3 Summary

The organic concentrations and loadings for the residential, commercial, and combined wastewater flows for the three phases of the Los Olivos WWTP are provided below. The total BOD loads, summarized in Table 3.7, are used in a latter section of this PER to develop design criteria for several different treatment alternatives.

Table 3.7 – Projected Influent BOD Loading

	Residential			Commercial			Total	
Phase	ADMMF (gpd)	BOD (mg/L)	BOD (ppd)	ADMMF (gpd)	BOD (mg/L)[1]	BOD (ppd)	BOD (mg/L)	BOD (ppd)
I	5,900		9	14,100		95	**630**	**105**
II	5,900	190	9	62,700	810	424	**755**	**435**
III	94,600		150	62,700		424	**435**	**575**

Notes:
1. Based on a weighted-average between retail and non-retail/commercial.

3.2.2 Total Suspended Solids

Along with BOD, TSS is one of the most common conventional pollutants regulated by an authority's Waste Discharge Requirements (WDRs). The TSS concentration is a measure of the suspended material in the influent.

3.2.2.1 Residential

The residential component of the total TSS loading to the WWTP was determined in accordance with the methodology previously described for organic or BOD loading. Metcalf & Eddy (2002) presents a typical moderate strength domestic wastewater average TSS concentration of 210 mg/L.

3.2.2.2 Commercial

The TSS loading for the commercial portion of the wastewater flow for the WWTP was determined using the same weighted-average method previously described for BOD loading. With a TSS concentration of 250 mg/L for retail and 750 mg/L for non-retail/commercial, the weighted-average is 510 mg/L. This concentration along with the ADMMF is used to determine the solids loading from the downtown core for each phase of the WWTP project.

3.2.2.3 Summary

The TSS concentrations and loadings for the residential, commercial, and combined wastewater flows for the three phases of the Los Olivos WWTP are provided below. The total TSS loads, summarized in Table 3.8, were used to develop design criteria for several different treatment alternatives.

Table 3.8 – Projected Influent TSS Loading								
	Residential			**Commercial**			**Total**	
Phase	**ADMMF (gpd)**	**TSS (mg/L)**	**TSS (ppd)**	**ADMMF (gpd)**	**TSS (mg/L)**[1]	**TSS (ppd)**	**TSS (mg/L)**	**TSS (ppd)**
I	5,900		10	14,100		60	**420**	**70**
II	5,900	210	10	62,700	510	267	**480**	**275**
III	94,600		166	62,700		267	**330**	**435**

Notes:
1. Based on a weighted-average between retail and non-retail/commercial.

3.2.3 Nitrogen

Nitrogen can be found in several different forms in raw wastewater including ammonia, organic nitrogen and nitrate. Typically, the nitrogen in untreated domestic wastewater is comprised of ammonia and organic nitrogen and is defined as the total Kjeldahl nitrogen (TKN). Since nitrogen is the main contaminant causing degradation of the groundwater basin, it is anticipated that any disposal method will require nitrogen removal or denitrification. Accurate determination of the influent nitrogen load is critical to development of design criteria for individual treatment alternatives.

3.2.3.1 Residential

The residential component of the total nitrogen load to the WWTP was determined in accordance with the methodology previously described for BOD and TSS loading. Again, Metcalf & Eddy (2002) was used to determine the average TKN concentration. Based on a moderate strength domestic wastewater, a value of 40 mg/L was used.

3.2.3.2 Commercial

Determination of the nitrogen loading for the commercial portion of the wastewater flow for the WWTP was determined using the same weighted-average method previously described for BOD and TSS loading. With a TKN concentration of 120 mg/L for retail and 75 mg/L for non-retail/commercial, the weighted-average is 100 mg/L. This concentration along with the ADMMF is used to determine the nitrogen loading from the downtown core for each phase of the WWTP project.

3.2.3.3 Summary

The TKN concentrations and loadings for the residential, commercial, and combined wastewater flows for the three phases of the Los Olivos WWTP are provided below. The total TKN loads, summarized in Table 3.9, are used in Section 6 of this PER to develop design criteria for several different treatment alternatives.

Table 3.9 – Projected Influent TKN Loading								
	Residential			**Commercial**			**Total**	
Phase	**ADMMF (gpd)**	**TKN (mg/L)**	**TKN (ppd)**	**ADMMF (gpd)**	**TKN (mg/L)**[1]	**TKN (ppd)**	**TKN (mg/L)**	**TKN (ppd)**
I	5,900		2	14,100		12	**90**	**15**
II	5,900	40	2	62,700	100	52	**95**	**55**
III	94,600		32	62,700		52	**65**	**85**

Notes:
1. Based on a weighted-average between retail and non-retail/commercial.

4 Regulations

4.1 Overview

Regulatory requirements for the WWTP will ultimately be determined by the selected effluent disposal method, and will be influenced by the type of treatment processes implemented. The Central Coast RWQCB is the agency responsible for issuing WDRs for this project. These requirements are administered to protect the State's waters under the California Water Code and Porter-Cologne Act, a provision of the California Water Code. The RWQCB develops and issues WDRs for treatment systems that discharge to land (percolation and/or irrigation), and National Pollutant Discharge Elimination System (NPDES) permits for discharges to surface waters. Where treated wastewater is to be recycled (reuse) additional regulations are required by the California Department of Public Health (CDPH) under California Code of Regulations (CCR) Title 22, Division 4, Chapter 3, Water Recycling Requirements (Title 22). The RWQCB implements the Central Coast Basin Plan (Basin Plan) [9] objectives by enforcing WDRs.

The following provides a general overview of the Central Coast RWQCB groundwater objectives for Los Olivos, water supply composition, descriptions of conventional and non-conventional pollutants typically regulated in wastewater and criteria for the production and reuse of recycled water. Discussion of general regulations required for surface water and land-based discharges is also included.

4.2 Basin Plan Groundwater Objectives

The Basin Plan and subsequent Triennial Reviews (2001, 2005, and 2009) form the basis for the WDRs developed by the RWQCB. The community of Los Olivos is located within the Los Olivos Hydrologic Area of the Santa Ynez Hydrologic Unit as defined by the Basin Plan. The Basin Plan provides groundwater quality objectives that are typically used to guide discharge requirements. Table 4.1 summarizes groundwater quality objectives for Los Olivos (Santa Ynez Sub-basin).

[9] Water Quality Control Plan for the Central Coast Basin (State of California, Central Coast Regional Water Quality Control Board, 1994)

Table 4.1 – Los Olivos Ground Water Quality Objectives		
Constituent	**Average Concentration**	**Units**
Total Dissolved Solids (TDS)	600	mg/L
Chloride (Cl)	50	mg/L
Sulfate (SO_4)	10	mg/L
Boron (B)	0.5	mg/L
Sodium (Na)	20	mg/L
Nitrogen	1	mg/L

Notes:
1. Objectives shown are median values based on data averages.
2. Objectives are based on preservation of existing quality or water quality enhancement believed attainable following control of point sources.

The Basin Plan outlines additional objectives for groundwater in order for it to be used for municipal and agricultural supply. Wastewater that is discharged to land with the potential to affect municipal water supplies must be monitored for bacterial concentrations. The Basin Plan designates that the median concentration of coliform organism over any seven-day period shall be less than 2.2/100 milliliters (mL). Additionally, to protect groundwater used for agricultural supplies, wastewater discharged to land shall not contain concentrations of chemical constituents in amounts that adversely affect the beneficial uses established for groundwater aquifers that would be affected by the discharge. The interpretation of adverse effect can be derived from the University of California Agricultural Extension Service guidelines found in the Basin Plan.

4.3 Water Supply

Existing source water data was obtained from the 2009 Annual Water Quality Report (2009 Water Quality Report) for the Santa Ynez River Water Conservation District- Improvement District No. 1 (District). In 2009 the District utilized both active groundwater wells operated by the District and surface water supplies. Surface water from the State Water Project via the California Aqueduct accounted for 37 percent of the District's supply for 2009. Understanding source water quality is important in establishing a baseline and determining the allowable impacts as a consequence of domestic use. A summary of the source water quality data obtained from the 2009 Water Quality Report is shown in Table 4.2.

Table 4.2 – 2009 Source Water Quality Data for Los Olivos

Constituent	Average Concentration	Units
Total Dissolved Solids (TDS)	486	mg/L
Chloride (Cl)	62	mg/L
Sulfate (SO_4)	122	mg/L
Boron (B)	0.17	mg/L
Sodium (Na)	56	mg/L

Notes:
1 Values are based on a flow-weighted average of both surface and groundwater sources.

4.4 Pollutants

4.4.1 Conventional Pollutants

Conventional pollutants are those typically found in municipal wastewater that are used to characterize it. Municipal wastewater treatment facilities are typically designed to reduce the concentrations of conventional pollutants. Federal Regulations [40 CFR 401.16] includes the following as conventional pollutants: BOD, TSS, fecal coliform bacteria, oil and grease, and pH. Typically BOD and TSS are the most common conventional pollutants regulated in the WDRs with numerical limits.

4.4.2 Non-Conventional Pollutants

Non-conventional pollutants are those not included in the previous category. The two most important non-conventional pollutants that will likely be addressed by the RWQCB as part of the WDRs for the Los Olivos WWTP are salinity or total dissolved solids (TDS) and nitrogen. A brief explanation of these pollutants is provided below. Further discussion of these constituents is provided in latter sections of this PER.

4.4.2.1 Salinity

Salinity is a measure of the amount of minerals dissolved in wastewater. As a consequence of domestic and agricultural use, water dissolves minerals and the salinity of the wastewater is higher than that of the source water. Typical domestic water use adds 200 to 300 milligrams per liter (mg/L) of dissolved minerals to the water supply.

Based on available data from the 2009 Water Quality Report, the average TDS of the delivered State Water varied between 131 and 493 mg/L with an average of 362 mg/L. Groundwater varied between 400 to 710 mg/L with an average of 555 mg/L. Using a flow-weighted average based on the percentage of deliveries from each of these sources, the average water supply TDS for 2009 was 486 mg/L. Assuming an increase of 250 mg/L from domestic use the estimated wastewater TDS would be 736 mg/L. However, the ultimate source water quality will be impacted by the amount of State Water Los Olivos receives in any given year. Therefore, a range 736 mg/L to 805 mg/L has been assumed for this PER. The high end of the range is based on the community using only groundwater with an average TDS concentration of 555 mg/L and a salt increase of 250 mg/L.

4.4.2.2 Nitrogen

Nitrogen is a non-conventional pollutant found in treated wastewater effluent. Nitrogen compounds most commonly include ammonia, nitrate and organic nitrogen. Total nitrogen (TN) is a measure of the nitrogen that gives rise to nitrate and nitrite ions. Total nitrogen is the sum of nitrate (NO_3-N), nitrite (NO_2-N), ammonia (NH_3-N) organically bonded nitrogen. Since the main regulatory driver behind establishment of a centralized treatment system for the Los Olivos SPA is nitrate groundwater contamination from the existing OWTSs, AECOM has assumed the WDRs issued by the RWQCB will include a numerical discharge limitation for TN regardless of the disposal method selected. Groundwater sampling in the immediate vicinity of the effluent disposal site will also most likely be a provision of the WDRs.

4.5 Discharge Requirements

WDRs issued to the Los Olivos WWTP by the Central Coast RWQCB will explicitly state the constituent concentrations that will be permitted for discharge. The WDR will be constructed in such a way that ensures that beneficial uses will be maintained for receiving waters. The WWTP will be required to meet these discharge requirements and performance will be regularly monitored and recorded according to the Monitoring and Reporting section of the WDR.

4.5.1 Surface Water Discharge

Los Olivos is located immediately adjacent to Alamo Pintado Creek, a tributary to the Santa Ynez River (at Solvang). The reach of the Santa Ynez River downstream of Lake Cachuma, including the convergence with Alamo Pintado Creek, is listed by the State Water Resources Control Board (SWRCB) as a 303(d) impaired water body. This means its beneficial uses are impaired. The Central Coast Basin Plan identifies the following uses for Alamo Pintado Creek:

- Municipal and Domestic Supply
- Agricultural Supply
- Industrial Service Supply
- Groundwater Recharge
- Water Contact Recreation
- Non-Contact Water Recreation
- Wildlife Habitat
- Warm Fresh Water Habitat
- Commercial and Sport Fishing

In particular, the concentrations of nutrients, salinity and sedimentation impair its beneficial uses according to the SWRCB listing. If a surface water discharge is pursued, nutrients and salinity are the two parameters that could be incorporated into the Los Olivos project's discharge requirements. Nutrients would include nitrogen and/or phosphorus. In most dry areas like the Central Coast, phosphorus is not included in the permits since nitrogen is usually the limiting nutrient for eutrophication in surface waters. Nitrogen limits in surface waters are related to the aquatic habitat impacts of eutrophication, which can be much more sensitive to nitrogen levels than health impacts for humans.

Unlike land-based discharge alternatives and water reuse, surface water discharges require compliance with 40 CFR Part 131 Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California, or the California Toxics Rule (CTR), implemented under the NPDES permit and WDR orders in California. In order to comply with these criteria, a high level of treatment for non-conventional pollutants is often required. A more in-depth discussion of the California Toxics Rule is included below.

A surface water discharge option is not recommended for the Los Olivos WWTP due to the following challenges:

- Discouraged by both federal and state water policies;
- Additional, stringent discharge requirements to eliminate aquatic toxicity in accordance with the CTR;
- Ongoing and expensive testing for compliance with the CTR;
- Uncertain, constantly evolving regulatory environment; and
- Difficulty ceasing discharge once established, particularly if the receiving water supports endangered species and the discharge is considered a significant contribution to base flows.

4.5.1.1 California Toxics Rule

The CTR was finalized in May 2000 and identifies over 130 contaminants that must be monitored and treated if observed in plant effluent. These contaminants include organics and metals typically present in trace amounts in domestic wastewater. If present in treated effluent, they must be removed to provide long-term protection of public health and aquatic ecology. Allowable concentrations of these parameters can be more stringent than drinking water requirements. In accordance with the CTR, surface water discharges require regular toxicity testing up to four times per year. This testing includes exposing sensitive organisms such as daphnia and minnows to the effluent for a specified period of time and recording the percentage of fatalities. Toxicity limits based on these statistics, are included in the NPDES permit issued for surface water discharges and violations result in fines.

The likelihood of receiving permit limitations based on CTR parameters is difficult to predict. The studies needed to comply with the monitoring requirements of the Rule, not including the studies required to isolate and identify the actual toxicants if toxicity is observed, typically can cost $50,000 or more (City of Lompoc, 2011 WDR). Limiting concentrations of the CTR parameters are calculated by RWQCB on a case-by-case basis. Often, drinking water supplies and house plumbing can have a significant impact on the quality of plant effluent and can cause exceedance of CTR-based limitations. For instance, trihalomethanes, lead, and copper can enter wastewater collection systems through the water supply itself and through reactions between water and disinfectants and/or household plumbing. Each of these are included in the CTR list and limitations can theoretically be established at concentrations that are considerably less than drinking water levels. These constituents can be very difficult to remove by biological wastewater treatment processes.

4.5.1.2 Discharge Design

The design of an instream discharge requires special consideration. The most common design issues are limiting or preventing in-stream erosion, providing adequate mixing with the receiving water to diffuse contaminants, and minimizing construction impacts to the streambed. While the percolation discharge can be accomplished with either percolation ponds or “off-the-shelf” subsurface infiltration systems, surface water discharges typically require either an infiltration gallery buried under the creek bed, a “polishing channel” to slow the water and promote mixing at the confluence with the creek/stream, or an outlet design with velocity dissipation (such as a headwall with riprap armament). Any option will require considerable coordination during the design phase and, ultimately, approvals from California Department of Fish and Game (CDFG), National Oceanic and Atmospheric Administration (NOAA) Fisheries, and the Army Corps of Engineers (ACOE).

4.5.1.3 Possible Cost Impacts

Two modes of surface water discharge could be pursued by the County; seasonal and year-round discharge. The treatment requirements for seasonal discharge would be the same as for year-round discharge, since the California Toxics Rule applies to any and all discharges regardless of schedule.

To provide a more detailed discussion on the potential cost impacts to the project for planning, treatment and monitoring the Central Coast RWQCB was contacted. Several questions regarding requirements and restrictions for a surface water discharge from a community WWTP in Los Olivos were posed and Board Staff has provided comments (Appendix A). It is important to note that until a specific project is submitted to the RWQCB detailed requirements of the WDR will not be available. The letter represents the opinions of staff and the decisions of the Board itself can vary significantly. Within this letter the Board has provided a general overview of the level of treatment, likely studies and monitoring required for a surface water discharge to the Alamo Pintado Creek.

In addition, the Board noted that certain mandatory minimum penalties apply only to surface water dischargers. Per California Water Code, Section 13385 a mandatory penalty of $3,000 for any effluent limit violation assessed. Depending on the number of violations assessed, the penalty amount could be significant. The City of Paso Robles recently faced fines of up to $10,000 per day if treatment and discharge upgrades were not performed to their existing plant to satisfy their NPDES requirements. The City of Lompoc wastewater facility discharges to the San Miguelito Creek, a tributary to the Santa Ynez River, and typically pays $30,000 to $50,000 a year in fines for discharge violations.

4.5.1.3.1 Required Studies

Several studies would be required during the planning stages of the project to assess the potential impacts associated with discharging to the Alamo Pintado Creek or any other water body. At a minimum the following studies would be required by the RWQCB.

- *Flow Studies*- This study would determine the effluent flows generated by the WWTP for each phase of the project and would include peak seasonal flows.
- *Hydrological Study*- These studies evaluate the downstream impacts associated with the flows generated. Included with this report would be a discussion of the baseline riparian and stream conditions, potential downstream erosion and sediment transport, and water quality impacts.
- *Groundwater Study*- The potential effects of the proposed discharge on groundwater quality would be studied. In-stream recharge would be evaluated as a mechanism for changing groundwater conditions. This study could include hydraulic connectivity studies if a groundwater basin or stream/river underflow is used as a drinking water source and could be affected by the discharge.
- *Endangered Species Study*- This study would identify and evaluate endangered species that would be affected by the discharge flows. Both federal and state species would be addressed and review by the California Department of Fish and Game and the US Fish and Wildlife Service would be required.
- *Reasonable Potential Analysis*- An analysis of the California Toxic Rule pollutants discussed above and their presence in the discharge would be performed to determine if there is a reasonable potential for the effluent to exceed water quality standards.

Provided below in Table 4.3 is a comparison list of required studies for a surface water discharge and a land-based discharge such as percolation ponds.

Table 4.3 – Required Discharge Studies

Study	Surface Water Discharge	Land-Based Discharge
Groundwater Studies	✓	✓
Hydrological Study	✓	Rarely
Flow Studies	✓	✓
Endangered Species Study	✓	✓[1]
Reasonable Potential Analysis	✓	

Notes:
1 Limited to areas directly in conflict with pipelines or facilities.

Costs to perform these studies can vary significantly. The studies listed above in Table 4.3 would likely be performed as part of the project EIR. The cost to perform an EIR for a surface water discharge would likely be on the order of 2 to 4 times the cost of an EIR for a land-based discharge ($75,000 to $100,000). This would be a result of the additional types of studies required and the physical area the study would cover downstream of the proposed discharge location.

4.5.1.3.2 Required Monitoring

As previously stated, the monitoring program (parameters, location, and frequency) would be established by the RWQCB in the plant's WDR based on the type of discharge. The flowing monitoring types have been identified by the RWQCB that would be required for Los Olivos at a minimum for surface water discharge.

- *Influent Monitoring*- Influent wastewater would be monitored to allow calculation of removal efficiency and loading rates.
- *Effluent Monitoring*- Effluent would be monitored to verify federal secondary standards, Basin Plan objectives, and California Toxics Rule objectives are being achieved.

  Receiving Water Monitoring- Monitoring points would be established both upstream and downstream of the discharge location. Monitoring would include assessing the chemical contribution from the discharge, verifying permit compliance, and determining downstream impacts as a result of the discharge.
- *Groundwater Monitoring-* Similarly to receiving water monitoring, groundwater would be monitored upstream and downstream of the discharge location to evaluate potential impacts to groundwater quality as a result of the discharge

Provided below in Table 4.4 is a list of monitoring parameters required for a surface water discharge and a land-based discharge such as percolation ponds. In addition, monitoring required for recycled water systems is included (see Section 4.5.2).

Table 4.4 – Required Discharge Monitoring[1]

Monitoring	Surface Water Discharge	Land-Based Discharge	Recycled Water
Influent	✓	✓	✓
Effluent	✓	✓	✓
Groundwater	✓	✓	✓
Receiving Water	✓		

Notes:
1 As required by the RWQCB for Los Olivos.

Table 4.5 below provides example monitoring frequency for typical constituents for a surface water discharge, land based discharge, and recycled water use. Actual monitoring requirements for Los Olivos would be determined by the RWQCB.

Table 4.5 – Typical Minimum Sampling Frequencies

Constituents	Surface Water Discharge[1]	Land-Based Discharge[2]	Recycled Water[3]
Flow	Continuously	Continuously	Continuously
BOD_5	Weekly	Weekly	Weekly
Temperature	5/Week	-	Monthly
pH	Daily	Weekly	Daily
DO	Monthly	-	Monthly
Total Suspended Solids	Weekly	Weekly	Weekly
Turbidity	Every ten days	-	Continuous
Oil and Grease	Monthly	-	Monthly
Total Coliform Organisms	5/Week	-	Daily
Fecal Coliform Organisms	5/Week	-	Daily
Nitrogen[4]	Monthly	Semiannually	Monthly
Total Dissolved Solids	Quarterly	Semiannually	Monthly
Residual Chlorine	Daily	-	Monthly
Sodium	Quarterly	Semiannually	-
Chloride	Quarterly	Semiannually	Monthly
Sulfate	Quarterly[5]	Semiannually	Monthly
Acute Toxicity	Annually	-	-
Chronic Toxicity	Annually	-	-
Priority Toxic Pollutants	Annually	-	Semi-Annually
Title 22 Pollutants[6]	Annually	Semiannually[5]	-

Notes:

1 Reference: City of San Luis Obispo Water Reclamation Facility Waste Discharge Requirements (WDR) Order No. R3-2002-0043 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA0049224.

2 Reference: Nipomo Community Services District – Southland Wastewater Treatment Facility WDR Order No. R3-2012-0003

3 Reference: City of Fillmore WDR Order No. R4-2006-0049 and NPDES No. CAG0059021

4 Total Kjeldahl Nitrogen, Ammonia as N, Nitrite as N, and Nitrate as N

5 Reference: City of Lompoc Regional Wastewater Reclamation Plant WDR Order No. R3-2011-0211 and NPDES No. CA0048127.

6 The Title 22 pollutants are those for which primary Maximum Contaminant Levels (MCLs) have been established by the Department of Health Services and which are listed in Tables 64431-A and 64444-A of the California Code of Regulations, Title 22, Division 4, Chapter 15.

Estimated costs for each of these discharge types are provided in Table 4.6 and were based on a survey of monitoring costs of several local facilities. Costs for monitoring include sampling and laboratory expenses. These expenses typically do not vary significantly based on plant size (up to approximately 10 MGD) since monitoring is based on discharge type not plant capacity.

Table 4.6 – Typical Monitoring Costs	
Discharge Type/Use	**Cost per Year**
Surface Water Discharge	$150,000 to $200,000
Land-Based Discharge	$6,000 to $10,000
Recycled Water (Title 22 Requirements)	$25,000 to $50,000

4.5.1.3.3 Capital Costs

Additional treatment process may be required to satisfy federal secondary standards, Basin Plan objectives, and California Toxics Rule objectives. Both cooling of the effluent prior to discharge and additional de-nitrification (including carbon addition to promote a higher level of nitrogen removal) may be required to meet surface water discharge requirements.

Cooling of the effluent is typically performed using cooling towers. Effluent is required to be cooled to a temperature of no more than five degrees (F) above the receiving water. Effluent water leaving the treatment process can often have a temperature that varies from 10 to 30 degrees higher than the receiving water. This requirement varies among surface water dischargers and is dependent on the properties of the receiving water.

Additional denitrification could be required to reduce nitrogen levels to within limits established by the RWQCB. This reduction is achieved by adding carbon upstream of anoxic reactors in the form of chemical additives. The additional capital cost for chemical addition (typically methanol) would likely be in the $10,000 to $20,000 range, but the impact on operations and maintenance could be higher since there would be a recurring cost to purchase the carbon source

4.5.1.3.4 Other Costs and Funding Impacts

Some other significant impacts related to funding the project design and construction, which are not capital cost impacts but are considerable, are discussed in the letter from RWQCB and are listed below.

- RWQCB staff noted that a surface water discharge project with no significant reuse component would not attract funding. It would be anticipated that a project with no surface water discharge that relies on groundwater disposal and water reuse would be a candidate for recycled water grants and/or low interest loans. An example is the City of Fillmore's Water Recycling Program which qualified for nearly $16M in grant funding (20% of the total project cost) from the state since it relied entirely on water reuse and groundwater percolation for discharge.
- If habitat is created or enhanced by directing the discharge into a surface water body, the discharger may be required to preserve that discharge in perpetuity. The City of San Luis Obispo cannot eliminate plant flow discharge to San Luis Obispo Creek since the removal would negatively impact aquatic habitat.
- The additional studies and monitoring requirements have been discussed in the paragraphs above and are also significant considerations.

4.5.2 Land-Based Discharge

Land-based discharge includes effluent disposal methods such as percolation or irrigation (restricted or unrestricted). The quality of the treated effluent required is dictated by the selected land-based discharge method. Soil characteristics, groundwater depth, recognized beneficial uses, access to the disposal areas, and ultimate use of the crops being grown are factors that dictate the quality of the effluent. Wastewater characteristics of particular concern are salinity, nitrate, boron, pathogenic organisms, and toxic chemicals.

As mentioned earlier in this section, Los Olivos is located within the Los Olivos Hydrologic Area of the Santa Ynez Hydrologic Unit, which is used extensively as a source of agricultural and domestic-municipal water supply. The groundwater basin has been identified by the RWQCB as one of three basins in the County experiencing increases in nitrate concentrations.

Land-based discharge alternatives considered in this section include: percolation ponds, subsurface dispersal system (leachfields), irrigation of feed and fodder crops (undisinfected secondary), and unrestricted irrigation (disinfected tertiary). The treated effluent quality will be dictated primarily by the discharge alternative selected. Table 4.7 provides the anticipated effluent limits for the discharge alternatives considered. The design of these disposal systems is discussed in detail in Section 7 of this PER.

Table 4.7 – Anticipated Effluent Limits for Land-Based Discharge Alternatives

Disposal/Reuse Option	Treatment Level	Monthly Mean TSS (mg/L)	Monthly Mean BOD (mg/L)	Monthly Mean Total N[2] (mg/L)
Percolation Ponds	Undisinfected Secondary	30	30	10
Leachfields	Undisinfected Secondary	30	30	10
Restricted Irrigation	Undisinfected Secondary	30	30	10
Unrestricted Irrigation [1]	Disinfected Tertiary-2.2	10	10	10

Notes:
1. California Code of Regulations Title 22
2. Nitrogen or Total Nitrogen limit anticipated in accordance with primary drinking water MCL

4.5.2.1 Restricted Irrigation

CCR Title 22, Division 4, Chapter 3, Sections 60301 through 60355 is used to regulate recycled wastewater and is administered jointly by CDPH and RWQCB. If reuse is implemented, involved agencies will also include the County Environmental Health Services (Title 17). Local farmers and ranchers may also be involved as the end users. Allowed uses are limited to fenced areas with controlled access. Acceptable applications would include irrigation of animal feed or fodder crops, non food-bearing trees, orchards, and sod farms.

The treatment process for undisinfected secondary includes oxidation. This option would not require the addition of a disinfection process, such as chlorination or ultraviolet (UV) radiation. If disinfection was provided, Title 22 requirements include a median total coliform requirement of 23 most probable number (MPN)/100mL for seven consecutive days, and a maximum total coliform requirement of 240 MPN/100mL in one sample over a 30-day period for disinfected secondary-23 recycled water. Additional opportunities that accompany the addition of disinfection would include cemeteries, highway landscaping, restricted access golf courses, and pasture for animals producing milk for human consumption.

4.5.2.2 Unrestricted Irrigation

Potential users of disinfected tertiary-2.2 wastewater would include food crops, parks and playgrounds, school yards, unrestricted access golf courses, and residential and commercial landscaping. This level of treatment will meet the most stringent requirements for all uses allowed under the Title 22 criteria. Owners of these facilities, CDPH, RWQCB, the County, and possibly local authorities will be involved in wastewater reuse contracts and permitting. The WDRs for the future WWTP would need to include permitting requirements for reuse of plant effluent for irrigation.

Disinfected tertiary treatment requires the following treatment processes: oxidation, coagulation[10], filtration, and disinfection. These treatment stages will need to be added to the WWTP as part of the upgrades if this reuse option is pursued. According to Title 22 requirements, the 7-day median total coliform limit is 2.2 MPN/100mL, and the maximum total coliform limit is 23 MPN/100mL. The median total coliform is ascertained from samples collected over the last seven days of analysis. The maximum total coliform should not be exceeded in one sample for 30 consecutive days. Water quality objectives as discussed for the restricted irrigation option would also be applicable.

For all irrigation alternatives, contracts with local water purveyors and/or irrigation district(s) are required for recycling treated wastewater. In addition, facilities and appurtenances needed for recycling include transmission pipelines, pump stations, storage reservoirs, and property or easements for locating these facilities.

4.5.2.3 Percolation (Basins & Subsurface Disposal)

Groundwater degradation is a major concern for the Los Olivos SPA. The RWQCB policies would require the addition of disinfection for this disposal method if seasonal groundwater levels are within five feet of the infiltration surface. Therefore, considerations such as distance to the nearest well, depth to groundwater, and mounding potential must be considered in addition to water quality. Sizing and siting requirements for the percolations ponds will depend on the types of soils, and the results percolation testing.

4.5.2.4 Groundwater Monitoring

As part of any land-based discharge, groundwater monitoring wells would be required both up gradient and down gradient of the discharge area(s). By monitoring the quality in wells, the impacts of the wastewater disposal can be observed. The number of wells and the frequency of testing would be outlined in the WDR issued to the Los Olivos WWTP.

[10] Coagulation is not typically required if turbidity requirements are met and/or membrane filtration is used.

5 Collection System Evaluation

5.1 Overview

As part of the Los Olivos centralized treatment system, a sanitary sewer collection system will be required to convey wastewater flows to the WWTP. In Phase I the system would serve the downtown commercial businesses, and in subsequent phases the collection system would expand to the rest of the community. With proper planning during the initial phase, the collection system would be adequately sized to handle future flows without requiring upgrades during subsequent phases.

5.2 Collection System Types

Conventional gravity collection systems convey wastewater using open channel flow sewer pipe lines and manholes. The depth of the lines varies depending on surface topography and slope requirements. Typically, when pipelines reach a depth of 20 feet or more, lift stations are required to pump wastewater to a shallower depth. Maintenance of the system includes cleaning and inspection of the lines and performing the recommended maintenance for lift stations when necessary.

As discussed in the LOWWMP, pressure sewers, small diameter gravity sewers, and vacuum sewers can also be used as an alternative to conventional gravity systems. These alternatives are viable in smaller communities and in areas where topography is such that a conventional gravity system will require deep sewer lines and a large number of lift stations.

Pressure sewer collection systems use small diameter pipes, usually between two and four inches, at shallow depths (less than three feet) to convey wastewater pumped from each connection. Smaller pipes and shallow depths minimize soil disturbance, and construction costs can be significantly less than those for gravity lines. Pressure sewer collection systems can accommodate solids or have solids removed before entering the system. A solids handling system requires grinder pumps to reduce the sizes of solids to be transported through the small diameter pipes without plugging. Alternatively, solids can be removed prior to entering the system with the use of conventional septic tanks. These tanks would be similar to those used for OWTSs and would remove solids through settling prior to reaching the pumps. Both solids handling and non-solids handling systems would require equipment to be located at each household (grinder pump or tank) on private property. Pumps could either be located at each connection or a larger pump station could be used to serve several connections. Grinder pumps and tanks would require regular maintenance including periodic septage removal to ensure system performance. In addition to regular maintenance, power to the grinder pumps would be required from the utility company or from each residence or business.

Small diameter gravity sewers are similar to non-solids handling pressure systems but use gravity instead of pumps to convey the wastewater. Grinder pumps or septic tanks would still be required to process the solids before entering the system. Similar maintenance and power requirements would apply to this system. However, shallower excavation depths than those for a conventional gravity system would be possible where site topography allows.

Vacuum sewers use differential pressure to convey wastewater. This type of system typically uses a central vacuum pump with valve pits at each connection. Since a closed system is required, the valves in each pit open when a predetermined amount of wastewater enters the pit. The valve pits can either be located on each property or in the public right-of-way (ROW) in sidewalks or streets. The main advantage of this system is the ability to convey wastewater uphill without the use of conventional lift stations. This could be beneficial to the community of Los Olivos if the WWTP is located in the northern portion of the SPA. Similar to pressure systems and small diameter gravity systems, scheduled maintenance would be required at each valve pit and the central vacuum pump station.

Based on our preliminary review of the collection systems discussed above, a typical gravity-type system is recommended for the Los Olivos system. As previously discussed, the Los Olivos SPA generally slopes to the south in gentle fashion without irregular grade breaks and a gravity system could be installed to take advantage of this topography. It is likely that conventional excavation depths of five to six feet could be maintained along the majority of the alignments. This anticipated excavation depth would not be significantly deeper than those required for an alternative system. Shallow depths would have significant cost impacts where shallow groundwater is present. However, mitigation measures such as limiting construction to the drier summer months could be implemented in areas where groundwater is known to be particularly shallow during wet winter months.

Based on the assumed flows, the majority of collection pipes will likely be 8 inches in diameter while some main lines could have a diameter up to 15 inches to accommodate projected Phase III flows. Although some cost savings would be realized by using smaller diameter pipelines with some of the alternative collections systems, additional equipment (grinder pumps and tanks) and associated maintenance costs at each connection would negate these potential savings.

5.3 Collection Layout Design

Using the flow estimates presented in Section 3 of this report, a preliminary layout of the collection system was prepared to develop estimated construction costs and operation and maintenance (O&M) costs. The layout was prepared using industry standard design parameters.

It is assumed that treatment and disposal will occur at one or several of the large agricultural properties located north or south of Los Olivos just outside of the SPA. Two alternative layouts using a northern and a southern route are presented below. Both layouts follow the natural topography of the area and utilize gravity flow while minimizing the use of lift stations. It is important to note that the layouts provided within this PER are conceptual and should only be used as a basis to evaluate the projects overall feasibility. A more detailed analysis will be required to adequately size and align the collection system.

A schematic layout of backbone collection pipelines was developed for both routes and potential lift stations were identified. The SPA was divided into individual service areas based on project phasing (Section 2) and site topography. In general, Service Area 1 represents the downtown core (Phase I) and several residences within the downtown area. Service Area 2 represents the full commercial build-out and the few residential connections included in Service Area 1 (Phase II). The remaining residential areas to be added in Phase III (A, B & C) were divided into service areas based on geographical features (Alamo Pintado Creek and State Highway 154) and likely directions for treatment and disposal facilities. Wastewater flows from each service area and design parameters discussed in Section 5.3 were used to size the collection system pipelines, lift stations, and force mains.

5.4 Design Parameters

The gravity sewer pipelines were sized based on the ratio of the depth of flow to the diameter of the pipe (d/D) during the PHF period. These ratios were calculated using the Manning's equation for open channel flow with minimum allowable pipe slopes and a coefficient of "n" equal to 0.013.

The flow velocity in the pipeline was also considered and is primarily a function of the slope of the pipe for self cleaning. As previously stated, minimum allowable slopes were used resulting in conservative velocity values. The minimum velocity was analyzed at AADF and the peak velocity was analyzed at PHF. For this PER, a minimum pipe diameter of 8 inches was used. The following table lists the assumed d/D ratios and minimum slopes used for pipe size selection for the collection system.

Table 5.1 – Minimum Gravity Sewer Grades and Design Depth Ratios

Pipe Size (inches)	Minimum Grade (%)	Liquid Depth to Diameter Ratio (d/D)
8	0.4	0.5
10	0.28	0.5
12	0.22	0.5
15	0.16	0.75
18	0.12	0.75
21	0.1	0.75
24	0.08	0.75

Lift stations were analyzed based on pump capacity during PHF, with one standby pump.

Force mains were sized based on the hydraulic capacity of the lift station using a minimum design velocity of 3 feet per second (fps) and a maximum velocity of 6 fps. Higher velocities generally result in higher pumping costs since the friction losses in a pipe are proportional to the square of the velocity. The scouring velocity is the minimum velocity to prevent solids from settling in the pipe. A value of 2 fps is widely recognized as the velocity required to prevent solids deposition. Due to the cyclic operation of sewage lift stations, the liquid in the force main will sit without flowing for long periods of time and will need a velocity of 3 fps to help keep the force main clean. Lower velocities could lead to the need for frequent cleaning and increased force main maintenance costs.

5.5 Northern Routing Option (Option No. 1)

5.5.1 Overview

As previously discussed, the general topography of the Los Olivos SPA slopes to the south. A northern routing option requires lift stations fed by gravity pipelines to convey wastewater to a treatment site. Based on AECOM's preliminary layout, three lift stations would likely be required for this routing.

5.5.1.1 Treatment Site Location

Several existing pastures are located to the north along Foxen Canyon Road and Calkins Road. A treatment site location was assumed to be near the northern most perimeter of the SPA. Again, it is important to note that the layouts provided are conceptual and are only used as a basis to evaluate the projects overall feasibility.

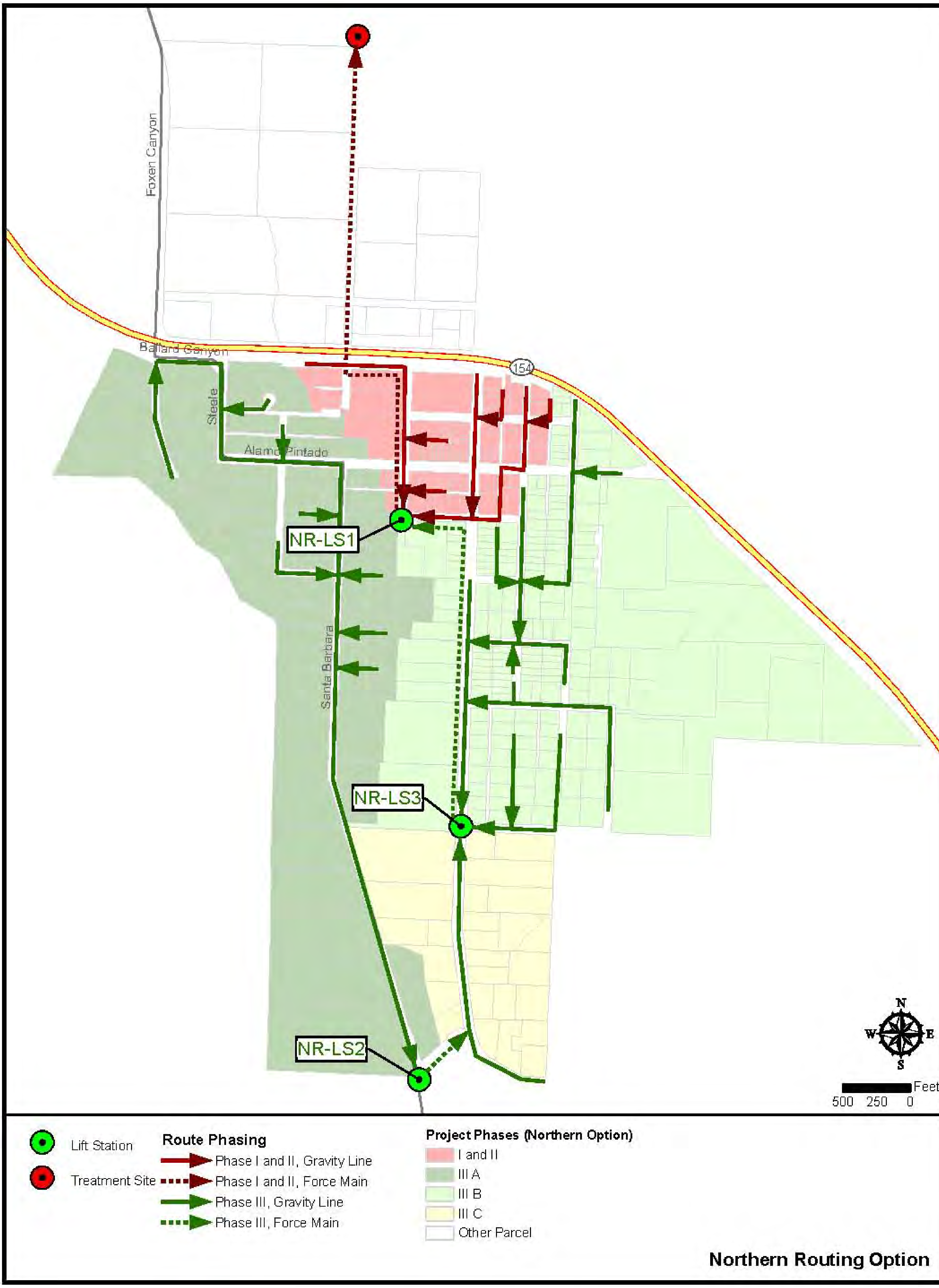

Figure 5.1 Northern Route Phase Areas

5.5.1.2 Layout Phasing

The initial collection system (Phase I) to serve the downtown core could be limited to serve businesses along Grand Avenue from Railway Avenue (State Highway 154) to Hollister Street and a limited number of residences with substandard lots (see Section 2.2). A network of gravity collection pipelines would be installed and connected to a lift station at the area's lowest point around the corner of Hollister Road and Nojoqui Road (NR-LS1). The collection system piping would be sized to handle any future build-out commercial flows (Phase II). The lift station installed for Phase I would need to be upsized (larger pumps) to handle the increased flows during Phase II. During Phase III, the remaining residences could be served using gravity collection pipelines emptying to lift stations to the south of the downtown core. A lift station will likely be required around the intersection of Santa Ynez Street and Grand Avenue (NR-LS3). Another lift station (NR-LS2) would be required to drain gravity flow from the west side of town and would be located near Santa Barbara Avenue and Lansing Crossing. NR-LS2 would lift the wastewater across Alamo Pintado Creek and into a gravity line along Grand Avenue. NR-LS3 would take flows from both the west side of town (NR-LS2) and the southern portion of town and pump it to NR-LS1. Again NR-LS1 would be upsized to accommodate increased flows from Phase II.

5.5.2 Design Flows and Sizing

Using the estimated flows discussed in Section 2, wastewater flow contributions were calculated for those service areas shown on Figure 5.1. Phases I and II of the project consist mainly of the downtown core and wastewater flows increase significantly with the build-out of the commercial properties. Phase III was separated into four separate service areas due to their geographic location to develop loadings and sizing calculations for the collection system. Table 5.2 details the calculated flows associated with the phases.

Table 5.2 – Estimated WW Generation by Phase Area- Northern Route

Phase	AADF (gpd)	PHF (gpd)
I	19,000	82,000
I + II	63,000	281,000
III – A	30,000	135,000
III – B	44,000	198,000
III – C	6,000	27,000
III A+B+C	80,000	360,000
Total Flow	**143,000**	**644,000**

The major pipelines for the collection system were sized based on the design parameters presented in Section 5.3. Only the major collection pipelines were analyzed assuming, that due to the relatively small flows, the remaining lines would be 8 inches in diameter (recommended minimum size). Table 5.3 below represents the results of AECOM's analysis.

Table 5.3 – Estimated Pipeline Sizing for Northern Route			
Phase	**Description**	**Estimated Capacity Required (gpd)**	**Pipeline Diameter[1] (inches)**
I	Phase I to NR-LS1	82,000	8
I+II	Phase I & II to NR-LS1	281,000	10
IIIA	Phase IIIA to NR-LS3	135,000	8
IIIA+IIIC	Phase IIIA & IIIC to NR-LS2	162,000	8
IIIB	Phase IIIB to NR-LS2	198,000	8

Notes:
Designed for Peak Hour Flow

As shown in Table 5.3, an 8-inch pipeline can handle wastewater flows in Phase I. However, with the increased flows from commercial build-out in Phase II, the required pipe size is 10 inches. It is assumed that the larger pipe would be installed during Phase II since the cost of installing the larger diameter pipe during construction of Phase II would be significantly less than if a larger diameter pipe was installed at a later date.

Lift station capacities were calculated and the corresponding force main size using the design parameters previously discussed. These results are presented below in Table 5.4.

Table 5.4 – Estimated Lift Station Capacity Requirements for Northern Route at Build-Out		
Lift Station	**Estimated capacity required for Build-Out (gpm)**	**Force Main Diameter[1] (inches)**
NR-LS1	447	6
NR-LS2	250	4
NR-LS3	94	4

Notes:
Designed for Peak Hour Flow averaged over 24 hours.

The pipe sizes presented in this PER are based on minimum design requirements and may differ from the sizes required after a detailed analysis of the system is performed. These calculations are provided for initial planning and feasibility discussions.

5.6 Southern Routing (Option No. 2)

5.6.1 Overview

The natural topography of the area makes a gravity-type system flowing to the south a viable option. Using this alternative routing, lift stations are only needed for the portion of the system west of Alamo Pintado Creek.

5.6.1.1 Treatment Site Location

Similar to the area north of Los Olivos, several existing agricultural fields are located to the south along Grand Avenue. A treatment site location was assumed to be near the southern perimeter of the SPA. Again, it is important to note that the layouts provided are conceptual and are only used as a basis to evaluate the projects overall feasibility.

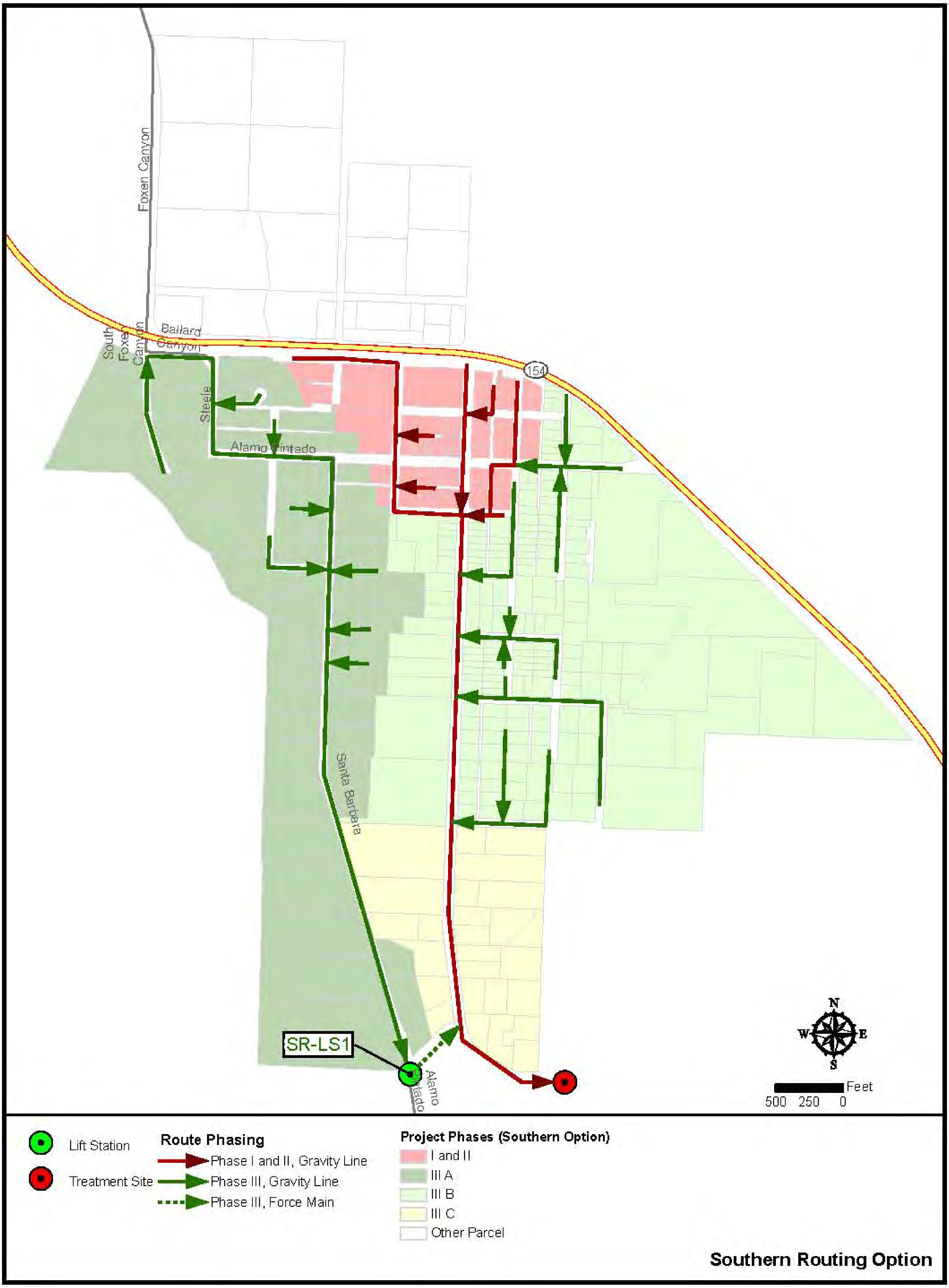

Figure 5.2 Southern Route Phase Areas

5.6.1.2 Layout Phasing

The initial collection system (Phase I) would be similar to the northern layout (Option No. 1) and would serve the downtown area along Grand Avenue from Railway Avenue (State Highway 154) to Hollister Street. A network of gravity collection pipelines would be installed and connected to a main trunk line that would continue down Grand Avenue to the treatment site. Future phases would connect to the trunk line as service areas are added. In order to serve the west side of the community it is necessary to cross Alamo Pintado Creek. As shown on Figure 5.2, a lift station (SR-LS1) will be placed near Lansing Crossing to pump wastewater flows across the creek and into the main trunk line.

5.6.2 Design Flows and Sizing

Using the estimated flows discussed in Section 3, wastewater flows were calculated for those service areas shown on Figure 5.2. Phases I and II of the project consist mainly of the downtown core and wastewater flows increase significantly with the build-out of the commercial properties. Phase III is separated into three separate service areas due to their geographic location to perform sizing calculations of the collection system. Table 5.5 summarizes the flows determined for each phases.

Table 5.5 – Estimated WW Generation by Phase Area- Southern Route

Phase Area	AADF (gpd)	PHF (gpd)
I	19,000	82,000
II	63,000	281,000
III – A	6,000	27,000
III - B	30,000	135,000
III - C	44,000	198,000
III -Total	80,000	360,000
Total Flow	**143,000**	**644,000**

The major lines for the collection system were sized based on the design parameters present in Section 5.3. Only the major collection lines were analyzed assuming that due to the relatively small flows the remaining lines would be 8 inches in diameter (recommended minimum size). Table 5.6 below represents the results of our calculations.

Table 5.6 – Estimated Pipeline Sizing for Southern Route

Phase	Description	Estimated Capacity Required (gpd)	Pipeline Diameter[1] (inches)
I	Phase I to Treatment Area	68,000	8
I+II	Phase I & II to Treatment Area	288,000	10
I+II+IIIA	Phase I, II and IIIA to IIIC	308,000	10
IIIB	Phase IIIB to SR-LS1	135,000	8
I+II+IIIA+ IIIC	Phase I, II, IIIA & IIIC to SR-LS1 connection	506,000	12
I+II+III (A+B+C)	All Phases to Treatment Area	644,000	15

Notes:
1. Designed for Peak Hour Flow

Like the northern route, an 8-inch pipe size would be adequate to serve Phase I. However, the pipe will need to be upsized to 10 inches and 15 inches in Phases II and III respectively.

The lift station capacity and corresponding force main size was determined using the design parameters previously discussed. These results are presented below in Table 5.7

Table 5.7 – Estimated Lift Station Capacity Requirements for Southern Route at Build-Out

Lift Station	Estimated Capacity Required for Build-Out (gpm)	Force Main Diameter[1] (inches)
SR-LS1	94	4

Notes:
1. Designed for Peak Hour Flow.

The pipe sizes presented in this PER are based on minimum design requirements and may differ from sizes required after a detailed analysis of the system is performed. These calculations are provided for initial planning and feasibility discussions

5.7 Opinion of Probable Costs

5.7.1 Capital Cost Summary

Opinions of probable construction cost for the collection system were developed based on estimated costs of materials, preparation, earthwork, installation, and roadwork. Design and administration costs were estimated at 35 percent of total construction costs and an additional 20 percent contingency was included. Cost criteria are summarized in Table 5.8.

Table 5.8 – Sewer Improvement Cost Criteria			
Item Description	**Estimated Construction cost**	**Including Contingency (20 Percent)**	**With Engineering/Administration (35 Percent)**
4-in Force Main	$107/LF	$128/LF	$173/LF
6-in Force Main	$117/LF	$140/LF	$190/LF
8-in Gravity Sewer	$158/LF	$190/LF	$256/LF
10-in Gravity Sewer	$178/LF	$214/LF	$288/LF
12-in Gravity Sewer	$198/LF	$238/LF	$321/LF
15-in Gravity Sewer	$229/LF	$275/LF	$371/LF

These cost opinions are based on the following assumptions:

- Except where other data are available, cost opinions are generally derived from bid prices from similar wastewater projects, with adjustments for inflation, size, complexity, and location.
- Cost opinions are in 2012 dollars;
- When budgeting for future years, appropriate escalation factors should be applied (ENR Construction Cost Index of: 9175.94 for January 2012);
- Cost opinions are “budget-level” and may not fully account for site-specific conditions that will affect the actual costs; and
- Cost opinions do not include the cost to purchase or acquire the land needed to accommodate the collection system.

The opinions of probable cost prepared by AECOM represent our judgment and are supplied for the general guidance of the County. Since AECOM has no control over the cost of labor and material, or over competitive bidding or market conditions, AECOM does not guarantee the accuracy of such opinions as compared to contractor bids or actual costs.

The project cost summaries presented in Tables 5.9 and 5.10 were developed using the cost criteria from Table 5.8 and the collection layouts displayed in Figures 5.1 and 5.2. Lift station cost estimates are based on actual cost of recent lift station projects in the area of similar size. The lift station required for Phase 1 and II would be larger than the additional two required at project build-out as shown below. A more detailed cost estimate is provided in Section 9 for an assumed project. The cost estimated provided in the tables below are provided for the purpose of evaluating the benefits and disadvantages between a northern and southern collection system route.

Table 5.9 – Northern Route - Collection System Project Cost Summary

	Phase I & II		Phase III		Total	
Component	**Quantity**	**Value**	**Quantity**	**Value**	**Quantity**	**Value**
4-in Force Main	-	$ -	2,950 LF	$316,000	2,950 LF	$316,000
6-in Force Main	3,700 LF	$433,000	-	$ -	3,700 LF	$433,000
8-in Gravity Sewer	5,200 LF	$822,000	21,700 LF	$3,424,000	26,900 LF	$4,246,000
10-in Gravity	1,650 LF	$294,000	-	$ -	1,650 LF	$294,000
Lift Station #1	1	$600,000	-	$ -	1	$600,000
Lift Station #2	-	$ -	1	$450,000	1	$450,000
Lift Station #3	-	$ -	1	$450,000	1	$450,000
Subtotal		**$2,149,000**		**$4,640,000**		**$6,789,000**
Contingency (20 Percent)		$430,000		$928,000		$1,358,000
Total		**$2,579,000**		**$5,568,000**		**$8,147,000**
Engineering, Administration, and Legal (35 Percent)		$903,000		$1,949,000		$2,852,000
Total Project		**$3,482,000**		**$7,517,000**		**$10,999,000**

Table 5.10 – Southern Route - Collection System Project Cost Summary						
Component	**Phase I & II**		**Phase III**		**Total**	
	Quantity	Value	Quantity	Value	Quantity	Value
4-in Force Main	-	$ -	500 LF	$54,000	500 LF	$54,000
8-in Gravity Sewer	6,900 LF	$1,091,000	17,000 LF	$2,686,000	23,900 LF	$3,777,000
12-in Gravity Sewer	3,700 LF	$733,000	-	$ -	3,700 LF	$733,000
15-in Gravity Sewer	500 LF	$115,000	-	$ -	500 LF	$115,000
Lift Station #1	-	$ -	1	$450,000	1	$450,000
Subtotal		**$1,939,000**		**$3,190,000**		**$5,129,000**
Contingency (20 Percent)		$388,000		$638,000		$1,026,000
Total Construction		**$2,327,000**		**3,828,000**		**$6,155,000**
Engineering, Administration, Legal (35 Percent)		$815,000		$1,340,000		$2,155,000
Total Project		**$3,142,000**		**$5,168,000**		**$8,310,000**

5.7.2 Operations and Maintenance

Another important component of the overall life-cycle cost for a collection system is O&M. Typical maintenance items for the system include periodic cleaning and inspection of the sewer lines and maintenance of the pumps at the lift stations.

5.7.2.1 Sewer Line and Manhole Cleaning and Inspection

Collection system cleaning and inspection is typically recommended for 20 percent of the system each year. Through these inspections, high maintenance areas (HMAs) are identified along with any other issues in the line (root intrusion, pipe damage, etc.). Cleaning and inspection frequency can be modified to target those areas that require more frequent cleaning.

5.7.2.2 Lift Station Maintenance

Periodic inspection of lift stations is required to identify potential problems not detected by the control system. Lift stations typically have specific O&M manuals to guide inspection and maintenance activities. During the inspection the following tasks are generally performed:

- Observation of pumps, motors and drives for unusual vibration, noise, heat;
- Observation of controls for proper settings;
- Check pump suction and discharge lines and suction and discharge pressures;
- Check pumping rates, runtimes, speed;
- Confirm chemical storage levels where applicable; and
- Preventative maintenance: list of parts needing periodic replacement, log of inspections and note anticipated problems or repairs.

Operational checks of lift stations are typically conducted daily or weekly and include evaluation of pumps and motors, drive shafts, bearings, seals, packing, electrical systems, controls, pumping cycles and levels, piping, air releases, compressors, ventilation, and auxiliary equipment.

5.7.2.3 Estimated Operations and Maintenance Cost

O&M cost estimates for the collection system are provided in the following tables. These estimates provide general items typically required and AECOM has assumed 20 man-hours will be required per week to perform these items. A 20-year net present value is also provided for each estimate. Similarly to the construction cost estimates the O&M cost estimates provided are for the purpose of evaluating the benefits and disadvantages between a northern and southern collection system route. More detailed cost estimates are provided in Section 9 for an assumed project.

Table 5.11 provides estimated O&M cost for Phase 1 of the northern route.

Table 5.11 – Northern Route - Phase I Annual O&M Cost Estimate

Component	Unit Cost	Unit	Quantity	Unit	Total
Power	$0.16	$/kWh	2,072	kWh	$332
Line Cleaning	$0.64	$/LF	1,730	LF	$1,107
Line Inspection (CCTV)	$1.07	$/LF	1,730	LF	$1,851
Line Replacement[4]	$15.00	$/LF	87	LF	$1,298
Labor	$58.37	$/hour	1,043	hours	$60,880
Maintenance[2]	2.0	%	$100,000	-	$2,000
Misc. Equipment Replacement[2]	4.0	%	$100,000	-	$4,000
Total					**$71,500**
20-Year Net Present Value					**$1,084,000**

Notes:
1. Costs based on the first year of operation in 2014.
2. Percentage of the total Phase I equipment cost.
3. 20-Year Net Present Value determined using 2 percent inflation and 4 percent interest rate.
4. Percentage of total average pipeline cost.

Table 5.12 provides estimates for the southern route for Phase I.

Table 5.12 – Southern Route - Phase I Annual O&M Cost Estimate					
Component	**Unit Cost**	**Unit**	**Quantity**	**Unit**	**Total**
Power	$0.16	$/kWh	179	kWh	$29
Line Cleaning	$0.64	$/LF	1,840	LF	$1,178
Line Inspection (CCTV)	$1.07	$/LF	1,840	LF	$1,969
Line Replacement[4]	$15.00	$/LF	92	LF	$1,380
Labor	$58.37	$/hour	1,043	hours	$60,880
Maintenance[2]	2.0	%	$ -	-	$ -
Misc. Equipment Replacement[2]	4.0	%	$ -	-	$ -
Total					**$65,500**
20-Year Net Present Value					**$990,000**

Notes:
1. Costs based on the first year of operation in 2014.
2. Percentage of the total Phase I equipment cost.
3. 20-Year Net Present Value determined using 2 percent inflation and 4 percent interest rate.
4. Percentage of total average pipeline cost.

6 Treatment Alternatives Evaluation

This section of the report describes and compares feasible treatment alternatives for the Los Olivos WWTP project. Since the impacts of nitrogen on the underlying groundwater in the Santa Ynez sub-basin is a major focus for the RWQCB, AECOM has assumed that any WDRs developed for the Los Olivos WWTP will include a TN limit of less than 10 mg/L. The four treatment alternatives which will be evaluated in-depth in this PER include:

- Extended Aeration Activated Sludge Modified Ludzak-Ettinger (MLE)
- Sequencing Batch Reactor (SBR)
- Membrane Bioreactor (MBR)
- AdvanTex

The MLE, SBR, and MBR systems have a successful track record of meeting typical secondary treatment and nitrogen removal requirements in situations similar to this project in California. Information provided by the AdvanTex vendor also claims success in meeting a TN limit less than 10 mg/L; however, AECOM requested performance data specifically for similarly-sized, publicly-owned community systems in California and data was not provided at the time of this report.

The following provides descriptions, process flow diagrams, detailed design criteria, and capital and O&M cost estimates for each of these alternatives. The information developed for these various treatment alternatives will be used in a latter section of this PER to determine the final recommended project for the Los Olivos WWTP project.

6.1 Basis of Cost Evaluation

In order to develop preliminary cost estimates for the four treatment alternatives considered in this report, the following major equipment manufacturers were consulted. These manufacturers are presented in Table 6.1. Relative costs are included for each option and may not include all necessary construction elements however, estimated costs are provided as a basis for comparison. More inclusive costs are provided in Section 9 of this report.

Table 6.1 – Basis for Evaluated Equipment Costs

Process	Manufacturer/Model
Spiral Screen[1]	Parkson Hycor® Helisieve Plus®/HLS300P
SBR Equipment	Aqua-Aerobic Systems, Inc. AquaSBR®
Activated Sludge Equipment	Siemens Davco Biological Treatment System
Cloth Media Disk Filters	Aqua-Aerobic Systems, Inc. AquaMiniDisk®
MBR Equipment	GE Z-MOD M™6 Dual and 44 Dual ZeeWeed® MBR
AdvanTex	AX100 AdvanTex® Filter
UV Disinfection Equipment[2]	TrojanUVFit™ 18AL40 Reactor

Notes:
1. GE Z-MOD package provided with internally-fed fine screens.
2. AdvanTex package provided with Hallet 30 UV disinfection equipment.

6.1.1 Sludge Treatment and Disposal

AECOM has assumed a common sludge treatment and disposal scheme for the four alternatives considered in this report. Due to the size of the WWTP needed to accommodate the Los Olivos SPA, waste sludge resulting from the secondary process will be sent to an aerated sludge holding tank or aerobic digester for stabilization. These facilities will provide storage and the potential for some volatile solids reduction (VSR) to help minimize the amount of sludge that must be disposed of by the community. Following a period of approximately 15 days, the solids will be hauled offsite by a liquid hauler and disposed of at another wastewater treatment facility in the County, or a neighboring county, that accepts sludge or septage. The cost of this aerated tank has been included in the construction cost estimates for each treatment alternative. The impacts of the aeration and disposal of this material have also been included in the O&M cost estimates provided for each alternative.

6.2 Alternative No. 1 – Extended Aeration Activated Sludge MLE

6.2.1 Overview

The activated sludge process is a suspended growth system where the microorganisms break down and consume the waste that is suspended in the liquid or mixed liquor (ML). There are many variations in the activated sludge process including conventional activated sludge, extended aeration, and extended aeration with MLE.

The activated sludge process configuration applicable for the Los Olivos WWTP is known as a packaged activated sludge system where the different components of the treatment process are housed in an aboveground bolted, or welded steel tank configured with two concentric rings. The secondary clarifier is housed in the inner tank, while the equalization, aerobic, anoxic, and aerobic digestion zones are housed in the outer tank. Like a typical activated sludge system, package systems can be configured to accommodate biological nutrient removal (BNR) via the MLE process to achieve low total nitrogen levels.

Nitrification and denitrification is accomplished by using an extended aeration activated sludge process coupled with a MLE configuration. The MLE process consists of an anoxic zone upstream of the aerobic zone. In the aerobic zone, ammonia and organic nitrogen are converted to nitrate. Nitrified effluent from this zone is then recycled back to the anoxic zone for denitrification where the nitrate is converted to nitrogen gas and released into the atmosphere. The wastewater flows from the preliminary treatment facilities to the anoxic stage and continues to the aerobic stage before being sent the secondary clarifiers. At the secondary clarifiers, return activated sludge (RAS) is returned to the anoxic zone to maintain the proper solids inventory in the system.

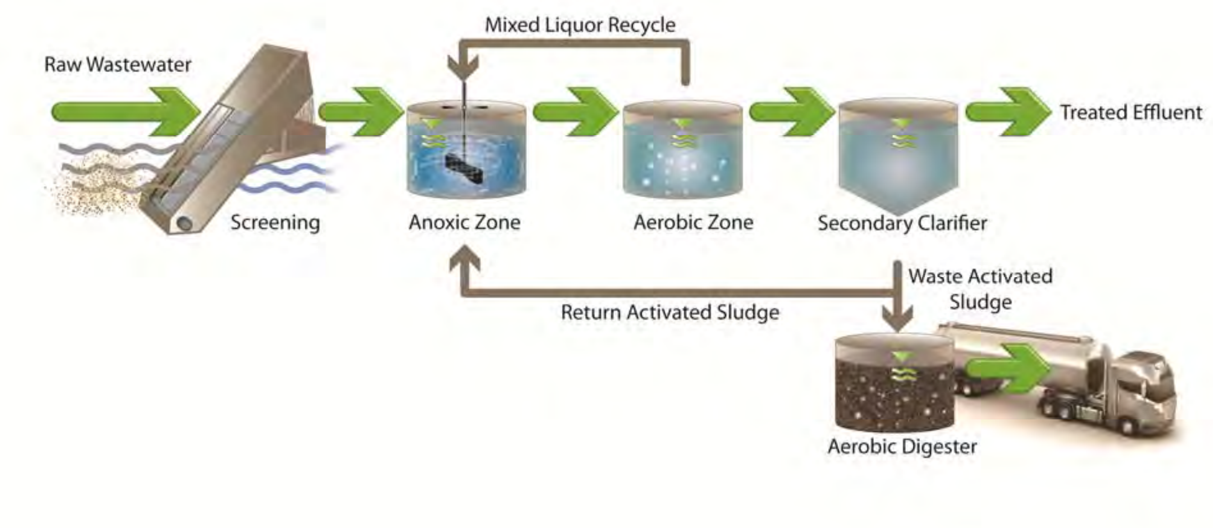

Figure 6.1 Typical Extended Aeration Activated Sludge MLE Configuration Flow Schematic

6.2.2 Additional Processes

Alternative effluent disposal methods are discussed in Section 7 of this PER. In order to achieve the level of treatment necessary for several of these alternatives, the MLE process would need to be followed by several ancillary processes including filtration and disinfection. A description of the filtration and disinfection facilities considered for the Los Olivos WWTP as well as detailed design criteria are included in this PER.

6.2.2.1 Filtration

One viable effluent disposal alternative evaluated in this PER is agricultural irrigation of food crops. In order to meet CDPH Title 22 requirements for this recycled water use, disinfected tertiary effluent would be required. The regulations govern not only the method of disinfection, but also the amount of suspended and colloidal solids in the effluent. The specific effluent requirements for disinfected tertiary reuse are detailed in Section 4.5.2 of this PER.

In order to limit the amount of solids and colloidal particles in the effluent to below the levels dictated by Title 22, coagulation and filtration would be required.

For the Los Olivos WWTP project, AECOM has evaluated the use of cloth media disk filters for tertiary filtration. This technology has several advantages to other filtration technologies including:

- Smaller footprint;
- Simple operation; and
- Lower capital.

Cloth media disk filters include multiple disks installed in carbon steel, stainless steel, or concrete tanks. The disks care constructed of needle felt or pile media consisting of nylon fibers attached to a polyester backing. The disks operate while fully submerged in the effluent and can operate during the backwash cycle. The disks are connected to a filtrate header that collects and transports filtrate generated by gravity flow of filtered effluent through the media. The eventual increase in head loss caused by the accumulation of solids in the media causes the level in the tank to rise. An automatic backwash cycle is initiated once a preset level is reached.

While cloth media disk filters are well-suited for the Los Olivos WWTP, several other cost-effective technologies may be viable for the project. The investigation of additional technologies and manufacturers should be evaluated at a later time as part of preliminary or final design efforts.

6.2.2.2 Disinfection

As mentioned previously, some of the evaluated effluent disposal options will require the addition of disinfection to the main treatment process. In order to meet the requirements for disinfected tertiary effluent in accordance with Title 22, the WWTP would need provisions to reliably reduce total coliform to less than 2.2 MPN/100 mL. In order to achieve this level of disinfection, UV light has been considered for this PER.

UV disinfection is a technology that is prevalent in the wastewater industry. UV light inactivates pathogens by damaging the cellular structure and nucleic acids of microorganisms. There are two types of reactors available including in-vessel and open channel. The in-vessel-type is a self-contained aboveground unit that installs between two pipe flanges. A benefit of an in-vessel system is its small footprint.

6.2.3 Design Criteria

Detailed design criteria have been developed for the extended aeration activated sludge MLE process as well as the filtration and disinfection facilities that may be required for this alternative.

6.2.3.1 Extended Aeration Activated Sludge MLE

A separate packaged activated sludge unit or tank is needed for each phase of the Los Olivos WWTP project. Each package unit contains a pre-equalization zone, anoxic zone, aerobic zone, post-anoxic zone, aerobic digester, and integral clarifier. Provisions for flow diversion to accurately apportion flow to each of the units are required. For Phase I, a single 54-foot diameter tank with an internal 12-foot diameter clarifier would be installed to treat a design ADMMF flow of 20,000 gpd.

6.2.3.2 Cloth Media Filtration

As part of Phase I, a single filter basin would be constructed with the capacity to hold six separate disks. The CDPH has developed a maximum hydraulic loading rate of six gallons per minute per square foot (gpm/sf) for this type of cloth media filter. In order to remain below this maximum rate, only two disks are needed to serve the initial downtown core project. An additional two disks would be installed in the basin for both Phase II and Phase III.

6.2.3.3 UV Disinfection

For the initial phase of the Los Olivos WWTP project, one low-pressure, high-intensity in-vessel reactors would be installed. A single reactor is needed to treat the maximum day flow for Phase I and Phase II projects. A second duty reactor would be installed to treat the Phase III MDF of 458,000 gpd.

6.2.4 Summary

The detailed design criteria for each component of the MLE alternative is summarized in Table 6.2.

Table 6.2 – Alternative No. 1 - Extended Aeration Activated Sludge MLE Design Criteria

Parameter	Phase I	Phase II	Phase III
Influent Characteristics			
Average Annual Daily Flow (gpd)	19,000	63,000	143,000
Average Day Maximum Month Flow (gpd)	20,000	69,000	158,000
Maximum Daily Flow (gpd)	59,000	200,000	458,000
Peak Hour Flow (gpd)	82,000	281,000	644,000
BOD			
(mg/L)	630	755	435
(ppd)[1]	105	435	575
TSS			
(mg/L)	420	480	330
(ppd)[1]	70	275	435
TKN			
(mg/L)	90	95	65
(ppd)[1]	15	55	85
Activated Sludge Basins			
Total Design Capacity (gpd)	20,000	69,000	158,000
Number of Units	1	2	3
Design Capacity per Unit (gpd)	20,000	34,500	52,667
Equalization Volume (gal)	5,000	17,150	39,325
Anaerobic Volume (gal)	2,500	8,575	19,663
Pre-Anoxic Volume (gal)	2,182	5,017	24,854
Aerobic HRT (hours)	41	44	27
Aerobic Volume (gal)	33,770	124,325	175,629
Post-Anoxic Volume (gal)	3,000	10,492	24,057
Total Basin Volume (gal)	46,452	165,559	283,528
Unit Diameter (feet)[2]	-	50	66
SRT (days)[3]	14.2	13.1	13.1
MLSS (mg/L)	3,500	3,500	3,500
F:M (lb BOD/lb MLSS x day)	0.107	0.120	0.112
Internal Clarifiers			
Number of Units	1	2	3

Table 6.2 – Alternative No. 1 - Extended Aeration Activated Sludge MLE Design Criteria

Parameter	Phase I	Phase II	Phase III
Overflow Rate at MDF (gpd/sf)	590	910	865
Diameter (feet)[4]	-	17	26
Tertiary Filtration			
Type	Cloth Media	Cloth Media	Cloth Media
Number of Units	1	1	1
Number of Disks per Unit	2	4	6
Surface Area per Disk (sf)	12	12	12
Total Surface Area (sf)	24	48	72
HLR at ADMMF (gpm/sf)	0.6	1.0	1.6
HLR at MDF (gpm/sf)	1.8	2.9	4.5
Disinfection			
Type	Ultraviolet	Ultraviolet	Ultraviolet
Number of Units	1	1	2
Number of Units in Service	1	1	2
Transmittance (%)	65	65	65
Dose (mJ/cm^2)	80	80	80
Number of Lamps per Reactor	18	18	18
Number of Lamps	18	18	36
Sludge Holding			
WAS Loading			
Hydraulic (gpd)	1,205	4,725	6,700
Solids (ppd)	70	275	390
HRT(days)	16.6	16.8	17.2
Volume (gal)	6,986	27,756	40,315
Number of Basins	1	2	3
Volume per Basin (gal)	6,986	13,878	13,438
Hauled Sludge Volume (gal/month)	9,620	37,800	53,610
Oxygen Required (ppd)	35	145	205

Notes:
1. Loading based on the ADMMF condition.
2. Phase I project will be supplied as a modular package plant with separate tanks.
3. SRT for aerobic zone only.
4. Phase I project will be supplied with a separate 10-foot square hopper clarifier.

6.2.5 Opinion of Probable Costs

Based on these design criteria, project cost estimates were developed for the MLE alternative. It should be noted that these costs represent the highest level of treatment and therefore cost for the MLE alternative since the costs include provisions for filtration and disinfection. As discussed in a latter section of this PER, different effluent disposal options may not require these ancillary processes.

The construction cost estimate for the MLE alternative is included in Table 6.3.

Table 6.3 – Alternative No. 1 - Extended Aeration Activated Sludge MLE Project Cost Summary

	Value			
Component	**Phase I**	**Phase II**	**Phase III**	**Total**
Equipment				
Screening	$177,000	$ -	$ -	$177,000
Activated Sludge	$425,000	$625,000	$625,000	$1,675,000
Filtration	$197,000	$ -	$ -	$197,000
Disinfection	$103,000	$ -	$103,000	$206,000
Civil/Yard Piping	$81,000	$65,000	$73,000	$219,000
Structural	$145,000	$166,000	$166,000	$477,000
Process Mechanical	$159,000	$100,000	$116,000	$375,000
Electrical & Instrumentation	$322,000	$258,000	$289,000	$869,000
Subtotal	**$1,609,000**	**$1,214,000**	**$1,372,000**	**$4,195,000**
Tax	$71,000	$57,000	$64,000	$192,000
Contractor Overhead & Profit	$168,000	$135,000	$151,000	$454,000
Contingency (20 Percent)	$369,000	$296,000	$332,000	$997,000
Total Construction Cost	**$2,217,000**	**$1,702,000**	**$1,919,000**	**$5,838,000**
Engineering, Administration, Legal (35 Percent)	$775,000	$621,000	$697,000	$2,093,000
Total Project Cost	**$2,992,000**	**$2,323,000**	**$2,616,000**	**$7,931,000**

6.2.5.1 Operations and Maintenance

The O&M cost estimate for the MLE alternative is included in Table 6.4. It should be noted that these O&M costs were developed for the Phase I project and are based on an AADF of 19,000 gpd. A 20-year net present value is also provided for the Phase I project.

Table 6.4 – Alternative No. 1 - Extended Aeration Activated Sludge MLE Annual O&M Cost Estimate

Component	Unit Cost	Unit	Quantity	Unit	Total
Sludge Disposal	$0.22	$/gallon	125,850	gallons	$27,687
Power	$0.16	$/kWh	177,984	kWh	$28,477
Filter Replacement	$991.17	$/filter	0.8	filters	$793
UV Bulb Replacement	$297.14	$/bulb	18	bulbs	$5,349
Labor	$58.37	$/hour	522	hours	$30,469
Maintenance[2]	2.0	%	$791,468	-	$15,829
Misc. Equipment Replacement[2]	4.0	%	$791,468	-	$31,659
Total					**$140,300**
20-Year Net Present Value					**$2,180,000**

Notes:
1. Costs based on the first year of operation in 2014.
2. Percentage of the total Phase I equipment cost.
3. 20-Year Net Present Value determined using 2 percent inflation and 4 percent interest rate.

6.3 Alternative No. 2 – Sequencing Batch Reactor (SBR)

6.3.1 Overview

The SBR treatment process is a true batch system where equalization, treatment, and clarification is achieved within the confines of a single reactor. The typical treatment cycle of a SBR includes separate fill, react, settle, and decant treatment phases. Since all of these processes occur in a single basin, footprint requirements are reduced and mixed liquor recycle (MLR) pumping needed to achieve denitrification is eliminated.

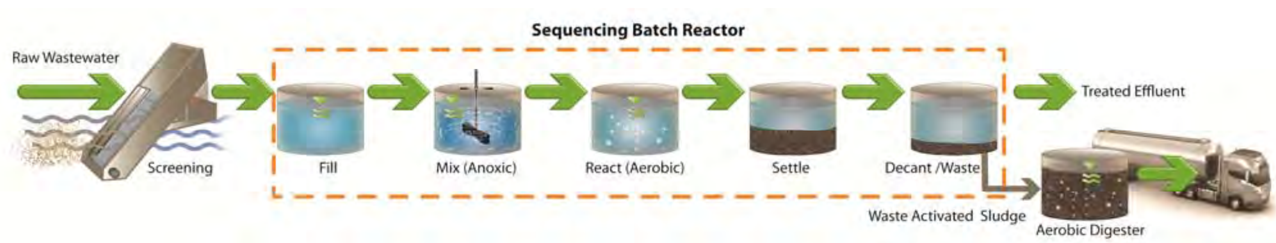

Figure 6.2 Typical SBR System Flow Schematic

6.3.2 Additional Processes

As discussed previously, several additional treatment processes may need to be added to the SBR in order to achieve the level of treatment required for effluent disposal alternatives presented in a latter section of this PER. Like the MLE alternative, these processes include filtration and disinfection.

6.3.2.1 Filtration

Like the MLE alternative, cloth media disk filtration has been evaluated for the SBR alternative. Detailed filtration design criteria for the SBR alternative are presented in a latter section of this PER.

6.3.2.2 Disinfection

Like the MLE alternative, UV disinfection has been evaluated for the SBR alternative. Detailed disinfection design criteria for the SBR alternative are presented in a latter section of this PER.

6.3.3 Design Criteria

Detailed design criteria have been developed for the SBR process as well as the filtration and disinfection facilities that may be required for this alternative.

6.3.3.1 SBR

For Phase I of the WWTP project, a single SBR basin and pre-equalization basin will be provided to attenuate diurnal peak flows and store influent wastewater while the SBR is in operation. Once the SBR cycle is completed, and the effluent has been decanted, the influent in the pre-equalization basin would be pumped into the SBR and the cycle would be repeated. During Phase II, a new SBR would be constructed and the existing basins would be used as a larger pre-equalization basin. The operation of the Phase II process would be similar to that in Phase I where a single SBR is in operation while the pre-equalization basin provides influent storage. However in Phase II, a post-equalization basin would be used to equalize the decant flow from the SBR to reduce the hydraulic impact on downstream facilities such as filtration and disinfection. For Phase III, a new SBR would be constructed and the existing pre-equalization basin would be eliminated. However, the post-equalization basin would continue to be used to equalize the decant flow for build-out conditions.

6.3.3.2 Cloth Media Filtration

Like the MLE alternative, a single filter basin would be constructed with the capacity to hold six separate disks as part of the Phase I project. However, because of the intermittent decant of the SBR, a total of six disks would be installed in the basin in order to achieve the desired hydraulic loading rate. During Phase II and Phase III when a new post-equalization basin is constructed, the instantaneous peak flow to the filters would be significantly reduced. Therefore, one filter unit with a total of six disks would be adequate for the build-out project.

6.3.3.3 UV Disinfection

For the SBR alternative, an additional in-vessel reactor is required to treat the high peak flows caused by the SBR decant cycle. During Phase II when the post equalization basin is constructed, a single reactor would be sufficient to treat the equalized flow. However, the second reactor would be required to treat the MDF of 458,000 gpd for Phase III.

6.3.3.4 Summary

The detailed design criteria for each component of the SBR alternative is summarized in Table 6.5.

Table 6.5 – Alternative No. 2 – SBR Design Criteria

Parameter	Phase I	Phase II	Phase III
Influent Characteristics			
Average Annual Daily Flow (gpd)	19,000	63,000	143,000
Average Day Maximum Month Flow (gpd)	20,000	69,000	158,000
Maximum Daily Flow (gpd)	59,000	200,000	458,000
Peak Hour Flow (gpd)	82,000	281,000	644,000
BOD			
(mg/L)	630	755	435
(ppd)[1]	105	435	575
TSS			
(mg/L)	420	480	330
(ppd)[1]	70	275	435
TKN			
(mg/L)	90	95	65
(ppd)[1]	15	55	85
Sequencing Batch Reactor (SBR) Basins			
Total Design Capacity (gpd)	20,000	69,000	158,000
Number of Basins	1	1	2
Design Capacity per Basin (gpd)	20,000	69,000	79,000
Length (ft)	34	34	34
Width (ft)	12	46	46
Depth			
Minimum (ft)	11.2	11.7	11.1
Average (ft)	12.8	13.2	12.8
Maximum (ft)	16.0	16.0	16.0
Total Volume (gal)	39,060	154,420	299,490
HRT (hours)	47	54	46
SRT (days)	18.3	17.4	22.7
MLSS (mg/L)	4,500	4,500	4,500
F:M (lb BOD/lb MLSS x day)	0.072	0.075	0.051
Tertiary Filtration			
Type	Cloth Media	Cloth Media	Cloth Media
Number of Units	1	1	1

Table 6.5 – Alternative No. 2 – SBR Design Criteria

Parameter	Phase I	Phase II	Phase III
Number of Disks per Unit	6	6	6
Surface Area per Disk (sf)	12	12	12
Total Surface Area (sf)	72	72	72
HLR at ADMMF (gpm/sf)	1.6	0.7	1.6
HLR at MDF (gpm/sf)[2]	4.6	2.0	4.5
<u>Disinfection</u>			
Type	Ultraviolet	Ultraviolet	Ultraviolet
Number of Units	2	2	2
Number of Units in Service	2	1	2
Transmittance (%)	65	65	65
Dose (mJ/cm^2)	80	80	80
Number of Lamps per Reactor	18	18	18
Number of Lamps	36	36	36
<u>Sludge Holding</u>			
WAS Loading			
Hydraulic (gpd)	840	3,545	5,170
Solids (ppd)	70	295	430
HRT(days)	20.0	16.1	11.0
Volume (gal)	8,380	28,480	28,480
Number of Basins	1	1	1
Volume per Basin (gal)	8,380	28,480	28,480
Hauled Sludge Volume (gal/month)	9,620	40,550	59,110
Oxygen Required (ppd)	35	155	225

Notes:
1. Loading based on the ADMMF condition.
2. Phase I does not include post-equalization. Decant and filter loading rate is equal to 8 x MDF or 472,000 gpd.

6.3.4 Opinion of Probable Costs

Based on these design criteria, project cost estimates were developed for the SBR alternative. These costs represent the highest level of treatment, and therefore the highest cost for the SBR alternative, since the costs include provisions for filtration and disinfection.

6.3.4.1 Construction

A construction cost estimate for the SBR alternative is included in Table 6.6.

Table 6.6 – Alternative No. 2 - SBR Project Cost Summary

	Value			
Component	**Phase I**	**Phase II**	**Phase III**	**Total**
Equipment				
Screening	$177,000	$ -	$ -	$177,000
Sequencing Batch Reactor	$344,000	$295,000	$223,000	$862,000
Filtration	$197,000	$ -	$ -	$197,000
Disinfection	$205,000	$ -	$ -	$205,000
Civil/Yard Piping	$83,000	$37,000	$29,000	$149,000
Structural	$175,000	$213,000	$172,000	$560,000
Process Mechanical	$142,000	$46,000	$35,000	$223,000
Electrical & Instrumentation	$330,000	$148,000	$115,000	$593,000
Subtotal	**$1,653,000**	**$739,000**	**$574,000**	**$2,966,000**
Tax	$73,000	$33,000	$25,000	$131,000
Contractor Overhead & Profit	$173,000	$77,000	$60,000	$310,000
Contingency (20 Percent)	$379,000	$170,000	$132,000	$681,000
Total Construction Cost	**$2,278,000**	**$1,019,000**	**$791,000**	**$4,088,000**
Engineering, Administration, Legal (35 Percent)	$796,000	$356,000	$276,000	$1,428,000
Total Project Cost	**$3,074,000**	**$1,375,000**	**$1,067,000**	**$5,516,000**

6.3.4.2 Operations and Maintenance

The O&M cost estimate for the SBR alternative is included in Table 6.7. Like the MLE alternative, these O&M costs are for the Phase I project treating an AADF of 19,000 gpd. A 20-year net present value is also provided for the Phase I project.

Table 6.7 – Alternative No. 2 - SBR Annual O&M Cost Estimate

Component	Unit Cost	Unit	Quantity	Unit	Total
Sludge Disposal	$0.22	$/gallon	115,440	gallons	$25,397
Power	$0.16	$/kWh	172,815	kWh	$27,650
Filter Replacement	$991.17	$/filter	7.2	filters	$7,136
UV Bulb Replacement	$297.14	$/bulb	18	bulbs	$5,349
Labor	$58.37	$/hour	783	hours	$45,704
Maintenance[2]	2.0	%	$708,482	-	$14,170
Misc. Equipment Replacement[3]	4.0	%	$708,402	-	$28,339
Total					**$153,800**
20-Year Net Present Value					**$2,387,000**

Notes:
1. Costs based on the first year of operation in 2014.
2. Percentage of the total Phase I equipment cost.
3. 20-Year Net Present Value determined using 2 percent inflation and 4 percent interest rate.

6.4 Alternative No. 3 – Membrane Bioreactor

6.4.1 Overview

The MBR process consists of activated sludge reactors or aeration basins that use membrane filtration for solids separation. Membrane filtration is a solids separation process which utilizes polymeric filtration media with extremely small pore sizes ranging from 0.04 (hollow fiber) to 0.4 microns (flat sheet) to sieve and separate solids from the treated effluent. These systems are used to replace the secondary clarification and filtration steps normally associated with the activated sludge process. Without the limitations set by solids flux in conventional secondary clarification, the mixed liquor suspended solids (MLSS) concentration can be as high as 10,000 mg/L, which is much higher than conventional suspended growth processes. The higher MLSS concentration and the elimination of secondary clarifiers reduce the footprint of the overall MBR process. A MBR also produces a higher-quality effluent compared to that produced by secondary clarification paired with tertiary filtration.

The biological process for a MBR is controlled similarly to conventional activated sludge, where the solids retention time (SRT) is adjusted to achieve the desired removal efficiencies and sludge characteristics. The aeration basins of the MBR can also be configured for nitrification and denitrification with the addition of anoxic stages and MLR associated with the MLE process.

In order to protect the membranes downstream, the influent must be screened using fine screens with openings of two millimeters (mm) or less, prior to entering the aeration basins. MBR systems typically have higher operations and maintenance costs as compared to other activated sludge systems due to the following:

- Higher power costs due to membrane air scouring requirements;
- Higher chemical costs due to the need for periodic maintenance and recovery membrane cleaning; and
- Periodic membrane replacement approximately every ten years.

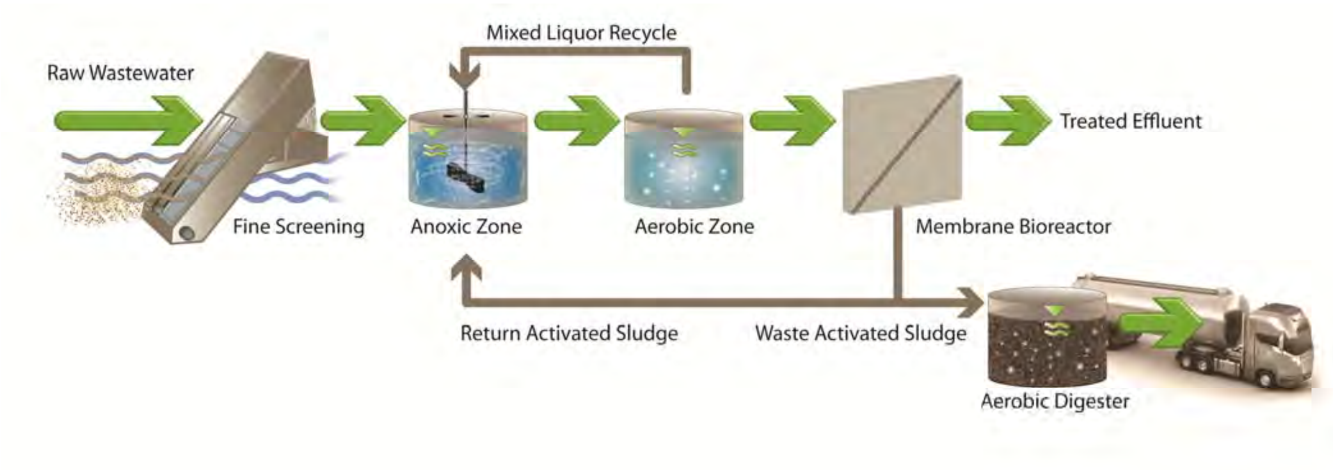

Figure 6.3 Typical MBR System Flow Schematic

6.4.2 Additional Processes

As discussed previously, additional treatment processes may need to be added to the MBR in order to achieve the level of treatment required for effluent disposal alternatives presented in a latter section of this PER. However, unlike the MLE and SBR alternatives, only disinfection is required for the MBR alternative since the membranes provide an equivalent level of solids treatment to filtration.

6.4.2.1 Disinfection

Like the previous alternatives, UV disinfection has been evaluated for the MBR alternative. Detailed disinfection design criteria for the MBR alternative are presented in a latter section of this PER.

6.4.3 Design Criteria

Detailed design criteria have been developed for the MBR process as well as disinfection facilities that may be required for this alternative.

6.4.3.1 MBR

For Phase I of the Los Olivos WWTP a single biological treatment train followed by two membrane trains would be constructed. Each biological treatment train consists of pre-anoxic, aerobic, and post-anoxic zones. The anoxic zone is required to achieve denitrification, but also serves as an equalization basin to attenuate peak hourly flow events. The post-anoxic zone is required to minimize the amount of dissolved air that is recycled to the post-anoxic zone that could inhibit the denitrification process. For Phase II, the existing biological treatment train would be expanded and a second train of equal volume would be added. A total of four membrane trains would be installed for Phase II. For Phase III, a third biological treatment train with two additional larger membrane trains would be added to increase the total treatment capacity to 158,000 gpd.

6.4.3.2 UV Disinfection

For the MBR alternative, a single in-vessel reactor is required to treat the MDF from Phase I and Phase II. During Phase III an additional reactor would be required to treat the MDF of 458,000 gpd.

6.4.3.3 Summary

The detailed design criteria for each component of the MBR alternative is summarized in Table 6.8.

Table 6.8 – Alternative No. 3 - MBR Design Criteria

Parameter	Phase I	Phase II	Phase III
Influent Characteristics			
Average Annual Daily Flow (gpd)	19,000	63,000	143,000
Average Day Maximum Month Flow (gpd)	20,000	69,000	158,000
Maximum Daily Flow (gpd)	59,000	200,000	458,000
Peak Hour Flow (gpd)	82,000	281,000	644,000
BOD			
(mg/L)	630	755	435
(ppd)[1]	105	435	575
TSS			
(mg/L)	420	480	330
(ppd)[1]	70	275	435
TKN			
(mg/L)	90	95	65
(ppd)[1]	15	55	85
Membrane Bioreactor (MBR)			
Total Design Capacity (gpd)	20,000	69,000	158,000
Number of Treatment Units	1	2	3
Pre-Anoxic Zone			
Volume per Train (gal)	2,200	4,300	4,300
Total Volume (gal)	2,200	8,600	12,900
Aerobic Zone			
Volume per Train (gal)	14,000	28,000	28,000
Membrane Tank Volume (gal)	2,400	2,400	2,400
Total Volume (gal)	16,400	60,800	91,200
Post-Anoxic Zone			
Volume per Train (gal)	1,400	2,700	2,700
Total Volume (gal)	1,400	5,400	8,100
HRT (hours)	24	27	18
SRT (days)	17.2	16.8	17.1
MLSS (mg/L)[2]	8,000	8,000	8,000
F:M (lb BOD/lb MLSS x day)	0.076	0.086	0.075
Trains per Units	2	2	2

Table 6.8 – Alternative No. 3 - MBR Design Criteria

Parameter	Phase I	Phase II	Phase III
Total Trains	2	4	6
Cassettes Per Train	1	1	1
Total Cassettes	2	4	6
Modules per Cassette	6	7	22
Total Modules	12	28	76[1]
Total Membrane Area (sf)	6,000	14,000	27,000
Total Membrane Area (sf)[3]	3,000	10,500	21,500
Flux at MDF (gpm/sf)	20	20	22
Flux at PHF (gpm/sf)	28	27	30
Disinfection			
Type	Ultraviolet	Ultraviolet	Ultraviolet
Number of Units	1	1	2
Number of Units in Service	1	1	2
Transmittance (%)	65	65	65
Dose (mJ/cm^2)	80	80	80
Number of Lamps per Reactor	18	18	18
Number of Lamps	18	18	36
Sludge Holding			
WAS Loading			
Hydraulic (gpd)	960	3,595	5,275
Solids (ppd)	80	300	440
HRT (days)	12.0	12.8	13.1
Volume (gal)	4,610	18,440	27,660
Number of Basins	1	2	3
Volume per Basin (gal)	4,610	9,220	9,220
Hauled Sludge Volume (gal/month)	10,995	41,240	60,485
Oxygen Required (ppd)	40	160	230

Notes:
1. Loading based on the ADMMF condition.
2. Number of modules based on 4 cassettes with 8 modules each and 2 larger cassettes with 22 modules each.
3. Total membrane area is with one of the largest cassettes out of service.

6.4.4 Opinion of Probable Costs

Based on these design criteria, project cost estimates were developed for the MBR alternative. These costs represent the highest level of treatment, and therefore cost for the MBR alternative, since the costs include provisions for disinfection.

6.4.4.1 Construction

A construction cost estimate for the MBR alternative is included in Table 6.9. The GE Z-MOD package is provided with internally-fed fine screens.

Table 6.9 – Alternative No. 3 - MBR Project Cost Summary

	Value			
Component	**Phase I**	**Phase II**	**Phase III**	**Total**
Equipment				
Membrane Bioreactor	$894,000	$900,000	$993,000	$2,787,000
Disinfection	$103,000	$ -	$103,000	$206,000
Civil/Yard Piping	$87,000	$81,000	$95,000	$263,000
Structural	$147,000	$163,000	$147,000	$457,000
Process Mechanical	$154,000	$139,000	$169,000	$462,000
Electrical & Instrumentation	$346,000	$321,000	$377,000	$1,044,000
Subtotal	**$1,731,000**	**$1,604,000**	**$1,884,000**	**$5,219,000**
Tax	$76,000	$71,000	$83,000	$230,000
Contractor Overhead & Profit	$181,000	$168,000	$197,000	$546,000
Contingency (20 Percent)	$397,000	$368,000	$432,000	$1,197,000
Total Construction Cost	**$2,385,000**	**$2,211,000**	**$2,596,000**	**$7,192,000**
Engineering, Administration, Legal (35 Percent)	$834,000	$773,000	$907,000	$2,514,000
Total Project Cost	**$3,219,000**	**$2,984,000**	**$3,503,000**	**$9,706,000**

6.4.4.2 Operations and Maintenance

The O&M cost estimate for the MBR alternative is included in Table 6.10. These O&M costs are for the Phase I project. A 20-year net present value is also provided for the Phase I project.

Table 6.10 – Alternative No. 3 - MBR Annual O&M Cost Estimate

Component	Unit Cost	Unit	Quantity	Unit	Total
Sludge Disposal	$0.22	$/gallon	131,940	gallons	$29,027
Power	$0.16	$/kWh	283,680	kWh	$45,389
Membrane Replacement	$3,035.06	$/module	2	modules	$6,070
Membrane Cleaning					
Chemical - NaOCl	$0.28	$/gallon	36	gallons	$10
Chemical - Citric Acid	$5.49	$/gallon	14.0	gallons	$77
UV Bulb Replacement	$297.14	$/bulb	18	bulbs	$5,349
Labor	$58.37	$/hour	522	hours	$30,469
Maintenance[2]	2.0	%	$766,684	-	$15,334
Misc. Equipment Replacement[3]	4.0	%	$766,684	-	$30,667
Total					**$162,400**
20-Year Net Present Value					**$2,527,000**

Notes:
1. Costs based on the first year of operation in 2014.
2. Percentage of the total Phase I equipment cost.
3. 20-Year Net Present Value determined using 2 percent inflation and 4 percent interest rate.

6.5 Alternative No. 4 – AdvanTex

6.5.1 Overview

The AdvanTex system is manufactured by Orenco Systems, Inc., and is a packed bed aerobic system. The system consists of a reactor with media and an effluent recirculation chamber to keep the media wet continuously. The bed is composed of a textile-covered, plastic media that promotes attached growth of microorganisms, similar to a trickling filter process. Ventilation fans are utilized to aerate the reactor and provide sufficient oxygen to the attached-growth communities to convert the incoming organics to biomass. The recirculation chamber includes pumps for both recirculation and discharge of treated effluent.

The AdvanTex filter system has been utilized for commercial applications in California, however, no project examples or studies were provided with similar sizing for a community system in California at the time of this report. Several examples were provided for other community installations across the county. However, these installations used a step-type collection system. The proposed system consists of multiple, parallel treatment trains, each equipped with a media filter and effluent recirculation system including a dedicated set of recirculation and effluent pumps.

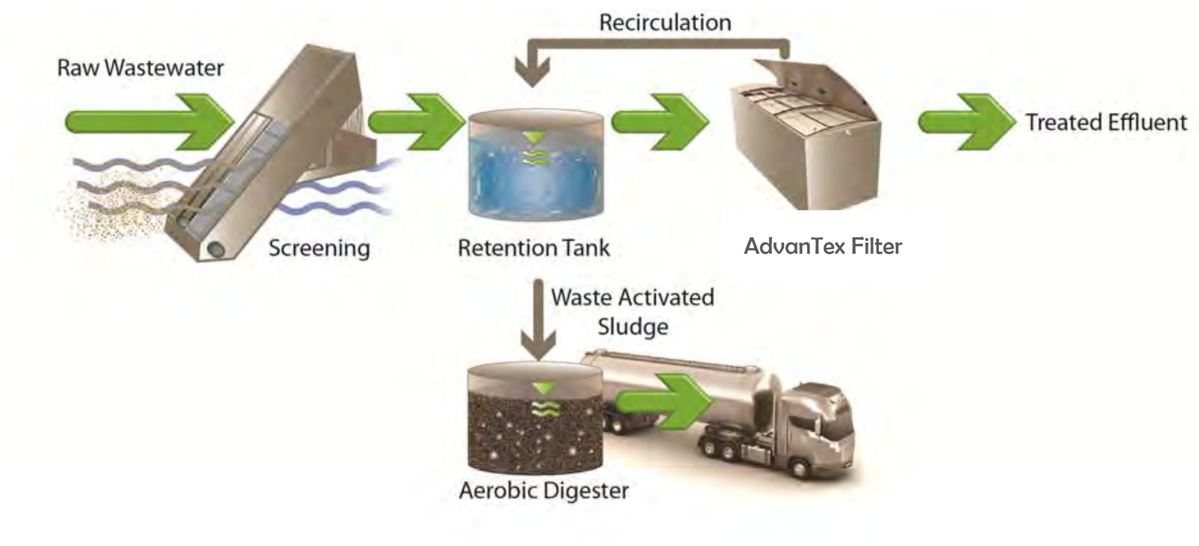

Figure 6.4 Typical AdvanTex System Flow Schematic

6.5.2 Additional Processes

In addition to the AdvanTex treatment system described above, raw sewage will require screening and a pretreatment tank that provides primary settling and flow equalization upstream of the AdvanTex system. To meet the anticipated nitrogen goals and Title 22 unrestricted reuse requirements, denitrification, filtration, and disinfection units will be needed downstream of the AdvanTex system to achieve the design effluent limits.

6.5.2.1 Screening

Similar to the processes described earlier in this section, the AdvanTex process will also require influent screening. Although not proposed by the vendor, screening will prevent ragging issues and other nonorganic solids from passing further into the treatment process. These inorganic solids would be disposed of in a landfill.

6.5.2.2 Primary Treatment

Primary treatment of the screened incoming effluent is necessary prior the AdvanTex system, since the textile media requires constant wetting and relatively steady flows and loadings. Primary treatment would consist of large septic tanks allowing both primary settling of solids and retention of incoming flows.

6.5.2.3 Denitrification

To achieve denitrification a Blue NITE™ nitrogen and phosphorus removal system would be included in the overall treatment process. The Blue NITE™ achieves denitrification with a continuous backwash, center upflow sandfilter. An external carbon source will likely be required to achieve the denitrification goals described in this report.

6.5.2.4 Disinfection

Similar to the previous alternatives, UV disinfection has been proposed by the vender for the AdvanTex alternative. For this project the Hallet 30 by UV Pure has been proposed. Although not currently California Title 22 accepted, certification of the units is being performed and acceptance is expected by April 2013.

6.5.3 Design Criteria

Design criteria have been provided for the AdvanTex system by Orenco Systems, Inc.

6.5.3.1 Primary Treatment

To achieve a two day hydraulic retention time (HRT) a 40,000 gallon tank will be required for Phase I of the project. An additional 100,000 gallon retention capacity will need to be added for Phase II of the project. Phase III of the project will require a total volume of 300,000 gallons to achieve retention.

6.5.3.2 AdvanTex

The AdvanTex system is sized based on the ADMMF. Phase I of the project will require 645 square feet (sq. ft.) of media. An additional 2749 sq. ft. of media will be required for Phase II of the project. For Phase III of the project, an additional 3287 sq. ft. of media will be required. The filter material would be placed over cast in place concrete channels as flows increase. The channels for phase 1 and phase 2 would be placed at phase 1 and would be approximately 80 feet by 120 feet in total dimensions. For phase 3 additional concrete channels would be constructed and would match the shape and size constructed for the earlier phases.

6.5.3.3 Denitrification

For Phase I and Phase II of the project a single unit measuring 5 feet in diameter and 14.75 feet high will be required. Phase III flows will require an additional unit of similar size.

6.5.3.4 UV Disinfection

For the Phase I loading 3 Hallet 30 units would be required. During Phase II an additional 4 units would be installed. To accommodate Phase III flows, an additional 7 units would be installed for a total of 14 units.

6.5.3.5 Summary

The design criteria for each component of the AdvanTex alternative are summarized in Table 6.11.

Table 6.11 – Alternative No. 4 – AdvanTex

Parameter	Phase I	Phase II	Phase III
Influent Characteristics			
Average Daily Flow (gpd)	19,000	63,000	143,000
Maximum Month Flow (gpd)	20,000	69,000	158,000
Maximum Daily Flow (gpd)	59,000	200,000	458,000
Peak Hour Flow (gpd)	82,000	281,000	644,000
BOD			
(mg/L)	630	755	435
(ppd)	105	435	575
TSS			
(mg/L)	420	480	330
(ppd)	70	275	435
TKN			
(mg/L)	90	95	65
(ppd)	15	55	85
AdvanTex			
Total Design Capacity (gpd)	20,000	69,000	143,000
Primary Treatment Volume (gal)	40,000	140,000	300,000
Pump Packages	1	2	2

Table 6.11 – Alternative No. 4 – AdvanTex			
AdvanTex Textile Media (sq. ft)	645	3,394	6,681
Design Loading Rate (gpd/sq. ft.)	31	20	21
AdvanTex Channels	3	15	30
Recirculating Tank Volume (gal)	100,000	100,000	260,000
Pump Packages			
Recirculating Pumps	3	15	30
Discharge Pumps	2	12	24
Vent Fan Assemblies	1	6	12
Denitrification			
Number of Treatment Units – Blue NITE			
Number of Units	1	1	2
Diameter (ft.)	5	5	5
Height (ft.)	14.75	14.75	14.75
Disinfection			
Type	Ultraviolet	Ultraviolet	Ultraviolet
Number of Units	3	7	14
Number of Lamps	6	14	28
Sludge Holding[1]			
WAS Loading			
Hydraulic (gpd)	1,090	4,160	5,990
Solids (ppd)	75	290	415
HRT (days)	14.3	14.8	15.2
Volume (gal)	5,800	23,100	33,990
Number of Basins	1	2	3
Volume per Basin (gal)	5,800	11,550	11,330
Hauled Sludge Volume (gal/month)	10,310	39,520	57,050
Oxygen Required (lb/day)	40	160	220

1. Sludge Holding design criteria data was assumed to be an average of an Activated Sludge and Membrane Bioreactor system since no comparison system was available to provide an estimation of sludge production. Actual sludge production could be less than estimated.

6.5.4 Opinion of Probable Costs

Based on these design criteria, project cost estimates were developed for the AdvanTex alternative. These costs represent the highest level of treatment (appropriate for unrestricted reuse of effluent under Title 22 requirements), and therefore the highest cost for the AdvanTex alternative, since the costs include provisions for disinfection.

6.5.4.1 Construction

A construction cost estimate for the AdvanTex alternative is included in Table 6.12.

Table 6.12 – Alternative No. 4 - AdvanTex Project Cost Summary

	Value			
Component	**Phase I**	**Phase II**	**Phase III**	**Total**
Equipment[1]				
Screening[2]	$177,000	$ -	$-	$177,000
Primary Treatment Tank	$173,000	$586,000	$1,213,000	$1,972,000
AdvanTex	$553,000	$750,000	$1,572,000	$2,875,000
DeNite & Disinfection	$401,000	$-	$711,000	$1,112,000
Civil/Yard Piping	$50,000	$10,000	$10,000	$70,000
Structural	$119,000	$ -	$ -	$119,000
Process Mechanical	$ -	$ -	$ -	$ -
Electrical & Instrumentation	$100,000	$25,000	$25,000	$150,000
Subtotal	**$1,573,000**	**$1,371,000**	**$3,531,000**	**$6,475,000**
Tax	$64,000	$60,000	$155,000	$279,000
Contractor Overhead & Profit	$152,000	$143,000	$369,000	$664,000
Contingency (20 Percent)	$334,000	$315,000	$811,000	$1,460,000
Total Construction Cost	**$2,123,000**	**$1,889,000**	**$4,866,000**	**$8,878,000**
Engineering, Administration, Legal (35 Percent)	$701,000	$661,000	$1,703,000	$3,065,000
Total Project Cost	**$2,824,000**	**$2,550,000**	**$6,569,000**	**$11,943,000**

Notes:
1. Based on revised proposal dated November 2, 2012. Equipment costs include labor and installation.
2. Screening not included in proposal. Screens as proposed for MLE and SBR systems used.

6.5.4.2 Operations and Maintenance

The O&M cost estimate for the AdvanTex alternative is found in Table 6.13. The O&M costs presented in the table reflect costs for Phase I of the project. A 20-year net present value is also provided for the Phase I project.

Table 6.13 – Alternative No. 4 - AdvanTex Annual O&M Cost Estimate					
Component	**Unit Cost**	**Unit**	**Quantity**	**Unit**	**Total**
Sludge Disposal	$ 0.22	$/gallon	125,850	gallons	$27,687
Power	$0.16	$/kWh	76,241	kWh	$12,039
UV Bulb Replacement	$ 275.92	$/bulb	3	bulbs	$828
Labor	$ 58.37	$/hour	522	hours	$30,469
Maintenance[2]	2.0	%	$912,800	-	$ 18,256
Misc. Equipment Replacement[3]	4.0	%	$912,800	-	$36,512
Total					**$125,800**
20-Year Net Present Value					**$1,951,000**

Notes:
1. Costs based on the first year of operation in 2014.
2. Percentage of the total Phase I equipment cost.
3. 20-Year Net Present Value determined using 2 percent inflation and 4 percent interest rate.

6.6 Summary

A summary of the cost for each alternative is presented in Table 6.14. As mentioned previously, the cost for these alternatives includes ancillary facilities such as filtration and disinfection needed to achieve the highest level of treatment necessary for the level of treatment anticipated in this PER, which is disinfected tertiary effluent.

Table 6.14 – Phase I Total NPV Cost Summary				
	Alternative			
Component	**No. 1 – MLE**	**No.2 – SBR**	**No. 3 – MBR**	**No. 4 – AdvanTex**
Construction Cost	$2,217,000	$2,278,000	$2,385,000	$2,123,000
Project Cost	$2,992,000	$3,074,000	$3,219,000	$2,824,000
Annual O&M Cost	$140,300	$153,800	$162,400	$125,800
O&M NPV Cost	$2,180,000	$2,387,000	$2,527,000	$1,951,000
Total Project & O&M NPV Cost	$5,172,000	$5,461,000	$5,746,000	$4,775,000

A summary of equipment and installation costs for each phase of the project is shown in Table 6.15. The costs shown in Table 6.15 do not reflect state tax or contractor markup. Detailed cost comparison tables for each phase are provided in Appendix B.

Table 6.15 – Equipment and Installation Cost Comparison				
Treatment Alternative	**Phase I**	**Additional for Phase II**	**Additional for Phase III**	**Total**
MLE	$1,609,000	$1,214,000	$1,372,000	$4,195,000
SBR	$1,653,000	$739,000	$574,000	$2,966,000
MBR	$1,731,000	$1,604,000	$1,884,000	$5,219,000
AdvanTex	$1,573,000	$1,371,000	$3,531,000	$6,475,000

Figure 6.5 on the next page displays the four treatment alternatives and associated equipment and installation costs for each phase.

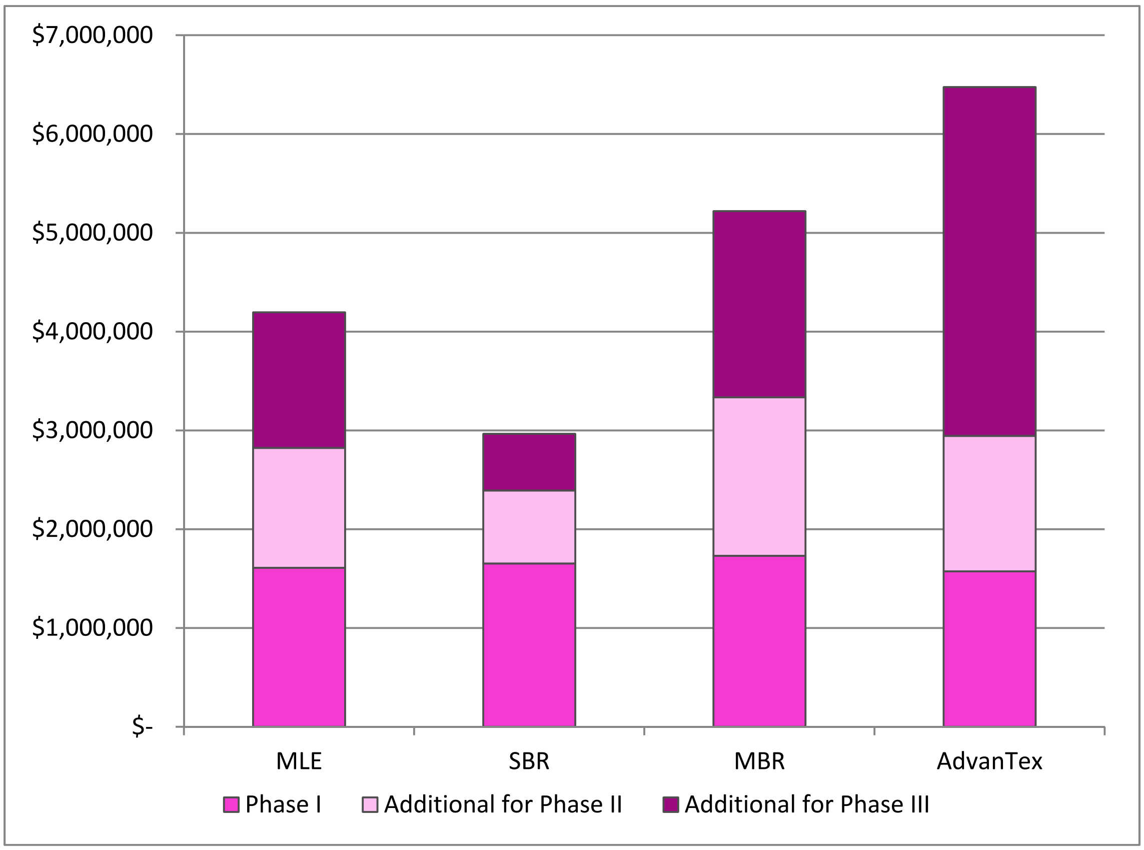

Figure 6.5 Treatment Alternative Cost Comparison

A summary of advantages and disadvantages associated with each treatment alternative considered for this PER are included in Table 6.16.

Table 6.16 – Viable Treatment Alternatives Advantages and Disadvantages

	Alternative			
Criteria	**No. 1 – MLE**	**No. 2 – SBR**	**No. 3 – MBR**	**No. 4 – AdvanTex**
Construction Cost	0	0	-	-
O&M Cost	+	+	-	+
Ease of Unattended Operation	+	-	0	+
Footprint	-	+	+	-
Expandability	-	0	+	0
Effluent Quality	0	0	+	0
Visual Impacts	-	+	+	+

Legend:
(+) Advantage
(0) Neutral
(-) Disadvantage

7 Effluent Disposal

The community of Los Olivos currently relies on individual OWTSs for treatment and disposal of wastewater. The most common disposal method is subsurface dispersal fields, which can include shallow dispersal fields, conventional leachfields, or seepage pits. The LOWMMP provided an in-depth discussion of these types of systems. Since OWTSs only provide a minimum level of treatment in a septic tank, the disposal field is used to provide further treatment before the effluent reaches the groundwater table. Ideally, the disposal field is designed to maintain aerobic conditions in the vadose zone underlying the infiltration surface to promote removal of organics and nutrients from the effluent. Due to shallow groundwater and influence of OWTS's in the SPA, nitrate concentrations in the groundwater of the Santa Ynez sub-basin are increasing.

Since this PER addresses the implementation of a new WWTP, an evaluation of additional effluent disposal options needs to be provided. Effluent disposal will ultimately dictate the quality of effluent required. This PER evaluates the feasibility of four effluent disposal methods:

- Percolation
- Subsurface disposal (leachfields)
- Agricultural Reuse – Undisinfected Secondary
- Agricultural Reuse – Disinfected Tertiary

The fundamental difference between the effluent disposal methods described in this PER and those encountered for conventional OWTSs is reliance on the effluent disposal practice for additional treatment. For example, all the treatment systems evaluated in this PER can reduce the level of TN in the effluent to below 10 mg/L. Due to the impacts of existing OWTSs resulting in the presence of elevated nitrate concentration in the groundwater, and the RWQCB's sensitivity to this issue, AECOM recommends nitrogen removal even with a disposal method such as agricultural reuse, which is often used to reduce the level of nitrogen in the effluent.

A summary of the effluent disposal alternatives evaluated in this PER are presented in Table 7.1. A discussion of each of these alternatives is included that considers pertinent issues such as anticipated regulatory requirements, siting and area requirements, detailed design criteria, and construction cost estimates are provided in this section.

Table 7.1 – Summary of Viable Effluent Disposal Alternatives			
Disposal/Reuse Alternative	**Filtration Required**	**Disinfection Required**	**Nitrogen Removal Required**
Percolation	No	No[3]	Yes
Subsurface Disposal (Leach field)	Yes[1]	No[3]	Yes
Agricultural Reuse – Undisinfected Secondary	No	No	Partial[2]
Agricultural Reuse – Disinfected Tertiary	Yes	Yes	Partial[2]

Notes:
1. Filtration may be implemented to increase the expected life of the leachfields.
2. Due to concerns with nitrate infiltration to the groundwater, denitrification to a TN of 10 mg/L has been assumed for all disposal options, even surface irrigation.
3. Regional Water Quality Control Board may require disinfection if groundwater levels are within 5 feet of the infiltration area.

7.1 Percolation

Percolation ponds are reservoirs where water is stored and allowed to either percolate into the ground or evaporate. The pond bottoms are managed to maintain percolation rates by periodically drying, ripping, and conditioning the soils.

Groundwater degradation is a major consideration for this type of disposal practice. Regulations are continually changing and becoming more restrictive to protect groundwater quality. Considerations such as distance to the nearest well, depth to groundwater, and mounding potential must all be considered in addition to water quality. Sizing and siting requirements for the percolations pond depends on these groundwater issues, the types of soils, and percolation capacity.

7.1.1 Regulatory Requirements

As discussed previously, nitrate concentrations in the groundwater underlying the SPA and surrounding areas are increasing due to the use of OWTSs. In order to minimize future degradation from the Los Olivos WWTP, the concentration of nitrogen in the effluent would be reduced to within the primary drinking water MCL of 10 mg/L nitrate (as N) or 10 mg/L TN. The shallow groundwater in the SPA highlights the need for nitrogen removal with percolation since natural nitrification/denitrification in the soil matrix is expected to be limited.

7.1.2 Design Criteria

The most important criterion for development of the percolation disposal method is selecting a site with adequate area based on the sites percolation rate. Based on an initial evaluation of the area, the location of the disposal sites will be either northeast or southeast of the SPA. According to the LOWWMP, the soils northeast of the special problem area are dominated by Salinas silty clay loam (SdA) with a permeability of 0.20 to 0.63 inches per hour. The soils in the area southeast of the SPA are dominated by Ballard gravelly fine sandy loam (BhC) with a permeability of 2.0 to 6.3 inches per hour. Typically, percolation rates are estimated at between 4 and 10 percent of the saturated vertical permeability.[11] Therefore, four percent of the lowest expected permeability results in a percolation rate of approximately 0.20 inches per day (inches/day). To develop the size and cost of the percolation facilities, this percolation rate has been assumed for this PER.

[11] Land Treatment EPA 2006

In order to calculate the volume and area of percolation basins necessary for each phase of the Los Olivos WWTP project, water balances have been developed. The water balances take into account not only the water lost through percolation, but also water lost from evaporation and the contribution of rainfall. Table 7.2 summarizes the climatic characteristics used to develop the water balances for the percolation alternative. The water balances are included in the Appendix C.

Table 7.2 – Evaporation and Precipitation Data for the Los Olivos Area

Month	Pan Evaporation (inches/month)[1]	Evaporation (inches/month)[2]	Precipitation (inches/month)[3]
January	2.44	1.83	3.10
February	3.53	2.65	3.14
March	4.41	3.31	2.55
April	6.01	4.51	1.12
May	7.55	5.66	0.27
June	8.56	6.42	0.03
July	9.50	7.13	0.02
August	8.98	6.74	0.03
September	7.00	5.25	0.18
October	5.42	4.07	0.52
November	3.49	2.62	1.53
December	2.79	2.09	2.27
Total	**69.68**	**52.26**	**14.76**

Notes:
1. Western Regional Climate Center – Cachuma Lake (1952 – 2002).
2. Pan Evaporation (inches/month) x 0.75.
3. Western Regional Climate Center – Lompoc (1917 – 2010).

Detailed design criteria for Phase I, II, and III of the Los Olivos WWTP are provided in Table 7.3.

Table 7.3 – Percolation Design Criteria

Parameter	Phase I	Phase II	Phase III
Influent Characteristics			
Average Annual Daily Flow (gpd)	19,000	63,000	143,000
Average Day Maximum Month Flow (gpd)	20,000	69,000	158,000
Maximum Daily Flow (gpd)	59,000	200,000	458,000
Peak Hour Flow (gpd)	82,000	281,000	644,000
Effluent Characteristics			
BOD (mg/L)[1]	20	20	20
TSS (mg/L)[1]	20	20	20
Total Nitrogen (mg/L)	10	10	10
Percolation Basins			
Nitrogen Loading (lb/year)	389	1,283	2,911
Percolation Rate (in/day)	0.14	0.18	0.20
Total Percolation Area (acres)	3.6	8.9	17.8
Total Basin Area (acres)	4.6	11.4	22.7
Total Volume (AF)	14.2	35.4	70.8
Number of Basins[2]	2	5	10
Basin Dimensions			
Length (ft)	498	498	498
Width (ft)	198	198	198
Side Water Depth (ft)	4	4	4
Freeboard (ft)	2	2	2
Side Slope (H:V)	4	4	4

Notes:
1. Typical effluent limits for BOD and TSS of 30 mg/L are anticipated. Treatment facilities will be designed for 20 mg/L to ensure a limit of 30 mg/L can be reliably achieved.
2. A redundant basin is provided in Phase I to allow for periodic drying and conditioning of the percolation basins.

It is important to note the hydraulic loading rate, and therefore the basis of design for this alternative, is based on assumed soil characteristics and vertical permeability. Once potential disposal sites are identified infiltration tests should be conducted by a hydrogeologist to determine the suitability of this disposal method for a particular location.

7.1.3 Siting and Area Requirements

As mentioned previously, percolation basins should be located in areas with high infiltration rates such as coarse sandy soils. While expansive clay soils should be avoided, very fine sandy soils also have limited percolation capacity and a propensity for clogging or fouling. Percolation testing should be done at prospective sites to determine the applicability of percolation and accurately determine the necessary basin capacity.

Based on a percolation rate of 0.20 inches/day, approximately 5 acres of percolation basins would be required for Phase I. With accommodations for dikes and set-backs, the County would need to acquire roughly 10 acres of land. At build-out, a total pond area of approximately 24 acres would be required with an associated land requirement of 40 acres.

7.1.4 Opinion of Probable Costs

Cost estimates for implementation of percolation have been developed for Phases I, II, and III. The costs for the percolation alternative are summarized in Table 7.4.

Table 7.4 – Percolation Alternative Project Cost Summary

	Value			
Component	**Phase I**	**Phase II**	**Phase III**	**Total**
Percolation Basins	$64,000	$99,000	$165,000	$330,000
Subtotal	**$66,000**	**$99,000**	**$165,000**	**$330,000**
Tax	$3,000	$5,000	$7,000	$15,000
Contractor Overhead & Profit	$7,000	$10,000	$17,000	$34,000
Contingency (20 Percent)	$15,000	$42,000	$70,000	$127,000
Total Construction Cost	**$91,000**	**$156,000**	**$259,000**	**$506,000**
Engineering, Administration, Legal (35 Percent)	$31,000	$88,000	$146,000	$265,000
Total Project Cost	**$122,000**	**$244,000**	**$405,000**	**$771,000**

For the purpose of this PER it has been assumed effluent will flow by gravity to the percolation basins and no effluent pumping is required. In addition, the costs presented in this PER do not include the cost to purchase or acquire the land needed to accommodate the percolation basins.

7.2 Subsurface Disposal (Leachfields)

7.2.1 Overview

Subsurface disposal is a common method for effluent disposal for OWTSs. Most individual parcels in the SPA rely on either conventional leachfields or seepage pits to dispose of wastewater from septic tanks. However, unlike the subsurface disposal methods used by existing OWTSs, which apply effluent with a BOD concentration between 100 and 200 mg/L, the subsurface disposal systems evaluated in this PER will be used to dispose of effluent with a BOD concentration less than 20 mg/L and a TN concentration less than 10 mg/L. Therefore, further soil aquifer treatment to avoid contamination of the groundwater and risks to public health is not needed.

While the most common forms of subsurface disposal are conventional leachfields and seepage pits, shallow drip systems are also gaining popularity and were discussed in detail in the LOWWMP. Both of these systems are discussed in detail below.

7.2.1.1 Shallow Drip System

Subsurface disposal via a shallow drip system discharges treated effluent directly to the active soil layer, typically six to ten inches beneath the ground surface. These systems typically consist of pressurized small diameter tubing (1/2 inch) with integrated emitters. Operating pressures for drip systems range from 7 to 60 pounds per square inch (psi) and can deliver up to two gallons per hour (gph) per emitter depending on the supply characteristics.

There are several advantages to the use of shallow drip systems for wastewater disposal. The main benefit of this system is its ability to deliver effluent to the root-zone of plants to facilitate additional treatment. Nutrients are removed from the effluent and utilized by the plants. In addition, since dispersal occurs near the ground surface, a separation distance to groundwater as little as three feet is needed. Because of these benefits and others such as the ability to install on varying topography and irregular shaped areas, drip systems have become a popular method for treatment and disposal for OWTSs. Shallow drip irrigation is particularly well suited for large areas of turf and other landscaped areas.

Although a shallow drip system is a potential disposal alternative for the Los Olivos WWTP, the major benefit of nitrogen removal would not be realized since the treatment alternatives presented previously include nitrogen removal.

7.2.1.2 Leachfields

Conventional leachfields consist of shallow trenches approximately two feet in depth. Small diameter perforated piping is installed in the trenches, and gravel backfill is placed several inches above and below the pipe. A layer of geotextile fabric is placed over the gravel to prevent the intrusion of fines and fouling of the leachfield and the remaining trench depth is backfilled with native or imported fill. Treated wastewater flows by gravity to a simple distribution structures that evenly distribute effluent to individual trenches several hundred feet in length. The effluent leaves the perforated pipe and percolates through the gravel to the infiltration surface, which is the bottom of the narrow trenches.

Conventional leachfields are a proven wastewater disposal technology for both small decentralized systems as well as larger community treatment facilities. Due to the smaller area requirements, lack of pumping, reduced O&M requirements, and reduced fouling potential as compared to a drip system, conventional leachfields have been assumed for this PER.

7.2.2 Regulatory Requirements

As mentioned previously, the impact of nitrogen on the groundwater is a major regulatory concern for subsurface disposal and the new WWTP cannot contribute to that contamination. Incorporating nitrogen removal into the selected treatment alternative can mitigate this concern. Nitrogen reduction is anticipated for the Los Olivos WWTP for any of the disposal alternatives evaluated, but in particular percolation or subsurface disposal.

7.2.2.1 Total Suspended Solids

Conventional secondary treatment requirements of approximately 30 mg/L for TSS are anticipated in the WDRs issued for the Los Olivos WWTP if subsurface disposal is pursued. However, AECOM recommends this alternative be accompanied by filtration. While not dictated by the regulations, minimizing the solids loading to the leachfield would extend their useful life expectancy and minimize the frequency of costly excavation and maintenance.

7.2.3 Design Criteria

Soil characteristics and hydraulic loading are critical design criteria for leachfields. According to the Onsite Wastewater Treatment Systems Manual[12], typical hydraulic loading rates for fine sandy loam and very fine sandy loam are between 0.5 and 0.8 gallons per day per square foot (gpd/sf) for secondary effluent with a BOD concentration of 30 mg/L. Organic loading guidelines for these soil types is 0.13 to 0.20 pounds of BOD per 1,000 square feet (ppd/1,000 sf) for secondary treated effluent. For the purposes of this PER, a hydraulic loading factor of 0.6 gpd/sf has been assumed. Based on the design criteria and the assumed effluent quality of 10 mg/L for BOD, the expected organic loading is 0.05 ppd/sf.

Another important consideration for the design of leachfield systems is redundancy. Redundancy is needed to both preserve the infiltration capacity of the leachfield as well as provide adequate capacity for prolonged shutdowns associated with periodic disruptive maintenance. For the purpose of this PER, full redundancy has been provided for the leachfield alternative.

Detailed design criteria are provided in Table 7.5.

Table 7.5 – Subsurface Disposal (Leachfield) Design Criteria

Parameter	Phase I	Phase II	Phase III
<u>Influent Characteristics</u>			
Average Annual Daily Flow (gpd)	19,000	63,000	143,000
Average Day Maximum Month Flow (gpd)	20,000	69,000	158,000
Maximum Daily Flow (gpd)	59,000	200,000	458,000
Peak Hour Flow (gpd)	82,000	281,000	644,000
<u>Effluent Characteristics</u>			
BOD (mg/L)[1]	10	10	10
TSS (mg/L)[1]	10	10	10
Total Nitrogen (mg/L)	10	10	10

[12] Onsite Wastewater Treatment Systems Manual (EPA/625/R-00/008), February 2002

Table 7.5 – Subsurface Disposal (Leachfield) Design Criteria			
Parameter	**Phase I**	**Phase II**	**Phase III**
Subsurface Disposal			
Type	Conventional/ Gravity	Conventional/ Gravity	Conventional/ Gravity
Number of Leachfields (Total)[2]	2	2	2
Number of Leachfields (In Service)	1	1	1
Nitrogen Loading (lb/year)	574	1,935	4,395
Hydraulic Loading Rate (gpd/sf)	0.58	0.60	0.60
Infiltration Area per Leachfield (sf)	30,645	70,968	129,032
Organic Loading (ppd/1000 sf)	0.05	0.05	0.05
Trench Dimensions			
Width (ft)	3	3	3
Length (ft)	500	500	500
Depth (ft)	2	2	2
Bed Depth (in)	8	8	8
Number of Trenches per Leachfield (ft)	21	67	152
Trench Spacing (ft)	6	6	6
Disposal Field			
Area (acres)	2.2	6.9	15.7
Length (ft)	500	500	500
Width (ft)	183	597	1,362
Total Disposal Field Area (acres)	4.4	13.8	31.4

Notes:
1. Typical effluent limits for BOD and TSS of 30 mg/L are anticipated. Treatment facilities will be designed for 10 mg/L prolong the potential life of the leachfields.
2. Full redundancy for the leachfield area required for each phase is provided to allow for prolonged outages due to maintenance and to preserve disposal capacity by alternating leachfields.

The sizing for the infiltration area is based on limited soil information and typical infiltration rates for soil, textural classes. In order to determine the feasibility of leachfields at a particular site, infiltration testing and analysis by a hydrogeologist is recommended.

7.2.4 Siting and Area Requirements

The presence of shallow groundwater and expansive clay soils can have negative impacts on the capacity of a leachfield. Therefore, areas with seasonal or sustained high groundwater levels and these types of soils should be avoided for leachfield construction.

Based on the design criteria detailed in Table 7.5, an infiltration area of approximately 5 acres is required for redundant leachfields to handle flows for Phase I. This infiltration area translates to a total disposal area of approximately 10 acres for Phase I. At build-out, an infiltration area of approximately

32 acres is needed to accommodate an AADF of 143,000 gpd. The total land requirement for build-out for the leachfield alternative is 50 acres.

7.2.5 Opinion of Probable Costs

Cost estimates for implementation of percolation have been developed for Phases I, II, and III. The costs for the percolation alternative are summarized in Table 7.6.

Table 7.6 – Subsurface Disposal (Leachfield) Alternative Project Cost Summary

	Value			
Component	**Phase I**	**Phase II**	**Phase III**	**Total**
Leachfields	$209,000	$459,000	$847,000	$1,515,000
Subtotal	**$209,000**	**$459,000**	**$ 847,000**	**$1,515,000**
Tax	$10,000	$21,000	$38,000	$69,000
Contractor Overhead & Profit	$22,000	$48,000	$89,000	$159,000
Contingency (20 Percent)	$48,000	$106,000	$195,000	$349,000
Total Construction Cost	**$289,000**	**$634,000**	**$1,169,000**	**$2,092,000**
Engineering, Administration, Legal (35 Percent)	$101,000	$221,000	$409,000	$731,000
Total Project Cost	**$390,000**	**$855,000**	**$1,578,000**	**$2,823,000**

For the purpose of this PER it has been assumed effluent will flow by gravity to the leachfields and no effluent pumping is required. In addition, the costs presented in this PER do not include the cost to purchase or acquire the land needed to accommodate the leachfields.

7.3 Agricultural Reuse

The Los Olivos SPA is surrounded by agriculture sites. Crops grown in the area vary widely and include alfalfa, barley, beets, beans, vineyards, olives, walnuts, miscellaneous row crops, and organically grown vegetables. In order to encompass this diversity, AECOM has evaluated two options for agricultural reuse: feed and fodder crops such as alfalfa and human consumption crops such as grapes and vegetables. Alfalfa requires undisinfected secondary effluent for irrigation. However, crops intended for human consumption that come in contact with irrigation water, must be irrigated with disinfected tertiary recycled water. An in-depth discussion of CDPH Title 22 recycled water regulations is provided in Section 4.5.2 of this PER. A discussion of both of these effluent disposal methods is presented below.

7.3.1 Regulatory Requirements

7.3.1.1 Nitrogen

Nitrogen in wastewater effluent is a nutrient that supports plant growth and therefore is beneficial. However, nitrogen must be applied at agronomic rates, meaning the application of nitrogen on reclamation areas cannot exceed the amounts that the crop uptakes. With surface irrigation applications, typically higher levels of nitrogen are required than would be applied at the hydraulic application rate and supplemental nitrogen is usually required. In addition, all the treatment alternatives evaluated will reliably produce an effluent with an effluent TN concentration of 10 mg/L.

7.3.1.2 Salinity

Data obtained from the 2009 Water Quality Report for the District indicates anticipated source water quality for Los Olivos will have a TDS concentration of approximately 555 mg/L assuming none of the supply is received from the Cachuma Project entitlement. Residential water use typically adds between 200 and 300 mg/L TDS to the source water. Assuming a salt pick-up of approximately 250 mg/L, the expected effluent quality would have a TDS concentration of 805 mg/L.

While feed and fodder crops such as alfalfa have a high salt tolerance, a high TDS concentrations can affect the yields of certain vegetables and row crops. Table 7.7 summarizes the effects of TDS on many of the most common crops grown in the area immediately surrounding the special problem area.

Table 7.7 – Effects of Salinity on Crop Yield

	Effect of TDS (mg/L) on Crop Yield				
Crop	**100 % Yield**	**90 % Yield**	**75 % Yield**	**50 % Yield**	**Sensitivity Rating**
Beans	450	640	960	1,535	Sensitive
Lettuce	575	895	1,345	2,175	Moderately Sensitive
Almond	640	895	1,215	1,790	Sensitive
Grapes	640	1,090	1,730	2,880	Moderately Sensitive
Pepper	640	960	1,410	2,175	Moderately Sensitive
Corn	705	1,090	1,600	2,495	Moderately Sensitive
Spinach	830	1,410	2,240	5,015	Moderately Sensitive
Tomato	1,090	1,470	2,175	3,200	Moderately Sensitive
Beets	1,730	2,175	2,880	5,630	Moderately Tolerant

Notes:
1. Values for electroconductivity effects obtained from Grattan, 2002.
2. Electroconductivity (dS/m) converted to TDS (mg/L) with a factor of 640 mg/L for <5 dS/m and 880 mg/L for >5 dS/m.

7.3.1.3 Turbidity

The two recycled water options discussed in this PER, undisinfected secondary and disinfected tertiary, differ in the levels of turbidity and total coliform allowed for irrigation. While undisinfected secondary effluent has no filtration requirements, disinfected tertiary must be filtered. The specific requirements are discussed in detail in the following sections.

7.3.1.3.1 Disinfected Tertiary

Disinfected tertiary effluent must be oxidized, filtered, and disinfected for irrigation. The effluent must be coagulated and filtered to not exceed the following criteria for turbidity:

- Average of 2 NTU within a 24-hour period;
- 5 NTU more than 5 percent of the time within a 24-hour period;
- 10 NTU at any time.

If the effluent is passed through microfiltration, ultrafiltration, nanofiltration or reverse osmosis, as is the case with the MBR treatment alternative, the following turbidity levels must not be exceeded:

- 0.2 NTU more than 5 percent of the within a 24-hour period; and
- 0.5 NTU at any time.

For the purposes of this PER, both treatment Alternative No. 1 – MLE and Alternative No. 2 – SBR have been presented with coagulation and cloth media disk filtration to meet the Title 22 requirements. Alternative No. 3 – MBR inherently includes filtration in the form of ultrafiltration membranes.

7.3.1.4 Coliform

In addition to filtration, disinfected tertiary must be disinfected to lower the level of coliform in the effluent before it can be applied for irrigation. The specific requirements are discussed below.

7.3.1.4.1 Disinfected Tertiary

The median level of coliform in tertiary disinfected effluent must not exceed 2.2 MPN/100 mL. Disinfection must occur by either chlorination or a process that inactivates and/or removes 99.999 percent of F-specific bacteriophage MS-2, or polio viruses.

For the purposes of this PER, AECOM has assumed UV disinfection will be used with each alternative to bring total coliform levels in line with the Title 22 requirements.

7.3.1.4.2 Federal Leafy Greens Criteria

In 2009, the United States Food and Drug Administration (FDA) published a draft guidance document[13]aimed at reducing the risks of microbial hazards on leafy greens. Leafy greens (iceberg lettuce, romaine lettuce, leaf lettuce, butter lettuce, baby leaf lettuce) are minimally processed and once contaminated, removing or killing pathogens is difficult. The draft guidance provides growers with recommendations in limiting the sources of contamination at all stages of processing from production and harvest to retail and foodservice handling.

Immediately following discharge from the WWTP, the effluent would be disinfected in accordance with disinfected tertiary requirements per Title 22. However, the effluent would be stored in uncovered and unlined ponds until being conveyed to individual growers. These ponds could provide the opportunity for contamination or re-growth of pathogens in the recycled water. Effluent supplied for production of leafy greens would most likely require additional disinfection after being delivered to the irrigation site.

[13] U.S. Food and Drug Administration- Guidance for Industry: Guide to Minimize Microbial Food Safety Hazards of Leafy Greens; Draft Guidance (July 2009)

7.3.1.5 Reliability

Article 9 of the Regulations Related to Recycled Water[14] describes the reliability requirements for various portions of a wastewater treatment plant producing reclaimed water for irrigation. These requirements apply to both undisinfected secondary and disinfected tertiary recycled water production, and pertain to biological treatment, coagulation and filtration, and disinfection facilities. In order to meet the reliability requirements for these facilities, either redundant treatment units or long-term storage is required. Long-term storage is defined as facilities with sufficient capacity for the storage or disposal of wastewater for at least 20 days.

In order to minimize the construction cost of the facility, AECOM has assumed the Title 22 reliability requirements will be met with long-term storage rather than installation of redundant treatment units. For both the undisinfected secondary and disinfected tertiary alternatives, an additional emergency storage basin has been included that provides a minimum of 20 days of storage for each phase of the WWTP.

7.3.2 Design Criteria

In order to develop design criteria for the agricultural reuse alternatives, water balances were developed for both undisinfected secondary and disinfected tertiary options. To construct these water balances, irrigation estimates were determined for two representative crops in the Los Olivos area. The water balances are included in Appendix C. For the undisinfected secondary option, irrigation of alfalfa was assumed since it is prevalent in the area surrounding the SPA. For the disinfected tertiary option, vineyards were selected. Also, the recycled water may be used to irrigate another crop such as beans that requires tertiary disinfected effluent for unrestricted reuse.

[14] California Department of Public Health – Regulations Related to Recycled Water (January 2009)

The irrigation requirements for both alfalfa and vineyards are included in Table 7.8.

Table 7.8 – Los Olivos Area Irrigation Demands

Month	Standard Monthly Average ETo[1] (inches)	Monthly Average Precipitation[2] (inches)	Crop Coefficients (Kc)[3]		Crop Water Demands (inches)[4]	
			Alfalfa	Vineyard	Alfalfa	Vineyard
January	1.68	3.10	1.17	0.00	0.00	0.00
February	2.21	3.14	1.11	0.00	0.00	0.00
March	3.52	2.55	1.05	0.00	1.35	0.00
April	5.01	1.12	1.02	0.68	4.72	2.71
May	5.78	0.27	1.02	0.78	6.60	5.00
June	6.18	0.03	1.00	0.80	7.24	5.76
July	6.40	0.02	1.00	0.80	7.51	5.98
August	6.01	0.03	1.00	0.80	7.04	5.60
September	4.46	0.18	1.00	0.73	5.04	3.60
October	3.57	0.52	1.01	0.53	3.65	1.63
November	2.19	1.53	1.07	1.20	0.97	1.28
December	1.67	2.27	1.11	0.00	0.00	0.00
Total	**48.68**	**14.76**	-	-	**44.10**	**31.55**

Notes:
1. California Irrigation Management Information System (CIMIS) Station 64 – Santa Ynez (1986).
2. Western Regional Climate Center – Lompoc (1917 – 2010).
3. State of California – Department of Water Resources Consumptive Use Program + (2008).
4. Includes 85 percent irrigation efficiency.

7.3.2.1 Undisinfected Secondary

Detailed design criteria for the undisinfected secondary option are provided in Table 7.9.

Table 7.9 – Agricultural Reuse (Undisinfected Secondary) Design Criteria

Parameter	Phase I	Phase II	Phase III
<u>Influent Characteristics</u>			
Average Annual Daily Flow (gpd)	19,000	63,000	143,000
Average Day Maximum Month Flow (gpd)	20,000	69,000	158,000
Maximum Daily Flow (gpd)	59,000	200,000	458,000
Peak Hour Flow (gpd)	82,000	281,000	644,000
<u>Effluent Characteristics</u>			
BOD (mg/L)[1]	20	20	20
TSS (mg/L)[1]	20	20	20
Total Nitrogen (mg/L)	10	10	10
<u>Irrigation Area</u>			
Type	Undisinfected Secondary	Undisinfected Secondary	Undisinfected Secondary
Crop	Feed and Fodder (Alfalfa)	Feed and Fodder (Alfalfa)	Feed and Fodder (Alfalfa)
Total Area (acres)	5	15	30
Application Rate (inches/acre-year)	45	45	45
Nitrogen Loading (lb/acre-year)	101	101	100
<u>Emergency Storage</u>[2]			
Total Volume Required (AF)	1.2	3.9	8.8
Type	Lined	Lined	Lined
Total Volume (AF)	6.0	6.0	12.0
Number of Basins	1	1	2
<u>Effluent Storage</u>			
Type	Unlined	Unlined	Unlined
Total Volume (AF)	6.0	24.0	47.9
Number of Basins	1	4	9
Basin Dimensions			
Length (ft)	335	335	335
Width (ft)	165	165	165
Side Water Depth (ft)	8	8	8
Freeboard (ft)	2	2	2
Side Slope (H:V)	4	4	4

Notes:

1. Typical effluent limits for BOD and TSS of 30 mg/L are anticipated. Treatment facilities will be designed for 20 mg/L to ensure a limit of 30 mg/L can be reliably achieved.
2. Emergency long-term storage of 20 days is required meet Title 22 reliability criteria for biological treatment, coagulation and filtration, and disinfection facilities.

7.3.2.2 Disinfected Tertiary

Detailed design criteria for the disinfected tertiary option are provided in Table 7.10.

Table 7.10 – Agricultural Reuse (Disinfected Tertiary) Design Criteria

Parameter	Phase I	Phase II	Phase III
Influent Characteristics			
Average Annual Daily Flow (gpd)	19,000	63,000	143,000
Average Day Maximum Month Flow (gpd)	20,000	69,000	158,000
Maximum Daily Flow (gpd)	59,000	200,000	458,000
Peak Hour Flow (gpd)	82,000	281,000	644,000
Effluent Characteristics			
BOD (mg/L)	10	10	10
TSS (mg/L)	10	10	10
Total Nitrogen (mg/L)	10	10	10
Coliform (MPN/100 mL)	2.2	2.2	2.2
Turbidity (NTU)	2	2	2
Irrigation Area			
Type	Disinfected Tertiary	Disinfected Tertiary	Disinfected Tertiary
Crop	Vineyard	Vineyard	Vineyard
Total Area (acres)	10	30	70
Application Rate (inches/acre)	32	32	32
Nitrogen Loading (lb/acre-year)	73	72	72
Emergency Storage[1]			
Total Volume Required (AF)	1.2	3.9	8.8
Type	Lined	Lined	Lined
Total Volume (AF)	5.5	5.5	10.9
Number of Basins	1	1	2
Effluent Storage			
Type	Unlined	Unlined	Unlined
Total Volume (AF)	5.5	21.7	48.7
Number of Basins	1	4	9
Basin Dimensions			
Length (ft)	320	320	320
Width (ft)	160	160	160
Side Water Depth (ft)	8	8	8
Freeboard (ft)	2	2	2
Side Slope (H:V)	4	4	4

Notes:
1. Emergency long-term storage of 20 days is required meet Title 22 reliability criteria for biological treatment, coagulation and filtration, and disinfection facilities.

7.3.3 Opinion of Probable Costs

Cost estimates for the two agricultural reuse options discussed previously have been developed. It is important to note that several components of these effluent disposal options are not included in the cost estimates. Like the percolation and leachfield alternatives, the cost presented for agricultural reuse does not include the cost for purchase of land to accommodate the disposal or irrigation facilities. Also, unlike the percolation and the leachfield alternatives, the agricultural reuse options will require the addition of an effluent pump station and other infrastructure including pipelines to deliver recycled water to a County-owned reclamation area or farmers who have been contracted to use the water produced by the WWTP. Once potential reuse sites and customers have been identified in a subsequent PER, the cost for the associated facilities will be determined. The cost for effluent pumping will also be incorporated into the overall O&M cost for the WWTP.

7.3.3.1 Undisinfected Secondary

A cost estimate for the undisinfected secondary reuse option is presented in Table 7.11.

Table 7.11 – Agricultural Reuse (Undisinfected Secondary) Alternative Project Cost Summary

Component	Value			
	Phase I	**Phase II**	**Phase III**	**Total**
Irrigation/Emergency Storage	$41,000	$61,000	$101,000	$203,000
Subtotal	**$41,000**	**$61,000**	**$101,000**	**$203,000**
Tax	$4,000	$3,000	$6,000	$13,000
Contractor Overhead & Profit	$8,000	$7,000	$14,000	$29,000
Contingency (20 Percent)	$17,000	$14,000	$ 31,000	$62,000
Total Construction Cost	**$70,000**	**$85,000**	**$152,000**	**$307,000**
Engineering, Administration, Legal (35 Percent)	$36,000	$29,000	$65,000	$130,000
Total Project Cost	**$106,000**	**$114,000**	**$217,000**	**$437,000**

7.3.3.2 *Disinfected Tertiary*

A cost estimate for the disinfected tertiary reuse option is presented in Table 7.12.

Table 7.12 – Agricultural Reuse (Disinfected Tertiary) Alternative Project Cost Summary

	Value			
Component	**Phase I**	**Phase II**	**Phase III**	**Total**
Irrigation/Emergency Storage	$37,000	$55,000	$109,000	$201,000
Subtotal	**$37,000**	**$55,000**	**$109,000**	**$201,000**
Tax	$3,000	$3,000	$7,000	$13,000
Contractor Overhead & Profit	$7,000	$6,000	$15,000	$28,000
Contingency (20 Percent)	$16,000	$13,000	$32,000	$61,000
Total Construction Cost	**$63,000**	**$77,000**	**$163,000**	**$303,000**
Engineering, Administration, Legal (35 Percent)	$32,000	$27,000	$67,000	$126,000
Total Project Cost	**$95,000**	**$104,000**	**$230,000**	**$429,000**

7.4 Summary

A summary of the construction costs for each of the disposal alternatives is presented in Table 7.13. It should be noted that the cost and area requirements for the percolation and subsurface disposal alternatives are based on the lowest expected infiltration rates near the SPA. Percolation testing could significantly decrease the cost and footprint of these disposal alternatives.

Table 7.13 – Effluent Disposal Alternatives Cost Summary

	Total Project Cost			
Component	**Phase I**	**Phase II**	**Phase III**	**Total**
Percolation	$122,000	$244,000	$405,000	$771,000
Subsurface Disposal (Leachfield)	$390,000	$855,000	$1,578,000	$2,823,000
Agricultural Reuse				
Undisinfected Secondary[1]	$106,000	$114,000	$217,000	$437,000
Disinfected Tertiary[1]	$95,000	$104,000	$230,000	$429,000

Notes:
1. Costs for the agricultural reuse options do not include components such as pump stations or pipelines.

A summary of the estimated land requirements for each of the disposal alternatives is presented in Table 7.14. The estimated land requirements are based on the information in the previous design criteria tables and include accommodations for necessary areas not used for disposal including applicable setbacks, pond embankments, access roads, etc. These area estimates are for the disposal area only, and do not include the area required for the WWTP.

Table 7.14 – Summary of Disposal Alternative Land Requirements

Alternative	Component	Area (acres)			
		Phase I	Phase II	Phase III	Total
Percolation	Basins	10	15	15	40
	Total	**10**	**15**	**15**	**40**
Subsurface Disposal (Leach field)	Disposal Field	10	15	25	50
	Total	**10**	**15**	**25**	**50**
Agricultural Reuse (Undisinfected Secondary)	Storage	10	15	25	50
	Cultivated Land	5	10	15	30
	Total	**15**	**25**	**40**	**80**
Agricultural Reuse (Disinfected Tertiary)	Storage	10	15	25	50
	Cultivated Land	10	20	40	70
	Total	**20**	**35**	**65**	**120**

A summary of the advantages and disadvantages for each of the effluent disposal alternatives evaluated in this PER is presented in Table 7.15.

Table 7.15 – Viable Treatment Alternatives Advantages and Disadvantages

Criteria	Alternative			
	Percolation	Leachfields	Agricultural Reuse Undisinfected Secondary	Agricultural Reuse Disinfected Tertiary
Construction Cost	+	-	+	+
O&M Cost	+	0	-	-
Level of Treatment	+	-	+	-
Land Requirements	+	+	-	-
Visual Impacts	-	+	-	-
Beneficial Reuse	-	-	+	+

Legend:
(+) Advantage
(0) Neutral
(-) Disadvantage

8 Preliminary Site Evaluation

Specific sites for new wastewater facilities were not identified and evaluated as part of this PER. However, general evaluation criteria such as acreage requirements, zoning, and adjacent uses are discussed to allow the County to conduct an initial siting study in the future.

8.1 Selection Parameters

It is important to consider a number of parameters when evaluating potential WWTP sites. These parameters include regulatory restrictions, land use, available area, site access, available utilities and potential impacts associated with noise and odors. These issues are briefly discussed below and should be considered during preliminary siting evaluations.

8.1.1 Regulatory Restrictions

Regulatory requirements for the WWTP will ultimately be determined by the selected effluent disposal method, and will be influenced by the type of treatment processes implemented. The Central Coast Regional Water Quality Control Board (RWQCB) is the agency responsible for issuing waste discharge requirements (WDRs). Where treated wastewater is to be recycled (reuse) additional regulations are required by the California Department of Public Health (CDPH) under California Code of Regulations (CCR) Title 22, Division 4, Chapter 3, Water Recycling Requirements (Title 22). Typical requirements in WDRs include constituent effluent limits for pollutants, monitoring, and reporting as well as separation distances from groundwater, and setback distances from surrounding wells (private, drinking, agricultural, etc.) and fence lines for each discharge method.

8.1.2 Land Use

The surrounding land use may be a factor in the public acceptance of the treatment and disposal area. In general, the area required for the proposed treatment technologies discussed in Section 6 of this report is relatively small, and mitigation measures could be implemented to reduce noise and odor impacts. Control of these issues may permit placement of the treatment system in sensitive areas such as residential neighborhoods. Disposal sites require larger amounts of land, and are typically surrounded by agricultural type properties.

Existing site usage is a factor in evaluating treatment and disposal sites. Sites that have not been previously developed are considered more desirable since they are likely less costly to develop and may decrease the number and complexity of mitigation measures required to address site-related issues.

8.1.3 Area Requirements

The ideal site would have sufficient room to accommodate facilities through the planned system build-out. Depending on the treatment process selected and disposal method used, total size requirements will vary.

For the purposes of this PER, sizing of the treatment facility includes area required for major process components including auxiliary facilities such as a lift station, headworks, maintenance and control building. These items combined with setbacks and providing adequate space between structures could add significant area to each treatment alternative.

A variety of effluent disposal methods are currently being considered by the County. For the purposes of this PER, area requirements are provided for each disposal alternative. These area requirements include disposal facilities such as percolation and storage ponds and irrigation areas. In addition to these facilities, AECOM has also added accommodations for potential setbacks or area required for site access. Actual site conditions such as soil permeability or availability of agricultural reuse areas may have significant impacts on area requirements and may result in decreased area needs.

8.1.4 Site Access

It is important the WWTP site provide sufficient access for operations and maintenance (O&M) staff, biosolids tanker trucks, waste disposal, and material deliveries.

8.1.5 Utility Service

The proposed WWTP could require potable water, electrical, telephone, and possibly natural gas service. The availability of each utility should be taken into consideration during site selection.

8.1.6 Noise Control

The WWTP will include mechanical equipment such as pumps, blowers and generators that generate noise that could impact the surrounding area. While efforts will be made to implement sound attenuation at individual pieces of equipment, the level of additional noise mitigation will depend on the facility location. For sites located near sensitive areas such as residential neighborhoods or the downtown core, additional mitigation measures will most likely be required.

8.1.7 Odor Control

Odor control can be an important consideration when siting a WWTP. Processes that utilize uncovered basins containing raw wastewater or uncovered sludge storage tanks can produce foul odors. Mitigation measures to control these odors would vary depending on the treatment process selected and location of the facility.

8.1.8 Additional Studies/Reports

The information presented in this PER is intended to provide the County with a general overview of potential treatment and disposal site criteria. A detailed evaluation of possible treatment and disposal sites will be required to fully address any potential issues that would affect project components, costs, permitting, and environmental mitigation. Site specific studies such as a geotechnical assessment, percolation testing (for disposal sites) and an environmental site assessment will be required prior to final site selection.

8.2 Treatment Sites

8.2.1 Overview

Treatment sites available near the downtown core are considered more favorable compared to more remote sites since they minimize the distance between service area and treatment site. However, the majority of town is located to the south of the downtown core. Due to the elevation differences across the community, the use of lift stations will likely be required to convey wastewater flows to a treatment facility located near the downtown core. Treatment sites located on the south side of the community could result in a gravity collection system. However, pumping could still be required depending on the location of the disposal site. Sites near downtown would also likely require additional mitigation measures to control odors and excessive noise as compared to a treatment site located outside of town. The following table (Table 8.1) displays these items and other suggested siting requirements for the treatment site.

Table 8.1 – Treatment Siting Issues	
Siting Parameters	**Issues**
Location, Land Use	• Plant should be located close to the collection system to reduce construction costs and O&M costs • Plant must be constructed above the 100 year flood level • Buildable site (constructability, no shallow groundwater, etc.) • Site should be readily available
Area Requirements	• Sufficient space for all treatment alternatives through Phase 3 and associated structures/facilities
Site Access	• Adjacent to a public roadway. • Roadway is able to handle increased traffic
Utility Service	• All utilities are available at the site
Noise and Odor Control	• Mitigation measures will be required and will be defined based on proximity of surrounding properties.
Visual Screening	• Plant should be located out of site from businesses and residences. Screening will also be required at the entrance and exit of the community.

8.2.2 Treatment Alternatives
Four treatment alternatives are being considered for the Los Olivos WWTP project. These alternatives include Extended Aeration Activated Sludge Modified Ludzak-Ettinger (MLE), Sequencing Batch Reactor (SBR), Membrane Bioreactor (MBR), and AdvanTex. For this report, it is assumed that an influent lift station and headworks structure will be required. In addition, a control and maintenance building, and other ancillary facilities such as staff parking will also be required.

A brief description of each process is provided below and includes the estimated size required for each project phase. Detailed descriptions of these alternatives are discussed below, and in Section 6 of this report. Also included in this PER is a detailed discussion of the phasing scheme developed for the Los Olivos WWTP.

8.2.2.1 Extended Aeration Activated Sludge Modified Ludzak-Ettinger (MLE)
The activated sludge process configuration applicable for the Los Olivos WWTP is known as a packaged activated sludge system where the different components of the treatment process are housed in an aboveground bolted, or welded steel tank configured with two concentric rings. The secondary clarifier is housed in the inner tank, while the equalization, aerobic, anoxic, and aerobic digester zones are housed in the outer tank.

Preliminary sizing of a MLE treatment system was performed as in section 6 of this report. For Phase 1 (Existing Commercial) of the project a single tank approximately 12 feet by 54 feet would be required with a 12-foot diameter circular clarifier. At Phase 2 (Commercial Build-Out), an additional 50-foot diameter tank would be required. For Phase 3 (Build-Out) a second 50-foot diameter tank would be needed.

8.2.2.2 Sequencing Batch Reactor (SBR)
The SBR treatment process is a true batch system where equalization, treatment, and clarification are achieved within the confines of a single reactor. The typical treatment cycle of a SBR includes separate fill, react, settle, and decant treatment phases. Since all of these processes occur in a single basin, footprint requirements are reduced and mixed liquor recycle (MLR) pumping needed to achieve denitrification is eliminated.

Preliminary sizing of a SBR treatment system was performed as part of section 6 of this report. For Phase 1 of the project, a tank approximately 22 feet wide by 36 feet long would be required. At Phase 2, a tank approximately 36 feet wide by 90 feet long would be required. For Phase 3 a tank approximately 36 feet wide by 124 feet long would be required.

8.2.2.3 Membrane Bioreactor (MBR)
The MBR process consists of activated sludge reactors or aeration basins that use membrane filtration for solids separation. Membrane filtration is a solids separation process which utilizes polymeric filtration media with extremely small pore sizes ranging from 0.04 (hollow fiber) to 0.4 microns (flat sheet) to sieve and separate solids from the treated effluent. These systems are used to replace the secondary clarification and filtration steps normally associated with the activated sludge process. Without the limitations set by solids flux in conventional secondary clarification, the mixed liquor suspended solids (MLSS) concentration can be as high as 10,000 mg/L, which is much higher than conventional suspended growth processes. The higher MLSS concentration and the elimination of secondary clarifiers reduce the footprint of the overall MBR process.

Preliminary sizing of an MBR treatment system was performed as part of section 6 of this report. For Phase 1 of the project a tank approximately 50 feet long by 7 ½ feet wide would be required. At Phase 2, two tanks approximately 79 feet long by 7 ½ feet wide would be required. For Phase 3 a total of three tanks approximately 79 feet long by 7 ½ feet wide would be required.

8.2.2.4 AdvanTex
The AdvanTex system is a packed bed aerobic system. The system consists of a reactor with media and an effluent recirculation chamber to keep the media wet continuously. The bed is composed of textile-covered, plastic media that promote attached growth of microorganisms, similar to a trickling filter process. Ventilation fans are utilized to aerate the reactor and provide sufficient oxygen to the attached-growth communities to convert the incoming organics to biomass. The recirculation chamber includes pumps for both recirculation and discharge of treated effluent.

Preliminary sizing of an Advantex treatment system was performed as part of section 6 of this report. For Phase 1 and 2 of the project concrete channels covered by the AdvanTex filter media measuring 120 feet long by 80 feet wide would be required. At Phase 3, a similarly sized facility would be installed.

8.2.3 Total Land Requirements
Treatment sites will contain one of the outlined treatment alternatives along with other supporting structures and setbacks. The following table (Table 8.2) provides a summary of the estimated size requirement for the four treatment alternatives.

Table 8.2 – Estimated Required Land per Alternative				
Phase	Alternative Land Requirements (Acres)			
	Modified Ludzak-Ettinger (MLE)	Sequencing Batch Reactor (SBR)	Membrane Bioreactor (MBR)	AdvanTex
1	0.2	0.2	0.2	0.8
2	0.4	0.4	0.2	0.8
3	0.6	0.4	0.3	1.50

8.3 Treatment and/or Disposal Sites

8.3.1 Overview

Large agricultural sites located north of town could be considered the most favorable due to the large parcel sizes and primarily agricultural use. Since it is intended for the disposal method to incorporate some form of agricultural reuse it is recommend the disposal site be located near potential users. The following table (Table 8.3) displays suggested siting requirements for the disposal site.

Table 8.3 – Disposal Siting Issues	
Siting Parameters	Issues
Regulatory Restrictions	• Location of wells
Location, Land Use	• Near agricultural land for increased reuse potential • Disposal must be out of or constructed above the 100-year flood level • Permeability of soils • Topography of site does not prohibit large pond construction • Site should be readily available
Area Requirements	• Large enough for all or a combination of treatment alternatives through Phase 3 • Adequate area for WWTP facilities
Site Access	• Located near a major roadway. • Roadway is able to handle increased traffic
Utility Service	• All utilities are available at the site
Noise and Odor Control	• Mitigation measures will be required and will be defined by proximity of surrounding properties.
Visual Screening	• Plant should be located out of site from businesses and residences. Screening will also be required at the entrance and exit of the community.

8.3.2 Disposal Alternatives

Four effluent disposal methods are being considered for the Los Olivos WWTP. These methods include percolation ponds, subsurface disposal (leachfields), and agricultural reuse with either undisinfected secondary or disinfected tertiary effluent. In addition, disinfected tertiary recycled water is also being considered for supplemental irrigation water at community parks and other community landscaping areas if feasible. The final disposal site, or combination of sites, will likely include a combination of these disposal methods. A brief description of each method is presented below and includes the estimated size required for each project phase. Detailed descriptions of these alternatives are discussed in Section 7 of this report.

8.3.2.1 Percolation Ponds

Percolation ponds are reservoirs where water is stored and allowed to either percolate into the ground or evaporate. The pond bottoms are managed to maintain percolation rates by periodically drying, ripping, and conditioning the soils.

Potential for groundwater degradation is a major consideration for this type of disposal practice without the appropriate level of treatment. Regulations are continually changing and becoming more restrictive to protect groundwater quality. Considerations such as distance to the nearest well, depth to groundwater, and mounding potential must all be considered in addition to water quality. Mounding of treated effluent is typically a result of underlying impermeable layers slowing the rate of downward percolation and forcing treated effluent laterally. Mounding can attribute to increased flows to surrounding water bodies and destabilization of the percolation ponds. Sizing and siting requirements for the percolation ponds depend on these groundwater issues, the types of soils (near surface and underlying layers), and percolation capacity.

8.3.2.2 Subsurface Disposal (Leachfields)

Conventional leachfields consist of shallow trenches approximately two feet in depth. Small diameter perforated piping is installed in the trenches, and gravel backfill is placed several inches above and below the pipe. A layer of geotextile fabric is placed over the gravel to prevent the intrusion of fines and fouling of the leachfield and the remaining trench depth is backfilled with native or imported fill. Treated wastewater flows by gravity to a simple distribution structure that evenly distributes effluent to individual trenches several hundred feet in length. The effluent leaves the perforated pipe and percolates through the gravel to the infiltration surface, which is the bottom of the narrow trenches. Conventional leachfields are a proven wastewater disposal technology for both small decentralized systems as well as larger community treatment facilities.

8.3.2.3 Agricultural Reuse (Undisinfected Secondary or Disinfected Tertiary)

Los Olivos is surrounded by agriculture land. Crops grown in the area vary widely and include alfalfa, barley, beets, beans, vineyards, olives, walnuts, miscellaneous row crops, and organically grown vegetables. In order to encompass this diversity, two reuse options for agricultural were identified in section 7 of this PER. For feed and fodder crops such as alfalfa, undisinfected secondary can be used. However, disinfected tertiary must be used for crops grown for human consumption crops such as grapes and vegetables. As previously mentioned, disinfected tertiary recycled water could be used for irrigation of community parks and other landscaped areas.

8.3.3 Total Land Requirements

Disposal sites could contain one or several of the outlined disposal alternatives. For larger areas of land (greater than 20 aces) it has been assumed that the WWTP could also be placed at the disposal site. The table below (Table 8.4) provides a summary of required acreage for each of the disposal methods under consideration. These values do not include the comparatively small amount of space required for the WWTP. Area requirements for agricultural reuse were calculated using irrigation demand estimates for alfalfa (undisinfected effluent) and grapes (disinfected tertiary).

Table 8.4 – Disposal Area Requirements (acres)				
Phase	**Percolation Ponds**	**Subsurface Disposal (Leachfield)**	**Agricultural Reuse**	
			Undisinfected	**Disinfected**
1	10	10	15	20
2	15	15	25	35
3	15	25	40	65
Total	40	50	80	120

9 Engineer's Opinion of Cost

This section presents a preliminary planning-level Engineer's Opinion of Cost for a new wastewater treatment plant (WWTP), effluent disposal facilities, and collection system for the community of Los Olivos. The treatment and disposal processes selected for this cost are based on alternatives provided in Sections 6 and 7 of this report. For cost estimating purposes a treatment and disposal site has been assumed to be north of town. Due to the elevation of the service area in relation to the assumed WWTP location, it is assumed a gravity collection system will be used with several lift stations to convey wastewater flows to the WWTP site. It is important to note that the WWTP site is conceptual and is only used as a basis to evaluate the overall project cost.

9.1 Cost Basis

9.1.1 Phasing

As discussed in Section 2 of this report, the construction of the collection system and WWTP for the Los Olivos community may be implemented in one, two, or three distinct phases. The county and community may decide to phase the development of this system, or to initially build either a Phase 2 or Phase 3 system and skip "Phase 1".

- Phase 1- Downtown Core
- Phase 2- Downtown Core including full commercial build-out
- Phase 3- Entire community

This report provides project cost opinions for Phase 1 and at project build-out, which represents service to the entire community. This methodology provides the County with a projected range and sequence of project costs. Flows estimated in Section 3 were used in sizing the collection system, WWTP, and disposal facilities.

9.1.2 Recommended Treatment Alternatives

Four treatment alternatives are discussed in Section 6, including extended aeration activated sludge modified Ludzak-Ettinger (MLE), sequencing batch reactor (SBR), membrane bioreactor (MBR), and AdvanTex. These treatment alternatives were evaluated based on their ability to produce a treated effluent with a total nitrogen concentration below future, anticipated discharge limits.

9.1.2.1 Sequencing Batch Reactor

The sequencing batch reactor (SBR) treatment process is a true batch system where equalization, treatment, and clarification are achieved within the confines of a single reactor. The typical treatment cycle of a SBR includes separate fill, react, settle, and decant phases. Since all of these processes occur in a single basin, footprint requirements are reduced and mixed liquor recycle (MLR) pumping needed to achieve denitrification is eliminated.

This treatment alternative is recommended for the Los Olivos WWTP due to its ability to handle a large range of flow and loading conditions. Since this project represents the first centralized treatment facility for Los Olivos, flows and loadings could be different than those estimated in Section 3. As previously discussed, wastewater flow estimates were developed to roughly size the new wastewater facilities. Actual flows experienced could vary significantly depending on the Phase 1 service area. Although the other treatment alternatives discussed can produce an effluent with a similar quality, they can be more difficult to operate with variable loading conditions. Another benefit of the SBR is its relatively compact footprint compared to other suspended growth technologies.

9.1.2.2 Size Requirements

For Phase I of the WWTP project, a single SBR basin and pre-equalization basin will be provided to attenuate diurnal flow variations and store influent wastewater while the SBR is in operation. Once the SBR cycle is completed, and the effluent has been decanted, the influent in the pre-equalization basin will be pumped into the SBR and the cycle will be repeated.

At full build-out, the existing SBR would be expanded and a new SBR would also be constructed. The existing pre-equalization basin would be eliminated and a post-equalization basin would be constructed to equalize the decant flow.

9.1.3 Support Facilities

In addition to the recommended treatment process, additional facilities will be required. These ancillary facilities will be included, but not necessarily be limited to, a new headworks, control and electrical building, and sludge treatment and disposal facilities.

9.1.3.1 Headworks

The headworks consists of mechanical screening equipment that is used to remove inorganic solids and trash from the influent wastewater stream. Large inorganic solids remaining in the influent can cause issues with downstream mechanical equipment, resulting in decreased efficiency and the need for increased maintenance. In addition, removal of these types of solids increases the stability of the treatment process operation.

9.1.3.2 Control and Electrical Building

A relatively small structure will be used to house a control room as well as necessary electrical equipment. For the purpose of this report, a 35 foot by 98 foot structure has been assumed. Sizing of this building would be sufficient through build-out of the project.

9.1.3.3 Sludge Treatment and Disposal

Due to the small size of the proposed WWTP, waste activated sludge (WAS) pumped from the SBR will be sent to an aerated sludge holding tank or aerobic digester for stabilization. These facilities will provide storage and the potential for some volatile solids reduction (VSR) to help minimize the amount of sludge that must be disposed of by the community. Following a period of approximately 15 days, the solids will be hauled offsite by a liquid hauler and disposed of at another wastewater treatment facility in the County, or a neighboring county, that accepts sludge or septage. The cost of this aerated tank has been included in the construction cost estimates.

9.1.4 Recommended Disposal Alternative

Four effluent disposal alternatives have been analyzed for the Los Olivos WWTP. These alternatives include percolation ponds, subsurface disposal (leachfields), and agricultural reuse with either undisinfected secondary or disinfected tertiary recycled water. In addition, disinfected tertiary effluent is also being considered for supplemental irrigation water at community parks and other community landscaping areas if feasible.

For the purpose of estimating project costs it has been assumed that percolation ponds along with agricultural reuse will be used for disposal. However, percolation ponds would be used as the main form of disposal and would be adequately sized to handle all effluent produced by the plant. This would maintain the plant's ability to properly dispose of treated effluent during periods of limited or zero agricultural demand. It should be noted that drip irrigation or other forms of disposal and reuse will be explored during concept design but percolation ponds have been selected for cost planning purposes.

Factors in selecting a final disposal or reuse method will include property costs, site percolation capacity, available land, and adjacent land reuses among other considerations.

9.1.4.1 Percolation Ponds
Percolation ponds are reservoirs where water is stored and allowed to either percolate into the ground or evaporate. The pond bottoms are managed to maintain percolation rates by periodically drying, ripping, and conditioning the soils.

In order to calculate the volume and area of percolation basins necessary water balances were developed as discussed in Section 7 of this report. The water balances take into account percolation, water lost from evaporation and the contribution of rainfall. Based on the water balances, preliminary sizing for this alternative were determined. The selected disposal area may exhibit increased percolation rates, but for the purpose developing cost estimates, the conservative assumptions utilized will be used.

9.1.4.2 Agricultural Reuse (Undisinfected Secondary)
The assumed area for the WWTP and disposal system is surrounded by land designated for agriculture production. Crops grown in the area appear to be generally feed and fodder crops. Undisinfected secondary can be used for irrigation of these crops and would not require additional treatment of the effluent. In addition, undisinfected secondary can be applied to beef cattle pasture.

9.1.4.3 Unrestricted Reuse (Disinfected Tertiary)
In order to achieve the level of treatment necessary for unrestricted reuse, additional processes including tertiary filtration and disinfection would be required. A description of the filtration and disinfection facilities considered for the Los Olivos WWTP as well as detailed design criteria can be found in Section 6. For the Los Olivos WWTP, the use of cloth media disk filters are recommended for tertiary filtration and UV is recommended for disinfection. These processes have a comparatively small foot print and lower capital cost than other alternatives.

9.1.4.4 Proposed WWTP Layout
Figures 9.1 and 9.2 provide sample layouts for the initial phase and build-out of the Los Olivos WWTP. The initial layout would take into consideration requirements for future plant expansion.

9.1.5 Collection System
Based on discussions with the County, a typical gravity collection system has been assumed for the community wastewater system. Since the terrain in and around Los Olivos slopes to the south, and the disposal site is assumed to be to the north, lift stations will be required to convey wastewater collected in gravity lines located throughout the community. Initially, one lift station would be required with additional lift stations becoming necessary during latter subsequent phases. For the purposes of this report, one lift station will be associated with Phase 1 with two additional lift stations required for build-out. An example collection system layout used to develop estimated costs is provided on Figure 9.3.

9.1.6 Operations and Maintenance (O&M)

9.1.6.1 Staffing Requirements
Due to the relatively small size of the WWTP, it has been assumed that one operator would be required at the plant for half of the day, 5 days a week. For one of these days an additional operator would likely be required to assist in performing maintenance functions.

According to Section 3675, Chapter 26, Title 23 of the California Code of Regulations the Los Olivos WWTP would be considered a Class III plant. Section 3680 of the same chapter also states that for a Class III plant the Chief Plant Operator would have to possess at a minimum a valid Grade III license.

Supervisors and shift supervisors would have to possess a Grade II license while operators would be required to have a valid Grade 1 or operator-in-training certificate.

9.1.6.2 Treatment and Disposal

Operations and maintenance of the treatment and disposal systems would include material replacements including cloth filter sections and UV bulbs, maintenance items, and power usage of the facility. The impacts of the aeration and disposal of this material have also been accounted for in the O&M cost estimates.

9.1.6.3 Collection system

It is assumed typical O&M associated with a gravity collection system with lift stations would be required for Los Olivos. This would include periodic cleaning and inspection of the sewer lines and maintenance of the pumps at the lift stations. Collection system cleaning and inspection is typically recommended for 20 percent of the system each year. Periodic inspection and cleaning of lift stations would also be required. Inspection of lift stations identifies potential problems not detected by the control system.

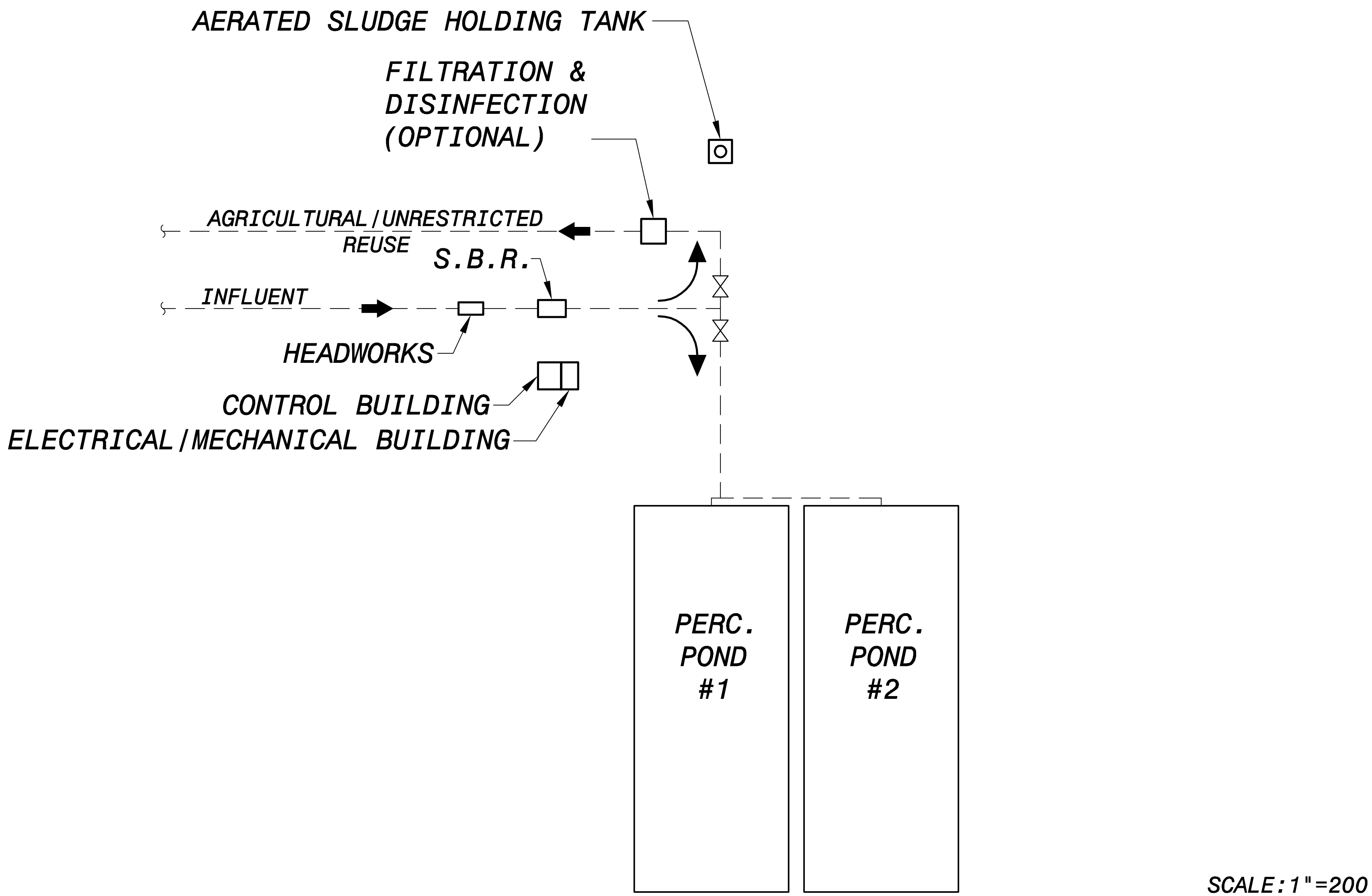

FIGURE 9.1	LOS OLIVOS WWTP PER PHASE 1 - SITE LAYOUT	AECOM PROJECT NO. 60198379	AECOM

AECOM Technical Services, Inc.
1194 Pacific Street, Suite 204
San Luis Obispo, California 93401
T 805.542.9840 F 805.542.9990
www.aecom.com

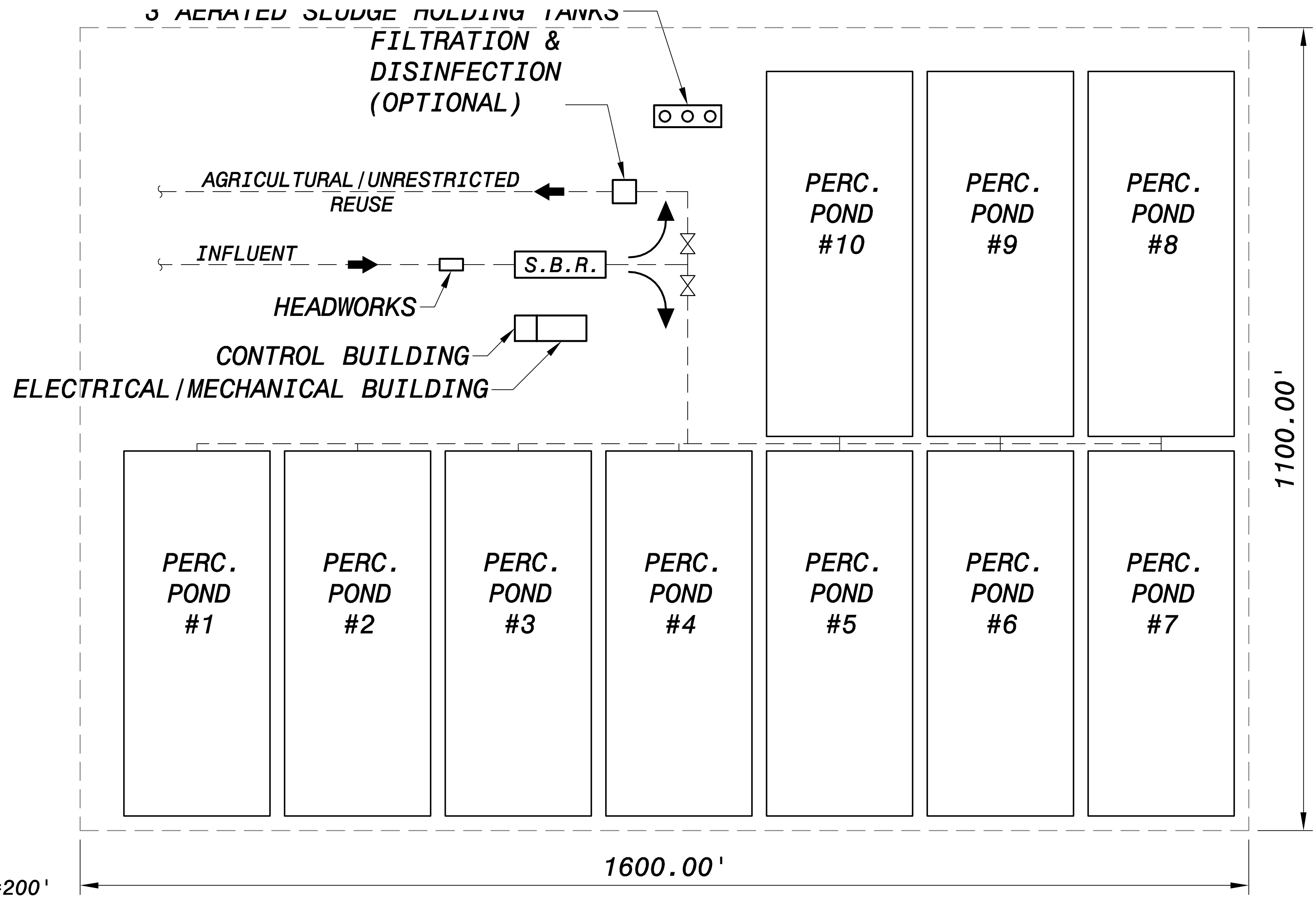

FIGURE	LOS OLIVOS WWTP PER	AECOM PROJECT NO.	AECOM
9.2	BUILD-OUT - SITE LAYOUT	60198379	AECOM Technical Services, Inc. 1194 Pacific Street, Suite 204 San Luis Obispo, California 93401 T 805.542.9840 F 805.542.9990 www.aecom.com

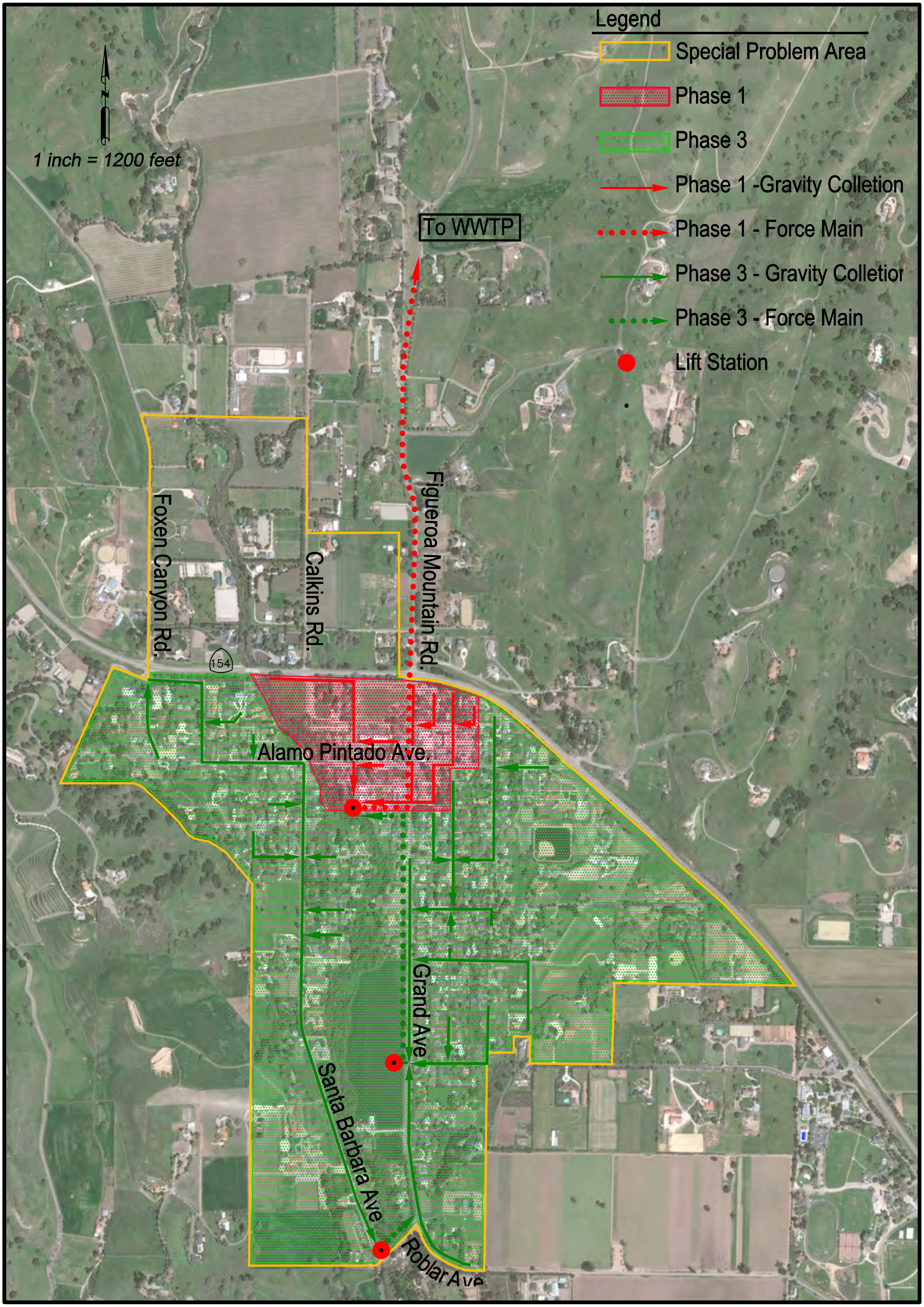

Figure 9.3 Collection Routes

9.2 Project Costs

9.2.1 General Cost Parameters

The objective is to develop project cost opinions with sufficient flexibility for a range of collection, treatment, and disposal system options. These costs will be revised and refined as the project proceeds. The following assumptions were made to develop planning-level cost opinions:

- Except where other data is available, construction cost opinions are generally derived using bid prices from similar wastewater projects, with adjustments for inflation, size, complexity, and location;
- Except where other data is available, operations and maintenance cost opinions are generally derived using information from product venders, utility rates and personnel costs provided by the County, and costs from similar wastewater projects, with adjustments for inflation, size, complexity, and location;
- 20 percent construction contingency;
- Engineering, administration, and legal costs were assumed to be 35 percent of the total construction costs;
- Construction cost opinions are in 2012 dollars;
- Operations and maintenance cost opinions are in 2014 dollars;
- When budgeting for future years, appropriate escalation factors are applied (ENR Construction Cost Index of 9175.94 for January 2012);
- Cost opinions are "budget-level" and may not fully account for site-specific conditions that will affect the actual costs; and
- Cost opinions do not include the cost to purchase or acquire the land needed to accommodate the WWTP and collection system.

The opinions of probable cost prepared by AECOM represent our judgment and are supplied for the general guidance of the County. Since AECOM has no control over the cost of labor and material, or over competitive bidding or market conditions, AECOM does not guarantee the accuracy of such opinions as compared to contractor bids or actual costs.

9.2.2 Collection System

It is assumed that conventional excavation depths of five to six feet can be maintained along the majority of the alignments. Opinions of probable construction cost for the collection system were developed based on conventional excavation and estimated costs of materials, preparation, earthwork, installation, and roadwork. Cost criteria are summarized in Table 9.1.

Table 9.1 – Sewer Improvement Cost Criteria			
Item Description	**Estimated Construction cost**	**Including Contingency (20 Percent)**	**Plus Engineering/Administration (35 Percent)**
4-in Force Main	$107/LF	$128/LF	$173/LF
6-in Force Main	$117/LF	$140/LF	$190/LF
8-in Gravity Sewer	$158/LF	$190/LF	$257/LF
10-in Gravity Sewer	$178/LF	$214/LF	$288/LF

Preliminary sizing of the collection system lines were calculated for the "northern route" as described in Section 5. These pipe sizes and the estimated line lengths shown on Figure 9.3 were used in calculating construction costs for the collection system. Lift station cost estimates are based on actual cost of recent lift station projects in the area of similar size. The lift station required for Phase 1 would be larger than the additional two required at project build-out as shown below. The following table provides a cost summary for the collection system.

Table 9.2 – Collection System Project Cost Summary							
Component		**Phase I**		**Build-Out**		**Total**	
	Unit	**Quantity**	**Cost**	**Quantity**	**Cost**	**Quantity**	**Cost**
4" force main	LF	0	$ -	2950	$316,000	2950	$316,000
6" force main	LF	5200	$609,000	0	$ -	5200	$609,000
8" Pipeline	LF	5200	$822,000	21670	$3,424,000	26870	$4,246,000
10" Pipeline	LF	1650	$294,000	0	$ -	1650	$294,000
Lift Stations	EA	1	$600,000	2	$900,000	3	$1,500,000
Subtotal			**$2,325,000**		**$4,640,000**		**$6,965,000**
Contingency (20 Percent)			$465,000		$928,000		$1,393,000
Total Construction Cost			**$2,790,000**		**$5,568,000**		**$8,358,000**
Engineering, Administration, Legal (35 Percent)			$977,000		$1,949,000		$2,926,000
Total Project Cost			**$3,767,000**		**$7,517,000**		**$11,284,000**

9.2.3 Treatment

Based on the design criteria presented in Section 6, project cost estimates were developed for the recommended treatment alternative. Since the preferred method of disposal is percolation with some agricultural reuse, filtering and disinfection would not be required. However, filtering and disinfection would be required if unrestricted reuse is desired. In addition, public opinion may dictate the level of filtration and disinfection of the effluent regardless of the disposal method.

In order to develop cost estimates for the recommended treatment alternative, major equipment manufacturers were consulted. These manufacturers are presented in Table 9.3.

Table 9.3 – Basis for Evaluated Equipment Costs

Process	Manufacturer/Model
Spiral Screen	Parkson Hycor® Helisieve Plus®/HLS300P
SBR Equipment	Aqua-Aerobic Systems, Inc. AquaSBR®
Cloth Media Disk Filters	Aqua-Aerobic Systems, Inc. AquaMiniDisk®
UV Disinfection Equipment	TrojanUVFit™ 18AL40 Reactor

Tables 9.4 and 9.5 provide an opinion of cost for the treatment facility. Subtotals are provided for the treatment process and for additional filtration and disinfection equipment. As shown in Table 9.5 below, the filtration and disinfection costs are only in Phase 1 since the initial equipment installed would be adequate to handle the additional flows at build-out.

Table 9.4 – Treatment Cost Summary-Undisinfected Secondary

	Value		
Component	**Phase I**	**Additional for Build-Out**	**Total**
Equipment			
Screening	$212,000	$ -	$212,000
Sequencing Batch Reactor	$411,000	$518,000	$929,000
Civil/Yard Piping	$102,000	$57,000	$159,000
Structural	$730,000	$245,000	$975,000
Process Mechanical	$170,000	$80,000	$250,000
Electrical & Instrumentation	$406,000	$225,000	$631,000
Subtotal	**$2,031,000**	**$1,125,000**	**$3,156,000**
Contingency (20 Percent)	$502,000	$225,000	$727,000
Total Construction Cost	**$2,533,000**	**$1,350,000**	**$3,883,000**
Engineering, Administration, Legal (35 Percent)	$886,550	$472,500	$1,359,050
Total Project Cost	**$3,419,550**	**$1,822,500**	**$5,242,050**

Table 9.5 – Treatment Cost Summary-Disinfected Tertiary

Component	Value		
	Phase I	Additional for Build-Out	Total
Equipment			
Screening	$212,000	$ -	$212,000
Sequencing Batch Reactor	$411,000	$518,000	$929,000
Civil/Yard Piping	$102,000	$57,000	$159,000
Structural	$730,000	$245,000	$975,000
Process Mechanical	$170,000	$80,000	$250,000
Electrical & Instrumentation	$406,000	$225,000	$631,000
Subtotal	**$2,031,000**	**$1,125,000**	**$3,156,000**
Additional Equipment for Recycled Water			
Filtration	$236,000	$ -	$236,000
Disinfection	$245,000	$ -	$245,000
Subtotal	**$481,000**	**$ -**	**$481,000**
Total	**$2,512,000**	**$1,125,000**	**$3,637,000**
Contingency (20 Percent)	$502,400	$225,000	$727,400
Total Construction Cost	**$3,014,400**	**$1,350,000**	**$4,364,400**
Engineering, Administration, Legal (35 Percent)	$1,055,040	$472,500	$1,527,540
Total Project Cost	**$4,069,440**	**$1,822,500**	**$5,891,940**

9.2.4 Disposal

For the purpose of this report, AECOM has assumed effluent will flow by gravity to the percolation basins. Additional costs for pumping effluent off site including a pump facility and pipelines are also included. Large agricultural fields located north of the community were assumed for calculation of the agricultural reuse pipe quantities. For calculation of the unrestricted reuse pipe length, the center of downtown (Alamo Pintado Avenue and Grand Avenue) was assumed as the end point. For the purposes of this report it is assumed the additional facilities to pump effluent off site will be constructed only in Phase 1 of the project and would remain the same through build-out. Costs for the disposal system are separated for undisinfected secondary and for disinfected tertiary and are provided in Tables 9.6 and 9.7 on the next page.

Table 9.6 – Disposal Cost Summary-Undisinfected Secondary

Component	Value		
	Phase I	Additional for Build-Out	Total
Percolation Basins	$76,000	$302,000	$378,000
Subtotal	**$76,000**	**$302,000**	**$378,000**
Contingency (20 Percent)	$16,000	$61,000	$77,000
Total Construction Cost	**$92,000**	**$363,000**	**$455,000**
Engineering, Administration, Legal (35 Percent)	$32,200	$127,050	$159,250
Total Project Cost	**$124,200**	**$490,050**	**$614,250**

Table 9.7 – Disposal Cost Summary-Disinfected Tertiary

Component	Value		
	Phase I	Additional for Build-Out	Total
Percolation Basins	$76,000	$302,000	$378,000
Subtotal	**$76,000**	**$302,000**	**$378,000**
Pump Station	$60,000	$ -	$60,000
Ag Reuse Piping	$321,000	$ -	$321,000
Recycled Piping	$514,000	$ -	$514,000
Subtotal	**$895,000**	**$ -**	**$895,000**
Contingency (20 Percent)	$195,000	$61,000	$256,000
Total Construction Cost	**$1,166,000**	**$363,000**	**$1,529,000**
Engineering, Administration, Legal (35 Percent)	$408,100	$127,050	$535,150
Total Project Cost	**$1,574,100**	**$490,050**	**$2,064,150**

9.3 Operations and Maintenance Costs

9.3.1 Collection system

O&M cost estimates for the collection system are provided in Tables 9.8 and 9.9 for Phases 1 and at build-out, respectively. These estimates provide general items typically required such as line inspection and cleaning and lift station maintenance.

Table 9.8 – Collection System - Phase 1 Annual O&M Cost Estimate1

Component	Unit Cost	Unit	Quantity	Unit	Total
Power	$0.16	$/kWh	2,072	kWh	$332
Line Cleaning	$0.64	$/ft	2,410	ft	$1,542
Line Inspection (CCTV)	$1.07	$/ft	2,410	ft	$2,579
Line Replacement[3]	$15.00	$/ft	121	ft	$1,808
Labor	$58.37	$/hour	1,252	hours	$73,079
Maintenance[2]	2.0	%	$100,000	-	$2,000
Misc. Equipment Replacement[2]	4.0	%	$100,000	-	$4,000
Total					**$85,400**

Notes:
1. Costs based on the first year of operation in 2014.
2. Percentage of the total Phase I equipment cost.
3. Percentage of total average pipeline cost.

Table 9.9 – Collection System – Build-Out Annual O&M Cost Estimate1					
Component	**Unit Cost**	**Unit**	**Quantity**	**Unit**	**Total**
Power	$0.16	$/kWh	9,499	kWh	$1,520
Line Cleaning	$0.64	$/ft	7,334	ft	$4,694
Line Inspection (CCTV)	$1.07	$/ft	7,334	ft	$7,847
Line Replacement[3]	$15.00	$/ft	367	ft	$5,501
Labor	$58.37	$/hour	1,252	hours	$73,079
Maintenance[2]	2.0	%	$300,000	-	$6,000
Misc. Equipment Replacement[2]	4.0	%	$300,000	-	$12,000
Total					**$110,700**

Notes:
1. Costs based on the first year of operation in 2014.
2. Percentage of the total equipment cost.
3. Percentage of total average pipeline cost.

9.3.2 Treatment and Disposal

The O&M cost estimates for the WWTP are provided in Tables 9.10 and 9.11 for undisinfected secondary at Phase 1 and build-out and Tables 9.12 and 9.13 for disinfected tertiary for Phase 1 and at build-out, respectively. Offsite effluent disposal O&M costs are not included in these tables.

Table 9.10 – Annual Treatment and Disposal O&M Cost Estimate-Phase 1, Undisinfected Secondary[1]					
Component	**Unit Cost**	**Unit**	**Quantity**	**Unit**	**Total**
<u>Treatment</u>					
Sludge Disposal	$0.22	$/gallon	115,440	gallons	$25,397
Labor	$58.37	$/hour	1,252	hours	$73,079
Maintenance[2]	2.0	%	$402,961	-	$8,059
Misc. Equipment Replacement[2]	4.0	%	$402,961	-	$16,118
Power	$0.16	$/kWh	$149,227	kWh	$23,876
Total					**$146,600**

Notes:
1. Costs based on the first year of operation in 2014.
2. Percentage of the equipment cost.

Table 9.11 – Annual Treatment and Disposal O&M Cost Estimate-Build-Out, Undisinfected Secondary[1]

Component	Unit Cost	Unit	Quantity	Unit	Total
<u>Treatment</u>					
Sludge Disposal	$0.22	$/gallon	709,320	gallons	$156,050
Labor	$58.37	$/hour	1,252	hours	$73,079
Maintenance[2]	2.0	%	$737,881	-	$14,758
Misc. Equipment Replacement[2]	4.0	%	$737,881	-	$29,515
Power	$0.16	$/kWh	1,123,000	kWh	$179,680
Total					**$453,100**

Notes:
1. Costs based on the first year of operation in 2014.
2. Percentage of the equipment cost.

Table 9.12 – Annual Treatment and Disposal O&M Cost Estimate-Phase 1, Disinfected Tertiary[1]

Component	Unit Cost	Unit	Quantity	Unit	Total
<u>Treatment</u>					
Sludge Disposal	$0.22	$/gallon	115,440	gallons	$25,397
Labor	$58.37	$/hour	1,252	hours	$73,079
Maintenance[2]	2.0	%	$402,961	-	$8,059
Misc. Equipment Replacement[2]	4.0	%	$402,961	-	$16,118
Power	$0.16	$/kWh	149,227	kWh	$23,876
Subtotal					**$146,600**
<u>Filtration and Disinfection</u>					
Filter Replacement	$991.17	$/filter	7.2	filters	$7,136
UV Bulb Replacement	$297.14	$/bulb	18	bulbs	$5,349
Power	$0.16	$/kWh	26,380	kWh	$4,221
Maintenance[2]	2.0	%	$289,968	-	$5,799
Subtotal					**$22,600**
Total					**$169,200**

Notes:
1. Costs based on the first year of operation in 2014.
2. Percentage of the equipment cost.

Table 9.13 – Annual Treatment and Disposal O&M Cost Estimate-Build-Out, Disinfected Tertiary[1]					
Component	**Unit Cost**	**Unit**	**Quantity**	**Unit**	**Total**
Treatment					
Sludge Disposal	$0.22	$/gallon	709,320	gallons	$156,050
Labor	$58.37	$/hour	1,252	hours	$73,079
Maintenance[2]	2.0	%	$737,881	-	$14,758
Misc. Equipment Replacement[2]	4.0	%	$737,881	-	$29,515
Power	$0.16	$/kWh	1,123,000	kWh	$179,680
Subtotal					**$453,100**
Filtration and Disinfection					
Filter Replacement	$991.17	$/filter	7.2	filters	$7,136
UV Bulb Replacement	$297.14	$/bulb	18	bulbs	$5,349
Power	$0.16	$/kWh	26,380	kWh	$4,221
Maintenance[2]	2.0	%	$289,968	-	$5,799
Subtotal					**$22,600**
Total					**$475,700**

Notes:
3. Costs based on the first year of operation in 2014.
4. Percentage of the equipment cost.

9.4 Summary

The following tables provide a summary of project costs for Phase 1 and at build-out for both undisinfected secondary and disinfected tertiary.

Table 9.14 – Total Project Cost Summary-Undisinfected Secondary

	Phase 1	Additional for Build-Out	Total
Land Purchase Cost	$1,500,000	-	$1,500,000
Construction Cost	$5,320,000	$7,281,000	$12,601,000
Project Cost	$1,862,000	$2,549,000	$4,411,000
Total Cost	**$8,682,000**	**$9,830,000**	**$18,512,000**
Land Purchase Cost	$1,500,000	$-	$1,500,000
Construction Cost	$6,971,000	$7,281,000	$14,252,000
Project Cost	$2,440,000	$2,549,000	$4,989,000
Total Cost	**$10,911,000**	**$9,830,000**	**$20,741,000**

Note:
Land Purchase Cost based on market price of available parcels around Los Olivos
Construction Cost includes 20% contingency
Project Cost includes engineering, administration and legal cost (35% of Construction Costs)

As shown in the tables above, inclusion of the filtration and disinfection process results in a project cost increase of approximately two million dollars. A majority of this cost comes from installation of a distribution system to convey the treated effluent to the use locations. This additional cost only occurs during phase 1 of the project since the equipment and distribution system installed during Phase 1 is adequately sized for the total expected flows for the community.

An estimated land value has been included in the total project cost summary. This figure has been calculated based on listing prices per acre of agricultural parcels currently on the market and the total acreage required for the assumed treatment and disposal methods. Depending on the actual treatment and disposal method, final WWTP site location, and market conditions at the time of land acquisition this price may be significantly different.

10 Preliminary Benefit Assessment Analysis

A preliminary benefit assessment analysis for a new wastewater treatment plant (WWTP), effluent disposal facilities and collection system for the community of Los Olivos has been prepared as part of this PER. A preliminary method of assessment spread has also been developed based on the Engineer's Opinion of Construction Cost presented in Section 9 of this report. The assessment spread was developed based on estimated benefit units for residential and commercial development at Phases 1 and 3 as defined Section 2 of this report.

10.1 Benefit Assessment Districts Overview

One option that is typically used for funding of capital improvement projects such as the proposed Los Olivos community WWTP and collection system is through the formation of an assessment district. Benefit assessments are involuntary charges to properties to fund public improvements or services that provide benefits specifically to that property. These charges are different than those of taxes or fees. Taxes are not based on actual benefit and fees are voluntary charges to cover the expense of the service provided.

Benefit assessment usage is limited by the California Constitution. Over 30 types of benefit assessment types are listed in the Constitution. The benefit assessment types vary by agencies allowed to use them, determination of who benefits, what the assessment can fund, and limits on the duration and renewal of the assessment.

10.1.1 Benefit Assessment District Formation

The formation of a benefit assessment district varies depending on the type. However, there are basic steps they all follow including:

- Creation of the district begins with a petition or a resolution. Petitions are generated by property owners, whereas resolutions are created by the governing body.
- Following the petition or resolution, an engineering report is prepared to study the proposed improvements, costs, and district boundaries and to calculate the benefit assessment per parcel.
- As required by Proposition 218, agencies use the engineer's report to determine the level of benefit to property owners as well as the overall benefit to the community. In some cases the benefits to the property owner are only a percentage of the overall project benefits. In this case the agency can only set the assessment charges to cover the same percentage of project costs.
- A public meeting is held to hear comments from property owners located in the proposed assessment district.
- Ballots are mailed to the affected property owners and are counted at another public hearing. Ballots are weighted depending on the amount each owner will have to pay based on the benefit. Assessments are approved based a simple majority of the weighted ballots.
- After adoption, the assessment is placed on the property owners' annual property tax bill.

10.2 Preliminary Benefit Assessment for Los Olivos

Within this report, a preliminary method of assessment spread was developed. In addition, a range of possible assessment amounts is calculated to be used in discussions of the possible project options. These calculations are based on the cost opinions presented in Section 9. The project phasing and wastewater flow factors used as basis of the assessment spread are as defined in Sections 2 and 3.

10.2.1 Cost Allocation Factors

By law, the assessment of the total cost of the improvements to the various properties within an assessment district is to be in proportion to the estimated benefit to be received by the property from the improvements. To that end, the residential and commercial wastewater flow factors from Section 3 for annual average daily flow (AADF) were was used to calculate the percent of total AADF per residential connection and per 1,000 square feet (SF) of commercial development. Commercial flows were converted into the number of residential unit equivalents by dividing the total amount of expected commercial flow by the estimated flow per residence. Residential unit equivalents (RUE) are commonly used in benefit assessments to account for the differing wastewater flow amounts between various types of residences and commercial business and to determine the amount of actual benefit the commercial property would receive from the proposed service. For instance, a restaurant will have much higher wastewater flows than those expected for a retail type store and in turn would have a larger cost allocation. Commercial duty factors would be established by the governing agency and used to determine the connection and service costs per residence and commercial property.

Table 10.1 displays the calculated values to be used as a basis for the allocation of costs. These Cost Allocation Factors were developed for Phase I of the project and for project build-out.

Table 10.1 – Calculation of Unit Cost Percentages

Residential					
Project Phase	**No. of Connections**	**Factor (gpd/conn)[1]**	**AADF (gpd)**	**% of Total AADF**	**% Cost per Connection**
I	25	215	5,400	29.67%	1.19%
Build-out	400	215	86,000	60.14%	0.15%
Commercial					
Project Phase	**Area (SF)**	**Factor (gpd/SF)[1]**	**AADF (gpd)**	**No. of Equivalent Residential Connections[2]**	
I	228,990	0.056	12,800	60	
Build-out	1,018,071	0.056	57,000	265	

Notes:
1. Residential and commercial flow factors are from Section 3 of this report.
2. Equivalent Residential Connections for commercial development are equal to the commercial AADF divided by the residential flow factor of 215 gpd/residential connection.

10.2.2 Preliminary Assessment Spread

The estimated costs developed in Section 9 for the recommended alternative for collection, treatment and disposal system improvements have been summarized as shown in Table 10.2 for both Phase I and build-out of the project. Costs have also been developed for both undisinfected secondary and disinfected tertiary treatment. Incidental costs (legal, administration and engineering) have been estimated at 35 percent of the improvement costs. A land purchase price was also included based on the current retail prices of agricultural type properties in the general area of Los Olivos. It should be noted that costs in Table 10.2 do not include costs for right-of-way acquisition or bond issuance.

The total estimated costs were then multiplied by the percent cost per connection developed in Table 10.1 to provide an estimated assessment cost for per RUE for the various phases and treatment alternatives.

Table 10.2 – Preliminary Cost Estimate and Assessment Spread

	Phase I Undisinfected Secondary	Build-out Undisinfected Secondary	Phase I Disinfected Tertiary	Build-out Disinfected Tertiary
Improvement Costs[1]				
Land Purchase Cost	$1,500,000	$1,500,000	$1,500,000	$1,500,000
Collection System	$2,790,000	$8,358,000	$2,790,000	$8,358,000
Treatment Improvements	$2,533,000	$3,883,000	$3,014,000	$4,364,000
Disposal System	$92,000	$454,000	$1,166,000	$1,529,000
Total	**$6,915,000**	**$14,195,000**	**$8,470,000**	**$15,751,000**
Incidental Costs[2]				
Engineering, Admin. & Legal	$2,420,000	$4,968,000	$2,965,000	$5,513,000
Total Estimated Cost	$9,335,000	$19,163,000	$11,435,000	$21,264,000
Preliminary Assessment[3]				
Cost/RUE	$110,800	$28,800	$135,700	$32,000

Notes:
1. Improvement costs do not include costs for right-of-way acquisition. Collection, treatment and disposal costs include 20% contingency
2. Incidental costs are estimated at 35% of improvement costs and do not include costs associated with bond issuance.
3. Preliminary Assessment is the Total Estimated Cost multiplied by the percent cost per connection(including equivalent residential connections) from Table 10.1.

Based on this analysis, the preliminary assessment spread is estimated to be in the range of $110,800 to $135,700 per RUE for Phase I of the project and in the range of $28,800 to $32,000 per RUE for build-out when the costs are spread among the entire community. As stated in previously, these costs are based on preliminary information and are intended to provide the basis for discussion relative comparison of project options.

Actual costs per RUE could be significantly lower by incorporating several cost lowering strategies. These strategies could include:

1. Reduced land purchase price

   As previously discussed the estimated land purchase price is calculated based on the average current market price and acreage required for the WWTP and effluent disposal. This amount could be reduced if the selected location has better soil characteristics for effluent disposal resulting in a reduced land requirement. In addition, agreements with land owner(s) may be possible for agricultural reuse further reducing the amount of disposal area needed.

2. Acquire grant funding

   Several grants are available for projects designed to improve water quality. Because grant funds do not have to be repaid the impact on the total cost per RUE could be significant.

3. Reduce administrative costs

   As previously indicated administrative costs have been assumed to be 35% of the project construction costs. The costs include design, legal and miscellaneous administrative fees that occur through the life of the project. Careful project planning and management could result in administration fees as low as 20% of the construction costs.

   A design-build type project could also be considered to reduce administrative costs. A design-build project would proceed more expeditiously than a traditional design-bid-build project since multiple procurement processes would be avoided and design and construction could be integrated to make the project execution both more efficient and less expensive.

Table 10.3 incorporates the strategies discussed above and presents target cost estimates for the project.

Table 10.3 – Target Preliminary Cost Estimate and Assessment Spread

	Phase I Undisinfected Secondary	Build-out Undisinfected Secondary	Phase I Disinfected Tertiary	Build-out Disinfected Tertiary
Improvement Costs[1]				
Land Purchase Cost	$1,500,000	$1,500,000	$1,500,000	$1,500,000
Collection System	$2,790,000	$8,358,000	$2,790,000	$8,358,000
Treatment Improvements	$2,533,000	$3,883,000	$3,014,000	$4,364,000
Disposal System	$92,000	$454,000	$1,166,000	$1,529,000
Cost Reduction[4]	$ (1,500,000)	$ (1,500,000)	$ (1,500,000)	$ (1,500,000)
Total	**$5,415,000**	**$12,695,000**	**$6,970,000**	**$14,251,000**
Incidental Costs[2]				
Engineering, Admin. & Legal	$1,083,000	$2,539,000	$1,394,000	$2,850,000
Total Estimated Cost	$6,498,000	$15,234,000	$8,364,000	$17,101,000
Preliminary Assessment[3]				
Cost/RUE	$77,100	$22,900	$99,300	$25,700

Notes:
1. Improvement costs do not include costs for right-of-way acquisition. Collection, treatment and disposal costs include 20% contingency
2. Incidental costs are estimated at 20% of improvement costs and do not include costs associated with bond issuance.
3. Preliminary Assessment is the Total Estimated Cost multiplied by the percent cost per connection from Table 10.1.
4. Land costs, grant funding, or other target strategies

The table above assumes $1,500,000 in grants or cost reduction and incidental costs of 20% of the total construction costs. With these assumptions cost reductions are in the range of $33,700 to $36,400 per RUE for Phase 1 and $5,900 to $6,300 at build-out.

10.2.3 Annual Payments

Estimated annual payments based on a 20-year payback period are provided in Table 10.4. Typically, this repayment schedule is offered to provide a more affordable payback option for the user.

Table 10.4 – Estimated Annual Assessments				
	Phase I Undisinfected Secondary	**Build-out Undisinfected Secondary**	**Phase I Disinfected Tertiary**	**Build-out Disinfected Tertiary**
Total Estimated Cost	$9,335,000	$19,163,000	$11,435,000	$21,264,000
Total Estimated Cost- Targeted ($1.5 mil. credit and 20% Admin)	$6,498,000	$15,234,000	$8,364,000	$17,101,000
Total Annual Cost (6% interest, 20 years)	$813,900	$1,670,700	$997,000	$1,853,900
Total Annual Cost- Targeted (2.1% interest, 20 years)	$401,200	$940,700	$516,500	$1,056,000
Estimated Annual Assessments				
Cost/RUE	$9,700	$2,500	$11,800	$2,800
Estimated Annual Assessments- Target				
Cost/RUE	$4,800	$1,400	$6,100	$1,600

The above table provides estimated annual costs based on the estimated project costs presented in Tables 10.2 and 10.3. Annual payments are estimated based on a 20 year loan with an assumed six percent interest rate.

Target annual payments are calculated using an interest rate of only 2.1 percent. This rate is based on the current interest rate for a loan provided through the Clean Water State Revolving Fund Program (CWSRF). The Federal Water Pollution Control Act established the CWSRF program in 1987 and offers low interest financing for water quality projects. This financing is available to any city, town, or district for construction of publicly-owned facilities such as wastewater treatment plants and local sewers. The interest rate for these loans is calculated by taking one half the most recent General Obligation Bond Rate at the time of Preliminary Funding Commitment. Over the past five years the interest rate has varied between two to three percent. Securing this type of loan is another strategy that should be pursued to lower the assessed costs. Another strategy could be to extend the financing payback period beyond 20 years. Although a larger amount would be paid in interest over the life of the loan, it would further reduce the annual assessment costs.

10.2.4 Annual Service Charge

Annual operating and maintenance (O&M) costs are typically funded through annual service charges for each connection. Using percent cost per connection developed in Table 10.1, estimated service charges were calculated for RUE's. Table 10.5 presents these charges and is provided for both Phase 1 of the project and build-out based on the O&M costs developed in Section 9. Again, values are provided for both undisinfected secondary and disinfected tertiary treatment.

Table 10.5 – Estimated Annual O&M Unit Costs

	Phase I Undisinfected Secondary	Build-out Undisinfected Secondary	Phase I Disinfected Tertiary	Build-out Disinfected Tertiary
Total Annual O&M Costs				
Collection System	$85,400	$110,700	$85,400	$110,700
Treatment & Disposal	$146,600	$453,100	$169,200	$475,700
Total	**$232,000**	**$563,800**	**$254,600**	**$586,400**
Annual O&M Unit Costs				
Cost/RUE	$2,800	$800	$3,000	$900

These O&M costs are approximate and actual costs could be half of the values presented depending on the final project. Cost saving strategies such as sharing personnel and equipment with surrounding districts to perform O&M duties should be fully explored to lower annual costs.

10.3 Conclusion

The following table provides a summary of the estimated total annual cost per RUE. Annual costs include the total assessment for project construction and O&M. It is assumed target O&M costs would be 50% of those calculated for the project. The summary below provides a range of costs that include both estimated costs and targeted costs as discussed throughout this section.

Table 10.6 – Estimated Annual Unit Costs per RUE

	Phase I Undisinfected Secondary	Build-out Undisinfected Secondary	Phase I Disinfected Tertiary	Build-out Disinfected Tertiary
Estimated Annual Assessments	$4,800-$9,700	$1,400-$2,500	$6,100-$11,800	$1,600-$2,800
Annual O&M Unit Costs	$1,400-$2,800	$400-$800	$1,500-$3,000	$450-$900
Total	**$6,200-$12,500**	**$1,800-$3,300**	**$7,600-$14,800**	**$2,050-$3,700**
Monthly Payment	$517-$1,042	$150-$275	$633-$1,233	$171-$308

As shown in the above table there is a financial benefit to all potential users to fully explore the cost saving strategies presented throughout this section since the costs per RUE could be significantly lower. These strategies include:

- Reducing the required land purchasing costs
- Obtaining grant funding
- Reducing administrative costs through alternative delivery or other techniques
- Securing low interest rate loans
- Increasing the loan payback period to greater than 20 years
- Serving the largest area possible to distribute the costs among more users

11 District Formation

The proposed WWTP and collection system project will require a new governing agency such as a special district. The agency would be responsible for funding, operating and maintaining sewer service in the Los Olivos Community. Provided is a brief discussion of the types of service districts available and a general description of the associated formation process.

11.1 Background

As previously discussed in the beginning of this report the LOWWMP provided recommendations to mitigate the current issues with OWTSs. The LOWWMP concluded that a community treatment system would be the most efficient way to reduce the impacts of the high density of OWTSs on groundwater quality. The nearest existing treatment plant is to the south in Solvang. However, a new WWTP will be required since the option of connecting to Solvang's WWTP with a new trunk line would not be allowed as discussed in the Santa Ynez Valley 2009 Community Plan (SYVCP)[15]. This is due to the potential for development to occur along the trunk line between Los Olivos and the plant.

The proposed new WWTP will require funding for construction, operations and maintenance. Formation of a new special district may be undertaken as a mechanism to provide this funding. Alternatively, Los Olivos could be annexed into the Santa Ynez Community Services District (SYCSD), an existing special district located to the south. This would be considered a non-contiguous annexation since Los Olivos is not adjacent to the existing district boundary. With approval, the SYCSD would expand their services to the annexed area and would be responsible for the new WWTP and collection system. A brief discussion of special districts and the formation process is provided in this section.

11.2 Special Districts

11.2.1 Overview

In California, special districts are formed by land owners and residents to provide a mechanism for funding desired services not provided through the local county or municipality. According to the Senate Local Government Committee, the first several districts were created by rural land owners to deliver irrigation water, and to fund their activities through water rates and bond sales[16]. Since then, special districts have been formed to provide a wide array of services to areas consisting of only a handful of members to those serving millions of members.

Special districts provide a focused service or services for a defined boundary. In areas where services either do not exist or where residents want a higher level of service, special districts can be formed to meet these demands and to provide a mechanism to pay for these services. Special districts have corporate powers similar to counties and cities, including but not limited to abilities associated with issuing bonds, levying special taxes, signing contracts, and hiring employees. The main difference between special districts and counties or cities is that districts do not have the ability to make and enforce rules (i.e. police power).

11.2.2 Types of Special Districts

Two types of special districts can be formed; independent or dependent districts. Independent districts are governed by a board elected by residents located within the district's boundary. An example of this

[15] Santa Ynez Valley Community Plan (County of Santa Barbara, October 2009)
[16] *What's So Special About Special Districts?*, (Fourth Edition), Senate Local Government Committee, October 2010

type of district is the Santa Ynez Community Services District (SYCSD). The SYCSD was formed in 1971 to provide sewer services for the Santa Ynez Township and locally elects its Board of Directors.

Dependent districts are governed by existing governments such as a county board of supervisors. County Service Areas (CSAs), such as Santa Barbara County's Mission Canyon (CSA 12), are dependent districts since they are governed by the county board of supervisors. Although a CSA is governed by a county, a Local Advisory Group could be formed to advise the board of supervisors on district issues. This group would be composed of residents and landowners located within the CSA. The formation of a CSA is particularly useful for districts serving a smaller number of residents, since the county is responsible for the administrative costs.

Special districts can also be single or multi-function. According to CALAFCO[17] only 15% of special districts offer more than one service. This includes all service districts and not just CSAs and Community Service Districts (CSD). However, multi-function districts such as CSAs can perform an array of services that are typically provided by the County. CSDs can also provide up to 32 types of services under the Community Service District Law (Government Code §61100).

11.2.3 Special District Funding

Spending by districts is broken into two separate categories:

- Capital projects; and
- Operations and maintenance (O&M).

Funding for each of these types of spending comes from different sources. The following sections describe the funding for these categories.

11.2.3.1 Capital Projects

Special districts can issue bonds or receive loans from the state or federal government to fund capital projects such as construction of new infrastructure to expand existing services. Typical bonds used include general obligation bonds and benefit assessment bonds. According to the California Debt Issuance Primer prepared by the California Debt and Investment Advisory Commission, "*general obligation bonds are secured either by a pledge of the full faith and credit of the issuer or by a promise to levy property taxes in an unlimited amount necessary to pay debt service*." General obligation bonds are typically payable from ad valorem property taxes. Issuance of general obligation bonds requires a supermajority (2/3) voter approval. Benefit assessment bonds also require property owner approval but only require a simple majority through a weighted-ballot election. If approved, assessment amounts are based on the proportion of services the property receives and are typically added to the property tax bills. A more detailed discussion of benefit assessments is provided in Section 10 of this report.

11.2.3.2 Operations and Maintenance

Three different types of revenue sources can be used to fund O&M services of the district. These include taxes, service charges, and benefit assessments. Proposition 218 (1996) prohibits service districts from levying separate general taxes. Special taxes can be levied with a two thirds voter approval and are typically a flat amount per lot. Service charges such as water or electricity rates charge residents within the district based on the usage of the service. Benefit assessments similar to those for capital improvements can also be used for funding of operations and maintenance.

[17] *Special District Fact Sheet*, Senate Local Government Committee, August 2009.

11.3 Formation and Annexation Process

The process of forming a new district or annexation of an area into an existing district involves several steps that are briefly described below.

11.3.1 LAFCO

In 1963 the California legislature created the Local Agency Formation Commissions (LAFCo). The goal of the formation was to improve coordination and planning for and between local government agencies since at the time several agencies overlapped geographically and had inefficient service boundaries. The result of this lack of coordination and planning was the premature loss of agricultural and open space lands.

LAFCo's purpose is to encourage orderly formation of local agencies, preserve agricultural resources and to discourage urban sprawl. To accomplish these goals, LAFCo reviews proposals for formation of new agencies, as well as proposed changes to existing agencies. LAFCo has the power to either approve or deny the proposal based on their review.

Each county has its own LAFCo that is typically comprised of members from the Board of Supervisors and members of city councils. Some LAFCos also include members of independent special districts located in the county. The Santa Barbara LAFCo includes two City members, two County members, two Special District members, and one public member.

11.3.2 Process

The formation of a new district or annexation of an area into an existing district requires five general steps:

1. Registered voters within the proposed district/annexation area apply to LAFCo on specified application forms. Alternatively the County could adopt a resolution and submit an application for formation of a dependent district such as a CSA.
2. LAFCo reviews the application and provides the public with recommendations after an initial public hearing. LAFCo can either approve or reject the submitted application.
3. If LAFCo approves the application a second public hearing is held to measure formal protests. If a majority of the voters protest the proposal, the process stops.
4. If there is not a majority of protests then an election is held within the proposed district boundaries.
5. If the voters approve, LAFCo files the formal documents to create the new district or annex the proposed area.

A flow chart representing this process is provided the Appendix D of this report. The time required to complete all of the steps listed above to form a new special district or to be annexed into an existing district can vary from several months to several years.

11.3.3 Required Application Information

The application to LAFCo to initiate the formation process would include a general description of the area, type of district to be formed, reasoning for the creation, legal description of the district boundary, and support of the residents and land owners. In addition, the application would include the appropriate environmental documentation under CEQA. A detailed application package including the associated fees would be obtained from LAFCo prior to the initiation of the process. The current schedule of processing fees is provided in Appendix C.

11.4 Summary

As previously discussed, the community of Los Olivos has several alternatives available to fund and manage a new WWTP and collection system. Either annexation to an existing special district such as the SYCSD or formation of a new district are viable options. It is assumed that all options would be explored and a final option selected with input from the community, County staff, the Board of Supervisors, nearby special districts, and LAFCo.

APPENDIX A
Central Coast Regional Water Quality Control Board- Preliminary Engineering Report Response to Surface Water Discharge Alternative

June 18, 2012

J.J. Reichmuth, PE
Email (Joseph.Reichmuth@aecom.com)
AECOM, Project Manager
1194 Pacific Street, Suite 204
San Luis Obispo, CA 93401

Dear Mr. Reichmuth:

SANTA BARBARA COUNTY'S LOS OLIVOS WASTEWATER TREATMENT FACILITY - PRELIMINARY ENGINEERING REPORT RESPONSE TO SURFACE WATER DISCHARGE ALTERNATIVE

Central Coast Water Board staff received your June 7, 2012 letter regarding the Los Olivos Wastewater Facility Preliminary Engineering report. We understand that you and the County are seeking to better understand issues surrounding discharges of treated effluent to surface water.

We understand that the project will be conducted in three phases. Phase I will serve the existing downtown core, which will include the entire commercial district as well as some residential homes. Phase II will expand wastewater treatment capacity to serve the build-out of the commercial and residential downtown core. Phase III will expand wastewater treatment capacity to serve the remaining properties identified within the Special Problems Area (as delineated by the County). Total average annual daily flow from the wastewater treatment facility is anticipated to be 143,000 gallons per day at the completion of Phase III. If the project is designed to discharge to surface water, then the likely location for discharge would be Alamo Pintado Creek. We offer the following responses to your questions related to surface water discharges:

Given the possible discharge locations (i.e., Alamo Pintado Creek or a tributary to the creek), what additional effluent limitations (other than BOD, TSS, and TN) are anticipated?

Surface water discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permitting program, as required by the federal Clean

Water Act. Discharges to surface water bodies are subject to review and permitting through the Central Coast Water Board. Discharges to surface water require effluent limitations that are protective of aquatic life and habitat. Title 40 of the Code of Federal Regulations, Section 133.102 requires compliance with secondary standards for biochemical oxygen demand (BOD), total suspended solids (TSS) and pH, at a minimum. In addition to these secondary standards, surface water discharges are subject to water quality objectives identified in the Central Coast Water Quality Control Plan (Basin Plan) and the California Toxics Rule. The Basin Plan includes water quality objectives that are protective of beneficial uses. Basin Plan water quality objectives include, but are not limited to organic chemicals, radioactivity, bacteria, dissolved oxygen, temperature, and salts. The California Toxics rule includes a list of volatile organics, semi-volatile organics, pesticides, inorganics, and other pollutants (approximately 130)[1].

If the future Los Olivos Wastewater Treatment Facility would treat the wastewater to meet tertiary standards for recycled water reuse and have a surface water discharge, then the facility would have to satisfy Title 22, California Code of Regulations (Title 22) as well as the aforementioned effluent requirements.

What studies would be required to evaluate impacts on aquatic life and other beneficial uses during the CEQA/EIR and permitting process for the NPDES/WDRs?

In order to allow Central Coast Water Board staff to fully understand the project, its anticipated discharge, and its potential downstream impacts, staff would request, at a minimum, the following studies:

- Flow Studies – This study should calculate flows through each phase of the project. This would include peak seasonal flows and community growth projections.

- Hydrological Study – This study should include an evaluation of downstream impacts associated with the additional daily flows. This would include a discussion of baseline riparian and stream conditions; potential downstream erosion and sediment transport; and water quality changes (i.e., increasing nutrients, salts, sediment, temperature, organics) that might alter aquatic life habitat.

- Groundwater Studies – This study should include an evaluation of groundwater impacts related to the additional discharges to the creek. This would include a evaluation of groundwater connectivity via in-stream recharge, potential impacts

[1] The discharger may conduct a Reasonable Potential Analysis to identify pollutants with reasonable potential to impact water quality. Pollutants may not have effluent limitations only if they are identified not to have reasonable potential to impact water quality.

to downstream drinking water sources, and groundwater quality changes as a result of the discharge.

- Endangered Species Study – This study would include an evaluation/survey of endangered species that would be impacted by the additional surface water discharge. This study would need to include both federal and state species of concern and would also be reviewed by California Department of Fish and Game and the US Fish and Wildlife Service.

- Reasonable Potential Analysis – This study would analyze the priority pollutants identified in the California Toxic Rule and evaluate whether the pollutants would be present in the discharge and have reasonable potential to cause an exceedance of water quality standards.

Other federal and state resources agencies may have additional requirements.

What monitoring requirements would be imposed? In particular, what are the current toxicity testing requirements for water bodies with similar beneficial uses?

As discussed in the first question above, surface water discharges are required to meet secondary standards, water quality objectives identified in the Basin Plan, and California Toxics Rule. Therefore, monitoring for influent wastewater, effluent wastewater, and receiving water (creek) would be required in order to establish compliance and protection of the receiving water. At a minimum, the following monitoring requirements would be established.

- Influent Monitoring – The Discharger would be required to monitoring influent wastewater (Flow, BOD, TSS, pH, etc.) to determine removal efficiency and loading rates.

- Effluent Monitoring - Effluent monitoring would include all of the pollutants identified to meet federal secondary standards, water quality objectives in the Basin Plan, and water quality objectives in the California Toxics Rule. If recycled water is proposed, then the Discharger would be required to monitor for Title 22 standards and constituents of emerging concern[2].

- Receiving Water Monitoring - The discharger would be required to establish receiving water monitoring points upstream and downstream of the effluent discharge location. Typical receiving water monitoring includes evaluating the chemical contribution from the discharge, compliance with the permit, and identifying any downstream impacts as a result of the discharge.

[2] Constituents of Emerging Concern are established by the Department of Public Health and are associated with recycled water reuse and irrigation.

- Groundwater Monitoring – The discharger would be required to monitor groundwater. This study would evaluate potential impacts to groundwater as a result of the surface water discharges. Typical groundwater monitoring parameters include, but are not limited to, salts, nitrogen, and some drinking water parameters.

If the County proposed this option as a seasonal solution or short-term solution (coupled with direct reuse for irrigation and/or percolation elsewhere), would the environmental studies, monitoring requirements, or effluent limitations be different?

Any discharge of waste to surface water would be subject to NPDES regulation. In other words, regardless of the discharge duration to surface water, the discharger would be subject to federal secondary standards and compliance with Basin Plan and California Toxics Rule water quality objectives. Monitoring frequency of the receiving water may change due to the temporary nature of discharge.

Would state funding and/or grant opportunities be limited with surface water discharges?

More recently, the state has placed emphasis on projects related to recycled water and reuse. As a result, grand funding opportunities are available for recycled water projects. Projects that do not have a recycled water element are limited from receiving recycled water grant funds.

Additional Comments:

Mandatory Minimum Penalties - Surface water discharges are subject to mandatory minimum penalties, pursuant to California Water Code, Section 13385. This section of the water code requires a mandatory penalty of $3,000 per effluent violation. The total amount of mandatory penalties is dependent on the number of violations assessed by Water Board staff.

Habitat Maintenance - Wastewater treatment facilities that discharge to surface water have also been required to support aquatic habitat. For example, the City of San Luis Obispo currently discharges to San Luis Obispo Creek. As a result, the additional water in the creek has created and maintained a habitat for aquatic life, more specifically steelhead trout. Subsequently, the City of San Luis Obispo is required by the US Fish and Wildlife Service to provide a certain flow to the creek in order to maintain the aquatic habitat in perpetuity.

Conclusion:

In general, the federal Clean Water Act discourages waste discharges to surface water. The NPDES program exists to make sure that where these discharges exist, there are requirements in place to protect water quality. California laws encourage recycling of wastewater to the greatest extent possible. Recycled wastewater can be a valuable source of water, especially in chronically water-short areas such as the central coast.

The Central Coast Water Board appreciates the County's efforts to provide wastewater management to the community of Los Olivos. The Basin Plan identifies Los Olivos and Ballard Canyon as urbanizing areas that are in need of wastewater management[3]. We encourage the County to continue its environmental analysis, design, and construction of a community wastewater treatment facility in an expeditious manner. Central Coast Water Board staff encourages the County to seek alternatives that are beneficial for the surface water and groundwater protection. As such, staff would likely recommend approval for a wastewater treatment facility that involves sustainable methods for discharge. We recognize that wastewater treatment/recycled water projects are most sustainable and provide opportunities for urban and agricultural reuse.

If you have any further questions, please contact **David LaCaro at (805) 549-3892 or via email at dlacaro@waterboards.ca.gov.**

Sincerely,

for Roger W. Briggs
Executive Officer

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[3] Section VIII.D.3.g. of the Basin Plan.

APPENDIX B
Cost Estimation – Treatment Comparison

Table B.1 – Cost Summary by Treatment Alternative-Phase 1				
	Treatment Alternative			
Component	**MLE**	**SBR**	**MBR**	**AdvanTex**
Equipment				
Screening	$177,000	$177,000	NA	$177,000
Treatment Alternative	$425,000	$344,000	$894,000	$553,000
Retention Tank	NA	NA	NA	$173,000
Filtration	$197,000	$197,000	NA	NA
Disinfection[1]	$103,000	$205,000	$103,000	$401,000
Civil/Yard Piping	$81,000	$83,000	$87,000	$50,000
Structural	$145,000	$175,000	$147,000	$119,000
Process Mechanical[2]	$159,000	$142,000	$154,000	$ -
Electrical & Instrumentation	$322,000	$330,000	$346,000	$100,000
Subtotal	**$1,609,000**	**$1,653,000**	**$1,731,000**	**$1,573,000**
Overhead (Contractor Profit & Tax)	$239,000	$246,000	$257,000	$216,000
Contingency (20 Percent)	$369,000	$379,000	$397,000	$334,000
Total Construction Cost	**$2,217,000**	**$2,278,000**	**$2,385,000**	**$2,123,000**
Engineering, Administration, Legal (35 Percent)	$775,000	$796,000	$834,000	$701,000
Total Project Cost	**$2,992,000**	**$3,074,000**	**$3,219,000**	**$2,824,000**

1. Includes dentrification (Blue NITE) for the AdvanTex Alternative
2. Included in equipment pricing for the AdvanTex Alternative

Table B.2 – Cost Summary by Treatment Alternative-Phase 2				
	Treatment Alternative			
Component	MLE	SBR	MBR	AdvanTex
Equipment				
Screening	$ -	$ -	NA	$ -
Treatment Alternative	$625,000	$295,000	$900,000	$750,000
Retention Tank	NA	NA	NA	$586,000
Filtration	$ -	$ -	NA	NA
Disinfection[1]	$ -	$ -	$ -	$ -
Civil/Yard Piping	$65,000	$37,000	$81,000	$10,000
Structural	$166,000	$213,000	$163,000	$ -
Process Mechanical[2]	$100,000	$46,000	$139,000	$ -
Electrical & Instrumentation	$258,000	$148,000	$321,000	$25,000
Subtotal	**$1,214,000**	**$739,000**	**$1,604,000**	**$1,371,000**
Overhead (Contractor Profit & Tax)	$192,000	$110,000	$239,000	$203,000
Contingency (20 Percent)	$296,000	$170,000	$368,000	$315,000
Total Construction Cost	**$1,702,000**	**$1,019,000**	**$2,211,000**	**$1,889,000**
Engineering, Administration, Legal (35 Percent)	$621,000	$356,000	$773,000	$661,000
Total Project Cost	**$2,323,000**	**$1,375,000**	**$2,984,000**	**$2,550,000**

1. Includes dentrification (Blue NITE) for the AdvanTex Alternative
2. Included in equipment pricing for the AdvanTex Alternative

Table B.3 – Cost Summary by Treatment Alternative-Phase 3				
	Treatment Alternative			
Component	**MLE**	**SBR**	**MBR**	**AdvanTex**
Equipment				
Screening	$ -	$ -	NA	$ -
Treatment Alternative	$625,000	$223,000	$993,000	$1,572,000
Retention Tank	NA	NA	NA	$1,213,000
Filtration	$ -	$ -	NA	NA
Disinfection[1]	$103,000	$ -	$103,000	$711,000
Civil/Yard Piping	$73,000	$29,000	$95,000	$10,000
Structural	$166,000	$172,000	$147,000	$ -
Process Mechanical[2]	$116,000	$35,000	$169,000	$ -
Electrical & Instrumentation	$289,000	$115,000	$377,000	$25,000
Subtotal	**$1,372,000**	**$574,000**	**$1,884,000**	**$3,531,000**
Overhead (Contractor Profit & Tax)	$215,000	$85,000	$280,000	$524,000
Contingency (20 Percent)	$332,000	$132,000	$432,000	$811,000
Total Construction Cost	**$1,919,000**	**$791,000**	**$2,596,000**	**$4,866,000**
Engineering, Administration, Legal (35 Percent)	$697,000	$276,000	$907,000	$1,703,000
Total Project Cost	**$2,616,000**	**$1,067,000**	**$3,503,000**	**$6,569,000**

1. Includes dentrification (Blue NITE) for the AdvanTex Alternative
2. Included in equipment pricing for the AdvanTex Alternative

Table B.4 – Project Cost Summary by Treatment Alternative-Buildout				
	Treatment Alternative			
Component	**MLE**	**SBR**	**MBR**	**AdvanTex**
Equipment				
Screening	$177,000	$177,000	NA	$177,000
Treatment Alternative	$1,675,000	$862,000	$2,787,000	$2,875,000
Retention Tank	NA	NA	NA	$1,972,000
Filtration	$197,000	$197,000	NA	NA
Disinfection[1]	$206,000	$205,000	$206,000	$1,112,000
Civil/Yard Piping	$219,000	$149,000	$263,000	$70,000
Structural	$477,000	$560,000	$457,000	$119,000
Process Mechanical[2]	$375,000	$223,000	$462,000	$ -
Electrical & Instrumentation	$869,000	$593,000	$1,044,000	$150,000
Subtotal	**$4,195,000**	**$2,966,000**	**$5,219,000**	**$6,475,000**
Overhead (Contractor Profit & Tax)	$646,000	$441,000	$776,000	$943,000
Contingency (20 Percent)	$997,000	$681,000	$1,197,000	$1,460,000
Total Construction Cost	**$5,838,000**	**$4,088,000**	**$7,192,000**	**$8,878,000**
Engineering, Administration, Legal (35 Percent)	$2,093,000	$1,428,000	$2,514,000	$3,065,000
Total Project Cost	**$7,931,000**	**$5,516,000**	**$9,706,000**	**$11,943,000**

1. Includes dentrification (Blue NITE) for the AdvanTex Alternative
2. Included in equipment pricing for the AdvanTex Alternative

APPENDIX C
Effluent Disposal Alternatives – Water Balances

Effluent Disposal - Percolation

Month	Flow (gpd)	Flow (AF/mo)	Percolation Basins Area (acres)	Percolation Rate (in/day)	Percolation Rate (AF/mo)	Evaporation (in/mo)	Evaporation (AF/mo)	Precipitation (in/mo)	Precipitation (AF/mo)	Monthly Storage	Cumulative Storage
November	19,000	1.7	2.3	0.20	1.2	2.62	0.5	1.53	0.3	0.3	0.3
December	19,000	1.8	2.3	0.20	1.2	2.09	0.4	2.27	0.4	0.6	0.9
January	19,000	1.8	2.3	0.20	1.2	1.83	0.4	3.10	0.6	0.8	1.7
February	19,000	1.6	2.3	0.20	1.1	2.65	0.5	3.14	0.6	0.6	2.3
March	19,000	1.8	2.3	0.20	1.2	3.31	0.6	2.55	0.5	0.5	2.8
April	19,000	1.7	2.3	0.20	1.2	4.51	0.9	1.12	0.2	0.0	2.6
May	19,000	1.8	2.3	0.20	1.2	5.66	1.1	0.27	0.1	0.0	2.2
June	19,000	1.7	2.3	0.20	1.2	6.42	1.2	0.03	0.0	0.0	1.5
July	20,000	1.9	2.3	0.20	1.2	7.13	1.4	0.02	0.0	0.0	0.8
August	19,000	1.8	2.3	0.20	1.2	6.74	1.3	0.03	0.0	0.0	0.1
September	19,000	1.7	2.3	0.20	1.2	5.25	1.0	0.18	0.0	0.0	0.0
October	19,000	1.8	2.3	0.20	1.2	4.07	0.8	0.52	0.1	0.0	0.0
Total		21.1	2.3	0.20	14.3	52.26	10.1	14.76	2.8		
											-0.5

ADF 19,000 gpd
MMF 20,000 gpd

Month	Flow (gpd)	Flow (AF/mo)	Percolation Basins Area (acres)	Percolation Rate (in/day)	Percolation Rate (AF/mo)	Evaporation (in/mo)	Evaporation (AF/mo)	Precipitation (in/mo)	Precipitation (AF/mo)	Monthly Storage	Cumulative Storage
November	63,000	5.8	7.7	0.20	3.9	2.62	1.7	1.53	1.0	1.2	1.2
December	63,000	6.0	7.7	0.20	4.0	2.09	1.3	2.27	1.5	2.2	3.4
January	63,000	6.0	7.7	0.20	4.0	1.83	1.2	3.10	2.0	2.8	6.2
February	63,000	5.4	7.7	0.20	3.6	2.65	1.7	3.14	2.0	2.1	8.3
March	63,000	6.0	7.7	0.20	4.0	3.31	2.1	2.55	1.6	1.5	9.8
April	63,000	5.8	7.7	0.20	3.9	4.51	2.9	1.12	0.7	0.0	9.5
May	63,000	6.0	7.7	0.20	4.0	5.66	3.6	0.27	0.2	0.0	8.1
June	63,000	5.8	7.7	0.20	3.9	6.42	4.1	0.03	0.0	0.0	5.9
July	69,000	6.6	7.7	0.20	4.0	7.13	4.6	0.02	0.0	0.0	3.9
August	63,000	6.0	7.7	0.20	4.0	6.74	4.3	0.03	0.0	0.0	1.6
September	63,000	5.8	7.7	0.20	3.9	5.25	3.4	0.18	0.1	0.0	0.2
October	63,000	6.0	7.7	0.20	4.0	4.07	2.6	0.52	0.3	0.0	0.0
Total		71.2	7.7	0.20	47.2	52.26	33.5	14.76	9.4		
											-0.1

ADF 63,000 gpd
MMF 69,000 gpd

Month	Flow (gpd)	Flow (AF/mo)	Percolation Basins Area (acres)	Percolation Rate (in/day)	Percolation Rate (AF/mo)	Evaporation (in/mo)	Evaporation (AF/mo)	Precipitation (in/mo)	Precipitation (AF/mo)	Monthly Storage	Cumulative Storage
November	143,000	13.2	17.6	0.20	8.8	2.62	3.8	1.53	2.2	2.8	2.8
December	143,000	13.6	17.6	0.20	9.1	2.09	3.1	2.27	3.3	4.7	7.5
January	143,000	13.6	17.6	0.20	9.1	1.83	2.7	3.10	4.5	6.3	13.8
February	143,000	12.3	17.6	0.20	8.2	2.65	3.9	3.14	4.6	4.8	18.6
March	143,000	13.6	17.6	0.20	9.1	3.31	4.9	2.55	3.7	3.3	21.9
April	143,000	13.2	17.6	0.20	8.8	4.51	6.6	1.12	1.6	0.0	21.3
May	143,000	13.6	17.6	0.20	9.1	5.66	8.3	0.27	0.4	0.0	17.9
June	143,000	13.2	17.6	0.20	8.8	6.42	9.4	0.03	0.0	0.0	12.9
July	158,000	15.0	17.6	0.20	9.1	7.13	10.5	0.02	0.0	0.0	8.3
August	143,000	13.6	17.6	0.20	9.1	6.74	9.9	0.03	0.0	0.0	2.9
September	143,000	13.2	17.6	0.20	8.8	5.25	7.7	0.18	0.3	0.0	0.0
October	143,000	13.6	17.6	0.20	9.1	4.07	6.0	0.52	0.8	0.0	0.0
Total		161.7	17.6	0.20	107.1	52.26	76.8	14.76	21.4		
											-0.8

ADF 143,000 gpd
MMF 158,000 gpd

Effluent Disposal - Feed & Fodder Crop Irrigation with Unlined Storage (Undisinfected Secondary)

Month	Flow (gpd)	Flow (AF/mo)	Cropping and Applied Effluent: Crop	Application (in/acre)	Area (acres)	Total (AF/mo)	Excess Effluent (AF/mo)	Storage Basins: Area (acres)	Percolation Rate (in/day)	Percolation Rate (AF/mo)	Evaporation (in/mo)	Evaporation (AF/mo)	Precipitation (in/mo)	Precipitation (AF/mo)	Monthly Storage (AF)	Cumulative Storage (AF)	Imported Water (AF)
November	19,000	1.7	Feed/Fodder	0.97	5	0.4	1.3	0.8	0.20	0.4	2.62	0.2	1.53	0.1	0.8	0.8	0.0
December	19,000	1.8	Feed/Fodder	0.00	5	0.0	1.8	0.8	0.20	0.4	2.09	0.1	2.27	0.1	1.4	2.2	0.0
January	19,000	1.8	Feed/Fodder	0.00	5	0.0	1.8	0.8	0.20	0.4	1.83	0.1	3.10	0.2	1.5	3.7	0.0
February	19,000	1.6	Feed/Fodder	0.00	5	0.0	1.6	0.8	0.20	0.4	2.65	0.2	3.14	0.2	1.2	4.9	0.0
March	19,000	1.8	Feed/Fodder	1.35	5	0.6	1.2	0.8	0.20	0.4	3.31	0.2	2.55	0.2	0.8	5.7	0.0
April	19,000	1.7	Feed/Fodder	4.72	5	2.0	0	0.8	0.20	0.4	4.51	0.3	1.12	0.1	0.0	4.8	0.0
May	19,000	1.8	Feed/Fodder	6.60	5	2.8	0	0.8	0.20	0.4	5.66	0.4	0.27	0.0	0.0	3.0	0.0
June	19,000	1.7	Feed/Fodder	7.24	5	3.0	0	0.8	0.20	0.4	6.42	0.4	0.03	0.0	0.0	0.9	0.0
July	20,000	1.9	Feed/Fodder	7.51	5	3.1	0	0.8	0.20	0.4	7.13	0.5	0.02	0.0	0.0	0.0	1.2
August	19,000	1.8	Feed/Fodder	7.04	5	2.9	0	0.8	0.20	0.4	6.74	0.4	0.03	0.0	0.0	0.0	1.9
September	19,000	1.7	Feed/Fodder	5.04	5	2.1	0	0.8	0.20	0.4	5.25	0.3	0.18	0.0	0.0	0.0	1.1
October	19,000	1.8	Feed/Fodder	3.65	5	1.5	0.3	0.8	0.20	0.4	4.07	0.3	0.52	0.0	0.0	0.0	0.4
Total		21.1		44.10	5	18.4		0.8	0.20	4.8	52.26	3.4	14.76	0.9			4.6
																	-4.6

ADF 19,000 gpd
MMF 20,000 gpd

Month	Flow (gpd)	Flow (AF/mo)	Cropping and Applied Effluent: Crop	Application (in/acre)	Area (acres)	Total (AF/mo)	Excess Effluent (AF/mo)	Storage Basins: Area (acres)	Percolation Rate (in/day)	Percolation Rate (AF/mo)	Evaporation (in/mo)	Evaporation (AF/mo)	Precipitation (in/mo)	Precipitation (AF/mo)	Monthly Storage (AF)	Cumulative Storage (AF)	Imported Water (AF)
November	63,000	5.8	Feed/Fodder	0.97	15	1.2	4.6	3.1	0.20	1.5	2.62	0.7	1.53	0.4	2.8	2.8	0.0
December	63,000	6	Feed/Fodder	0.00	15	0.0	6	3.1	0.20	1.6	2.09	0.5	2.27	0.6	4.5	7.3	0.0
January	63,000	6	Feed/Fodder	0.00	15	0.0	6	3.1	0.20	1.6	1.83	0.5	3.10	0.8	4.7	12.0	0.0
February	63,000	5.4	Feed/Fodder	0.00	15	0.0	5.4	3.1	0.20	1.4	2.65	0.7	3.14	0.8	4.1	16.1	0.0
March	63,000	6	Feed/Fodder	1.35	15	1.7	4.3	3.1	0.20	1.6	3.31	0.8	2.55	0.7	2.6	18.7	0.0
April	63,000	5.8	Feed/Fodder	4.72	15	5.9	0	3.1	0.20	1.5	4.51	1.2	1.12	0.3	0.0	16.2	0.0
May	63,000	6	Feed/Fodder	6.60	15	8.3	0	3.1	0.20	1.6	5.66	1.5	0.27	0.1	0.0	10.9	0.0
June	63,000	5.8	Feed/Fodder	7.24	15	9.0	0	3.1	0.20	1.5	6.42	1.6	0.03	0.0	0.0	4.6	0.0
July	69,000	6.6	Feed/Fodder	7.51	15	9.4	0	3.1	0.20	1.6	7.13	1.8	0.02	0.0	0.0	0.0	1.6
August	63,000	6	Feed/Fodder	7.04	15	8.8	0	3.1	0.20	1.6	6.74	1.7	0.03	0.0	0.0	0.0	6.1
September	63,000	5.8	Feed/Fodder	5.04	15	6.3	0	3.1	0.20	1.5	5.25	1.3	0.18	0.0	0.0	0.0	3.3
October	63,000	6	Feed/Fodder	3.65	15	4.6	1.4	3.1	0.20	1.6	4.07	1.0	0.52	0.1	0.0	0.0	1.1
Total		71.2		44.10	15	55.2		3.1	0.20	18.6	52.26	13.3	14.76	3.8			12.1
																	-12.1

ADF 63,000 gpd
MMF 69,000 gpd

Month	Flow (gpd)	Flow (AF/mo)	Cropping and Applied Effluent: Crop	Application (in/acre)	Area (acres)	Total (AF/mo)	Excess Effluent (AF/mo)	Storage Basins: Area (acres)	Percolation Rate (in/day)	Percolation Rate (AF/mo)	Evaporation (in/mo)	Evaporation (AF/mo)	Precipitation (in/mo)	Precipitation (AF/mo)	Monthly Storage (AF)	Cumulative Storage (AF)	Imported Water (AF)
November	143,000	13.2	Feed/Fodder	0.97	30	2.4	10.8	6.2	0.20	3.1	2.62	1.3	1.53	0.8	7.2	7.2	0.0
December	143,000	13.6	Feed/Fodder	0.00	30	0.0	13.6	6.2	0.20	3.2	2.09	1.1	2.27	1.2	10.5	17.7	0.0
January	143,000	13.6	Feed/Fodder	0.00	30	0.0	13.6	6.2	0.20	3.2	1.83	0.9	3.10	1.6	11.1	28.8	0.0
February	143,000	12.3	Feed/Fodder	0.00	30	0.0	12.3	6.2	0.20	2.9	2.65	1.4	3.14	1.6	9.6	38.4	0.0
March	143,000	13.6	Feed/Fodder	1.35	30	3.4	10.2	6.2	0.20	3.2	3.31	1.7	2.55	1.3	6.6	45.0	0.0
April	143,000	13.2	Feed/Fodder	4.72	30	11.8	1.4	6.2	0.20	3.1	4.51	2.3	1.12	0.6	0.0	41.6	0.0
May	143,000	13.6	Feed/Fodder	6.60	30	16.5	0	6.2	0.20	3.2	5.66	2.9	0.27	0.1	0.0	32.7	8.9
June	143,000	13.2	Feed/Fodder	7.24	30	18.1	0	6.2	0.20	3.1	6.42	3.3	0.03	0.0	0.0	21.4	11.3
July	158,000	15.0	Feed/Fodder	7.51	30	18.8	0	6.2	0.20	3.2	7.13	3.7	0.02	0.0	0.0	10.7	10.7
August	143,000	13.6	Feed/Fodder	7.04	30	17.6	0	6.2	0.20	3.2	6.74	3.5	0.03	0.0	0.0	0.0	10.7
September	143,000	13.2	Feed/Fodder	5.04	30	12.6	0.6	6.2	0.20	3.1	5.25	2.7	0.18	0.1	0.0	0.0	5.1
October	143,000	13.6	Feed/Fodder	3.65	30	9.1	4.5	6.2	0.20	3.2	4.07	2.1	0.52	0.3	0.0	0.0	0.5
Total		161.7		44.10	30	110.3		6.2	0.20	37.7	52.26	26.9	14.76	7.6			47.2
																	-5.6

ADF 143,000 gpd
MMF 158,000 gpd

Effluent Disposal - Food Crop Irrigation with Unlined Storage (Disinfected Tertiary)

Month	Flow (gpd)	Flow (AF/mo)	Cropping and Applied Effluent: Crop	Application (in/acre)	Area (acres)	Total (AF/mo)	Excess Effluent (AF/mo)	Storage Basins: Area (acres)	Percolation Rate (in/day)	Percolation Rate (AF/mo)	Evaporation (in/mo)	Evaporation (AF/mo)	Precipitation (in/mo)	Precipitation (AF/mo)	Monthly Storage (AF)	Cumulative Storage (AF)	Imported Water (AF)
November	18,200	1.7	Vineyard	1.28	10	1.1	0.6	0.7	0.20	0.3	2.62	0.2	1.53	0.1	0.2	0.2	0.0
December	18,200	1.7	Vineyard	0.00	10	0.0	1.7	0.7	0.20	0.4	2.09	0.1	2.27	0.1	1.3	1.5	0.0
January	18,200	1.7	Vineyard	0.00	10	0.0	1.7	0.7	0.20	0.4	1.83	0.1	3.10	0.2	1.4	2.9	0.0
February	18,200	1.6	Vineyard	0.00	10	0.0	1.6	0.7	0.20	0.3	2.65	0.2	3.14	0.2	1.3	4.2	0.0
March	18,200	1.7	Vineyard	0.00	10	0.0	1.7	0.7	0.20	0.4	3.31	0.2	2.55	0.1	1.2	5.4	0.0
April	18,200	1.7	Vineyard	2.71	10	2.3	0	0.7	0.20	0.3	4.51	0.3	1.12	0.1	0.0	4.3	0.0
May	18,200	1.7	Vineyard	5.00	10	4.2	0	0.7	0.20	0.4	5.66	0.3	0.27	0.0	0.0	1.1	0.0
June	18,200	1.7	Vineyard	5.76	10	4.8	0	0.7	0.20	0.3	6.42	0.4	0.03	0.0	0.0	0.0	2.7
July	20,000	1.9	Vineyard	5.98	10	5.0	0	0.7	0.20	0.4	7.13	0.4	0.02	0.0	0.0	0.0	3.9
August	18,200	1.7	Vineyard	5.60	10	4.7	0	0.7	0.20	0.4	6.74	0.4	0.03	0.0	0.0	0.0	3.8
September	18,200	1.7	Vineyard	3.60	10	3.0	0	0.7	0.20	0.3	5.25	0.3	0.18	0.0	0.0	0.0	1.9
October	18,200	1.7	Vineyard	1.63	10	1.4	0.3	0.7	0.20	0.4	4.07	0.2	0.52	0.0	0.0	0.0	0.3
Total		20.5		31.55	10	26.5		0.7	0.20	4.3	52.26	3.1	14.76	0.8			12.6
																	-12.6

ADF 19,000 gpd
MMF 20,000 gpd

Month	Flow (gpd)	Flow (AF/mo)	Cropping and Applied Effluent: Crop	Application (in/acre)	Area (acres)	Total (AF/mo)	Excess Effluent (AF/mo)	Storage Basins: Area (acres)	Percolation Rate (in/day)	Percolation Rate (AF/mo)	Evaporation (in/mo)	Evaporation (AF/mo)	Precipitation (in/mo)	Precipitation (AF/mo)	Monthly Storage (AF)	Cumulative Storage (AF)	Imported Water (AF)
November	63,000	5.8	Vineyard	1.28	30	3.2	2.6	2.8	0.20	1.4	2.62	0.6	1.53	0.4	1.0	1.0	0.0
December	63,000	6	Vineyard	0.00	30	0.0	6	2.8	0.20	1.4	2.09	0.5	2.27	0.5	4.6	5.6	0.0
January	63,000	6	Vineyard	0.00	30	0.0	6	2.8	0.20	1.4	1.83	0.4	3.10	0.7	4.9	10.5	0.0
February	63,000	5.4	Vineyard	0.00	30	0.0	5.4	2.8	0.20	1.3	2.65	0.6	3.14	0.7	4.2	14.7	0.0
March	63,000	6	Vineyard	0.00	30	0.0	6	2.8	0.20	1.4	3.31	0.8	2.55	0.6	4.4	19.1	0.0
April	63,000	5.8	Vineyard	2.71	30	6.8	0	2.8	0.20	1.4	4.51	1.1	1.12	0.3	0.0	15.9	0.0
May	63,000	6	Vineyard	5.00	30	12.5	0	2.8	0.20	1.4	5.66	1.3	0.27	0.1	0.0	6.8	0.0
June	63,000	5.8	Vineyard	5.76	30	14.4	0	2.8	0.20	1.4	6.42	1.5	0.03	0.0	0.0	0.0	4.7
July	69,000	6.6	Vineyard	5.98	30	14.9	0	2.8	0.20	1.4	7.13	1.7	0.02	0.0	0.0	0.0	11.4
August	63,000	6	Vineyard	5.60	30	14.0	0	2.8	0.20	1.4	6.74	1.6	0.03	0.0	0.0	0.0	11.0
September	63,000	5.8	Vineyard	3.60	30	9.0	0	2.8	0.20	1.4	5.25	1.2	0.18	0.0	0.0	0.0	5.8
October	63,000	6	Vineyard	1.63	30	4.1	1.9	2.8	0.20	1.4	4.07	0.9	0.52	0.1	0.0	0.0	0.3
Total		71.2		31.55	30	78.9		2.8	0.20	16.7	52.26	12.2	14.76	3.4			33.2
																	-33.2

ADF 63,000 gpd
MMF 69,000 gpd

Month	Flow (gpd)	Flow (AF/mo)	Cropping and Applied Effluent: Crop	Application (in/acre)	Area (acres)	Total (AF/mo)	Excess Effluent (AF/mo)	Storage Basins: Area (acres)	Percolation Rate (in/day)	Percolation Rate (AF/mo)	Evaporation (in/mo)	Evaporation (AF/mo)	Precipitation (in/mo)	Precipitation (AF/mo)	Monthly Storage (AF)	Cumulative Storage (AF)	Imported Water (AF)
November	143,000	13.2	Vineyard	1.28	70	7.5	5.7	5.6	0.20	2.8	2.62	1.2	1.53	0.7	2.4	2.4	0.0
December	143,000	13.6	Vineyard	0.00	70	0.0	13.6	5.6	0.20	2.9	2.09	1.0	2.27	1.1	10.8	13.2	0.0
January	143,000	13.6	Vineyard	0.00	70	0.0	13.6	5.6	0.20	2.9	1.83	0.9	3.10	1.4	11.2	24.4	0.0
February	143,000	12.3	Vineyard	0.00	70	0.0	12.3	5.6	0.20	2.6	2.65	1.2	3.14	1.5	10.0	34.4	0.0
March	143,000	13.6	Vineyard	0.00	70	0.0	13.6	5.6	0.20	2.9	3.31	1.5	2.55	1.2	10.4	44.8	0.0
April	143,000	13.2	Vineyard	2.71	70	15.8	0	5.6	0.20	2.8	4.51	2.1	1.12	0.5	0.0	37.8	0.0
May	143,000	13.6	Vineyard	5.00	70	29.1	0	5.6	0.20	2.9	5.66	2.6	0.27	0.1	0.0	16.9	20.9
June	143,000	13.2	Vineyard	5.76	70	33.6	0	5.6	0.20	2.8	6.42	3.0	0.03	0.0	0.0	0.0	26.2
July	158,000	15.0	Vineyard	5.98	70	34.9	0	5.6	0.20	2.9	7.13	3.3	0.02	0.0	0.0	0.0	26.1
August	143,000	13.6	Vineyard	5.60	70	32.7	0	5.6	0.20	2.9	6.74	3.1	0.03	0.0	0.0	0.0	25.1
September	143,000	13.2	Vineyard	3.60	70	21.0	0	5.6	0.20	2.8	5.25	2.4	0.18	0.1	0.0	0.0	12.9
October	143,000	13.6	Vineyard	1.63	70	9.5	4.1	5.6	0.20	2.9	4.07	1.9	0.52	0.2	0.0	0.0	0.5
Total		161.7		31.55	70	184.1		6.3	0.20	34.1	52.26	24.2	14.76	6.8			111.7
																	-73.9

ADF 143,000 gpd
MMF 158,000 gpd

APPENDIX D

Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 Annexation/Detachment/Reorganization Procedure Diagram from Napa LAFCo.

CORTESE-KNOX-HERTZBERG LOCAL GOVERNMENT REORGANIZATION ACT OF 2000
ANNEXATION/DETACHMENT/REORGANIZATION PROCEDURE DIAGRAM

AGENCY PRE-NOTICE
Mailed notice by proponent to subject and interested agencies at least 20 days before resolution adoption unless 100% consent (optional).

COMMISSION PROCEEDINGS
May be initiated by resolution of application by affected agency, or petition with required signature of landowners or registered voters.

NOTICE OF INTENT TO CIRCULATE PETITION
Must be filed with Executive Officer prior to circulation of the petition.

RESOLUTION
Resolution of application by affected local agency.

PETITION
Petition with required signatures of landowners or registered voters. Check with LAFCO for specific signature requirement.

APPLICATION SUBMITTAL
Application is submitted to LAFCO in form required by Commission to include resolution/petition, map, pre-zoning (for city annexations) and legal description, applicable fees, CEQA compliance documents and comprehensive plan for services.

Environmental Review is performed if LAFCO is the lead agency.

Tax exchange resos are adopted by agencies, if applicable.

APPLICATION REVIEW
Request for information from other agencies or affected counties; Executive Officer prepares report and recommendation on proposal; report mailed at least 5 days prior to hearing.

NOTICE OF HEARING
Notice of Commission hearing is given by Executive Officer; notice given by posting, publication and *mailing to property owners and registered voters within boundaries (within 300 feet) at least 21 days before date of heairng. *(If >1000 notices, 1/8 page display ad in lieu of mailed noticee.)

COMMISSION HEARING
At the hearing the Commission will consider staff report and factors related to proposal, testimony of affected agencies and parties, service plan, CEQA documentation, and make determinations.

COMMISSION DENIES PROPOSAL
If denied, no similar proposal may be made within one year.

COMMISSION APPROVES PROPOSAL
May be approved with revisions/conditions. Commission directs Executive Officer to conduct protest proceedings. Approval expires within one year if not completed (see next page).

WAIVER OF PROTEST HEARING
Commission may waive hearing if 100% landowner consent and concurrence from affected agencies. (see next page)

*These are generalized procedures. Processing of specific proposals can vary slightly.

PROTEST PROCEEDINGS

A public hearing must be held to determine whether there is enough protest to warrant an election or terminate proceedings.

WAIVER OF PROTEST HEARING

If protest is waived, proposal may be completed.

NOTICE OF HEARING

Notice is given by Executive Officer within 35 days of Commission hearing; notice given by posting, publication and *mailing to property owners and registered voters within boundaries at least 21 days before date of hearing. *(If >1,000 notices, 1/8 page display ad in lieu of mailed notice.)

PROTEST HEARING

Protest hearing is held by the Executive Officer on date and time of notice; written protests must be filed on LAFCO protest form with Executive Officer prior to the conclusion of the hearing and each must have proper date, signature, and address. Value of written protest determined by Executive Officer. Executive Officer adopts resolution within 30 days of hearing.

APPROVAL OF PROPOSAL

Executive Officer must order annexation if:

1. Uninhabited (< 12 reg.voters) < 50% landowner protest received.
2. Inhabited (≥ 12 reg. voters) less than 25% of reg voters file written protest or < 25% of landowners owning < 25% of the total assessed land value file written protest.

TERMINATION

Proposal must be terminated if:

1. Majority of reg. voters file written protest (if inhabited).
2. Landowners owning 50% or more of the total assessed land value file written protest (if uninhabited). New proposal must wait one year, two years for city incorporation/consolidation.

CALL FOR ELECTION

LAFCO Must call for election if inhabited and 25 - 50% of registered voters file written protest, or, 25% or more of landowners owning 25% or more of the total assessed land value file written protest.

VOTERS APPROVE (Simple Majority)

Commission adopts resolution of approval.

VOTERS DENY

Commission adopts resolution to terminate proposal. New proposal must wait 1 year.

COMPLETION OF PROPOSAL

Once all term and conditions are complied with, a Certificate of Completion is recorded and subsequently filed with State Board of Equalization.

*These are generalized procedures. Processing of specific proposals can vary slightly.

APPENDIX E

Santa Barbara Local Agency Formation Commision- Schedule of Processing Fees

SANTA BARBARA LOCAL AGENCY FORMATION COMMISSION

SCHEDULE OF PROCESSING FEES

Effective August 8, 2011

Annexations and Detachments

Acreage	Fee
Less than 5	$ 1,430 (10 hours)
5 to 10	2,000 (14 hours)
11 to 25	2,430 (17 hours)
26 +	4,290 (30 hours)

Staff hours in excess of those shown in parentheses shall be charged at an hourly rate of $143. Such fees shall be received prior to the time the staff records the proposed boundary change.

Reorganizations:

Annexation or detachment fee plus a 20% surcharge for each additional change of organization in the application, except for detachments from the County Fire Protection District or CSA 32.

Formations and Incorporations $ 2,530 $ 8,580 (60 hours)

In addition to the processing fee, the cost of preparing the comprehensive fiscal analysis shall be borne by the applicant, proponents or supporters of the incorporation.

Sphere of Influence Amendment $970 $ 1,070

Out-of-Agency Service Agreements The same fee as for an annexation.

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Documents 1-50 pages is $0.25 a page; 50+ is $0.10 page

DVDs of LAFCO meetings $20

Fee Policies:

1. Fees may not be charged for proposals that result from LAFCO orders.
2. Fees must be received at the time application materials are submitted.
3. Allowed refunds are based on staff effort that has been expended prior to the withdrawal of the application as follows:

After staff requests reportbacks	80% of the fee
After Certificate of Filing has been issued	50% of the fee
After Executive Officer Report has been issued	20% of the fee

4. If an annexation occurs within one year of the date the affected property receives an out-of-agency service approval the annexation fee shall be reduced by fifty percent.

5. A supplemental fee shall be charged for proposals that require LAFCO to conduct protest hearings. The fee shall include out-of-pocket costs to publish and mail notices of hearing to landowners and registered voters as required by law.

6. A supplemental fee shall be charged when a Commission meeting, that would not otherwise be held, is held at the request of an applicant. The fee includes Commissioner per diem stipends and mileage reimbursement and out-of-pocket costs to copy and mail the notice of hearing and agenda packet for the meeting.

7. A supplemental fee shall be charged to recover actual costs for preparing environmental documents when LAFCO is the lead agency. The fee shall include out-of-pocket costs to prepare, copy and distribute the environmental document.

8. A supplemental fee shall be charged to recover out-of-pocket costs to copy documents that exceed 100 pages for distribution to the members of the Commission.

9. A $1,100 deposit payable to “County of Santa Barbara” for reviewing maps and legal descriptions must be submitted with proposals that include maps and legals. Boundary changes will be completed only when obligations to the County Surveyor are satisfied.

10. The processing fee to file a request for reconsideration is 50% of the original processing fee amount. The fee shall be returned to the applicant if the Commission determines that the reconsideration is required to correct a procedural defect in its earlier action.

11. The cost for the State to review the Comprehensive Fiscal Analysis for an incorporation shall be the responsibility of those requesting the review.

About AECOM

AECOM (NYSE: ACM) is a global provider of professional technical and management support services to a broad range of markets, including transportation, facilities, environmental, energy, water and government. With approximately 45,000 employees around the world, AECOM is a leader in all of the key markets that it serves. AECOM provides a blend of global reach, local knowledge, innovation, and collaborative technical excellence in delivering solutions that enhance and sustain the world's built, natural, and social environments. A Fortune 500 company, AECOM serves clients in more than 100 countries and has annual revenue in excess of $6 billion.

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1194 Pacific Street, Suite 204
San Luis Obispo CA 93401
805.542.9840

Update to Los Olivos Wastewater System Preliminary Engineering Report

Submitted to
Santa Barbara County
Environmental Health Services
2125 Centerpointe Parkway
Room 333
Santa Maria, CA 93455

Submitted by
AECOM
2400 Professional Pkwy., Ste. 100
Santa Maria, CA 93455

Date: November 2, 2016

Update to Los Olivos Wastewater System Preliminary Engineering Report

November 2, 2016

Prepared by Tyler Hunt, PE

Table of Contents

Figures

Tables

1. Introduction

1.1 Purpose

The purpose of this update to Los Olivos Wastewater System Preliminary Engineering Report is to revise the recommendations for a community wastewater collection, treatment and disposal system for the downtown core, as well as other parcels in the Los Olivos Special Problem Area (SPA) shown in **Figure 1.1**.

Under the direction of the County, AECOM developed the Los Olivos Wastewater System Preliminary Engineering Report (PER) in 2013. The PER supported the effort to address and recommend long-term solutions for the wastewater disposal issues of the Los Olivos SPA. The document also explored wastewater collection, treatment, and disposal options and provided an evaluation of two types of collection systems, four treatment system options, and four effluent disposal alternatives, as summarized below:

Collection, Treatment, and Disposal Systems Evaluated in PER

System	Options Evaluated in PER
Collection System	· Gravity · Pressurized
Treatment System	· Extended Aeration Activated Sludge Modified Ludzak-Ettinger (MLE) · Sequencing Batch Reactor (SBR) · Membrane Bioreactor (MBR) · AdvanTex
Effluent Disposal System	· Infiltration · Subsurface disposal (leach fields) · Agricultural Reuse - Undisinfected Secondary · Agricultural Reuse - Disinfected Tertiary

During the 2013 effort, AECOM evaluated a collection and treatment system to serve the "downtown commercial core" only (Phase I), the commercial core and selected adjacent residential parcels (Phase II) and the entire community (Phase III). The PER also provided preliminary evaluation criteria for siting a wastewater treatment plant (WWTP) and an Engineer's Opinion of Construction Cost for a new WWTP, effluent disposal facilities, and collection system for each alternative.

1.2 Scope

At the request of the Los Olivos Steering Committee, the County requested AECOM to fine tune the PER and obtain construction, operation and maintenance (O&M) costs for a wastewater collection, treatment, and disposal system for Los Olivos.

This update provides the following revisions to the PER:

- Rather than following the tiered approach used in the PER, the update will analyze a system that will serve the entire SPA.
- The update will include the MBR treatment process only.
- The update will evaluate two effluent disposal methods, infiltration and nonpotable reuse (NPR).
- The update will include an analysis of a "no action alternative" i.e. what would it cost an individual homeowner to continue to use an OWTS under the approved Local Agency Management Program rather than construct and connect to a public sewer system including an O&M analysis of an appropriate onsite treatment technology.

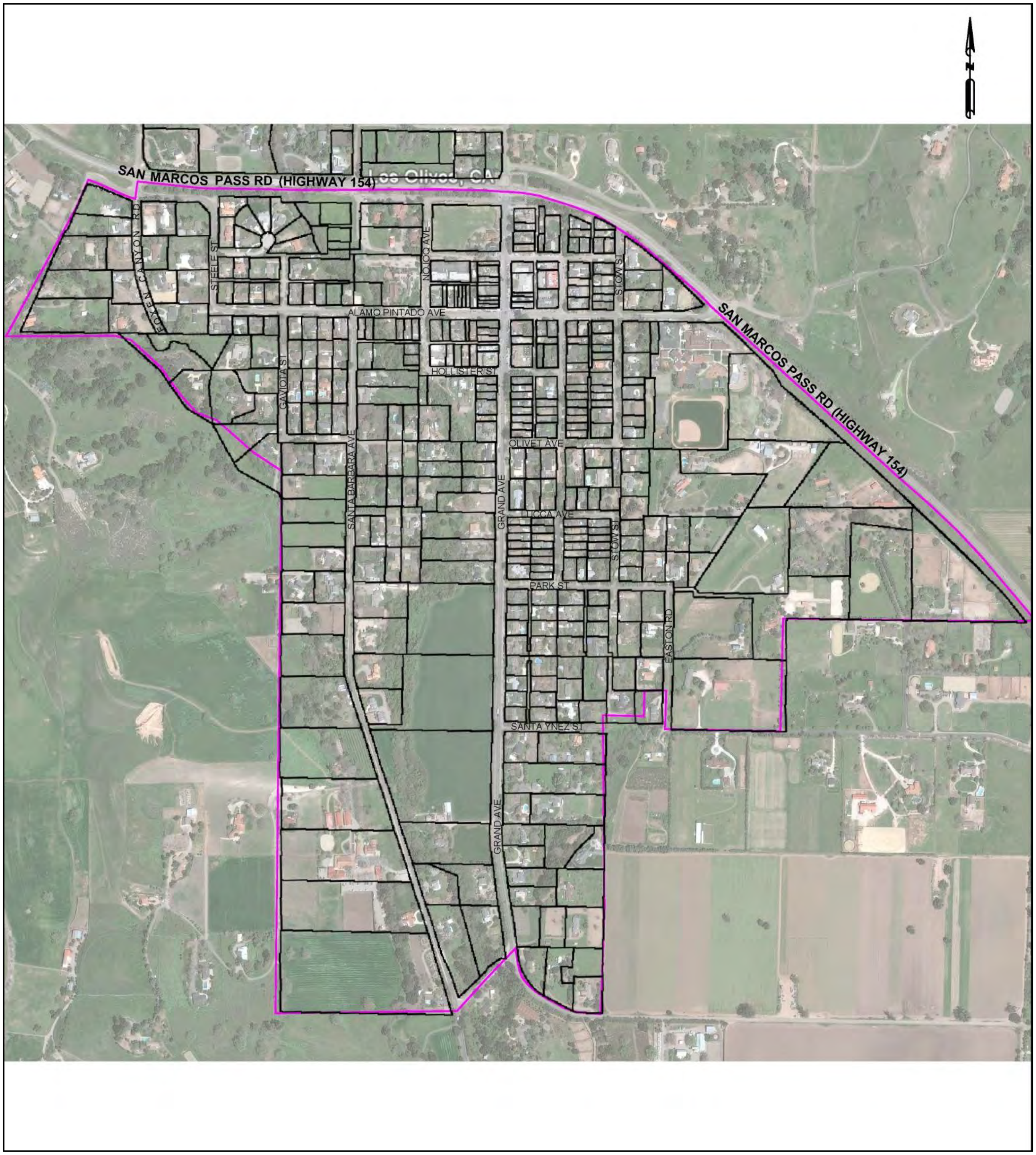

Figure 1.1 Los Olivos Special Problem Area

Sections of the PER which will be updated include:

- Collection System Evaluation and Cost (Section 5.7)
- MBR Evaluation and Cost (Sections 6.3.4 and 6.4.4)
- Effluent Disposal (Section 7)
- Engineer's Opinion of Cost (Section 9)

In addition to updating these sections, AECOM will also add a new section to provide analysis of a "no action alternative" to evaluate the cost for a homeowner to continue using an OWTS in accordance with current guidelines.

2. Basis of Design

2.1 Study Service Area

The service area for the wastewater collection system remains identical to what was presented as Phase III in the PER, including approximately 418 parcels with 340 located in the township of Los Olivos. The PER identifies 400 existing residential units in Los Olivos and 228,990 square feet (sf) of developed commercial area[1.] An additional 120,539 sf of commercial is included in this Basis of Design (BOD) to account for the 20-year (yr) buildout[1] of additional commercial area assumed in the Santa Ynez Valley 2009 Community Plan Environmental Impact Report (2009 EIR). Many of the commercial businesses are located in the downtown area and consist of restaurants, hotels, wine tasting rooms and retail shops that support the high volume of tourism the town experiences.

The service area is presented in Figure 1.1. The total acreage of service area is approximately 536 acres[2].

2.2 Population Projection (20 years)

The PER estimated a population of 1,000 residents in the Los Olivos community. However, the results of the 2010 United States Census Bureau (USCB) reported that Los Olivos has a population of 1,132[3]. This BOD will use the USCB data. Based on information presented in the Santa Barbara County Regional Growth Forecast, the unincorporated areas of the County are projected to experience an average population growth rate of 0.49% between 2015 and 2040. Assuming this growth rate for the Los Olivos SPA between 2010 and 2016, the current population is 1,166. The total population in 20 years (2036) would be 1,286 based on a constant growth rate model.

Weekends see an influx of visitors that can increase the population by up to 200%. These visitors include guests at the local hotels and patrons to the local retail stores, wine tasting rooms, and restaurants.

2.3 Projected Average, Maximum Month, Maximum Day, and Peak Flows

Estimates for average and peak flow conditions used in the PER were based on data provided in the Los Olivos Wastewater Management Plan (LOWMMP) and the 2009 EIR. Flow projections in the LOWMMP were developed based on assumed septic tank volumes and a percentage of anticipated potable water usage. Based on this method, a maximum daily flow (MDF) of 323,000 gallons per day (gpd) and average annual daily flow (AADF) of 180,000 gpd was determined. The 2009 EIR estimated residential wastewater flows assuming a factor of 215 gpd per connection. According to the Land Use Element of the Santa Barbara County Comprehensive General Plan[4], the approximate household size for urban areas with one unit per acre in the Los Alamos-Garey-Sisquoc area is 3.0 residents per household. Assuming a similar dwelling size for Los Olivos, the resulting per capita wastewater generation factor is 72 gpd. This factor is consistent with typical residential wastewater generation in the Central Coast of California. Commercial wastewater flows were estimated using a factor of 0.056 gpd per square foot of commercially-developed area. **Table 2.1** summarizes the AADF wastewater flow estimates from the PER revised using a 20-yr buildout of commercial properties. The average day maximum month flow (ADMMF) is summarized in **Table 2.2**, maximum daily flow (MDF) in **Table 2.3**, and peak hour flow (PHF) in **Table 2.4**.

Wastewater calculations for the Los Olivos study area were more recently estimated by Stantec in April 2015. Stantec's estimates were based on water use data (when available) provided by the local water

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[1] Santa Ynez Valley Community Plan Environmental Impact Report (County of Santa Barbara, September 2009)

[2] PER

[3] 2010 US Census (http://www.census.gov/2010census/popmap/ipmtext.php?fl=06:0644168)

[4] County of Santa Barbara Comprehensive General Plan Land Use Element (Republished May 2010)

purveyor, the Santa Ynez River Water Conservation District. Water use and irrigation factors were applied to the metered water usage data to estimate wastewater flows. For areas of the special problems district that had no water use data, an assumption of water consumption was used. Estimates were only developed for the Phase II existing and build-out commercial and select residential properties. Flows for the remaining Phase III residential properties are not included in the calculations. However, the residential water use factor of 268.7 gpd per connection and 0.042 gpd per square foot of commercial estimated in Stantec's report can be used to calculate the total Phase III (remaining 389 residences and commercial buildout) wastewater flows. **Table 2.1** below summarizes the AADF wastewater flow from Stantec's analysis. The ADMMF is summarized in **Table 2.2**, MDF in **Table 2.3**, and PHF in **Table 2.4**.

Los Alamos is a community located approximately 11 miles northeast of Los Olivos. The community of Los Alamos has a similar mix of residential and commercial properties. In 2012 the population of Los Alamos was 1,800 and the AADF was 122,460 gpd. According to the Los Alamos Community Services District Wastewater Collection and Treatment Planning Study (Bethel Engineering, April 2012), the average residential flow is estimated to be 180 gpd per connection and commercial flow is estimated at 60 gpd per 1,000 ft^2. Due to the similarities between the two communities, Los Alamos's data will be used to generate a comparative wastewater flow estimate for Los Olivos. **Table 2.1** below summarizes the AADF wastewater flow from the Los Alamos data. The ADMMF is summarized in **Table 2.2**, MDF in **Table 2.3**, and PHF in **Table 2.4**.

This update uses the same flow factors as the PER.

Table 2.1 Projected Average Annual Flows

	Residential			Commercial (20-yr Buildout)			
	Total Connections	**Factor (gpd/ connection)**	**AADF (gpd)**	**Total Area (ft^2)**	**Factor (gpd/ft^2)**	**AADF (gpd)**	**Total (gpd)**
PER	400	215	86,000	349,529	0.056	19,574	105,574
Stantec Report	400	269	107,600	349,529	0.042	14,680	122,280
Los Alamos Comparison	400	180	72,000	349,529	0.060	20,972	92,972
Composite	400	221	88,400	349,529	0.053	18,409	106,942

Table 2.2 Projected Average Daily Maximum Month Flows

	AADF (gpd)				ADMMF (gpd)		
	Residential	**Commercial**	**Total**	**AADF: ADMMF Factor**	**Residential**	**Commercial**	**Total**
PER	86,000	19,574	105,574	1.1	94,600	21,531	116,131
Stantec Report	107,600	14,680	122,280	1.1	118,360	16,148	134,508
Los Alamos Comparison	72,000	20,972	92,972	1.1	79,200	23,069	102,269
Composite	88,400	18,409	106,942	1.1	97,387	20,249	117,636

Table 2.3 Projected Maximum Day Flows

	AADF (gpd)				MDF (gpd)		
	Residential	Commercial	Total	AADF:MDF Factor	Residential	Commercial	Total
PER	86,000	19,574	105,574	3.2	275,200	62,636	337,836
Stantec Report	107,600	14,680	122,280	3.2	344,320	46,977	391,297
Los Alamos Comparison	72,000	20,972	92,972	3.2	230,400	67,110	297,510
Composite	88,533	18,409	106,942	3.2	283,307	58,907	342,214

Table 2.4 Projected Peak Hour Flows

	AADF (gpd)				PHF (gpd)		
	Residential	Commercial	Total	AADF:PHF Factor	Residential	Commercial	Total
PER	86,000	19,574	105,574	4.5	387,000	88,081	475,081
Stantec Report	107,600	14,680	122,280	4.5	484,200	66,061	550,261
Los Alamos Comparison	72,000	20,972	92,972	4.5	324,000	94,373	418,373
Composite	88,533	18,409	106,942	4.5	398,400	82,838	481,238

Per the above tables, a composite flow using data from three different sources was generated. These composite flows are summarized in **Table 2.5**. The composite flows will be utilized going forward for sizing of collection and treatment facilities.

Table 2.5 Composite Flows

AADF (gpd)	ADMMF (gpd)	MDF (gpd)	PHF (gpd)
107,000	118,000	342,000	481,000

2.4 Sewer and Pump Station Preliminary Sizing and Layout

The PER recommends a gravity-type collection system to take advantage of the generally south-sloping topography of the area. The PER estimated that collection pipes will likely range from 8-inches to 15-inches in diameter, to accommodate commercial and residential build-out flows. The revisions to the flow estimates do not affect this assumption.

The PER provides design information for a single lift station as part of the Southern Route. Revisions to the flow estimates allow us to reduce the flow capacity of the station from 94 gallons per minute (gpm) to 80 gpm. The size of the force main can be reduced from 4-inches in diameter to 3-inches in diameter to maintain adequate velocity in the force main.

2.5 Wastewater Treatment Plant Sizing

The selected MBR treatment train will be sized to treat the ADMMF of 118,000 gpd. The sequence of installation for the membrane treatment trains and operations will be the same as outlined in the PER. A 300,000 gallon equalization tank or basin should be installed to smooth the spikes in flow during peak tourism days.

2.6 Land Requirements

Per the PER, the land requirement for the MBR treatment facility is estimated to be 0.30 acres. This assumption is not changing. A 300,000 gallon equalization tank or basin will add an additional 0.20 acres.

The PER assumes a total of 24-acres of infiltration basins (with an associated land requirement of 40 acres) would be needed for disposal of wastewater effluent. However, this sizing was based on a very conservative 0.20 inches/day infiltration rate. Research performed with the United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey found many areas to the north and southeast of Los Olivos with significantly higher infiltration rates. These areas have infiltration rates that range from 1.44 inches/day to 13.5 inches/day. Using the lower end of this range, the area required for the infiltration basins can be reduced to 5 acres.

2.7 Current Number of On-Site Wastewater Systems

According to the 2014 Onsite Wastewater Treatment Systems Local Agency Management Program (LAMP), there are approximately 343 septic systems within the Los Olivos specials problems district.

3. Treatment Alternatives Evaluation

This section of the report describes the recommended membrane bioreactor (MBR) wastewater treatment system components, approximate cost of the treatment plant and provides comparison to continuing on-site treatment by retrofitting existing septic systems.

3.1 Membrane Bioreactor Wastewater Treatment System

Table 3.1 indicates the wastewater flow and characteristics used for sizing of the wastewater treatment plant (WWTP).

The WWTP is designed around MBR technology. In order to develop preliminary cost estimates for the wastewater treatment system the following equipment manufacturers presented in **Table 3.2** were consulted.

Table 3.1 Basis of Design

Average Annual Daily Flow (gpd)	107,000
Average Day Maximum Month Flow (gpd)	118,000
Maximum Daily Flow (gpd)	342,000
Peak Hour Flow (gpd)	481,000
BOD	
(mg/L)	435
pounds per day (ppd)	575
TSS	
(mg/L)	330
(ppd)	435
TKN	
(mg/L)	65
(ppd)	85

Table 3.2 Basis for Evaluated Equipment Costs

Process	Manufacturer/Model
Screen & Grit	Roto Sieve Model RS-24 Screen
MBR Equipment	Econity
UV Disinfection Equipment	TrojanUVFit™ 18AL40 Reactor

The following is a brief description of the equipment and processes selected for the WWTP.

3.1.1 Screen/Grit Facility

Screen and grit facility will be provided to prevent large particles from getting carried into the downstream treatment process. The screen opening will be 0.2 mm and sized to protect the membrane elements of the MBR. Two Rotosieve Model RS-24 screens, (one duty, one standby) will be provided. Compaction and bagging of the screenings will be included. Screenings will require disposal at a qualified landfill facility.

3.1.2 Wastewater Equalization Tank

The wastewater equalization tank will be sized at 300,000 gallons. The equalization tank will be a concrete tank and include a flat aluminum roof. The aluminum roof is provided to reduce the spread of odorous compounds into the atmosphere. Design of the tank will include odor control and internal wash down systems.

3.1.3 MBR Equipment

The MBR process consists of activated sludge reactors (aeration basins) that use membrane filtration for solids separation. Membrane filtration is a solids separation process which utilizes polymeric filtration media with small pore sizes ranging from 0.04 (hollow fiber) to 0.4 microns (flat sheet) to sieve and separate solids from the treated effluent. These systems are used to replace the secondary clarification and filtration steps normally associated with the activated sludge process. Without the limitations set by solids flux in conventional secondary clarification, the mixed liquor suspended solids (MLSS) concentration can be as high as 8,000 mg/L in the aeration basins and 10,000 mg/L in the membrane tanks, which is much higher than conventional suspended growth processes. The higher MLSS concentration and the elimination of secondary clarifiers reduce the footprint of the overall MBR process. A MBR also produces a higher-quality effluent compared to that produced by secondary clarification paired with tertiary filtration.

The biological process for an MBR system is controlled similarly to conventional activated sludge, where the solids retention time (SRT) is adjusted to achieve the desired removal efficiencies and sludge characteristics. **Figure 3.1** provides an illustration of the process.

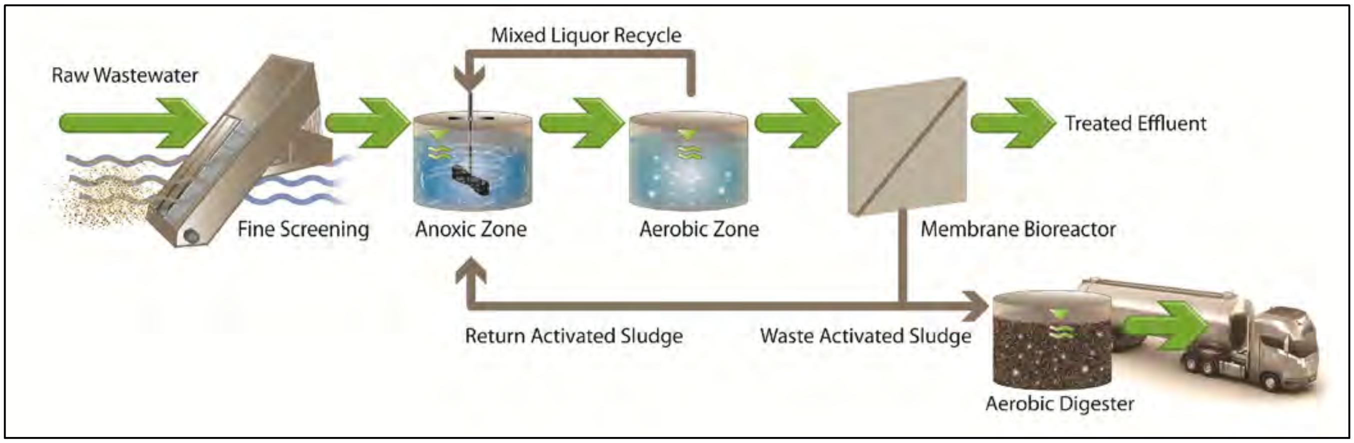


Figure 3.1 Typical MBR System Flow Schematic

For the Los Olivos WWTP, two biological treatment trains followed by two membrane trains would be constructed. Each biological treatment train will consist of pre-anoxic, aerobic, and post-anoxic zones. The anoxic zone is required to achieve denitrification. The post-anoxic zone is required to minimize the amount of dissolved air that is recycled to the pre-anoxic zone that could inhibit the denitrification process. **Figure 3.2** shows the simplified flow scheme of the MBR system proposed for Los Olivos.

The membrane system will be designed using hollow fiber membrane with pore sizes of 0.1 micron. Pertinent design features of the MBR system is provided in **Table 3.3**.

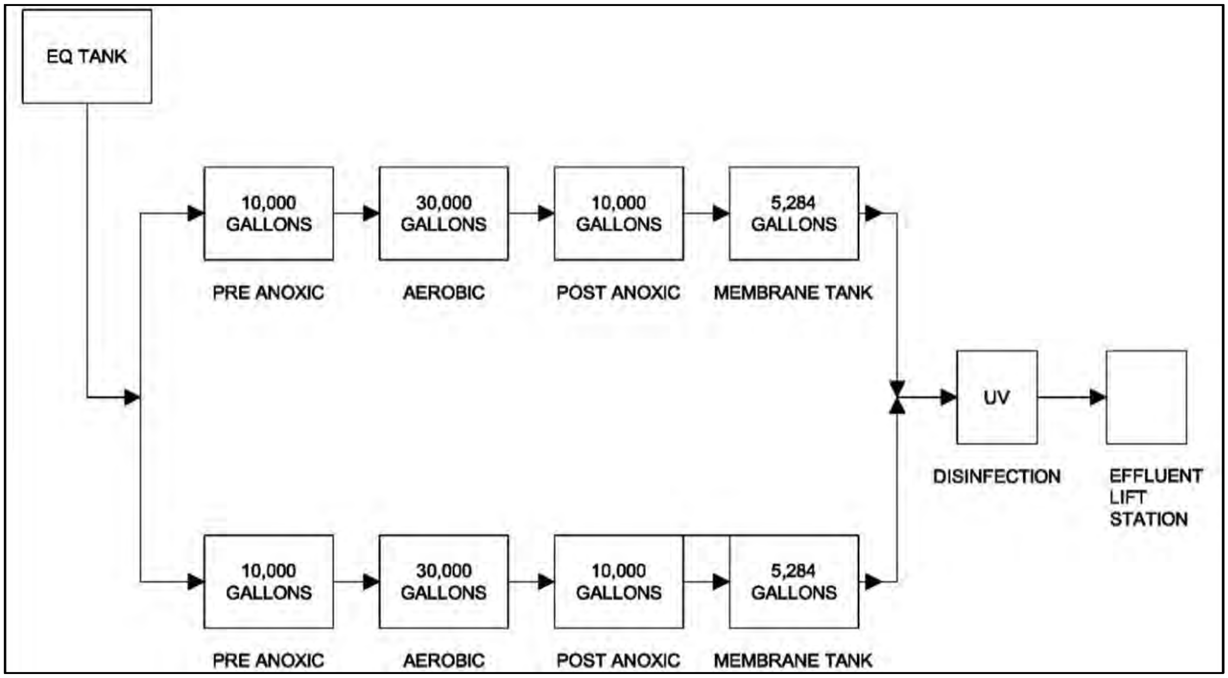


Figure 3.2 MBR Flow Scheme

Table 3.3 Pertinent Design Features of the MBR System

Membrane Bioreactor (MBR)	Capacity
Total Design Capacity (gpd)	118,000
Number of Treatment Units	2
Pre-Anoxic Zone	
Volume per Train (gal)	10,000
Total Volume (gal)	20,000
Aerobic Zone	
Volume per Train (gal)	30,000
Membrane Tank Volume (gal)	5,284
Total Volume (gal)	70,568
Post-Anoxic Zone	
Volume per Train (gal)	10,000
Total Volume (gal)	20,000
Hydraulic Retention Time (hours)	22.4
Solids Retention Time (days)	15 - 30
MLSS Aeration Basins, max (mg/L)	8,000
MLSS Membrane Tanks, max (mg/L)	10,000
F:M (lb BOD/lb MLSS x day)	0.05 – 0.25
Trains per Unit	1
Total Trains	2
Cassettes per Train	3
Total Cassettes	6
Modules per Cassette	24
Total Modules	144
Total Membrane Area (sf)	32,544
Flux at MDF (gallons/sf/day)	10.51
Flux at PHF (gallons/sf/day)	14.8

The system will be configured in two trains as shown in **Figure 3.2**. Each train will have three cassettes of membranes. A cassette is a frame which holds several membrane cartridges. For Los Olivos each cassette will hold 24 membrane cartridges. Typical arrangement of cartridges in a cassette is shown in Figure 3.3. The total number of cartridges for the two trains will be 144. The total surface area for one membrane cartridge will be 226 sq. ft. The total membrane surface area will be 32,544 sq. ft.

3.1.4 System Controls

Process control and alarm notification will be provided through a preprogrammed PLC-based control system, fully factory pre-wired and installed in a NEMA 12 panel. The control panel will be housed in a container and will be installed at site. A human machine interface (HMI) touchscreen will allow the operator to control and monitor the complete system operation through operator inputs within preset limits.

3.1.5 Motor Control

Starters for the blowers and pumps, soft starts, variable frequency drives (VFDs), and power transformers will be housed in a NEMA 12 panel. The starters and VFD drives will be installed indoors.

3.1.6 UV Disinfection

Three 18AL40 Trojan UV units will be provided. Two of the units working in parallel will provide treatment at peak flow. The third unit will remain on standby. Should one UV unit fail, the standby unit will be brought on line. Each UV units will have 18 lamps each at 250 watts.

3.1.7 Sludge Disposal

About 1 percent of the volume of the raw wastewater will be generated as waste sludge at about 1.5 percent solids content. This amounts to 1,180 gallons of sludge generated per day. Sludge will be stored in a 10,000-gallon, aerated, aboveground, bolted-steel storage tank. Sludge will be hauled off site for disposal.

3.1.8 Effluent Lift Station

Two 100-gpm, 100-ft total dynamic head (TDH) pumps will be provided to send the treated wastewater to the disposal system. One pump will operate and the second pump will be a standby. Pumps will be provided with variable frequency drives. The lift station will have a wet well to store 30 minutes of effluent.

3.1.9 Odor Control System

Odor control system will be designed to remove odorous air from the wastewater equalization tank vapor space and will treat the air in a packed bed scrubber. The scrubber will be designed treat 2,000 CFM of odorous air.

3.1.10 Overhead Crane System

One electric chain hoist will be provided for the maintenance of the membranes inside the MBR.

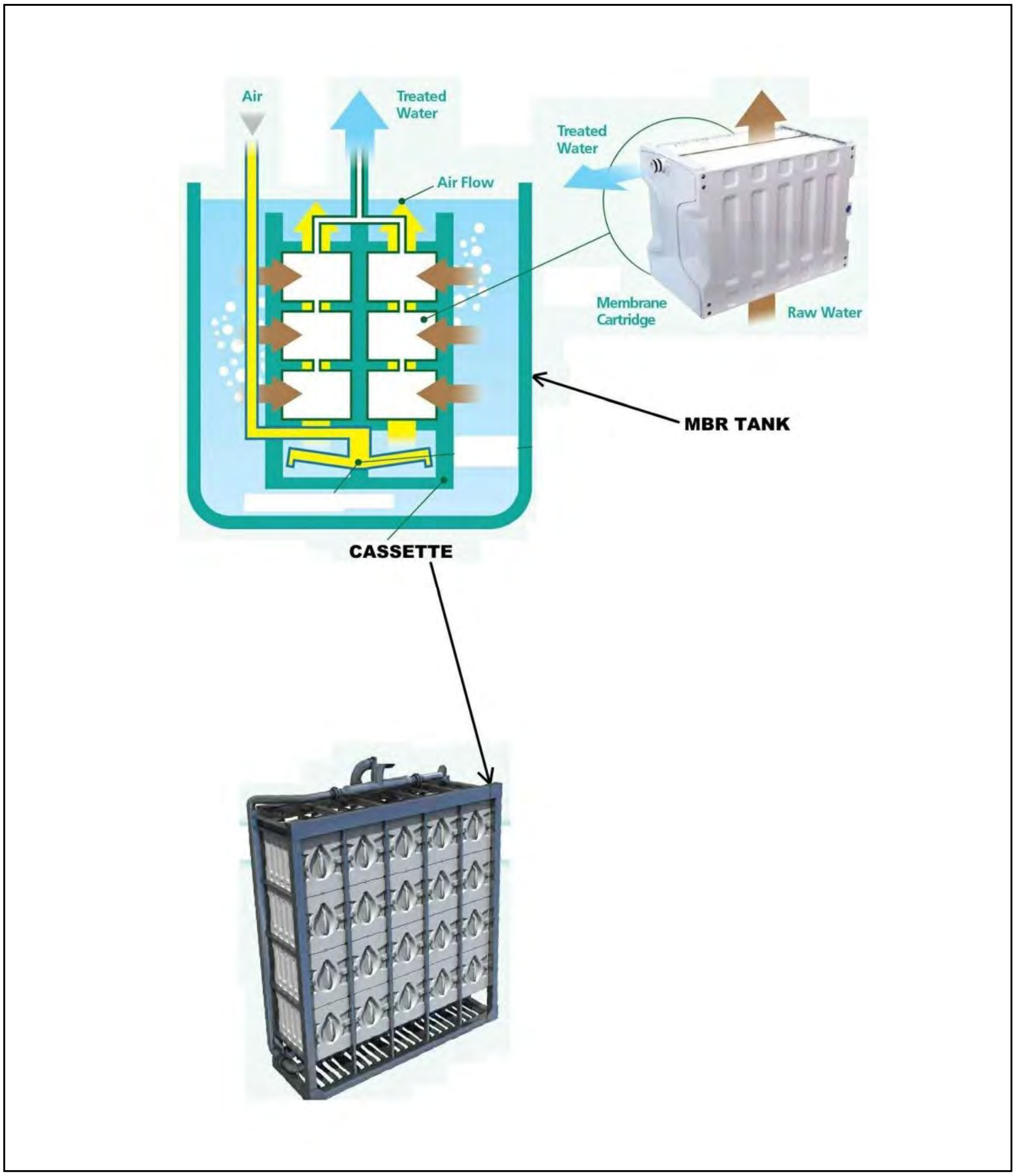


Figure 3.3 Typical Cartridge Arrangement

3.1.11 Opinion of Probable Costs Wastewater Treatment

Based on these design criteria, an opinion of probable cost (OPC) was developed for the WWTP using MBR. The MBR OPC is included in **Table 3.4**.

3.1.12 Operations and Maintenance Cost Wastewater Treatment System

The O&M OPC for the MBR is included in **Table 3.5**.

3.2 On-Site Waste Treatment

On-site treatment of household sanitary waste can be performed using several treatment technologies that demonstrate some degree of nitrogen removal. These include suspended growth systems, such as pulse aeration or sequencing batch reactors (SBRs), as well as attached growth systems (or fixed-film systems) such as trickling filters, rotating biological contactors (RBCs), recirculating sand filters (RSF), peat filters, or combinations of both suspended and attached growth systems. Site-specific wastewater parameters and effluent requirements will drive the appropriate technology selection for a given area..

The recirculating sand filter (RSF) and the peat filter are viable candidate technologies for the SPA as they leverage use of the existing septic tanks which do remove some nitrogen. When one of these add-on technologies is combined with the existing septic tanks, up to 60 percent removal of total nitrogen may be achieved in addition to meeting typical secondary effluent standards for BOD and TSS. The peat filter system is described in more detail below as one viable on site treatment system.

The peat filter is a fixed film bioreactor system much like a trickling filter. Peat, however, has unique chemical, physical and biological properties, all of which contribute to the treatment process. Treatment within the peat filter is accomplished by a combination of physical filtration, chemical adsorption, and biological treatment by microorganisms. Peat fibers are polar, have a high surface area, and a highly porous structure (90 to 95 percent porosity). These properties enable the peat bed to hold a large amount of water, much like a sponge. As a result, effluent has a long residence time in the peat bed. As the wastewater is wicked through the peat it flows in a thin film over the surfaces of the peat fibers. This allows the effluent to become aerated and exposed to the acidic chemical environment of the peat as well as come in close contact with the microbiological community residing in the peat. The relatively constant moisture content of the peat filter also enables the survival of the natural microbial population in the peat even when the system is not being actively used. Moisture in the peat also helps keep the temperature of the peat bed relatively constant even when outside air temperatures change. Peat filters can reduce BOD to below 30 mg/L with an influent BOD of 300 mg/L. It is reported that most single pass peat filter systems remove, on average, approximately 30 percent nitrogen. **Figure 3.2** provides a schematic drawing showing how a typical peat filter system could be installed as an add-on to an existing septic system.

Additional testing and analysis would be required to determine the expected performance and costs associated with providing on-site waste treatment for the SPA.

Table 3.4 Wastewater Treatment System OPC Summary

Equipment	Total
Equalization Tank	$430,000
Aluminum Dome Cover	$552,000
Screen & Grit Facility	$205,400
MBR Equipment	$2,082,400
Sludge Disposal Facilities	$70,000
Disinfection UV system	$319,250
Effluent Pump Station	$88,800
Odor Control System	$121,500
Site Piping	$200,000
Aeration Blowers	$138,000
MCC/Blower Building	$120,000
Electrical/Instrumentation	$200,000
Overhead Crane	$21,950
Subtotal	**$4,549,300**
Contingencies (20%)	$909,860
Total Construction Cost	**$5,459,000**[1]
Engineering, Administration, Legal (35%)	$1,910,650
Total Project Cost	**$7,370,000**

[1]AACE Class 4 planning level estimate. Expected accuracy range of -30 to +50 percent.

Table 3.5 MBR Annual O&M OPC[1]

Component	Unit Cost	Unit	Quantity	Unit	Total
Sludge Disposal	$0.24	$/gallon	430,700	gallons	$103,368
Power	$0.16	$/kWh	1,138,800	kWh	$182,208
Maintenance[2]	2.0	%	$4,549,300	-	$90,986
Misc. Equipment Replacement[2]	4.0	%	$4,549,300	-	$181,972
Total					**$558,534**

[1]Costs based on the first year of operation in 2017.
[2]Percentage of the total equipment cost.

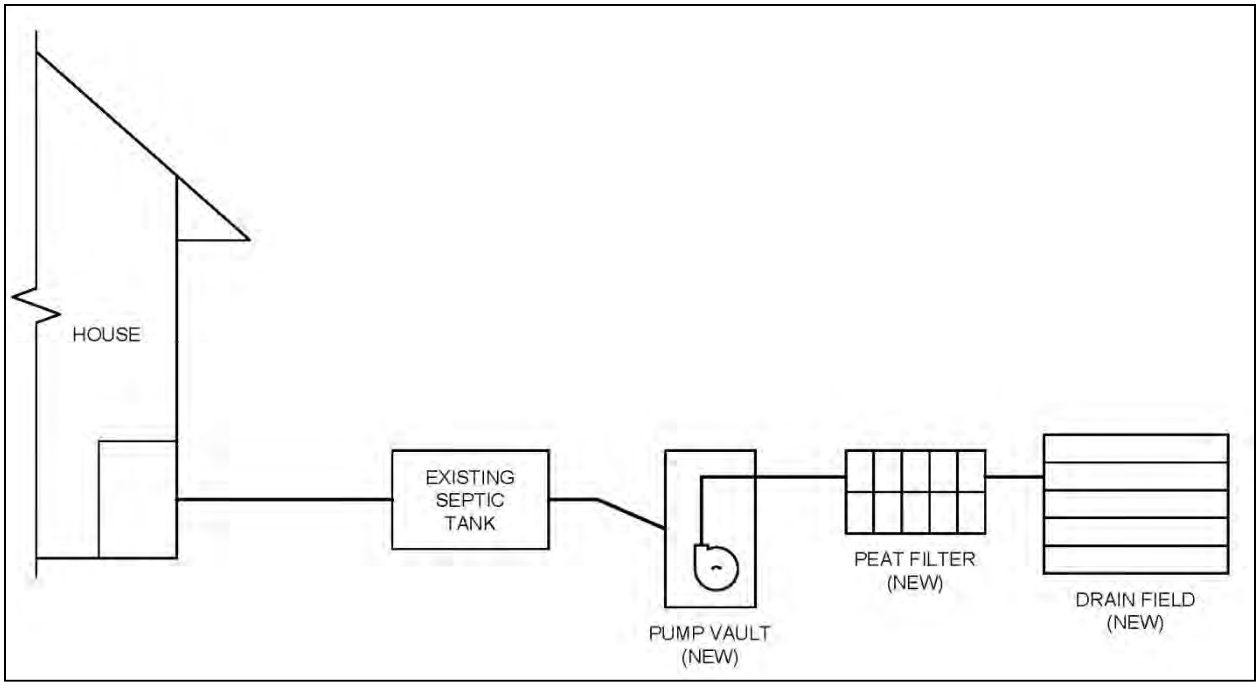


Figure 3.2 Peat Filter Flow Schematic

3.2.1 Peat Filter OPC

The following is the OPC for installation peat filters for 400 properties based on equipment supplied by Ecopure:

Table 3.6 Peat Filter OPC

Peat Filter System	$/Unit	Units	Total
(a) Pump Vault (24" dia x 84" high)	$3,000	1	$3,000
(b) Peat Filter PBF4 (120" x 84")	$4,000	1	$4,000
(c)Drain field (12 feet x 24 feet)	$3,500	1	$3,500
Subtotal			**$10,500**
Tax and delivery @13%			$1,365
Installation @15%			$1,575
Electrical @10%			$1,050
Manufacturer Services @10%			$1,050
Contingencies (20%)			$2,100
Subtotal (one home)			**$17,640**
Total construction cost (400 properties)			**$7,056,000**

It should be noted that many houses may not have the required space to install the peat filter which would result in the need for a more compact and higher cost system.

3.2.2 Operations and Maintenance OPC for Peat Filter Beds

Cost Basis:

- One ¼ HP motor for each system
- 400 systems
- Maintenance cost/year is 2% of the installed cost
- Change of peat bed every 10 years
- Change of peat bed every 10 years

Table 3.7 OWTS Annual O&M Cost Estimate

Component	Unit Cost	Unit	Quantity	Unit	Total
Power	$0.16	$/kWh	357,000	kWh	$57,000
Maintenance[1]	2.0	%	$7,056,000	-	$141,000
Peat Replacement[2]	$400	$/yr per filter	400	Filters	$160,000
Total					**$358,000**

[1]Percentage of the total installed cost.
[2]Annualized cost per peat filter replacement which is required every 10 years.

4. Effluent Disposal

Since this revision addresses the implementation of a new WWTP utilizing MBR, an evaluation of recommended effluent disposal options needs to be provided. This revision evaluates the feasibility of two effluent disposal methods:

- Infiltration
- Nonpotable reuse

A summary of the recommended effluent disposal alternatives evaluated in this revision are presented in **Table 4.1**. A discussion of each of these alternatives is included in this section that considers pertinent issues such as anticipated regulatory requirements, siting and area requirements, design criteria, and construction cost opinions.

Table 4.1 Summary of Viable Effluent Disposal Alternatives

Disposal/Reuse Alternative	Filtration Required	Disinfection Required	Nitrogen Removal Required
Infiltration	Yes	Yes	Yes
Nonpotable Reuse	Yes	Yes	Yes
Due to concerns with nitrate infiltration to the groundwater, denitrification to a TN of 10 mg/L has been assumed for both disposal options.			

4.1 Infiltration

Infiltration ponds are reservoirs where water is stored and allowed to either infiltrate into the ground or evaporate. The pond bottoms are managed to maintain infiltration rates by periodically drying, ripping, and conditioning the soils.

Groundwater degradation is a major consideration for this type of disposal practice. Regulations are continually changing and becoming more restrictive to protect groundwater quality. Considerations such as distance to the nearest well, depth to groundwater, and mounding potential must all be considered in addition to water quality. Sizing and siting requirements for the infiltration pond depends on these groundwater issues, the types of soils, and infiltration capacity.

4.1.1 Regulatory Requirements

Advances in treatment technology which allow for the production of high quality recycled water have made infiltration a time-proven, sustainable method of replenishing groundwater and augmenting drinking water supplies. With an MBR treatment system, Los Olivos would be well positioned to implement infiltration. The system will need to comply with Title 22 of the Code of California Regulations.

As discussed previously, nitrate concentrations in the groundwater underlying the SPA and surrounding areas are increasing due to the use of OWTSs. In order to minimize future degradation from the Los Olivos WWTP, the concentration of nitrogen in the effluent would be reduced to within the primary drinking water MCL of 10 mg/L nitrate (as N) or 10 mg/L TN. The shallow groundwater in the SPA highlights the need for nitrogen removal with infiltration since natural nitrification/denitrification in the soil matrix is expected to be limited.

4.1.2 Design Criteria

The most important criterion for development of the infiltration disposal method is selecting a site with adequate area based on the site's infiltration rate. According to the Web Soil Survey, the soils northeast of the special problem area range from Salinas silty clay loam (SdA) with a permeability of 0.20 to 0.63 inches per hour to Ballard gravelly fine sandy loam (BhC) with a permeability of 2.0 to 6.3 inches per hour. Based on the soil data, a conservative infiltration rate of 1.44 inches per day (0.06 inches per hour) was selected. This document assumes that the infiltration basins will be located on the north side of Los Olivos to maximize groundwater recharge benefit. Therefore, an effluent pump station will be required.

In order to calculate the volume and area of infiltration basins necessary for each phase of the Los Olivos WWTP project, a water balance was developed. The water balance takes into account not only the water lost through infiltration, but also water lost from evaporation and the contribution of rainfall. **Table 4.2** summarizes the climatic characteristics used to develop the water balances for the infiltration alternative.

Detailed design criteria for the Los Olivos WWTP are provided in **Table 4.3**.

4.1.3 Siting and Area Requirements

As mentioned previously, infiltration basins should be located in areas with high infiltration rates such as coarse sandy soils while expansive clay soils should be avoided. Infiltration testing should be done at prospective sites to determine the applicability of infiltration and accurately determine the necessary basin capacity.

Based on a infiltration rate of 1.44 inches/day, approximately 2.6 acres of infiltration basins would be required. With accommodations for dikes and set-backs, roughly 5 acres of land would need to be aquired.

4.1.4 Opinion of Probable Costs

The OPC for the infiltration alternative are summarized in **Table 4.4**. For the purpose of this document it has been assumed effluent will be pumped to the infiltration basins.

Table 4.2 Evaporation and Precipitation Data for the Los Olivos Area

Month	Pan Evaporation (inches/month)[1]	Evaporation (inches/month)[2]	Precipitation (inches/month)[3]
January	2.44	1.83	3.10
February	3.53	2.65	3.14
March	4.41	3.31	2.55
April	6.01	4.51	1.12
May	7.55	5.66	0.27
June	8.56	6.42	0.03
July	9.50	7.13	0.02
August	8.98	6.74	0.03
September	7.00	5.25	0.18
October	5.42	4.07	0.52
November	3.49	2.62	1.53
December	2.79	2.09	2.27
Total	**69.68**	**52.26**	**14.76**

[1]Western Regional Climate Center – Cachuma Lake (1952 – 2002).
[2]Pan Evaporation (inches/month) x 0.75.
[3]Western Regional Climate Center – Lompoc (1917 – 2010).

Table 4.3 Infiltration Design Criteria

Parameter	
Influent Characteristics	
Average Annual Daily Flow (gpd)	107,000
Average Day Maximum Month Flow (gpd)	118,000
Maximum Daily Flow (gpd)	342,000
Peak Hour Flow (gpd)	481,000
Pump Station	
Maximum Capacity (gpd)	342,000
Forcemain Diameter (in)	6
Pump Horsepower (each)	5
Number of Pumps	2
Infiltration Basins	
Infiltration Rate (in/day)	1.44
Total Infiltration Area (acres)	2.6
Total Basin Area (acres)	4.5
Total Volume (AF)	14.2
Number of Basins	2
Basin Dimensions	
Length (ft)	498
Width (ft)	198
Side Water Depth (ft)	4
Freeboard (ft)	2
Side Slope (H:V)	4

Table 4.4 Infiltration Project Cost Summary

Component	Total
Infiltration Basins including Land Acquisition	$700,000
Pump Station and Forcemain	$1,660,000
Subtotal	$2,360,000
Contingency (20 percent)	$472,000
Total Construction Cost	$2,832,000
Engineering, Administration, Legal (35 percent)	$991,000
Total Cost	**$3,823,000**

4.2 Nonpotable Reuse

Construction of a Nonpotable Reuse (NPR) system will require a distribution network, pump stations, and a monitoring and controls system to demonstrate compliance with regulations.

Significant improvements will be required depending on how Los Olivos chooses to ultimately utilize the nonpotable water. These could include:

- Securing enough demand for the recycled water.
- Infrastructure to store and distribute the NPR water.

Identifying demand for NPR water could be challenging, especially considering the minimal demand for irrigation during the winter season. Lack of demand would require Los Olivos to provide storage for the treated effluent. The Los Olivos area does not currently, and is not likely in the foreseeable future, anticipated to host industrial users which require a large water demand. Thus, expansion of the NPR system is likely to have only limited benefits.

4.2.1 NPR Feasibility

NPR could prove to be feasible if a suitable number of users could be identified. There could also be some cost savings in constructing the NPR distribution lines in a common trench (with required clearance) with the new sewer collection system lines. Unfortunately, due to the lack of potential industrial and commercial users, as well as parks and golf courses, NPR is not considered a feasible option for Los Olivos. Costs to construct and maintain storage facilities to store the effluent during the non-irrigation season also make NPR unfeasible.

5. Recommendations and Engineer's Opinion of Cost

This section presents recommendations and a revised planning-level engineer's OPC for a new wastewater treatment plant (WWTP), effluent disposal facilities, and collection system for the community of Los Olivos. For cost estimating purposes a treatment site has been assumed south of town and disposal site has been assumed to be north of town. Due to the elevation of the service area in relation to the assumed WWTP location, it is assumed a gravity collection system will be used with a lift station to convey treated effluent flows to the disposal site. It is important to note that the WWTP site is conceptual and is only used as a basis to evaluate the overall project cost.

5.1 Recommended Cost Basis

5.1.1 Membrane Bioreactor

Cost basis for the Membrane Bioreactor system is described in **Section 3**.

5.1.2 Infiltration Ponds

Cost basis for the infiltration ponds is described in Section 4.

5.1.3 Proposed WWTP Layout

Figure 5.1 provides a sample layout for the Los Olivos WWTP. The initial layout would take into consideration requirements for future plant expansion.

5.1.4 Collection System

A typical gravity collection system is recommended for the community wastewater system. Since the terrain in and around Los Olivos slopes to the south, and the disposal site is assumed to be to the north, lift stations will be required to convey wastewater collected in gravity lines located throughout the community. Initially, one lift station would be required for the collection system as outlined in the PER. The collection system layout used to develop estimated costs is provided on **Figure 5.2**.

5.1.5 Operations and Maintenance (O&M)

5.1.5.1 Staffing Requirements

Due to the relatively small size of the WWTP, it has been assumed that one operator would be required at the plant for half of the day, 5 days a week. For one of these days an additional operator would likely be required to assist in performing maintenance functions.

According to Section 3675, Chapter 26, Title 23 of the California Code of Regulations the Los Olivos WWTP would be considered a Class III plant. Section 3680 of the same chapter also states that for a Class III plant, the Chief Plant Operator would have to possess at a minimum a valid Grade III license. Supervisors and shift supervisors would have to possess a Grade II license while operators would be required to have a valid Grade 1 or operator-in-training certificate.

5.1.5.2 Treatment and Disposal

Operations and maintenance of the treatment and disposal systems would include material replacements including membranes and UV bulbs, maintenance items, and power usage of the facility. The impacts of the aeration and disposal of this material have also been accounted for in the O&M cost estimates.

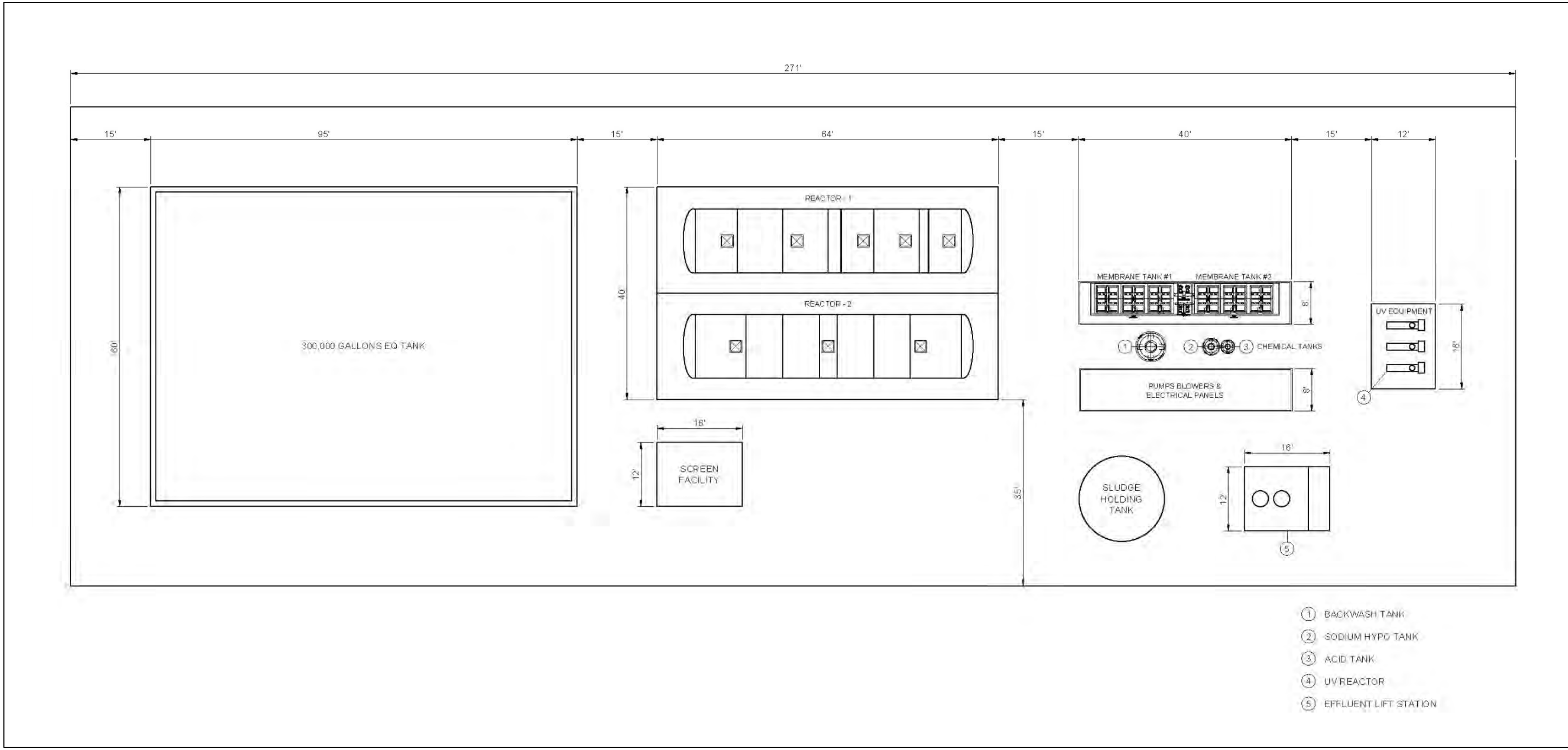


Figure 5.1 Conceptual WWTP Site Layout

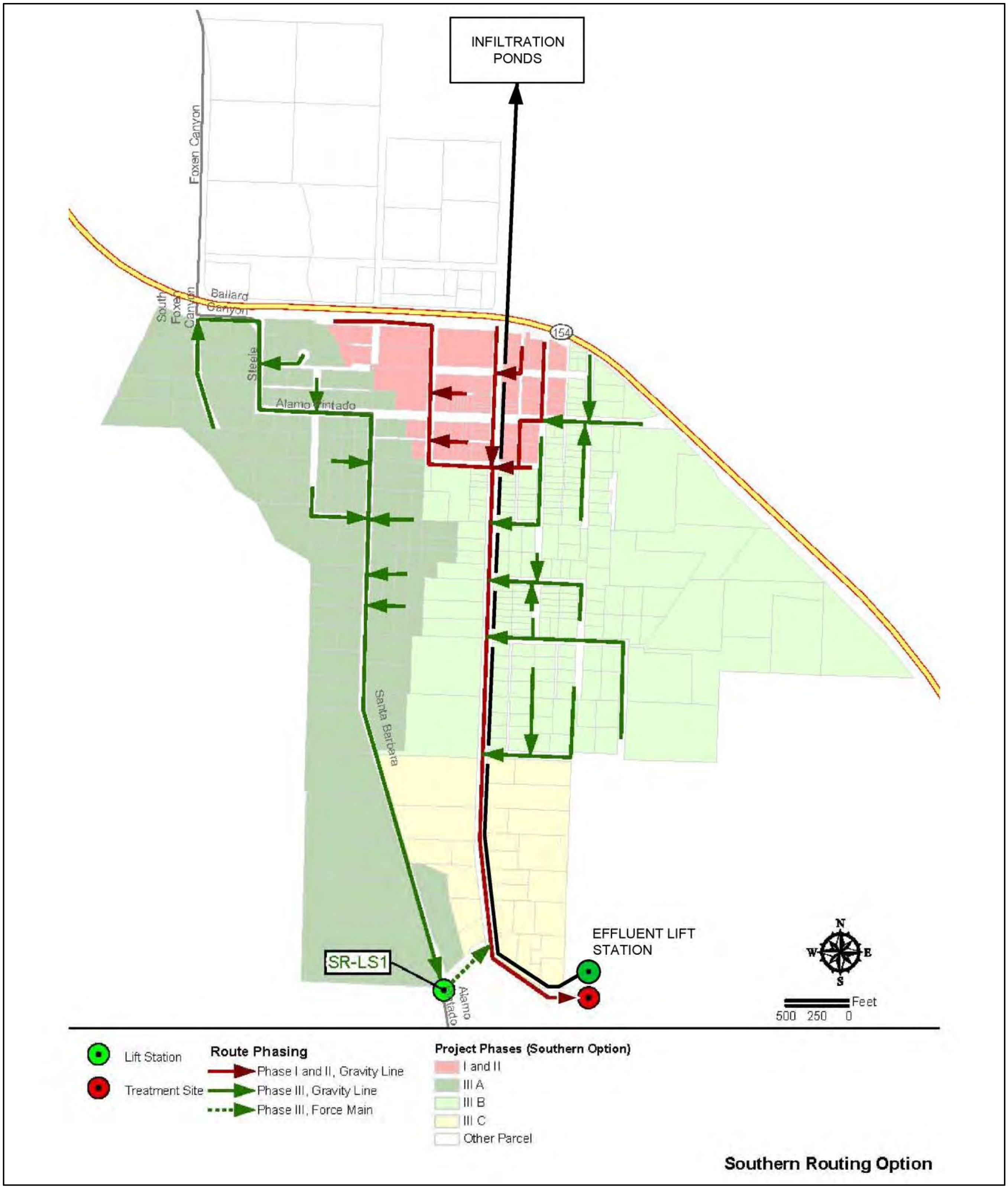


Figure 5.2 Collection Routes

5.1.5.3 Collection System

It is assumed that typical O&M associated with a gravity collection system with lift stations would be required for Los Olivos. This would include periodic cleaning and inspection of the sewer lines and maintenance of the pumps at the lift stations. Collection system cleaning and inspection is typically recommended for 20 percent of the system each year. Periodic inspection and cleaning of lift stations would also be required. Inspection of lift stations identifies potential problems not detected by the control system.

5.2 Project Costs

5.2.1 General Cost Parameters

These OPCs will be revised and refined as the project proceeds. The following assumptions were made to develop planning-level cost opinions:

- Except where other data is available, construction cost opinions are generally derived using bid prices from similar wastewater projects, with adjustments for inflation, size, complexity, and location.
- Except where other data is available, operations and maintenance cost opinions are generally derived using information from product venders, utility rates and personnel costs provided by the County, and costs from similar wastewater projects, with adjustments for inflation, size, complexity, and location.
- 20 percent construction contingency.
- Engineering, administration, and legal costs were assumed to be 35 percent of the total construction costs.
- Cost opinions are AACE Class 4 planning level with an accuracy range of -30 to +50 percent.
- Construction cost opinions are in 2016 dollars.
- Operations and maintenance cost opinions are in 2017 dollars.
- When budgeting for future years, appropriate escalation factors should be applied.
- Cost opinions are “budget-level” and may not fully account for site-specific conditions that will affect the actual costs.

The OPCs prepared by AECOM represent our judgment and are supplied for the general guidance of the County. Since AECOM has no control over the cost of labor and material, or over competitive bidding or market conditions, AECOM does not guarantee the accuracy of such opinions as compared to contractor bids or actual costs.

5.2.2 Collection System

It is assumed that conventional excavation depths of five to six feet can be maintained along the majority of the alignments. Opinions of probable construction cost for the collection system were developed based on conventional excavation and estimated costs of materials, preparation, earthwork, installation, and roadwork. Costs for the collection system were increased based on the ENR Construction Cost Index increase from January 2013 to August 2016. This increase was 8.5 percent. Cost criteria are summarized in **Table 5.1**.

Table 5.1 Sewer Improvement Cost Criteria

Item Description	Estimated Construction cost	Including Contingency (20 Percent)	With Engineering/Administration (35 Percent)
3-inch Force Main	$108/LF	$130/LF	$176/LF
8-inch Gravity Sewer	$171/LF	$205/LF	$277/LF
10-inch Gravity Sewer	$193/LF	$232/LF	$313/LF
12-inch Gravity Sewer	$215/LF	$258/LF	$348/LF
15-inch Gravity Sewer	$248/LF	$298/LF	$402/LF

Preliminary sizing of the collection system lines were calculated for the “southern route” as described in the PER. These pipe sizes and the estimated line lengths shown on **Figure 5.2** were used in calculating construction costs for the collection system. Lift station OPCs are based on actual cost of recent lift station projects in the area of similar size. **Table 5.2** provides a cost summary for the collection system.

Table 5.2 Southern Route –Collection System Project Cost Summary

Component	Quantity	Value
3-in Force Main	500 LF	$54,000
8-in Gravity Sewer	23,900 LF	$4,087,000
12-in Gravity Sewer	3,700 LF	$795,000
15-in Gravity Sewer	500 LF	$124,000
Lift Station #1	1	$488,000
Subtotal		**$5,548,000**
Contingency (20 Percent)		$1,110,000
Total Construction		**$6,658,000**
Engineering, Administration, Legal (35 Percent)		$2,330,000
Total Project		**$8,988,000**

5.2.3 Treatment

Based on the design criteria presented in Section 2, project OPCs were developed for the recommended treatment alternative.

In order to develop OPCs for the recommended treatment alternative, major equipment manufacturers were consulted. These manufacturers were presented in **Table 3.1**.

Table 5.3 provides an OPC for the treatment facility. Subtotals are provided for the treatment process and for the disinfection equipment.

5.2.4 Disposal

For the purpose of this report, AECOM has assumed effluent will flow by pumping to the infiltration basins. Additional costs for pumping effluent off site including a pump facility and pipelines are also included. For calculation of the unrestricted reuse pipe length, an area north of State Highway 154 (Figueroa Mt. Rd. and Acampo Rd.) was assumed as the end point. An OPC for the disposal system is provided in **Table 5.4**.

Table 5.3 Wastewater Treatment System Cost Summary

Component	Total
Equalization Tank	$430,000
Aluminum Dome Cover	$552,000
Screen & Grit Facility	$205,400
MBR Equipment	$2,082,400
Sludge Disposal Facilities	$70,000
Disinfection UV system	$319,250
Effluent Pump Station	$88,800
Odor Control System	$121,500
Site Piping	$200,000
Aeration Blowers	$138,000
MCC/Blower Bldg	$120,000
Electrical/Instrumentation	$200,000
Overhead Crane	$21,950
Subtotal	**$4,549,300**
Contingencies (20%)	$909,860
Total Construction Cost	**$5,459,000**
Engineering, Administration, Legal (35%)	$1,910,650
Total Project Cost	**$7,370,000**

Table 5.4 Infiltration Project Cost Summary

Component	Total
Infiltration Basins including Land Acquisition	$700,000
Pump Station and Forcemain	$1,660,000
Subtotal	**$2,360,000**
Contingency (20 percent)	$472,000
Total Construction Cost	**$2,832,000**
Engineering, Administration, Legal (35 percent)	$991,000
Total Cost	**$3,823,000**

5.3 Operations and Maintenance Costs

5.3.1 Collection System

O&M OPC for the collection system is provided in **Table 5.5**. This opinion provides general items typically required such as line inspection, cleaning, and lift station maintenance.

Table 5.5 Collection System Annual O&M OPC[1]

Component	Unit Cost	Unit	Quantity	Unit	Total
Power	$0.16	$/kWh	9,499	kWh	$1,520
Line Cleaning	$0.69	$/ft	7,334	ft	$5,060
Line Inspection (CCTV)	$1.16	$/ft	7,334	ft	$8,507
Line Replacement[3]	$16.30	$/ft	367	ft	$5,982
Labor	$63.33	$/hour	1,252	hours	$79,289
Maintenance[2]	2.0	%	$450,000	-	$9,000
Misc. Equipment Replacement[2]	4.0	%	$450,000	-	$18,000
Total					**$127,400**
[1]Costs based on the first year of operation in 2017. [2]Percentage of the total equipment cost. [3]Percentage of total average pipeline cost.					

5.3.2 Treatment and Disposal

The O&M OPC for the WWTP is provided in Table 5.6. Offsite effluent disposal O&M OPCs are not included in these tables.

Table 5.6 MBR Annual O&M OPC[1]

Component	Unit Cost	Unit	Quantity	Unit	Total
Sludge Disposal	$0.24	$/gallon	430,700	Gal	$103,368
Power	$0.16	$/kWh	1,138,800	kWh	$182,208
Maintenance[2]	2.0	%	$4,549,300	-	$90,986
Misc. Equipment Replacement[2]	4.0	%	$4,549,300	-	$181,972
Total					**$558,534**
[1]Costs based on the first year of operation in 2017. [2]Percentage of the equipment cost.					

5.4 Summary

Table 5.7 provides a summary of project costs.

Table 5.7 Total Project Cost Summary

Component	Total
Land Purchase Cost	$688,000
Construction Cost	$14,949,000
Additional Project Costs	$5,232,000
Total Capital Cost Opinion	**$20,869,000**
Land purchase cost based on market price of available parcels around Los Olivos construction cost includes 20% contingency. Additional project costs include engineering, administration and legal cost (35% of construction costs)	

An estimated land value has been included in the total project cost summary. This figure has been calculated based on listing prices per acre of agricultural parcels currently on the market and the total acreage required for the assumed treatment and disposal methods. Depending on the actual treatment and disposal method, final WWTP site location, and market conditions at the time of land acquisition this price may be significantly different.

TO:
Local Agency Formation Commission
County of Santa Barbara
105 East Anapamu Street, Rm 407
Santa Barbara, CA 93101

17-01

To be filled in by LAFCO

File No: ____________________
Date Presented: ____________________
Officially Filed: ____________________
Designated as: ____________________

LAFCO Action: ____________________
Date: ____________________

PETITION FOR

Formation of Los Olivos Community Services District
(Name of Proposal)

The undersigned by their signature hereon DO HEREBY REPRESENT REQUEST AND PETITION as follows:

1. The proposal is made pursuant to Part 3, Division 3, and Title 5 of the California Government Code (commencing with Section 56000, Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000).

2. The nature of the proposed change of organization (i.e., annexation, detachment, Reorganization, etc.) is/are:

   Formation of community services district to collect, treat, or dispose of wastewater.

3. The name or names of all districts and/or cities for which any such change or organization is proposed is as follows:

   None

4. The names of all other affected counties, cities and districts are:

   See attached list

5. The territory(ies) proposed for **Formation**

   is: **inhabited**
   (**uninhabited** (less than 12 people) or **inhabited** (12 or more people))

6. This proposal **is not** within the sphere of influence of the affected city and/or district.
   (Circle one)

7. Complete description of the exterior boundaries of the territory proposed for annexation. **Please attach legal description to this petition.**

8. Do the boundaries of the districts or cities listed above overlap or conflict with the boundaries of the proposed annexation? _____ Yes __x__ No

If yes, justify the need for overlapping or conflicting boundaries:

Not applicable

9. List any of the districts or cities, as above-listed, which possess authority to perform the same or similar function as requested herein.

None

(Name of public agency or agencies)

10. Do the boundaries of the territory proposed split lines of assessment? _____ Yes __x__ No

11. Do the boundaries of the territory proposed create an island or corridor of unincorporated territory or a strip? _____ Yes __x__ No

If yes, justify the necessity for the island corridor or strip:

Not applicable

12. If the proposed boundary follows a street or highway, does it follow the center of the street or highway? _____ Yes __x__ No

13. It is desired that this proposal provide for and be made subject to the following terms and conditions:

A. **The District shall be authorized to collect, treat, and dispose of sewage, wastewater, recycled water, and storm water, in the same manner as a sanitary district, formed pursuant to the Sanitary District Act of 1923, Division 6 (commencing with Section 6400) of the Health and Safety Code. (Reference: Government Code sections 61011(a)(1), 61100(b))**

B. **The initial board of directors shall be elected at large. (Reference: Government Code sections 61011(a)(4), 61021)**

C. **The District, if formed, shall cease to exist if an assessment to fund a wastewater collection, treatment, and disposal system or systems to serve the community is not approved within one year of the effective date, or Santa Barbara LAFCO otherwise extends such deadline, or other LAFCO approved arrangements are made for funding the District.**

D. **The formation of the District shall be conditioned upon the approval of an assessment to fund the District's administrative functions. The amount of up to $200,000 per year is deemed adequate to fund the District's administrative functions.**

14. The reasons for this proposal are to:

A. Formally give Los Olivos voters the power to maintain local control of its community while complying with potential regulatory action arising from groundwater quality problems created by the use of individual septic systems.

B. A locally elected Los Olivos Community Services District Board will be responsible for implementing the community's desired solution for protecting groundwater quality and implementing a wastewater management system that ensures compliance with State of California regulatory requirements for the designated Special Problems Area. District responsibilities may include the building, financing, operating and managing a wastewater collection, treatment, and disposal system or systems in an environmentally and economically responsible manner that meets regulatory requirements. The District may opt to contract services with other agencies or entities if it is in the best financial interests of the community.

15. The persons signing this petition have signed as __x___ registered voters **OR** _____ owners of land.

16. If the formation of a new district is included in the proposal:

    A. The principal act(s) under which said district(s) is/are proposed to be formed is/are: **Community Services District Law (Government Code sections 61000–61250)**

    B. The proposed name(s) of the new district(s) is: **Los Olivos Community Services District**

    C. The boundaries of the proposed new district(s) are as described in Exhibit(s) A, heretofore incorporated herein.

17. If an incorporation or formation of a district is in the proposal:

    A. The proposed name of the new city/district is: **Los Olivos Community Services District**

    B. Provisions are requested for appointment of:

i.	City/District Manager	__x__ Yes	_____ No
ii	City Clerk & City Treasurer (City only)	_____ Yes	__x__ No

    C. Number of members proposed for initial Board of Directors/City Council, pursuant to Chapter Three commencing with §61120. (Please check one, below.)
    _____3 (Three) __x__ 5 (Five)

18. If the proposal includes the consolidation of special districts, the proposed name of the consolidated district(s) is/are: **Not applicable**

19. How will the new district be financed?

The District's first year of operations will consist of planning and development activities as it (a) determines appropriate wastewater collection, treatment, and disposal system or systems for the community that ensures compliance with State of California regulatory requirements for the designated Special Problems Area and (b) identifies the means of financing its development and eventual operations and maintenance. The costs of the District's administrative functions during the first year will be funded by some combination of (i) assessments approved by the property owners within the proposed district; (ii) special taxes approved by the electorate within the proposed district; (iii) capital contributions from the community; or (iv) grants or loans from other government agencies, such as the County of Santa Barbara or the State Water Resource Control Board's Clean Water State Revolving Fund.

If the district determines to proceed with development of a wastewater system or systems, the construction and development costs would be funded with governmental grants and loans and potentially the sale of bonds. The sources of funding would be determined by the Board of Directors. The likely sources of funding include grants and loans from the State of California's Clean Water State Revolving Fund and/or the Water Recycling Funding Program and from the United States Department of Agriculture's Water and Waste Disposal Loan and Grant Program. Repayment would be secured by a combination of assessments and user fee revenue.

The cost of operating the sewer system or systems would be funded by a user fee.

20. Proponents of this proposal: (Names of Chief Petitioners, not to exceed three (3), who hereby request that proceedings be taken in accordance with the provisions of Section 56000, et. seq. of the Government Code and herewith affix signatures) as follows:

Please sign on the top line and print on the line below.

Name	**Mailing Address**
1.	P.O. Box 865 Los Olivos, CA 93441
Neil Cline	
2.	P.O. Box 126 Los Olivos, CA 93441
Mark Herthel	
3.	P.O. Box 305 Los Olivos, CA 93441
Lisa Palmer	

When a form is completed and the requisite number of qualified signatures has been obtained (after circulation), the petition is to be filed with the Executive Officer.

The petition and signature sheets must be left intact. Removal of the signature sheets from one counterpart to another counterpart will invalidate the entire petition.

List of Affected Agencies

County of Santa Barbara

Auditor-Controller's Office

16-01

Where your property taxes go...

2015 Secured Property Taxes For Assessor Parcel Number (APN): 135-030-006

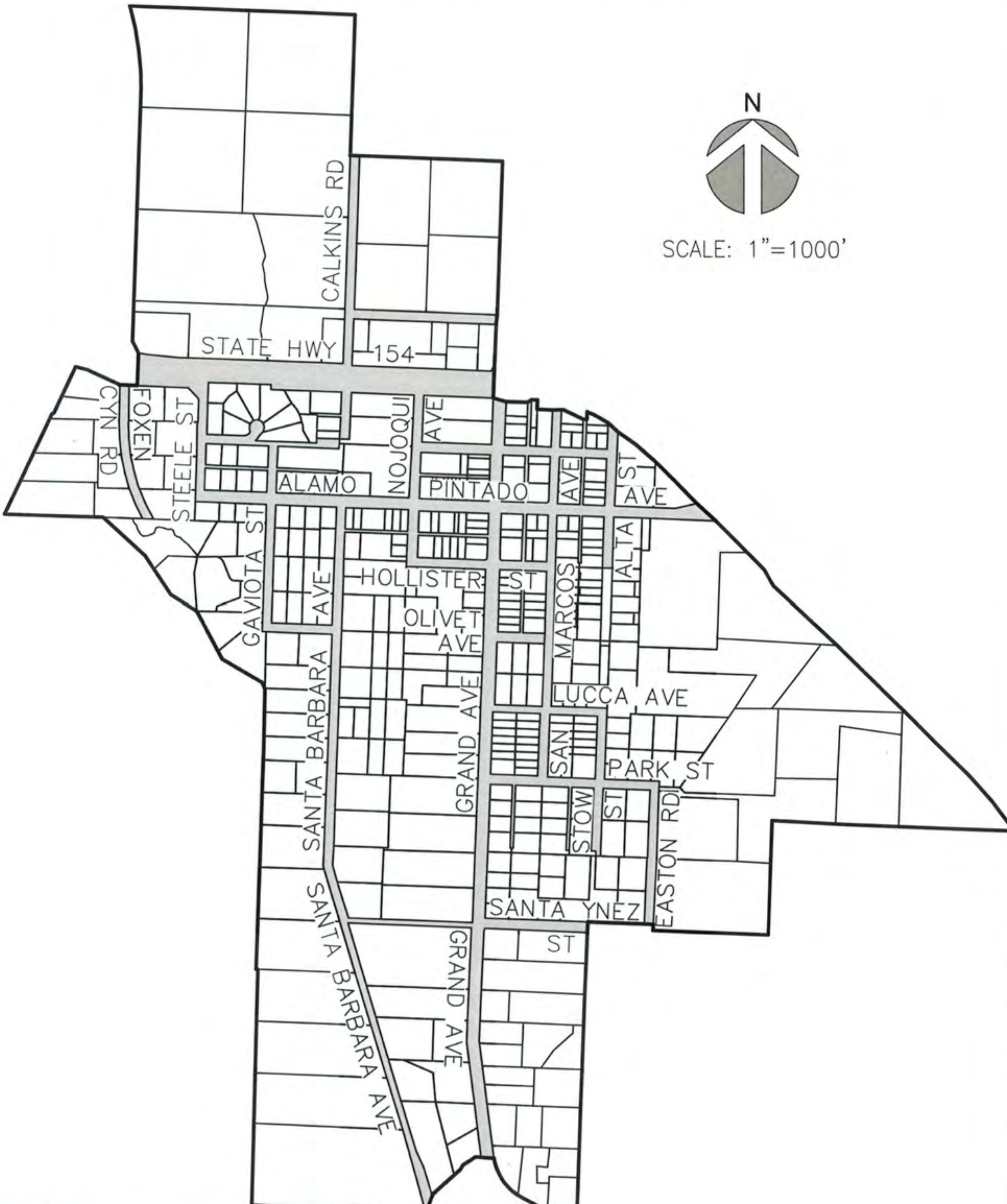
Situs	Tax Rate Area / Jurisdiction	Net Assessed Value
3055 CALKINS RD	074024 / County	$515,559

Fund	Amount
Basic 1% Property Taxes	
0001 - Santa Barbara County General	1,174.63
2280 - SB County Fire Protection Dist	704.48
2400 - SB County Flood Cntrl/Wtr Cnsrv	15.97
2590 - Santa Ynez Flood Zn 1	29.67
3050 - Santa Barbara County Wtr Agency	20.58
3310 - Oak Hill Cemetery Dist	18.18
4160 - SB Mosquito/Vector Dist	1.11
5800 - Santa Ynez River Wtr Cnsrv General	16.91
7201 - Los Olivos Elem Dist General	1,189.79
8401 - Santa Ynez Valley HS Dist General	909.32
9401 - Allan Hancock CC Dist General	311.56
9801 - County School Srvc Fund	215.42
9802 - Education Revenue Augmentation	617.97
Total Basic 1% Property Taxes	5,225.59
Bonds	
7251 - Los Olivos Elem Bond 1996	103.15
7255 - Los Olivos Elem Bond 2006	156.77
9421 - Allan Hancock CC Bond 2006	130.64
Total Bonds	390.56
Fixed Charges	
2591 - Sta Ynez Flood Zn Ben Assmt	9.22
Total Fixed Charges	9.22
TOTAL TAX	**5,625.37**

Legal Description of the Boundaries of the Proposed Los Olivos Community Services District

The boundaries of the proposed Los Olivos Community Services District include all of the territory of the "Los Olivos Special Problems Area" as designated by the Board of Supervisors of the County of Santa Barbara. The boundaries of the Los Olivos Special Problems Area are depicted on the attached map.

Proposed Formation of the Los Olivos Community Services District



MNS ENGINEERS INC
201 N. Calle Cesar Chavez, Ste 300
Santa Barbara, CA 93103
805.692.6921 Phone

ENGINEERING
PLANNING
SURVEYING
CONSTRUCTION MANAGEMENT

Total Area of Parcels = 440± Acres

LOCSD.160586.00 * ANX MAP.dwg * 11/8/2016 * RCS * E-FILE

***NOTE*: THIS PAGE MUST BE COMPLETED AND ATTACHED TO EACH PETITION.**

According to Election Code, Section 104, whenever any petition is submitted to the elections official, each section of the petition shall have attached to it a declaration signed by the Circulator of the petition, setting forth, in the Circulator's own hand, the following:

PRINTED NAME OF CIRCULATOR (including given name, middle name or initial and last name):

____

RESIDENCE ADDRESS OF CIRCULATOR:

____

DATES ON WHICH ALL SIGNATURES TO THE PETITION WERE OBTAINED:

Starting date: ______________________

Ending date: ______________________

The Circulator, by affixing his/her signature below, hereby certifies:

1. That the Circulator circulated the attached petition and witnessed the appended signatures being written;

2. That, according to the best information and belief of the Circulator, each signature is the genuine signature of the person whose name it purports to be;

3. That the Circulator shall certify to the content of the declaration as to its truth and correctness, under penalty of perjury under the laws of the State of California, with the signature of his or her name at length, including given name, middle name or initial, and last name.

____________________ ______________________________________

Date | Name (as required above)

As a signer of this Petition, I hereby certify that I have read the content of the Petition and request that proceedings be taken for the proposal as provided by said Petition.

PLEASE SIGN NAME ON THE TOP LINE
PRINT NAME ON THE SECOND LINE

Date signed	Signature & printed name of Petitioners	Residential Address of Petitioners	Official Use Only
	Sign:		
	Print:		
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<u>PLEASE SIGN NAME ON THE TOP LINE</u>
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Date signed	Signature & printed name of Petitioners	Residential Address of Petitioners	Official Use Only
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2708507.1

Santa Barbara Local Agency Formation Commission
105 East Anapamu Street ◆ Santa Barbara CA 93101
805/568-3391 ◆ FAX 805/647-7647
www.sblafco.org ◆ lafco@sblafco.org

Date: September 3, 2020 (Agenda)

To: Honorable Commissioners
Santa Barbara Local Agency Formation Commission

Consider Request for Time Extension for the Los Olivos Community Services District to Implement a Proposition 218 Assessment to Fund Wastewater Treatment Facilities

RECOMMENDATION.

That the Commission grant the Los Olivos Community Services District a one-year extension for the implementation of a Proposition 218 assessment to fund wastewater treatment facilities.

DISCUSSION

The Los Olivos Community Services District has requested that the Commission extend the time limit contained in Commission Resolution 17-04 to implement a Proposition 218 assessment to fund planning and construction work necessary to build a wastewater treatment system for the Los Olivos community. The assessment was due one year after the effective date of the District's formation. The condition of formation is set forth in Paragraph B(vii) is as follows:

> "The District shall implement a Proposition 218 assessment within one year of the effective date as necessary to fund the wastewater treatment facilities for the area, including CEQA and other planning analysis, assessment study and necessary election. Santa Barbara LAFCO may otherwise extend such deadline, or other LAFCO approved arrangements are made for funding such construction."

The effective date of the District's formation was April 5, 2018; hence the assessment was originally due by April 5, 2019. The District's first request for a one-year extension was made on November 14, 2008 and approved by the Commission on December 6, 2018. The District made a second extension request on March 20, 2020. Unfortunately, due to extenuating circumstances, Staff did not bring this request to the Commission for approval. The District resubmitted its request in a second letter dated August 10, 2020, with the March 20, 2020 letter attached. **(Exhibit A.)** The District Interim General Manager Douglas Pike followed up with a phone call.

The two letters outline the extensive work done by the District to move forward with the wastewater treatment project. The District is requesting a one-year extension to complete the

Proposition 218 assessment process which, if approved, will run through April 5, 2021. In light of the District's efforts, Staff recommends the request be approved.

Please contact the LAFCO office if you have any questions.

William M. Dillon

William Dillon
Interim Executive Officer

Exhibits

Exhibit A Los Olivos CSD letters dated March 20, 2020 and August 10, 2020 requesting extension.

Lisa Palmer, President
Tom Fayram, Vice President
Julie Kennedy, Director
Mike Arme, Director
Brian O'Neill, Director

August 10, 2020

William Dillon, Interim Executive Director
Local Agency Formation Commission
County of Santa Barbara
105 East Anapamu Street, Rm 407
Santa Barbara, CA 93101

SUBJECT: Los Olivos Community Services District Project Progress

Dear Mr. Dillon and Commissioners:

As you may recall, LAFCO officially issued a Certificate of Completion in the formation of the Los Olivos Community Services District on April 5, 2018, following the successful County certified vote on January 30, 2018. The District was created to be the governance structure for Los Olivos to address wastewater treatment requirements in the town.

The requirement to enact an assessment to fund a wastewater collection, treatment, and disposal system or systems to serve the community, has been graciously extended by LAFCO as wecontinue to demonstrate diligent progress in our mission to develop a community wastewater collection and treatment system for the District.

The District reports the following progress since our last update of March 20, 2020 (a copy of that letter is attached, as we believe, due to understandable circumstances, it was not agendized or advanced to the Board):

The Los Olivos CSD Board continues to work to develop a cost effective wastewater solution for our community with a focus on the Phase 1 Wastewater Collection and Treatment System (downtown core), the development of Residential Onsite Wastewater Treatment System guidelines, and identifying a variety of potential funding sources to help pay for building and operating a collection and treatment system (see our Community Wastewater Program Project Description for more detail https://www.losolivoscsd.com/los-olivos-community-wastewater-program-project-description).

Phase 1 Wastewater Collection and Treatment Project Update: The District Board has been diligently working to site and design a Phase 1 system, including:

- Worked with County Environmental Health Services to successfully secure $180,000 in funding for:
  - Preliminary design services, including a Wastewater Load Study, estimating anticipated volumes and wastewater strength.
  - Development of a Groundwater Monitoring Plan and Preliminary Soils/Geotechnical Report.
  - Preliminary environmental services to determine potential impacts and mitigations required.

EXHIBIT A

These three efforts are in the consultant selection and contract award process. We expect work for all three efforts to begin in August and September.

- Explore and narrow Wastewater Treatment Plant siting options. We have a preliminary understanding with the County of Santa Barbara and are seeking formal agreement for use of an existing excess road right-of-way parcel for this purpose.
- We have procured expert consultants to assist in preparing a Draft Assessment Engineer's Report to estimate project costs and recommend a financial plan including assessments. This is the foundation document for an equitable calculation of fair share assessments and will be subject to public hearings and a districtwide vote. This Report will be completed when design, construction and siting assumptions are solidly defined.
- We have continued coordination with the County, the Regional Water Quality Control Board, and community partners including the Santa Ynez River Water Conservation District – ID1 and Mattei's Tavern representatives. We meet monthly with the RWQCB staff.
- We are engaged with a consultant to assist the CSD in development of clear guidelines for on-going operation and maintenance of residential Onsite Wastewater Treatment Systems while the Phase 1 downtown core project is being evaluated, developed, and implemented.

Grant & Funding Source Identification Update: The District has initiated a Grant Funding Application with the State Water Board and is evaluating and pursuing various funding programs and grant sources such as Proposition 68 with a desire to maximize our use of grant funds to pay for studies, design and construction costs.

Upcoming Director Elections - November 2020: In October 2019, the board took the required action of staggering director terms of office, with two board seats (Directors Tom Fayram and Julie Kennedy) now up for election in November 2020 and the remaining three seats in 2022. We have been proactive in mailings and emails to inform the residents of the District with our progress, and of their opportunities to participate.

We respectfully request, based on this progress report, that the LAFCO Board of Directors extend the LAFCO Resolution deadline to conduct Prop 218 proceedings for the Los Olivos Community Services District.

Thank you for your continued support of the Los Olivos CSD and our efforts to resolve ground water quality issues through developing an appropriate technical solution for our sewerage needs. If you have any questions, please contact me at (805) 680-2336 (or lisa@lpalmerconsulting.com) or Douglas Pike, Interim General Manager, at (805) 331-3553 (or dpike@mnsengineers.com.)

Sincerely,
Los Olivos CSD

Lisa Palmer
Board of Directors, President

Tom Fayram, President
Lisa Palmer, Vice President
Julie Kennedy, Secretary
Mike Arme, Director
Brian O'Neill, Director

March 20, 2020

Local Agency Formation Commission
c/o Paul Hood, Executive Officer
County of Santa Barbara
105 East Anapamu Street, Rm 407
Santa Barbara, CA 93101

SUBJECT: Los Olivos Community Services District Project Progress

Dear Commissioners and Mr. Hood:

LAFCO officially issued a Certificate of Completion in the formation of the Los Olivos Community Services District on April 5, 2018, following the successful County certified vote on January 30, 2018. The District was created to be the governance structure for Los Olivos to address wastewater treatment requirements in the town.

The requirement to enact an assessment to fund a wastewater collection, treatment, and disposal system or systems to serve the community within one year of the effective formation date, was extended an additional year, after the District reported that the Board has worked diligently to set up the District and it's administrative functions, including; hiring legal counsel, calculating and submitting assessments to the County for FY 2018-19, securing insurance, approving agreements with the County Auditor for use of FIN for the District finances, hiring an Interim General Manager, and completing a "Dry Period Funding" agreement with the County Treasurer's Office.

Additional Administration Tasks previously reported include formation of a standing Financial Subcommittee, refinement of the District's County Assessors roles and exclusion of exempt parcels, adoption of essential District policies, working with District citizens on a variety of septic questions and issues, and training and Form 700 Compliance. Additionally the District Board has formed an ad-hoc Technical Committee, mapped out technical options and a strategy for moving forward, developed a Three-Month Plan as well as a Three-Year Plan and MS Project Schedule.

The District has revamped the District Website in preparation for public workshops (See www.LosOlivosCSD.com). Public workshops dates are pending, but shall be in the near future.

The District would like to report the following progress since our last report in April, 2019:

1. Completion of a series of three community workshops to obtain public input in the development of a detailed project description. The adopted Project Description is attached.
2. Three consultant contracts have been awarded to perform the following tasks:
    a. Grant Preparation for a State Revolving Fund application to the State Water Resources Control Board.

EXHIBIT A

b. Hiring of an Assessment Engineer tasked to draft the Engineer's Report for the proposed new special assessment. This effort has produced a draft report,and identified gops in data required to complete an accurate competent and fair assessment. The District has prioritised the development of data to fill these gaps.

c. Preparation of a "Los Olivos Supplement to the Local Area Management Plan (LAMP)" to provide focused answers to questions that have been brought forward regarding application of the LAMP within the Boundaries of the District during development of the new wastewater collection and reclaimation facilities.

3. The District has coordinated closely with the Regional Water Control Board Staff, as well as the County Environmental Health Services Department to assure our path and approach is consistent with sound principals and good practice

4. The District has worked with County EHS to procure cooperation and funding for the following efforts to be contracted with consultants within the next several months:
   a. **Loading Study** to determine the expected flows and extent of commercial and residential BOD loading in the proposed wastewater collection and treatment system to determine the appropriate capacity of the planned treatment and reclamation facilities.
   b. **Groundwater Monitoring Plan** to determine a regulatory acceptable strategy for defining baseline groundwater quality within the District, quantify the effectiveness of remedial measures associated with Phase 1 improvements in groundwater quality and form the basis for subsequent phases of the project, if necessary.
   c. **Preliminary Environmental Report** to include an initial review of the environmental baseline of the project area to include, as a minimum, identification of regulatory limitations, prerequisite environmental, consideration of the engineering approach and other factors necessary in order to comply with applicable environmental State and Federal laws and requirements.

5. The District continues to refine cost estimates, adjust the schedule, and communicate with key partners in the Phase 1 project area in the Commercial Zone within the District. This includes Matteis Resort.

We respectfully request that the LAFCO Board of Director's receive this progress report and extend our deadline to put a new assessment in place another year.

Thank you for your continued support of the Los Olivos CSD and our efforts to resolve ground water quality issues through developing an appropriate technical solution for our sewerage needs. If you have any questions, please contact me at (805) 448-7033 or tom.fayram.locsd@gmail.com or Douglas Pike, Interim General Manager, at (805) 331-3553 or dpike@mnsengineers.com.

Sincerely,
Los Olivos CSD

Douglas S Pike

Douglas Pike For
Thomas Fayram

Thomas Fayram
Board of Directors, President

EXHIBIT A

Los Olivos Community Services District
PO Box 345
Los Olivos, California 93441

8-14-19

Los Olivos Community Wastewater Program
Project Description

OUR PURPOSE

The Los Olivos Community Services District (District) was formed by voters in 2018 to provide a funding mechanism for the development, building and operation of facilities necessary to collect and treat wastewater in the unincorporated community of Los Olivos.

PROJECT GOAL

The purpose of the Los Olivos Wastewater Reclamation Program Project Description (Project Description) is to define a strategy to provide economically viable wastewater treatment and reclamation solutions to the residents and property owners within the District that meets public health needs and the regulatory requirements of the Regional Water Quality Board (RWQCB).

The Los Olivos Wastewater Reclamation Program is comprised of four distinct components, each being interdependent and implemented concurrently:

1. Development of Residential Onsite Wastewater Treatment System (OWTS) Requirements
2. Financial Outreach and Assistance for Program Development, Construction and Operation
3. Implementation of a Local Groundwater Monitoring Program; and
4. Phased Collection and Treatment

DEVELOPMENT OF RESIDENTIAL OWTS REQUIREMENTS

Currently, residential Onsite Wastewater Treatment System (OWTS) in Los Olivos are governed by the Santa Barbara County Public Health Department's (County EHS) Local Area Management Plan (LAMP).

Los Olivos residents who seek County EHS guidance on OWTS-related issues have been repeatedly met with ambiguous and indistinct direction regarding dwelling expansion, system failure, need for installation of an advanced treatment system (ATS), existing system maintenance and other issues and costs associated with requirements for connection to a community collection and treatment system.

EXHIBIT A

To resolve this the District will develop a customized Local Area Management Plan (LAMP) that addresses the conditions specific to the Los Olivos Community Services District Area. This Plan will be similar to the County's LAMP but tailored to Los Olivos. This Plan will include local District standards and policies and provide clear guidance on OWTS matters including operations of conventional systems, routine maintenance, management of existing low and high-risk systems within the community, dwelling expansion, system failure, requirements and need for installation of an advanced treatment system (ATS) and requirements for connection to a community collection and treatment system.

The District's LAMP will endeavor to establish requirements that are equal in nature and application to those required for all County parcels based on existing site conditions.

The District will be charged with the administration of the RWQCB approved Los Olivos LAMP to include the State mandatory reporting requirements. Permitting and enforcement of the LAMP will remain with the County EHS through an agreement approved by the County and the District extending the County EHS authority to within the District.

The creation of a District governed LAMP benefits residents by enabling the District to seek out grants and low interest loans, competitive procurement of select vendors, and consortium-based pricing from service providers.

FINANCIAL OUTREACH AND ASSISTANCE

Concurrently, the District - having held Public Community Workshops which presented potential project alternatives, a project approach and Project Description - is now able to seek Local, State and Federal funding mechanisms to minimize property owners and business economic impacts associated with implementing the defined Program.

With this well-defined Project Description, the District will pursue available grants and funding for all elements and components of the Program.

Every potential source of funds will be explored to minimize any eventual Fee Assessment that must be established in accordance with State Law (Proposition 218), and as required by the Local Agency Formation Commission (LAFCO).

The District will also seek additional sources to augment these economic impacts that may include but are not limited to public–private partnerships (P3), identifying matching fund opportunities, Program Privatization, and commercial/private financing alternatives.

A public–private partnership (P3) is a cooperative arrangement between two or more public and private sector entities, typically long-term in nature. They are primarily used for infrastructure provision, such as the building and equipping of schools, hospitals, transport systems, water and sewer systems.

IMPLEMENTATION OF A LOCAL GROUNDWATER MONITORING PROGRAM

The District remains committed to proactively work with the residents of Los Olivos, regulatory community and other stakeholders to develop an economically acceptable, technically feasible and timely solution to the potential impacts OWTS density has in our community.

However, one of the basic tenants to this approach is dependent on the development and implementation of a comprehensive groundwater monitoring program. Historical assessments, plans and feasibility studies developed specifically for Los Olivos validate the need for further groundwater characterization in order to:

- Determine the nature and extent of groundwater impacts associated with OWTS in and around the Community of Los Olivos,
- Investigate known upgradient sources impacting groundwater quality in Los Olivos,
- Provide information to address data gaps associated with site specific conditions and critical modeling considerations including infiltration rates, permeability and other geological, hydrological and geotechnical parameters not currently available, and
- Establish baseline conditions that can be utilized to monitor the effectiveness of treatment and mitigation measures implemented in the Los Olivos Community.

The District will work closely with the Santa Barbara County Environmental Health Services (EHS) and the Regional Water Control Board (RWQCB) to develop and finance a groundwater monitoring work plan that establishes the number, type and locations for monitoring locations, a suite of analytical and geotechnical sampling parameters, along with frequency and reporting requirements.

Once the work plan is approved, installation of monitoring points and ongoing monitoring will occur. The results of the initial and ongoing monitoring will be used to influence subsequent treatment phases, if necessary, within the District.

The analytical and geotechnical data obtained during groundwater monitoring point installation, will also be used to identify and site locations favorable for aquifer recharge and existing contaminant mitigation.

PHASED COLLECTION AND TREATMENT

Historic documentation establishes the fact that there are a large number of small to very small lots in the Los Olivos Commercial Core, areas of high OWTS density and historic records of system failures. These factors may contribute to groundwater impacts from nitrate migration from OWTS.

This Commercial Core area has been selected as the location for the initial phase (Phase I) under this Program. The Commercial Core has been identified as the area of highest density, use (volume) and nitrate loading and has been recommended for action in multiple reports specific to OWTS impacts in Los Olivos. Subsequent phases into adjacent high-density areas will be determined by the results of groundwater monitoring.

The Commercial Core area is easily defined by Zoning (C-2), easily expanded, centrally located and its topological nature allows for the most expedient, least complex and economically acceptable setting to initiate this Program.

The District will design, site, permit, procure, construct and manage a Los Olivos Wastewater Reclamation Facility to include the associated collection and transport infrastructure required to provide economically viable wastewater treatment and reclamation solution to District residents and property owners. This system will address public health needs while also meeting the regulatory requirements of the RWQCB.

Adjacent properties outside the C-2 zone, will be permitted to connect to the system at their own cost and as capacity allows.

Treatment Facility

The proposed Treatment Facility will be consistent with the polices and development standards of the Santa Barbara County Comprehensive Plan, including the Santa Ynez Valley Community Plan and the Santa Barbara County Land Use and Development Code.

The system will be designed for potential future expansion and to provide treatment that improves wastewater quality before it is reused, recycled or discharged to the environment. Reclaimed wastewater would be treated to levels compliant with California Code of Regulations (CCR), Title 22 discharge requirements to allow for:

- Beneficial reuse through underground infiltration
- Groundwater recharge
- Strategic flushing of existing nitrate/contaminates
- Local irrigation as site conditions allow

Because the project will generate in excess of 10,000 gallons per day, exceeding the 10,000 gallons per day County EHS limit, it will be under the jurisdiction of the Central Coast Regional Wastewater Quality Control Board, who would be the lead regulator agency, review the system and issue all appropriate permits.

The treatment facility will be comprised of a high-efficiency, low odor, expandable Membrane Bioreactor (MBR) package plant sized to serve Phase I needs and sited to accommodate modular expansion should further study warrant a facility expansion. The facility will be operated by a California licensed and properly trained wastewater treatment plant operator, who will be responsible for ensuring proper operation and maintenance of plant equipment as well as required reporting.

EXHIBIT A

The architectural style will be consistent with the historical architectural details of Los Olivos. Roof materials will consist of earth tone colors and landscaped to blend in locally to reduce visual impacts.

Collection System

The collection system will include a subsurface wastewater collection structure consisting of gravity pipelines, lift stations as required, and effluent handling facilities returning drinking water quality reclaimed water to customers or the groundwater basin for beneficial reuse.

The collection system "backbone" will consist of underground gravity sewer pipe that will be strategically placed under community streets and alleys to allow for the closest possible connection to parcels in the high-density water use areas of the downtown C-2 Commercial Core and small-lot residential parcels near the downtown core. Maintenance holes and an "end of the line" lift station will be provided, with an associated force-main (pressure main) to move the wastewater to the MBR package plant for treatment, as necessary.

Structures will be connected to the District-owned collection system via privately owned laterals. Existing septic systems and leach fields will be abandoned as required by local codes. Certain laterals may be successfully connected with gravity flow while many may require small private grinder pumps to move the sewage into the collection system.

District participation in lateral, grinder pump and septic abandonment costs would depend on grant and funding sources.

Potential expansion of the collection system, as with the treatment system, will be determined based on results of the groundwater monitoring and in coordination with the RWQCB.

Operations and Maintenance

The collection and treatment systems will be operated and maintained initially by contract system operators. System costs will be shared in an equitable manner by those connected to and benefitting from the facility. The District will review and consider established formulas for this participation that may include zoning, water-use, fixture unit counts, etc.

Parcels not connected initially will be subject to the District's LAMP and will contribute to the cost of management, inspection and enforcement of this plan and operating costs of the District.

Ongoing monitoring and reporting will occur in accordance with operating and discharge permits required by the Board.

Treatment Facility Siting

The District will procure a site for the package plant. Siting factors will include:

- Availability of land,
- Surface and subsurface suitability,

- Economics of procurement,
- Proximity to the collection system and effluent discharge locations, and
- Local, state and federal requirements.

Location and siting of the facility remains under examination. Given the above siting factors, the District prefers that the location be within District boundaries and south of State Route 154. Currently, potential locations include:

- County parcels
- County Right of Ways
- Institutional parcels including churches and schools
- Commercial parcels, and
- Private land

Construction Implementation and Timing

Construction will generally consist of the following phases:

1. Project planning, preliminary design, environmental documentation preparation and review, and permitting.
2. Preliminary design, budgeting, and initiation of the Proposition 218 assessment process.
3. Final Design, including preparation of plans, specifications and estimates. The package plant will be a "design build" component.
4. Advertising and bidding of the various components. The District will procure professional and construction services in accordance with the State Contracting Code. The package plant will be built offsite, most other components will be built by contractors on-site.
5. Service lateral connections will be coordinated with and completed in conjunction with sewer trunk-main installation.
6. Package plant start-up.
7. System Operation and Maintenance.

Construction timing will be affected by many factors, including funding process, environmental process, and construction duration. Lateral connection is anticipated to require significant property owner participation and cooperation.

The District anticipates a minimum of three years to design, review, permit, finance and construct the complete Phase I project.

Santa Barbara County
Environmental Health Services

Santa Barbara County

LOS OLIVOS
WASTEWATER MANAGEMENT PLAN

September 2010

Environmental Health Services
County of Santa Barbara
225 Camino del Remedio, Santa Barbara, Ca. 93110
2125 Centerpointe Parkway, Rm. 333, Santa Maria, Ca. 93455

Executive Summary

Introduction

The Los Olivos Wastewater Management Plan (LOWWMP) has been prepared by Environmental Health Services for consideration by the County Board of Supervisors for use as a tool to address an existing groundwater quality problem in the Los Olivos Special Problems Area of the Santa Ynez Uplands Groundwater Basin.

The goal of the LOWWMP is to protect public health and safety by recommending a process to mitigate the negative effects of existing onsite wastewater treatment systems (OWTS) on groundwater quality under and around Los Olivos. The LOWWMP presents alternatives and recommendations for design, construction, monitoring, and maintenance standards intended to stop the upward trend of this contamination and gradually improve ground water quality. Implementation will require the community and policy makers to work together to agree on measures and an approach that focus on inspecting, repairing, upgrading or replacement utilizing current technology, and maintenance of the OWTS's in the Los Olivos Special Problems Area. This new generation of systems will help restore groundwater quality and contribute to the long-term health and safety of citizens that rely on this source of water.

The Los Olivos Special Problems Area designation was established in 1974. There are currently ten "Special Problems Areas" in the County of Santa Barbara, with this being the first management plan prepared to address onsite wastewater issues. More and more areas of California with increasing onsite wastewater effluent loads are identifying groundwater quality issues and are adopting management plans to address the problem. This is the first of several management plans that may be developed to address water quality issues in various areas of Santa Barbara County. Others in the Santa Ynez Valley include Ballard, Janin Acres, and the urbanized area near Santa Ynez Township.

The recommendations of the LOWWMP are essentially a compilation of "lessons learned" and new technologies from the applicable experience of other communities, modified as required, to the unique conditions in the Los Olivos area. The Environmental Protection Agency (EPA) has contributed to the discussion of this growing issue by offering the *EPA Guidelines for Management of Onsite/Decentralized Wastewater Systems*. The LOWWMP contains a number of elements of their recommended approach. The Regional Water Quality Control Board has also requested that this Management Plan be prepared. The LOWWMP is in harmony with the goals of the Santa Ynez Valley Community Plan.

The LOWWMP represents a foundation for the significant amount of effort that will be needed as the Los Olivos area shifts from traditional to advanced onsite wastewater treatment. It is intended to provide a reference for understanding why this shift is necessary and why it is necessary now. Advanced onsite wastewater treatment is now a commonly employed technology and has become a relatively economical option for protecting public health and the environment.

The LOWWMP is intended to be a living document, subject to updates as new technologies are developed and as our understanding of water quality preservation advances. The approach is intended to be practical. The LOWWMP does not propose to accomplish everything possible but to apply practical water quality solutions in the earliest possible timeframe.

Content of the Los Olivos Wastewater Management Plan

The Los Olivos Wastewater Management Plan begins with a primer on Onsite Wastewater Treatment Systems (OWTS), followed by definitions helpful in understanding the topic. A historic and regulatory setting is then presented for a greater understanding of the studies and regulatory actions that have helped define the Los Olivos Special Problems Area.

Because of some controversy in the past regarding the general knowledge and acceptance of the water quality data and subsequent "Special Problems Area" designation, a great deal of information is presented in the LOWWMP on the water quality data from well testing performed in the Los Olivos area. The Data is from 56 wells in the shallow groundwater basin, 19 of which have a history of testing, 14 of which show a trend of increasing nitrates (which is a key contaminant indicator) demonstrating the increasing trend in the problem area as a whole. The data collectively demonstrates a clear trend for increasing nitrate levels in the shallow groundwater under Los Olivos.

Like much of the Valley, the Special Problem Area is over both a perched, or shallow groundwater that is tapped by private wells generally between 25 and 180 feet deep and deeper aquifer which is tapped by wells between 250 and 600 feet deep. 32 private wells tested in the Los Olivos area demonstrate similar levels of nitrate in both shallow and deep aquifers as defined. However, outside the immediate area, deeper wells sampled show considerably less nitrates. Indicating that shallow wells in and around the problem area, as well as deeper wells immediately under or adjacent to the problem area are most influenced by the nitrate contamination.

> It is important to mention that the water purveyor Santa Ynez River Water Conservation District, Improvement District No.1 (ID#1) wells mentioned in this Plan are all located outside the special Problem Area proper, and are all drawing water from the deeper aquifer. It is also important to note that the domestic drinking water sampled from their wells has among the lowest concentrations of nitrates for water tested, and that although low levels of nitrates are present, the domestic water supply is well below the ½ MCL action level requiring increased sampling and reporting.

Although existing water quality in the special problem area is still generally under the action level requiring enhanced testing or the maximum contaminate level (MCL) for drinking water as defined by the EPA and State Department of Public Health, the upward trend toward actionable levels is consistent, and indicates a plan to reverse the trend is urgent. Use of one of ID#1's older wells, located on Refugio Road between Baseline Ave. and Highway 246, was discontinued in 1998 due to high nitrate concentrations. The well is relatively shallow, completed to a depth of 495', with the top of the screened interval at 195'. It is possible that the high nitrate concentrations in the well are, at least in part, due to migration of shallow groundwater from the Los Olivos area.

Based on the average annual rainfall of the Santa Ynez Valley, and the calculated effluent from the existing OWTS in the Special Problems Area, approximately 50% of the current groundwater recharge contributed by the surface rains directly over the Special Problem area is from area septic system effluent. This source of groundwater recharge mixes with other groundwater flows from upgradient of Los Olivos. The following conditions exist that have contributed to the problem and need to be addressed:

1. A high groundwater table exists in many areas of Los Olivos resulting in an inadequate separation from existing leach fields and dry wells. In some cases, septic system effluent is being discharged directly into the shallow groundwater table. Again, please note the discussion above (in box) regarding domestic drinking water drawn from deeper aquifers outside Los Olivos

2. The high density of OWTS combined with inadequate area for proper sizing or set-backs for leach fields. The Regional Water Quality Control Board has determined that a developed residential lot of less than one acre in size is insufficient for a competent leach field. Many leach fields currently exist on lots in Los Olivos that are less than one acre.

3. The age of many septic systems in the Los Olivos area exceed the expected life of septic tanks and/or dispersal systems. Many of these are no longer treating the wastewater or leaching effectively.

4. Many of the existing systems are not designed to current codes and requirements. A number of existing systems were installed under antiquated design standards under marginal site conditions.

The LOWWMP demonstrates that a reversal in water quality will be slow and require many years, due to the administrative and regulatory effort required, funding issues, capital construction costs, and the sluggish movement of the groundwater, with its slow ability to replace itself with cleaner water. In order for the current downward water quality trend to be reversed before negative consequences are potentially realized, implementation of a plan is recommended as soon as possible. It will take possibly decades for all the existing OWTS units to be repaired, replaced or upgraded to assure each parcel is not contributing to the increasing ground water quality problem.

The LOWWMP lays forth options for consideration with recommendations derived from the successful experiences of others, as well as current technologies that have been emerging in Southern and Central California. These technologies have been applied to some degree already in Santa Barbara County, such as advanced wastewater treatment systems for both residential and commercial use.

In addressing solutions to the ground water quality concerns, there are two major components of the LOWWMP. They are: the Commercial Component, which addresses the septic systems in the downtown core; and the Residential Component, which addresses the remaining septic systems in the Los Olivos Special Problems Area.

Separating out the commercial core is due, in part, to the understanding that there is currently some support within the business community to implement a downtown commercial component as soon as feasible. This support stems from the fact that as substandard systems fail, there are few options for repair and replacement of these systems because of the small, compact lots in the downtown area. This condition could limit the extent that the businesses may be able to do business as they desire, add restrooms, wash facilities or sinks, or engage in high water use activities. There is also a desire by the business community to be able to construct public restrooms.

Starting with the downtown commercial component has additional advantages for the community. The lots in the downtown core, on average, generate more wastewater effluent, and are situated in an undesirable setting for OWTS which combines most of the factors of concern listed above. The downtown core commercial area, as defined, consists of 52 lots which represent 12% of the lots within the Special Problems Area but contribute approximately 22% of the wastewater generated. The dispersal of effluent from these downtown OWTS is within an area known for shallow groundwater and small lot size. Many of the existing dispersal systems in the downtown core consist of dry wells that contact the ground water table during certain times of the year. Starting with the downtown could make a significant contribution to the protection of water quality under Los Olivos. This seems to be a natural prioritization strategy for obtaining the earliest groundwater quality benefit for expenditure of public resources.

Although a few of these downtown commercial lots may be able to accommodate advanced OWTS meeting the new proposed requirements on their lots, the most viable options for the downtown core include communal wastewater treatment systems utilizing a communal dispersal field, or treated to a level that allows dumping to surface waters. This treatment facility would be funded and operated by a locally controlled mechanism such as a Special Assessment District. Initial capital improvement costs are expensive but would be shared in a cooperative effort between users, grants, low-interest loans, and possibly other agencies.

The communal systems examined include package plants, three types of which are described in the Plan, and a fourth system known as a STEP (Septic Tank Effluent Pump) System with an advanced secondary treatment facility.

The package plants considered include common commercial units manufactured by AdvanTex, GE Corporation, and Hoot Systems, Inc.

In General these systems can be described as:

1. Package Plant Options with examples from three quality vendors. The following three systems are all capable of meeting the selected wastewater treatment effluent quality requirements for dispersal field disposal or release to surface waters:
   a. The AdvanTex Manufactured packed-bed filter system with scalable modules for varied flows, from onsite advanced septic to community treatment modules. Pre-engineered and available in package plant configurations.
   b. The Hoot Systems integrated fixed film/ activated sludge (IFFAS) treatment pre-engineered package plant.
   c. The GE pre-engineered, modular ultra-filtration based package plant for wastewater treatment and recycle, scalable for virtually any wastewater application from 5,000 gpd up to 5 mgd . This system is dual-trained for redundancy. System configurations include the Z-MOD S, fully containerized wastewater treatment plant as offered for the commercial project, with Z-MOD M skidmounted filtration plants to be combined with concrete process tanks, which lends itself to expansion, and Z-MOD L skid mounted plants for the potential expansion to add residential wastewater.

2. The STEP system is a concept that has become increasingly popular in communities with dense OWTS concentrations and has been implemented in a number of States since the late 1960's including California. This approach has continued to be used and has adopted new state-of-the-art technologies.

   The basic treatment process train of a STEP system includes state-of-the-art advanced secondary treatment and can be described as follows:

   a. Sewage from the business passes through a grease trap (if required) and then into an onsite septic tank (sometimes called an "interceptor tank"). Here the wastewater is treated through the biological septic process. The onsite goal is to remove as much of the grease, suspended solids and biological oxygen demand (BOD) as practical.
   b. From the STEP tank, a small pump would move the pre-treated wastewater to a collection system designed to carry septic tank effluent from the downtown business area to a compact communal advanced treatment system for additional treatment (and possibly disinfection).
   c. This highly treated effluent will be suitable for dispersal in a local field without contributing to groundwater contamination. It may also be recycled for irrigation purposes. It is estimated that approximately 5 acres is needed for an adequate dispersal system.

The residential component, while essential, is identified by the County as second in priority. The LOWWMP, for now, addresses residential lot OWTS issues in a general way, providing a preview of options and recommendations. This element of the LOWWMP will be developed in greater detail at some undetermined later date. Until then, the current strict practices for addressing new and replaced residential OWTS in the Los Olivos Special Problems Area will continue to be implemented.

The LOWWMP defines the roles and relationships of the various regulatory agencies that will be involved. It is anticipated that for implementation of both the commercial and residential components of the LOWWMP, a funding, operational, inspection & monitoring and reporting and enforcement structure will need to be put in place. It is recommended that a locally controlled Special Service District be created to assure these tasks are accomplished, either with staff or through contracted services.

The alternative of a centralized sewer collection and treatment system is presented as it is considered necessary to have a complete OWTS wastewater management plan, but this option is identified as unpopular among many residents and business owners in Los Olivos. This option is recommended to only be considered as a final option if efforts to correct the groundwater quality concerns are not successfully resolved through other feasible options.

It cannot be overstated that the purpose of this Management Plan is to protect and improve water quality for the health and well being of the current generation as well as future generations that will live in this beautiful area.

Consultant Contract Cost Summary

STATUS DATE **1/11/2021**

	Project	Consultant	SCHEDULE		Contract Value	FY 2019-20	FY 2020-21			FY 2020-21	TOTAL CONTRACT TO-DATE
			START	FINISH		TOTAL FY 2019-20	Sep-20	Oct-20	Nov-20	TOTAL FY 2020-21	
1	Residential OWTS Requirements & Guidelines	Paul Jenzen	1/31/2020	1/30/2021	$19,200.00	**$1,960.00**				**$0.00**	**$1,960.00**
	MNS Project Management					**$905.00**	$300.00		$200.00	**$500.00**	**$1,405.00**
	A&W Contract Review/Support					**$0.00**				**$0.00**	**$0.00**
2a	Grant Writing	Wallace Group	CLOSED	CLOSED	$5,000.00	**$3,490.00**				**$0.00**	**$3,490.00**
	MNS Project Management					**$350.00**				**$200.00**	**$550.00**
	A&W Contract Review/Support					**$0.00**				**$0.00**	**$0.00**
2b	Grant Writing Phase 1	MNS Grant Wri	10/1/2020	12/31/2020*	$5,000.00	**$0.00**	$2,358.75	$1,530.00	$337.50	**$4,462.50**	**$4,462.50**
	MNS Project Management					**$0.00**				**$0.00**	**$0.00**
	A&W Contract Review/Support					**$0.00**				**$0.00**	**$0.00**
3	Assessment Engineer's Report	Water Consulta	12/30/2019		$15,280.00	**$9,860.00**				**$0.00**	**$9,860.00**
	MNS Project Management					**$855.00**				**$0.00**	**$855.00**
	A&W Contract Review/Support					**$0.00**				**$0.00**	**$0.00**
4	Preliminary Design Services	Stantec	8/20/2020	1/15.2021	$20,000.00	**$0.00**		$1,760.00	$6,640.00	**$8,400.00**	**$8,400.00**
	MNS Project Management					**$1,105.00**	$200.00	$600.00	$300.00	**$1,700.00**	**$2,805.00**
	A&W Contract Review/Support					**$0.00**				**$0.00**	**$0.00**
5	Preliminary Hydrogeologic/ Geotechnical Services	GSI	12/8/2020	12 Weeks	$85,000.00	**$0.00**				**$0.00**	**$0.00**
	MNS Project Management					**$1,000.00**	$1,100.00	$300.00	$300.00	**$2,000.00**	**$3,000.00**
	A&W Contract Review/Support					**$0.00**				**$38.00**	**$38.00**
6	Preliminary Environmental Services	TBD	1/13/2020	10 Weeks	$45,000.00	**$0.00**				**$0.00**	**$0.00**
	MNS Project Management					**$0.00**			$200.00	**$200.00**	**$200.00**
	A&W Contract Review/Support					**$0.00**				**$0.00**	**$0.00**
7	Site ID	County of SB	7/30/2020	1/30/2021	$5,000.00	**$0.00**				**$0.00**	**$0.00**
	MNS Project Management/Engrg.					**$5,725.00**	$337.50	$385.00	$200.00	**$2,663.75**	**$8,388.75**
	MNS Survey				$2,240.00	**$0.00**				**$2,235.00**	**$2,235.00**
	A&W Contract Review/Support					**$0.00**				**$0.00**	**$0.00**
	TOTAL Contract Costs				**$201,720.00**	**$25,250.00**				**$22,399.25**	**$47,649.25**
8	MNS IGM Dist. Mgmt.						$3,040.00	$4,808.78	$5,366.25		
	TOTAL IGM Dist Mgmt. Costs				**$201,720.00**	**$31,230.55**				**$24,578.78**	

Lisa Palmer, President
Tom Fayram, Vice President
Mike Arme, Director
Brian O'Neill, Director

POSTED 12-4-2020

LOS OLIVOS COMMUNITY SERVICES DISTRICT
Board of Directors Regular Board Meeting, December 9, 2020, 6:00 p.m.

The Meeting was held electronically via RingCentral Meetings. The public was able to hear and participate.: https://meetings.ringcentral.com/j/1497108123 Meeting ID: 149 710 8123

REGULAR MEETING Minutes

1. CALL TO ORDER 6:05 PM

2. ROLL CALL

3. PLEDGE OF ALLEGIANCE

4. APPROVAL OF MEETING MINUTES
   a. Minutes of 11-18-2020 Regular Meeting Approved. Motion to approve: Director Fayram, 2nd by Director Arme. Approved 4-0.

5. DIRECTOR COMMENTS
   - Director Fayram reported on his meeting with the new Environmental Health Director Lars Seifert
   - Director Palmer indicated she will meet with Supervisor Hartmann before the end of the year

6. PUBLIC COMMENTS - None

7. INTERIM GENERAL MANAGER REPORT – Disussed Director Appointment process and hope for appointment in January 2021

8. BUSINESS ITEMS

   A. Consent Calendar:
      1. Approved Payment of the following Invoices as reviewed and recommended for approval by the Finance Committee:
         a. 11-23-2020 MNS Invoice 76753 (Oct. Services) $7,623.75
         b. 12-1-2020 Aleshire & Wynder Invoice 59839 (Services through 11-19-2020) $1292.00
      2. Motion to approve: Director Fayram, 2nd by Director Arme. Approved 4-0.

   B. District Election and Appointment Status Update
      1. Swearing-in and Seating of Director Fayram Completed.
      2. Appointment process for vacant position reviewed and expected in January.

   C. WWTP Siting Options
      a. Siting – Received update on Siting Feasibility Study (One Mile criteria) RFP. Additional solicitations to be obtained before next meeting for award on January 13th.
      b. Letter to ID1 requesting consideration of sharing Well 5 Site will be sent before January 2021.

   D. Groundwater Monitoring Plan Update & Timeline -GSI
      1. GSI Task Order No. 1 proposal considered. Contract with GSI Approved. Motion to approve: Director Fayram, 2nd by Director O'Neill. Approved 4-0.

   E. Funding and Grant Report and Milestones

1. A full Report and Presentation of the SRF Grant Application (Phase 1 Planning) was given by Greg Jaquez, PE (MNS).Application to be submitted before the end of the year with confirmation to the Board
2. Bureau of Reclamation Grant being “watched“ for emergence as a viable option. GSA Update in January.

F. Residential Requirements-Local LAMP Document
   1. Report on Paul Jenzen Meeting and Update of progress and estimate to complete. Draft should be expected by 1-4-2021 (suggestion by Brad Ross) in order to have full Board discussion on 13th. Paul Jenzen will be available at January 13th meeting to discuss.
   2. Process and timeline for review and approval by SBCEHS & RWQCB: goal for agency review in January, with acceptance in February.
   3. Director Fayram indicated this is the “most critical task“.
   4. Diector O’neill indicated that a key goal is removal of the Special Pronlem Area (SPA) designation.

G. Environmental Consultant Selection – Timeline and Completion Date
   1. No Change: RFQ Sent out 11-24-2020 Due 12-21-2020.

H. Year End Update to Residents – Review Draft Letter will be sent out before Christmas.

8. Next Regular Meeting: Wednesday, January 13, 2020, 6:00 p.m.

9. ADJOURNMENT : 7:35 Motion to approve: Director Fayram, 2nd by Director O‘Neill. Approved 4-0.

APPROVED

____ Lisa Palmer, President

ATTEST

____ Doug Pike, IGM/Secretary

POSTED 11-8-2019

Tom Fayram, President
Lisa Palmer, Vice President
Julie Kennedy, Secretary
Mike Arme, Director
Brian O'Neill, Director

LOS OLIVOS COMMUNITY SERVICES DISTRICT

Board of Directors Meeting, November 13, 2019, 6:00 p.m.
Los Olivos School, Room 602
2540 Alamo Pintado Avenue, Los Olivos, CA 93441

REGULAR MEETING AGENDA

1. CALL TO ORDER

2. ROLL CALL

3. PLEDGE OF ALLEGIANCE

4. APPROVAL OF MEETING MINUTES

a. Minutes of 10-09-2019 Regular Meeting

5. DIRECTOR COMMENTS

Directors will give reports on any meetings that they attended on behalf of the District and/or choose to comment on various District activities.

6. PUBLIC COMMENTS

Members of the public may address the Board on any items of interest within the subject matter and jurisdiction of the Board but not on the agenda today (Government Code - 54954.3).

Speakers are limited to 3 minutes. Due to the requirements of the Ralph M. Brown Act, the District cannot take action today on any matter not on the agenda, but a matter raised during Public Comments can be referred to District staff for discussion and possible action at a future meeting.

7. INTERIM GENERAL MANAGER REPORT

Interim General Manager Report on current assignments and general District business. See Attached.

8. BUSINESS ITEMS

A. **Project Funding From the County EHS Department, including Senator Hannah-Beth Jackson set-aside funds for Los Olivos water quality improvement support. Discuss all correspondence and communications of EHS with Los Olivos CSD Directors and Staff. Direct next steps including next meeting with Mr. Larry Faye, with ideas on who should attend, when, what to discuss, how to work cooperatively with the County moving forward.**

B. **Budget Update Report from the Finance Committee.**

C. **Consider Committee recomendations, funding availability and Approve and Authorize of the following Contracts:**

   a. **Proposal from Paul Jenzen's to Develop A Local Agency Management Program for the Los Olivos Community Services District. Specialty product, consider finding that sole source is in the best interest of the District. (Proposal Attached)**

Date

Mr. Doug Pike
General Manager
Los Olivos Community Services District
Address

Dear Mr. Pike:

RE: Proposal to Develop A Local Agency Management Program for the Los Olivos Community Services District

Thank you for meeting with David Brummond and myself on July 16, 2019 to discuss the Los Olivos Community Services District's (District) interest in developing its own Local Agency Management Program (LAMP). Pursuant to that discussion, Coastal Onsite Design Services is pleased to submit the following proposal.

BACKGROUND

Los Olivos is an unincorporated community of approximately 1000 located in the Santa Ynez Valley north of the City of Santa Barbara. While water to the community is provided by the Santa Ynez River Water Conservation District (ID1), there is no there is no public sewer. Consequently, the residents utilize onsite wastewater treatment systems (OWTS) to treat and dispose wastewater.

Overall authority for the regulation of OWTS lies with the State Water Resources Control Board (SWRCB). As such, in 2012 the SWRCB adopted its Water Quality Control Policy for the Siting, Design, Operation and Maintenance of Onsite Wastewater Treatment Systems (Policy). The Policy became effective in 2013 and established a risk-based, tiered approach for the regulation of OWTS that includes minimum standards for new and replacement systems.

The Policy also allows for local agencies to develop Local Agency Management Programs (LAMP) that are alternative regulations customized to reflect jurisdiction specific conditions but are equally protective of water quality. The Central Coast Regional Water Quality Control Board approved Santa Barbara County's LAMP in November 2015 which then went in effect in January, 2016. The County's LAMP is extensive covering the siting, construction, repair, maintenance and destruction of OWTS in the unincorporated areas of the county.

The Los Olivos Community Services District was formed in April 13, 2018 primarily to address the wastewater treatment and disposal issues that exist in the township. Subsequently, the District is interested in developing a LAMP for its area of jurisdiction.

Proposal

The elements for a Local Agency Management Program are specified under Tier 2 of the Policy. Consequently, the LOCSD LAMP would contain the following elements:

- Minimum standards for the siting, design, construction, operation and maintenance of OWTS within the LOCSD. These standards may be different from those specified in Tier 1 of the Policy but they must be equally protective of water quality.
- Detail the maximum projected OWTS flows authorized by the LAMP as well as the types of systems that would be permitted under the program. These may include standard, supplemental treatment and alternative systems.
- The criteria and procedures for requesting a variance from specific standards or requirements.
- Certification/licensing requirements for companies and or individuals engaged in OWTS activities.
- The District's homeowner education program that explains how to operate and maintain their OWTS.
- The types of records that will be maintained by the district as well as the number and frequency of reports that will be provided to the Central Coast Water Board.
- The Water Quality Assessment Program to be implemented to track the effectiveness of the LAMP in protecting/improving water quality.

Staff and Hourly Rate

David Brummond will be assisting me with the development and writing of the Los Olivos Community Services District LAMP. Mr. Brummond and I are both Registered Environmental Health Specialists with more than 50 years of combined experience in Environmental Health. In addition we were co-authors of the Santa Barbara County LAMP and its implementing regulations. Our rate is $160.00/hr. per person, and we estimate that approximately 120 staff hours will be required for this project.

Notice to Proceed

We anticipate that it will take 180 days to complete the project once we receive a Notice to Proceed.

Thank you for the opportunity to submit this proposal. Please call me at 805-310-7521 should you have any questions.

Sincerely,

Paul Jenzen
Coastal Onsite Design Services

Santa Barbara County Public Health Department
Environmental Health Services

Onsite Wastewater Treatment Systems

Local Agency Management Program

Lawrence Fay, Director

Revision 1: 07/21/15

2014

Revision History

Date	Revision	Description
12/09/14	0	Original Document
07/21/15	1	Incorporates changes recommended by the Central Coast Water Board

TABLE OF CONTENTS

Section I
Introduction

The California Water Code authorizes the State Water Resources Control Board (SWRCB) to regulate all discharges that could affect the quality of the waters of the state. The policies of the SWRCB are implemented locally through nine regional water quality control boards. Historically, each regional board developed “basin plans” that outlined water quality objectives in their respective jurisdictions as well as policies and programs to achieve those objectives.

Discharges are regulated through the use of Waste Discharge Requirements that act as discharge permits. With regards to the regulation of wastewater in Santa Barbara County, the Central Coast Regional Water Quality Control Board (Central Coast Water Board) issues discharge permits to the municipalities and special districts that operate wastewater (sewage) treatment plants in the county. In addition, they issue storm water permits to the incorporated cities and to the County as well as permits for the use of recycled water.

The State’s regulatory authority extends to individual Onsite Wastewater Treatment Systems (OWTS). Therefore, general guidelines for the siting, design and construction of new OWTS were part of each regional board’s basin plan. The SWRCB and the regional boards recognized the advantages and efficiencies of regulation of such systems by local agencies. Consequently, while the regional boards retained primacy over large and some specialized systems, direct regulatory authority for individual OWTS has been delegated to individual counties through Memorandums of Understanding.

In June 2012, the SWRCB adopted the Water Quality Control Policy for Siting, Design, Operation and Maintenance of Onsite Wastewater Treatment Systems hereinafter referred to the as the State Policy or the Policy. The Policy became effective in May 2013 and for the first time, established a statewide, risk-based tiered approach for the regulation and management of OWTS. Please see Appendix 2 to review the complete text of the Policy.

Under the tiered approach of the Policy, Tier 1 establishes minimum standards for low risk new or replacement OWTS. Tier 2 allows local agencies to develop customized management programs that address the conditions specific to that jurisdiction. These Local Agency Management Programs (LAMPS) must be approved by the appropriate regional water quality control board. Tier 3 applies special, enhanced standards to both new and existing OWTS located near a water body that has been listed as impaired due to nitrogen or pathogens pursuant to Section 303(d) of the Clean Water Act. Once approved, the standards contained in an approved LAMP supersede the Tier 1 standards.

Environmental Health Services acknowledges that the Tier 1 standards afford an essential level of public health and water quality protection. Accordingly, the County’s local ordinance (Appendix I) includes a number of the Tier 1 standards including the site and soil evaluation requirements, effluent application rates and setbacks to groundwater. Additionally, the Tier 1 standards apply unless they are specifically addressed in the LAMP or ordinance.

There are however, certain elements in Tier 1 that would be problematic in Santa Barbara County. Examples would include: ***limits on dispersal field depth, the 2½ acre minimum parcel size for new lots on which an OWTS can be installed and the prohibition of the use of seepage pits.*** There are properties throughout the county where these restrictions would preclude an individual from developing their property.

To reconcile these competing concerns, when conditions will not allow the use of a standard OWTS, the ordinance will require the use of supplemental treatment in conjunction with an operating permit, to remove the constituents of concern. Conditions of the operating permits would include regular system inspection, maintenance and reporting. Consequently, in those areas where the County's ordinance differs from Tier 1, the required mitigation measures would result in an equal level of public health and groundwater protection.

On September 10, 2013 the Santa Barbara County Board of Supervisors authorized the Local Health Officer and Director of the Public Health Department to submit a letter to the Central Coast Regional Water Quality Control Board informing the Board of the County's intent to develop a LAMP in lieu of implementing Tier 1 standards. It is the intent of the Board of Supervisors, in adopting this plan, to ensure that OWTS are constructed, modified, repaired, abandoned, operated, maintained, inspected and serviced in a manner that prevents environmental degradation and protects the health, safety and general welfare of the people of the county.

This LAMP conforms to all of the applicable Tier 2 criteria listed in Section 9 of the State Policy including adherence to the "prohibitions" contained in Section 9.4. It is structured and organized in accordance with the Onsite Wastewater Management Plan Guidance developed by the Central Coast Water Board included in Appendix 3.

The actual standards for existing and new OWTS are specified in the State Water Resources Control Board's Policy, the California Plumbing Code and in Article I, Chapter 18C of the Santa Barbara County Code (Ordinance). The County ordinance has been revised and updated so that it addresses conventional OWTS (those systems using a standard tank and dispersal field as well as those utilizing supplemental treatment or alternative systems such as mound and evapotranspiration systems). A complete copy of the ordinance is included in Appendix I.

OWTS, including conventional systems, require routine maintenance in order to ensure that they function properly and to extend the life of the system. While this LAMP does not require mandatory maintenance for conventional systems, operating permits with regular maintenance and reporting conditions, will be required for all other types of systems.

It is the intent of Environmental Health Services (EHS), as the Administrative Authority, to regulate all domestic waste flows up to peak flows of 10,000 gallons per day, the maximum allowed under the state regulations**.** Surface discharge and other types of wastewater discharge such as winery production waste will be regulated by the Regional Water Quality Control Board unless an agreement is made with EHS for those duties.

The provisions of this LAMP will apply to the unincorporated areas of Santa Barbara County. It will not be implemented within the incorporated cities unless there is an agreement approved by the County and the City extending the authority of EHS to within the City's jurisdiction.

While every effort was made to make this a comprehensive plan, it is likely that it will be necessary to modify it in the future for several reasons. Section 9.3.3 of the Policy requires that a jurisdiction complete an evaluation of its monitoring program every five (5) years to determine if water quality is being impacted by OWTS and whether modifications must be made to its LAMP to address any noted water quality impacts. In addition, modifications or revisions will be needed as technology, conditions and experience change over time. When it has been determined changes are necessary, those changes will be made after consultation with the Central Coast Regional Water Quality Control Board and if changes are substantive, EHS will return to the Santa Barbara County Board of Supervisors for approval.

Section II
Survey and Evaluation

In 2001, Santa Barbara County Environmental Health Services (EHS) authorized an in-depth survey of the OWTS in the county that was completed in 2003. This survey offers a comprehensive review of the climate, soil and geologic conditions in Santa Barbara County as they relate to onsite sewage treatment systems as well as a comprehensive review of the distribution, age and condition of systems throughout the county. The conditions have not changed significantly since the survey was completed and it still represents the best data source on the use of OWTS in the county.

A significant part of the survey consisted of researching and compiling existing data from a number of different sources. These included reviewing previous OWTS surveys, and Septic Tank Inspection Reports as well as EHS and Central Coast Water Board files. An additional source of information was the collective knowledge and experience of EHS staff, the Central Coast Water Board staff, contractors, consultants and individual homeowners.

While the Septic System Survey (the Survey) covered the entire county, it focused on the designated "special problem areas" and other areas where there are especially dense concentrations of OWTS and or other specific problems with the use of these systems. The goals of the survey were to:

- *assess the impacts of existing OWTS on groundwater and surface water'*
- *identify those areas that are problematic for the use of OWTS;*
- *determine the condition of the systems that were surveyed;*
- *identify areas where OWTS inspection and servicing is recommended;*
- *identify areas where the extension of the public sewer was warranted and feasible.*

Due to its length (in excess of 200 pages) the entire Septic System Sanitary Survey is not included in this LAMP. However, the Executive Summary is included on the following pages followed by a Survey Update. The complete Survey can be accessed through the EHS website at:

www.countyofsb.org/phd/environmentalhealth

2003 Septic System Sanitary Survey
Executive Summary

Introduction

This report presents the results of a Septic System Sanitary Survey of Santa Barbara County conducted by Questa Engineering Corporation for the Santa Barbara County Environmental Health Services. The study is one of a number of efforts that the County has undertaken over the past several years in response to the growing concerns about the use and public health and water quality impacts of septic systems. Other activities to improve the understanding and overall management of septic systems in the County have included:

- *County Wastewater Ordinance. Updating of County regulations for onsite sewage dispersal systems, including the prohibition of hollow "seepage pits".*
- *GIS Mapping. Development of a Geographic Information System (GIS) analysis to begin the process of locating, characterizing and tracking the septic systems in the unincorporated area of the County.*
- *Septic Tank Inspection Reports. Requirements for inspection, evaluation and reporting of the condition and noted deficiencies whenever a septic system is serviced.*
- *Public Education. Provision of educational information and workshops on basic operational and maintenance aspects of septic systems.*
- *Septic to Sewer Conversions. Acquisition of State funding to support local efforts to investigate and develop plans for extension of public sewers to areas experiencing chronic septic system problems.*

The Septic System Sanitary Survey was undertaken with the express purpose of collecting and consolidating pertinent data regarding onsite sewage dispersal systems, assessing the associated impact on public health and water quality, identifying and evaluating specific areas that are problematic for the use of septic systems, and developing recommendations on ways to address certain types of problems or specific problem areas. The study covered the entire County; however, the primary focus of the work was centered on identified "Special Problem Areas" and other parts of the County where there are especially heavy concentrations of septic systems and/or suspected problems. The Study was not intended to isolate or evaluate the functioning status or impact from individual septic systems or specific properties.

Geology, Soils and Water Resources

Geology

The geology of Santa Barbara County is related to the tectonic and depositional history of the area. The northeast portion of the county is mountainous with a northeast to southwest structural trend paralleling the San Andreas Fault. The southeast and south coast portions of the county have a structural trend of east-west, which includes the Santa Ynez Mountains. The western coast and adjacent low-lying valleys and hills in the north-central region trend mainly west-northwest to east-southeast.

South Coast Region. In the south coast and coastal mountains portion of the county, the rocks are characterized by a folded stratigraphic sequence that increases in age, in general, from the southwest to the northeast across the Santa Ynez Mountains. Alluvial deposits are also present along the coast and in stream valleys and include alluvium and alluvial fan deposits of silt, sand and gravel, and boulder-cobble fanglomerate and conglomerate. A large amount of residential development utilizing septic systems has occurred in areas that lie at the interface between the alluvial deposits and the Quaternary and Tertiary sedimentary formations, especially in the Goleta, Santa Barbara and Carpinteria areas.

Bedrock types include shale, siliceous shale siltstone and sandstone. Most of the bedrock of the area has low permeability and low percolation rates. Shale, mudstone, and claystone have very low permeability. Geologic formations posing the most difficult constraints for septic systems include the Rincon, Monterey, Sespe and (locally) Santa Barbara formations due to very low or highly variable permeability. Surficial sedimentary deposits are generally favorable for septic system, but may have constraints locally due to excessively fast percolation rates, steep slopes, drainage, flooding, and high groundwater conditions.

West Coast and North-Central Region. The west coast and north-central portion of the county is dominated by Quaternary sedimentary deposits and underlying Tertiary deposits. In the river valleys and low-lying coastal plains, deposits are dominated by surficial sediments and older dissected surficial deposits. These sediments include recent and older beach sands, dune sands, stream channel deposits of gravel, sand, and silt, remnants of beach terrace and alluvial fan deposits, and the Orcutt Sand, a wind-blown sand deposit. These deposits are generally moderate to well drained with variable percolation rates; however, locally, permeability and septic system suitability can be restricted due to accumulation of finer-grained sediments or high water table conditions.

Northeastern Region. The northeastern portion of the county consists of the San Rafael and Sierra Madre Mountains. This part of the county is very sparsely developed, with very few septic systems. These mountains are dominated by a sequence of folded Tertiary and Cretaceous age sedimentary deposits. Rock types include sandstone, siltstone, claystone, shale and conglomerate.

Soils

South County. The South County soils are divided into three main categories as follows:

Alluvial Fans, Flood Plains, Valleys, and Tidal Flats. Alluvial fans, flood plains, valleys, and tidal flats are mostly located along the coast and adjacent drainage ways. The soils are formed from sedimentary-derived alluvium. The soils are generally moderately to severely limited for leachfield use due to flooding, wetness, moderately sloping ground, and slow permeability. Some sandy areas have rapid permeability.

Terraces and Coastal Valleys. The terraces and coastal valleys are located within four miles of the Pacific Ocean and along the coastline. In these areas the soils tend to be relatively deep, formed in alluvium derived from sedimentary rock, and are moderately well drained to well drained. In general, these areas tend to be suitable for leachfield systems; however, there are some sections within this area where steep slopes and slow permeability present moderate to severe limitations for leachfield use.

Foothills and Mountains. The soils in the foothills and mountains are loamy sands and clays derived from shale, sandstone sediments, and some igneous rock. Leachfield suitability ranges from moderately to severely limited, although most soils are severely limited. The limitations are due to slow percolation rates, steep slopes, and shallow depths to bedrock.

North County. The North County soils are divided into four categories as follows:

Alluvial Fans, Flood Plains, Valleys, and Terraces. These soils are deep and range from somewhat excessively well drained to somewhat poorly drained and occur on nearly level to moderately steep slopes. The soils are formed in alluvium derived mostly from sedimentary rock. The soils have a broad range in permeability, from slow to rapid, depending upon the relative amount of sands, silts and clays in the sedimentary deposits. Consequently, the areas include soil types that range from slightly to severely limited for leachfield use.

Terraces and Adjacent Uplands. The terraces and adjacent upland soils are somewhat excessively drained to somewhat poorly drained sands to clay loams. Slow permeability, slopes, and poor drainage slightly to severely limit leachfield use in these areas.

Uplands and High Terraces. These soils are sands to clays derived from sedimentary and igneous rock. Leachfield suitability ranges from moderately to severely limited, though most soils are severely limited. The limitations are due to slow percolation rates, steep slopes, and shallow depths to bedrock.

Miscellaneous Land Types. Miscellaneous land types include sedimentary rock landscape and coastal sand dunes and beaches, which have relatively little or no significance or impact on the use and effects of septic systems in Santa Barbara County. They are used for watershed and recreation.

Surface Waters

Santa Barbara County contains six principal watersheds: South Coast, Santa Ynez, San Antonio, Santa Maria, Cuyama and Sisquoc River. The South Coast Watershed is unique in that it consists of north-south flowing drainages flowing from their headwaters in the Santa Ynez Mountains to the Pacific Ocean. The other principal watersheds generally drain from east to west. In all watersheds, flow is highly dependent upon rainfall, with little base flow (i.e., from groundwater) and no significant snowmelt. Average annual rainfall in the County ranges from 9 inches in New Cuyama to 24 inches in the Santa Ynez Mountains; annual rainfall along the coast is in the range of 16 to 18 inches.

Groundwaters

Overall, groundwater supplies an estimated 75-85% of Santa Barbara County's commercial, industrial, and agricultural water. However, some areas, such as the Goleta Water District, have used almost no groundwater for several years. There are eleven major groundwater basins, located in four geographically distinct regions of the county. There are also four relatively small and/or undeveloped groundwater basins in the county.

South County. Five major groundwater basins are located between the Santa Ynez Mountains and the Pacific Ocean: Carpinteria, Montecito, Santa Barbara, Foothills and Goleta. The basins are generally composed of unconsolidated material from uplift and erosion of the mountains.

Santa Ynez River. Three major groundwater basins lie within the drainage area of the Santa Ynez River, Santa Ynez Uplands, Buellton Uplands, and Lompoc Groundwater Basin.

North County. The North County Groundwater Basins include the San Antonio and Santa Maria Valley Groundwater Basins. Land use is dominated by agriculture, though ranching, urban development, and oil development are also distributed through the basins.

Cuyama. Encompassing 255 square miles, the Cuyama Groundwater Basin is located between the Caliente Range to the north and the San Rafael Mountains to the south. Roughly twenty percent of the basin's area underlies northeastern Santa Barbara County, with most of the basin extending into Ventura, Kern, and San Luis Obispo Counties.

Existing Septic System Practices

Regulatory Framework

In California, all wastewater treatment and disposal systems, including individual septic systems, fall under the overall regulatory authority of the State Water Resources Control Board and the nine California Regional Water Quality Control Boards (Regional Boards). The Regional Board's involvement in regulation of onsite systems most often involves the formation and implementation of basic water protection policies. These are reflected in the individual Regional Board's Basin Plan, generally in the form of guidelines, criteria and/or prohibitions related to the siting, design, construction and maintenance of onsite systems. The Regional Boards generally delegate regulatory authority for septic systems to counties, cities or special districts, subject to the condition that the local agency commits to enforcing the minimum requirements contained in the Basin Plan policies. The Regional Boards generally elect to retain permitting authority over large and/or commercial or industrial onsite systems.

Santa Barbara County falls within the jurisdiction of the Central Coast Regional Water Quality Control Board (Regional Board). The Regional Board has adopted policies and requirements pertaining to onsite systems that are contained within the Water Quality Control Plan for the Central Coast Basin, more commonly referred to as the "Basin Plan". The onsite systems element of the Basin Plan sets forth various objectives, guidelines, general principles and recommendations for the use of onsite systems that cover various topics related to siting, design, construction, operation, maintenance and corrective/enforcement actions.

Since 1991, onsite sewage disposal systems in Santa Barbara County have been regulated by the County Public Health Department, Environmental Health Services Division. Prior to that, permitting of onsite systems came under the administrative authority of the County Building Department.

Santa Barbara County regulations for onsite sewage disposal systems are contained in Chapter 29, Article II of the County Code, which was most recently updated in 1999. This is commonly referred to as the "County Wastewater Ordinance". These regulations set forth specific requirements related to (a) permitting and inspection of onsite systems; (b) septic tank design and construction; (c) drywell and disposal field requirements; and (c) servicing, inspection, reporting and upgrade requirements. Standards pertaining to system sizing and construction are contained in the California (Uniform) Plumbing Code. Additional requirements for onsite systems in Santa Barbara County may be adopted as part of Community Plans or as project-specific mitigation measures or conditions applied to development proposals lying within a designated Special Problem Area of the County.

Septic System Design and Siting Requirements

Santa Barbara County septic system requirements provide for use of conventional systems including septic tanks for treatment and leachlines or drywells for disposal.

Leachlines are the preferred method of disposal; drywells are permissible only where the use of leachlines is infeasible. Hollow "seepage pits" have been prohibited since 1999. There are only a small number of "alternative" systems (less than 10) in the County; these are systems that provide additional treatment (beyond the septic tank) or different methods of disposal (e.g. mounds, or pressure-dosing leachfields) designed to overcome specific soil or groundwater constraints.

Standard criteria in County regulations follow the Basin Plan guidelines, and address such factors as (a) soil characteristics and depth; (b) percolation rates; (c) vertical separation to groundwater; (d) maximum ground slope; (e) setback distances to wells and water features; (f) system sizing; and (g) reserve area for future drainfield replacement/expansion.

Septic System Usage in Santa Barbara County

GIS Mapping. In early 2000, Santa Barbara County undertook a project using Geographic Information System (GIS) analysis to begin the process of locating, characterizing and tracking the septic systems in the unincorporated area of the County. The study determined that there are an estimated 8,749 properties in unincorporated areas served by septic systems, plus an additional 581 parcels within sewer districts that also have septic systems, despite the availability of sewers. The Health Department has used this work as a springboard to begin the "hard file" conversion of years of septic system permit history into the Department's permit software program and the GIS database. The Septic System Sanitary Survey helped advance this effort and also was able to take advantage of some of the first "batches" of information converted to the GIS database system.

Identification of Focus Areas. The GIS mapping information shows that septic system usage in Santa Barbara County includes a large number of systems scattered widely throughout the County, with heavy concentrations around the main population areas of the South Coast and the Santa Ynez Valley and, to lesser extent, the Orcutt and Santa Maria areas (see **Figure 2-1**). Under the Septic System Sanitary Survey, the GIS mapping data, along with reconnaissance field surveys and other information, was used to help identify 24 "Focus Areas", which encompass the heaviest concentrations of septic systems and the areas of potentially greatest concern from a public health and water quality perspective. The Focus Areas encompass defined neighborhoods or geographical areas warranting special attention; they also provide the basis for presenting the full range of conditions and problems that need to be addressed in regard to septic system usage in the County. These locations of the Focus Areas are indicated in **Figure 2-1** and described in **Table 2-1**. They encompass about 4,300 septic systems, or approximately 45% of the total number of systems in the County. They include roughly 2,850 parcels in the South Coast and about 1,450 parcels in the Santa Ynez Valley and North County. The largest numbers of systems covered in the list are in Hope Ranch, Montecito Area, Santa Ynez and Los Olivos. The smallest Focus Areas identified are Rincon Point several small subdivisions in the Goleta foothills area and near Orcutt.

Figure 2-1
Septic System Usage and Focus Areas

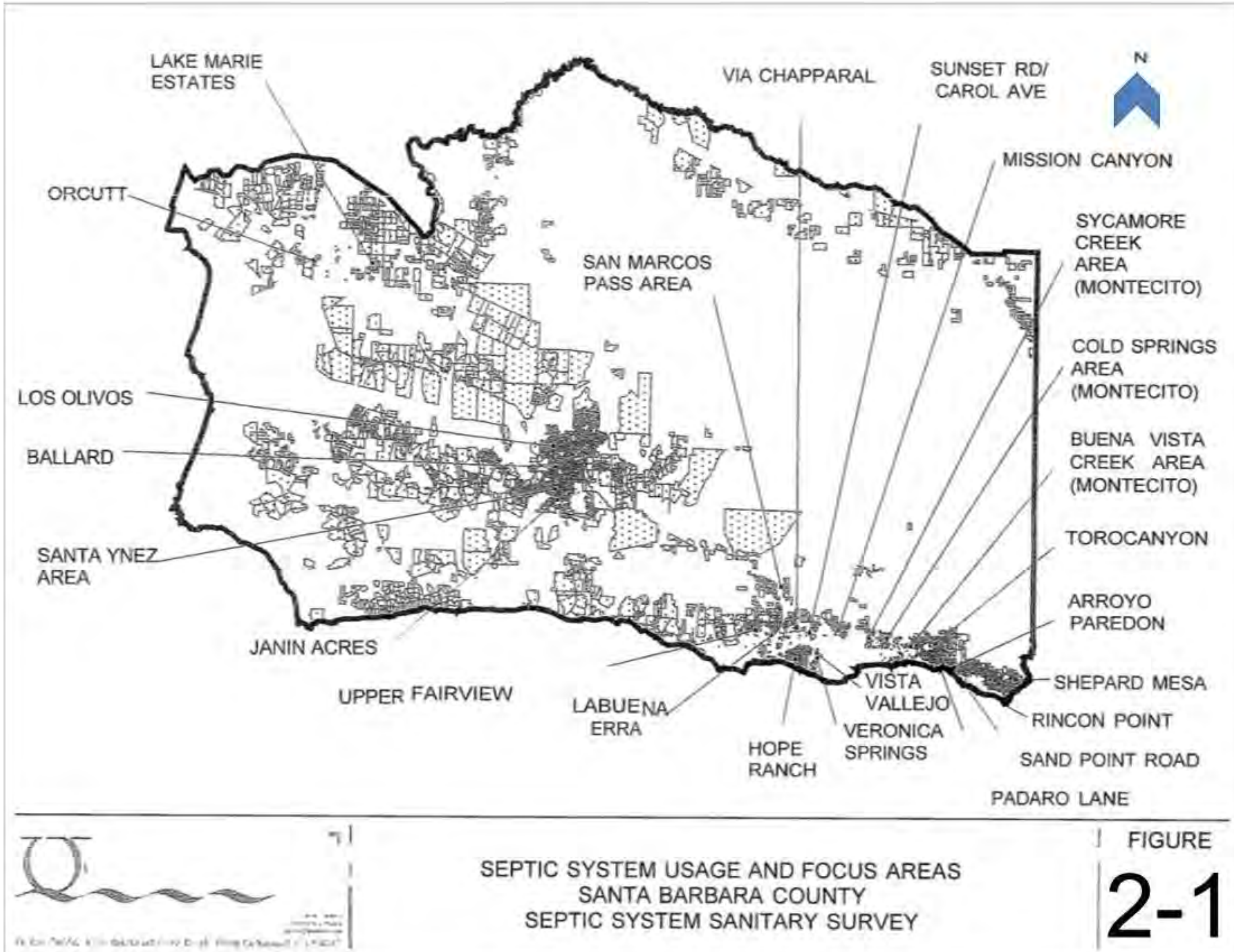

Table 2-1

Focus Area	Area (Acres)	Number of Septic Systems	Description
CARPINTERIA AREA			
Rincon Point	10	36	Beachfront development area at Santa Barbara-Ventura County line; high groundwater conditions, small lots abutting Rincon Creek and ocean. Nearshore ocean waters listed as 303(d) impaired water body for pathogens: prior water quality studies Lower Rincon Creek Watershed Study (DNA study) and South Coast Characterization Study. Sewer study in progress.
Shepard Mesa	448	119	Special Problem Area; large-lot rural residential area; Rincon Creek and Carpinteria Creek watershed.
Arroyo Paredon	303	84	Semi-rural area near Carpinteria in area of orchards and greenhouses near Foothill Road. Drains via Arroyo Paredon Creek to ocean at Serena area.
Sand Point Rd	85	70	Beachfront area between Carpinteria Marsh and Pacific Ocean along Sand Point Road and Avenue Del Mar; small lots on dune sands with high groundwater conditions: preliminary sewer feasibility study completed by Carpinteria Sanitary District.
Padaro Lane	47	53	Beachside area east of Loon Point (Summerland); many beachfront lots on dune sands with high groundwater conditions; preliminary sewer feasibility study completed by Carpinteria Sanitary District.
Toro Canyon	1.058	297	Toro Canyon Plan Area; medium to large lot rural residential area; difficult soil and topographic constraints and close proximity to East and West Toro Creek. Special septic system requirements adopted for area in Toro Canyon Plan.
MONTECITO AREA			
Buena Vista Creek Area	544	340	Large semi-rural residential area located above E. Valley Road in Romero Creek and Buena Vista Creek drainage basins. Very high density of septic systems on small lots in vicinity of Orchard Avenue and Tabor Lane; difficult terrain and soil conditions in higher elevations: located in Montecito Sanitary District.
Cold Springs Area	379	141	Semi-rural residential area located above E. Valley Road in Cold Springs-Montecito Creek drainage basins. Difficult terrain and soil conditions in higher elevations; located in Montecito Sanitary District.
Sycamore Creek Area	340	175	Semi-rural residential area located above Sycamore Canyon Road adjacent to Santa Barbara; medium to large lots; difficult terrain and soil conditions in higher elevations; creek encroachment-setback problems; located in Montecito Sanitary District.

Focus Area	Area (Acres)	Number of Septic Systems	Description
SANTA BARBARA AREA			
Mission Canyon	485	253	Special Problem Area; large semi-rural residential area adjacent to Santa Barbara in generally steep terrain with difficult soil and geologic conditions for septic systems; several alternative septic system designs (evapotranspiration systems) used to overcome constraints; drains to Mission Creek through Botanical Gardens, which is listed as 303(d) impaired water body for pathogens; prior water quality sampling data from South Coast Characterization Study and Project Clean Water.
Vista Vallejo	12	49	Pocket of small residential lots surrounded by Santa Barbara urban area near Santa Barbara Golf Club: many old septic systems 40+ years old: located in Arroyo Burro Creek watershed.
Veronica Springs	82	77	Semi-rural residential area on hilly terrain near mouth of Arroyo Burro Creek; some parcels border tributary stream; variable to difficult soil and geologic conditions for septic systems; Arroyo Burro Creek listed as 303(d) impaired water body for pathogens.
Sunset St/Carol Ave Area	25	84	Pocket of small residential lots surrounded by Santa Barbara urban area near La Cumbre Road; many very small lots with limited septic system repair options; local water supply wells potentially at risk.
Hope Ranch	1,947	809	Medium to large-lot semi-rural residential community on rolling hills and coastal terraces west of Santa Barbara; drains via local tributary stream to ocean, Arroyo Burro Creek and Goleta area to west; mix of older and new homes with significant equestrian uses.
GOLETA AREA			
La Buena Tierra Area	31	27	Small pocket of semi-rural residences at north edge of Goleta: drains through orchards and urban area to San Jose and Maria Ygnacio Creek; moderate to good conditions for septic systems.
Via Chaparral/La Paloma Ave	102	59	Rural residential area in foothills north of Goleta near Highway 154; rolling hills with numerous small seasonal drainage channels; moderate to difficult conditions for septic systems.
Upper Fairview Area	397	97	Rolling foothills and creekside area at north edge of Goleta on Vegas Creek; includes Holliday Hills subdivision and La Goleta Road area. Moderate to poor soil and geologic conditions for septic systems: includes some multi-family residential properties and commercial business (Infogenesis). This area is characterized by shallow perched groundwater and very poor percolation.
Painted Cave Area	44	78	Small parcels located in steep. Rugged terrain near Painted Cave area and San Marcos Trout Club; older systems for homes built on National Forest; very poor/difficult conditions for septic systems.
SOUTH COUNTY TOTAL		2,848	

Focus Area	Area (Acres)	Number of Septic Systems	Description
SANTA YNEZ AREA			
Los Olivos	280	343	Special Problem Area; large number of small to very small lots in densely developed septic town setting; shallow groundwater in large portions of town; drywells discharge directly to water table; groundwater nitrate impacts documented; recommended for wastewater management plan by Regional Water Quality Control Board; prior septic tank maintenance study; dissected by Alamo Pintado Creek; tributary to Santa Ynez River.
Ballard	173	129	Special Problem Area; medium to large-lot rural town; medium to high density of septic systems; fair to good conditions for septic systems; many older developed properties with possible code compliance problems; adjacent to Alamo Pintado Creek; tributary to Santa Ynez River. Flood control improvements completed at the northeast end of the village alleviated shallow groundwater issues.
Santa Ynez Area	1.610	669	Large number and density of semi-rural and rural residential development on east side of Santa Ynez; soil conditions range from good to very poor due to undulating topography and high (perched) groundwater conditions caused by deposition from old stream meanders.
Janin Acres	207	98	Special Problem Area; rural residential subdivision and some commercial properties, located between Santa Ynez and Solvang; shallow restrictive soils favoring deep trenches and dry-wells have apparently led to elevated nitrate levels in groundwater/local water supply wells (Rancho Marcelino Water Company).
NORTH COUNTY			
Lake Marie Estates	134	181	Large semi-rural subdivision located east of Orcutt; relatively small lots in fair to good soil conditions; many older systems and some localized problems due to restrictive (slowly permeable) subsoils.
Orcutt	98	38	Large rural residential lots located west of Orcutt fair to good soil conditions: older systems and possible localized problems due to restrictive (slowly permeable) subsoils.
NORTH COUNTY TOTAL		1,458	
GRAND TOTAL		**4,306**	

Septic System Information Surveys

A major part of the Septic System Sanitary Survey was devoted to researching, compiling and reviewing existing information from a variety of sources, including: (a) prior septic system surveys; (b) personal experience and permit and complaint files maintained by the County Health Department and the Regional Water Board; (c) Septic Tank Inspection reports; (d) personal knowledge and experience of septic tank contractors and consultants; and (e) individual homeowners. This information forms a large part of the basis for assessing the status of septic system practices in the County.

Prior Studies

The only significant prior septic system surveys in Santa Barbara County were conducted in the Santa Ynez area. In 1975, the County completed a door-to-door survey in Los Olivos. The septic systems were found to be functioning satisfactorily, but most of the systems were determined to be discharging directly to groundwater during certain times of the year. In 1995, a Septic Tank Maintenance District Study was completed for the Santa Ynez area. This involved review of current practices and problems and an assessment of the feasibility of establishing a maintenance program to address the problems. No action has been taken to implement the conclusions and recommendations of the study.

County Records

Permit Files. One of the main sources of septic system information are County permit files. Since 1991, septic system permit files have been maintained by the Public Health Department in the Main Office (Santa Barbara) and North County Office (Santa Maria). Before that septic system permitting was the responsibility of the Building Department. Building Department septic system records are scattered and sketchy, and were not researched and compiled as part of this Study. It is estimated that there is permit information on file with the Health Department for about 25% to 30% of the septic systems in the County.

As part of the Sanitary Survey, an extensive review of permit files was completed. The file information was assembled in an excel spreadsheet, which was then incorporated into the GIS database for use along with the 800 to 900 electronic permit files already compiled by the Health Department staff. At the conclusion of the search, approximately 2,500 permit files were added to the County's permit database. From these data it was determined that permits issued over the past 10 years included 376 new construction, 173 modifications, 607 repairs, 251 abandonment, and 288 certification of existing systems. In terms of system types, the data show an almost even, 50-50 split between leachline and drywell designs.

Complaint Files. The Health Department maintains records of complaints that are received in regard to various public health or sanitation matters. Septic system surfacing and nuisance odor problems are a common complaint issue. As part of the Sanitary Survey individual complaint files were reviewed, concentrating mainly on information for the various defined Focus Areas. Complaint information was entered into excel spreadsheets, and made available for integration into the GIS database. During the period of 1993 through 2001, there were a total of 88 septic system-related complaints in the 24 Focus Areas examined in this Study. Of the complaints filed, approximately one-third were confirmed as a problem that the Health Department was able to trace to a malfunctioning septic system or graywater discharge. The Focus Areas recording the greatest number of complaints (six or more) were Hope Ranch, Mission Canyon, Sunset/Carol Avenue Area (Santa Barbara), Toro Canyon and Veronica Springs. The greatest numbers of confirmed problems (three or more) were the Sunset/Carol Avenue Area, Painted Cave Area, and Santa Ynez.

Septic Tank Inspection Reports

Septic tank inspection reports provided significant information for the Sanitary Survey. As part of this Sanitary Survey, data from the first three years of Septic Tank Inspection Reports were compiled and reviewed. Concurrent with the Sanitary Survey, the Health Department staff converted the hard copy Inspection Reports into an electronic format linked to the GIS database. The data reviewed included inspections for a total of 1,820 parcels, completed through December 2001.

Overall, the Inspection Reports for the first three years of this mandatory inspection program revealed 75 dry well/seepage pit failures, 59 leachline failures, and 223 additional unspecified failures. Failures are defined as those systems noted in the inspection reports as: (a) failed disposal field with discharge to surface; (b) disposal field not absorbing septic effluent; or (c) discharge of groundwater to surface/drainage (possible failure). This amounts to a total of 357 system failures that were identified in a 3-year period (roughly 120 per year) and have been (or will be) addressed with appropriate corrective action. These represent significant septic system problems that may have not been identified and addressed, were it not for the County's mandatory inspection and reporting program. Additionally, the Inspection Reports show that several hundred maintenance issues were identified and corrected through the septic system evaluations.

Inspection data for the various Focus Areas showed the following:

1. Inspection Rate. Overall, about 25% of the septic systems in these Focus Areas were serviced during the first three years of the Inspection Reporting Program. The areas having the greatest inspection activity, as a percentage of the number of systems, were Padaro Lane, Hope Ranch, Veronica Springs, Buena Vista Creek, Cold Springs, Sycamore Creek, Mission Creek, Upper Fairview and Toro Canyon. In these areas, the rate of inspection ranged from 25 to 33%. The areas with the lowest rate of inspection (less than 15% of the systems) were Painted Cave, Lake Marie Estates and Orcutt area.

2. Maintenance Rate. Overall, system maintenance work was required on approximately 5.3% of the systems in these Focus Areas during the 3-year reporting period. The areas reporting the greatest maintenance activity, as a percentage of total systems, were Sand Point Road, Hope Ranch, Rincon Point, Sycamore Creek and Mission Canyon. As a percentage of inspections performed, the greatest amount of required maintenance was reported to be in Rincon Point, Sand Point Road, Ballard, Santa Ynez, and Sunset/Carol Ave. Area.

3. Failure Rate. Overall, system failures were observed in about 4.3% of the total systems in these Focus Areas during this 3-year reporting period. The greatest number of failures were observed in Hope Ranch, Santa Ynez, Toro Canyon, Buena Vista Creek, Los Olivos and Sycamore Creek areas. As a percentage of the total systems in the area, Arroyo Paredon and Padaro Lane had the highest rate of failure (8%). The areas reporting the lowest number and rate of failures were Rincon Point, Orcutt area, Ballard, Painted Cave, and Mission Canyon.

Contractor-Consultant Questionnaire Survey

A questionnaire was developed and distributed to contractors and consultants that provide septic system services within Santa Barbara County to information, such as: (a) the types of septic system problems frequently encountered; (b) areas of concern; (c) problem ratings; (d) opinion on long term septic system management needs; and (e) comments or recommendations on standards, regulations, pumper inspection report requirements, monitoring needs, or any comments in general. Fourteen contactors/consultants responded to the survey.

In general the South Coast was given a medium overall problem rating. Specific focus areas that were assigned a high problem rating include Rincon Point, Padaro Lane, Sand Point Road, and Cold Springs area. Improved practices, which include routine system inspection, alternative design, community system, and sewers, were recommended for Rincon Point, Padaro Lane, Sand Point Road, Toro Canyon and Hope Ranch. In the North County, the overall problem rating was ranked as low to medium. Routine system inspections and allowing alternative designs were recommended for the Santa Ynez area. A minority of the respondents either had no opinion or felt the program is OK as is. Specific comments and recommendations received from contractors/consultants are listed in **Table 2-2**.

Homeowner Questionnaire Survey

A septic system questionnaire was developed and distributed to residents in the watershed areas that were selected for water quality sampling and for focused evaluation. In conjunction with the mail-out survey, five public meetings were held in the South Coast and North County areas during April 2002. The purpose of the questionnaire survey and meetings was three-fold: (1) to inform the residents in the study area about the Sanitary Survey and share some of the preliminary findings; (2) to allow homeowners to provide direct input to the Sanitary Survey regarding their own personal knowledge and experience with the septic system on their property; and (3) to provide a forum for discussion of septic system issues in general as a matter of public outreach and education. Out of approximately 3,860 questionnaire survey forms mailed to property owners, a total of 576 (15%) questionnaires were completed and returned by homeowners.

Briefly, information obtained from the homeowner questionnaire survey included the following:

- *Type of Disposal System. Approximately two-thirds indicated their system include leachlines for disposal; a little less than one-third reported dry wells/seepage pits.*
- *Graywater Systems. Approximately 7% reported having graywater systems.*
- *Age of System. About 16% indicated their system to be less than 10 years old, and nearly 60% stated that their system was more than 10 years old; the remainder indicated no knowledge of the system age.*
- *Pumping of System. About half of the people indicated they have their septic tank pumped out about once every 2 to 5 years, which is the normally recommended frequency. About the same number indicated less frequent pumping. Some (6%) indicated pumping once a year and, in Hope Ranch, about 2% reported more than one pumping per year, which is generally indicative of more frequent system problems.*
- *Repairs. Roughly 40% indicated that their septic system had been repaired at some point in time; and virtually all indicated that the repair was effective.*
- *Problems Observed. About 12% indicated that they had observed problems with their system, including: (a) slow drainage of plumbing fixtures and backup into the house; (b) wet areas and/or odors in the leachfield area; and (c) surfacing sewage (i.e., liquid on the ground surface). The predominant response for all problems was that the conditions occurred in response to heavy rainfall or for "unexplained reasons".*
- *Other Homeowner Comments. About 5% entered other comments on the survey form in the space provided. Most of the individual comments fell into three main categories: (1) expressing frustration with the operation of their septic system and urging the extension of sewers to their area; (2) emphasizing that septic systems can be effective as long as they are maintained properly; and (3) complaints about failures of neighboring septic systems.*

Table 2-2
Contractor-Consultant Comments and Recommendations

- **Design Standards and Regulations**
  - Recycler System
  - Efforts to update ordinance is good
  - Encourage sewer connections
  - Recommend minimum depth under 4" perforated pipe to be no less than 36"
  - Old systems are typically undersized
  - Require grease traps where needed
  - Install diverter valve instead of distribution box
  - Upgrade septic system, as needed, when house is remodeled.
  - Seasonal saturation is a problem
  - Old drywells are not gravel filled

- **Septic system pumper/inspection reporting requirements**
  - Enforce codes to repair or replace failed systems.
  - Require mandatory pumping every 2-3 years.
  - Drywells on pumper's maps should be checked for rock.
  - Properly pumping the septic tank and making sure invert is properly installed in the tank would solve most leachfield failures.

- **Other monitoring/inspection needs**
  - Safety
  - Pumpers completing inspection reports must be knowledgeable in the installation and maintenance of the systems that they inspect.

- **Other**
  - Montecito, Hope Ranch, and Padaro Lanes are good candidates for sewer because of poor percolation rates and/or high groundwater makes sites unsuitable for septic systems.
  - Poor design of the septic system is the rule rather than the exception.
  - Mainly old septic systems experiencing failure.
  - Eliminate use of septic systems.

Surface Water Quality Impacts

A major impetus for this Septic System Sanitary Survey was the chronic observation of high bacteriological readings in the ocean waters along the South Coast of Santa Barbara County. Discharges from septic systems located near the ocean or in the contributing watershed areas were identified as one possible source for these high readings. Various water quality sampling efforts have been conducted in the past, and there are other on- going studies and sampling programs that provide information on surface water quality conditions in Santa Barbara County. However, there have been no comprehensive water quality sampling studies directed specifically at septic system areas in the County. To address this "data gap", a surface water quality sampling effort was conducted as part of the Sanitary Survey. The purpose of the sampling program was to document the water quality conditions in surface streams in areas of the County where there are large concentrations of septic systems, to aid in assessing whether or not (and where) surface water contamination may be occurring as a result of existing septic system practices.

Sampling Program

Sampling Locations. Surface water sampling stations were selected to isolate, as much as possible, surface waters in areas having a relatively large number or heavy concentration of septic systems or where there have been historic problems or special concern regarding septic system usage. Initially, 53 sampling stations were identified for sampling on 20 different streams that flow through areas of the County served by septic systems. Approximately two-thirds of the sampling stations were on streams in the South Coast area, a few in the Orcutt area, and the remainder in the Santa Ynez area. Because of unusually low rainfall-runoff conditions during the period of the study, several of the proposed sampling stations were dry throughout the sampling period. Out of the original 53 identified sampling stations, only 33 had sufficient streamflow and were able to be sampled during the study.

Water Quality Constituents. The sampling program focused strictly on bacteriological impacts, which is the primary public health consideration relative to septic system practices and, generally, the best indicator of septic system influence. Each sample was analyzed for the following bacteria indicators: Total Coliform, E. coli, and Enterococcus.

Sampling Period and Methods. The water quality sampling was conducted over an approximate 14-week period in the winter and spring of 2002, starting the last week of January and extending into the first week of May. Six full sampling runs were conducted during the study period. The sampling program was designed to avoid sampling during rainfall-runoff periods, in order to avoid collection of stormwater runoff pollutants from other sources (e.g., animal wastes). There were no major storms during the sampling period; all samples were taken during what would be considered non-rainy periods.

Summary of Sampling Results and Findings

The results and findings from the sampling data can be summarized as follows:

1. A large percentage of the sample results were in excess of water contact recreation criteria for all bacteria indicator organisms; and this was common to most of the streams sampled.

2. Streams showing the lowest bacteriological readings and fewest incidents of exceedances included:

Romero Creek	San Antonio Creek
Buena Vista Creek	Maria Ygnacio Creek
Montecito Creek	San Jose Creek
Mission Creek	

3. Streams showing the highest bacteriological readings and the most incidents of exceedances included:

Rincon Creek	Sycamore Creek
Arroyo Paredon	Arroyo Burro Tributary
East Toro Creek	Hope Ranch (unnamed creek)
West Toro Creek	Alamo Pintado Creek

4. The percentage of all values found to be in excess of bacteriological water quality objectives for each indicator organism were as follows:

Parameter	Log Mean	Single Sample Maximum
Total Coliform	91%	35%
E. coli	39%	28%
Enterococcus	73%	53%

5. The percentage of values exceeding the State Health Department standards and Basin Plan objectives for water contact recreation (28 to 91 percent) was similar to the findings from the 1999 South Coast Watershed Characterization Study, which reported exceedance percentages of 30 to 90 percent for the four streams investigated in that study.

Groundwater Quality Impacts

Standard criteria for siting and design are intended to prevent adverse impacts on groundwaters from onsite sewage disposal systems. The most important factors are the provision of sufficient depth of unsaturated soil below the leachfield (or drywell) where filtering and breakdown of wastewater constituents can take place. Without adequate separation distance to the water table, groundwater becomes vulnerable to contamination with pathogenic bacteria and viruses, as well as other wastewater constituents (e.g., nitrogen). Highly permeable soils (e.g., sands and gravels) also provide minimal treatment of the percolating wastewater and normally require greater separation distances to afford proper groundwater protection. Additionally, where there is a high concentration or density of septic systems in a given area (i.e., small lot sizes), groundwater can be degraded from the accumulation of nitrate, chloride and other salts that are not filtered or otherwise removed to a significant extent by percolation through the soil. Adverse effects on groundwater quality from septic systems can show up in the form of degraded or contaminated well water supplies, or potentially as subsurface seepage into streams, lakes, lagoons or ocean waters.

The Septic System Sanitary Survey for Santa Barbara County did not include any field investigation or testing of groundwater quality. Instead, a review was made of available groundwater quality information to help in identifying areas of existing or threatened impacts from onsite sewage disposal systems. The information was obtained from published reports, County and Regional Water Board studies, and monitoring data from selected water supply wells in the County. The findings are summarized below.

Groundwater Basin Information

Information from the Santa Barbara County Water Agency and the Central Coast Regional Water Quality Control Board indicates that groundwater quality is generally adequate tor existing and potential uses in most of the groundwater basins in the County. However, the data indicate evidence of increasing nitrate levels in several of the major groundwater basins, namely, Santa Maria, Cuyama and Santa Ynez. The Regional Board has identified these groundwater basins for further investigation to determine the specific sources and develop appropriate measures to arrest, control or manage the nitrate problems. Agricultural operations are believed to be responsible for most of the observed increases in groundwater-nitrate concentrations. However, in the Santa Ynez Valley, the large concentrations of septic systems are also considered to be a contributing factor.

Water System Information

Review of groundwater data for small water system wells located in and around the defined Focus Areas show reasonably good groundwater quality, with respect to nitrate concentrations, for most of the systems. There are noticeably higher nitrate concentrations in several of the wells in the Santa Ynez and Los Olivos area, corresponding with findings of the Regional Board's groundwater-nitrate assessment study. None of the systems reported nitrate levels in excess of the drinking water limit of 45 mg/L; however, there were several showing results approaching the limit.

Groundwater quality data reported for small water systems in the South Coast area are generally lower in nitrate levels than in the Santa Ynez Valley, with the following exceptions.

Veronica Springs – Vista Vallejo Area. The Las Positas Mutual Water Company has one inactive well (#1) that has shown a consistently high nitrate concentration, virtually at the drinking water limit of 45 mg/L. This well draws its supply beginning at a depth of 75 feet and may be influenced by discharges from septic systems in the Veronica Springs area or, more likely, the Vista Vallejo area, which is located immediately to the north of the well.

Sunset Road/Carol Avenue Area. Nitrate data for the Amber Gardens and Lincolnwood Subdivision water wells in the Sunset Road/Carol A venue area of Santa Barbara show an increasing trend in nitrate concentration over the past 20 years, with levels approaching the drinking water limit in recent years. Both wells are in relatively close proximity and downgradient of the "pocket" of septic systems in the Sunset Road/Carol A venue area, where numerous drywells are used due to the relatively small lot sizes of these parcels. Based on the dense concentration of septic systems on relatively small lots so close by, there is a reasonable likelihood that the elevated nitrate concentrations in these wells is due mainly to septic system discharges.

Local Problem Areas

Two specific groundwater pollution problem areas have been documented in septic system areas in Santa Barbara County. These are Los Olivos and Janin Acres in the Santa Ynez Valley. The finding of elevated groundwater-nitrate problems in both of these areas was a significant factor in the Board of Supervisors' designation of these two areas as Special Problem Areas.

Los Olivos. In 1975, the Santa Barbara County Health Department conducted a door-to- door sanitary survey of residences and businesses in Los Olivos to assess the status of septic system conditions. The study revealed that about 60% of the properties were served by drywells that generally extend into permeable alluvial deposits and discharge directly to the groundwater during certain times of the year. A follow-up water quality sampling effort in 1977 showed conclusively that the high density of septic systems discharging into or immediately above the water table in Los Olivos is contributing to a significant increase locally in the groundwater-nitrate concentration. Some of the wells registered nitrate concentrations virtually at the drinking water limit of 45 mg/L.

Janin Acres. The Janin Acres subdivision, located between Solvang and Santa Ynez, was developed in the late 1960s and obtains its water supply from two local wells owned and operated by the Rancho Marcelino Water Company. Many of the parcels in the subdivision utilize deep trenches or drywells for onsite sewage disposal. Sampling of the Rancho Marcelino water wells over the past 40 years has indicated a significant increase in nitrate concentration that coincides with the development of the subdivision and the use of onsite sewage disposal systems in the area. The nitrate concentrations found in the wells has increased from less than 10 mg/l to over 50 mg/L (i.e., exceeding the drinking water limit) during this time period. The data show a strong correlation between groundwater quality degradation and the installation and use of septic systems in the Janin Acres subdivision and neighboring areas in Santa Ynez (to the north).

Problem Assessment

Using the data collected in the study, an overall problem assessment was made for each of the identified septic system Focus Areas. The purpose of this assessment was to define or rate the degree of the septic system problems in each of the Focus Areas related to environmental effects and provision of basic sanitation requirements. Septic system performance is affected by numerous factors that cannot be reduced to simple calculations; and evidence of system performance often changes over time and is not easily discerned from a one-time inspection or survey. Accordingly, the analysis incorporated a combination of factual (scientific) data, anecdotal information obtained from files, surveys and interviews, and professional judgment exercised by the project team based on many years of experience in this field. The results are intended to establish, as much as possible, an objective picture of the septic system operational and environmental conditions in each area to guide decisions on long-term management of these systems or, as necessary, their eventual replacement with more appropriate methods of sanitary waste treatment and disposal.

Assessment Factors

The following assessment factors and rating system were used as the basis for judging the suitability and performance of septic systems in each Focus Area.

Geology/Soils/Groundwater Constraints. The basic physical suitability of an area for the use of onsite sewage disposal systems is dictated more than anything else by the geology, soils and groundwater conditions. For this factor, a "High" rating was assigned to areas where siting constraints were judged to be significant because of the geology, soils or known high groundwater conditions. A "Medium" rating was assigned where there was found to be evidence of probable or variable, site-specific constraints. A "Low" rating was assigned to areas where the conditions appear, from all available evidence, to be generally suitable for septic system use with few or no serious inherent geologic, soils or groundwater constraints.

Lot Size and Density of Systems. Generally, the larger the lot size, the greater the ability for septic systems to be located and operated safely and effectively. For this factor, a "High" rating was assigned to areas having a high percentage of lot sizes less than 0.5 acres. A "Medium" rating was assigned for areas with lot sizes predominantly 0.5 to 1.0 acre or larger; and a "Low" rating was assigned for areas with lot sizes generally greater than 1.0 acres.

Total Number of Septic Systems. The number of septic systems in a given area is important from the standpoint of judging the total population that may be exposed to public health hazards or nuisances from malfunctioning systems. For this factor, a "High" rating was assigned to areas having generally 100 or more properties served by septic systems. However, there were also a few areas with a relatively small number of systems ("pockets") surrounded by urban development on public sewers that were also assigned a "High" rating. In these few instances the potential impacts on the surrounding (urban area) population were taken into account. A "Medium" rating was assigned generally for areas with 50 to 100 septic systems; and a "Low" rating was assigned to areas with about 50 or fewer septic systems.

Type and Age of Systems. This factor was included to give consideration to the age of the septic systems, which are an indicator of the likely technology and design standards in use, which, in turn, can be a reflection on the probable compliance with current codes and industry standards. For this factor, a "High" rating was assigned to virtually all Focus Areas. The only areas receiving a "Medium" rating were those judged to have reasonably suitable soil/site conditions in areas well removed from surface waters and groundwater impact areas. The basis for this distinction was that the potential for finding code compliance problems or system failure problems in these areas is less, despite the system age. No areas were believed to warrant a "Low" rating with respect to system type and age.

Survey Information. This factor provided for the consideration of a wide variety of background information and input regarding the general condition, suitability and performance of septic systems in each area as reflected in the information surveys and inspection data. Considerable professional judgment was used to interpret and apply the survey information. In general, the information was reviewed to look for an indication of chronic or repeated problems and other comments indicative of the level of septic system problems or concerns in each area. Based on this review, each area was rated, qualitatively, as "High", "Medium" or "Low", depending on the preponderance of the evidence available.

Proximity/Threat to Surface Water Uses. Avoiding impacts to coastal waters as well as streams, lakes and lagoons are an important aspect of septic system use and management. This is affected largely by proximity to surface waters and the nature or uses of the waters. For this factor, a "High" rating was assigned where septic systems immediately adjoin coastal waters, perennial streams or other significant seasonal watercourses. A "Medium" rating was assigned where the watercourses in the area were judged to be primarily seasonal in nature. A "Low" rating was assigned where there were few if any identifiable watercourses judged to be at risk of impact from septic systems in the area.

Proximity/Threat to Groundwater Uses. Properly sited and operated septic systems can generally be relied upon to provide suitable protection to groundwaters. However, older and deep drywell systems as well as high concentrations of septic systems may contribute pollutants directly to the water table without sufficient opportunity for soil absorption or dispersion. For this factor a "High" rating was assigned to areas overlying major groundwater basins of the County. A "Medium" rating was assigned where only portions of the Focus Area overly a groundwater basin. A "Low" rating was assigned where the area is located outside any active or known groundwater basins, such as in the upper foothill areas north of Goleta or immediately along the coast.

Evidence of Water Quality Impact. Impacts on both surface water quality and groundwater quality were a major impetus for the funding and authorization of this Septic System Sanitary Survey. The results from the surface water bacteriological sampling program conducted as part of this study, as well as results from other prior water quality investigations, were considered in judging each area. Generally, where water quality impacts have been documented which have caused or threaten to cause exceedance of water quality criteria (i.e., standards), a "High" rating was assigned. A "Medium" rating was assigned where water quality results are suggestive of a possible impact from septic systems; and a "Low" rating was assigned where, to date, there is little or no existing or prior evidence of water quality impact that would implicate septic systems in the area.

Summary of Results

Table 2-3 displays, in summary form, the results of the problem assessment of each of the 24 Septic System Focus Areas according to the various factors adopted for the analysis. In the far right-hand column an overall rating for the area is suggested based on collective consideration of the various individual factors.

Management Recommendations

A series of recommendations were formulated and to address septic system problems in Santa Barbara County identified through this Sanitary Survey. Recommendations include various general management measures that can be implemented by the County Environmental Health Services to address certain types of problems or situations, as well as more specific measures applicable to the individual Focus Areas examined in the study.

General Recommendations

Based partly on the results of this Sanitary Survey and partly on a broader overview of current practices, the following general recommendations are made to improve overall management of septic systems in Santa Barbara County.

Water Quality Monitoring. The water quality monitoring program developed and conducted during this Sanitary Survey should be continued. A regular sampling program is warranted to maintain a minimum baseline level of water quality information in areas of special concern, to track any trends that may arise, and generally help to recognize problems and assist in ongoing assessment of the overall effectiveness of septic systems in the County.

Septic System Information Review A periodic review and evaluation of septic system information compiled in the County's permit and GIS database system should be made. As inspection data continues to become available, review and analysis of the data will help to identity developing problems before they become severe and give guidance on changes in policies, practices or other measures as they become needed.

Education and Training. Measures should be taken to provide or encourage training and education of septic system installers and pumping contractors. As regulations change and different technologies come into more common use, continuing education and training is needed to assure consistent understanding and application of practices and overall better performance and quality of onsite systems.

Operating Permits. The County Wastewater Ordinance should be amended to provide a mechanism for the issuance of operating permits for systems employing alternative or supplemental treatment and disposal technologies, or for other special circumstances. Alternative technologies require a higher level of maintenance oversight which would be facilitated by the use of operating permits, requiring that routine inspection and reporting is carried out to assure that system components are checked and remain functional.

Drywell Design Requirements. The County regulations for drywells should be revised to require the installation of dual (200%) capacity fields in all new installations, and supplemental treatment systems in problematic or sensitive locations. Drywells, while a necessary option in many instances in the County, are an inferior method of onsite sewage disposal. This is because they rely primarily on physical filtering and dispersal of wastewater constituents at depths and in geologic materials that typically lack the aerobic/biological activity which predominates in the near surface soil environment and helps to sustain the long-term functioning of leachline systems. Their useful life and effectiveness can be improved through the installation of redundant (200%) systems and a higher level of pre-treatment to compensate for the lack of favorable "soil" treatment processes at the deep depths where sewage effluent is released to the environment.

Focus Area Recommendations

Specific management recommendations for the various Focus Areas examined in the Sanitary Survey fall into several categories, ranging from case-by-case management of individual septic systems (i.e., status quo) to public sewer conversion projects as follows.

Case-by-Case System Management. This reflects the current management program for septic systems in the County, where permitting of new systems, repairs and upgrades to existing systems, and response to complaints are dealt with on a system-by-system or "case-by-case" basis. This is an appropriate level of management for the majority of the County, including the following Focus Areas examined in this study:

Shepard Mesa	Upper Fairview
La Buena Tierra	Via Chaparral
Lake Marie Estates	Orcutt Area

Mandatory Inspection-Upgrade Program. A mandatory inspection and upgrade program is recommended for several areas of the County due to the age and density of septic systems, difficult site conditions, general lack of information about the sewage disposal practices and actual evidence of or potential threat to public health and water quality. The aim would be to require an inspection and servicing of each septic system similar to that performed under the existing Septic Tank Inspection requirements. Areas where this is recommended are as follows and encompass approximately 800 total septic systems:

Arroyo Paredon	Buena Vista Creek
Cold Spring	Sycamore Creek
Veronica Springs	Painted Cave

Onsite Wastewater Management Plan. Development and implementation of an onsite Wastewater Management Plan is recommended for certain areas of the County where soil-geologic conditions are reasonably suitable for continued use of septic systems for significant portions of the area, but where other factors (e.g., total number of systems, localized problems, age of systems, water quality threats) dictate that special management efforts be made to improve and maintain long-term effectiveness of onsite wastewater systems and avoid serious environmental problems. In essence, an Onsite Wastewater Management Plan is a customized septic system plan for a specific area that could include, for example, a mix of different types of septic system designs, sewerage of certain areas, and special maintenance activities. Areas where this is recommended include:

Toro Canyon	Mission Canyon
Hope Ranch	Ballard
Santa Ynez	

Extension of sewers to portions of Santa Ynez and Mission Canyon should be considered where feasible.

Public Sewerage. Conversion from septic systems to public sewers is recommended for several Focus Areas where significant problems or threat to public health have been identified in this study and where public sewers are reasonably available and represent the probable best long-term wastewater management approach for the area. The areas warranting consideration for conversion to public sewers include:

Rincon Point	Sand Point Road
Padaro Lane	Sunset Rd/Carol Ave
Vista Vallejo	Santa Ynez (selected areas)
Janin Acres	

Community Wastewater Facility. It is recommended that feasibility and environmental studies be undertaken to develop and implement a community wastewater facility for the town of Los Olivos. The need for a community wastewater solution in Los Olivos stems from the very high density of development in the town, combined with the inherent soil and groundwater conditions that force homeowners and businesses to utilize drywell systems that discharge directly into the groundwater strata in the area. The study of alternatives for the town can and should consider various service area configurations, the possibility of maintaining septic systems in limited areas of town, the possibility of a joint community facility with Ballard, an interceptor sewer connection to the City of Solvang, and various locations and technologies for a community wastewater treatment and disposal facility.

Update to the 2003 Sanitary Survey

As mentioned previously, while the Survey covered the entire county, it primarily concentrated on a number of “focus areas” where the conditions made the use of OWTS particularly problematic. Since the completion of the Survey in 2003, EHS has worked to mitigate the impacts of the use of OWTS in some of these focus areas. These efforts have primarily come in the form of funding studies to determine the feasibility of extending the public sewer. Several of these projects are discussed below.

At the request of a number of the homeowners and the City of Santa Barbara, EHS authorized and funded engineering studies to determine the feasibility and the potential costs of extending the sewer to Sunset/Carol Rd and sections of Mission Canyon. The Survey gave these areas an overall problem ranking of High and Medium High, respectively. The reports found that sewering these areas will be difficult because the terrain will necessitate the need for lift stations and the need to obtain a number of easements across private property. In addition the soil formation in the studied area of Mission Canyon is prone to slides that could result in damaging or breaking a sewer line. As a result, there has been no additional effort to extend the sewer to these areas to date.

South of the City of Carpinteria, the Survey gave the areas of Rincon Pt., Sand Point Rd. and Padaro Ln. overall problem rankings of High, High, and Medium High, respectively. The properties on Sand Point Rd. have since been connected to sewer and the OWTS abandoned. Much of Padaro Ln. is now served by public sewer and extension of the public sewer to the western portions south of U.S. Highway 101 has received all necessary permits and construction will begin soon. Work to extend the sewer to the homes located near Rincon Point began in January, 2014.

Due to high density, poor soil conditions and seasonally high groundwater, the Township of Los Olivos is a county listed Special Problems Area for the use of OWTS. Accordingly, the Survey also gave Los Olivos an overall problem ranking of High. In 2012, EHS authorized and funded a Preliminary Engineering Report to study feasibility and potential costs of installing a wastewater collection system and packaged treatment plant to serve the commercial area of Los Olivos. The report was completed in 2013 and while no construction has occurred, a “steering committee” has been formed to investigate the concept further.

Section III
Water Quality Monitoring

The purpose of this LAMP is to establish standards and policies for the installation, operation and maintenance of OWTS in order to protect water quality and public health. The water quality monitoring element is intended to track the impact of OWTS effluent on groundwater and surface water as well as the effectiveness of this LAMP in addressing those impacts over time.

Surface water is very limited and primarily in the form of reservoirs such as Cachuma Lake. The Santa Ynez River and the Santa Maria River are located adjacent to very rural land and national forest with a very low density of OWTS operating in the watershed. These rivers, while large, contain flowing water only after substantial winter rains.

There are a number of “blue-line” streams in the county. “Blue-line stream” means that a stream appears as a broken or solid blue line (or a purple line) on a USGS topographic map. Most are located in the Santa Ynez Mountains and related foothills. In general, these creeks are ephemeral in nature and contain water for only a short period of time after the winter rain season. While some creeks flow year round, they are generally located in, or adjacent to, rural lands that have a very low density of OWTS in the watershed.

Using information obtained from the Water Resources Division of the Santa Barbara County Public Works Department, the 2003 Sanitary Survey identifies and briefly describes the major groundwater basins of the county. Reproduced from the Survey, **Figure 3-1** contains a map showing the configuration and location of these basins while **Table 3-1** provides information on the approximate size of each basin (in acres) as well as the primary uses of each basin’s water resources.

Because of the factors discussed above, the water quality monitoring element of the LAMP will focus on the groundwater resources of the county. More specifically, it will focus on those groundwater basins located beneath areas with a large number and or a high density of OWTS where the use of these systems could impact or is thought to have impacted, groundwater quality.

The County will use data from available sources consistent with OWTS Policy Section 9.3.2 to assess groundwater quality. In addition to the water systems operated by the cities and special districts, there are a number of smaller public and semi-public water systems operating in Santa Barbara County. Most of these smaller systems utilize groundwater exclusively and all are required to perform routine, water quality monitoring as a condition of their Domestic Water Supply Permits. EHS proposes to utilize this data, specifically, bacteria, nitrate and nitrite results, to measure OWTS impacts on groundwater.

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Figure 3-1
Major Groundwater Basins
Santa Barbara County, California

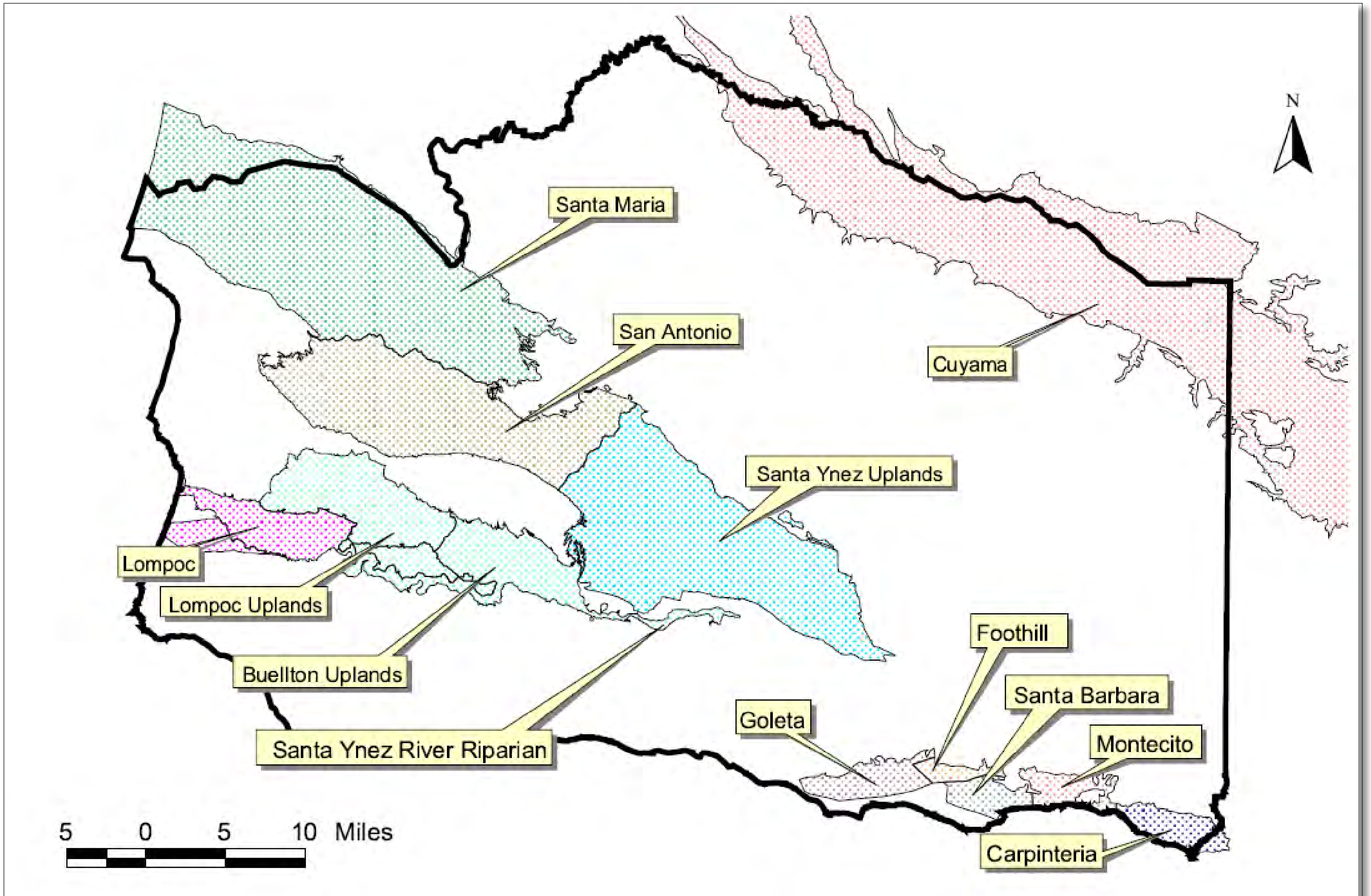


Table 3-1
Groundwater Resources

Region	Groundwater Basin	Area (acres)	Groundwater Uses	Land Uses	Number of Septic Systems*
South County Groundwater Basins	Carpinteria	6,700	Agricultural	Agricultural	655
	Montecito	4,300	Agricultural, residential	Agricultural, residential	876
	Santa Barbara	4,500	Municipal	Urban residential, industrial, commercial	146
	Foothill	3,000	Municipal	Residential	261
	Goleta (North/Central and West)	9,200	Agricultural	Urban residential, commercial, some agricultural	305
Santa Ynez River Groundwater Basins	Santa Ynez Uplands	83,200	Agriculture, some residential		2,245
	Buellton Uplands	16,400	Agricultural, municipal, and domestic	Agricultural, rural residential	526
	Lompoc	48,600	Agricultural, mining and processing, municipal	Agricultural, oil development, mining, sanitary landfill	121
North County Groundwater Basins	San Antonio	70,400	Agricultural, military, municipal	Agricultural (mostly vineyards), ranching, limited urban development	126
	Santa Maria Valley	110,000	Petroleum operations, agriculture, municipal	Agricultural, oil development, sanitary landfill, limited urban development	826
Cuyama Groundwater Basins	Cuyama	441,600	Agriculture, petroleum operations, commercial and domestic	Agricultural, oil development, sanitary landfill, limited urban development	159
Other Groundwater Basins and Extraction Areas	More Ranch	502	NA	Open space, limited residential and greenhouse agriculture	included in Goleta total
	Ellwood to Gaviota	67,200	Petroleum operations, agricultural, residential	Oil development, agricultural, residential, open space, sanitary landfill	included in Goleta total
	Gaviota to Point Conception	23,040	Ranching, limited agricultural, domestic	NA	
	Santa Ynez River Riparian Groundwater Basin	12,000	NA	Urban development, ranching, agricultural	included in Buellton Uplands total

Each major basin and EHS's proposed monitoring program is described below.

South Santa Barbara County

Carpinteria Groundwater Basin

This groundwater basin underlies approximately 6,700 acres in the Carpinteria Valley, measuring approximately 7 miles long and up to 2 miles wide between the Santa Ynez Mountains and the Pacific Ocean. South of U.S. Highway 101 into the foothills, the dominant land use in the valley is agricultural consisting of nurseries, orchards and greenhouses. The interior of the Carpinteria Valley consists of larger parcels that allow for agricultural use and consequently a low concentration or density of OWTS.

The coastal, more urban area is served by the public sewer operated by the Carpinteria Sanitary District. This system consists of approximately 40 linear miles of collection pipe and a 2.5 million gallon per day treatment plant. Treated effluent is discharged to the ocean. As was mentioned in Section II, the Carpinteria Sanitary District has extended the sewer to serve the beachfront residential areas located at Rincon Point, Sand Point Rd, Sandyland Cove and Padaro Lane and is in the process of completing the sewer extension to Rincon Point.

With the extension of the sewer to the beach communities, remaining parcels served by OWTS are located in the rural and inner rural areas. These parcels tend to be multiple acres in size with adequate area for an OWTS. Due to the low density of OWTS and the predominant agricultural land use in the valley, nitrate loading in surface or groundwater would likely be the result of agricultural practices. Therefore, EHS does not intend to collect groundwater monitoring data from this basin as part of this LAMP.

Montecito Groundwater Basin

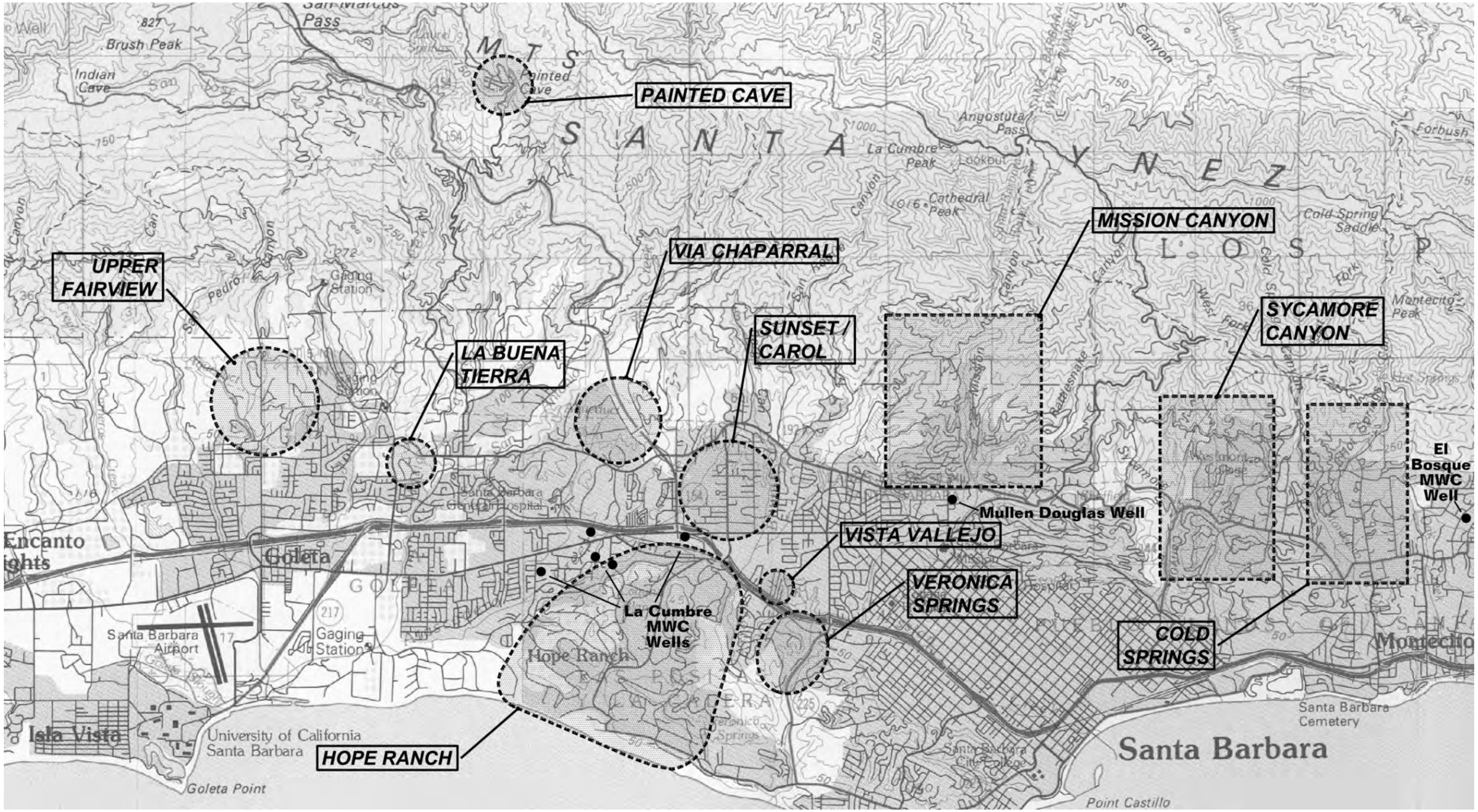
This basin underlies approximately 4,300 acres along a narrow strip between the Santa Ynez Mountains and the Pacific Ocean. Predominant land use is residential with some agriculture north of U.S. Highway 101 and into the foothills of Santa Ynez Mountains.

The higher density urban areas adjacent to U.S. Highway 101 are served by the public sewer systems operated by the Montecito and Summerland Sanitary Districts. The two districts own and maintain approximately 80 linear miles of collection pipe and two treatment plants with a combined capacity of about 2 mgd. Both plants discharge treated effluent to the ocean.

OWTS are used by residences in the inner rural and rural areas located north of U. S. Highway 101 into the foothills. Parcels range in size from small to very large with a median area of approximately 2 acres. The poor soils and difficult terrain in the foothills make the siting and use of OWTS, challenging. Consequently, Toro Canyon, the Buena Vista and Cold Springs Creek drainages as well as Sycamore Canyon were identified as focus areas in the Sanitary Survey.

Groundwater from the basin supplies some semi-rural residences, several small public and semi-public water systems and a small amount of agricultural uses. The El Bosque Mutual Water Company is a State Small Water System operating under permit and inspection by EHS (please see **Figure 3-2**). Title 22 of the California Code of Regulations requires that State Small systems monitoring the bacteriological quality of their water on a quarterly basis. In addition, Chapter 34B of the Santa Barbara County Code requires that the water system operator monitor for nitrates and nitrites once every three (3) years. EHS proposes to use the water quality data from this water system as part of the LAMP's monitoring element.

Figure 3-2
Water Quality Data Points



Santa Barbara, Foothill & Goleta Basins

The Santa Barbara, Foothill & Goleta basins and sub-basins cover approximately 16,700 acres collectively. There are some interspersed remnant agricultural parcels but generally the area is urbanized. The primary land use is residential, commercial and industrial.

The majority of this area is served by public sewer that are owned and operated by the City of Santa Barbara, the Goleta Sanitary District and the Goleta West Sanitary District. Located within this area is approximately 400 miles of pipe and two 8 million gallons per day wastewater treatment plants. One plant is operated by the City of Santa Barbara and the other by the Goleta Sanitary District. Both plants discharge treated effluent to the ocean.

The majority of OWTS above these groundwater basins are located on parcels in the Santa Ynez Mountain foothills north of the cities of Santa Barbara and Goleta. The generally poor soils and steep, hilly terrain in these semi-rural areas make the siting and use of OWTS challenging. OWTS in this area have a long history of failure. For these reasons, the Mission Canyon area was identified as a focus area in the Survey.

Aside from the foothill area the other significant concentration of OWTS is the Hope Ranch area. Like the foothills, Hope Ranch is semi-rural residential community on rolling hills and coastal terraces located west of the City of Santa Barbara. While the parcels are generally large, average lot size is 2.4 acres, with better soil and terrain than those found in the foothills, the area is crisscrossed by drainages and there are areas of perched high groundwater.

The closest active well to the Mission Canyon area is owned and operated by a state small water system (Mullen–Douglas) under permit and inspection by Environmental Health Services (please see **Figure 3-2**). As previously stated, the Santa Barbara County Code requires State Small water systems to monitor for nitrates and nitrites on a tri-annual basis and to forward the results to EHS. Additionally, state law requires quarterly bacteriological monitoring of the water supply.

The La Cumbre Mutual Water Company (LCMWC) owns and operates the water system that supplies potable water to the Hope Ranch community. This water system operates under a Domestic Water Supply Permit issued by the California Department of Public Health (CDPH). While the LCMWC utilizes some water from the state water project, it relies mostly on groundwater obtained from wells that the water company owns and maintains (please see **Figure 3-2**).

EHS will utilize the nitrate, nitrite and bacteriological analysis results from the Mullen-Douglas State Small water system and the La Cumbre Mutual Water Company as data points in the groundwater monitoring element of the LAMP. Please see **Figure 3-2** for the location of the water systems and sample points.

The remaining coastal area west of the City of Goleta is sparsely populated consisting primarily of large agricultural zoned parcels. While the soils and topography are generally not conducive to the use of OWTS, the large parcels and the corresponding low density indicates that the impact on water quality is considered to be minimal.

Santa Ynez River Groundwater Basins

Santa Ynez Uplands Groundwater Basin

The Santa Ynez Uplands basin encompasses approximately 83,000 acres bordered on the south by the Santa Ynez Mountains and by the San Rafael Mountains on the northeast. The primary land uses are agriculture (wine grape growing, cattle grazing) and residential.

Residential parcels are semi-rural to rural in nature with a median parcel size of 2.5 acres. Conditions for the use of OWTS vary, ranging from very good to poor with areas with restrictive soil characteristics, shallow groundwater and or difficult topographic features such as steep slopes and drainages.

The major “urban” centers consist of the City of Solvang and the unincorporated townships of Santa Ynez, Los Olivos and Ballard. The residents in Solvang are connected to a public sewer owned and operated by the City. Similarly, most of the residents in the township of Santa Ynez are connected to a sewer owned and operated by the Santa Ynez Community Services District. The District operates and maintains the collection system only. The effluent is directed to Solvang’s treatment plant.

The residential and commercial structures in the townships of Los Olivos and Ballard are served by OWTS. The use of OWTS in these areas is problematic due to a combination of poor soils, high groundwater and small parcels. Both Los Olivos and Ballard were listed as Focus Areas in the Sanitary Survey.

Janin Acres is also listed as a Focus Area in the Survey. Janin Acres is a residential subdivision consisting of approximately 80 parcels located east of the City of Solvang along Highway 246. While the median parcel size is approximately 2 acres, poor shallow soil conditions generally result in the use deep trenches or seepage pits for effluent dispersal.

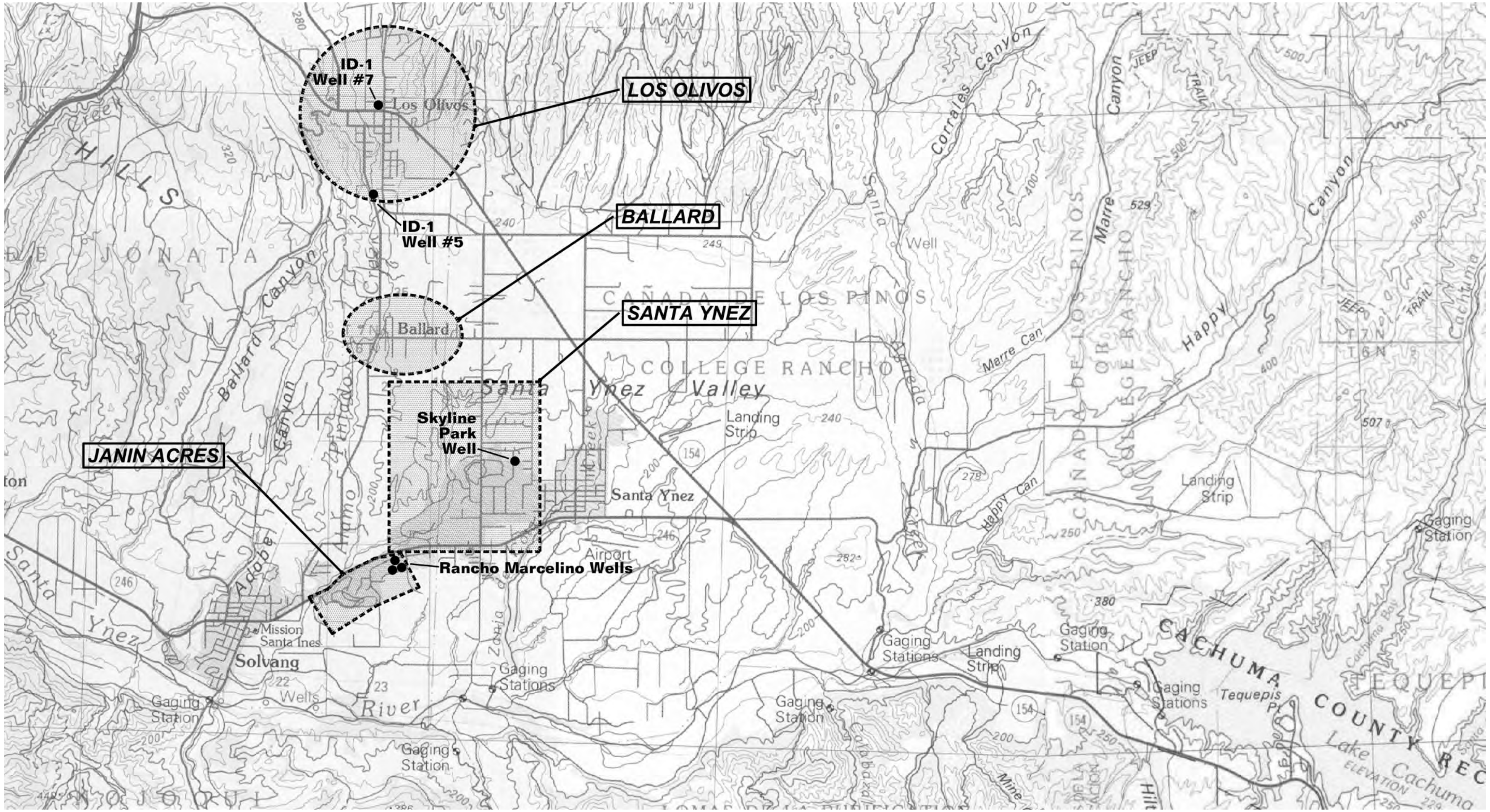
Examining a map of the Santa Ynez Valley shows that Los Olivos, Ballard and Janin Acres are located along a north-south line paralleling Alamo Pintado Creek. Consequently, EHS will use the water quality monitoring results from several public water systems located in this area as data points for the LAMP water quality monitoring element. Please see **Figure 3-2** for the locations of the water system and sample points. Please see **Figure 3-3** for the locations of the water systems and the wells that will be used as data points.

The Santa Ynez River Water Conservation District, Improvement District #1 (ID1) provides drinking water to large part of the unincorporated areas adjacent to the City of Solvang including Santa Ynez, Ballard and Los Olivos. ID1 operates under the authority of a Domestic Water Supply Permit issued by CDPH. As noted in **Figure 3-3**, ID1 has several wells in and around Los Olivos that will also be used as data points.

The Skyline Park Mutual Water Company is a small community water system supplying water to a residential subdivision located near the intersection of Highway 246 and Refugio Rd. in Santa Ynez. The Water Company serves 94 residential connections under the authority of a Domestic Water Supply Permit issued by EHS as the designated Local Primacy Agency. As a condition of its permit, the water company must perform routine water quality monitoring and submit the results of that monitoring to EHS. EHS proposes to use the data obtained from the Skyline Park Mutual Water Company as part of the LAMP water monitoring element.

The Rancho Marcelino Water & Service Company supplies drinking water to the aforementioned Janin Acres subdivision. Like the Skyline Park Mutual Water Company, it operates under a permit issued by EHS and similarly must complete routine water analysis. EHS proposes to use these results as its final data point for monitoring the water quality in the Santa Ynez Upland Basin.

Figure 3-3
Water Quality Data Points



Buellton Uplands Groundwater Basin

The Buellton Uplands Groundwater Basin underlies an area of 16,000 acres located between cities of Solvang and Lompoc. Agriculture, primarily in the form of cattle grazing and wine grape growing, is the dominant land use.

The City of Buellton is the largest urbanized area located within the basin's boundaries. Its 4,000 residents are connected to a sewer system owned, operated and maintained by the City. The remaining residential areas in the basin are semi-rural or rural in nature.

Due to the low density of OWTS in use in the Buellton Uplands Groundwater Basin, it is felt that any impact to groundwater quality by these systems is minimal.

Lompoc Groundwater Basin

The Lompoc Groundwater Basin is bounded by the Purisima, Santa Rosa and Lompoc Hills and covers approximately 48,000 acres. The primary land use in the valley is agriculture.

The major urban areas consist of the City of Lompoc and the unincorporated areas of Mission Hills and Vandenberg Village. The residents of these areas are connected to sewer systems operated and maintained by the City of Lompoc, the Mission Hills Community Services District and the Vandenberg Village Community Services District, respectively. The remaining residential development is rural in nature on multiple acre or large agricultural parcels.

Due to the low density of OWTS in the Lompoc Groundwater Basin, as with the Buellton Uplands, any impact to groundwater by these systems would be minimal.

North Santa Barbara County Groundwater Basins

San Antonio Groundwater Basin

The San Antonio Groundwater Basin encompasses approximately 70,000 acres and lies between the Solomon and Casmalia Hills to the north and the Purisima Hills to the south. The primary land uses consist of agriculture and some industrial uses in the form of oil extraction.

The only 'urbanized" area is the unincorporated town of Los Alamos. Its 1800 residents are connected to a sewer operated and maintained by the Los Alamos Community Services District. The remaining residential development in this basin is widely disseminated on multiple acre or large agricultural parcels.

Due to the small number of OWTS in this basin, any impact on groundwater from their use would be negligible.

Santa Maria Valley Groundwater Basin

The Santa Maria Groundwater Basin covers more than 100,000 acres in northwestern Santa Barbara County extending into the southwestern portions of San Luis Obispo County. The primary land uses are residential, agricultural and industrial (oil extraction).

The major urbanized areas consist of the Cities of Santa Maria and Guadalupe and the unincorporated area of Orcutt. All three areas are served by sewer operated and maintained by the Cities of Santa Maria, Guadalupe and the Laguna Sanitary District respectively. Smaller residential areas exist in the unincorporated townships of Casmalia, Garey and Sisquoc. There is no sewer service available in these townships; consequently OWTS are used for wastewater treatment and dispersal.

The Santa Maria Valley is now and has historically been extensively utilized for the production of row crops and the subsequent application of nitrogen based fertilizers. The groundwater basin in the valley is experiencing an upward trend in nitrate concentrations. With the exception of the townships of Casmalia, Garey and Sisquoc, most of the OWTS in the valley are located on semi-rural, rural or large agricultural parcels. The RWQCB is currently establishing TMDL for the Santa Maria River Watershed and has indicated that the elevated nitrate levels are not from OWTS.

Cuyama Groundwater Basin

The Cuyama groundwater basin underlies approximately 160,000 acres in north eastern Santa Barbara County between the Caliente Range and the San Rafael Mountains. Only a portion of the basin is located in Santa Barbara County. The majority of it extends into San Luis Obispo, Kern and Ventura Counties. The predominant land use is agricultural with some industrial (oil) uses.

The Cuyama Valley is sparsely populated with three small communities located in the area, New Cuyama, Cuyama and Ventucopa. New Cuyama is the largest of the three. Its residents are connected to a sewer operated and maintained by the Cuyama Community Services District.

The Cuyama Groundwater Basin is experiencing an upward trend in nitrate concentrations. However, due to small number and low density of OWTS, it is believed that the increasing nitrates are not associated with OWTS. Therefore, EHS does not propose to establish monitoring points within this basin.

In summary, the sites selected as data points for the groundwater monitoring element of this LAMP were chosen because they are located adjacent to and generally down gradient to designated Special Problem Areas or areas with large concentrations of OWTS as identified in the 2003 Sanitary Survey.

Groundwater quality will be monitored by tracking nitrate and nitrite levels. While nitrates may rarely be present from naturally occurring sources, elevated levels are usually the result of contamination from agricultural practices, high density livestock facilities or OWTS. Once consumed nitrates are converted to nitrites in the body. **Table 3-2** provides the most recent water quality analysis results for nitrates and nitrites from the wells specified as data points.

No monitoring points were chosen in the County's other watersheds due to the absence of significant numbers and concentrations OWTS. However, if in the future, there are areas in the County where increased urbanization based on the use of OWTS becomes a concern EHS may include additional monitoring points after consultation with the Central Coast Regional Water Quality Control Board.

Table 3-2

Water Basins/ WaterSystems	Location	Nitrates	Last Analysis	Nitrites	Last Analysis
Montecito					
El Bosque	East Valley Rd. and El Bosque Rd.	5.9 ppm	5/2013	0.0 ppm	5/2013
Santa Barbara, Foothill, Goleta					
Mullen-Douglas	Mission Canyon Rd. and Foothill Rd.	9.0 ppm	2/2014	0.0 ppm	3/2014
La Cumbre MWC	Hope Ranch				
Well 16	Hwy 154 @ State St.	6.5 ppm	4/2013	0.0 ppm	4/2013
Well 17	Puente Dr. at Mint Ln.	9.7 ppm	4/2013	0.0 ppm	4/2013
Well 18	Juvenile Hall Rd. at Hollister Ave.	0.0 ppm	4/2013	0.0 ppm	4/2013
Well 19	Nueces Dr. at Arboleda Rd.	0.0 ppm	4/2013	0.0 ppm	4/2013
Well 21	Nogal Dr. at Nueces Dr.	0.0 ppm	4/2013	0.0 ppm	4/2013
Santa Ynez Uplands					
SYRWCD ID#1 Well 5	Santa Barbara Ave. at Alamo Pintado Rd.	9.7 ppm	10/2013	0.0 ppm	10/2013
SYRWCD ID#1 Well 7	Hwy 154 at Grand Ave.	5.6 ppm	9/2013	0.0 ppm	9/2013
Skyline Park Well 2 Well 3	Highland Rd. and Refugio Rd.	 33 ppm 31 ppm	 9/2013 12/2013	 0 ppm 0 ppm	 6/2012
Rancho Marcelino Well 1 Well 2 Well 3	Hwy 246 and Entrance Road	 36.7 ppm 45.6 ppm 6.3 ppm	 5/2013 5/2013 11/2013	 0 ppm 0 ppm 0 ppm	 7/2011 7/2011 11/2013

Section IV
Projected Onsite Wastewater Demand

The implementation of this LAMP will result in different work (new tasks, different procedures, different record keeping) than that performed in the past by Environmental Health Services. In order to estimate the resources needed to adequately administer this LAMP, a thorough workload analysis is necessary. That calculation involves a number of factors including an estimate of the number of new OWTS that could reasonably be expected to be constructed in the future.

State law requires that all cities and counties adopt a comprehensive, long-term general plan that outlines physical development of the county or city. The general plan consists of a number of mandated elements that cover a local jurisdiction's entire planning area so that it can adequately address the broad range of issues associated with the city or county's development. One of the mandated elements is the Housing Element.

The Housing Element of the General or Comprehensive Plan guides the determination of housing needs and establishes policy that facilitates the development of housing for all economic segments in the County. The California Department of Housing & Community Development requires that the Housing Element be updated every 8 years.

Using these criteria as a guideline and historical data, this LAMP includes a good faith effort to make a 10 year projection of future OWTS demand. While these are linear projections, as the following data illustrates, the actual numbers could vary significantly as a result of economic conditions and or regulatory changes.

Using data obtained from the Environmental Health Services comprehensive computer database (Envision), during the years from 2000-2008 1,213 applications to construct new OWTS were processed. This equates to an average 151 applications/year. It is important to note that for a variety of reasons, the submittal of an application does not automatically result in the actual construction on an OWTS. While in excess of 1200 applications were processed during this timeframe, 398 systems were completed. This equates to an average 50 new systems per year.

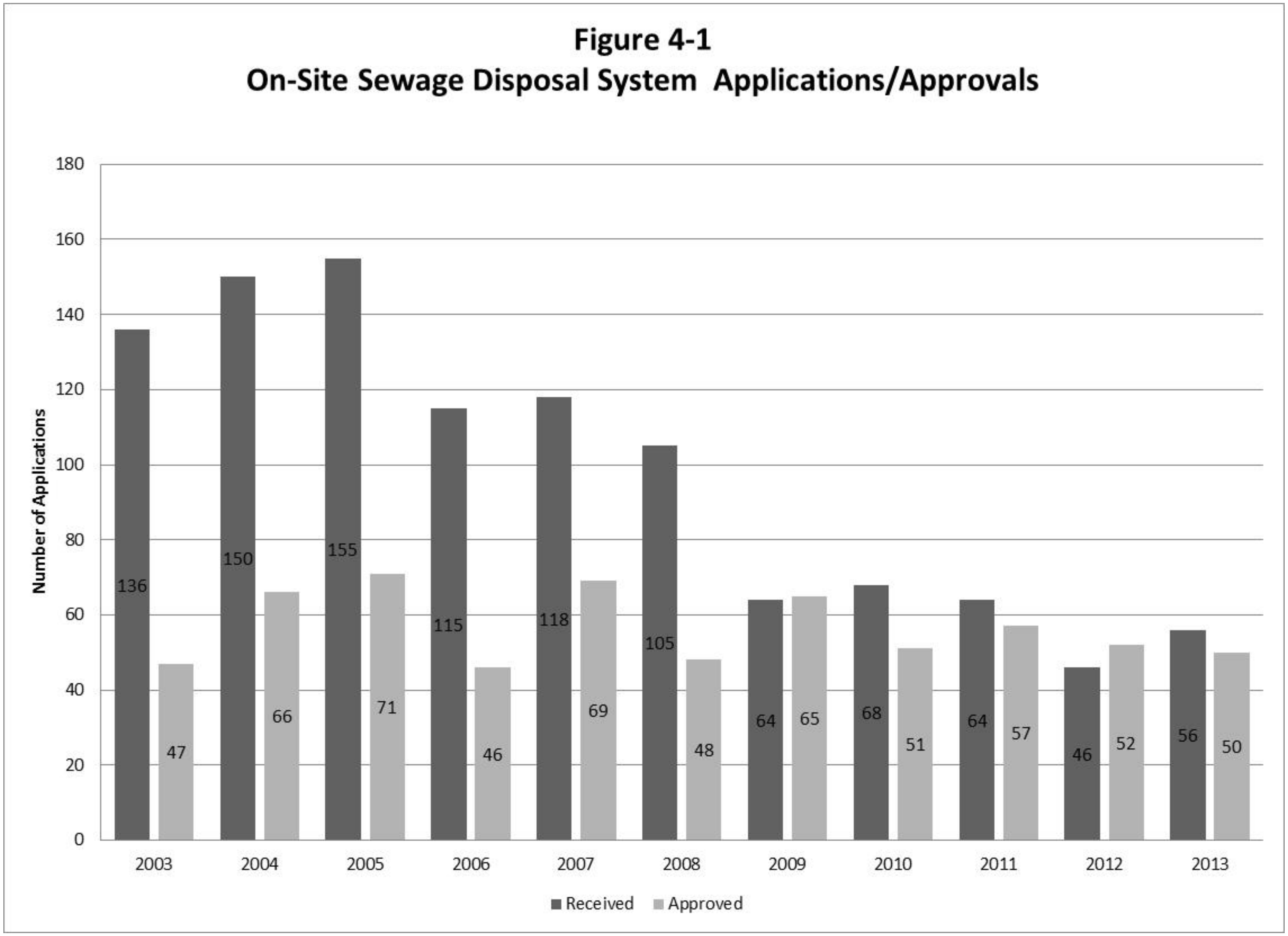
During the time period of 2009-2013, a total of 298 applications were received (average 60/year) and 275 OWTS were completed for an average 55 per year. Please see Figure 4-1.

The numbers discussed above represent permit applications received, permits issued and systems satisfactorily completed countywide. The Envision database can be modified to breakdown similar data by a defined geographic area. This capability is not currently used, but it could be activated in the future should it be necessary or desired.

While the data showed that the number of applications for new OWTS varied widely between the years leading up to and following the 2009 recession, the total number of new OWTS approved remained about the same (50 vs 55). Consequently it is reasonable to assume that permits for approximately 55 new OWTS will be approved in any given year in the future. Furthermore, extrapolating this figure out over a ten year period, it is reasonable to assume that approximately 550 new OWTS will be constructed over the course of the next 10 years. This represents an increase of approximately 5% in the total number of OWTS while the percentage of residents that use an OWTS will remain at about 10%.The increase in the number of OWTS may be offset by properties that connect to sewer as it becomes available and abandon existing onsite systems.

This number is in general conformity with the Housing Element of the County’s Comprehensive Plan. The analysis of potential future development does not anticipate a large number of new housing units to be constructed in areas that are not served by a public sewer.

Figure 4-1
On-Site Sewage Disposal System Applications/Approvals



Section V
Requirements for Existing
Onsite Wastewater Treatment Systems

Existing Functioning Onsite Wastewater Treatment Systems

Consistent with the criteria outlined in Tier 0 of the Policy, systems that are functioning properly will not be affected by this LAMP for as long for as they continue to function properly. Nevertheless, regular inspection and maintenance is necessary to ensure that an OWTS continues to operate satisfactorily and to extend the life of the system. OWTS that fail will be repaired consistent with the criteria outlined in Tier 4 of the Policy and County standards.

Santa Barbara County has an effective voluntary maintenance/mandatory reporting program for standard systems. In 1999, the Board of Supervisors approved County Ordinance 4356 that revised the County Code establishing local regulations for the construction, modification, repair and maintenance of OWTS. The ordinance did not require routine maintenance, however it did stipulate that whenever an OWTS was serviced, the system was to be thoroughly inspected and a written report was to be completed and submitted to EHS.

The current practice of voluntary maintenance for standard systems will be continued as the cornerstone of an ongoing inspection program for the vast majority of systems. As in the past, whenever an OWTS is serviced, a Qualified Inspector shall examine the tank to look for signs of deterioration, corrosion or evidence that the dispersal field has failed or is in the process of failing.

A Qualified Inspector prepares a written report that includes the property owner's name and address, a description of the system and any deficiencies noted during the inspection. The report must be submitted to EHS within 30 days of the date of the servicing/inspection. A copy of the approved inspection form can be found in Appendix IV. In those cases where the inspection has found that the system has failed, the report must be submitted within 24 hours.

When the report is received by EHS, it is reviewed and the information contained in the report is entered into the Envision database. If the report identifies any deficiencies, a notice is generated and mailed to the property owner. Depending on the severity of the problem, the notice will either recommend that corrective action be taken or direct that corrective action be taken. A list of the most common tank deficiencies is provided in Appendix IV.

Failed Onsite Wastewater Treatment Systems

The primary functions of the Voluntary Maintenance Program are to assure that the individuals who service and inspect OWTS are qualified to do so and that failing OWTS are identified and repaired. In addition to failures, the inspection may identify conditions that would lead to a determination that the system is in a state of failure. These conditions range from the most severe and obvious form of failure such as surfacing effluent, to the less obvious sign of effluent backing up into a structure.

As with the installation of a new system, all repairs to an existing OWTS must be performed by a Qualified Contractor and must meet current standards. In cases of a failure that creates a health & safety hazard or nuisance where effluent is discharging to the surface of the ground, repairs must be made immediately.

When it has been determined that a system is failing or has failed and EHS has a permit record, the replacement dispersal field is to be the same type, i.e., seepage pit or trenches, and the same size or larger than the existing field.

A replacement system that meets the requirements of the Ordinance shall be installed in those instances when the OWTS has failed and were previously permitted or considered legal non-conforming but the site is severely constrained. If site conditions preclude the installation of a new dispersal field that meets the adopted standards, supplemental treatment may be required if necessary to provide treatment equivalent to the adopted standard.

Onsite Wastewater Treatment System Repairs/Upgrades

Certain corrective measures shall be taken when an inspection finds a substandard OWTS or a component thereof that requires repair and or upgrade to meet current standards. Examples of typical failures or conditions that lead to failure (or in some cases to threats to human safety) include:

- *Hollow (non-gravel filled) seepage pits and cesspools*
    - *These are a significant threat to ground water and a physical threat due to the tendency to collapse. They should be properly abandoned, repaired or replaced upon discovery.*
- *Severely damaged or deteriorated tanks, bottomless tanks or otherwise non-watertight tanks shall be replaced with one that meets the County and State standards.*

Onsite Wastewater Treatment Systems in Degraded Basins

If the Central Coast Water Board identifies a groundwater basin or sub-basin in the County where the use of OWTS is causing or contributing to exceedances of nitrate or pathogen maximum contaminant levels (MCLs), the County will develop an Advanced Groundwater Protection Management Program (AGPMP) in close consultation with and approved by the Central Coast Water Board. The AGPMP shall provide the same level of protection as the Tier 3 standards in the Policy and may include but not be limited to: supplemental treatment for all new and replacement systems, mandatory, routine inspections and maintenance, connection to the public sewer, shallow groundwater monitoring or other appropriate actions.

The County will require conformance with current standards (Section 18C of the County Code), including supplemental treatment standards, to the greatest extent practicable. The requirements for existing systems will be consistent with Tier 4 of the Policy. Supplemental treatment standards will be equivalent to those contained in Tier 3. Variances from the prohibitions specified in sections 9.4.1 – 9.4.9 of the Policy are not allowed in areas covered by an AGPMP.

Onsite Wastewater Treatment System Evaluation/Modification

Existing functioning OWTS that would otherwise be expected to continue to function properly may become over taxed when homes are remodeled or expanded in a manner than increases the sewage flow or changes the characteristics of the sewage generated. When a building remodel will increase the flow, the OWTS should be upgraded so that the anticipated new flow can be received and treated reliably. Examples of changes that would indicate an increased flow to the system include the addition of a bedroom, increased population or fixtures.

Additionally, improvements on a property that intrude upon the physical location of the OWTS and the expansion area for the dispersal system would trigger the need for review.

The determination for the need for a system modification is made as part of an evaluation of the existing system by EHS. As part of the evaluation EHS reviews the proposed changes or project, any EHS records of the existing system as well as any additional information/data provided by the applicant. If it is concluded that there is no impact or that the existing system is adequate, no modification is required.

Onsite Wastewater Treatment System Abandonment Standards

Unless properly abandoned, an OWTS that is no longer used represents a safety hazard. The top and lids of a septic tank or the cement cover of a hollow seepage pit deteriorate over time and may collapse should a vehicle drive or an individual walk over it leading to a serious injury or death. Therefore, EHS makes it a priority to ensure that these structures are properly abandoned to prevent such accidents.

An existing OWTS or a portion thereof shall be properly abandoned, under the following conditions:

- *Upon the discovery of a hollow seepage pit or cesspool*
- *When the structure is connected to the public sewer or*
- *When the structure served by the OWTS is demolished unless the owner demonstrates their intention to use the system again.*

The abandonment standards for a septic tank include:

- *The tank or pit must be pumped to remove all contents.*
- *A tank may be removed entirely or*
- *If left in place, the top is removed, the bottom punctured or cracked to allow for drainage and the shell filled with inert material such as clean soil, sand, cement etc.*

Standards for abandoning the dispersal field include:

- *Seepage pits are to be excavated to a depth of 2 feet below grade and the center pipe cut. The center pipe and the excavation are then to be backfilled with clean soil or other approved fill material.*
- *Leach lines composed of gravel and pipe may be abandoned in place.*
- *If hollow chambers were used, the chambers must be removed and the trench backfilled. Hollow leaching chambers may remain in place with EHS approval.*

Advanced Protection Management Plan

The State Policy stipulates that existing, new and replacement OWTS that are located near a water body that has been listed as impaired due to Nitrogen or pathogens pursuant to Section 303(d) of the Clean Water Act may be addressed by a TMDL and its implementation program, by special provisions contained in a Local Agency Management Program or by the specific requirements of Tier 3.

If a water body in the county is designated by the Central Coast Water Board as “impaired” or significantly degraded as a result of the use of OWTS, Santa Barbara County will develop an Advanced Protection Management Program (APMP) in accordance with the established TMDL. In the absence of an approved TMDL, the APMP will be developed in close consultation with the Central Coast Regional Water Quality Control Board and may include but not be limited to requirements for supplemental treatment for existing systems and mandatory, routine inspections as determined by the Central Coast Water Board in order to be consistent with the Policy. In the absence of a TMDL or an APMP approved by the Central Coast Water Board, the provisions of Tier 3 of the Policy shall apply to OWTS adjacent to water body segments listed in Attachment 2 of the Policy.

Section VI
Requirements for New OWTS

EHS review of OWTS can occur on two levels. An initial review to verify OWTS feasibility would occur as part of the discretionary process for proposals to create new lots with the County's Planning and Development Department. A second, more detailed review would happen when an application to construct an OWTS is submitted. The review of the application and the issuance of a permit are a ministerial process and act.

EHS staff in the Land Use program interacts with the Planning & Development Department as part of the discretionary review process. The role of the Land Use program is to review projects within the unincorporated portions of Santa Barbara County to ensure conformity with state and local regulations and policies enforced by Environmental Health Services as they relate to projects involving retail food, recreational health, vector control, solid waste, drinking water and for purposes of this LAMP, sewage or wastewater dispersal.

For projects that involve subdivisions, Development Plans and Conditional Use Permits a determination must be made as to whether adequate services (water & sewer) are available. If public services are available, EHS will recommend that as a condition of project approval, that the applicant be required to connect to the public water and or sewer system. For those projects where public services are not available and a private water system and/or use of an OWTS is proposed, Environmental Health Services reviews well and soil test data to confirm their feasibility for the proposed project.

OWTS feasibility is determined by reviewing the proposed site conditions and the preliminary engineering and layout of the system to ensure that adequate space for both the primary field as well as the 100% expansion area is available and that setbacks from watercourses and steep slopes are met. A deep boring is required in order to define soil strata, mottling and the presence or absence of groundwater or bedrock relative to the bottom of the dispersal field. In addition, the results of three percolation tests in the area of the proposed dispersal field must be provided in order to determine if the soils are suitable for long-term wastewater dispersal. In most cases a site visit is made to confirm the accuracy of the map and the location of any limiting features of the property.

If this review finds that the proposed project site is unsuitable for wastewater treatment and dispersal then the project could not move forward until a suitable site is found. For projects located in areas known to be problematic for the use of OWTSs, a strategy is developed to deal with those specific conditions and to mitigate impacts to ground or surface water. Additionally, if the onsite wastewater treatment system is inadequate for the proposed project, it is during the Land Use review that the necessary upgrades are communicated to the applicant.

If it is determined that the use of an OWTS is feasible, EHS will recommend that as a condition of project approval that the applicant be required to submit an application for a permit to construct or modify an OWTS.

The standards for new OWTS are contained in Sections 18C 3.0 & 18C 5.0 of the Ordinance. Section 3.0 outlines general provisions for both new systems and for the repair and or modification of existing systems while specific siting, design and construction criteria are listed in Section 5.0. The Tier 1 standards of the Policy apply unless otherwise specifically addressed in the Ordinance.

General Policy Recommendations/Provisions

Any structure, regardless of use, that produces wastewater, shall have adequate wastewater treatment and dispersal. When connecting to the public sewer is not possible, adequate treatment and dispersal shall be accomplished by means of an approved OWTS.

Chemical toilets are acceptable for temporary use during special events. They are not acceptable as a permanent method of waste management.

Composting or incinerating toilets would be considered only in those situations where site conditions preclude the use of standard or supplemental wastewater treatment. In those limited circumstances oversight would occur in one of the following manners:

- If the proposal was part of a project under discretionary review, such as a Conditional Use Permit, a recommended conditional of approval of the permit would include a requirement for ongoing maintenance and inspection.
- If the proposal was part of a ministerial permit process, final approval of the permit would require that a Notice to Property Owner be recorded with the Title of the property stating that the property was served by a composting or incinerating toilet and that routine, ongoing inspection and maintenance of the system was required.

Environmental Health Services will continue the current practice of utilizing the Regional Water Quality Control Board recommended flow of 375 gallons per day (gpd) for a standard three bedroom house and 75 gpd for each additional bedroom for determining tank capacity & dispersal field sizing. Wastewater flow from commercial structures will be determined by peak design flow as listed in the most recent edition of the California Plumbing Code (CPC) or other flow calculations acceptable to the Environmental Health Services.

The 2003 Sanitary Survey identified a number of areas in the County that were developed using OWTS but where the use of these systems is problematic due to parcel size, soil conditions, topography or a combination of these factors. To address the impacts of OWTS in these areas and to prevent future problems related to increasing density of OWTS, supplemental treatment should be required. These identified areas include:

- *Areas designated by the Santa Barbara County Board of Supervisors as Special Problem Areas for wastewater dispersal.*
- *Areas identified by the Central Coast Regional Water Quality Control Board as having groundwater basins or waterbodies experiencing significant degradation as a result of the use of OWTS.*
- *When seepage pits are used on parcels of 5 acres or less and performance testing indicates an absorption capacity of between 500 – 1000 gpd or greater than 8000 gpd.*
- *When an existing OWTS on a severely constrained parcel requires repair but constructing a replacement system that meets current standards is not possible practical or feasible.*
- *For newly created parcels of 1 – 2.5 acres regardless of the type of dispersal field.*

As previously stated, the provisions of this LAMP and the Ordinance apply to wastewater flows of 10,000 gpd or less. Projects with flows calculated to exceed 10,000 gpd will be referred to the Central Coast Water Board for review and approval.

It is the intent of EHS to maintain an open dialogue with the Central Coast Water Board and to consult with them when necessary to ensure that this LAMP is implemented in a manner consistent with the goals and objectives of the Policy.

Protection of OWTS

All OWTS require regular maintenance to ensure that they are operating as designed and to prolong the useful life of the system. This is especially true for alternative systems and those that utilize supplemental treatment. In order to facilitate inspection and maintenance, OWTS components must be accessible.

Currently the primary dispersal field must be constructed and a 100% expansion area has to be set aside for future use. In some circumstance it may be beneficial to require the actual installation of the primary and secondary dispersal fields with a third 100% expansion area set aside for future use. Development in this expansion area that would preclude its future use as a dispersal field should not be allowed.

Prohibitions

In 1999, the Board of Supervisors approved changes to the County Code that prohibited the use of hollow (non-gravel filled) seepage pits and cesspools and required that they be abandoned or repaired upon discovery. This prohibition should be continued and additional prohibitions should be added including the following:

- *The use of holding tanks as a permanent means of wastewater management.*
- *Sewage dispersal is not permitted in fill material unless it is fill material engineered for that purpose.*
- *A discharge to an OWTS that exceeds peek design flow or maximum permitted capacity.*
- *The creation of new parcels or lots of less than one acre using OWTS.*

Professional Qualifications

To ensure performance that is consistent with the goals and objectives of this LAMP, OWTS must be sited, designed and constructed properly. Once placed into operation, regular inspections and maintenance are necessary to keep the system functioning as designed and to prolong its useful life. Therefore, specific qualifications and licenses that are required in order to design, construct, maintain and or repair an OWTS in Santa Barbara County include:

- *Soil evaluations must be performed by a Registered Civil or Geotechnical Engineer*
- *OWTS must be designed by a Qualified Professional such as a Professional Engineer, Professional Geologist or a Registered Environmental Health Specialist.*
- *Construction, modification, repair and abandonment of an OWTS must be performed by a Qualified Contractor.*
- *Inspections, maintenance and servicing must be performed by a Qualified Inspector, a Qualified Contractor or Professional Engineer.*

Site/Soil Evaluation

A general site evaluation is to be completed that includes a geologic report that describes the soil conditions, depth to groundwater or bedrock and a slope stability study if it is proposed to place the dispersal field on a slope greater than 30%.

A soil evaluation is required in both the area designated as the primary dispersal area and the expansion area. Testing shall include one deep boring and 3 percolation tests within the proposed dispersal area. Results from the soil evaluation are used to determine the appropriate application rate and the subsequent size of the dispersal field.

Because the septic tank effluent is discharged at a shallow soil depth, the use of leach lines is the preferred method of dispersal. Seepage pits may be used but only when it has been determined by the project engineer that the site conditions are not conducive to the use of leach lines.

When seepage pits are used, the absorptive capacity of each pit must be determined using a slug test such as a constant head type test. Absorptive capacities ranging between 1000 – 8000 gpd are acceptable. When using seepage pits with this absorptive capacity, the Qualified Professional designing the system shall use an effluent application rate of .8 gallons per square foot per day (gal/sf/day) to calculate the number of seepage pits necessary to serve the proposed structure.

Seepage pits found to have absorptive capacities of 500 – 1000 gpd or greater than 8000 gpd may be used but supplemental treatment must be utilized. When using seepage pits with these capacities, the system designer shall use effluent application rates of .4 gal/sf/day and 1.2gal/sf/day respectively.

Wet Weather Borings

There are areas of Santa Barbara County that are known to experience seasonally high or perched groundwater. These areas include but are not limited to Los Olivos, sections of the Santa Ynez Valley and Hope Ranch Community near Santa Barbara. When available information or site/soil investigation indicates that fluctuations in groundwater levels may result in an inadequate distance between the bottom of the dispersal field and groundwater, EHS may require wet weather soil borings in addition to the soil borings and percolation tests previously described. To be reasonably sure that these borings will measure “worst case” conditions, they generally should be completed between March 1 and May 31.

Tank Requirements

The construction standards and sizing criteria for septic and treatment tanks (tanks) must be consistent with standards contained in the state regulations. As stipulated in the California Plumbing Code, all tanks are to be watertight and constructed of durable, corrosion resistant material such as reinforced concrete or fiberglass and must conform to International Association of Plumbing and Mechanical Officials (IAPMO), National Sanitation Foundation (NSF) or American Society for Testing and Materials (ASTM) standards.

If the OWTS design calls for placing a tank beneath areas subject to vehicular traffic such as a driveway, the tank must be rated to withstand such conditions or the installation is to be engineered to support the additional weight. The tank lids and risers used in such installations must be traffic rated as well.

Septic tanks must have a minimum of two compartments and a minimum capacity of three times the peak daily flow. Each compartment shall be accessible through a manway or port that is a minimum twenty inches in diameter.

In general, all tanks should be buried as shallow as practicable. Septic tanks should be installed no deeper than twelve inches below finish grade. If it is demonstrated that a septic tank must be placed deeper than twelve inches below finish grade, than each compartment is to be fitted with watertight risers that extend to within twelve inches of finish grade.

When it is necessary to extend septic tank risers to finish grade, corrosion resistant, tamper resistant fasteners shall be used to secure the lid to the riser.

There must be adequate separation from structures, patios and decks so that both compartments are accessible for inspection, servicing and maintenance.

Dispersal Fields

As in the past, EHS will require the installation of dual dispersal fields, interconnected by a diverter valve, for new OWTS serving commercial buildings. In addition a 100% expansion area must be designated for future use. There are several benefits to requiring the installation of dual fields.

1. Eliminates the possibility that suitable dispersal area would be lost to future development of the property.

2. Should one field fail, the second field is readily available. There would be little or no public exposure to sewage and no downtime for the commercial operation.

3. Switching from one dispersal field to the other on a regular basis allows one field to rest while the second is being used, prolonging the useful life of both fields.

The same dual dispersal field requirements should be applied to new residential OWTS located on parcels of 2.5 acres or less. On parcels of 2.5 acres and larger, installation of dual drain fields may not be strictly necessary when there is reasonable assurance the reserve area will not be covered or otherwise damaged. However, if the site is seriously constrained, EHS retains the authority to require the installation of dual fields and a designated 100% expansion area regardless of zone district or parcel size.

Leach Line Construction

Leach lines are the preferred method of OWTS effluent dispersal by Environmental Health Services for a number of reasons. Shallow trenches allow for both percolation and evaporation of liquid, soil microbes that breakdown or utilize the effluent are more numerous at shallow soil depth and nitrogen in the effluent is available for uptake by plants. Therefore the general policy should be that leach lines are the required means of dispersal unless exceptional circumstances of the site makes their use infeasible.

Leach line trenches may be a minimum of 18 inches in width to a maximum of 36 inches. The depth will vary according to soil characteristics however they are generally 4 – 6 ft. deep. Trenches may exceed 6 ft. in depth however the beneficial evaporation process is diminished. When parallel distribution is used for wastewater dispersal, trench lines shall be of equal length to the greatest extent possible.

A maximum of 4 square feet per lineal foot of trench may be used for calculating total absorption area. A maximum of 7 square feet per lineal foot of trench (when using pipe & rock) may be used when supplemental treatment is provided. Environmental Health Services will utilize the application rates listed in Tables 3 and 4 of the State Policy (Appendix II) that are based on stabilized percolation rates or from a determination of soil texture and structure.

To facilitate future inspections of the dispersal field, inspection ports are to be installed at the end of each trench. Depending on the circumstances, Environmental Health Services should retain the authority to require the installation of additional inspection ports at different locations of the dispersal field.

Seepage Pit Construction

In those cases where use of leach lines in not feasible Environmental Health Services may allow the use of seepage pits with conditions.

In general, each seepage pit is 4 – 6 ft. in diameter. The depth varies depending on the soil conditions and the depth to groundwater but typically is 30 – 40 ft. deep. Seepage pits that are greater than 60 ft. deep are not recommended and may require special review.

Each seepage pit typically is gravel filled and has a centrally located, perforated four inch diameter pipe that extends from the inlet to the bottom of the pit. The use of “hollow” seepage pits is prohibited under current code and should continue to be prohibited.

When soil testing indicates that multiple seepage pits are necessary in order to provide adequate dispersal capacity, it is important that the wastewater flow to each pit be as equal as possible. Consequently, an approved distribution method must be provided when multiple seepage pits are used.

Use of seepage pits should only be allowed in conjunction with supplemental treatment to reduce the risk of ground water contamination resulting from placement of untreated septic effluent in deep geologic strata.

Low Pressure Distribution

For cost considerations and simplicity the preferred method of wastewater dispersal is by gravity flow. However, when site conditions preclude the use of this method, effluent may be distributed to a dispersal field under pressure. Pressure distribution systems must be designed by a Qualified Professional.

The pump chamber or tank shall meet industry accepted standards, have a capacity equal to six hours of peak flow or 375 gallons, whichever is greater, and be equipped with an audible and visible high water alarm.

Subsurface Drip Systems

Subsurface drip systems are a special category of pressure distribution. When site conditions warrant, a subsurface drip system may be utilized in lieu of a standard dispersal field. Subsurface drip systems must be designed by a Qualified Professional.

All wastewater discharged to a drip system shall have supplemental treatment. The drip lines must be placed in native soil, as level as possible and parallel to elevation contours. Up to twelve inches of fill may be placed over the drip lines in order to meet the minimum cover requirements. The amount of soil cover may be reduced to six inches if the wastewater has been treated to a tertiary level.

Alternative Wastewater Treatment Systems

Alternative Wastewater Treatment Systems are onsite wastewater utilizing dispersal field consisting of components other than a conventional or supplemental treatment system such as “mound”, “at grade” and “evapo-transpiration” systems.

Alternative systems must be designed by a Qualified Professional in conformance with State guidelines. However, Environmental Health Services may adopt local design standards after consultation with the Central Coast Regional Water Quality Control Board.

Prior to final approval, the property owner should be required to record a notice stating that an alternative system has been installed on the property. This “Notice to Property Owner” shall run with the land and will act as constructive notice to any future property owner that the property is served by an alternative wastewater treatment system and is therefore subject to an operating permit with regular maintenance, monitoring and reporting requirements. A copy of the recorded document shall be provided to Environmental Health Services before final system approval.

To ensure that the system continues to function properly, it is should be inspected at least annually by a Qualified Inspector. Inspection reports should be submitted to Environmental Health Services detailing the findings of the inspection within thirty days of its completion so that routine inspections are tracked and required maintenance can be assured.

Supplemental Treatment

Environmental Health Services must approve any proposed method of supplemental treatment prior to installation. All Supplemental Treatment systems must be tested and certified by an independent testing organization such as NSF. Part of the testing must include an evaluation of the system’s effectiveness in reducing Total Suspended Solids (TSS), Bio-chemical Oxygen Demand (BOD) and Total Nitrogen (TN). Any supplemental treatment system shall be listed by testing organization and treatment standard before being considered for permitting. Listing standards include but are not limited to:

- *NSF Standard 40-Residential: Onsite Systems*
- *NSF Standard 41- Non-liquid Systems (composting toilets)*
- *NSF Standard 245- Nitrogen Reduction*
- *NSF Standard 350 & 350-1: Onsite Water Reuse*
- *NSF Standard 46: Components and Devices*

The treatment objectives dictated by the site limitations determines which standard or standards may be applicable.

Because Supplemental Treatment is usually provided as a mitigation factor, it is essential that the treatment system receive regular maintenance by a qualified technician to ensure that it is operating as designed. Therefore, Environmental Health Services requires that a maintenance contract be signed and in place prior to the systems installation. This agreement is to remain in force for the life of the Supplemental Treatment system.

Similar to the procedures for alternative systems, prior to final approval, a notice of the installation of the Supplemental Treatment system shall be recorded at the Santa Barbara County Clerk-Recorder’s Office. This “Notice to Property Owner” shall run with the land and shall serve as constructive notice to all future owners that the property is served by a wastewater treatment system that utilizes supplemental treatment and is subject to operating permits as well as maintenance, monitoring and reporting requirements. A copy of the recorded document shall be provided to Environmental Health Services.

Operating Permits

Supplemental Treatment is a newer technology that reduces constituents of concern in wastewater such as Bio-Chemical Oxygen Demand (BOD), Total Suspended Solids (TSS) and Total Nitrogen (TN). While this technology is very effective, systems utilizing supplemental treatment are more dependent on periodic inspections, maintenance and servicing than the passive, standard OWTS.

Alternative dispersal fields and or supplemental treatment would typically be used on constrained sites where standard setbacks from groundwater or a water course for example, could not be met. Because they are generally used as a mitigation measure, the failure of an OWTS using these methods of treatment and dispersal would likely have a greater potential to negatively impact the environment and public health.

Consequently, operating permits will be required for OWTS that utilize an alternative dispersal system or supplemental treatment to ensure that they are functioning properly and as designed. Permit conditions would require regular inspections of the system by a Qualified Inspector or a trained manufacturer's representative. In addition, a report detailing the findings of the inspection must be submitted to EHS for review.

Section VII
Alternative Means of Wastewater Disposal in the Event of an OWTS Failure or Groundwater Degradation

As previously described, OWTS must be located, designed, installed and operated in accordance with State and County standards. Systems built to these standards should last decades if they are regularly maintained. However, even a properly maintained OWTS will eventually fail and require repair. When repairs are necessary it is the general policy to upgrade the system to the standards in effect at the time of the failure to the extent feasible.

There are a number of OWTS in use in the County that pre-date current standards or in some cases, any standards. These systems are generally located on severely constrained parcels. These constraints include one or more of the following conditions:

- *Inadequate area available for the dispersal field;*
- *Inadequate setback from drainages or watercourses;*
- *Inadequate setback from the well or surface water intake of a public water system;*
- *Inadequate setback from steep slopes;*
- *Inadequate vertical separation from groundwater or impervious surfaces.*

When the existing OWTS on these lots fail, it is often not possible to make repairs that meet all current standards. It has been and will remain the policy of Environmental Health Services to be flexible when dealing with systems on lots of record. Accordingly, the repairs are to be made in a manner so that the applicable standards are met to the maximum extent feasible. This approach results in the installation of an OWTS that is often better than the original, keeps the wastewater below the ground surface and protects water quality and public health.

There may be instances when a parcel has no viable area in which to install a competent standard dispersal field. With advances in OWTS technology, depending on the type of site constraint, there may be multiple alternative solutions available. For example, if it were not possible to provide adequate vertical separation between the bottom of the dispersal field and groundwater, the use of supplemental treatment with a shallow drip dispersal field or an alternative wastewater treatment system could be considered.

In almost all situations, it is possible to design an OWTS that will adequately serve the structure and be protective of the environment and public health. However, it is possible that there will be a site that it so constrained where no adequate OWTS can be located and installed. In such cases, when all options for subsurface dispersal are exhausted, then a haul away system may be utilized with concurrence of the building official.

In addition to repairs on lots with severe constraints there are other circumstances or conditions that would require the use of supplemental treatment as a mitigation factor in order to perform to a standard equivalent to or better than Tier I. This includes areas designated as “Special Problem Areas” for the use of OWTS by the Santa Barbara County Board of Supervisors. It also includes any areas identified by the Central Coast Regional Water Quality Control Board as having groundwater basins with significant degradation as a result of the use of OWTS. Supplemental treatment shall be required for all new and replacement systems in areas with these designations.

Section VIII
Education & Outreach

An onsite sewage system is a significant investment for the property owner and to the public that is potentially impacted from failing or poorly designed and installed systems. This is especially so with the increased costs of newer systems that depends on supplemental treatment. Yet, there is a lot of myth and mis-information about how to take care of and maintain onsite systems. Education and outreach is vital to supporting an informed consumer who is better able to assure proper maintenance that reduces the chance of failure.

Direct Staff Contact

The primary method of education and outreach is by direct interaction between EHS staff and the public. EHS routinely receives and responds to phone calls and office visits by private property owners, consultants and contractors with questions about the regulations and or the permit process. As part of EHS' role in the planning process, we will regularly answer questions and provide information to consultants, staff from other departments or agencies and occasionally directly to decision makers such as members of the Planning Commission and the Board of Supervisors.

EHS Website

All OWTS permit application forms and instructions are available on the EHS website. In addition to the forms, EHS posts or provides links to the various regulations such as the applicable sections of the Central Coast Regional Water Quality Control Board's Basin Plan and the County's OWTS ordinance. Additionally, there is general information on the website about proper OWTS maintenance.

Stakeholder/Community Meetings

Stakeholder or community meetings are generally conducted as outreach efforts for significant or important projects such as the writing/implementation of new regulations or for projects such as the 2003 Sanitary Survey and this LAMP. The number of meetings will vary depending on the nature of the project that is being discussed however a general protocol is usually followed.

- *A meeting is convened at the outset to explain the goals and objectives of the project, answer questions and to gather comments and concerns from the attendees. If the project is area specific, the community meeting is held at a venue close to the area under discussion. If a project has county wide implications, multiple meetings are scheduled with one usually held in the southern part of the county and the other in the north county.*
- *Depending on the length of time that will be required to complete the project, status or progress meetings will be held to update interested parties. In lieu or a meeting, progress or status reports may be distributed electronically.*
- *When the project has been completed and a draft report prepared, a second round of meetings are scheduled to present the findings and to take questions and comments.*
- *Occasionally, extensive modifications of the draft report are necessary due to volume and or nature of the comments received. When this occurs, another round of meetings is convened to again present the report, highlight the changes and take questions and listen to comments.*

Ongoing Education

Environmental Health Services should look for opportunities to collaborate with other interest groups such as the California Onsite Wastewater Association (COWA), home owners' organizations, real estate groups and the building industry to provide reliable and accurate information about septic system functioning and proper maintenance. See Appendix 6 for a sample Septic System educational flyer.

EHS has proposed using Supplemental Treatment as a mitigating measure when seepage pits are used, for increasing OWTS density and in those instances when it is not possible to install a system that meets Santa Barbara County standards. While the use of such systems will require operating permits with routine, ongoing inspection and maintenance, owner education on how these systems work and the importance of maintenance will be necessary. Therefore EHS will work with representatives from the industry to develop appropriate education materials that will be provided to the property owner when the operating permit is issued.

Section IX
Enforcement

Santa Barbara County has a well-established ordinance and procedure related to OWTS code enforcement. Initiating enforcement action is generally used only when all other means to correct a problem or a violation have failed. However there are situations such as when there is a threat to public health and safety, that enforcement action must be implemented immediately. The circumstances or conditions that would result in EHS initiating enforcement are described below.

Failure to Obtain a Permit

The Ordinance requires that a permit be obtained before an OWTS is constructed, repaired, modified or abandoned. It further states that it is unlawful to cover, conceal or put into use an OWTS or any part thereof, without having first obtained an inspection and final approval from the Administrative Authority (EHS).

Should EHS be made aware of or discover that an OWTS is being installed, modified, repaired or abandoned without a permit, and the work is in progress, a Notice of Violation is issued to the property owner directing that all work cease and that he/she obtain the appropriate permit. All information required as part of the application as well as the established fee, must be submitted before work may commence.

An OWTS that was installed, modified, repaired or abandoned without benefit of a permit and inspection has no legal standing. Should EHS discover or be made aware of a system that was constructed or modified “after the fact” the property owner would be required to submit the standard application and supporting documents (percolation tests, soil evaluation etc.) to obtain a permit. The owner would also have to provide evidence that the work met current standards or repeat the work in order to satisfy EHS that system meets all applicable provisions of the ordinance.

It is important to note that there was no requirement for a permit to construct an OWTS prior to 1958. While one would expect that a system that old would be in need of repair that may not be the case. Consequently, OWTS installed before 1958 are considered as prior non-conforming and may be used as long as it continues to function as intended except when it is determined that these antiquated systems are using a cesspool or a hollow seepage pit. These excavations must be abandoned or repaired immediately.

If an OWTS was repaired or abandoned without a permit, the property owner must provide “evidence” that the work was completed properly. Such evidence might include a letter from the contractor that performed the work, photographs of the work, bills for materials and supplies etc.

Inspection/Maintenance

Santa Barbara County’s Voluntary Maintenance Program was described in Section V of this LAMP. In short, the Ordinance does not require ongoing, routine inspections of standard OWTS. However, it does require that any time an OWTS is serviced the tank is to be inspected for signs of deterioration and other system deficiencies. In addition, a report detailing the results of the inspection is to be submitted to Environmental Health Services within 30 days unless the system is in a state of failure. Under those circumstances the report must be submitted within 24 hours.

If the report identifies any deficiencies, a tiered enforcement response is implemented. (Refer to the Program Process flowchart in Appendix V). Initially, a notice is generated and mailed to the property owner. Depending on the severity of the problem, the notice will either recommend corrective action or direct that a repair of the OWTS be completed by a specified date. Appendix IV lists the most common deficiencies. If the property owner makes the necessary repairs, then no further action is taken. Should the property owner not take the needed action, a second notice is sent.

The majority of property owners make the needed repairs after receiving the Second Notice. In those cases when the property owner fails to comply with the Second Notice by the stated deadline, EHS will implement the next enforcement tier and issue a Notice of Violation. The Notice of Violation contains essentially the same information as the previous notices but it more emphatically states that the property owner is in violation of the County Code and corrective action is necessary to avoid additional enforcement measures.

Section 24A-1 of the Santa Barbara County Code states that violations of Chapter 18C, Article I (Onsite Wastewater Treatment Systems) as well as other specified chapters of the County Code, are subject to an administrative fine or penalty as set forth in the California Government Code. Therefore, if a property owner fails to take remedial action after receiving a second Notice of Violation, EHS will issue a Notice of Determination of Fine (NDF).

The NDF lists the violation(s) and the dates and types of the previous notices that were sent to the owner. The NDF then states that as a result of the lack of compliance with those previous notices, an administrative fine of a specified amount has been assessed. The NDF explains that the recipient has ten days to appeal the assessment and outlines the steps to make an appeal. If no appeal is received by the deadline, the Determination of Fine is final.

The goal of an enforcement action is to correct a violation. The assessment of a fine does not end the matter as abatement of the violation is still required. A continued failure to correct the violation would result in another enforcement action leading to a potential second fine or the initiation of civil action.

OWTS Failure

A failing onsite wastewater treatment system is defined in Section 18C-2(T) of the Ordinance. In general terms a system has failed when wastewater is no longer safely treated or discharged and therefore represents a health risk or a threat to the environment. Signs of a failing system may range from an elevated liquid level in the tank to a discharge of effluent to the surface of the ground.

EHS starts an enforcement action when made aware of a failing OWTS as a result of receiving a complaint that sewage from a particular property is surfacing. If during the subsequent investigation these allegations are confirmed, a Notice of Violation will be issued to the property owner directing them to take immediate action to stop the discharge and to repair the system under permit and inspection by EHS. Repairs must usually be made within thirty days of receiving the notice unless EHS and the property owner in question have agreed to a different compliance schedule but in all cases the discharge must be stopped.

EHS is most frequently made aware of a failing system when an inspection report is submitted to our office that states that the system is failing or has failed. The majority of property owners make repairs immediately when they are made aware of the condition of their system. In those instances when they are not, the procedures previously described in the **Inspection/Maintenance** section above are followed.

Section X
Septage Management

Septage is the partially treated waste from an OWTS. It generally consists of all the wastes that are disposed of through a structure's plumbing system that neither drain out into the soil nor are converted to gases by the bacteria in the tank. In the septic tank where primary treatment takes place the waste separates into three distinct layers; the upper scum layer, the middle clarified layer and the lower sludge layer.

Over time the scum and sludge layers accumulates to the point where the biologically active clarified area is minimized. When this occurs the tank should to be pumped. The liquid waste pumped from the tank is referred to as septage. Septage is essentially sewage and like sewage must disposed of in a manner that protects public health.

Voluntary Maintenance Program records indicate that approximately 900-1,000 septic tanks are pumped and inspected annually in Santa Barbara County. If the assumption is made that an average 1000 gallons of septage is removed during each one of these pump-outs (a 1000 gallon septic tank is standard for a three bedroom house) and inspections, approximately 900,000-1,000,000 gallons of septage is collected and disposed of annually in Santa Barbara County. The volume calculated above does not include septage from chemical toilets which is not directly reported. Due to increased inspection frequency for OWTS that utilize supplemental treatment the volume of septage could increase an incremental amount.

Once removed from the tank by a registered pumper, septage must be transported to a dispersal facility that operates under the authority of a permit by the Central Coast Regional Water Quality Control Board. Currently there are two facilities in Santa Barbara County that accept septage for treatment and dispersal.

The City of Santa Maria's Wastewater Treatment plant accepted 6.6 M gallons of septic system and chemical toilet septage during 2013. Please refer to **Table 10-1** and **Figure 10-1**. The source of this septage is not only from Santa Barbara County but from adjacent areas in San Luis Obispo County. The City of Santa Barbara's El Estero Wastewater Treatment Plant accepts an unknown quantity of septage through a contractual agreement with Marborg Industries that owns and operates a dumping station on their property at 23 N. Quarantina St. in Santa Barbara.

There are facilities in Kern County, King's County and Ventura County that can accept septage. However, due to distance from the source, the volume of material taken to these facilities is believed to be minimal. Finally, it is EHS' understanding that the City of Paso Robles is interested in accepting this material but it is unknown if the City will follow through with these plans. Again, because of the distance from the source, it is believed that any septage transported to Paso Robles from Santa Barbara County, would be minimal.

The City of Santa Maria's wastewater treatment plant is operated and managed by its Utilities Department. A representative of the Utilities Department has stated that the City recognizes the public benefit that the treatment plant provides by accepting septage, verified that Santa Maria has the capacity to handle the anticipated septage volumes into the foreseeable future and intends to continue to provide this service to the community.

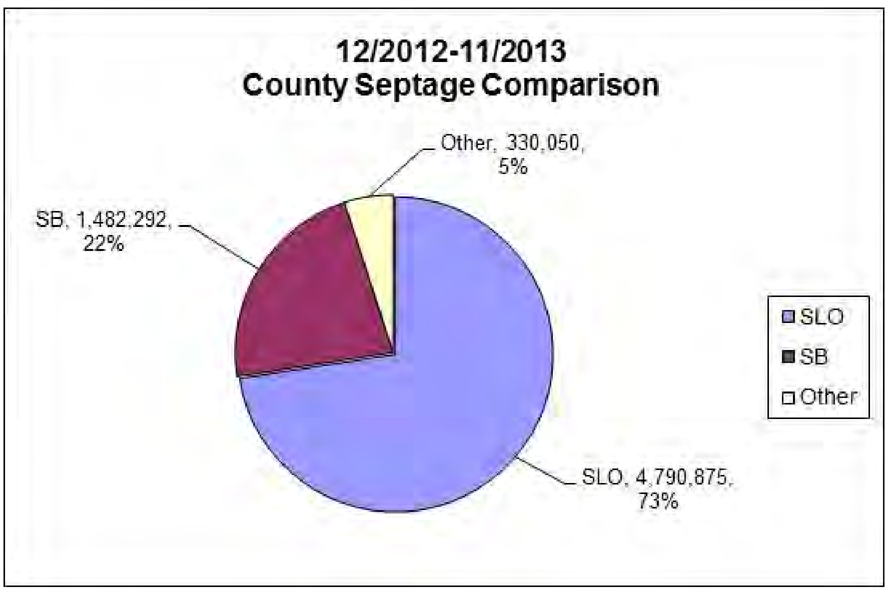
The City of Santa Maria's Wastewater Treatment plant accepted 6.6 M gallons of septic system and chemical toilet septage during 2013. Please refer to **Table 10-1** and **Figure 10-1**. The source of this

septage is not only from Santa Barbara County but from adjacent areas in San Luis Obispo County. In addition, the City of Guadalupe has a contractual agreement to accept this material from one pumping company amounting to approximately 8000 gallons per day.

Table 10-1

2012-2013	SLO	SB	Other	Monthly-All
Dec-12	348419	150200	13000	**511,619**
Jan-13	421294	147899	174600	**743,793**
Feb-13	409177	79800	14900	**503,877**
Mar-13	488749	120945	19600	**629,294**
Apr-13	501,125	155,339	10,600	**667,064**
May-13	448,699	108,610	16,500	**573,809**
Jun-13	355,117	105,997	15,800	**476,914**
Jul-13	402,349	135,682	14,300	**552,331**
Aug-13	408,480	99,142	14,400	**522,022**
Sep-13	352,400	132,739	12,000	**497,139**
Oct-13	354,498	104,994	21,950	**481,442**
Nov-13	300568	140945	2400	**443,913**
Annual Total	**4,790,875**	**1,482,292**	**330,050**	**6,603,217**

Figure 10-1



Section XI
Program Administration

Environmental Health Services is a division of the Santa Barbara County Public Health Department. Please see the department organization chart on in Appendix 7. EHS is responsible for thirteen separate programs that are distributed between three sections; Community Health, Technical Services and Hazardous Materials. The staff assigned to each of these sections report to a Supervisor that in turn report to the Environmental Health Services Director.

The Liquid Waste Program is assigned to the Technical Services section and is responsible for the oversight of the LAMP. All of the Technical Services staff are journey or senior level Registered Environmental Health Specialists. In addition, there are two Registered Geologists in the Hazardous Materials section that are available for consultation should the need arise.

Permit records are currently maintained in paper and electronic formats. The Ordinance requires that a permit be obtained to construct, modify, repair or abandon an OWTS. When a permit application is received the information contained in the application is entered into the Envision database. This includes the property owner's name, the site address, the Assessor's Parcel Number as well as the system specifications. When the project is completed and has received final approval, the application and supporting documents are maintained in EHS's hard files.

The use of operating permits will involve tracking required inspection and maintenance. Initially, hard files will be utilized for this function. However, EHS intends to implement an electronic reporting system in the future, hopefully eliminating the need to maintain paper files

For time accounting purposes, all staff complete Daily Activity Reports (DAR) that detail the tasks performed by an individual in a given program on a given day. A DAR consists of a series of numeric codes that identify the particular program, the permit or project, the activity or type of work performed and the time spent by the Environmental Health Specialist performing the specified activity. This information is entered into the Envision database and can be used to determine how much time staff spent in any element or elements within the Liquid Waste program.

As stipulated in sections 3.3 and 9.3 in the Policy, SBCEHS shall submit an annual report by Feb 1 to the Central Coast Water Board. The annual report will summarize a number of local agency actions including permit activities and complaints received regarding OWTS and will be submitted in a format acceptable to the Central Coast Water Board. In addition, every fifth year, the annual report will include an evaluation of the water quality monitoring program. The "Report Builder" function of the Envision database will be used to comply with annual reporting requirement of the LAMP approval.

Over the course of the past three fiscal years, an average of 2455 hours was coded to the program. This equates to approximately 1.4 Full Time Equivalent positions. To provide adequate coverage and services, this workload is distributed primarily between three staff that also have responsibilities and duties in other programs. However, workload and staffing may be shifted depending on program needs.

The program is funded by a combination of permit fees and the County General Fund. All EHS fees, including the Liquid Waste Program, are established through time studies utilizing the data from staff Daily Activity Reports that is stored in Envision. The data from Envision allows PHD Administration to accurately determine the amount of staff time spent in the various Liquid Waste program elements and activities which is then used to establish the various permit fees.

The standards for the construction, operation and maintenance of OWTS are primarily contained in the County Code adopted by Ordinance by the Santa Barbara County Board of Supervisors after holding requisite public hearings. While the Ordinance is comprehensive, some aspects may be governed by administrative policy. This typically occurs when there is a need to clarify a procedure or address issues related to administration of the code. These policies will be approved by the Director of Environmental Health Services after consultation with staff and as appropriate, with Public Health Department Administration.

APPENDIX I
Ordinance

Ordinance Number ________________

CHAPTER 18C – ENVIRONMENTAL HEALTH SERVICES

ARTICLE I. Onsite Wastewater Treatment Systems

ARTICLE I. Onsite Wastewater Treatment Systems

Sec. 18C-1. Purpose and Intent

The purpose of this article is to regulate onsite wastewater treatment systems as defined herein. It is the intent of the Board of Supervisors, in adopting this article, to ensure that onsite wastewater treatment systems are constructed, modified, repaired, abandoned, maintained, inspected and serviced in a manner that prevents environmental degradation and protects the health, safety and general welfare of the people of Santa Barbara County. This article is intended to achieve the same policy purpose as the California State Onsite Wastewater Treatment System Policy, adopted June 19, 2012 and as may be amended, which is to protect water quality and public health.

Sec. 18C-2. Definitions

The definitions set forth in this section shall govern the construction of this article.

(A) “Accessible” means being readily reached and located and opened for purposes of servicing, inspection, repair, upgrade or modification, as defined in this article.

(B) “Accessory Structure” is any structure, which is subordinate to a main structure. Examples include, but are not limited to, residential second units, guesthouses, decks, cabanas, pools, tennis courts, greenhouses and paved or impervious driveways.

(C) “Adequate Access” means an unobstructed tank port with a minimum of a twenty inch inside diameter.

(D) “Administrative Authority” is the Director of the Environmental Health Services division of the Santa Barbara County Public Health Department, or a duly authorized representative.

(E) **“**Alluvium” means unconsolidated rock and/or soil that has been redeposited and typically lies above consolidated bedrock.

(F) “Alternative Wastewater Treatment System” is an onsite wastewater dispersal field that consists of components other than a conventional or supplemental treatment system as defined in this article. Examples include, but are not limited to, “mound”, “evapotranspiration”, and “at grade” systems.

(G) “ANSI” means the American National Standards Institute.

(H) “Bedroom” is any room in a dwelling that has a door for privacy, a closet and an egress window.

(I) “Bedrock” is any consolidated rock, either weathered or not, which usually underlies alluvium. Bedrock would include sedimentary rocks excluding alluvium. Examples include, but are not limited to, Rincon Formation, Sespe Formation, Coldwater Formation, Sisquoc Formation, and Monterey Formation.

(J) “Cesspool” is an excavation with permeable sides and/or bottom that receives sewage, wastewater, or drainage and is designed to retain organic matter or solids but permits liquids to seep through the bottom or sides.

(K) “Community System” is a residential wastewater treatment system for more than five units or more than five parcels; or commercial, industrial or institutional systems that treat 2,500 gallons or more of domestic/sanitary wastewater per day (peak daily flow).

(L) “Conventional Onsite Wastewater Treatment System” is an onsite wastewater treatment system composed of a septic tank and a dispersal field that uses leach lines, a leaching bed or seepage pits**,** a shallow drip or pressurized drain field and does not include alternative onsite wastewater treatment systems.

(M) “Dispersal Area” is the location of a dispersal field and expansion area.

(N) “Dispersal Field” means a location used for discharge of liquid sewage effluent from a septic tank, dosing tank or treatment tank. Standard dispersal fields include, but are not limited to, leach lines, leach beds, and seepage pits.

(O) “Drywell” is synonymous with the term “Seepage Pit”.

(P) “Dual Dispersal Field” consists of two dispersal fields, connected by a diverter valve, each of which is designed to accommodate the full volume of effluent received from other components of an onsite wastewater treatment system.

(Q) “Effluent” means the partially treated wastewater discharge from an onsite wastewater treatment system.

(R) “Emergency Repair” is a repair that is intended to immediately remedy a failing onsite wastewater treatment system where wastewater has surfaced and is a threat to health and safety or creates a nuisance as defined in this article.

(S) “Expansion Area” means an undeveloped area designated as a location for an additional dispersal field.

(T) “Failing Onsite Wastewater Treatment System,” is any onsite wastewater treatment system where wastewater is no longer safely treated or discharged and presents a health risk to humans or adversely impacts the environment, as determined by the Administrative Authority. Evidence of a failing system includes, but may not be limited to:

(1) A backup of sewage into a structure which is caused by a septic tank or dispersal area problem other than a plumbing blockage;

(2) A discharge of sewage or onsite wastewater treatment system effluent to the surface of the ground that creates a health and safety concern, creates a nuisance, or contaminates the waters of the state;

(3) A septic tank that requires pumping more frequently than once a year in order to provide adequate dispersal of sewage;

(4) Inability to use the system as intended.

(U) “Graywater System” means an onsite wastewater treatment system as defined by the California Plumbing Code.

(V) “Groundwater” is water located below the land surface in the saturated zone of the soil or rock. Groundwater includes perched water tables, shallow water tables, and zones that are seasonally or permanently saturated.

(W) “Inspection” means checking, observing, testing, and/or evaluating an onsite wastewater treatment system to determine the condition of the onsite wastewater treatment system.

(X) IAPMO means the International Association of Plumbing and Mechanical Officials.

(Y) “Inspection Port” is a pipe installed directly into a leaching trench, mound system and/or other dispersal field to monitor the performance of the system through visual inspection and collection of samples.

(Z) “LAMP” is an acronym for a “Local Agency Management Program” used for implementation of the Tier 2 standards in the State Water Resources Control Board’s Policy for Siting, Design, Operation and Management of Onsite Wastewater Treatment Systems.

(AA) “Leach Line,” is a subsurface soil absorption wastewater dispersal system installed in a trench, usually consisting of a perforated distribution pipe placed over gravel or other media and backfilled with native material.

(BB) “Limiting Conditions” are geological, hydrological or soil conditions that restrict the ability of the soil in a dispersal field to eliminate effluent. Examples of limiting conditions may include but are not limited to: impervious material, bedrock, high groundwater, fractured rock, consolidated rock, and extreme percolation rates (less than one minute per inch or greater than 120 minutes per inch).

(CC) “Low Pressure Distribution” means a wastewater dispersal system of small diameter pipes equally distributing effluent throughout a trench or bed at greater than atmospheric pressure.

(DD) “Maintenance” means work related to the upkeep of a wastewater treatment system. Examples include, but are not limited to, any installation, repair or replacement of septic tank baffles, risers, tees, ells, tops, access port lids, pumps and blowers.

(EE) “Modification” means replacement or enlargement of any component of an onsite wastewater treatment system, not defined as maintenance or repair in this article, which results in a change in flow, capacity or design of the system.

(FF) “NSF” means the National Sanitation Foundation or NSF International, a not-for-profit, non-governmental organization that develops health and safety standards and performs product certification.

(GG) “Nuisance” is an onsite wastewater treatment system that has created an obnoxious situation such as, but not limited to, unpleasant odors, saturated surface soils or surfacing effluent.

(HH) “Onsite Wastewater Treatment System” (OWTS) is a system composed of a septic tank and a dispersal field and related equipment and appurtenances. Onsite wastewater treatment systems are also referred to as septic systems, onsite sewage disposal systems, individual sewage disposal systems or private sewage disposal systems and may include alternative and supplemental treatment systems.

(II) “Operating Permit” is a written authorization to operate an onsite wastewater treatment system issued by the Administrative Authority.

(JJ) “Parallel Distribution” means a dispersal field in which the onsite wastewater treatment system effluent is distributed simultaneously through a distribution box.

(KK) “Percolation Test” means a subsurface test conducted to measure the absorption rate of water in soil strata. The test is conducted after initial presaturation and is usually expressed as minutes per inch.

(LL) “Performance Test” means a test conducted to determine the absorptive capacity of a seepage pit by measuring the maximum rate of water absorption after initial presaturation usually expressed as gallons per day.

(MM) “Person” means any individual, firm, partnership, association, corporation, estate, trust, joint venture, receiver, county, or other political subdivision, or any other group or combination acting as a unit.

(NN) “Primary Treatment” means temporary holding of wastewater in a septic tank where heavy solids can settle to the bottom while oil, grease and lighter solids float to the surface.

(OO) “Qualified Contractor” means a contractor holding a license that is current and active from the Contractors State License Board for Plumbing (C-36), Sanitation System (C-42), or General Engineering Contractor (A). A contractor holding a license as a General Building Contractor (B) shall be considered a qualified contractor when constructing, modifying or abandoning an onsite wastewater treatment system as part of a larger construction project involving a new structure or major addition to an existing structure.

(PP) “Qualified Inspector” means a Registered Environmental Health Specialist, Professional Engineer, or Qualified Contractor or an individual that meets the requirements of the State OWTS Policy.

(QQ) “Qualified Professional” means an individual licensed or certified by a State of California agency to design onsite wastewater treatment systems and practice as professionals for other associated reports, as allowed under their license or registration. Depending on the work to be performed and various licensing and registration requirements, this may include an individual who possesses a Registered Environmental Health Specialist certificate or is currently licensed as a Professional Engineer or Professional Geologist.

(RR) “Registered Pumper” is a firm or person that pumps and/or hauls septage or wastewater from chemical toilets and has been issued a registration by the Administrative Authority.

(SS) “Repair” means restoration, replacement, or alteration of any malfunctioning or damaged component of an onsite wastewater treatment system except those defined in this article as maintenance. The alteration of a hollow seepage pit to a rock filled seepage pit for the purposes of this article shall be considered a repair.

(TT) “Secondary Treatment” means wastewater treatment which removes dissolved and suspended biological matter. Secondary treatment is typically performed by indigenous, water-borne micro-organisms in a septic tank or treatment tank.

(UU) “Seepage Pit” means an excavation, typically cylindrical in shape and filled with rock, constructed for the purpose of disposing of sewage effluent from a septic tank or treatment tank.

(VV) “Septic Tank" means a water tight, compartmentalized, covered receptacle designed and constructed to: receive the discharge of sewage; separate the solids from the liquid; digest organic matter; store digested solids for a period of retention; and allow the resultant effluent to discharge from the tank to the dispersal field.

(WW) “Serial Distribution” means the distribution of septic tank effluent by gravity flow that progressively loads one section of a dispersal system to a predetermined level before overflowing to the succeeding section.

(XX) “Servicing,” means inspection pumping and cleaning of a septic tank, dispersal field, or other system components.

(YY) “Severely Constrained Lot” is a lot of record that contains limiting conditions that prevent the installation of an onsite wastewater treatment system that conforms to the provisions of this article.

(ZZ) “Sewage” is any and all waste substance, liquid or solid, associated with human habitation, or which contains or may contain human or animal excreta or excrement, offal or any feculent matter. Industrial wastewater shall not be considered as sewage.

(AAA) “Shallow Drip System” means a treated wastewater dispersal system using filters, flexible tubing, drip emitters and a flushing mechanism to disperse directly to the soil without stone aggregate or chambers.

(BBB) “Special Problems Area” is an area designated by the Board of Supervisors, in Chapter 10, Article XV of the Santa Barbara County Code as having severe constraints to development that include, but are not limited to, access, drainage and wastewater disposal.

(CCC) “Subdrain” is an underground passage for the re-direction of water, typically made by filling a trench with loose stones and/or a perforated pipe and covering with earth. Subdrains are also called curtain drains, rubble drains or French drains.

(DDD) “Supplemental Treatment System” is an onsite wastewater treatment system that utilizes engineered designs and/or technology to treat effluent to reduce one or more constituents of concern in wastewater. It may also be referred to as an Advanced Treatment System or Enhanced Treatment System. Examples include, but are not limited to, sand filters, textile filters and aerobic treatment units but do not include composting or incinerating toilets.

(EEE) “Tertiary Treatment” means wastewater that has already undergone primary and secondary treatment and will be disinfected prior to discharge.

(FFF) “Treatment Tank” is a tank other than a septic tank in which wastewater is acted on either by chemical or biological means, to reduce the concentrations of constituents of concern.

Sec. 18C-3. General Provisions

(A) Requirement for Adequate Wastewater Treatment

(1) Any structure, regardless of use, that produces wastewater shall have adequate wastewater treatment as required by the California Plumbing Code, as amended and adopted by the County of Santa Barbara in Chapter 10, Article IV. Wastewater treatment shall either be accomplished by means of an approved onsite wastewater treatment system or connection to a public sewer.

(2) The minimum daily design flow for residences shall be three hundred-seventy five gallons per day for up to three bedrooms. Each additional bedroom above three shall increase the daily design flow by seventy-five gallons per day.

(3) Chemical toilets may be used only on a temporary or occasional basis.

(4) A supplemental treatment system for new or replacement onsite wastewater treatment systems shall be required under any one of the following conditions:

a) The following shall apply to areas designated by the Board of Supervisors as a “Special Problem Area” for the use of onsite wastewater treatments systems due to treatment and dispersal constraints:

i) If the existing onsite wastewater treatment system is found to no longer meet minimum standards to serve a proposed project that requires a Land Use Permit, Coastal Development Permit, or Building Permit, then a supplemental treatment system shall be installed.

ii) If the existing onsite wastewater treatment system dispersal field has failed, then a supplemental treatment system shall be installed. Replacement of tanks and repairs not requiring permits do not trigger the requirement for supplemental treatment.

iii) For projects that require onsite wastewater treatment system modifications, including but not limited to, bedroom additions, intensification of use and major remodels, then supplemental treatment shall be installed. Projects and uses that add development area but not additional flow will not be required to install supplemental treatment.

iv) If the project is located within the designated Special Problems Area on a parcel with the AG-I, AG-II, RR, 3-E-1, 5-E-1, 10-E-1, or 3.5-EX-1 zone district, and the parcel is equal to or greater than 2.5 gross acres, the project will need to meet minimum state and county standards but will not be required to install supplemental treatment.

b) Areas identified by the Regional Water Quality Control Board as having groundwater basins experiencing significant groundwater degradation due to onsite wastewater treatment systems.

c) When the seepage pit method of wastewater dispersal is used on parcels of five acres or less or where the seepage pit has a maximum absorptive capacity greater than or equal to 8,000 gallons per day or absorptive rates between 500 and 1000 gallons per day.

d) On previously developed severely constrained lots where a repair is required but no conforming onsite wastewater treatment system can be constructed.

e) For the creation of parcels of 1-2 ½ acres in size irrespective of the type of dispersal field. A Notice to Property Owner shall be recorded with the map indicating that an OWTS utilizing a supplemental treatment system shall be required when development occurs.

(5) Composting and incinerating toilets may only be utilized with written permission from the Administrative Authority where site constraints preclude standard wastewater treatment and dispersal or use of supplemental treatment. Composting and incinerating toilets shall conform to the standards of NSF/ANSI Standard 41 and NSF P157 respectively.

(6) Graywater systems are allowed as per the requirements of the California Plumbing Code.

(7) For OWTS utilizing parallel distribution for wastewater dispersal, each trench line shall be of equal length to the maximum extent practical. For dispersal systems using serial distribution, trenches shall be maintained at the shallowest depth possible and no deeper than five feet below ground surface. Seepage pits must be connected in a manner that balances the volume of effluent received not to exceed the required application rate.

(B) Protection of Onsite Wastewater Treatment Systems

(1) Onsite wastewater treatment systems shall be located so as to be accessible for servicing, inspection, upgrades, modification and repairs.

(2) Designated expansion areas shall not be developed in a manner that precludes their availability for the new dispersal field.

(3) Each onsite wastewater treatment system shall be designed, installed and maintained so as to prevent infiltration and exfiltration.

(4) If subdrains discharge diverted water to subsurface soils, the minimum upslope separation from any dispersal field shall be twenty feet and the minimum down slope separation shall be fifty feet. If the subdrain is provided for the sole purpose of protecting the integrity of a structure, such as a retaining wall, then the Administrative Authority may modify the separation requirements provided above.

(C) Permit Issuance Does Not Allow Continued Violation

The issuance of a permit or approval of plans shall not be deemed or construed to allow a violation of any of the provisions of the Santa Barbara County Code or California State Law. The issuance of a permit or approval of plans shall not prevent the Administrative Authority from requiring the correction of errors in said permit or approved plans when a condition allowed in the approval is found to be in violation of the Santa Barbara County Code or California State Law. Continued violation may result in administrative fines assessed to the responsible party pursuant to Chapter 24A.

(D) Prohibitions

(1) Discharges from new onsite sewage treatment systems are prohibited if they could result in noncompliance with state and county regulations.

(2) Hollow seepage pits and any form of cesspool are prohibited. Upon discovery, cesspools shall be properly abandoned and replaced with an onsite wastewater treatment system that meets the requirements of this article. Hollow seepage pits shall be properly abandoned or rock filled.

(3) Holding tanks are prohibited as a permanent method of sewage disposal unless specifically approved in writing by the Building Official and Environmental Health Services has been notified.

(4) Sewage dispersal shall not be permitted in fill material unless it is specifically designed by a Registered Civil Engineer to accommodate the discharge without creating a nuisance or public health hazard as approved by the Administrative Authority.

(5) Discharge from an onsite wastewater treatment system that exceeds peak design flow or maximum permitted capacity is prohibited.

(6) Dispersal fields are prohibited in roadways but may be allowed in designated parking areas only if they are designed to withstand vehicle load ratings and are covered with a permeable surface with prior approval of the Administrative Authority.

(E) Industrial Operations

(1) Any industrial operation which generates wastewater other than, or in addition to, domestic wastewater shall have separate onsite wastewater treatment systems for the domestic and the industrial wastewater unless a single system is approved by the

Regional Water Quality Control Board. Separate applications, plans and specifications must be submitted for each system.

(2) Industrial wastewater may be subject to regulation by the Regional Water Quality Control Board.

(F) Inspections

(1) Inspections shall be scheduled with the Administrative Authority a minimum of two working days in advance of the time requested. Inspections are required prior to final covering of any components of the system.

(2) A qualified professional shall conduct periodic inspections of onsite wastewater treatment systems after excavation and prior to the placement of any rock or fill material. Prior to final approval, a signed report shall be submitted to the Administrative Authority confirming that the OWTS installation has been completed in accordance with the approved design. This does not preclude the normal inspection process associated with any building permit.

(3) When the system is installed outside the permitted/approved area, additional testing will be required, or approved by the qualified professional that designed the OWTS. The previously approved plans shall be revised to reflect the new location or design change.

(G) Permit Suspension and Revocation.

(1) The Administrative Authority may suspend or revoke a permit whenever it is determined that the permittee has violated any provisions of this article; has misrepresented any material fact in the permit application or supporting documents for such permit; and/or performed any work under the permit that has resulted in a nuisance.

(2) No person whose permit has been suspended or revoked shall continue to perform the work for which the permit was granted until, in the case of a suspension, the permit has been reinstated by the Administrative Authority. The permit shall not be reinstated until the violation causing the suspension has been abated.

(3) Upon suspension or revocation of any permit, if any work already done by the permittee has left an onsite wastewater treatment system in such a condition as to constitute an emergency, the Administrative Authority may order the permittee to perform any work reasonably necessary to protect the health and safety of the public. No permittee or person who has held any permit issued pursuant to this article shall fail to comply with any such order.

(H) Professional Qualifications, Signatures and Stamps

(1) An onsite wastewater treatment system shall be designed by a qualified professional as defined by this article.

(2) In order to construct, modify, repair, abandon or replace any onsite wastewater treatment system, a person must be a qualified contractor as defined by this article. However, a property owner may construct, repair or modify a system on his/her own property provided the owner complies with all the provisions of this article.

(3) A qualified inspector, qualified contractor or professional engineer shall perform inspection, maintenance and servicing required by this article.

(4) Prior to approval by the Administrative Authority, percolation and performance test reports and final onsite wastewater treatment system plans, shall have an original signature and stamp of the professional engineer or the Registered Geotechnical Engineer who performed the tests, wrote the reports and designed the onsite sewage treatment system.

Sec. 18C-4. Permits

No person shall construct, reconstruct, repair, modify, destroy or abandon any onsite wastewater treatment system or graywater system, or any portion thereof, without having first obtained a permit from the Administrative Authority. It shall be unlawful for any person to cover, abandon, destroy, modify, repair, conceal, or put into use an onsite wastewater treatment system or graywater system, or any portion thereof, without having first obtained a permit and final approval from the Administrative Authority.

Alternative systems and systems with supplemental treatment require an operating permit in conformance with section 18C-5(l) of this code which shall be issued by the Administrative Authority prior to the final approval of the construction of the system.

(A) Applications

(1) An onsite wastewater treatment system permit application shall be submitted on a form approved by the Administrative Authority for new construction, repair, abandonment or modification of an onsite wastewater treatment system, alternative system or graywater system. The application shall be accompanied by plans and specifications submitted in a format prescribed by the Administrative Authority. The approved application shall be deemed a permit to construct and may contain conditions that apply to the construction, operation and maintenance of the system. The permit conditions shall be binding upon the property owner and successive property owners for the life of the system.

(2) When an evaluation of an existing onsite wastewater treatment system is required, an application shall be completed and submitted to the Administrative Authority.

(B) Fees

(1) Submission of an application shall be accompanied by payment of all appropriate fees. The Board of Supervisors may, by resolution, adopt such fees as are allowed under § 101325 of the California Health and Safety Code and may prescribe such terms and conditions as may be necessary to enable the County of Santa Barbara to recover the reasonable and necessary costs incurred by the County in administering this article.

(2) The Board of Supervisors shall determine fees for operating permits.

(C) Expiration

Construction permits shall expire by limitation and become null and void if the work authorized is not commenced within one year from the date of issuance of the permit. If the work authorized by such permit is started and then suspended or abandoned for a period of one year or longer, the work shall not be recommenced until a new permit is obtained. Upon written request from the applicant the Administrative Authority may renew the permit for a maximum of one year beyond the initial expiration date if the plans, specifications, and site conditions have not changed for a maximum of two renewals.

The renewal request must be received by the Administrative Authority prior to the expiration of the previously approved permit. When such renewal is authorized the work must comply with current requirements. Upon the expiration of a permit no further work shall be performed unless a new permit is issued.

(D) Exemption for Routine Maintenance and Servicing

Onsite wastewater treatment system maintenance and servicing, as defined in this article, may be performed by a Qualified Contractor without a permit as long as a written report of work performed is submitted to the Administrative Authority and such work complies with all codes, regulations and procedures applicable in Santa Barbara County at the time the maintenance is performed. The written report shall be submitted on a form approved by the Administrative Authority within thirty days of completion of the maintenance. If the report is not received by the Administrative Authority within 30 days of the completion of the maintenance or servicing the qualified contractor may be subject to administrative fines.

(E) Transfers

An onsite wastewater treatment system operation, construction, modification, repair, abandonment or evaluation permit is not transferable. If there is a sale or transfer of a property upon which a permit has been issued and the work authorized in the permit has not been completed the new property owner must submit a new application.

(F) Zoning Clearance

A Land Use Permit or a Coastal Development Permit shall be issued by the Santa Barbara County Planning and Development Department for any new structure utilizing an onsite wastewater treatment system prior to the issuance of a permit to construct the onsite wastewater treatment system.

(G) Administrative Fines and Penalties

Any person who commences work on an onsite sewage treatment system for which a permit is required, without first having obtained a permit, shall be required to obtain a permit and pay double the permit application fee established by the Board of Supervisors and may be subject to administrative fines as provided in chapter 24A of the Santa Barbara County Code.

(H) Suspension and Revocation

(1) The Administrative Authority may suspend or revoke any permit to construct, repair, modify, or abandon and onsite sewage treatment system, or any component of the system, issued pursuant to this article, whenever the permittee has violated any provisions of this article, misrepresented any material fact in the permit application or supporting documents for such permit, and/or performed any work that was not authorized under the permit or has created a nuisance.

(2) Any permittee whose permit has been suspended or revoked shall discontinue work for which the permit was granted until such permit has been reinstated or reissued.

(3) If the work halted by the suspension or revocation of a permit, has left an onsite wastewater treatment system in a condition that constitutes a safety hazard, a nuisance or threatens public health, the Administrative Authority may order the permittee to perform

any work reasonably necessary to protect public health and safety or mitigate the nuisance as allowed by Section 18-3 of the County Code. If the permittee fails to mitigate the hazard or nuisance, the Administrative Authority may have the construction completed at the expense of the permit holder through the administrative fines process noted in chapter 24A of the Santa Barbara County Code.

(I) Right to a Hearing

Any person, whose application for a permit has been denied, suspended, or revoked, may submit a request for an office hearing to appeal the denial, suspension, or revocation, to the Administrative Authority. The request must be submitted in writing within fifteen working days after receiving notification of the permit denial, suspension, or revocation. The request must specify the grounds upon which the appeal is submitted and should contain documentation that substantiates the reason for the appeal. The Administrative Authority shall set an office hearing for such appeal within fifteen working days of receipt of the request and shall notify the appellant in writing, of the time and place of the hearing at least five days prior to the date of the hearing. The Environmental Health Services Director, or his designee, acting as the Hearing Officer shall notify the appellant of his/her decision in writing within ten working days after the hearing is concluded.

Sec. 18C-5. New System Standards

The following requirements shall be met to ensure that all new onsite wastewater treatment systems are installed at locations that have been adequately evaluated and that methods used to conduct those evaluations meet specified minimum standards.

(A) General Site Evaluation

(1) The Administrative Authority shall require the submission of all information necessary to thoroughly evaluate the suitability of a site for wastewater treatment and dispersal and to asses any limiting conditions. At a minimum, the site evaluation information shall include but is not limited to:

a) The Administrative Authority may require a geologic report, prepared by a Certified Engineering Geologist, describing any soil or bedrock formations encountered and addressing slope stability when the proposed dispersal field is located on a slope greater than thirty percent.

b) The minimum separation from the bottom of the dispersal field to groundwater shall be confirmed by soil borings pursuant to §18C-5(B) and §18C-5(C) of this article. Where fluctuations in groundwater levels may impact the dispersal field, the highest recorded depth shall be utilized.

c) Minimum site requirements shall be those provided in the California Plumbing Code as amended and adopted by the County and/or the OWTS Policy, whichever are more stringent.

(B) Soil Evaluation for Leach lines and Seepage Pits

(1) Leach lines:

a) At least one deep soil boring or trench shall be required within the primary dispersal area and expansion area. Deep borings or trenches shall be a minimum of ten feet beneath the proposed maximum depth of the dispersal field.

b) When using percolation tests to determine site suitability, not less than three percolation tests shall be conducted in the primary dispersal field and expansion areas. Percolation tests shall be completed with adequate separation to characterize the primary dispersal field and the expansion area. The tests shall be performed at a depth corresponding to the bottom of the subsurface dispersal field.

c) Percolation tests shall be valid for five years after completion. A professional engineer or soils engineer may recertify the tests for an additional term of five years. After ten years, the original percolation tests are no longer valid and must be repeated.

(2) Seepage Pits:

a) Maximum absorptive capacity of each seepage pit shall be determined using a slug test such as a constant head type test after initial presaturation. Only the sidewall may be used for the purpose of calculating the absorption area using the following criteria:

Absorptive Capacity (gpd)	Application Rate (gpd/square foot)
<500 gallons per day	Discharge prohibited
500-1000 gallons per day	.4 (treatment required)
1000-8000 gallons per day	.8
>8000 gallons per day	1.2 (treatment required)

b) Seepage pit testing shall be valid for five years. A qualified professional may recertify the test once for an additional term of five years.

(3) Seepage pits may be utilized only if limiting conditions make leach lines infeasible, as determined by a qualified professional or registered geotechnical engineer with the concurrence of the Administrative Authority. A determination of leach line infeasibility must be provided and shall include a written statement that has been signed and stamped by the qualified professional or registered geotechnical engineer that specifies the unfavorable conditions, which render effluent dispersal using leach lines infeasible. A determination of leach line infeasibility shall be based on poor absorptive capacity or a lack of separation to a required setback. The encroachment of proposed accessory structures on otherwise suitable dispersal areas shall not be used to determine infeasibility for purposes of this article.

(4) Leach beds may be installed only if leaching trenches are not feasible, as determined by a qualified professional or registered geotechnical engineer with concurrence from the Administrative Authority. A determination of leach line infeasibility must be provided and shall include a certified written statement by the qualified professional or registered geotechnical engineer, which specifies the unfavorable conditions that render leach lines infeasible.

(5) Alternative systems may be utilized only if limiting conditions make leach lines infeasible, as determined by a qualified professional or registered geotechnical engineer with the concurrence of the Administrative Authority. A determination of leach line infeasibility must be provided and shall include a written statement that has been signed and stamped by the qualified professional or registered geotechnical engineer that specifies the unfavorable conditions, which render effluent dispersal using leach lines infeasible.

(C) Wet Weather Borings

(1) Wet weather borings may be required by the Administrative Authority when available information indicates that variations in groundwater levels occur that may result in a failure to maintain the minimum separation required between the bottom of the dispersal field and groundwater. Wet weather borings may also be required when there is reasonable cause to believe that groundwater is less than sixty feet below the natural ground surface for seepage pits and twenty feet for leach lines and such information is required to confirm adequate separation to groundwater during wet seasons.

(2) Additional requirements for wet weather borings:

a) The depth to groundwater shall be measured from the first encounter of water in the boring. A subsequent measurement shall be made within three days to determine if the water level is static or dynamic.

b) The boring shall be performed after seventy five percent of the average annual rainfall has occurred as determined by the County Water Agency.

c) In the event of a drought or the project is constructed in the dry times of the year, the Administrative Authority may accept additional hydrologic or geologic information provided by a professional engineer experienced in soil mechanics, a registered geotechnical engineer, a professional geologist, a certified engineering geologist, or a certified hydrogeologist that estimates the highest anticipated elevation of groundwater based on soil or historic data.

(D) Tank Requirements

(1) Septic tanks and treatment tanks must be watertight. Water tightness shall be ensured prior to backfilling the excavation around the tank.

(2) Septic tanks and treatment tanks shall be constructed of reinforced concrete, fiberglass, or other durable, corrosion resistant, synthetic material and shall conform to IAPMO, NSF or ASTM standards or similar criteria.

(3) Septic tanks and treatment tanks installed beneath surfaces subject to vehicular traffic (e.g., driveways and vehicle turnarounds) shall be traffic rated or engineered to support the additional load. Septic tanks and treatment tanks placed in areas subject to vehicular traffic shall be provided with lids or risers that are rated for traffic loading.

(4) Septic tanks shall have a minimum capacity of three times the peak daily flow.

(5) All septic tanks for new systems and replacement tanks for existing systems shall be equipped with an effluent filter that is an American National Standards Institute (ANSI) listed. The filter must be accessible for cleaning, replacement and maintenance.

(6) Septic tanks and treatment tanks shall be installed by a qualified contractor according to the manufacturer's specifications. Earth cover over the tank shall be clean fill material, free of debris and rock.

(7) Septic tanks shall have a minimum of two compartments with access to each compartment and a lid with a minimum of twenty inches in diameter for each compartment. Access lids shall have a maximum separation of ten feet. Treatment tanks may consist of a single tank if required by the manufacturer of the approved supplemental treatment system.

(8) Septic tanks and treatment tanks shall be installed so as to be accessible for servicing, inspection, maintenance, upgrades or replacement.

(9) Septic tanks shall be installed with the top of the tank no deeper than twelve inches below finish grade. If it is demonstrated that the top of a septic tank must be deeper than twelve inches below grade, each compartment of a septic tank shall be provided with a watertight riser, capable of withstanding anticipated structural loads and extending to within twelve inches of finish grade. Septic tanks and treatment tanks shall be installed as shallow as practical and in no case at a depth greater than factory recommendations.

(10) The qualified professional responsible for the approved design shall provide written certification that the installation has been completed per the approved plans.

(11) Risers shall be installed within twelve inches of grade to enhance access for maintenance.

(12) Distribution boxes, drop boxes, pump chambers and stilling chambers shall be watertight and commercially manufactured with corrosion resistant materials.

(13) When necessary to extend septic tank risers to finish grade, access lids shall be gas-tight, securely fastened with stainless steel or other corrosion resistant fasteners and be resistant to vandals, tampering, and access by children.

(14) Surface water shall be diverted away from the riser cover or septic tank lid by providing a sloping surface away from the riser, or extending the riser at least six inches above grade.

(E) Dual Dispersal Area Requirements for Onsite Wastewater Treatment Systems

(1) For new onsite wastewater treatment systems serving commercial projects installation of dual dispersal fields connected with a diverter valve is required. A third area of adequate size shall be set aside for future expansion of the onsite wastewater treatment system.

(2) Residential OWTS shall have dual fields installed with a 100% set aside if the project is located on a parcel equal to or less than 2.5 gross acres. If the project is located within the AG-I, AG-II, RR, 3-E-1, 5-E-1,10-E-1, or 3.5-EX-1 zone district, and on a parcel equal to or greater than 2.5 gross acres the OWTS will need to meet minimum state and county standards but will not be required to install dual fields. The Administrative Authority may

require that dual fields be installed and have a 100% expansion area set aside if the dispersal field area is found to be severely constrained irrespective of parcel size or zoning designation.

(F) Seepage Pit Construction

(1) Seepage pits shall be cylindrical in shape with a diameter of not less than four feet or more than six feet. Construction of a seepage pit with a diameter less than four feet or greater than six feet may be permitted with written approval of the Administrative Authority.

(2) Seepage pits shall have a centrally located four inch diameter perforated pipe which extends from the inlet to the bottom of the pit and the space around the pipe shall be filled with washed gravel which may vary in size from 3/4 inch to 2-1/2 inches. A smaller gravel size may be used if the design engineer can provide justification for its use and written approval is obtained from the Administrative Authority. When necessary to meet minimum slope setback requirements, the upper portion of the central pipe shall be unperforated.

(3) Rock fill in seepage pits shall be covered with building paper or equivalent, and backfilled with a minimum of eighteen inches of clean earth cover, free of debris and rock.

(4) Seepage pits shall have an effective dispersal depth of at least ten feet. Effective dispersal depth is defined as total depth minus the distance below the grade to the uppermost dispersal pipe perforation.

(5) The maximum depth of a seepage pit shall be sixty feet, unless the Administrative Authority provides written approval for a greater depth.

(6) Multiple seepage pit installations shall receive septic tank effluent via an approved distribution method.

(G) Leach Line Construction

(1) Four square feet of absorption area per lineal foot of trench shall be the maximum allowable absorption area for systems without supplemental treatment. Seven square feet per lineal foot of trench may be allowed for systems using supplemental treatment and the dispersal fields are constructed using pipe and rock.

(2) Application rates shall be in conformity with Table 3 in State Water Resources Control Board OWTS policy.

(3) Inspection ports shall be installed at the end of each trench and at other locations if required by the Administrative Authority. Inspection ports shall extend to the bottom of the trench or bed and must be anchored to prevent disturbance or removal. The portion of the inspection port within the rock filter material shall be perforated to permit the free flow of liquid. The inspection ports shall have removable caps and may either extend above grade or set to grade if enclosed in a service box with removable lid. The boxes shall be made of non-degradable material such as PVC, fiberglass or concrete.

(H) Low Pressure Distribution

(1) When required by site conditions, onsite wastewater treatment system effluent may be distributed to a dispersal field under pressure. Dispersal utilizing pressure distribution shall meet the following requirements:

a) Pressure distribution systems shall be fully engineered. A qualified professional shall submit a stamped and signed letter to the Administrative Authority stating that the pressure distribution system has been constructed per the previously submitted plans.

b) The pump chamber shall include a visual and audible high water alarm.

c) Emergency storage capacity shall be required equal to six hours of peak flow or three hundred seventy-five gallons whichever is greater.

d) The dispersal field shall be dosed in compliance with design requirements.

e) The distribution network shall be accessible for inspection, testing, flushing and adjustment.

(I) Shallow Drip Systems

(1) Shallow Drip Systems shall conform to the following requirements:

a) Drip lines shall be installed in native soil. The minimum depth to a limiting soil condition shall be in conformity with State standards.

b) Up to twelve inches of fill may be placed above the drip line to satisfy minimum soil cover requirements. The soil cover may be reduced to six inches when the wastewater has been treated to a tertiary level.

c) Measures shall be taken to avoid collection or ponding of rainfall or runoff in the dispersal field area. Soil erosion in the drip field shall be minimized.

d) All subsurface drip system dispersal fields shall be preceded by a supplemental treatment system that meets the requirements of §18C-5(K) of this article.

e) Drip lines shall be installed as level as possible and parallel to elevation contours.

f) Drip field design shall be fully engineered and in accordance with manufacturer recommendations. Within thirty days of the completion of the construction of the subsurface drip irrigation system, a qualified professional shall submit a stamped and signed letter to the Administrative Authority stating that the system was installed per the previously approved plans.

(J) Alternative Wastewater Treatment Systems

(1) Onsite wastewater treatment systems utilizing an alternative dispersal field that may be approved for installation include mound, evapo-transpiration and at-grade systems. The Administrative Authority may approve other types of systems.

(2) The Administrative Authority may adopt design standards for alternative systems after consultation with the Regional Water Quality Control Board.

(3) Alternative dispersal fields shall be engineered in conformance with the *Guidelines for Evapotranspiration Systems* published by the State Water Resources Control Board. Upon completion of the installation and prior to final approval, a qualified professional shall submit a stamped and signed letter to the Administrative Authority stating that the alternative dispersal field has been constructed per the previously approved plans.

(4) Operation, maintenance and monitoring specifications shall be provided for review and approval for any alternative dispersal system

(5) A notice of the installation of an alternative onsite sewage dispersal field shall be recorded with the Santa Barbara County Clerk-Recorder's office. Said notice shall run with the land and serve as constructive notice to any future owner, heirs, executors, administrators or successors that the onsite wastewater treatment system serving the subject property has an alternative dispersal field for wastewater dispersal and is subject to an operating permit, regular monitoring, maintenance and reporting requirements.

(6) The property owner shall ensure that a qualified inspector, acceptable to the Administrative Authority, conducts a visual and operational inspection of the system once every year to ensure that the system is functioning properly.

(7) The property owner shall submit a report a minimum of once a year, prepared by a qualified contractor or qualified professional in a form prescribed by the Administrative Authority. The report shall include the results of any inspections, a check of the high water alarm, and any other requirements specified by the Administrative Authority. Reports shall be submitted within 30 days of the completion of the inspection.

(K) Supplemental Treatment Systems

(1) The Administrative Authority shall review and approve the method of supplemental treatment proposed prior to construction. Treatment systems and their components shall be tested and certified by an independent testing agency, such as IAPMO, ANSI or NSF or similar, and shall be tested for the removal of total suspended solids, bio-chemical oxygen demand (BOD) and total nitrogen.

(2) A notice of the installation of a Supplemental Treatment System shall be recorded with the Santa Barbara County Clerk-Recorder office. Said notice shall run with the land and serve as constructive notice to any future owner, heirs, executors, administrators or successors that the onsite wastewater treatment system serving the subject property has supplemental treatment and is subject to an operating permit with monitoring, reporting and maintenance requirements.

(3) A maintenance contract between the property owner and the supplier of the supplemental treatment system or their representative shall be in force for the supplemental treatment unit and dispersal field prior to installation. The maintenance agreement shall be in force for the life of the supplemental treatment system.

(L) Operating Permits

(1) An operating permit issued by the Administrative Authority is required for the operation of alternative and supplemental treatment systems. All onsite wastewater treatment systems requiring operating permits shall be operated, maintained and monitored pursuant to the requirements of this article and the permit. The operating permit shall be renewed every five years following the review of satisfactory annual reports submitted to the Administrative Authority. The Administrative Authority may suspend or revoke an operating permit for failure to comply with any monitoring, maintenance or other requirements of the permit. If a permit is suspended or revoked, operation of the system shall cease until the suspension or revocation is lifted or a new permit issued. Continued use of an OWTS where the operating permit has expired or has been suspended may cause the responsible party be subject to administrative fines as provided in chapter 24A of the Santa Barbara County Code.

(2) Operation, maintenance and monitoring specifications shall be provided for review and approval for any supplemental treatment.

(3) The property owner shall ensure that a qualified contractor, qualified professional, Registered Environmental Health Specialist or manufacturer's representative conducts a visual and operational inspection of the system at the frequency specified by the manufacturer or a minimum of once per year to determine if the system is functioning properly.

(4) The property owner shall submit a report for every inspection or a minimum of once a year, within thirty days of inspection, prepared by a qualified contractor, qualified professional, Registered Environmental Health Specialist or manufacturer's representative in a form prescribed by the Administrative Authority. The report shall include the inspection results, analysis of the wastewater from the inspection ports for total suspended solids, biochemical oxygen demand and nitrogen series, and any other requirements specified by the Administrative Authority.

Sec. 18C-6. Repair, Upgrades, Evaluation, Modification and Abandonment Standards

(A) Failed Onsite Wastewater Treatment Systems

(1) A qualified contractor as defined in this article shall perform all repairs. An owner-builder may perform the work in lieu of the qualified contractor but all repairs shall meet the provisions of this article.

(2) Upon failure of an onsite wastewater treatment system, the system shall be repaired and shall conform to the provisions of this article. Failures in which there is surfacing of effluent shall be repaired immediately.

(3) If the onsite wastewater treatment system to be repaired was constructed under a valid permit and the approved expansion area is known, then the replacement dispersal field shall be of equal or larger size. The permittee shall verify the size, type and location of the existing dispersal field. This information shall be submitted to the Administrative Authority as part of the repair application.

(4) If the replacement dispersal field was previously approved, an adjacent “like for like” or larger dispersal field shall be installed under permit and inspection of the Administrative Authority.

(5) Onsite wastewater treatment systems that have failed and for which a replacement dispersal field that cannot meet current standards, shall meet the requirements of section 18C-5(K) of this article.

(6) Onsite wastewater treatment systems that have failed and were not constructed under a valid permit or were legal non-conforming, shall be replaced with a system that meets all the requirements of this article for a new onsite wastewater treatment system to the maximum extent feasible.

(7) Unless specifically required by the Administrative Authority, a statement of infeasibility of leach lines is not required for a new seepage pit that conforms to the standards of this article, and is constructed to replace an existing seepage pit.

(8) It is the intent of this code that when a dispersal field is repaired, a dual field consisting of two new dispersal fields be installed. However, if the existing dispersal field is serviceable and does not create a nuisance or a health and safety hazard, it may be utilized as one of the dual fields with concurrence from the Administrative Authority.

(B) Upgrades

(1) Upon discovery, all existing hollow seepage pits shall be properly abandoned or repaired, to conform to the construction standards for seepage pits included in this article. Abandonment or repair shall be completed under permit and inspection within thirty days of discovery. However, an application to abandon an existing seepage pit must meet the provisions specified in section 18C-6(E)(2) of this article.

(2) Upon discovery, all cesspools and bottomless septic tanks or otherwise non-watertight tanks shall be properly abandoned and replaced with a septic tank that conforms to the provisions of this article.

(3) Cesspools or onsite wastewater treatment systems without adequate dispersal fields shall install a dispersal field approved by the Administrative Authority.

(4) Upon discovery, septic tanks made of wood, metal or brick tanks with cracked or missing mortar, must be replaced with a septic tank that meets the requirements specified in section 18C-5(D) of this article.

(5) Replacement septic tanks and treatment tanks shall meet the standards noted in section 18C-5(D) of this article.

(6) Septic tanks and treatment tanks and all components must be constructed to provide adequate access so that all compartments can be inspected and pumped.

(7) Septic or treatment tanks constructed of concrete shall be replaced or structurally modified when the narrowest section of the lid or wall is found to have a remaining thickness of 2-1/2” or less at its narrowest point or if the remaining concrete is less than

half the original thickness. Risers shall be removed and reinstalled after the tank top is repaired.

(8) Septic tanks shall be replaced or repaired when the height of the baffle between compartments is equal to the water depth within the tank or when the baffle between compartments deteriorates to the point where it no longer provides compartment separation as designed.

(9) Any septic tank or treatment tank, which has more than two feet of cover and is uncovered for purposes of servicing, repair or modification shall be retrofitted with risers that have a minimum inside diameter of twenty inches and manhole covers as specified in this article.

(10) If the septic tank or treatment tank is located at greater than five feet beneath ground surface, then the riser shall be a minimum of thirty inches in diameter. Risers must be installed to allow for the measurement of the thickness of the tank top.

(11) Septic tanks or treatment tanks that are found to be located within the required setback distance from a structure shall be evaluated for adequate access. If it is determined that the septic tank or treatment tank is inaccessible, they shall be relocated to provide the required setback.

(12) Missing, deteriorated or damaged components, including but not limited to, tees, ells, risers, and lids, must be repaired or replaced.

(13) Single compartment septic tanks requiring repair or modification must be replaced, with a tank that meets the requirements of section 18C-5(B) of this article.

(14) Fiberglass or plastic tanks which have warped, collapsed, deflected or have a damaged baffle, shall be replaced.

(C) Onsite Wastewater Treatment System Evaluation

An OWTS evaluation permit is required for projects that remodel the interior of a structure, changes the footprint of the structure or changes the use of a structure. An evaluation can only be approved when it is determined by the Administrative Authority that the proposed improvements or change in use will not encroach into required setbacks or the one hundred percent expansion area and the existing system will accommodate the proposed changes.

(D) Modification

(1) Modification of an existing onsite wastewater treatment system shall be required by the Administrative Authority when:

a) Improvements to a property intrude upon the physical location of the system or the expansion area;

b) The existing septic system does not meet required setbacks;

c) The septic tank or treatment tank does not meet the minimum capacity requirements contained in this article;

d) The dispersal area including the 100 percent expansion area is not adequately sized or functioning properly;

e) A project increases flow to the dispersal field.

(2) The modification permit approval shall be based on field testing, engineering calculations and other information deemed necessary by the Administrative Authority in order to determine the adequacy of the dispersal project.

(3) Modifications that require replacement or expansion of the dispersal field shall meet the requirements for a new system to the maximum extent feasible.

(4) A modification permit is required when the proposed construction or change in use:

a) Adds a bedroom as defined in this chapter to a residential structure;

b) Increases peak daily design flow or the number of plumbing fixture units to a non-residential structure.

(5) A modification shall not be required if adequate information, as determined by the Administrative Authority, is provided to confirm that the existing system meets current requirements for the proposed project.

(E) General Abandonment Standards

(1) An existing onsite wastewater treatment system, or portion thereof, shall be properly abandoned under permit and inspection by the Administrative Authority within thirty days of the occurrence of any of the following:

a) The discovery of a hollow seepage pit not modified to meet the criteria for seepage pits, as provided in this article;

b) Connection of the served structure(s) to the public sewer;

c) Removal or demolition of the served structure(s), unless the owner demonstrates his/her intent to use the system to serve a replacement structure and demonstrates to the satisfaction of the Administrative Authority that the system can be maintained in a safe and secure manner until completion of the replacement structure.

(2) Prior to abandonment of any onsite wastewater treatment system or portion thereof, the property owner shall identify the replacement method of sewage treatment and dispersal or specifically identify the structure(s) to be demolished.

(3) The abandonment of the OWTS shall not occur prior to obtaining the required permit from the Administrative Authority.

(4) During abandonment of an onsite wastewater treatment system, the property owner shall provide evidence of the type of sewage dispersal field present on the property.

(5) All sewage plumbing lines leading to and from the septic tank shall be removed or capped with watertight fittings.

(6) Abandonment standards for septic tanks, treatment tanks, cesspools and seepage pits are as follows:

a) Prior to abandonment, a registered septic tank pumper shall pump the septic tank, treatment tank, cesspool or hollow seepage pit to remove any standing wastewater;

b) The top of the septic tank, treatment tank, cesspool or hollow seepage pit shall be removed;

c) The bottom of the tank shall be cracked or perforated, or at least one wall of the tank shall be removed, prior to inspection;

d) The tank, cesspool or hollow seepage pit shall be filled with clean earth, sand, gravel, concrete or other material approved by the Administrative Authority. In the event the abandoned septic tank is filled with concrete or cement slurry, perforation of the bottom or removal of a wall shall not be required;

e) The Building Official shall be consulted regarding the abandonment of a septic tank, treatment tank or hollow seepage pit located within the setback distance of a structure.

(7) Abandonment standards for dispersal fields are as follows:

a) Seepage pits shall be excavated to a minimum depth of two feet below grade and the inspection / vent pipe cut a minimum of eighteen inches below grade. The perforated pipe and the excavation shall be backfilled with clean earth or other fill material approved by the Administrative Authority.

b) Gravel-filled leach lines may be abandoned in place without structural modification. Leach lines utilizing hollow chambers shall have the chambers removed and the trench backfilled with clean fill, or be evaluated by a qualified professional or geotechnical engineer, with the concurrence of the Administrative Authority, if the chambers are to be abandoned in place.

Sec. 18C-7. Servicing, Inspections and Reporting

(A) Servicing and Pumping

(1) Any individual who inspects onsite wastewater treatment systems shall be a qualified inspector as defined by this article. Inspections shall include a visual evaluation of the system to detect any deficiencies and a review of any documents in the files of the qualified inspector to identify previous inspections, servicing, or work performed on the system.

(2) Whenever an onsite wastewater treatment system is serviced, the qualified inspector shall inspect the system in accordance with procedures adopted by the Administrative Authority. Such procedures shall include, but not be limited to:

a) A registered pumper shall pump the contents of all compartments of the septic tank;

b) The septic tank or treatment tank shall be inspected for signs of deterioration, corrosion, elevated liquid level or damage and the dispersal field examined for failure;

c) Ascertain the existence of a hollow seepage pit or cesspool if the structure is served by a substandard septic tank (e.g. made of wood, steel or bottomless).

d) The onsite wastewater treatment system inspection report shall be fully completed, legible and submitted to the Administrative Authority and in conformity with section 18C-7(B) of this article.

(B) Reporting

(1) A report on forms or in a manner approved by the Administrative Authority shall be submitted by qualified inspectors to the Administrative Authority and the property owner no later than thirty days following inspection, servicing or maintenance of an onsite sewage treatment system. If an inspection has determined that an onsite wastewater treatment system has failed, as defined in this article, the written report shall be provided within twenty-four hours of servicing or maintenance. The report shall include:

a) The name, address and telephone number of the property owner as well as the street address of the property on which the onsite wastewater treatment system is located.

b) The name, address and telephone number of the company that provided the service and conducted the inspection.

c) A description of the system including the type and size of the septic tank, treatment tank, other system components as well as the type and location of the dispersal field.

d) A description of the maintenance performed including the date of the service, the volume of material pumped from the septic and or treatment tank(s), an assessment of the condition of the tank(s) and other system components and a description of any repairs, modifications or upgrades provided;

e) A description of any uncorrected deficiencies in the onsite wastewater treatment system. Reported deficiencies shall include, but not be limited to, damaged, corroded deteriorated septic system components, failed dispersal field, backflow of effluent from the dispersal field back into the septic tank or treatment tank, lack of access risers or other upgrades required by this article, or other condition determined to be a significant deficiency or not in compliance with the provisions of this article.

(C) Property Owner Notification

(1) Upon receiving an inspection report identifying an uncorrected deficiency or required maintenance, repair or upgrade of an onsite wastewater treatment system, the Administrative Authority shall notify the property owner in writing of the corrections required to comply with the applicable standards in this article.

(2) All corrective actions necessary to comply with the standards of this article shall be completed within thirty days of the date that a notification has been sent, unless otherwise directed by the Administrative Authority.

(D) Registered Pumper Requirements

(1) Septage haulers shall register with the Administrative Authority.

(2) Septage haulers shall have vehicles that meet the following minimum standards, which shall be verified at the Administrative Authorities request:

a) The pumper vehicle, its holding tank(s) and all related appurtenances shall be watertight, functional and maintained in good operating condition;

b) Each pumper vehicle shall be identified with the business name and phone number with letters and numbers of at least three inches in height;

c) Holding tanks shall be constructed of durable, corrosion resistant material and shall meet the following criteria:

i) All hoses and related equipment shall be stored in covered containers or otherwise secured to the vehicle or holding tank;

ii) Man-ways and cleanouts shall be covered with secured, tight fitting lids;

d) Appropriate safety equipment is to be provided and shall include, but not limited to, a fire extinguisher, heavy-duty rubber gloves, bleach, disinfectant and eye protection;

e) The current registration decal shall be posted in the rear of the vehicle in a conspicuous location.

(3) The Administrative Authority may suspend or revoke a septage hauler's registration issued pursuant to this article and California Health & Safety Code Section 117445 whenever it finds that the registrant or its employees performing the work has done any of the following:

a) Violated any provision of this article;

b) Misrepresented any material facts in the application or supporting documents for such a registration;

c) Misrepresented facts in reports or failed to submit reports to the Administrative Authority as required by this article.

(4) No hauler whose registration has been suspended or revoked shall continue to perform the work for which the registration was granted until such time that the Administrative Authority reinstates the registration.

(5) Any hauler whose registration has been suspended or revoked may appeal the denial or suspension to the Environmental Health Services Director or the appointed representative in writing within 10 working days after notification of the imposition of suspension or revocation. Such an appeal must specify the grounds upon which it is taken. The Administrative Authority shall set the appeal hearing at the earliest practicable time and shall notify the appellant, in writing of the established date and time at least 10 days prior to the hearing date.

Sec. 18C-8. Violations and Conflicting Provisions

(A) Violations

(1) In the event of a violation of the provisions of this article, the property owner of the parcel where the violation exists shall be given notice of such violation and a reasonable time for its correction. In the event that all required corrections are not completed in the time noted on the notice of violation, the property owner shall be subject to administrative fines as provided in chapter 24A of the Santa Barbara County Code.

(2) If the Administrative Authority performs an inspection after notice of violation has been given and the violation has not been corrected, the property owner shall be subject to a violation reinspection fee at a rate approved by the Board of Supervisors.

(B) Conflicting Provisions

(1) If any of the provisions of this article conflict with any of the provisions of other codes adopted by the County of Santa Barbara, the provisions of this code shall control unless expressly stated to the contrary

(2) If any part of this article or its application is deemed invalid by a court of competent jurisdiction, the Board of Supervisors intend that such invalidity will not affect the effectiveness of the remaining provisions or applications and, to this end, the provisions of this article are severable.

Sec. 18C-9. Right of Entry

(A) Whenever it is necessary to make an inspection to enforce any of the provisions or perform any duty imposed by this article or by the County Codes adopted by reference hereby or other applicable law, the Administrative Authority is hereby authorized to enter such property at any reasonable time and to inspect the same and perform any duty imposed upon the Administrative Authority by this article or other applicable law, provided that if such property be occupied, the Administrative Authority shall first present proper credentials to the occupant and request entry, explaining the reasons therefore. If such entry is refused or cannot be obtained because the owner or other person having charge or control of the property cannot be found after due diligence, the Administrative Authority shall have recourse to every remedy provided by law to secure lawful entry and inspect the property.

(B) Notwithstanding subsection (a) of this section, if the Administrative Authority has reasonable cause to believe that the onsite sewage dispersal system or premises is so unsafe, offensive, or dangerous as to require immediate inspection to safeguard the public health or safety, the Administrative Authority shall have the right to immediately enter and inspect such property and use any reasonable means required to effect such entry and make such inspection, whether such property be occupied or unoccupied and whether or not permission to inspect has been obtained. If the property is occupied, the Administrative Authority shall first present proper credentials to the occupant and demand entry, explaining the reasons therefore and the purpose of the inspection.

Sec. 18C-10. Remedies

(A) Any violation of the provisions of this article by any person is subject to administrative fines as provided in chapter 24A of the Santa Barbara County Code. These remedies are not exclusive of any other remedies available under other federal, state or local laws and it is within the discretion of the Administrative Authority to seek cumulative remedies.

(B) The County Health Officer or his designee may order the public water supply to any premises or property to be discontinued upon finding by the County Health Officer or his designee that the continuation of such supply may endanger the public health. These may include but are not limited to:

(1) When sewage is overflowing or being discharged on the ground surface, the Director of Environmental Health Services may order the occupant or occupants thereof who contribute to such overflow or discharge to abate the same forthwith.

(2) If such occupant or occupants fail to abate such overflow or discharge as ordered, the County Health Officer may order such occupant or occupants to vacate the premises within 24 hours.

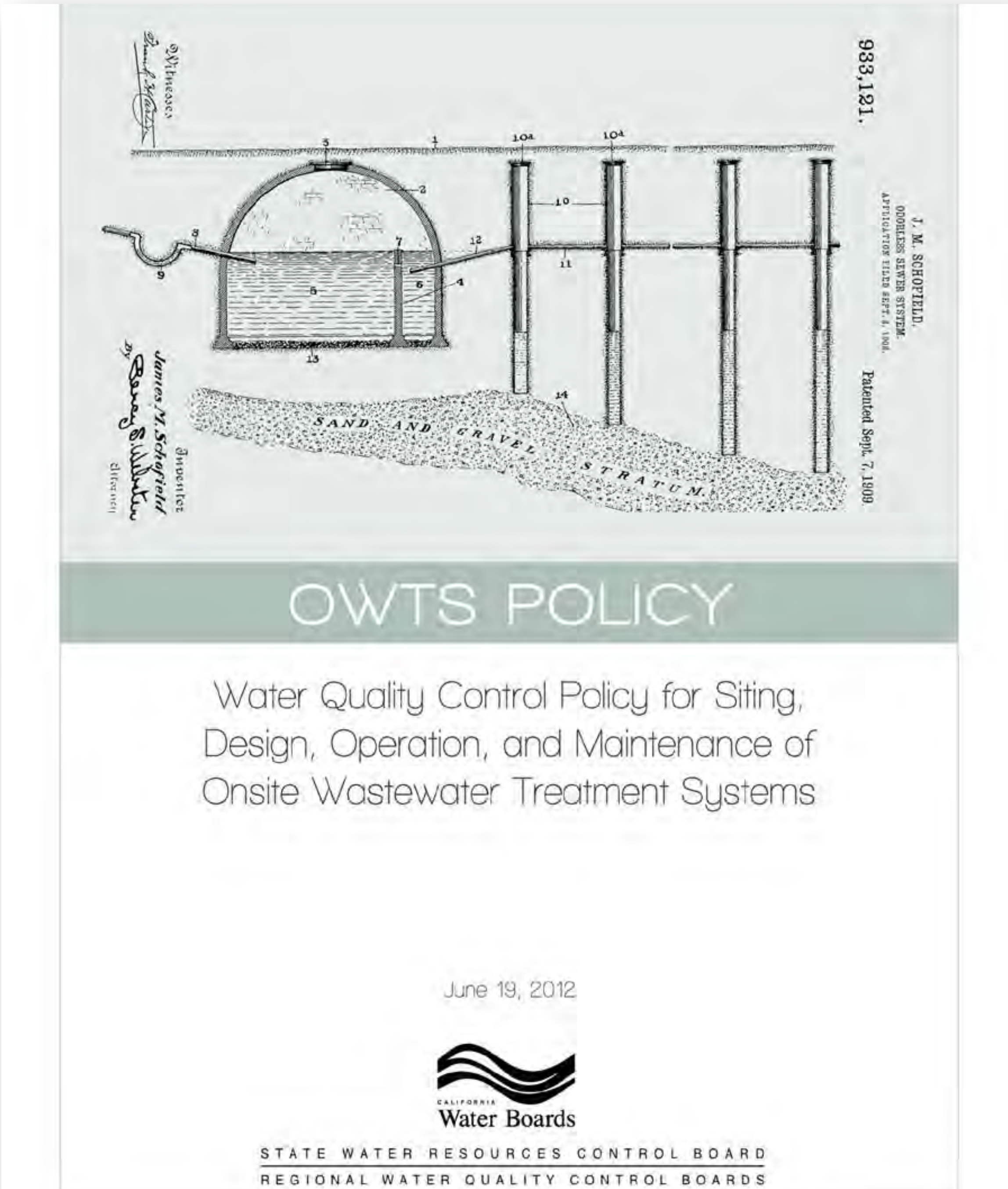
Sec. 18C-11. Powers and Duties of the Administrative Authority

(A) The Administrative Authority may adopt policies and procedures to implement and administer this article.

(B) Within the unincorporated area of Santa Barbara County, the Administrative Authority is authorized and directed to enforce the provisions of this article. It is authorized to consult with qualified experts in any matter concerning the construction, operation, maintenance and repair of onsite wastewater treatment systems to the extent that it deems it necessary to assist in carrying out its duties under this article. The Administrative Authority may request and shall receive the assistance and cooperation of other officials of the County of Santa Barbara, so far as may be necessary in the discharge of its duties.

(C) The Administrative Authority may approve requests for variances from the provisions of this article if it is determined that complete compliance with the prescribed standards is not possible or practical and that the variance is not counter to the purposes and intent of this article.

APPENDIX 2
State Water Resources Control Board
Onsite Wastewater Treatment System Policy



OWTS POLICY

Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems

June 19, 2012

California Water Boards

STATE WATER RESOURCES CONTROL BOARD

REGIONAL WATER QUALITY CONTROL BOARDS

State of California
Edmund G. Brown Jr., Governor

Cal/EPA

California Environmental Protection Agency
Matthew Rodriquez, Secretary

Water Boards

State Water Resources Control Board
http://www.waterboards.ca.gov

Charles R. Hoppin, Chair
Frances Spivy-Weber, Vice Chair
Tam M. Doduc, Member
Steven Moore, Member

Thomas Howard, Executive Director
Jonathan Bishop, Chief Deputy Director
Caren Trgovcich, Chief Deputy Director

Adopted by the State Water Resources Control Board on June 19, 2012
Approved by the Office of Administrative Law on November 13, 2012
Effective Date of the Policy: May 13, 2013

Preamble – Purpose and Scope – Structure of the Policy

Preamble

Onsite wastewater treatment systems (OWTS) are useful and necessary structures that allow habitation at locations that are removed from centralized wastewater treatment systems. When properly sited, designed, operated, and maintained, OWTS treat domestic wastewater to reduce its polluting impact on the environment and most importantly protect public health. Estimates for the number of installations of OWTS in California at the time of this Policy are that more than 1.2 million systems are installed and operating. The vast majority of these are functioning in a satisfactory manner and meeting their intended purpose.

However there have been occasions in California where OWTS for a varied list of reasons have not satisfactorily protected either water quality or public health. Some instances of these failures are related to the OWTS not being able to adequately treat and dispose of waste as a result of poor design or improper site conditions. Others have occurred where the systems are operating as designed but their densities are such that the combined effluent resulting from multiple systems is more than can be assimilated into the environment. From these failures we must learn how to improve our usage of OWTS and prevent such failures from happening again.

As California's population continues to grow, and we see both increased rural housing densities and the building of residences and other structures in more varied terrain than we ever have before, we increase the risks of causing environmental damage and creating public health risks from the use of OWTS. What may have been effective in the past may not continue to be as conditions and circumstances surrounding particular locations change. So necessarily more scrutiny of our installation of OWTS is demanded of all those involved, while maintaining an appropriate balance of only the necessary requirements so that the use of OWTS remains viable.

Purpose and Scope of the Policy

The purpose of this Policy is to allow the continued use of OWTS, while protecting water quality and public health. This Policy recognizes that responsible local agencies can provide the most effective means to manage OWTS on a routine basis. Therefore as an important element, it is the intent of this policy to efficiently utilize and improve upon where necessary existing local programs through coordination between the State and local agencies. To accomplish this purpose, this Policy establishes a statewide, risk-based, tiered approach for the regulation and management of OWTS installations and replacements and sets the level of performance and protection expected from OWTS. In particular, the Policy requires actions for water bodies specifically identified as part this Policy where OWTS contribute to water quality degradation that adversely affect beneficial uses.

This Policy only authorizes subsurface disposal of domestic strength, and in limited instances high strength, wastewater and establishes minimum requirements for the permitting, monitoring, and operation of OWTS for protecting beneficial uses of waters

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of the State and preventing or correcting conditions of pollution and nuisance. And finally, this Policy also conditionally waives the requirement for owners of OWTS to apply for and receive Waste Discharge Requirements in order to operate their systems when they meet the conditions set forth in the Policy. Nothing in this Policy supersedes or requires modification of Total Maximum Daily Loads or Basin Plan prohibitions of discharges from OWTS.

This Policy also applies to OWTS on federal, state, and Tribal lands to the extent authorized by law or agreement.

Structure of the Policy

This Policy is structured into ten major parts:

Definitions
Definitions for all the major terms used in this Policy are provided within this part and wherever used in the Policy the definition given here overrides any other possible definition.
[Section 1]

Responsibilities and Duties
Implementation of this Policy involves individual OWTS owners; local agencies, be they counties, cities, or any other subdivision of state government with permitting powers over OWTS; Regional Water Quality Control Boards; and the State Water Resources Control Board.
[Sections 2, 3, 4, and 5]

Tier 0 – Existing OWTS
Existing OWTS that are properly functioning, and do not meet the conditions of failing systems or otherwise require corrective action (for example, to prevent groundwater impairment) as specifically described in Tier 4, and are not determined to be contributing to an impairment of surface water as specifically described in Tier 3, are automatically included in Tier 0.
[Section 6]

Tier 1 – Low-Risk New or Replacement OWTS
New or replacement OWTS that meet low risk siting and design requirements as specified in Tier 1, where there is not an approved Local Agency Management Program per Tier 2.
[Sections 7 and 8]

Tier 2 – Local Agency Management Program for New or Replacement OWTS
California is well known for its extreme range of geological and climatic conditions. As such, the establishment of a single set of criteria for OWTS would either be too restrictive so as to protect for the most sensitive case, or would have broad allowances that would not be protective enough under some circumstances. To accommodate this

Preamble – Purpose and Scope – Structure of the Policy

extreme variance, local agencies may submit management programs ("Local Agency Management Programs") for approval, and upon approval then manage the installation of new and replacement OWTS under that program.

Local Agency Management Programs approved under Tier 2 provide an alternate method from Tier 1 programs to achieve the same policy purpose, which is to protect water quality and public health. In order to address local conditions, Local Agency Management Programs may include standards that differ from the Tier 1 requirements for new and replacement OWTS contained in Sections 7 and 8. As examples, a Local Agency Management Program may authorize different soil characteristics, usage of seepage pits, and different densities for new developments. Once the Local Agency Management Program is approved, new and replacement OWTS that are included within the Local Agency Management Program may be approved by the Local Agency. A Local Agency, at its discretion, may include Tier 1 standards within its Tier 2 Local Agency Management Program for some or all of its jurisdiction. However, once a Local Agency Management Program is approved, it shall supersede Tier 1 and all future OWTS decisions will be governed by the Tier 2 Local Agency Management Program until it is modified, withdrawn, or revoked.
[Section 9]

Tier 3 – Impaired Areas
Existing, new, and replacement OWTS that are near impaired water bodies may be addressed by a TMDL and its implementation program, or special provisions contained in a Local Agency Management Program. If there is no TMDL or special provisions, new or replacement OWTS within 600 feet of impaired water bodies listed in Attachment 2 must meet the specific requirements of Tier 3.
[Section 10]

Tier 4 – OWTS Requiring Corrective Action
OWTS that require corrective action or are either presently failing or fail at any time while this Policy is in effect are automatically included in Tier 4 and must follow the requirements as specified.
[Section 11]

Conditional Waiver of Waste Discharge Requirements
The requirement to submit a report of waste discharge for discharges from OWTS that are in conformance with this policy is waived.
[Section 12]

Effective Date
When this Policy becomes effective.
[Section 13]

Financial Assistance
Procedures for local agencies to apply for funds to establish low interest loan programs for the assistance of OWTS owners in meeting the requirements of this Policy.
[Section 14]

Preamble – Purpose and Scope – Structure of the Policy

Attachment 1
AB 885 Regulatory Program Timelines.

Attachment 2

Tables 4 and 5 specifically identify those impaired water bodies that have Tier 3 requirements and must have a completed TMDL by the date specified.

Attachment 3

Table 6 shows where one Regional Water Board has been designated to review and, if appropriate, approve new Local Agency Management Plans for a local agency that is within multiple Regional Water Boards' jurisdiction.

What Tier Applies to my OWTS?

Existing OWTS that conform to the requirements for Tier 0 will remain in Tier 0 as long as they continue to meet those requirements. An existing OWTS will temporarily move from Tier 0 to Tier 4 if it is determined that corrective action is needed. The existing OWTS will return to Tier 0 once the corrective action is completed if the repair does not qualify as major repair under Tier 4. Any major repairs conducted as corrective action must comply with Tier 1 requirements or Tier 2 requirements, whichever are in effect for that local area. An existing OWTS will move from Tier 0 to Tier 3 if it is adjacent to an impaired water body listed on Attachment 2, or is covered by a TMDL implementation plan.

In areas with no approved Local Agency Management Plan, new and replacement OWTS that conform to the requirements of Tier 1 will remain in Tier 1 as long as they continue to meet those requirements. A new or replacement OWTS will temporarily move from Tier 1 to Tier 4 if it is determined that corrective action is needed. The new or replacement OWTS will return to Tier 1 once the corrective action is completed. A new or replacement OWTS will move from Tier 1 to Tier 3 if it is adjacent to an impaired water body, or is covered by a TMDL implementation plan.

In areas with an approved Local Agency Management Plan, new and replacement OWTS that conform to the requirements of the Tier 2 Local Agency Management Plan will remain in Tier 2 as long as they continue to meet those requirements. A new or replacement OWTS will temporarily move from Tier 2 to Tier 4 if it is determined that corrective action is needed. The new or replacement OWTS will return to Tier 2 once the corrective action is completed. A new or replacement OWTS will move from Tier 2 to Tier 3 if it is adjacent to an impaired water body, or is covered by a TMDL implementation plan, or is covered by special provisions for impaired water bodies contained in a Local Agency Management Program.

Existing, new, and replacement OWTS in specified areas adjacent to water bodies that are identified by the State Water Board as impaired for pathogens or nitrogen and listed in Attachment 2 are in Tier 3. Existing, new, and replacement OWTS covered by a TMDL implementation plan, or covered by special provisions for impaired water bodies contained in a Local Agency Management Program are also in Tier 3. These OWTS will temporarily move from Tier 3 to Tier 4 if it is determined that corrective action is needed. The new or replacement OWTS will return to Tier 3 once the corrective action is completed.

Existing, new, and replacement OWTS that do not conform with the requirements to receive coverage under any of the Tiers (e.g., existing OWTS with a projected flow of more than 10,000 gpd) do not qualify for this Policy's conditional waiver of waste discharge requirements, and will be regulated separately by the applicable Regional Water Board.

1.0 Definitions. The following definitions apply to this Policy:

"303 (d) list" means the same as **"Impaired Water Bodies."**

"At-grade system" means an OWTS dispersal system with a discharge point located at the preconstruction grade (ground surface elevation). The discharge from an at-grade system is always subsurface.

"Average annual rainfall" means the average of the annual amount of precipitation for a location over a year as measured by the nearest National Weather Service station for the preceding three decades. For example the data set used to make a determination in 2012 would be the data from 1981 to 2010.

"Basin Plan" means the same as "water quality control plan" as defined in Division 7 (commencing with Section 13000) of the Water Code. Basin Plans are adopted by each Regional Water Board, approved by the State Water Board and the Office of Administrative Law, and identify surface water and groundwater bodies within each Region's boundaries and establish, for each, its respective beneficial uses and water quality objectives. Copies are available from the Regional Water Boards, electronically at each Regional Water Boards website, or at the State Water Board's *Plans and Policies* web page (http://www.waterboards.ca.gov/plans_policies/).

"Bedrock" means the rock, usually solid, that underlies soil or other unconsolidated, surficial material.

"CEDEN" means California Environmental Data Exchange Network and information about it is available at the State Water Boards website or http://www.ceden.org/index.shtml.

"Cesspool" means an excavation in the ground receiving domestic wastewater, designed to retain the organic matter and solids, while allowing the liquids to seep into the soil. Cesspools differ from seepage pits because cesspool systems do not have septic tanks and are not authorized under this Policy. The term cesspool does not include pit-privies and out-houses which are not regulated under this Policy.

"Clay" means a soil particle; the term also refers to a type of soil texture. As a soil particle, clay consists of individual rock or mineral particles in soils having diameters <0.002 mm. As a soil texture, clay is the soil material that is comprised of 40 percent or more clay particles, not more than 45 percent sand and not more than 40 percent silt particles using the USDA soil classification system.

"Cobbles" means rock fragments 76 mm or larger using the USDA soil classification systems.

"Dispersal system" means a leachfield, seepage pit, mound, at-grade, subsurface drip field, evapotranspiration and infiltration bed, or other type of system for final wastewater treatment and subsurface discharge.

Definitions

"Domestic wastewater" means wastewater with a measured strength less then high-strength wastewater and is the type of wastewater normally discharged from, or similar to, that discharged from plumbing fixtures, appliances and other household devices including, but not limited to toilets, bathtubs, showers, laundry facilities, dishwashing facilities, and garbage disposals. Domestic wastewater may include wastewater from commercial buildings such as office buildings, retail stores, and some restaurants, or from industrial facilities where the domestic wastewater is segregated from the industrial wastewater. Domestic wastewater may include incidental RV holding tank dumping but does not include wastewater consisting of a significant portion of RV holding tank wastewater such as at RV dump stations. Domestic wastewater does not include wastewater from industrial processes.

"Dump Station" means a facility intended to receive the discharge of wastewater from a holding tank installed on a recreational vehicle. A dump station does not include a full hook-up sewer connection similar to those used at a recreational vehicle park.

"Domestic well" means a groundwater well that provides water for human consumption and is not regulated by the California Department of Public Health.

"Earthen material" means a substance composed of the earth's crust (i.e. soil and rock).

"EDF" see "electronic deliverable format."

"Effluent" means sewage, water, or other liquid, partially or completely treated or in its natural state, flowing out of a septic tank, aerobic treatment unit, dispersal system, or other OWTS component.

"Electronic deliverable format" or **"EDF"** means the data standard adopted by the State Water Board for submittal of groundwater quality monitoring data to the State Water Board's internet-accessible database system Geotracker (http://geotracker.waterboards.ca.gov/).

"Escherichia coli" means a group of bacteria predominantly inhabiting the intestines of humans or other warm-blooded animals, but also occasionally found elsewhere. Used as an indicator of human fecal contamination.

"Existing OWTS" means an OWTS that was constructed and operating prior to the effective date of this Policy, and OWTS for which a construction permit has been issued prior to the effective date of the Policy.

"Flowing water body" means a body of running water flowing over the earth in a natural water course, where the movement of the water is readily discernible or if water is not present it is apparent from review of the geology that when present it does flow, such as in an ephemeral drainage, creek, stream, or river.

"Groundwater" means water below the land surface that is at or above atmospheric pressure.

Definitions

"High-strength wastewater" means wastewater having a 30-day average concentration of biochemical oxygen demand (BOD) greater than 300 milligrams-per-liter (mg/L) or of total suspended solids (TSS) greater than 330 mg/L or a fats, oil, and grease (FOG) concentration greater than 100 mg/L prior to the septic tank or other OWTS treatment component.

"IAPMO" means the International Association of Plumbing and Mechanical Officials.

"Impaired Water Bodies" means those surface water bodies or segments thereof that are identified on a list approved first by the State Water Board and then approved by US EPA pursuant to Section 303(d) of the federal Clean Water Act.

"Local agency" means any subdivision of state government that has responsibility for permitting the installation of and regulating OWTS within its jurisdictional boundaries; typically a county, city, or special district.

"Major repair" means either: (1) for a dispersal system, repairs required for an OWTS dispersal system due to surfacing wastewater effluent from the dispersal field and/or wastewater backed up into plumbing fixtures because the dispersal system is not able to percolate the design flow of wastewater associated with the structure served, or (2) for a septic tank, repairs required to the tank for a compartment baffle failure or tank structural integrity failure such that either wastewater is exfiltrating or groundwater is infiltrating.

"Mottling" means a soil condition that results from oxidizing or reducing minerals due to soil moisture changes from saturated to unsaturated over time. Mottling is characterized by spots or blotches of different colors or shades of color (grays and reds) interspersed within the dominant color as described by the USDA soil classification system. This soil condition can be indicative of historic seasonal high groundwater level, but the lack of this condition may not demonstrate the absence of groundwater.

"Mound system" means an aboveground dispersal system (covered sand bed with effluent leachfield elevated above original ground surface inside) used to enhance soil treatment, dispersal, and absorption of effluent discharged from an OWTS treatment unit such as a septic tank. Mound systems have a subsurface discharge.

"New OWTS" means an OWTS permitted after the effective date of this Policy.

"NSF" means NSF International (a.k.a. National Sanitation Foundation), a not for profit, non-governmental organization that develops health and safety standards and performs product certification.

"Oil/grease interceptor" means a passive interceptor that has a rate of flow exceeding 50 gallons-per-minute and that is located outside a building. Oil/grease interceptors are used for separating and collecting oil and grease from wastewater.

"Onsite wastewater treatment system(s)" (OWTS) means individual disposal systems, community collection and disposal systems, and alternative collection and disposal systems that use subsurface disposal. The short form of the term may be singular or plural. OWTS do not include "graywater" systems pursuant to Health and Safety Code Section 17922.12.

"Percolation test" means a method of testing water absorption of the soil. The test is conducted with clean water and test results can be used to establish the dispersal system design.

"Permit" means a document issued by a local agency that allows the installation and use of an OWTS, or waste discharge requirements or a waiver of waste discharge requirements that authorizes discharges from an OWTS.

"Person" means any individual, firm, association, organization, partnership, business trust, corporation, company, State agency or department, or unit of local government who is, or that is, subject to this Policy.

"Pit-privy" (a.k.a. outhouse, pit-toilet) means self-contained waterless toilet used for disposal of non-water carried human waste; consists of a shelter built above a pit in the ground into which human waste falls.

"Policy" means this Policy for Siting, Design, Operation and Management of OWTS.

"Pollutant" means any substance that alters water quality of the waters of the State to a degree that it may potentially affect the beneficial uses of water, as listed in a Basin Plan.

"Projected flows" means wastewater flows into the OWTS determined in accordance with any of the applicable methods for determining average daily flow in the *USEPA Onsite Wastewater Treatment System Manual, 2002,* or for Tier 2 in accordance with an approved Local Agency Management Program.

"Public Water System" is a water system regulated by the California Department of Public Health or a Local Primacy Agency pursuant to Chapter 12, Part 4, California Safe Drinking Water Act, Section 116275 (h) of the California Health and Safety Code.

"Public Water Well" is a ground water well serving a public water system. A spring which is not subject to the California Surface Water Treatment Rule (SWTR), CCR, Title 22, sections 64650 through 64666 is a public well.

"Qualified professional" means an individual licensed or certified by a State of California agency to design OWTS and practice as professionals for other associated reports, as allowed under their license or registration. Depending on the work to be performed and various licensing and registration requirements, this may include an individual who possesses a registered environmental health specialist certificate or is currently licensed as a professional engineer or professional geologist. For the purposes of performing site evaluations, Soil Scientists certified by the Soil Science Society of America are considered qualified professionals. A local agency may modify this definition as part of its Local Agency Management Program.

designated by Water Code Section 13200. Any reference to an action of the Regional Water Board in this Policy also refers to an action of its Executive Officer, including the conducting of public hearings, pursuant to any general or specific delegation under Water Code Section 13223.

"Replacement OWTS" means an OWTS that has its treatment capacity expanded, or its dispersal system replaced or added onto, after the effective date of this Policy.

"Sand" means a soil particle; this term also refers to a type of soil texture. As a soil particle, sand consists of individual rock or mineral particles in soils having diameters ranging from 0.05 to 2.0 millimeters. As a soil texture, sand is soil that is comprised of 85 percent or more sand particles, with the percentage of silt plus 1.5 times the percentage of clay particles comprising less than 15 percent.

"Seepage pit" means a drilled or dug excavation, three to six feet in diameter, either lined or gravel filled, that receives the effluent discharge from a septic tank or other OWTS treatment unit for dispersal.

"Septic tank" means a watertight, covered receptacle designed for primary treatment of wastewater and constructed to:

1. Receive wastewater discharged from a building;
2. Separate settleable and floating solids from the liquid;
3. Digest organic matter by anaerobic bacterial action;
4. Store digested solids; and
5. Clarify wastewater for further treatment with final subsurface discharge.

"Service provider" means a person capable of operating, monitoring, and maintaining an OWTS in accordance to this Policy.

"Silt" means a soil particle; this term also refers to a type of soil texture. As a soil particle, silt consists of individual rock or mineral particles in soils having diameters ranging from between 0.05 and 0.002 mm. As a soil texture, silt is soil that is comprised as approximately 80 percent or more silt particles and not more than 12 percent clay particles using the USDA soil classification system.

"Single-family dwelling unit" means a structure that is usually occupied by just one household or family and for the purposes of this Policy is expected to generate an average of 250 gallons per day of wastewater.

"Site" means the location of the OWTS and, where applicable, a reserve dispersal area capable of disposing 100 percent of the design flow from all sources the OWTS is intended to serve.

"Site Evaluation" means an assessment of the characteristics of the site sufficient to determine its suitability for an OWTS to meet the requirements of this Policy.

Definitions

"Soil" means the naturally occurring body of porous mineral and organic materials on the land surface, which is composed of unconsolidated materials, including sand-sized, silt-sized, and clay-sized particles mixed with varying amounts of larger fragments and organic material. The various combinations of particles differentiate specific soil textures identified in the soil textural triangle developed by the United States Department of Agriculture (USDA) as found in Soil Survey Staff, USDA; *Soil Survey Manual, Handbook 18,* U.S. Government Printing Office, Washington, DC, 1993, p. 138. For the purposes of this Policy, soil shall contain earthen material of particles smaller than 0.08 inches (2 mm) in size.

"Soil Structure" means the arrangement of primary soil particles into compound particles, peds, or clusters that are separated by natural planes of weakness from adjoining aggregates.

"Soil texture" means the soil class that describes the relative amount of sand, clay, silt and combinations thereof as defined by the classes of the soil textural triangle developed by the USDA (referenced above).

"State Water Board" is the State Water Resources Control Board

"Supplemental treatment" means any OWTS or component of an OWTS, except a septic tank or dosing tank, that performs additional wastewater treatment so that the effluent meets a predetermined performance requirement prior to discharge of effluent into the dispersal field.

"SWAMP" means Surface Water Ambient Monitoring Program and more information is available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/

"Telemetric" means the ability to automatically measure and transmit OWTS data by wire, radio, or other means.

"TMDL" is the acronym for "total maximum daily load." Section 303(d)(1) of the Clean Water Act requires each State to establish a TMDL for each impaired water body to address the pollutant(s) causing the impairment. In California, TMDLs are usually adopted as Basin Plan amendments and contain implementation plans detailing how water quality standards will be attained.

"Total coliform" means a group of bacteria consisting of several *genera* belonging to the family *Enterobacteriaceae*, which includes Escherichia coli bacteria.

"USDA" means the U.S. Department of Agriculture.

"Waste discharge requirement" or **"WDR"** means an operation and discharge permit issued for the discharge of waste pursuant to Section 13260 of the California Water Code.

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Responsibilities and Duties

Responsibilities and Duties

2.0 OWTS Owners Responsibilities and Duties

2.1 All new, replacement, or existing OWTS within an area that is subject to a Basin Plan prohibition of discharges from OWTS, must comply with the prohibition. If the prohibition authorizes discharges under specified conditions, the discharge must comply with those conditions and the applicable provisions of this Policy.

2.2 Owners of OWTS shall adhere to the requirements prescribed in local codes and ordinances. Owners of new and replacement OWTS covered by this Policy shall also meet the minimum standards contained in Tier 1, or an alternate standard provided by a Local Agency Management Program per Tier 2, or shall comply with the requirements of Tier 3 if near an impaired water body and subject to Tier 3, or shall provide corrective action for their OWTS if their system meets conditions that place it in Tier 4.

2.3 Owners of OWTS shall comply with any and all permitting conditions imposed by a local agency that do not directly conflict with this Policy, including any conditions that are more stringent than required by this Policy.

2.4 To receive coverage under this Policy and the included waiver of waste discharges, OWTS shall only accept and treat flows of domestic wastewater. In addition, OWTS that accept high-strength wastewater from commercial food service buildings are covered under this Policy and the waiver of waste discharge requirements if the wastewater does not exceed 900 mg/L BOD and there is a properly sized and functioning oil/grease interceptor (a.k.a grease trap).

2.5 Owners of OWTS shall maintain their OWTS in good working condition including inspections and pumping of solids as necessary, or as required by local ordinances, to maintain proper function and assure adequate treatment.

2.6 The following owners of OWTS shall notify the Regional Water Board by submitting a Report of Waste Discharge for the following:

2.6.1 a new or replacement OWTS that does not meet the conditions and requirements set forth in either a Local Agency Management Program if one is approved, an existing local program if it is less than 60 months from the effective date of the Policy and a Local Agency Management Program is not yet approved, or Tier 1 if no Local Agency Management Program has been approved and it is more than 60 months after the effective date of this Policy;

2.6.2 any OWTS, not under individual waste discharge requirements or a waiver of individual waste discharge requirements issued by a Regional Water Board, with the projected flow of over 10,000 gallons-per-day;

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Responsibilities and Duties

2.6.3 any OWTS that receives high-strength wastewater, unless the waste stream is from a commercial food service building;

2.6.4 any OWTS that receives high-strength wastewater from a commercial food service building: (1) with a BOD higher than 900 mg/L, or (2) that does not have a properly sized and functioning oil/grease interceptor.

2.7 All Reports of Waste Discharge shall be accompanied by the required application fee pursuant to California Code of Regulations, title 23, section 2200.

3.0 Local Agency Requirements and Responsibilities

3.1 Local agencies, in addition to implementing their own local codes and ordinances, shall determine whether the requirements within their local jurisdiction will be limited to the water quality protection afforded by the statewide minimum standards in Tier 0, Tier 1, Tier 3, and Tier 4, or whether the local agency will implement a Local Agency Management Program in accordance with Tier 2. Except for Tier 3, local agencies may continue to implement their existing OWTS permitting programs in compliance with the Basin Plan in place at the effective date of the Policy until 60 months after the effective date of this Policy, or approval of a Local Agency Management Program, whichever comes first, and may make minor adjustments as necessary that are in compliance with the applicable Basin Plan and this Policy. Tier 3 requirements take effect on the effective date of this Policy. In the absence of a Tier 2 Local Agency Management Program, to the extent that there is a direct conflict between the applicable minimum standards and the local codes or ordinances (such that it is impossible to comply with both the applicable minimum standards and the local ordinances or codes), the more restrictive standards shall govern.

3.2 If preferred, the local agency may at any time provide the State Water Board and all affected Regional Water Board(s) written notice of its intent to regulate OWTS using a Local Agency Management Program with alternative standards as authorized in Tier 2 of this Policy. A proposed Local Agency Management Program that conforms to the requirements of that Section shall be included with the notice. A local agency shall not implement a program different than the minimum standards contained in Tier 1 and 3 of this Policy after 60 months from the effective date of this Policy until approval of the proposed Local Agency Management Program is granted by either the Regional Water Board or State Water Board. All initial program submittals desiring approval prior to the 60 month limit shall be received no later than 36 months from the effective date of this Policy. Once approved, the local agency shall adhere to the Local Agency Management Program, including all requirements, monitoring, and reporting. If at any time a local agency wishes to modify its Local Agency Management Program, it shall provide the State Water Board and all affected Regional Water Board(s) written notice of its intended modifications and will continue to implement its existing Local Agency Management Program until the modifications are approved.

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Responsibilities and Duties

3.3 All local agencies permitting OWTS shall report annually to the Regional Water Board(s). If a local agency's jurisdictional area is within the boundary of multiple Regional Water Boards, the local agency shall send a copy of the annual report to each Regional Water Board. The annual report shall include the following information (organized in a tabular spreadsheet format) and summarize whether any further actions are warranted to protect water quality or public health:

3.3.1 number and location of complaints pertaining to OWTS operation and maintenance, and identification of those which were investigated and how they were resolved;

3.3.2 shall provide the applications and registrations issued as part of the local septic tank cleaning registration program pursuant to Section 117400 et seq. of the California Health and Safety Code;

3.3.3 number, location, and description of permits issued for new and replacement OWTS and which Tier the permit is issued.

3.4 All local agencies permitting OWTS shall retain permanent records of their permitting actions and will make those records available within 10 working days upon written request for review by a Regional Water Board. The records for each permit shall reference the Tier under which the permit was issued.

3.5 A local agency shall notify the owner of a public well or water intake and the California Department of Public Health as soon as practicable, but not later than 72 hours, upon its discovery of a failing OWTS as described in sections 11.1 and 11.2 within the setbacks described in sections 7.5.6 through 7.5.10.

3.6 A local agency may implement this Policy, or a portion thereof, using its local authority to enforce the policy, as authorized by an approval from the State Water Board or by the appropriate Regional Water Board.

3.7 Nothing in the Policy shall preclude a local agency from adopting or retaining standards for OWTS in an approved Local Agency Management Program that are more protective of the public health or the environment than are contained in this Policy.

3.8 If at any time a local agency wishes to withdraw its previously submitted and approved Tier 2 Local Agency Management Program, it may do so upon 60 days written notice. The notice of withdrawal shall specify the reason for withdrawing its Tier 2 program, the effective date for cessation of the program and resumption of permitting of OWTS only under Tiers 1, 3, and 4.

4.0 Regional Water Board Functions and Duties

4.1 The Regional Water Boards have the principal responsibility for overseeing the implementation of this Policy.

4.2 Regional Water Boards shall incorporate the requirements established in this Policy by amending their Basin Plans within 12 months of the effective date of this Policy, pursuant to Water Code Section 13291(e). The Regional Water

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Boards may also consider whether it is necessary and appropriate to retain or adopt any more protective standards. To the extent that a Regional Water Board determines that it is necessary and appropriate to retain or adopt any more protective standards, it shall reconcile those region-specific standards with this Policy to the extent feasible, and shall provide a detailed basis for its determination that each of the more protective standards is necessary and appropriate.

4.2.1 Notwithstanding 4.2 above, the North Coast Regional Water Board will continue to implement its existing Basin Plan requirements pertaining to OWTS within the Russian River watershed until it adopts the Russian River TMDL, at which time it will comply with section 4.2 for the Russian River watershed.

4.3 The Regional Water Board designated in Attachment 3 shall review, and if appropriate, approve a Local Agency Management Program submitted by the local agency pursuant to Tier 2 in this Policy. Upon receipt of a proposed Local Agency Management Program, the Regional Water Board designated in Attachment 3 shall have 90 days to notify the local agency whether the submittal contains all the elements of a Tier 2 program, but may request additional information based on review of the proposed program. Approval must follow a noticed hearing with opportunity for public comment. If a Local Agency Management Program is disapproved, the Regional Water Board designated in Attachment 3 shall provide a written explanation of the reasons for the disapproval. A Regional Water Board may approve a Local Agency Management Program while disapproving any proposed special provisions for impaired water bodies contained in the Local Agency Management Program. If no action is taken by the respective Regional Water Board within 12 months of the submission date of a complete Local Agency Management Program, the program shall be forwarded to the State Water Board for review and approval pursuant to Section 5 of this Policy.

4.3.1 Where the local agency's jurisdiction lies within more than one Regional Water Board, staff from the affected Regional Water Boards shall work cooperatively to assure that water quality protection in each region is adequately protected. If the Regional Water Board designated in Attachment 3 approves the Local Agency Management Program over the written objection of an affected Regional Water Board, that Regional Water Board may submit the dispute to the State Water Board under Section 5.3.

4.3.2 Within 30 days of receipt of a proposed Local Agency Management Program, a Regional Water Board will forward a copy to and solicit comments from the California Department of Public Health regarding a Local Agency Management Program's proposed policies and procedures, including notification to local water purveyors prior to OWTS permitting.

4.4 Once a Local Agency Management Program has been approved, any affected Regional Water Board may require modifications or revoke authorization of a local agency to implement a Tier 2 program, in accordance with the following:

4.4.1 The Regional Water Board shall consult with any other Regional Water Board(s) having jurisdiction over the local agency before providing the notice described in section 4.4.2.

4.4.2 Written notice shall be provided to the local agency detailing the Regional Water Board's action, the cause for such action, remedies to prevent the action from continuing to completion, and appeal process and rights. The local agency shall have 90 days from the date of the written notice to respond with a corrective action plan to address the areas of non-compliance, or to request the Regional Water Board to reconsider its findings.

4.4.3 The Regional Water Board shall approve, approve conditionally, or deny a corrective action plan within 90 days of receipt. The local agency will have 90 days to begin implementation of a corrective action plan from the date of approval or 60 days to request reconsideration from the date of denial. If the local agency fails to submit an acceptable corrective action plan, fails to implement an approved corrective action plan, or request reconsideration, the Regional Water Board may require modifications to the Local Agency Management Program, or may revoke the local agency's authorization to implement a Tier 2 program.

4.4.4 Requests for reconsideration by the local agency shall be decided by the Regional Water Board within 90 days and the previously approved Local Agency Management Program shall remain in effect while the reconsideration is pending.

4.4.5 If the request for reconsideration is denied, the local agency may appeal to the State Water Board and the previously approved Local Agency Management Program shall remain in effect while the appeal is under consideration. The State Water Board shall decide the appeal within 90 days. All decisions of the State Water Board are final.

4.5 The appropriate Regional Water Board shall accept and consider any requests for modification or revocation of a Local Agency Management Program submitted by any person. The Regional Water Board will notify the person making the request and the local agency implementing the Local Agency Management Program at issue by letter within 90 days whether it intends to proceed with the modification or revocation process per Section 4.4 above, or is dismissing the request. The Regional Water Board will post the request and its response letter on its website.

4.6 A Regional Water Board may issue or deny waste discharge requirements or waivers of waste discharge requirements for any new or replacement OWTS within a jurisdiction of a local agency without an approved Local Agency Management Program if that OWTS does not meet the minimum standards contained in Tier 1.

4.7 The Regional Water Boards will implement any notifications and enforcement requirements for OWTS determined to be in Tier 3 of this Policy.

Responsibilities and Duties

4.8 Regional Water Boards may adopt waste discharge requirements, or conditional waivers of waste discharge requirements, that exempt individual OWTS from requirements contained in this Policy.

5.0 State Water Board Functions and Duties

5.1 As the state agency charged with the development and adoption of this Policy, the State Water Board shall periodically review, amend and/or update this Policy as required.

5.2 The State Water Board may take any action assigned to the Regional Water Boards in this Policy.

5.3 The State Water Board shall resolve disputes between Regional Water Boards and local agencies as needed within 12 months of receiving such a request by a Regional Water Board or local agency, and may take action on its own motion in furtherance of this Policy. As part of this function, the State Water Board shall review and, if appropriate, approve Local Agency Management Programs in cases where the respective Regional Water Board has failed to consider for approval a Local Agency Management Program. The State Water Board shall approve Local Agency Management Programs at a regularly noticed board hearing and shall provide for public participation, including notice and opportunity for public comment. Once taken up by the State Water Board, Local Agency Management Programs shall be approved or denied within 180 days.

5.4 A member of the public may request the State Water Board to resolve any dispute regarding the Regional Water Board's approval of a Local Agency Management Program if the member of the public timely raised the disputed issue before the Regional Water Board. Such requests shall be submitted within 30 days after the Regional Water Board's approval of the Local Agency Management Program. The State Water Board shall notify the member of the public, the local agency, and the Regional Water Board within 90 days whether it intends to proceed with dispute resolution.

5.5 The State Water Board shall accept and consider any requests for modification or revocation of a Local Agency Management Program submitted by any person, where that person has previously submitted said request to the Regional Water Board and has received notice from the Regional Water Board of its dismissal of the request. The State Water Board will notify the person making the request and the local agency implementing the Local Agency Management Program at issue by letter within 90 days whether it intends to proceed with the modification or revocation process per Section 4.4 above, or is dismissing the request. The State Water Board will post the request and its response letter on its website.

5.6 The State Water Board or its Executive Director, after approving any Impaired Water Bodies [303 (d)] List, and for the purpose of implementing Tier 3 of this Policy, shall update Attachment 2 to identify those water bodies where: (1) it is likely that operating OWTS will subsequently be determined to be a contributing

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Responsibilities and Duties

source of pathogens or nitrogen and therefore it is anticipated that OWTS would receive a loading reduction, and (2) it is likely that new OWTS installations discharging within 600 feet of the water body would contribute to the impairment. This identification shall be based on information available at the time of 303 (d) listing and may be further updated based on new information. Updates to Attachment 2 will be processed as amendments to this Policy.

5.7 The State Water Board will make available to local agencies funds from its Clean Water State Revolving Fund loan program for mini-loan programs to be operated by the local agencies for the making of low interest loans to assist private property owners with complying with this Policy.

Tier 0 – Existing OWTS

Tier 0 – Existing OWTS

Existing OWTS that are properly functioning and do not meet the conditions of failing systems or otherwise require corrective action (for example, to prevent groundwater impairment) as specifically described in Tier 4, and are not determined to be contributing to an impairment of surface water as specifically described in Tier 3, are automatically included in Tier 0.

6.0 Coverage for Properly Operating Existing OWTS

6.1 Existing OWTS are automatically covered by Tier 0 and the herein included waiver of waste discharge requirements if they meet the following requirements:

6.1.1 have a projected flow of 10,000 gallons-per-day or less;

6.1.2 receive only domestic wastewater from residential or commercial buildings, or high-strength wastewater from commercial food service buildings that does not exceed 900 mg/L BOD and has a properly sized and functioning oil/grease interceptor (a.k.a. grease trap);

6.1.3 continue to comply with any previously imposed permitting conditions;

6.1.4 do not require supplemental treatment under Tier 3;

6.1.5 do not require corrective action under Tier 4; and

6.1.6 do not consist of a cesspool as a means of wastewater disposal.

6.2 A Regional Water Board or local agency may deny coverage under this Policy to any OWTS that is:

6.2.1 Not in compliance with Section 6.1;

6.2.2 Not able to adequately protect the water quality of the waters of the State, as determined by the Regional Water Board after considering any input from the local agency. A Regional Water Board may require the submission of a report of waste discharge to receive Region specific waste discharge requirements or waiver of waste discharge requirements so as to be protective.

6.3 Existing OWTS currently under waste discharge requirements or individual waiver of waste discharge requirements will remain under those orders until notified in writing by the appropriate Regional Water Board that they are covered under this Policy.

Tier 1 – Low Risk New or Replacement OWTS

Tier 1 – Low Risk New or Replacement OWTS

New or replacement OWTS meet low risk siting and design requirements as specified in Tier 1, where there is not an approved Local Agency Management Program per Tier 2.

7.0 Minimum Site Evaluation and Siting Standards

7.1 A qualified professional shall perform all necessary soil and site evaluations for all new OWTS and for existing OWTS where the treatment or dispersal system will be replaced or expanded.

7.2 A site evaluation shall determine that adequate soil depth is present in the dispersal area. Soil depth is measured vertically to the point where bedrock, hardpan, impermeable soils, or saturated soils are encountered or an adequate depth has been determined. Soil depth shall be determined through the use of soil profile(s) in the dispersal area and the designated dispersal system replacement area, as viewed in excavations exposing the soil profiles in representative areas, unless the local agency has determined through historical or regional information that a specific site soil profile evaluation is unwarranted.

7.3 A site evaluation shall determine whether the anticipated highest level of groundwater within the dispersal field and its required minimum dispersal zone is not less than prescribed in Table 2 by estimation using one or a combination of the following methods:

7.3.1 Direct observation of the highest extent of soil mottling observed in the examination of soil profiles, recognizing that soil mottling is not always an indicator of the uppermost extent of high groundwater; or

7.3.2 Direct observation of groundwater levels during the anticipated period of high groundwater. Methods for groundwater monitoring and determinations shall be decided by the local agency; or

7.3.3 Other methods, such as historical records, acceptable to the local agency.

7.3.4 Where a conflict in the above methods of examination exists, the direct observation method indicating the highest level shall govern.

7.4 Percolation test results in the effluent disposal area shall not be faster than one minute per inch (1 MPI) or slower than one hundred twenty minutes per inch (120 MPI). All percolation test rates shall be performed by presoaking of percolation test holes and continuing the test until a stabilized rate is achieved.

7.5 Minimum horizontal setbacks from any OWTS treatment component and dispersal systems shall be as follows:

7.5.1 5 feet from parcel property lines and structures;

7.5.2 100 feet from water wells and monitoring wells, unless regulatory or legitimate data requirements necessitate that monitoring wells be located closer;

7.5.3 100 feet from any unstable land mass or any areas subject to earth slides identified by a registered engineer or registered geologist; other setback distance are allowed, if recommended by a geotechnical report prepared by a qualified professional.

7.5.4 100 feet from springs and flowing surface water bodies where the edge of that water body is the natural or levied bank for creeks and rivers, or may be less where site conditions prevent migration of wastewater to the water body;

7.5.5 200 feet from vernal pools, wetlands, lakes, ponds, or other surface water bodies where the edge of that water body is the high water mark for lakes and reservoirs, and the mean high tide line for tidally influenced water bodies;

7.5.6 150 feet from a public water well where the depth of the effluent dispersal system does not exceed 10 feet;

7.5.7 Where the effluent dispersal system is within 1,200 feet from a public water systems' surface water intake point, within the catchment of the drainage, and located such that it may impact water quality at the intake point such as upstream of the intake point for flowing water bodies, the dispersal system shall be no less than 400 feet from the high water mark of the reservoir, lake or flowing water body.

7.5.8 Where the effluent dispersal system is located more than 1,200 feet but less than 2,500 feet from a public water systems' surface water intake point, within the catchment of the drainage, and located such that it may impact water quality at the intake point such as upstream of the intake point for flowing water bodies, the dispersal system shall be no less than 200 feet from the high water mark of the reservoir, lake or flowing water body.

7.6 Prior to issuing a permit to install an OWTS the permitting agency shall determine if the OWTS is within 1,200 feet of an intake point for a surface water treatment plant for drinking water, is in the drainage catchment in which the intake point is located, and located such that it may impact water quality at the intake point such as being upstream of the intake point for a flowing water body. If the OWTS is within 1,200 feet of an intake point for a surface water treatment plant for drinking water, is in the drainage catchment in which the intake point is located, and is located such that it may impact water quality at the intake point:

7.6.1 The permitting agency shall provide a copy of the permit application to the owner of the water system of their proposal to install an OWTS within 1,200 feet of an intake point for a surface water treatment. If the owner of the water system cannot be identified, then the permitting agency will notify California Department of Public Health Drinking Water Program.

7.6.2 The permit application shall include a topographical plot plan for the parcel showing the OWTS components, the property boundaries, proposed structures, physical address, and name of property owner.

Tier 1 – Low Risk New or Replacement OWTS

7.6.3 The permit application shall provide the estimated wastewater flows, intended use of proposed structure generating the wastewater, soil data, and estimated depth to seasonally saturated soils.

7.6.4 The public water system owner shall have 15 days from receipt of the permit application to provide recommendations and comments to the permitting agency.

7.7 Natural ground slope in all areas used for effluent disposal shall not be greater than 25 percent.

7.8 The average density for any subdivision of property made by Tentative Approval pursuant to the Subdivision Map Act occurring after the effective date of this Policy and implemented under Tier 1 shall not exceed the allowable density values in Table 1 for a single-family dwelling unit, or its equivalent, for those units that rely on OWTS.

Table 1: Allowable Average Densities per Subdivision under Tier 1.

Average Annual Rainfall (in/yr)	Allowable Density (acres/single family dwelling unit)
0 - 15	2.5
>15 - 20	2
>20 - 25	1.5
>25 - 35	1
>35 - 40	0.75
>40	0.5

8.0 Minimum OWTS Design and Construction Standards

8.1 OWTS Design Requirements

8.1.1 A qualified professional shall design all new OWTS and modifications to existing OWTS where the treatment or dispersal system will be replaced or expanded. A qualified professional employed by a local agency, while acting in that capacity, may design, review, and approve a design for a proposed OWTS, if authorized by the local agency.

8.1.2 OWTS shall be located, designed, and constructed in a manner to ensure that effluent does not surface at any time, and that percolation of effluent will not adversely affect beneficial uses of waters of the State.

8.1.3 The design of new and replacement OWTS shall be based on the expected influent wastewater quality with a projected flow not to exceed 3,500 gallons per day, the peak wastewater flow rates for purposes of sizing hydraulic components, the projected average daily flow for purposes of sizing the dispersal system, the characteristics of the site, and the required level of treatment for protection of water quality and public health.

8.1.4 All dispersal systems shall have at least twelve (12) inches of soil cover, except for pressure distribution systems, which must have at least six (6) inches of soil cover.

8.1.5 The minimum depth to the anticipated highest level of groundwater below the bottom of the leaching trench, and the native soil depth immediately below the leaching trench, shall not be less than prescribed in Table 2.

Table 2: Tier 1 Minimum Depths to Groundwater and Minimum Soil Depth from the Bottom of the Dispersal System

Percolation Rate	Minimum Depth
Percolation Rate ≤1 MPI	Only as authorized in a Tier 2 Local Agency Management Program
1 MPI< Percolation Rate ≤ 5 MPI	Twenty (20) feet
5 MPI< Percolation Rate ≤ 30 MPI	Eight (8) feet
30 MPI< Percolation Rate ≤ 120 MPI	Five (5) feet
Percolation Rate > 120 MPI	Only as authorized in a Tier 2 Local Agency Management Program
MPI = minutes per inch	

8.1.6 Dispersal systems shall be a leachfield, designed using not more than 4 square-feet of infiltrative area per linear foot of trench as the infiltrative surface, and with trench width no wider than 3 feet. Seepage pits and other dispersal systems may only be authorized for repairs where siting limitations require a variance. Maximum application rates shall be determined from stabilized percolation rate as provided in Table 3, or from soil texture and structure determination as provided in Table 4.

8.1.7 Dispersal systems shall not exceed a maximum depth of 10 feet as measured from the ground surface to the bottom of the trench.

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Table 5. Application Rates as Determined from Stabilized Percolation Rate

Percolation Rate (minutes per inch)	Application Rate (gallons per day per square foot)	Percolation Rate (minutes per inch)	Application Rate (gallons per day per square foot)	Percolation Rate (minutes per inch)	Application Rate (gallons per day per square foot)
<1	Requires Local Manage-ment Program	31	0.522	61	0.197
1	1.2	32	0.511	62	0.194
2	1.2	33	0.5	63	0.19
3	1.2	34	0.489	64	0.187
4	1.2	35	0.478	65	0.184
5	1.2	36	0.467	66	0.18
6	0.8	37	0.456	67	0.177
7	0.8	38	0.445	68	0.174
8	0.8	39	0.434	69	0.17
9	0.8	40	0.422	70	0.167
10	0.8	41	0.411	71	0.164
11	0.786	42	0.4	72	0.16
12	0.771	43	0.389	73	0.157
13	0.757	44	0.378	74	0.154
14	0.743	45	0.367	75	0.15
15	0.729	46	0.356	76	0.147
16	0.714	47	0.345	77	0.144
17	0.7	48	0.334	78	0.14
18	0.686	49	0.323	79	0.137
19	0.671	50	0.311	80	0.133
20	0.657	51	0.3	81	0.13
21	0.643	52	0.289	82	0.127
22	0.629	53	0.278	83	0.123
23	0.614	54	0.267	84	0.12
24	0.6	55	0.256	85	0.117
25	0.589	56	0.245	86	0.113
26	0.578	57	0.234	87	0.11
27	0.567	58	0.223	88	0.107
28	0.556	59	0.212	89	0.103
29	0.545	60	0.2	90	0.1
30	0.533			>90 - 120	0.1

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Tier 1 – Low Risk New or Replacement OWTS

Table 4: Design Soil Application Rates

(Source: USEPA Onsite Wastewater Treatment Systems Manual, February 2002)

Soil Texture **(per the USDA soil classification system)**	**Soil Structure Shape**	**Grade**	**Maximum Soil Application Rate(gallons per day per square foot)** [1]
Coarse Sand, Sand, Loamy Coarse Sand, Loamy Sand	Single grain	Structureless	0.8
Fine Sand, Very Fine Sand, Loamy Fine Sand, Loamy Very Fine Sand	Single grain	Structureless	0.4
Coarse Sandy Loam, Sandy Loam	Massive	Structureless	0.2
	Platy	Weak	0.2
		Moderate, Strong	Prohibited
	Prismatic, Blocky, Granular	Weak	0.4
		Moderate, Strong	0.6
Fine Sandy Loam, very fine Sandy Loam	Massive	Structureless	0.2
	Platy	Weak, Moderate, Strong	Prohibited
	Prismatic, Blocky, Granular	Weak	0.2
		Moderate, Strong	0.4
Loam	Massive	Structureless	0.2
	Platy	Weak, Moderate, Strong	Prohibited
	Prismatic, Blocky, Granular	Weak	0.4
		Moderate, Strong	0.6
Silt Loam	Massive	Structureless	Prohibited
	Platy	Weak, Moderate, Strong	Prohibited
	Prismatic, Blocky, Granular	Weak	0.4
		Moderate, Strong	0.6
Sandy Clay Loam, Clay Loam, Silty Clay Loam	Massive	Structureless	Prohibited
	Platy	Weak, Moderate, Strong	Prohibited
	Prismatic, Blocky, Granular	Weak	0.2
		Moderate, Strong	0.4
Sandy Clay, Clay, or Silty Clay	Massive	Structureless	Prohibited
	Platy	Weak, Moderate, Strong	Prohibited
	Prismatic, Blocky, Granular	Weak	Prohibited
		Moderate, Strong	0.2

[1] Soils listed as prohibited may be allowed under the authority of the Regional Water Board, or as allowed under an approved Local Agency Management Program per Tier 2.

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Tier 1 – Low Risk New or Replacement OWTS

8.1.8 All new dispersal systems shall have 100 percent replacement area that is equivalent and separate, and available for future use.

8.1.9 No dispersal systems or replacement areas shall be covered by an impermeable surface, such as paving, building foundation slabs, plastic sheeting, or any other material that prevents oxygen transfer to the soil.

8.1.10 Rock fragment content of native soil surrounding the dispersal system shall not exceed 50 percent by volume for rock fragments sized as cobbles or larger and shall be estimated using either the point-count or line-intercept methods.

8.1.11 Increased allowance for IAPMO certified dispersal systems is not allowed under Tier 1.

8.2 OWTS Construction and Installation

8.2.1 All new or replacement septic tanks and new or replacement oil/grease interceptor tanks shall comply with the standards contained in Sections K5(b), K5(c), K5(d), K5(e), K5(k), K5(m)(1), and K5(m)(3)(ii) of Appendix K, of Part 5, Title 24 of the 2007 California Code of Regulations.

8.2.2 All new septic tanks shall comply with the following requirements:

8.2.2.1 Access openings shall have watertight risers, the tops of which shall be set at most 6 inches below finished grade; and

8.2.2.2 Access openings at grade or above shall be locked or secured to prevent unauthorized access.

8.2.3 New and replacement OWTS septic tanks shall be limited to those approved by the International Association of Plumbing and Mechanical Officials (IAPMO) or stamped and certified by a California registered civil engineer as meeting the industry standards, and their installation shall be according to the manufacturer's instructions.

8.2.4 New and replacement OWTS septic tanks shall be designed to prevent solids in excess of three-sixteenths (3/16) of an inch in diameter from passing to the dispersal system. Septic tanks that use a National Sanitation Foundation/American National Standard Institute (NSF/ANSI) Standard 46 certified septic tank filter at the final point of effluent discharge from the OWTS and prior to the dispersal system shall be deemed in compliance with this requirement.

Tier 1 – Low Risk New or Replacement OWTS

8.2.5 A Licensed General Engineering Contractor (Class A), General Building Contractor (Class B), Sanitation System Contractor (Specialty Class C-42), or Plumbing Contractor (Specialty Class C-36) shall install all new OWTS and replacement OWTS in accordance with California Business and Professions Code Sections 7056, 7057, and 7058 and Article 3, Division 8, Title 16 of the California Code of Regulations. A property owner may also install his/her own OWTS if the as-built diagram and the installation are inspected and approved by the Regional Water Board or local agency at a time when the OWTS is in an open condition (not covered by soil and exposed for inspection).

Tier 2 – Local Agency OWTS Management Program

Tier 2 – Local Agency OWTS Management Program

Local agencies may submit management programs for approval, and upon approval then manage the installation of new and replacement OWTS under that program. Local Agency Management Programs approved under Tier 2 provide an alternate method from Tier 1 programs to achieve the same policy purpose, which is to protect water quality and public health. In order to address local conditions, Local Agency Management Programs may include standards that differ from the Tier 1 requirements for new and replacement OWTS contained in Sections 7 and 8. As examples, a Local Agency Management Program may authorize different soil characteristics, usage of seepage pits, and different densities for new developments. Once the Local Agency Management Program is approved, new and replacement OWTS that are included within the Local Agency Management Program may be approved by the Local Agency. A Local Agency, at its discretion, may include Tier 1 standards within its Tier 2 Local Agency Management Program for some or all of its jurisdiction. However, once a Local Agency Management Program is approved, it shall supersede Tier 1 and all future OWTS decisions will be governed by the Tier 2 Local Agency Management Program until it is modified, withdrawn, or revoked.

9.0 Local Agency Management Program for Minimum OWTS Standards

The Local Agency Management Program for minimum OWTS Standards is a management program where local agencies can establish minimum standards that are differing requirements from those specified in Tier 1 (Section 7 and Section 8), including the areas that do not meet those minimum standards and still achieve this Policy's purpose. Local Agency Management Programs may include any one or combination of the following to achieve this purpose:

- Differing system design requirements;
- Differing siting controls such as system density and setback requirements;
- Requirements for owners to enter monitoring and maintenance agreements; and/or
- Creation of an onsite management district or zone.

9.1 Where different and/or additional requirements are needed to protect water quality the local agency shall consider the following, as well as any other conditions deemed appropriate, when developing Local Agency Management Program requirements:

9.1.1 Degree of vulnerability to pollution from OWTS due to hydrogeological conditions.

9.1.2 High Quality waters or other environmental conditions requiring enhanced protection from the effects of OWTS.

9.1.3 Shallow soils requiring a dispersal system installation that is closer to ground surface than is standard.

9.1.4 OWTS is located in area with high domestic well usage.

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Tier 2 – Local Agency OWTS Management Program

9.1.5 Dispersal system is located in an area with fractured bedrock.

9.1.6 Dispersal system is located in an area with poorly drained soils.

9.1.7 Surface water is vulnerable to pollution from OWTS.

9.1.8 Surface water within the watershed is listed as impaired for nitrogen or pathogens.

9.1.9 OWTS is located within an area of high OWTS density.

9.1.10 A parcel's size and its susceptibility to hydraulic mounding, organic or nitrogen loading, and whether there is sufficient area for OWTS expansion in case of failure.

9.1.11 Geographic areas that are known to have multiple, existing OWTS predating any adopted standards of design and construction including cesspools.

9.1.12 Geographic areas that are known to have multiple, existing OWTS located within either the pertinent setbacks listed in Section 7.5 of this Policy, or a setback that the local agencies finds is appropriate for that area.

9.2 The Local Agency Management Program shall detail the scope of its coverage, such as the maximum authorized projected flows for OWTS, as well as a clear delineation of those types of OWTS included within and to be permitted by the program, and provide the local site evaluation, siting, design, and construction requirements, and in addition each of the following:

9.2.1 Any local agency requirements for onsite wastewater system inspection, monitoring, maintenance, and repairs, including procedures to ensure that replacements or repairs to failing systems are done under permit from the local governing jurisdiction.

9.2.2 Any special provisions applicable to OWTS within specified geographic areas near specific impaired water bodies listed for pathogens or nitrogen. The special provisions may be substantive and/or procedural, and may include, as examples: consultation with the Regional Water Board prior to issuing permits, supplemental treatment, development of a management district or zone, special siting requirements, additional inspection and monitoring.

9.2.3 Local Agency Management Program variances, for new installations and repairs in substantial conformance, to the greatest extent practicable. Variances are not allowed for the requirements stated in sections 9.4.1 through 9.4.9.

9.2.4 Any educational, training, certification, and/or licensing requirements that will be required of OWTS service providers, site evaluators, designers, installers, pumpers, maintenance contractors, and any other person relating to OWTS activities.

9.2.5 Education and/or outreach program including informational materials to inform OWTS owners about how to locate, operate, and maintain their

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Tier 2 – Local Agency OWTS Management Program

OWTS as well as any Water Board order (e.g., Basin Plan prohibitions) regarding OWTS restrictions within its jurisdiction. The education and/or outreach program shall also include procedures to ensure that alternative onsite system owners are provided an informational maintenance or replacement document by the system designer or installer. This document shall cite homeowner procedures to ensure maintenance, repair, or replacement of critical items within 48 hours following failure. If volunteer well monitoring programs are available within the local agency's jurisdiction, the outreach program shall include information on how well owners may participate.

9.2.6 An assessment of existing and proposed disposal locations for septage, the volume of septage anticipated, and whether adequate capacity is available.

9.2.7 Any consideration given to onsite maintenance districts or zones.

9.2.8 Any consideration given to the development and implementation of, or coordination with, Regional Salt and Nutrient Management Plans.

9.2.9 Any consideration given to coordination with watershed management groups.

9.2.10 Procedures for evaluating the proximity of sewer systems to new or replacement OWTS installations.

9.2.11 Procedures for notifying the owner of a public water system prior to issuing an installation or repair permit for an OWTS, if the OWTS is within 1,200 feet of an intake point for a surface water treatment plant for drinking water, is in the drainage area catchment in which the intake point is located, and is located such that it may impact water quality at the intake point such as upstream of the intake point for a flowing water body, or if the OWTS is within a horizontal sanitary setback from a public well.

9.2.12 Policies and procedures that will be followed when a proposed OWTS dispersal area is within the horizontal sanitary setback of a public well or a surface water intake point. These policies and procedures shall either indicate that supplemental treatment as specified in 10.9 and 10.10 of this policy are required for OWTS that are within a horizontal sanitary setback of a public well or surface water intake point, or will establish alternate siting and operational criteria for the proposed OWTS that would similarly mitigate the potential adverse impact to the public water source.

9.2.13 Any plans for the phase-out or discontinuance of cesspool usage.

9.3 The minimum responsibilities of the local agency for management of the Local Agency Management Program include:

9.3.1 Maintain records of the number, location, and description of permits issued for OWTS where a variance is granted.

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Tier 2 – Local Agency OWTS Management Program

9.3.2 Maintain a water quality assessment program to determine the general operation status of OWTS and to evaluate the impact of OWTS discharges, and assess the extent to which groundwater and local surface water quality may be adversely impacted. The focus of the assessment should be areas with characteristics listed under section 9.1. The assessment program will include monitoring and analysis of water quality data, review of complaints, variances, failures, and any information resulting from inspections. The assessment may use existing water quality data from other monitoring programs and/or establish the terms, conditions, and timing for monitoring done by the local agency. At a minimum this assessment will include monitoring data for nitrates and pathogens, and may include data for other constituents which are needed to adequately characterize the impacts of OWTS on water quality. Other monitoring programs for which data may be used include but are not limited to any of the following:

9.3.2.1. Random well samples from a domestic well sampling program.

9.3.2.2. Routine real estate transfer samples if those are performed and reported.

9.3.2.3. Review of public system sampling reports done by the local agency or another municipality responsible for the public system.

9.3.2.4. Water quality testing reports done at the time of new well development if those are reported.

9.3.2.5. Beach water quality testing data performed as part of Health and Safety Code Section 115885.

9.3.2.6. Receiving water sampling performed as a part of a NPDES permit.

9.3.2.7. Data contained in the California Water Quality Assessment Database.

9.3.2.8. Groundwater sampling performed as part of Waste Discharge Requirements.

9.3.2.9. Groundwater data collected as part of the Groundwater Ambient Monitoring and Assessment Program and available in the Geotracker Database.

9.3.3 Submit an annual report by February 1 to the applicable Regional Water Board summarizing the status of items 9.3.1 through 9.3.2 above. Every fifth year, submit an evaluation of the monitoring program and an assessment of whether water quality is being impacted by OWTS, identifying any changes in the Local Agency Management Program that will be undertaken to address impacts from OWTS. The first report will commence one year after approval of the local agency's Local Agency Management Program. In addition to summarizing monitoring data collected per 9.3.2 above, all groundwater monitoring data generated by the local agency shall be submitted in EDF format for inclusion into

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Tier 2 – Local Agency OWTS Management Program

Geotracker, and surface water monitoring shall be submitted to CEDEN in a SWAMP comparable format.

9.4 The following are not allowed to be authorized in a Local Agency Management Program:

9.4.1 Cesspools of any kind or size.

9.4.2 OWTS receiving a projected flow over 10,000 gallons per day.

9.4.3 OWTS that utilize any form of effluent disposal that discharges on or above the post installation ground surface such as sprinklers, exposed drip lines, free-surface wetlands, or a pond.

9.4.4 Slopes greater than 30 percent without a slope stability report approved by a registered professional.

9.4.5 Decreased leaching area for IAPMO certified dispersal systems using a multiplier less than 0.70.

9.4.6 OWTS utilizing supplemental treatment without requirements for periodic monitoring or inspections.

9.4.7 OWTS dedicated to receiving significant amounts of wastes dumped from RV holding tanks.

9.4.8 Separation of the bottom of dispersal system to groundwater less than two (2) feet, except for seepage pits, which shall not be less than 10 feet.

9.4.9 Installation of new or replacement OWTS where public sewer is available. The public sewer may be considered as not available when such public sewer or any building or exterior drainage facility connected thereto is located more than 200 feet from any proposed building or exterior drainage facility on any lot or premises that abuts and is served by such public sewer. This provision does not apply to replacement OWTS where the connection fees and construction cost are greater than twice the total cost of the replacement OWTS and the local agency determines that the discharge from the OWTS will not affect groundwater or surface water to a degree that makes it unfit for drinking or other uses.

9.4.10 Except as provided for in sections 9.4.11 and 9.4.12, new or replacement OWTS with minimum horizontal setbacks less than any of the following:

9.4.10.1 150 feet from a public water well where the depth of the effluent dispersal system does not exceed 10 feet in depth.

9.4.10.2 200 feet from a public water well where the depth of the effluent dispersal system exceeds 10 feet in depth.

9.4.10.3 Where the effluent dispersal system is within 600 feet of a public water well and exceeds 20 feet in depth the horizontal setback required to achieve a two-year travel time for microbiological contaminants shall be evaluated. A qualified professional shall conduct this evaluation. However in no case shall the setback be less than 200 feet.

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Tier 2 – Local Agency OWTS Management Program

9.4.10.4 Where the effluent dispersal system is within 1,200 feet from a public water systems' surface water intake point, within the catchment of the drainage, and located such that it may impact water quality at the intake point such as upstream of the intake point for flowing water bodies, the dispersal system shall be no less than 400 feet from the high water mark of the reservoir, lake or flowing water body.

9.4.10.5 Where the effluent dispersal system is located more than 1,200 feet but less than 2,500 feet from a public water systems' surface water intake point, within the catchment area of the drainage, and located such that it may impact water quality at the intake point such as upstream of the intake point for flowing water bodies, the dispersal system shall be no less than 200 feet from the high water mark of the reservoir, lake or flowing water body.

9.4.11 For replacement OWTS that do not meet the above horizontal separation requirements, the replacement OWTS shall meet the horizontal separation to the greatest extent practicable. In such case, the replacement OWTS shall utilize supplemental treatment and other mitigation measures, unless the permitting authority finds that there is no indication that the previous system is adversely affecting the public water source, and there is limited potential that the replacement system could impact the water source based on topography, soil depth, soil texture, and groundwater separation.

9.4.12 For new OWTS, installed on parcels of record existing at the time of the effective date of this Policy, that cannot meet the above horizontal separation requirements, the OWTS shall meet the horizontal separation to the greatest extent practicable and shall utilize supplemental treatment for pathogens as specified in section 10.8 and any other mitigation measures prescribed by the permitting authority.

9.5 A Local Agency Management Program for OWTS must include adequate detail, including technical information to support how all the criteria in their program work together to protect water quality and public health.

9.6 A Regional Water Board reviewing a Local Agency Management Program shall consider, among other things, the past performance of the local program to adequately protect water quality, and where this has been achieved with criteria differing from Tier 1, shall not unnecessarily require modifications to the program for purposes of uniformity, as long as the Local Agency Management Program meets the requirements of Tier 2.

Tier 3 – Impaired Areas

Tier 3 – Advanced Protection Management Programs for Impaired Areas

Existing, new, and replacement OWTS that are near impaired water bodies may be addressed by a TMDL and its implementation program, or special provisions contained in a Local Agency Management Program. If there is no TMDL or special provisions, new or replacement OWTS within 600 feet of impaired water bodies listed in Attachment 2 must meet the applicable specific requirements of Tier 3.

10.0 Advanced Protection Management Program

An Advanced Protection Management Program is the minimum required management program for all OWTS located near a water body that has been listed as impaired due to nitrogen or pathogen indicators pursuant to Section 303(d) of the Clean Water Act. Local agencies are authorized to implement Advanced Protection Management Programs in conjunction with an approved Local Agency Management Program or, if there is no approved Local Agency Management Program, Tier 1. Local agencies are encouraged to collaborate with the Regional Water Boards by sharing any information pertaining to the impairment, provide advice on potential remedies, and regulate OWTS to the extent that their authority allows for the improvement of the impairment.

10.1 The geographic area for each water body's Advanced Protection Management Program is defined by the applicable TMDL, if one has been approved. If there is not an approved TMDL, it is defined by an approved Local Agency Management Program, if it contains special provisions for that water body. If it is not defined in an approved TMDL or Local Agency Management Program, it shall be 600 linear feet [in the horizontal (map) direction] of a water body listed in Attachment 2 where the edge of that water body is the natural or levied bank for creeks and rivers, the high water mark for lakes and reservoirs, and the mean high tide line for tidally influenced water bodies, as appropriate. OWTS near impaired water bodies that are not listed on Attachment 2, and do not have a TMDL and are not covered by a Local Agency Management Program with special provisions, are not addressed by Tier 3.

10.2 The requirements of an Advanced Protection Management Program will be in accordance with a TMDL implementation plan, if one has been adopted to address the impairment. An adopted TMDL implementation plan supersedes all other requirements in Tier 3. All TMDL implementation plans adopted after the effective date of this Policy that contain load allocations for OWTS shall include a schedule that requires compliance with the load allocations as soon as practicable, given the watershed-specific circumstances. The schedule shall require that OWTS implementation actions for OWTS installed prior to the TMDL implementation plan's effective date shall commence within 3 years after the TMDL implementation plan's effective date, and that OWTS implementation actions for OWTS installed after the TMDL implementation plan's effective date shall commence immediately. The TMDL implementation plan may use some or all of the Tier 3 requirements and shall establish the applicable area of

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Tier 3 – Impaired Areas

implementation for OWTS requirements within the watershed. For those impaired water bodies that do have an adopted TMDL addressing the impairment, but the TMDL does not assign a load allocation to OWTS, no further action is required unless the TMDL is modified at some point in the future to include actions for OWTS. Existing, new, and replacement OWTS that are near impaired water bodies and are covered by a Basin Plan prohibition must also comply with the terms of the prohibition, as provided in Section 2.1.

10.3 In the absence of an adopted TMDL implementation plan, the requirements of an Advanced Protection Management Program will consist of any special provisions for the water body if any such provisions have been approved as part of a Local Agency Management Program.

10.4 The Regional Water Boards shall adopt TMDLs for impaired water bodies identified in Attachment 2, in accordance with the specified dates.

10.4.1 If a Regional Water Board does not complete a TMDL within two years of the time period specified in Attachment 2, coverage under this Policy's waiver of waste discharge requirements shall expire for any OWTS that has any part of its dispersal system discharging within the geographic area of an Advanced Protection Management Program. The Regional Water Board shall issue waste discharge requirements, general waste discharge requirements, waivers of waste discharge requirements, or require corrective action for such OWTS. The Regional Water Board will consider the following when establishing the waste discharge requirements, general waste discharge requirements, waivers of waste discharge requirements, or requirement for corrective action:

10.4.1.1 Whether supplemental treatment should be required.

10.4.1.2 Whether routine inspection of the OWTS should be required.

10.4.1.3 Whether monitoring of surface and groundwater should be performed.

10.4.1.4 The collection of a fee for those OWTS covered by the order.

10.4.1.5 Whether owners of previously-constructed OWTS should file a report by a qualified professional in accordance with section 10.5.

10.4.1.6 Whether owners of new or replacement OWTS should file a report of waste discharge with additional supporting technical information as required by the Regional Water Board.

10.5 If the Regional Water Board requires owners of OWTS to submit a qualified professional's report pursuant to Section 10.4.1.5, the report shall include a determination of whether the OWTS is functioning properly and as designed or requires corrective actions per Tier 4, and regardless of its state of function, whether it is contributing to impairment of the water body.

10.5.1 The qualified professional's report may also include, but is not limited to:

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Tier 3 – Impaired Areas

10.5.1.1 A general description of system components, their physical layout, and horizontal setback distances from property lines, buildings, wells, and surface waters.

10.5.1.2 A description of the type of wastewater discharged to the OWTS such as domestic, commercial, or industrial and classification of it as domestic wastewater or high-strength waste.

10.5.1.3 A determination of the systems design flow and the volume of wastewater discharged daily derived from water use, either estimated or actual if metered.

10.5.1.4 A description of the septic tank, including age, size, material of construction, internal and external condition, water level, scum layer thickness, depth of solids, and the results of a one-hour hydrostatic test.

10.5.1.5 A description of the distribution box, dosing siphon, or distribution pump, and if flow is being equally distributed throughout the dispersal system, as well as any evidence of solids carryover, clear water infiltration, or evidence of system backup.

10.5.1.6 A description of the dispersal system including signs of hydraulic failure, condition of surface vegetation over the dispersal system, level of ponding above the infiltrative surface within the dispersal system, other possible sources of hydraulic loading to the dispersal area, and depth of the seasonally high groundwater level.

10.5.1.7 A determination of whether the OWTS is discharging to the ground's surface.

10.5.1.8 For a water body listed as an impaired water body for pathogens, a determination of the OWTS dispersal system's separation from its deepest most infiltrative surface to the highest seasonal groundwater level or fractured bedrock.

10.5.1.9 For a water body listed as an impaired water body for nitrogen, a determination of whether the groundwater under the dispersal field is reaching the water body, and a description of the method used to make the determination.

10.6 For new, replacement, and existing OWTS in an Advanced Protection Management Program, the following are not covered by this Policy's waiver but may be authorized by a separate Regional Water Board order:

10.6.1 Cesspools of any kind or size.

10.6.2 OWTS receiving a projected flow over 10,000 gallons per day.

10.6.3 OWTS that utilize any form of effluent disposal on or above the ground surface.

10.6.4 Slopes greater than 30 percent without a slope stability report approved by a registered professional.

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Tier 3 – Impaired Areas

10.6.5 Decreased leaching area for IAPMO certified dispersal systems using a multiplier less than 0.70.

10.6.6 OWTS utilizing supplemental treatment without requirements for periodic monitoring or inspections.

10.6.7 OWTS dedicated to receiving significant amounts of wastes dumped from RV holding tanks.

10.6.8 Separation of the bottom of dispersal system to groundwater less than two (2) feet, except for seepage pits, which shall not be less than 10 feet.

10.6.9 Minimum horizontal setbacks less than any of the following:

10.6.9.1 150 feet from a public water well where the depth of the effluent dispersal system does not exceed 10 feet in depth;

10.6.9.2 200 feet from a public water well where the depth of the effluent dispersal system exceeds 10 feet in depth:

10.6.9.3 Where the effluent dispersal system is within 600 feet of a public water well and exceeds 20 feet in depth the horizontal setback required to achieve a two-year travel time for microbiological contaminants shall be evaluated. A qualified professional shall conduct this evaluation. However in no case shall the setback be less than 200 feet.

10.6.9.4 Where the effluent dispersal system is within 1,200 feet from a public water systems' surface water intake point, within the catchment of the drainage, and located such that it may impact water quality at the intake point such as upstream of the intake point for flowing water bodies, the dispersal system shall be no less than 400 feet from the high water mark of the reservoir, lake or flowing water body.

10.6.9.5 Where the effluent dispersal system is located more than 1,200 feet but less than 2,500 feet from a public water systems' surface water intake point, within the catchment of the drainage, and located such that it may impact water quality at the intake point such as upstream of the intake point for flowing water bodies, the dispersal system shall be no less than 200 feet from the high water mark of the reservoir, lake or flowing water body.

10.6.9.6 For replacement OWTS that do not meet the above horizontal separation requirements, the replacement OWTS shall meet the horizontal separation to the greatest extent practicable. In such case, the replacement OWTS shall utilize supplemental treatment and other mitigation measures.

10.6.9.7 For new OWTS, installed on parcels of record existing at the time of the effective date of this Policy, that cannot meet the above horizontal separation requirements, the OWTS shall meet the horizontal separation to the greatest extent practicable and shall

Tier 3 – Impaired Areas

utilize supplemental treatment for pathogens as specified in section 10.10 and any other mitigation measures as prescribed by the permitting authority.

10.7 The requirements contained in Section 10 shall not apply to owners of OWTS that are constructed and operating, or permitted, on or prior to the date that the nearby water body is added to Attachment 2 who commit by way of a legally binding document to connect to a centralized wastewater collection and treatment system regulated through WDRs as specified within the following timeframes:

10.7.1 The owner must sign the document within forty-eight months of the date that the nearby water body is initially listed on Attachment 2.

10.7.2 The specified date for the connection to the centralized community wastewater collection and treatment system shall not extend beyond nine years following the date that the nearby water body is added to Attachment 2.

10.8 In the absence of an adopted TMDL implementation plan or Local Agency Management Program containing special provisions for the water body, all new or replacement OWTS permitted after the date that the water body is initially listed in Attachment 2 that have any discharge within the geographic area of an Advanced Protection Management Program shall meet the following requirements:

10.8.1 Utilize supplemental treatment and meet performance requirements in 10.9 if impaired for nitrogen and 10.10 if impaired for pathogens,

10.8.2 Comply with the setback requirements of Section 7.5.1 to 7.5.5, and

10.8.3 Comply with any applicable Local Agency Management Program requirements.

10.9 Supplemental treatment requirements for nitrogen

10.9.1 Effluent from the supplemental treatment components designed to reduce nitrogen shall be certified by NSF, or other approved third party tester, to meet a 50 percent reduction in total nitrogen when comparing the 30-day average influent to the 30-day average effluent.

10.9.2 Where a drip-line dispersal system is used to enhance vegetative nitrogen uptake, the dispersal system shall have at least six (6) inches of soil cover.

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Tier 3 – Impaired Areas

10.10 Supplemental treatment requirements for pathogens

10.10.1 Supplemental treatment components designed to perform disinfection shall provide sufficient pretreatment of the wastewater so that effluent from the supplemental treatment components does not exceed a 30-day average TSS of 30 mg/L and shall further achieve an effluent fecal coliform bacteria concentration less than or equal to 200 Most Probable Number (MPN) per 100 milliliters.

10.10.2 The minimum soil depth and the minimum depth to the anticipated highest level of groundwater below the bottom of the dispersal system shall not be less than three (3) feet. All dispersal systems shall have at least twelve (12) inches of soil cover.

10.11 OWTS in an Advanced Protection Management Program with supplemental treatment shall be designed to meet the applicable performance requirements above and shall be stamped or approved by a Qualified Professional.

10.12 Prior to the installation of any proprietary treatment OWTS in an Advanced Protection Management Program, all such treatment components shall be tested by an independent third party testing laboratory.

10.13 The ongoing monitoring of OWTS in an Advanced Protection Management Program with supplemental treatment components designed to meet the performance requirements in Sections 10.9 and 10.10 shall be monitored in accordance with the operation and maintenance manual for the OWTS or more frequently as required by the local agency or Regional Water Board.

10.14 OWTS in an Advanced Protection Management Program with supplemental treatment components shall be equipped with a visual or audible alarm as well as a telemetric alarm that alerts the owner and service provider in the event of system malfunction. Where telemetry is not possible, the owner or owner's agent shall inspect the system at least monthly while the system is in use as directed and instructed by a service provider and notify the service provider not less than quarterly of the observed operating parameters of the OWTS.

10.15 OWTS in an Advanced Protection Management Program designed to meet the disinfection requirements in Section 10.10 shall be inspected for proper operation quarterly while the system is in use by a service provider unless a telemetric monitoring system is capable of continuously assessing the operation of the disinfection system. Testing of the wastewater flowing from supplemental treatment components that perform disinfection shall be sampled at a point in the system after the treatment components and prior to the dispersal system and shall be conducted quarterly based on analysis of total coliform with a minimum detection limit of 2.2 MPN. All effluent samples must include the geographic coordinates of the sample's location. Effluent samples shall be taken by a service provider and analyzed by a California Department of Public Health certified laboratory.

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Tier 3 – Impaired Areas

10.16 The minimum responsibilities of a local agency administering an Advanced Protection Management Program include those prescribed for the Local Agency Management Programs in Section 9.3 of this policy, as well as monitoring owner compliance with Sections 10.13, 10.14,and 10.15.

Tier 4 – OWTS Requiring Corrective Action

Tier 4 – OWTS Requiring Corrective Action

OWTS that require corrective action or are either presently failing or fail at any time while this Policy is in effect are automatically included in Tier 4 and must follow the requirements as specified. OWTS included in Tier 4 must continue to meet applicable requirements of Tier 0, 1, 2 or 3 pending completion of corrective action.

11.0 Corrective Action for OWTS

11.1 Any OWTS that has pooling effluent, discharges wastewater to the surface, or has wastewater backed up into plumbing fixtures, because its dispersal system is no longer adequately percolating the wastewater is deemed to be failing, no longer meeting its primary purpose to protect public health, and requires major repair, and as such the dispersal system must be replaced, repaired, or modified so as to return to proper function and comply with Tier 1, 2, or 3 as appropriate.

11.2 Any OWTS septic tank failure, such as a baffle failure or tank structural integrity failure such that either wastewater is exfiltrating or groundwater is infiltrating is deemed to be failing, no longer meeting its primary purpose to protect public health, and requires major repair, and as such shall require the septic tank to be brought into compliance with the requirements of Section 8 in Tier 1 or a Local Agency Management Program per Tier 2.

11.3 Any OWTS that has a failure of one of its components other than those covered by 11.1 and 11.2 above, such as a distribution box or broken piping connection, shall have that component repaired so as to return the OWTS to a proper functioning condition and return to Tier 0, 1, 2, or 3.

11.4 Any OWTS that has affected, or will affect, groundwater or surface water to a degree that makes it unfit for drinking or other uses, or is causing a human health or other public nuisance condition shall be modified or upgraded so as to abate its impact.

11.5 If the owner of the OWTS is not able to comply with corrective action requirements of this section, the Regional Water Board may authorize repairs that are in substantial conformance, to the greatest extent practicable, with Tiers 1 or 3, or may require the owner of the OWTS to submit a report of waste discharge for evaluation on a case-by-case basis. Regional Water Board response to such reports of waste discharge may include, but is not limited to, enrollment in general waste discharge requirements, issuance of individual waste discharge requirements, or issuance of waiver of waste discharge requirements. A local agency may authorize repairs that are in substantial conformance, to the greatest extent practicable, with Tier 2 in accordance with section 9.2.3 if there is an approved Local Agency Management Program, or with an existing program if a Local Agency Management Program has not been approved and it is less than 5 years from the effective date of the Policy.

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Tier 4 – OWTS Requiring Corrective Action

11.6 Owners of OWTS will address any corrective action requirement of Tier 4 as soon as is reasonably possible, and must comply with the time schedule of any corrective action notice received from a local agency or Regional Water Board, to retain coverage under this Policy.

11.7 Failure to meet the requirements of Tier 4 constitute a failure to meet the conditions of the waiver of waste discharge requirements contained in this Policy, and is subject to further enforcement action.

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Waiver – Effective Date – Financial Assistance

Conditional Waiver of Waste Discharge Requirements

12.0 In accordance with Water Code section 13269, the State Water Board hereby waives the requirements to submit a report of waste discharge, obtain waste discharge requirements, and pay fees for discharges from OWTS covered by this Policy. Owners of OWTS covered by this Policy shall comply with the following conditions:

12.0.1 The OWTS shall function as designed with no surfacing effluent.

12.0.2 The OWTS shall not utilize a dispersal system that is in soil saturated with groundwater.

12.0.3 The OWTS shall not be operated while inundated by a storm or flood event.

12.0.4 The OWTS shall not cause or contribute to a condition of nuisance or pollution.

12.0.5 The OWTS shall comply with all applicable local agency codes, ordinances, and requirements.

12.0.6 The OWTS shall comply with and meet any applicable TMDL implementation requirements, special provisions for impaired water bodies, or supplemental treatment requirements imposed by Tier 3.

12.0.7 The OWTS shall comply with any corrective action requirements of Tier 4.

12.1 This waiver may be revoked by the State Water Board or the applicable Regional Water Board for any discharge from an OWTS, or from a category of OWTS.

Effective Date

13.0 This Policy becomes effective six months after its approval by the Office of Administrative Law, and all deadlines and compliance dates stated herein start at such time.

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Waiver – Effective Date – Financial Assistance

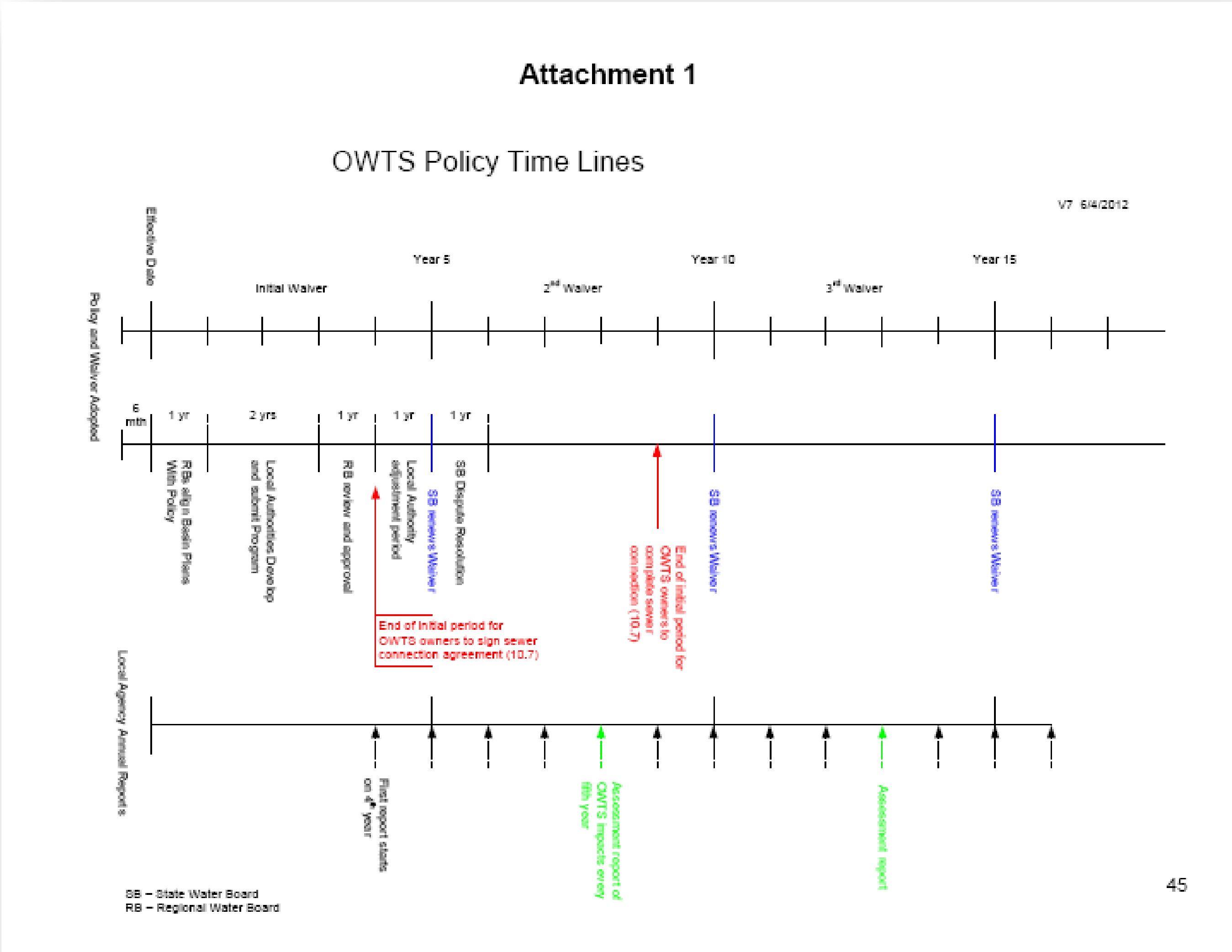
Financial Assistance

14.0 Local Agencies may apply to the State Water Board for funds from the Clean Water State Revolving Fund for use in mini-loan programs that provide low interest loan assistance to private property owners with costs associated with complying with this Policy.

14.1 Loan interest rates for loans to local agencies will be set by the State Water Board using its policies, procedures, and strategies for implementing the Clean Water State Revolving Fund program, but will typically be one-half of the States most recent General Obligation bond sale. Historically interest rates have ranged between 2.0 and 3.0 percent.

14.2 Local agencies may add additional interest points to their loans made to private entities to cover their costs of administering the mini-loan program.

14.3 Local agencies may submit their suggested loan eligibility criteria for the min-loan program they wish to establish to the State Water Board for approval, but should consider the legislative intent stated in Water Code Section 13291.5 is that assistance is encouraged for private property owners whose cost of complying with the requirements of this policy exceeds one-half of one percent of the current assessed value of the property on which the OWTS is located.


Attachment 1
OWTS Policy Time Lines
V7 6/4/2012
Effective Date
Policy and Waiver Adopted
Initial Waiver
Year 5
2nd Waiver
Year 10
3rd Waiver
Year 15
6 mth
1 yr
2 yrs
1 yr
1 yr
1 yr
RBs align Basin Plans With Policy
Local Authorities Develop and submit Program
RB review and approval
Local Authority adjustment period
SB reviews Waiver
SB Dispute Resolution
End of initial period for OWTS owners to sign sewer connection agreement (10.7)
End of initial period for OWTS owners to complete sewer connection (10.7)
SB reviews Waiver
SB reviews Waiver
Local Agency Annual Reports
First report starts on 4th year
Assessment report of OWTS impacts every fifth year
Assessment report
SB – State Water Board
RB – Regional Water Board
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Attachment 2

The tables below specifically identify those impaired water bodies where: (1) it is likely that operating OWTS will subsequently be determined to be a contributing source of pathogens or nitrogen and therefore it is anticipated that OWTS would receive a loading reduction, and (2) it is likely that new OWTS installations discharging within 600 feet of the water body would contribute to the impairment. Per this Policy (Tier 3, Section 10) the Regional Water Boards must adopt a TMDL by the date specified in the table. The State Water Board, at the time of approving future 303 (d) Lists, will specifically identify those impaired water bodies that are to be added or removed from the tables below.

Table 5. Water Bodies impaired for pathogens that are subject to Tier 3 as of 2012.

REGION NO.	REGION NAME	WATERBODY NAME	COUNTIES	TMDL Completion Date
1	North Coast	Clam Beach	Humboldt	2020
1	North Coast	Luffenholtz Beach	Humboldt	2020
1	North Coast	Moonstone County Park	Humboldt	2020
1	North Coast	Russian River HU, Lower Russian River HA, Guerneville HSA, mainstem Russian River from Fife Creek to Dutch Bill Creek	Sonoma	2016
1	North Coast	Russian River HU, Lower Russian River HA, Guerneville HSA, Green Valley Creek watershed	Sonoma	2016
1	North Coast	Russian River HU, Middle Russian River HA, Geyserville HSA, mainstem Russian River at Healdsburg Memorial Beach and unnamed tributary at Fitch Mountain	Sonoma	2016
1	North Coast	Russian River HU, Middle Russian River HA, mainstem Laguna de Santa Rosa	Sonoma	2016
1	North Coast	Russian River HU, Middle Russian River HA, mainstem Santa Rosa Creek	Sonoma	2016
1	North Coast	Trinidad State Beach	Humboldt	2020
2	San Francisco Bay	China Camp Beach	Marin	2014
2	San Francisco Bay	Lawsons Landing	Marin	2015
2	San Francisco Bay	Pacific Ocean at Bolinas Beach	Marin	2014

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REGION NO	REGION NAME	WATERBODY NAME	COUNTIES	TMDL Completion Date
2	San Francisco Bay	Pacific Ocean at Fitzgerald Marine Reserve	San Mateo	2016
2	San Francisco Bay	Pacific Ocean at Muir Beach	Marin	2015
2	San Francisco Bay	Pacific Ocean at Pillar Point Beach	San Mateo	2016
2	San Francisco Bay	Petaluma River	Marin, Sonoma	2017
2	San Francisco Bay	Petaluma River (tidal portion)	Marin, Sonoma	2017
2	San Francisco Bay	San Gregorio Creek	San Mateo	2019
3	Central Coast	Pacific Ocean at Point Rincon (mouth of Rincon Cr, Santa Barbara County)	Santa Barbara	2015
3	Central Coast	Rincon Creek	Santa Barbara, Ventura	2015
4	Los Angeles	Canada Larga (Ventura River Watershed)	Ventura	2017
4	Los Angeles	Coyote Creek	Los Angeles, Orange	2015
4	Los Angeles	Rincon Beach	Ventura	2017
4	Los Angeles	San Antonio Creek (Tributary to Ventura River Reach 4)	Ventura	2017
4	Los Angeles	San Gabriel River Reach 1 (Estuary to Firestone)	Los Angeles	2015
4	Los Angeles	San Gabriel River Reach 2 (Firestone to Whittier Narrows Dam	Los Angeles	2015
4	Los Angeles	San Gabriel River Reach 3 (Whittier Narrows to Ramona)	Los Angeles	2015
4	Los Angeles	San Jose Creek Reach 1 (SG Confluence to Temple St.)	Los Angeles	2015
4	Los Angeles	San Jose Creek Reach 2 (Temple to I-10 at White Ave.)	Los Angeles	2015
4	Los Angeles	Sawpit Creek	Los Angeles	2015
4	Los Angeles	Ventura River Reach 3 (Weldon Canyon to Confl. w/ Coyote Cr)	Ventura	2017
4	Los Angeles	Walnut Creek Wash (Drains from Puddingstone Res)	Los Angeles	2015
5	Central Valley	Wolf Creek (Nevada County)	Nevada, Placer	2020
5	Central Valley	Woods Creek (Tuolumne County)	Tuolumne	2020
7	Colorado River	Alamo River	Imperial	2017

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Attachment 2

REGION NO	REGION NAME	WATERBODY NAME	COUNTIES	TMDL Completion Date
7	Colorado River	Palo Verde Outfall Drain and Lagoon	Imperial, Riverside	2017
8	Santa Ana	Canyon Lake (Railroad Canyon Reservoir)	Riverside	2019
8	Santa Ana	Fulmor, Lake	Riverside	2019
8	Santa Ana	Goldenstar Creek	Riverside	2019
8	Santa Ana	Los Trancos Creek (Crystal Cove Creek)	Orange	2017
8	Santa Ana	Lytle Creek	San Bernardino	2019
8	Santa Ana	Mill Creek Reach 1	San Bernardino	2015
8	Santa Ana	Mill Creek Reach 2	San Bernardino	2015
8	Santa Ana	Morning Canyon Creek	Orange	2017
8	Santa Ana	Mountain Home Creek	San Bernardino	2019
8	Santa Ana	Mountain Home Creek, East Fork	San Bernardino	2019
8	Santa Ana	Silverado Creek	Orange	2017
8	Santa Ana	Peters Canyon Channel	Orange	2017
8	Santa Ana	Santa Ana River, Reach 2	Orange, Riverside	2019
8	Santa Ana	Temescal Creek, Reach 6 (Elsinore Groundwater sub basin boundary to Lake Elsinore Outlet)	Riverside	2019
8	Santa Ana	Seal Beach	Orange	2017
8	Santa Ana	Serrano Creek	Orange	2017
8	Santa Ana	Huntington Harbour	Orange	2017

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Attachment 2

Table 6. Water Bodies impaired for nitrogen that are subject to Tier 3.

REGION NO.	REGION NAME	WATERBODY NAME	COUNTIES	TMDL Completion Date
1	North Coast	Russian River HU, Middle Russian River HA, mainstem Laguna de Santa Rosa	Sonoma	2015
2	San Francisco Bay	Lagunitas Creek	Marin	2016
2	San Francisco Bay	Napa River	Napa, Solano	2014
2	San Francisco Bay	Petaluma River	Marin, Sonoma	2017
2	San Francisco Bay	Petaluma River (tidal portion)	Marin, Sonoma	2017
2	San Francisco Bay	Sonoma Creek	Sonoma	2014
2	San Francisco Bay	Tomales Bay	Marin	2019
2	San Francisco Bay	Walker Creek	Marin	2016
4	Los Angeles	Malibu Creek	Los Angeles	2016
4	Los Angeles	San Antonio Creek (Tributary to Ventura River Reach 4)	Ventura	2013
8	Santa Ana	East Garden Grove Wintersburg Channel	Orange	2017
8	Santa Ana	Grout Creek	San Bernardino	2015
8	Santa Ana	Rathbone (Rathbun) Creek	San Bernardino	2015
8	Santa Ana	Summit Creek	San Bernardino	2015
8	Santa Ana	Serrano Creek	Orange	2017

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Attachment 3

Regional Water Boards, upon mutual agreement, may designate one Regional Water Board to regulate a person or entity that is under the jurisdiction of both (Water Code Section 13228). The following table identifies the designated Regional Water Board for all counties within the State for purposes of reviewing and, if appropriate, approving new Local Agency Management Plans.

Table 7. Regional Water Board designations by County.

County	Regions with Jurisdiction	Designated Region
Alameda	2,5	2
Alpine	5,6	6
Amador	5	5
Butte	5	5
Calaveras	5	5
Colusa	5	5
Contra Costa	2,5	2
Del Norte	1	1
El Dorado	5,6	5
Fresno	5	5
Glenn	5,1	5
Humboldt	1	1
Imperial	7	7
Inyo	6	6
Kern	3,4,5,6	5
Kings	5	5
Lake	5,1	5
Lassen	5,6	6
Los Angeles	4,6	4
Madera	5	5
Marin	2,1	2
Mariposa	5	5
Mendocino	1	1
Merced	5	5
Modoc	1,5,6	5
Mono	6	6
Monterey	3	3
Napa	2,5	2
Nevada	5,6	5
Orange	8,9	8

County	Regions with Jurisdiction	Designated Region
Placer	5,6	5
Plumas	5	5
Riverside	7,8,9	7
Sacramento	5	5
San Benito	3,5	3
San Bernardino	6,7,8	6
San Diego	9,7	9
San Francisco	2	2
San Joaquin	5	5
San Luis Obispo	3,5	3
San Mateo	2,3	2
Santa Barbara	3	3
Santa Clara	2,3	2
Santa Cruz	3	3
Shasta	5	5
Sierra	5,6	5
Siskiyou	1,5	1
Solano	2,5	5
Sonoma	1,2	1
Stanislaus	5	5
Sutter	5	5
Tehama	5	5
Trinity	1	1
Tulare	5	5
Tuolumne	5	5
Ventura	4,3	4
Yolo	5	5
Yuba	5	5

50

APPENDIX 3
Onsite Wastewater Management Plan Guidance

~ GUIDANCE ~

CENTRAL COAST WATER BOARD
CHECKLIST FOR DEVELOPING & REVIEWING
ONSITE WASTEWATER MANAGEMENT PLANS

GOAL: Implementation of onsite management plan will protect and enhance ground and surface water. Each local agency is likely to have unique site limitations and potential water quality issues associated with onsite systems, and management measures to address those issues. Accordingly, the onsite management plan should be flexible and agency-specific. The plan must address each component required in the Basin Plan, however the means and degree to which each component is addressed is flexible. Following is based upon the order in which requirements appear in the Basin Plan, minus duplicative requirements (Chapter 4, Section VIII.D.)

Note: Many components of an effective onsite wastewater management plan may already be implemented by the local permitting jurisdiction or other resource agencies. To prevent duplicative efforts and maximize efficiency, such existing practices should be utilized to the maximum extent practical and summarized in the plan. For example, water quality monitoring data may be available from local health departments, water purveyors, Central Coast Water Board programs, etc. Such data can be used to support management plan activities providing the data is technically sound and adequately summarized in the plan. Adequate documentation should also be included to address any components omitted from a plan, such as those actions performed by other agencies or not applicable due to specified local conditions. The following guidance is based upon requirements adopted by the Central Coast Water Board on May 9, 2008, and not yet approved by the State Water Board.

1. Survey and evaluation of existing onsite systems.
   a. Identify areas served by existing onsite systems throughout jurisdiction. (Section should establish a baseline, include maps or GIS layers, identify areas suitable for conventional systems, summarize basis for suitability, etc.)
   b. Identify problematic areas (site limitations, failure rates, water quality impacts).
   c. Management measures 2, 3, 7 & 8 are implemented in problematic areas.

2. Water quality (ground and surface water) monitoring program.
   a. Ground and/or surface water monitoring in areas likely to detect and prevent degradation. (Include existing data sources and observations where available, document data sources, and document the basis for determining areas likely to be degraded.)
   b. Monitoring locations/depth are representative and can characterize early effects.
   c. Monitoring results support implementation measures and protection of water quality and beneficial uses.

3. Projections of onsite disposal system demand and determination of methods to best meet demand.
   a. Documentation/details that demand will be met without degrading water quality. (Section will reflect each agency's existing and planned policies, include feedback loops to ensure policies are working, and periodic reevaluation.)

   b. If sewering is proposed, a realistic schedule is provided. (Include legal authority to prohibit onsite systems within specified proximity of sewer or other tools, summarize measures to prevent water quality impacts until sewer is provided.)

4. Recommendations and requirements for existing onsite wastewater system inspection, monitoring, maintenance and repairs. (Consider different levels for conventional vs. alternative systems.)
   a. Recommendations & requirements are consistent with Basin Plan.
   b. Recommendations & requirements are implemented in an effective manner. (Include feedback loop to ensure effectiveness of policies described.)
   c. Replacements/repairs comply with Basin Plan recommendations, requirements and prohibitions. (Management proposed if repairs can not meet Basin Plan standards, deed restrictions, etc.)
   d. Method for informing onsite system owners is described and effective.
   e. Tracking of system failures, pumping, or other means of identifying problems.
   f. Implementation methods are supported by adequate resources. (Identify who implements or will implement actions.)

5. Recommendations and requirements for new onsite wastewater systems.
   a. Recommendations & requirements are consistent with Basin Plan.
   b. Recommendations & requirements are implemented in effective manner. (Include feedback loop to ensure effectiveness of policies described.)
   c. Site suitability tests are performed and support design.
   d. Permitting process ensures proper siting, design, construction & maintenance.
   e. Permitting conditions reflect Basin Plan criteria and protects set-aside areas.
   f. Property owners are notified of proper installation, operation & maintenance. (Describe when and how notification will occur in the local permitting process.)
   g. Alternative systems are prohibited unless consistent with specified criteria. (Includes water quality protection criteria for alternative systems, if allowed.)
   h. Alternative system criteria include means of verifying ongoing compliance (performance monitoring and reporting).
   i. Alternative system owners are provided maintenance or replacement document by the system designer or installer, citing homeowner procedures to ensure maintenance, repair, or replacement of critical items within 48 hours.
   j. Provisions to ensure long-term performance of alternative systems (service contract, deed restrictions, disclosures, etc.)
   g. Implementation methods are supported by adequate resources. (Identify who implements or will implement actions.)

6. Alternative means of disposing of sewage in the event of disposal system failure and/or irreversible degradation from onsite disposal. (Define how local agency characterizes system failure or irreversible degradation and how it will be detected.)
   a. List of alternate disposal options. (Availability of capacity at each optional disposal facility should be documented.)
   b. Estimated cost of wastewater disposal alternatives.

7. Education and outreach program.
   a. Sample information is fact-based, accurate, user-friendly, and lasting.
   b. Provisions for public inquiry and assistance.

8. Enforcement options. (Including maintenance of alternative systems and commitment to follow through).
   a. Local ordinance reflects Basin Plan criteria.
   b. Local enforcement tools are available and commitment is clearly stated. (Describe escalation of enforcement and who will implement each action.)

9. Septage management.
   a. Septage volume estimated.
   b. Long-term disposal capacity (authorization if site not owned by same agency).
   c. Septage disposal plans & schedule, if site not currently available.
   d. Discussion of private hauling company coordination with local agencies.

10. Program administration, staffing, records keeping, installation and repairs tracking, and financing (are adequate resources provided to support all activities).
    a. Clear delegation of tasks, who does what.
    b. Staff/contract inspectors use detailed checklist to verify construction compliance.
    c. Periodic summary reports, contents of report, and feedback loop.
    d. Local ordinance reflects Basin Plan criteria and supports management plan implementation.

APPENDIX 4
Santa Barbara County Septic Tank Inspection Report

County of Santa Barbara
Septic Tank Inspection Report

(Please Print or Type)

Department Date Stamp

Date of Service/Maintenance: ____________________

Owner's name : ____ Phone No.: ______________________

Location of inspection: ____
(ADDRESS) (CITY) (ZIP)

No. of Bedrooms: _________ Year Septic System Built: _________________

Septage disposal location / date: ____

System Components:

☐ Septic tank with leach field or drywell ☐ Septic Tank With Seepage Pit (Hollow) ☐ Cesspool ☐ Other

Estimated capacity of septic tank or cesspool: _______ gal. No. of compartments: _____ Amount pumped: _______ gal.

No. of Access Lids: _________ Depth to Access Lids: _________ Diameter of Access Lids: __________

Construction of septic tank or cesspool:

☐ Rectangular ☐ Round ☐ Other

☐ Concrete ☐ Fiberglass ☐ Plastic ☐ Brick ☐ Other ____________________

Condition of tank:	No	Yes		No	Yes
Tank deteriorated	☐	☐	Inlet tee present	☐	☐
Baffle wall deteriorated	☐	☐	Outlet tee present	☐	☐
Lids are deteriorated	☐	☐	House lateral open	☐	☐
Heavy grease build-up	☐	☐	Needs pumping	☐	☐

Minimum concrete thickness of tank top, measured at lids: _____________ Method of Measurement: ______________

Prior to pumping, was effluent level above outflow tee? ☐ No ☐ Yes (may indicate failing system)

Signs of surfacing effluent? ☐ No ☐ Yes, location: ____

Any signs of past drainage problems? ☐ No ☐ Yes

Maintenance Performed: ______________________________________

System appears to be functioning satisfactorily? No ☐ Yes ☐

Repairs / upgrade required? (see reverse side) No ☐ Yes ☐

1. ______________________________________
2. ______________________________________
3. ______________________________________

Comments / Recommendations: ______________________________________

Did a Qualified Inspector personally inspect system? No ☐ Yes ☐

(Complete or Stamp)

Company: ______________________________________

Registration/Contractor's License No.: ______________________

Site Map

The useful life of any septic system is determined by numerous factors including, but not limited to, soil characteristics, water usage and proper maintenance. This inspection report is based on observations by the inspector and information provided by the system owner. It is not a guarantee of system adequacy.

Signature of Qualified Inspector: ________________________ Date: __________ Phone: ______________

EHS 42-12 (Rev. 7/04)

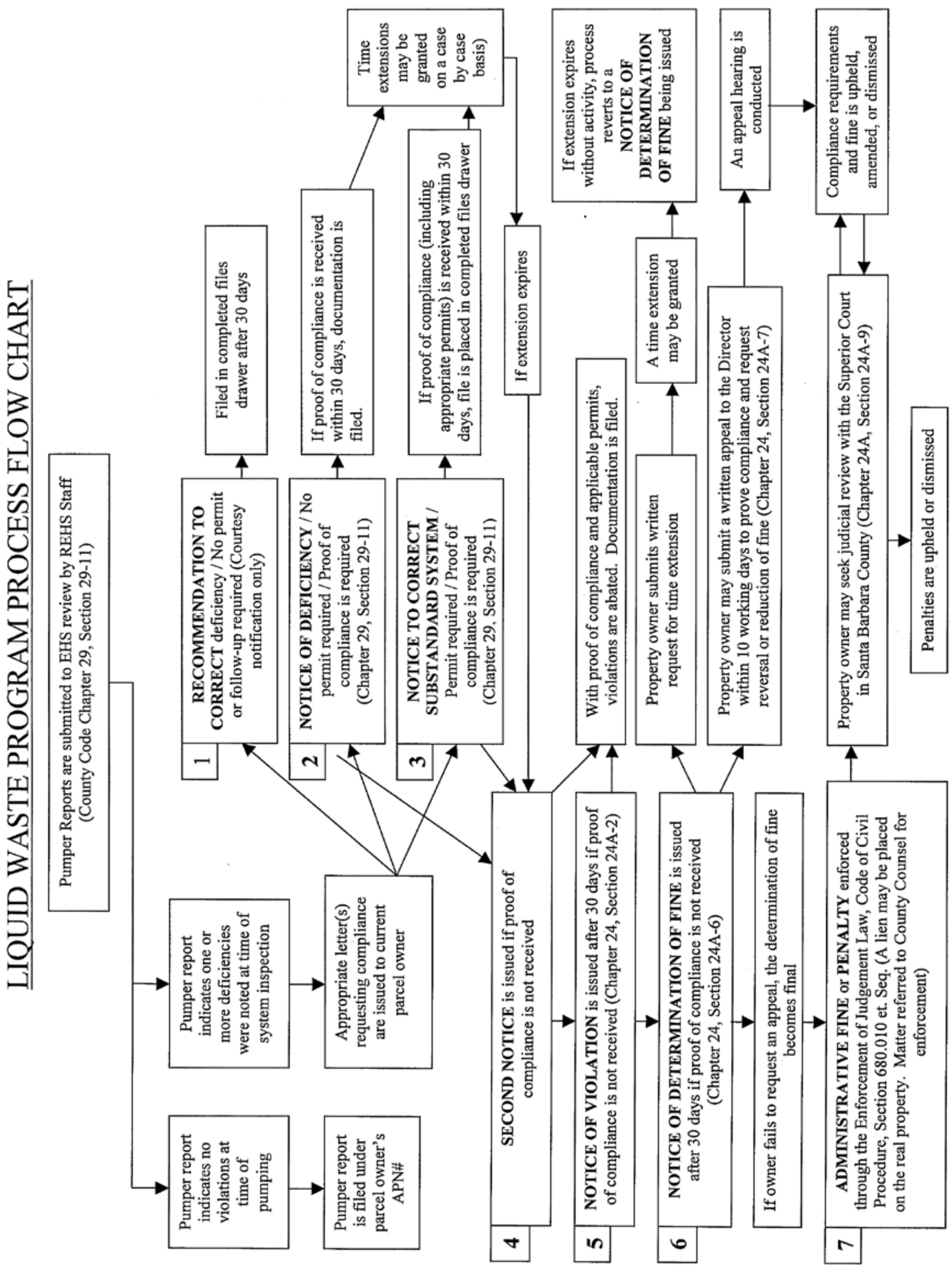
County of Santa Barbara
Septic Tank Inspection Report

SEPTIC TANK DEFICIENCIES REQUIRING FOLLOW-UP

Reference #	Deficiency	Typical Corrective Action	Permit Required
NOD-1	Inadequate access to both compartments	Install risers &/or lids to meet current code requirements	No
NOD-2	Access ports deeper than 24 inches	Install risers to within one foot of grade	No
NOD-3	Deteriorated access lid(s)	Replace lids	No
NOD-4	Deteriorated top of tank	Replace / repair	No
NOD-5	Deteriorated baffle between compartments	Replace / repair	No
NOD-6	Other		
NTC-1	Severely damaged or deteriorated septic tank	Replace septic tank	**Yes**
NTC-2	Unfilled seepage pit	Fill w/ rock or abandon	**Yes**
NTC-3	Cesspool (permeable sides & bottom)	Abandon & replace with approved septic tank and disposal field	**Yes**
NTC-4	Failed disposal field with discharge to surface	Add new field w/ diverter valve - match or exceed existing field	**Yes**
NTC-5	System constructed without required permit	Obtain permit	**Yes**
NTC-6	Discharge of graywater to ground surface or drainage course	Direct wastewater to approved disposal field	**Yes**
NTC-7	Septic tank constructed of metal or wood	Replace septic tank	**Yes**
NTC-8	Septic tank located under structure	Requires abandonment and replacement with an approved septic tank or removal or relocation of structure	**Yes**
RTC-1	Disposal field not adequately absorbing septic tank effluent	Clear blockage / repair pipe	No
		Replace / repair disposal field	**Yes**
RTC-2	Inadequate tank capacity	Replace with proper size tank	Yes
RTC-3	Missing inlet / outlet tee(s)	Replace missing tee(s)	No
RTC-4	Other		

NOD – Notice of Deficiency   NTC – Notice to Correct   RTC – Recommendation to Correct

APPENDIX 5
Liquid Waste Program Process Flow Chart



APPENDIX 6
Homeowner's Guide

Record of Service

Date	Work Done	Contractor

Remember to always dispose of wastewater from your home into the septic tank. This includes all sink, bath, shower, toilet, washing machine and dishwasher wastewaters. Any of these waters can contain disease-causing microorganisms or environmental pollutants.

For More Information

For more information, please contact your local Santa Barbara County Environmental Health Services office listed below:

Santa Barbara (805) 681-4900
Santa Maria (805) 346-8460

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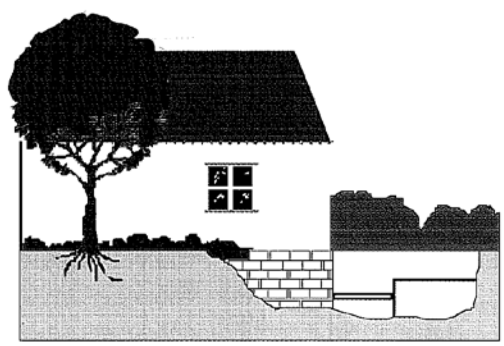
www.sbcphd.org/ehs

A Reference Guide

Your Septic System

for Homeowners



Caring for your Septic System

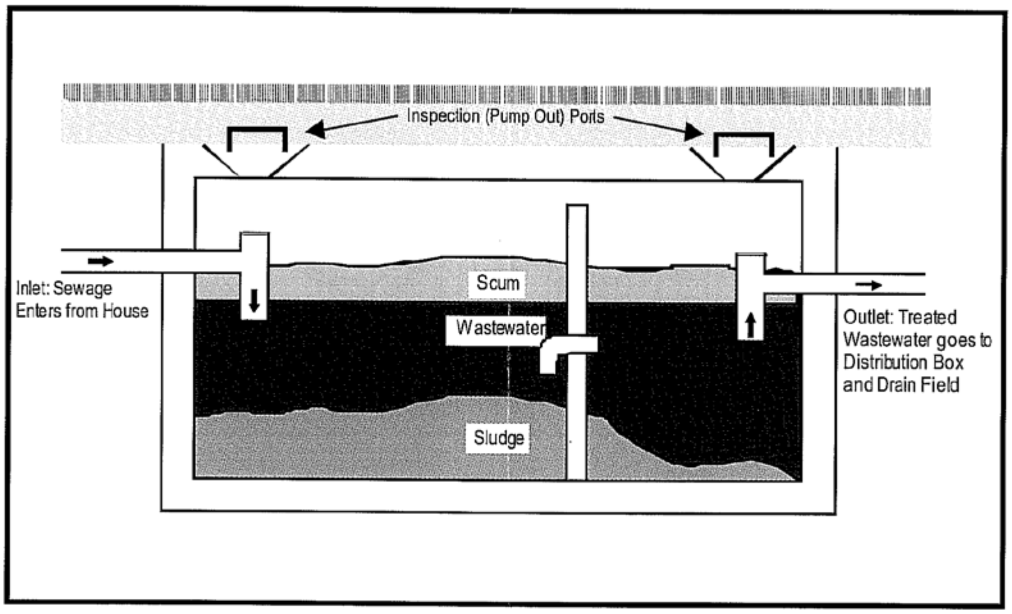
Septic systems must be maintained regularly to work properly. Solids and scum that accumulate in the septic tank should be pumped out every three to five years to protect the leachfield from clogging.

Neglect or abuse of your septic system can cause it to fail. Failing septic systems can:

- Cause a serious health threat to your family and neighbors;
- reduce the value of your property;
- be very expensive to repair;
- degrade the environment, especially lakes, streams, and groundwater; and
- put thousands of water supply users at risk if you live in a public water supply watershed.

Be alert to the warning signs of a failing system:

- sewage surfacing over the drainfield (especially after storms);
- sewage back-ups in the house;
- lush, green growth over the drainfield;
- slow draining toilets or drains;
- sewage odors.



Tips to Avoid Trouble

Do have your tank inspected every 3 to 4 years by a licensed septic tank pumper. If you have a garbage disposal unit, pump the tank at more frequent intervals.

Do keep a record of pumping, inspections, and other maintenance. Use the back page of this brochure to record maintenance dates.

Do practice water conservation. Repair dripping faucets and leaking toilets, run washing machines and dishwashers only when full, avoid long showers, and use water saving features in faucets, showerheads and toilets.

Do learn the location of your septic tank and drainfield. Keep a sketch of it handy for service visits. If your system has a flow diversion valve, learn its location and turn it once a year. Alternating drainfields can add many years to the life of your system.

Do divert roof drains and surface water from driveways and hillsides away from the septic system. Keep sump pumps and house drains away from the septic system as well.

Do use bleach and disinfectants sparingly. Bleach, disinfectants, and drain and toilet bowl cleaners can kill bacteria that are essential to the operation of the septic system system.

Don't allow anyone to drive or park over any part of the system. The area over the drainfield should be left undisturbed with only a mowed grass cover. Roots from nearby trees or shrubs may clog and damage your drain lines. Paving over a drainfield will reduce its efficiency and is prohibited.

Don't make repairs to your septic system without obtaining the required health department permit. Always use professional licensed septic system contractors for maintenance and repairs.

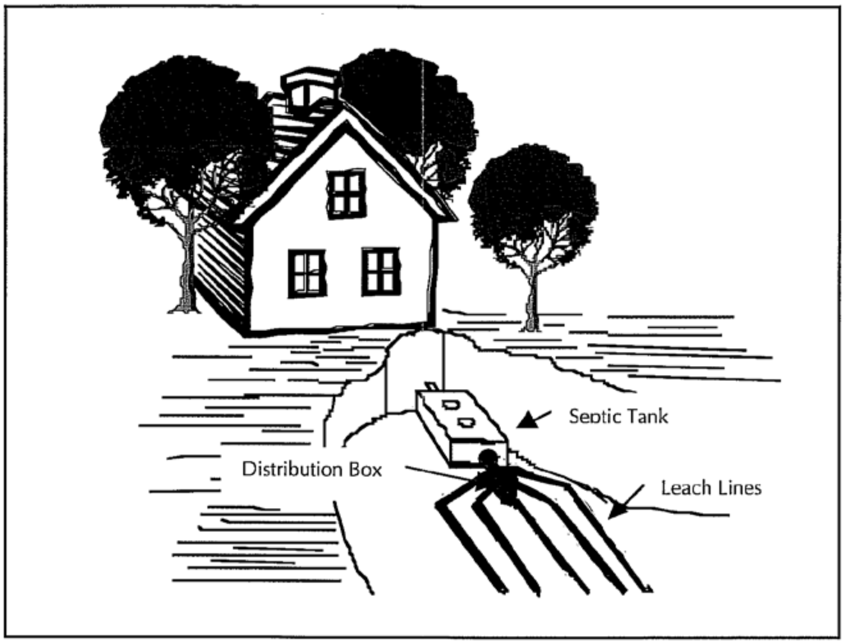
Don't use commercial septic tank additives or caustic drain chemicals. These products may hurt your system in the long run.

Don't use your toilet as a trash can by dumping nondegradables down your toilet or drains. Also, don't poison your septic system and the groundwater by pouring harmful chemicals down the drain. They can kill the beneficial bacteria that treat your wastewater. Keep the following materials out of your septic systems:

How Septic Systems Work

Septic systems are individual wastewater treatment systems that use a buried settling tank and the soil to treat small wastewater flows, usually from individual homes. They are typically used in rural or large lot settings where centralized wastewater treatment is impractical.

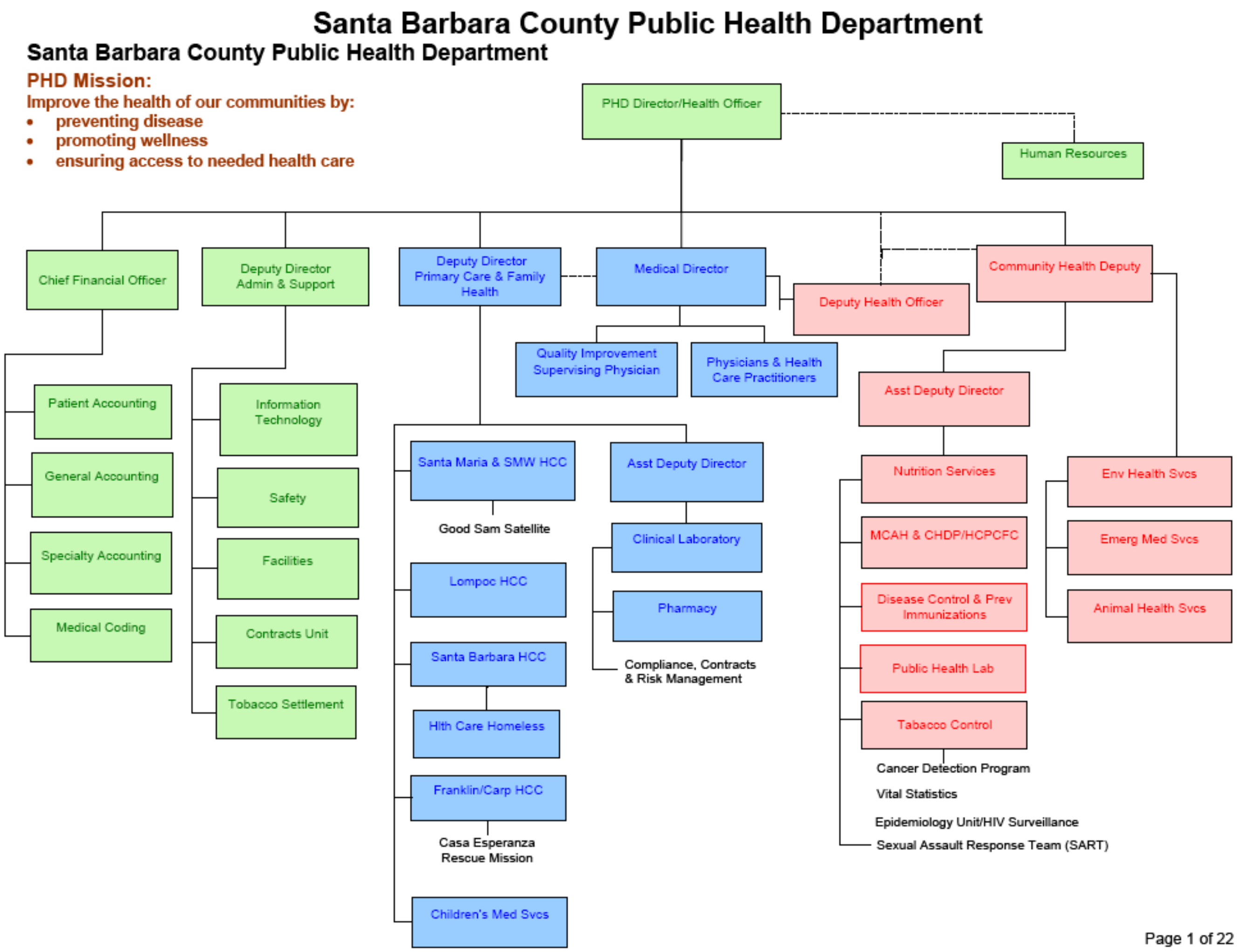
All septic systems are individually designed for each site but are based on the same principles.



A typical septic system consists of a septic tank, a distribution box and a drainfield, all connected by pipes. Your septic system treats your household wastewater by temporarily holding it in the septic tank where heavy solids and lighter scum are allowed to separate from the wastewater. This separation process is known as primary treatment. The solids stored in the tank are partially decomposed by bacteria and later removed, along with the lighter scum by a professional septic tank pumper. Failure to pump out accumulated solids and scum will eventually result in clogging of the drainfield and failure of the system.

When the partially treated wastewater leaves the tank, it typically flows into a distribution box that divides the flow among a network of drainfield trenches. Drainage holes in each line allow the wastewater to be absorbed into the soil. The wastewater then slowly seeps into the subsurface soil where it is further treated and purified (secondary treatment). A properly located and functioning septic system does not pollute the groundwater.

APPENDIX 7
Santa Barbara County Public Health Department
Organization Chart



APPENDIX 8
Lamp Completeness Checklist

GENERAL REQUIREMENTS FOR LAMPS			
OWTS Policy Section	**OWTS Policy Section Summary**	**Relevant LAMP Section**	**Legal Authority/ Code Section**
3.3	Annual Reporting	Sec XI, pg. 54, para 6	NA
3.3.1	Complaints	Sec XI, pg. 54, para 6	NA
3.3.2	OWTS Cleaning	Sec XI, pg. 54, para 6	Ch. 18C, SBCC, Sec 18C-7(B) & (D)
3.3.3	Permits for New and Replacement OWTS	Sec XI, pg. 54, para 6	Ch 18C, SBCC, Sec 18C-4
3.4	Permanent Records	Sec XI, pg. 54, para 3	Ch 18C, SBCC, Sec 18C-4
3.5	Notifications to Municipal Water Suppliers	Not Specifically Addressed	NA
9.0	Minimum OWTS Standards	Sec V & VI	Ch. 18C, SBCC, Sec 18C-3, Sec 18C-5, Sec 18C-6
9.1	Considerations for LAMPs	____________	_______________
9.1.1	Degree of vulnerability due to local hydrogeology	Sec VI, pg. 42 & Sec VII	Ch. 18C, SBCC, 18C-3(A), (D) & H(4), 18C-5, 18C-6(A) & (B)
9.1.2	High quality waters and other environmental conditions requiring enhanced protection	Not specifically addressed but generally covered in V pg. 38 Sec VI pg. 40-46 & VII.	Ch. 18C, SBCC, 18C-3(A)(4), 18C-5(A), 18C-5, 18C-6(A) & (B)
9.1.3	Shallow soils requiring non-standard dispersal systems	Sec VI, pg. 45, Sec VII	Ch. 18C, SBCC, 18C-5(I) – (L)
9.1.4	High domestic well usage areas	Not specifically addressed	Setbacks specified in CPC (2010), Table K-1, the DWR Bulletin 74-81, 90 & Sec 9.3.3 of the OWTS Policy apply.
9.1.5	Fractured bedrock	Sec VI, pg. 40 - 44	Ch 18C, SBCC, Sec 18C-3(A)(4)(c), Sec 18C-5(A) & (B)
9.1.6	Poorly drained soils	Sec VI, pg. 41-44	Ch. 18C, SBCC, Sec 18C-5(G)(2), Sec 18C-5(I) – (L), Table 3, OWTS Policy
9.1.7	Vulnerable surface water	Sec I, pg.1, para 6, Sec VII, pg. 47	Ch. 18C, SBCC, Sec 7.0 OWTS Policy
9.1.8	Impaired water bodies	Sec V, pg. 38, Sec VII, pg. 47	Sec 10.0 OWTS Policy (Tier 3) or development of Advanced Mgmt Prot Plan
9.1.9	High OWTS density areas	Sec VI, pg. 40,para 5, Sec VI, pg.45-46	Ch. 18C, SBCC, Sec 18C-3(A)(4), Sec 18C-5(K) – (L)

GENERAL REQUIREMENTS FOR LAMPS			
OWTS Policy Section	**OWTS Policy Section Summary**	**Relevant LAMP Section**	**Legal Authority/ Code Section**
9.1.10	Limits to parcel size	Sec VI, pg. 39, Sec VI, pg.40, para 5, Sec VI, pg. 41, para 4	NA
9.1.11	areas with OWTS that predate adopted standards	Sec V, pg. 37,para 2, Sec VII, pg. 47	Ch. 18C, SBCC, Sec 18C-3(A)(4), 18C-5(K), 18C-6(A) & (B)
9.1.12	areas with OWTS either within prescriptive, Tier 1 setbacks, or within setbacks that a Local Agency finds appropriate	Sec VII, pg.47	Ch. 18C, SBCC, Sec 18C-3(A)(4)(d), 18C-5(K), 18C-6(A)
9.2	Scope of Coverage:	Sec I, pg.2, para 6-7, Sec VI, pg. 40, para 6	Ch. 18C, SBCC, Sec 18C-5
9.2.1	Installation and Inspection Permits	Sec V, pg. 36, para 2-4, Sec VI, pg. 45 para 7, Sec IX, pg. 50-51	Ch. 18C, SBCC, Sec 18C-4
9.2.2	Special Provision Areas and Requirements near Impaired Water Bodies	Sec V, pg. 38, Sec VI, pg. 40, Sec VII, pg. 47	Sec 18C, SBCC, Sec 18C-5(K) – (L) or, Development of Adv Protection Mgmt Plan
9.2.3	LAMP Variance Procedures	Sec V, pg.37,para 2, Sec VII, pg. 47 para 3	, Ch.18C, SBCC, Sec 18C-6(A)(6), Sec 18C-11(C)
9.2.4	Qualifications for Persons who Work on OWTS	Sec V, pg. 36, Sec VI, pg. 41	Ch. 18C, SBCC, Sec 18C-3(H), 18C-7(A)
9.2.5	Education and Outreach for OWTS Owners	Sec VIII	NA
9.2.6	Septage Disposal	Sec X	Ch. 18C, SBCC, Sec 18C-7(A)(2)(a), Sec 18C-7(D)
9.2.7	Maintenance Districts and Zones	Not Addressed	NA
9.2.8	Regional Salt and Nutrient Management Plans	Not Addressed	NA
9.2.9	Watershed Management Groups	Not Addressed	NA
9.2.10	Proximity of Collection Systems to New or Replacement OWTS	Sec VI, pg.39, para 3	CPC (2010),, Ch 7, Part II, Sec 713.4
9.2.11	Public Water System Notification prior to permitting OWTS Installation or Repairs	Not specifically addressed	NA
9.2.12	Policies for Dispersal Areas within Setbacks of Public Wells and Surface Water Intakes	Sec V, pg. 37, para 2, Sec VI, pg. 40, para 5, Sec VII, pg.47, para 2	Ch. 18C, SBCC, Sec 18C-3(A)(4)(d)
9.2.13	Cesspool Discontinuance and Phase-Out	Sec V, pg. 37, para 3,8	Ch. 18C, SBCC, Sec 18C-3(D)(2), 18C-6(B)(2)
9.3	Minimum Local Agency Management Responsibilities:	________	

GENERAL REQUIREMENTS FOR LAMPS			
OWTS Policy Section	**OWTS Policy Section Summary**	**Relevant LAMP Section**	**Legal Authority/ Code Section**
9.3.1	Permit Records, OWTS with Variances	Sec XI, pg.54 para 2-3	Ch. 18C, SBCC, Sec 18C-4, Sec 18C-11(C)
9.3.2	Water Quality Assessment Program:	Sec III	NA
9.3.2.1	Domestic Well Sampling	May be included in future revisions. Sec III, pg. 23, para 6	NA
9.3.2.2	Domestic Well Sampling, Routine Real Estate Transfer Related	May be included in future revisions Sec III, pg. 23, para 6	NA
9.3.2.3	Water Quality of Public Water Systems	Sec III, pg. 28-29	NA
9.3.2.4	Domestic Well Sampling, New Well Development	May be included in future revisions. Sec III, pg. 23, para 6	NA
9.3.2.5	Beach Water Quality Sampling, H&S Code §115885	May be included in future revisions. Sec III, pg. 23, para 6	NA
9.3.2.6	Receiving Water Sampling Related to NPDES Permits	May be included in future revisions. Sec III, pg. 23, para 6	NA
9.3.2.7	Data contained in California Water Quality Assessment Database	May be included in future revisions. Sec III, pg. 23, para 6	NA
9.3.2.8	Groundwater Sampling Related to Waste Discharge Requirements	May be included in future revisions. Sec III, pg. 23, para 6	NA
9.3.2.9	Groundwater Sampling Related to GAMA Program	May be included in future revisions. Sec III, pg. 23, para 6	NA
9.3.3	Annual Status Reports Covering 9.3.1-9.3.2	Sec XI, pg. 54, para 6	NA
9.4	Not Allowed or Authorized in LAMP:	______	_______
9.4.1	Cesspools	Sec V, pg. 37, para 3 & 8	Ch. 18C, SBCC, Sec 18C-3(D)(2), 18C-6(B(2))
9.4.2	Projected Flow>10,000 gpd	Sec I, pg.2,para 6, Sec VI, pg.40, para 6	NA
9.4.3	Effluent Discharger Above Post-Installation Ground Surface	Sec I, pg. 2, para 6	NA

GENERAL REQUIREMENTS FOR LAMPS			
OWTS Policy Section	OWTS Policy Section Summary	Relevant LAMP Section	Legal Authority/ Code Section
9.4.4	Installation on Slopes >30% without Registered Professional's Report	Sec VI, pg. 39, para 4, Sec VI, pg. 42, para 1	Ch. 18C, SBCC, Sec 18C-5(A)(1)(a)
9.4.5	Decreased Leaching Area for IAPMO-Certified Dispersal System with Multiplier <0.70	Sec I, pg. 2, para 3	CPC, Sec K 3.0 (5)
9.4.6	Supplemental Treatments without Monitoring and Inspection	Sec I, pg. 2, para 1 & 3	Ch. 18C, SBCC, Sec 18C-5(K) – (L)
9.4.7	Significant Wastes from RV Holding Tanks	Sec I, pg. 2, para 3 & 6	NA
9.4.8	Encroachment Above Groundwater	Sec I, pg. 2, para 3	Sec 8.1.5 OWTS Policy, Table 2
9.4.9	Installations Near Existing Sewers	Sec VI, pg. 39 para 3	CPC, Ch 7, Part II , Sec 713.4
9.4.10	Minimum Setbacks:	Sec I, pg. 2, para 3	NA
9.4.10.1	From Public Supply Wells, dispersal less than 10 feet	Sec I, pg. 2, para 3	NA
9.4.10.2	From Public Supply Wells, dispersal greater than 10 feet	Sec I, pg. 2, para 3	NA
9.4.10.3	From Public Supply Wells, Regarding Pathogens	Sec I, pg. 2, para 3	NA
9.4.10.4	From Public Surface Water Supplies	Sec I, pg. 2, para 3	NA
9.4.10.5	From Public Surface Water Supplies	Sec I, pg. 2, para 3	NA
9.4.11	Supplemental Treatments, Replacement OWTS That Do Not Meet Minimum Setback Requirements	Sec V, pg. 37, para 2, Sec VI, pg. 40, para 5, Sec VII, pg. 47, para 2 – 3	Ch. 18C, SBCC, Sec 18C-5(K) – (L), Sec 18C-6(A)(5)
9.4.12	Supplemental Treatments, New OWTS That Do Not Meet Minimum Setback Requirements	Sec VI, pg. 40, para 5, Sec VI, pg. 45, para 5 & 7	Ch 18C, SBCC, Sec 18C-5(K) – (L)
9.5	Technical Support of LAMP	Sec 1, pg. 2, para 1	NA
9.6	Regional Water Quality Control Board Consideration of LAMP	________	__________

Update to the 2003 Sanitary Survey

As mentioned previously, while the Survey covered the entire county, it primarily concentrated on a number of "focus areas" where the conditions made the use of OWTS particularly problematic. Since the completion of the Survey in 2003, EHS has worked to mitigate the impacts of the use of OWTS in some of these focus areas. These efforts have primarily come in the form of funding studies to determine the feasibility of extending the public sewer. Several of these projects are discussed below.

At the request of a number of the homeowners and the City of Santa Barbara, EHS authorized and funded engineering studies to determine the feasibility and the potential costs of extending the sewer to Sunset/Carol Rd and sections of Mission Canyon. The Survey gave these areas an overall problem ranking of High and Medium High, respectively. The reports found that sewering these areas will be difficult because the terrain will necessitate the need for lift stations and the need to obtain a number of easements across private property. In addition the soil formation in the studied area of Mission Canyon is prone to slides that could result in damaging or breaking a sewer line. As a result, there has been no additional effort to extend the sewer to these areas to date.

South of the City of Carpinteria, the Survey gave the areas of Rincon Pt., Sand Point Rd. and Padaro Ln. overall problem rankings of High, High, and Medium High, respectively. The properties on Sand Point Rd. have since been connected to sewer and the OWTS abandoned. Much of Padaro Ln. is now served by public sewer and extension of the public sewer to the western portions south of U.S. Highway 101 has received all necessary permits and construction will begin soon. Work to extend the sewer to the homes located near Rincon Point began in January, 2014.

Due to high density, poor soil conditions and seasonally high groundwater, the Township of Los Olivos is a county listed Special Problems Area for the use of OWTS. Accordingly, the Survey also gave Los Olivos an overall problem ranking of High. In 2012, EHS authorized and funded a Preliminary Engineering Report to study feasibility and potential costs of installing a wastewater collection system and packaged treatment plant to serve the commercial area of Los Olivos. The report was completed in 2013 and while no construction has occurred, a "steering committee" has been formed to investigate the concept further.

Tier 4 – OWTS Requiring Corrective Action

Tier 4 – OWTS Requiring Corrective Action

OWTS that require corrective action or are either presently failing or fail at any time while this Policy is in effect are automatically included in Tier 4 and must follow the requirements as specified. OWTS included in Tier 4 must continue to meet applicable requirements of Tier 0, 1, 2 or 3 pending completion of corrective action.

11.0 Corrective Action for OWTS

11.1 Any OWTS that has pooling effluent, discharges wastewater to the surface, or has wastewater backed up into plumbing fixtures, because its dispersal system is no longer adequately percolating the wastewater is deemed to be failing, no longer meeting its primary purpose to protect public health, and requires major repair, and as such the dispersal system must be replaced, repaired, or modified so as to return to proper function and comply with Tier 1, 2, or 3 as appropriate.

11.2 Any OWTS septic tank failure, such as a baffle failure or tank structural integrity failure such that either wastewater is exfiltrating or groundwater is infiltrating is deemed to be failing, no longer meeting its primary purpose to protect public health, and requires major repair, and as such shall require the septic tank to be brought into compliance with the requirements of Section 8 in Tier 1 or a Local Agency Management Program per Tier 2.

11.3 Any OWTS that has a failure of one of its components other than those covered by 11.1 and 11.2 above, such as a distribution box or broken piping connection, shall have that component repaired so as to return the OWTS to a proper functioning condition and return to Tier 0, 1, 2, or 3.

11.4 Any OWTS that has affected, or will affect, groundwater or surface water to a degree that makes it unfit for drinking or other uses, or is causing a human health or other public nuisance condition shall be modified or upgraded so as to abate its impact.

11.5 If the owner of the OWTS is not able to comply with corrective action requirements of this section, the Regional Water Board may authorize repairs that are in substantial conformance, to the greatest extent practicable, with Tiers 1 or 3, or may require the owner of the OWTS to submit a report of waste discharge for evaluation on a case-by-case basis. Regional Water Board response to such reports of waste discharge may include, but is not limited to, enrollment in general waste discharge requirements, issuance of individual waste discharge requirements, or issuance of waiver of waste discharge requirements. A local agency may authorize repairs that are in substantial conformance, to the greatest extent practicable, with Tier 2 in accordance with section 9.2.3 if there is an approved Local Agency Management Program, or with an existing program if a Local Agency Management Program has not been approved and it is less than 5 years from the effective date of the Policy.

Tier 4 – OWTS Requiring Corrective Action

11.6 Owners of OWTS will address any corrective action requirement of Tier 4 as soon as is reasonably possible, and must comply with the time schedule of any corrective action notice received from a local agency or Regional Water Board, to retain coverage under this Policy.

11.7 Failure to meet the requirements of Tier 4 constitute a failure to meet the conditions of the waiver of waste discharge requirements contained in this Policy, and is subject to further enforcement action.

Santa Ynez River Groundwater Basins

Santa Ynez Uplands Groundwater Basin

The Santa Ynez Uplands basin encompasses approximately 83,000 acres bordered on the south by the Santa Ynez Mountains and by the San Rafael Mountains on the northeast. The primary land uses are agriculture (wine grape growing, cattle grazing) and residential.

Residential parcels are semi-rural to rural in nature with a median parcel size of 2.5 acres. Conditions for the use of OWTS vary, ranging from very good to poor with areas with restrictive soil characteristics, shallow groundwater and or difficult topographic features such as steep slopes and drainages.

The major “urban” centers consist of the City of Solvang and the unincorporated townships of Santa Ynez, Los Olivos and Ballard. The residents in Solvang are connected to a public sewer owned and operated by the City. Similarly, most of the residents in the township of Santa Ynez are connected to a sewer owned and operated by the Santa Ynez Community Services District. The District operates and maintains the collection system only. The effluent is directed to Solvang’s treatment plant.

The residential and commercial structures in the townships of Los Olivos and Ballard are served by OWTS. The use of OWTS in these areas is problematic due to a combination of poor soils, high groundwater and small parcels. Both Los Olivos and Ballard were listed as Focus Areas in the Sanitary Survey.

Janin Acres is also listed as a Focus Area in the Survey. Janin Acres is a residential subdivision consisting of approximately 80 parcels located east of the City of Solvang along Highway 246. While the median parcel size is approximately 2 acres, poor shallow soil conditions generally result in the use deep trenches or seepage pits for effluent dispersal.

Examining a map of the Santa Ynez Valley shows that Los Olivos, Ballard and Janin Acres are located along a north-south line paralleling Alamo Pintado Creek. Consequently, EHS will use the water quality monitoring results from several public water systems located in this area as data points for the LAMP water quality monitoring element. Please see **Figure 3-2** for the locations of the water system and sample points. Please see **Figure 3-3** for the locations of the water systems and the wells that will be used as data points.

The Santa Ynez River Water Conservation District, Improvement District #1 (ID1) provides drinking water to large part of the unincorporated areas adjacent to the City of Solvang including Santa Ynez, Ballard and Los Olivos. ID1 operates under the authority of a Domestic Water Supply Permit issued by CDPH. As noted in **Figure 3-3**, ID1 has several wells in and around Los Olivos that will also be used as data points.

The Skyline Park Mutual Water Company is a small community water system supplying water to a residential subdivision located near the intersection of Highway 246 and Refugio Rd. in Santa Ynez. The Water Company serves 94 residential connections under the authority of a Domestic Water Supply Permit issued by EHS as the designated Local Primacy Agency. As a condition of its permit, the water company must perform routine water quality monitoring and submit the results of that monitoring to EHS. EHS proposes to use the data obtained from the Skyline Park Mutual Water Company as part of the LAMP water monitoring element.

The Rancho Marcelino Water & Service Company supplies drinking water to the aforementioned Janin Acres subdivision. Like the Skyline Park Mutual Water Company, it operates under a permit issued by EHS and similarly must complete routine water analysis. EHS proposes to use these results as its final data point for monitoring the water quality in the Santa Ynez Upland Basin.

LOS OLIVOS LAMP
SCOPE OF WORK

Goals of this document:

1. Create a Los Olivos Specific LAMP that clarifies and aligns the appropriate State Tier 2 & 3 OWTS requirements for the District, providing detailed guidance to District residents and property owners while the District continues to develop its wastewater collection and treatment system. The creation of this LAMP will assist the residents of the District from unnecessary installation of advanced septic systems prior to the Proposition 218 vote for funding to implement the collection and treatment systems and the systems being available for hook up.

2. Provide detailed guidance to District residents and property owners with clear options for maintaining their existing septic systems while the CSD is implementing wastewater collection and treatment and working with the County EHS in the implementation of the Groundwater Monitoring Program. This section of the local LAMP, designated "Residential OWTS Requirements & Guidelines", will be a simple, user-friendly guide for residents, making it easy to understand how to regularly maintain their system and what to do if they are facing septic issues while the WW collection and treatment systems are in process of development. This is important to avoid the reality that residents will not maintain their systems during the development of a centralized sewer project for fear of ~~finding~~ problems that may trigger a replacement with advanced septic. This is a mindset we want to avoid. The District wants to encourage maintenance of existing systems.

3. Prepare a Los Olivos LAMP ~~that~~ more directly adopts State requirements which we believe is more appropriate in our ~~current~~ situation.

4. Describe and Provide a path for removal of the County "Special Problems Area" designation. Describe under what conditions this may be possible after Phase 1 completion and groundwater testing demonstrates groundwater improvement trends.

Consultant will draft the Local LAMP to appropriately address the Tier 2 requirements and any Tier 3 requirements that may be applicable in context of the Primary Goals above:

1. Address and implement the following approach in preparing the Los Olivos Community LAMP. These concepts are to be applied in the context of partner agency coordination. Also, the District wants to make sure septic maintenance is not ignored or deferred by residents under the fear of triggering the "worst case" of having to replace their existing systems with advanced treatment OWTS's in advance of the pending requirement to participate in a significant assessment for sewerage.

2. The District is technically is not "impaired" in strict accordance with the State Definition, nor does it qualify for an impaired designation according to the State definition. Refer to Page 41 of the County LAMP, Section "Advanced Protection Management Plan":

   a. State Policy stipulates that existing, new and replacement OWTS that are "located near a water body that has been listed as impaired…may be addressed by…a TMDL [Threshold Mitigation Detection Limits]…program, by special provisions contained in a Local Agency Management Program or by specific requirements of Tier 3." Los Olivos is not near a water body listed and impaired, and therefore is not strictly required to adhere to all the requirements in Tie 3.

b. This section also references Section 303(d) of the Clean Water Act, but the implied applicability that Los Olivos may be "located near a water body that has been listed as impaired" is an interpretation that needs correction for Los Olivos.

c. This section further indicates that "if a water body in the County is designated by the Central Coast Water Board as "impaired" ~~or significantly~~ degraded as a result of the use of OWTS, "an Advanced Protection Management Program will be developed in accordance with the TMDL or in close consultation with the [RWQCB}. This close coordination MAY [not shall or will] include supplemental treatment for existing systems ~~and…inspections as determined~~ by [The RWQCB]. Note this

d. This section further states that "in the absence of a TMDL or an APMP approved by the [RWQCB], the provisions of Tier 3 of the [State] policy shall apply to OWTS adjacent to water body segments listed in attachment 2 of the Policy." This again is assumed applicable to Los Olivos based on the assumption that Los Olivos is listed by the RWQCB as impaired, which it is not.

e. Of the many studies, the most recent analysis, as performed by RWQCB and Heal the Ocean, does not identify or label the district as impaired.

2. A Special Problems Area is not equivalent to the State Definition of "impaired". Therefore, the full jump from Tier 2 to full Tier 3 requirements is not required. This is further justification for completing the Groundwater Quality Monitoring System, and adhering primarily to Tier 2 while implementing the new sewerage system.

   a. The designation of Special Problem Area has not been confirmed, and is based on limited and poorly documented sampling from the early 1970's. This fact also warrants some special considerations for the District while a collection and treatment system is being installed.

   b. The District does recognize that a discussion with the RWQCB is important and necessary to determine specific requirements to consider from Tier 3 that me be desirable in a Los Olivos Specific Local LAMP. However, the District is seeking for a reasonable LAMP that recognizes the current implementation of groundwater monitoring, and septic to sewer conversion activities in process.

   c. The District does recognize that a discussion and agreement with the County Department of Environmental Health Services regarding implementation of their approach is necessary and important.

3. Specify what State Tier 3 requirements are necessary, and under what timing or circumstances they apply during this implementation phase of the sewerage system

   a. Pre-coordination with the RWQCB and Count EHS will be required. The District Interim General Manager and the Ad Hoc Technical Committee can assist in facilitating these reviews as necessary.

<u>Consultant will draft the District's Residential OWTS Requirements & Guidelines to contain the following elements, as required by Tier 2 of the County's Policy (and in context of the Primary Goals above:</u>

- Minimum standards for the siting, design, construction, operation and maintenance of Onsite Wastewater Treatment Systems ("OWTS") within the District. These standards may be different from those specified in Tier 1 of the Policy but they must be equally protective of water quality.

- Detail the maximum projected OWTS flows authorized by the LAMP as well as the types of systems that would be permitted under the program. These may include standard, supplemental treatment and alternative systems.

- The criteria and procedures for requesting a variance from specific standards or requirements.

- Certification/licensing requirements for companies and or individuals engaged in OWTS activities.

- The District's homeowner education program that explains how to operate and maintain their OWTS.

- The types of records that will be maintained by the district as well as the number and frequency of reports that will be provided to the Central Coast Water Board.

- The Water Quality Assessment Program to be implemented to track the effectiveness of the Residential OWTS Requirements & Guidelines in protecting/improving water quality.

<u>Consultant Will Provide the Following Deliverables:</u>

- Consultant to provide a Preliminary Draft LAMP Document for review by the District. This LAMP will replace the County LAMP for Los Olivos.

- Consultant to present preliminary draft at a District General Meeting.

- Consultant to revise preliminary draft into a Draft document for review by County Environmental Health Services and the Regional Water Quality Control Board.

- Consultant to revise Draft incorporating comments received from the regulatory agencies into the Los Olivos LAMP.

Attached:

1. County Lamp pages 41-42 ADVANCED PROTECTION MANAGEMENT PLAN
2. County Lamp pages 116-128 (State Basin Plan pages 28-40) TIER 2 AND 3 OWTS STATE REQUIREMENTS

BUSINESS ITEM 8E SUMMARY

Los Olivos CSD LAMP

On Wednesday, 3 March 2021, Director Palmer and IGM Pike met with Director Lars Seifert and Jason Johnston in one of our Monthly (or so) meetings to update them on the EHS funded projects and other relevant topics. Attached please find the Agenda for that Meeting.

The Draft LAMP Scope was discussed. Director Seifert offered the following, which will likely adjust our approach to prepare our own LAMP:

1. He agreed that a unique LAMP for Los Olivos would be appropriate.
2. He offered to "Open the County LAMP" for editing and work with us to include appropriate modifications for Los Olivos.
3. He agreed that deferred replacements, especially with advanced septic would be appropriate for residential lots. The duration of deferment will depend on several factors including lot size, but could be substantial. He is willing to work on this with us.
4. He indicated the small lots would likely be treated differently than larger lots.
5. He indicated he has done a similar approach in another community in his last position and sent us a copy of that document for our review (See attached email from Director Seifert and excerpt.)
6. He indicated the changes could be simply a clarification of policy for the Los Olivos Area, VS. a re-right/ recreation of a LAMP.
7. He indicated that he is confident the District does not have authority to create its own LAMP primarily because it is not the jurisdiction of monitoring and enforcement.

The Board may choose to direct the IGM and Ad Hoc Technical Committee to immediately begin working with EHS to create modified language for the existing LAMP that provides the most flexibility for the District Possible.