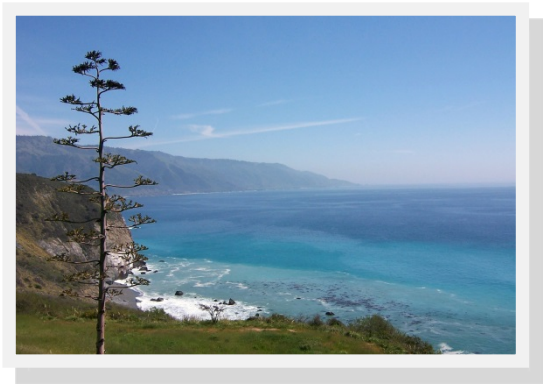
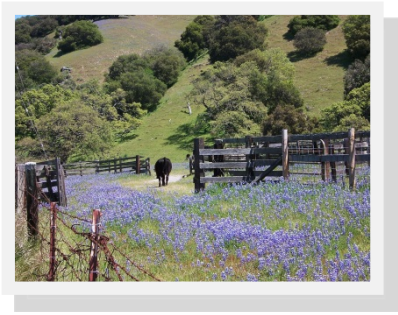
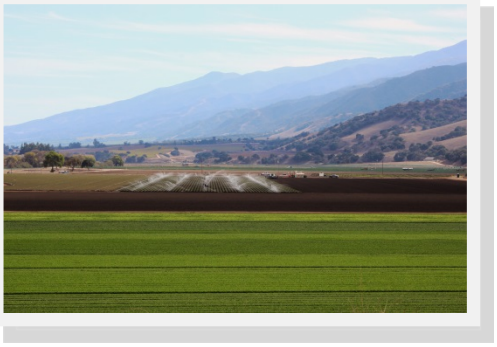
County of Monterey Health Department
Environmental Health Bureau



Local Agency Management Program for Onsite Wastewater Treatment Systems

Final Draft for consideration by the Monterey County Board of Supervisors and the Central Coast Regional Water Quality Control Board

April 3, 2018

Prepared by the Monterey County Environmental Health Bureau
Based on the County of Monterey LAMP Guidance Document by Wallace Group (March 2016)

TABLE OF CONTENTS

FIGURES and TABLES

SECTION 0: DEFINITIONS

Aerobic. Aerobic means an environment providing readily available (molecular) oxygen to aerobic bacteria metabolizing wastewater.

Alternative Onsite Wastewater Treatment System. Alternative onsite wastewater treatment system is a type of OWTS that utilizes either supplemental treatment and/or a method of wastewater dispersal other than a conventional leachfield for the purpose of producing a higher quality wastewater effluent and improved performance of and siting options for effluent dispersal.

Anaerobic. Anaerobic means septic, an environment with an absence of molecular oxygen. Anaerobic bacteria obtain their oxygen to metabolize wastewater from organic compounds and water.

At Grade System. At grade system is a type of alternative OWTS dispersal system consisting of a gravel distribution bed placed on top of a tilled, in situ soil absorption area, which is then covered by a minimum of 12 inches of suitable soil that will support vegetative growth. Wastewater effluent is applied to the gravel distribution bed using pressure distribution.

Basin plan. Basin plan means the same as "water quality control plan" as defined in Division 7 (commencing with Section 13000) of the California Water Code. Basin plans are adopted by each Regional Water Quality Control 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.

Bedrock. Bedrock means the rock, usually solid, that underlies soil or other unconsolidated, surficial material.

Bedroom. A bedroom is any room in the conditioned (heated) area of a dwelling unit which is:

- 70 square feet or greater in size; and
- Includes an exterior door or window for egress meeting health and safety code standards; and
- Includes a closing door that separates the room from other features of the dwelling.

The following shall not be considered a bedroom: Any interior room that must be passed through to access another bedroom; a hallway; bathroom; kitchen; living room; dining room; family room; breakfast nook; pantry; laundry room; closet/dressing room opening off of a bedroom.

Beneficial uses. Beneficial uses means those qualities in waters of the state that may be protected against quality degradation that include, but are not necessarily limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; esthetic enjoyment;

navigation; and preservation and enhancement of fish, wildlife and other aquatic resources or preserves.

Biological Oxygen Demand (BOD). BOD, measures the oxygen required for biochemical degradation of organic and inorganic material. High BOD causes an increased biological demand on downstream OWTS components and may shorten the life of the system.

Biomat. Biomat means the layer of biological growth and inorganic matter that forms at the wastewater-soil interface or infiltrative surface, and may extend as far as 1 inch into the soil matrix. It provides physical, chemical, and biological treatment of the OWTS effluent as effluent migrates toward groundwater.

California Environmental Data Exchange Network (CEDEN). California Environmental Data Exchange Network is a website operated by the State Water Resource Control Board that serves as a central location to find and share information about California's water bodies, including streams, lakes, rivers and the coastal ocean. www.ceden.org

Central Coast Regional Water Quality Control Board (Central Coast RWQCB). Central Coast RWQCB means Region 3 of the Regional Water Quality Control Boards as designated by Water Code Section 13200. Any reference to an action of the Regional Water Board in this LAMP 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.

Cesspool. 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 are not preceded by a septic tank and are not authorized under this LAMP. The term cesspool does not include pit-privies and out-houses which are not regulated under this Policy.

Clay. Clay is a kind of 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. Cobbles mean rock fragments 76 mm or larger using the USDA soil classification systems.

Contour Loading Rate. Contour loading rate, also known as linear loading rate, means the amount of effluent loaded to the soil per the length of the dispersal unit or units along the single hillslope along the contour. The contour loading rate is determined on the relationship between the vertical and horizontal water movement in the soil and is based on 1) the permeability difference between the absorption area and any deeper horizons, 2) the depth between the absorption area and the change in permeability and 3) the land slope.

Conventional OWTS. Conventional OWTS means an OWTS consisting of a septic tank with the effluent discharging into a subsurface leachfield.

Curtain drain. Curtain drain means a lined, rock-filled trench with a pipe in the bottom of the trench for the purpose of intercepting and diverting subsurface water.

Director. Director means Director of Monterey County Environmental Health Bureau, or the Director's authorized deputy(ies), assistant(s), or designee(s).

Dispersal system. 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.

Domestic wastewater. Domestic wastewater means 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. (see Table 4-3) and is defined as having a thirty (30) day average concentration of the following constituents prior to a septic tank or supplemental treatment component:

1. BOD less than or equal to 300 milligrams per liter (mg/L); or
2. TSS less than or equal to 330 mg/L; or
3. FOG less than or equal to 100 mg/L; or
4. TN less than 75 mg/L.

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 recreational vehicle (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.

Downhill embankment. Downhill embankment means an embankment that has a slope of thirty (30) percent or greater or one that interrupts the soil strata of the natural slope of the land. The slope is measured by taking into consideration the entire slope of the hillside. The embankment can either be manmade or created by natural processes. Examples: manmade (e.g. road cuts, pool/spa excavations etc.); natural (e.g. thirty (30) percent slope, erosion gully, cliff face, etc.).

Drainageway. Drainageway means a natural or artificial channel that is not a watercourse as defined by this LAMP. Examples of a drainage way include irrigation and drainage ditches that flow only for hours or days following rainfall, grass-lined swales, concrete-lined canals, and storm water runoff devices.

Dwelling Unit. Dwelling unit means a place of human habitation that is self-sufficient (i.e. bedroom/s, kitchen with sink, oven/stove, refrigerator, and storage of food, bathroom/s) and conforms with the edition of the Uniform Building Code and the Uniform Housing Code in place at the time of construction. A guesthouse, as defined in Monterey County Zoning Code (Titles 20 and 21) is not considered a dwelling unit.

Effective Depth. Effective depth means the depth of the useable, permeable layers of soil below the bottom of the distribution pipe in a dispersal system.

Effluent. Effluent means sewage, water, or other liquid, partially or completely treated or in its natural state, flowing out of a septic tank, supplemental treatment unit, dispersal system, or other OWTS component.

Electronic Deliverable Format (EDF). EDF is a comprehensive data standard designed to facilitate the transfer of electronic files between data producers and data users. The EDF may be used for the production of hard copy reports, electronic data review, or data summaries,

Existing OWTS. Existing OWTS means an OWTS that was constructed and operating prior to the effective date of this Policy, and OWTS for which an OWTS construction permit has been issued prior to the effective date of this LAMP.

Fats, Oils and Grease (FOG). FOG measures biological lipids and mineral hydrocarbons. The analytical test for FOG does not measure an absolute quantity, but is useful in making comparisons of wastewater. High FOG results in a highly increased biological demand on downstream OWTS components and may drastically shorten the life of the system.

Gray Water. Gray water means untreated wastewater that has not been contaminated by any toilet discharge, and has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes (Health and Safety Code section 17922.12). Gray water includes used water from bathtubs, showers, bathroom wash basins, clothes washing machines and laundry tubs. Gray water does not include waste water from kitchen sinks or dishwashers.

Gray Water System. Gray water system is a disposal system that disposes of gray water subsurface and conforms with the latest edition of the California Plumbing Code.

Groundwater. Groundwater means water below the land surface and includes perched water or subsurface sheeting water.

Guesthouse. Guesthouse means the same as described in Monterey County Zoning Ordinances (Titles 20 and 21) and is considered a detached bedroom(s) for purposes of sizing the OWTS.

Health Department. Health Department means the Monterey County Health Department.

High Strength Wastewater. High strength wastewater is defined as wastewater with a measured strength greater than domestic wastewater and is defined as having a thirty (30) average concentration of the following constituents prior to the septic tank or a supplemental treatment component:

1. BOD greater than 300 milligrams per liter (mg/L); or
2. TSS greater than 330 mg/L; or
3. FOG greater than 100 mg/L; or
4. TN greater than 75 mg/L.

Infiltrative Area. Infiltrative area means the surface area of the sidewalls below the effluent distribution pipe where the dispersal field media makes direct contact with the soil or permeable rock. The surface area of the bottom of the dispersal system can be included in specific circumstances.

International Association of Plumbing and Mechanical Officials (IAPMO). IAPMO is a service organization, providing code development assistance, industry-leading education, plumbing and mechanical product testing and certification, building product evaluation and a manufacturer-preferred quality assurance program.

Impervious layer or material. Impervious layer or material is characterized as having a percolation rate slower than one hundred twenty (120) minutes per inch or having clay content of sixty (60) percent or greater.

Local Agency Management Program for Onsite Wastewater Treatment Systems in Monterey County (LAMP). LAMP means this document, which conforms to all of the applicable Tier 2 criteria listed in the OWTS Policy, including adherence to the prohibitions specified in Section 9.4 of the Policy.

Leachfield. Leachfield means a system of trenches or beds filled with drain rock, or other approved aggregate material, and overlain by a perforated pipe that distributes treated sewage effluent for subsurface dispersal into the soil. A leachfield is also known as a “drainfield” or a “soil absorption system”.

Mottling. 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. Mound system is a type of alternative OWTS dispersal system consisting of an aboveground, 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.

NSF. NSF is an acronym for National Sanitation Foundation (also known as NSF International), a not for profit, non-governmental organization that develops health and safety standards and performs product certification.

New OWTS. New OWTS means an OWTS permitted after the effective date of this LAMP. A new OWTS is any new system installed to serve a new structure or an elective rebuild of an existing structure. For example, a rebuild of a fire damaged structure is not considered a New OWTS.

Nitrogen. Nitrogen is of concern due to its impact on groundwater and surface water. e environment. Nitrogen acts as a potentially limiting nutrient for photosynthetic autotrophs in surface water and as a potential health risk in groundwater. The principal forms of nitrogen found in wastewater are organic nitrogen (Organic-N), ammonia nitrogen (NH3-N), ammonium nitrogen (NH4-N), nitrite nitrogen (NO2-N), and nitrate nitrogen (NO3-N). These forms of nitrogen are expressed either individually or as components of the following:

1. Total Kjeldahl Nitrogen (TKN), which is the sum of (Organic-N) + (NH3-N)
2. Total Inorganic Nitrogen (TIN), which is the sum of (NH3-N) + (NO2-N) + (NO3-N)
3. Total Nitrogen (TN), which is the sum of (TKN) + (NO2-N) + (NO3-N)

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 (OWTS). OWTS means individual wastewater 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 gray water systems pursuant to Health and Safety Code Section 17922.12.

OWTS Policy. OWTS Policy is the Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems as adopted by the State Water Resources Control Board on June 19, 2012.

Pathogens. Pathogens mean disease-causing microorganisms. Their presence is indicated by sampling wastewater for coliform bacteria.

Perched Water. Perched water, which includes sheetwater, means subsurface drainage or groundwater that flows in a relatively thin sheet upon an impervious or very slowly permeable soil layer, such as clay.

Percolation test. Percolation test is 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.

Percolation rate. Percolation rate means the speed at which water moves through soil, usually reported in minutes per inch.

Permeable Rock. Permeable rock means decomposed granite, shale or other weathered bedrock formations. For the purposes of this LAMP, permeable rock may be considered a viable substrate to accommodate a dispersal system provided stabilized percolation rates and vertical separation requirements as determined by this LAMP to groundwater, consolidated bedrock or another impervious layer have been met.

Person. 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 LAMP or the OWTS Policy.

Privy. Privy means a structure (portable or fixed) and excavation used for the disposal of human wastes without the aid of water or chemical toilets (portable or fixed) which are subsequently pumped and disposed of in an approved facility.

Qualified professional. Qualified professional means an individual licensed or certified by a State of California agency to design, install, and/or maintain OWTS and to practice as professionals for other associated reports, as allowed under their license or registration. Qualified professionals must obtain an annual registration from the Health Department.

Repair. Repair means either: (1) for a dispersal system, repairs to an existing OWTS dispersal system that are installed in a “like-for-like” configuration to maintain the design specifications and location of the dispersal field; (2) for a septic tank, patching cracks that do not degrade the tank structural integrity and do not allow wastewater to exfiltrate or allow groundwater to infiltrate the tank.

Reserve Area. Reserve area means an accessible area that shall be available to accommodate a minimum of one replacement dispersal system without utilization or disruption of the initial installation(s).

Reservoir. Reservoir means a pond, lake, basin or other space either natural or created in whole or in part by the building of engineering structures, which is used for storage, regulation and control of water, recreation, power, flood control or drinking. A detention pond designed to meter runoff water during a storm event is not considered a reservoir.

Sand. Sand is a kind of 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.

Sanitary sewer. Sanitary sewer means a system for collecting residential or municipal wastewater and directing the collected wastewater to a treatment works prior to dispersal.

Seepage pit. Seepage pit means a drilled or dug excavation, three to six feet in diameter and gravel filled, that receives the effluent discharge from a septic tank or other OWTS treatment unit for dispersal.

Septage. Septage means solid residue with low water content from septic tanks, privies, or wastewater treatment facilities.

Septic tank. 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.

Shallow Pressure-Distribution Trench. Shallow pressure-distribution trench is a type of alternative OWTS dispersal field, similar to a conventional gravity leachfield except that it uses a pump and small-diameter pressure piping to achieve broad, uniform distribution of wastewater in the shallow soil zones for improved soil absorption and enhanced treatment of percolating effluent.

Silt. Silt is a kind of 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.

Soil. 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 LAMP, soil shall contain earthen material of particles smaller than 0.08 inches (2 mm) in size.

Soil Structure. 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. 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 United States Department of Agriculture.

Subsurface drip dispersal. Subsurface drip dispersal is a type of alternative OWTS dispersal system consisting of small diameter flexible plastic tubing manufactured with emitters spaced uniformly along its length that releases treated wastewater to the soil for final treatment and dispersal; the drip field is designed and installed such that the drip tubing is installed in the shallow surface soils, typically 8 to 12 inches below finished grade.

Supplemental Treatment. Supplemental treatment means a device or system used in an OWTS to perform additional wastewater treatment functions, beyond primary treatment, and capable of reliably producing wastewater effluent of secondary quality or better, prior to discharge to the dispersal system. For the purposes of this chapter, secondary quality is defined as effluent meeting 30-day average concentration limits of 30 mg/L for biochemical oxygen demand and 30 mg/L for total suspended solids.

Surface Water Ambient Monitoring Program (SWAMP). SWAMP is a comprehensive surface water monitoring and assessment program managed by the State Water Resources Control Board. https://www.waterboards.ca.gov/water_issues/programs/swamp/

Telemetric. Telemetric means the ability to automatically measure and transmit OWTS data by wire, radio, or other means.

Total Suspended Solids (TSS). TSS are a constituent of total solids. TSS is residue retained on a filter after drying the sample and is a measure of the level of treatment being achieved. TSS can be inorganic particles, which are difficult for biological processes to break down, resulting in mechanical clogging. In wastewater with high TSS, inorganics are less easily broken down and can accelerate mechanical clogging of the infiltrative surface of the dispersal system.

United States Geological Survey (USGS). USGS is a scientific agency for natural sciences, including earth science and biology and maintains topographic maps of blue-line streams.

Wastewater. Wastewater includes sewage, gray water, and any and all other contaminated liquid waste substances associated with human habitation.

Watercourse. Watercourse means any of the following:

1. A stream or surface water feature as mapped by the United States Geological Survey (USGS); or
2. Any channel with a bed, banks, or sides throughout substantially all its length that is not mapped by the USGS that consistently conveys water for more than 3 months out of the year or is used by fish;

SECTION 1: INTRODUCTION

1.1 Introduction

This Local Agency Onsite Wastewater Treatment Systems Management Program ("LAMP") pertains to the oversight of onsite wastewater treatment systems ("OWTS") within the County of Monterey, California. OWTS are individual systems designed to treat and dispose of domestic wastewater, sewage, below ground, usually on the same property that produces the wastewater. A septic tank and leach field, referred to as conventional OWTS, relies on natural processes to treat wastewater, and is the oldest and most common type of OWTS. In recent decades, wastewater treatment has advanced to include supplemental treatment technologies and modified dispersal fields that improve the quality of wastewater effluent prior to final dispersal in the soil. These systems are referred to as alternative OWTS. This LAMP develops standards for all new, replacement and expansion OWTS and for OWTS demolition within Monterey County.

Both conventional and alternative OWTS produce septage, which is the partially treated, residual sludge that accumulates over time in a septic tank. Septage is pumped out of a septic tank by a licensed liquid waste hauler using a vacuum truck, and disposed of at a centralized wastewater treatment facility. Centralized wastewater treatment facilities differ from OWTS in that they receive wastewater from cities or other regional areas by way of a sewage collection system and treat the wastewater before disposal or beneficial reuse. This LAMP does not address centralized wastewater treatment facilities.

Gray water is non-potable but relatively clean wastewater from baths, sinks, clothes washing machines or dish washers that is free of fecal contamination. Gray water tends to contain fewer pathogens than sewage and can be beneficially reused onsite for subsurface irrigation and if treated, for toilet flushing or other non-potable uses. Gray water systems are governed by Chapter 15 of the California Plumbing Code. This LAMP does not address gray water systems.

Through the Porter-Cologne Water Quality Control Act, the California Water Code authorizes the State Water Resources Control Board ("State Water Board") to regulate all discharges that could affect the water quality and beneficial uses of waters of the State. The policies of the State Water Board are implemented locally by the State's nine Regional Water Quality Control Boards ("Regional Water Boards"). Historically, each of the nine Regional Water Boards have developed and adopted water quality control plans that outline water quality objectives in their respective jurisdictions ("Basin Plan") as well as policies and programs to achieve those objectives. The basin plans are reviewed triennially and amended as necessary by the Regional Water Boards, subject to the approval of the California Office of Administrative Law, the State Water Board, and ultimately the U.S. Environmental Protection Agency (EPA).

The Regional Water Boards implement the basin plans by issuing and enforcing permits ("waste discharge requirements" or "WDRs") and waivers. The Central Coast Regional Water Quality Control Board ("Central Coast RWQCB") issues WDRs to individuals, communities, or businesses whose waste discharge can affect water quality. These requirements can be either State WDRs for discharges to land, or federally delegated National Pollutant Discharge Elimination System ("NPDES") permits for discharges to surface water. These discharges are managed so that: 1) they meet waste discharge requirements; 2) water quality objectives are met; and, 3) established beneficial uses of those waters are protected.

The RWQCB originally adopted rules for septic systems in 1983. Those rules called on local permitting agencies, mostly counties, to develop plans to manage septic systems, especially in urbanized areas and areas where site conditions were not favorable for septic systems.

The State's regulatory authority extends to individual OWTS. Requirements for OWTS have been incorporated into the Regional Water Boards respective basin plans. The State Water Board, and therefore the Regional Water Board, recognizes that responsible local agencies can provide the most effective means to manage these systems throughout the state and have therefore, extended regulatory authority for OWTS to local agencies through interagency memoranda of understanding ("MOU") between the Regional Water Boards and the local agencies. The County of Monterey entered into an MOU with the RWQCB on June 12, 1979. The MOU authorized the Monterey County "Director of Public Health or his or her authorized representative" to serve as "the administrator of the individual sewage disposal regulations". The County's MOU was conditional upon the County administrative authorities enforcing the "Regional Water Quality Control Plan, Central Coast Basin (known as the basin plan).

On September 27, 2000, Governor Gray Davis signed into law, Assembly Bill 885 (AB 885) that required the State Water Board to adopt standards or regulations for the permitting and operation of OWTS by January 1, 2004. AB 885 was originally written to address coastal onsite treatment systems but was later amended to address all OWTS throughout California (www.leginfo.ca.gov – AB885 1999-2000).

Draft state standards were released in 2005, but were not adopted at that time due to opposition by the public and special interest groups. At that time, California was one of only two states that had not yet adopted standards for the permitting and operations of OWTS. In 2011, the organizations Heal the Ocean Santa Barbara and Heal the Bay Santa Monica, filed a lawsuit against the State Water Board for failure to act. This resulted in the adoption of the statewide OWTS policy.

On June 19, 2012, the State Water Board approved Resolution No. 2012-0032, adopting the Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems ("OWTS Policy" or "State Policy"). The OWTS Policy became effective in May 2013.

The purpose of the OWTS Policy is to allow for the continued use of OWTS, while protecting water quality and public health. It is the intent of the State Policy to efficiently utilize and improve upon existing local programs through coordination between State and local agencies. The policy establishes a state-wide, 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. The State Policy requires action for water bodies specifically identified as part of the Policy where OWTS contribute to water quality degradation that adversely affect beneficial uses.

Applicable statewide, the OWTS Policy designates the Regional Water Boards as having principal responsibility for overseeing its implementation and calls for the incorporation of the OWTS Policy requirements into Regional Water Board respective basin plans within a year of the effective date of the OWTS Policy.

On May 30, 2013, the Central Coast RWQCB adopted Resolution No. R3-2013-0005 which amended the Water Quality Control Plan for the Central Coast Basin ("Central Coast Basin Plan") to incorporate by reference the provisions of the OWTS Policy and delete redundant or conflicting onsite wastewater system criteria. On January 21, 2014, the State Water Board adopted Resolution No. 2014-0003 which approved the amendment of the Basin Plan.

Implementation of the OWTS Policy will provide more effective and efficient regulation of onsite systems. In addition, Resolution No. R3-2013-0005 rescinds three previously adopted resolutions related to OWTS (R3-2008-0005, R3-2009-0012, and R3-2011-0004).

The OWTS Policy also conditionally waives the requirement for owners of OWTS to apply for and receive waste discharge requirements to operate their systems when they meet the conditions set forth in the OWTS Policy.

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 extreme variance, the OWTS Policy allows local agencies to submit a Local Agency Management Program ("LAMP") for approval by the Central Coast RWQCB and then to manage the installation of new and replacement OWTS under that program.

The County of Monterey Department of Health, Environmental Health Bureau (the "EHB"), has prepared this LAMP, subject to Board of Supervisors' adoption, to manage the installation of new and replacement OWTS in conformance with the OWTS Policy. It is the intent of the EHB, as the Administrative Authority, to regulate all domestic wastewater flows up to 10,000 gallons per day ("gpd"), the maximum allowed under State regulations. Discharges below 10,000 gpd, with unique and/or complex situations may also be regulated by the Central Coast RWQCB depending on the nature of the discharge, difficult siting constraints, existing water quality

background, effluent disposal/discharge to surface waters of the United States, and other factors.

This LAMP applies to all unincorporated areas of Monterey County, but does not extend within the boundaries of incorporated cities. The County may amend its own ordinance to extend County authority over OWTS to any city or jurisdictional area that has itself adopted an ordinance or resolution consenting to County authority. This will also require the County to enter into a written agreement extending the LAMP to the city or jurisdictional area.

The LAMP must be brought to the Board of Supervisors for adoption upon approval by the Central Coast RWQCB. It is also expected that this LAMP will require review, updates and revisions over time as the program is implemented. Section 9.3.3 of the OWTS Policy requires that the County monitor the LAMP every five years to determine if water quality is being impacted. The effectiveness of the program, along with identified needs for update and change to this LAMP will be considered in subsequent years, and necessary changes will be incorporated in consultation with the Central Coast RWQCB. Within one year of LAMP approval by the Central Coast RWQCB and adoption by the Monterey County Board of Supervisors, required changes to Monterey County Code to update the County Code to be consistent with the LAMP will be brought to the Monterey County Board of Supervisors for approval.

1.2 Purpose and Goals

Program Purpose

This LAMP provides a substitute method from the OWTS State Policy Tier 1 Program to achieve the same policy goal, which is to protect water quality and public health. Through this LAMP, the County of Monterey intends to protect water quality and public health from OWTS sewage contamination through the proper design, placement, installation, maintenance, and assessment of individual OWTS.

This LAMP develops minimum standards for the treatment and disposal of sewage by OWTS in Monterey County. This LAMP is intended to act as a guidance document for land owners and developers intending to construct, reconstruct, demolish/abandon, repair or replace any onsite wastewater treatment and dispersal system within Monterey County. This LAMP also applies to OWTS on federal, state, and tribal lands to the extent authorized by law or agreement.

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).

Primary Program Goals

This LAMP has the following primary program goals:

- Allow for the long-term, effective treatment of household and domestic wastewater by means of conventional and alternative OWTS in those areas that are geographically removed from centralized wastewater collection and treatment systems.
- Ensure that all existing and proposed conventional and alternative OWTS are properly sited, designed, constructed, and maintained under the jurisdictional authority of the County.
- Prevent groundwater and well water contamination due to pathogens, nitrates, and other toxic substances that discharge from OWTS.
- Prevent premature failure of OWTS through the implementation of State prescribed minimum design and operating standards.
- Prevent sewage discharges to the ground surface to avoid direct public contact.
- Minimize risk from reuse of inadequately treated effluent for drinking water, irrigation or other uses.

Secondary Program Goals

This LAMP has the following secondary program goals:

Public Health Protection Goals:

- Reduce health risks associated with sewage backup in homes and businesses.
- Minimize risk from inadequate management of septic tank residuals.
- Minimize risk due to public access to system components.

Public Nuisance Abatement Goals:

- Eliminate odors caused by inadequate plumbing and treatment processes.
- Eliminate odors or other nuisances related to transportation, reuse, or disposal of OWTS residuals such as septage.

Environmental Protection Goals:

- Prevent and reduce adverse impacts on water resources due to pollutants discharged from onsite systems.
- Protect shellfish habitat and harvest areas from pathogenic contamination and excessive nutrients
- Prevent and reduce nutrient over-enrichment of surface waters.
- Protect sensitive aquatic habitat and biota.

1.3 Legal Authority

Monterey County Code, Section 15.20.005, recognizes the legal and regulatory authority for the County to administer, oversee and enforce regulation of OWTS throughout the County. The County will continue to have authority to regulate OWTS; however, such authority now derives from the State's June 19, 2012 OWTS Policy. Under that policy, the County may adopt a LAMP, and if the LAMP is approved by the Central Coast RWQCB, the County has authority to regulate OWTS locally in accordance with the LAMP and to implement the LAMP. The County intends to adopt an ordinance amending and updating Chapter 15.20 to conform to the LAMP following the Central Coast RWQCB's approval and County's adoption of the LAMP.

1.4 Prior Studies

Two areas in particular, Carmel Highlands and Carmel Valley, have been studied and/or identified previously as areas of concern with regards to the installation of OWTS.

Carmel Highlands Onsite Wastewater Management Study and Plan

The Carmel Highlands area has challenging site constraints that make the area not amenable to conventional OWTS. In general, the majority of existing and new OWTS cannot meet the Tier 2 requirements of the OWTS Policy; thus wastewater disposal in this area will require special considerations and alternative OWTS to achieve the goals of this LAMP for protection of public health and water quality. The County prepared and adopted the Carmel Highlands Onsite Wastewater Management Plan (OWMP) on December 15, 2009. A summary of this OWMP and salient points as it pertains to this LAMP, are included in Section 6 of this LAMP.

Carmel Valley Wastewater Study

In 1982, Montgomery Engineers prepared a study entitled Carmel Valley Wastewater Study. The purpose of this study was to provide a planning tool for the evaluation of the cumulative impacts of using on-site wastewater facilities in the study area, based upon an analysis of soil percolation rates, soil depths, topography, groundwater, water quality, lot sizes, and septic system operations. The study used this information to determine septic tank capacity in Carmel Valley relative to ultimate build-out projections in the 1980 Carmel Valley Master Plan for this area. Refer to Section 6 for a summary of the study as it relates to this LAMP, and the management of septic tanks in Carmel Valley.

1.5 Implementation of LAMP

The requirements and specifications of this LAMP shall become effective immediately the day following approval by the Central Coast Water Board. In instances where a conflict exists between Monterey County Code, Chapter 15.20, and the LAMP, the intent of the LAMP shall prevail. If the intent of a section or requirement specified by the LAMP comes into question, the Director shall be responsible to make a final determination on a case-by-case basis and in consideration of the specific circumstances that effect the OWTS application.

The EHB will implement the LAMP for approximately 18 months prior to amending Monterey County Code, Chapter 15.20, to make it congruent with the requirements of the LAMP. During this time, the EHB will evaluate the practical application and clarity of the various requirements specified by the LAMP and provide an update to Central Coast Water Board staff every 6 months until such time that the ordinance has been amended. Concurrently, the EHB will prepare an OWTS Administrative Manual, which will provide policy, procedural and technical details for implementation of the LAMP, for consideration and approval by the Monterey County Board of Supervisors.

New or replacement OWTS permits that have been approved by the EHB in accordance with the standards of Monterey County Code, Chapter 15.20, in place at the time of the effective date of this LAMP are exempt from demonstrating conformance with this LAMP and will remain valid for a period of one year from the date of OWTS permit issuance. After this one year

period, the OWTS permit shall expire. The applicant may apply to the EHB to renew and amend the OWTS permit in accordance with the requirements of this LAMP. Additional site evaluation, soil testing and analysis may be necessary to demonstrate conformance with this LAMP.

New or replacement OWTS permit applications that were received by the EHB prior to May 10, 2016 shall be evaluated for conformance with the standards of Monterey County Code, Chapter 15.20, in place at the time of the effective date of this LAMP and the application will remain valid for a period of one year following the effective date of this LAMP. If an OWTS permit is not issued within one year of the effective date of this LAMP, the application shall expire. When an OWTS permit is issued during this one year period, it will remain valid for a period of one year from permit approval. After this one year period, the OWTS permit shall expire. The applicant may apply to the EHB to renew and amend the OWTS permit in accordance with the requirements of this LAMP. Additional site evaluation, soil testing and analysis may be necessary to demonstrate conformance with this LAMP.

SECTION 2: PROJECT AREA

This section describes the Monterey County area (Project Area) as a whole, with an emphasis on parameters germane to septic tank applications throughout the County. Monterey County is located along the central coast of California. It is bordered on the north by Santa Cruz County, on the east by San Benito, Fresno and Kings Counties, on the south by San Luis Obispo County and on the west by the Pacific Ocean. According to the U.S. Census Bureau, Monterey County has a total area of 3,771 square miles, of which 3,281 square miles is land, and 491 square miles is water. The County is approximately 130 miles long and approximately 30 miles wide. Refer to Figure 2-1 for the location of Monterey County.

The Salinas Valley extends approximately 90 miles, from the City of Salinas to King City, nestled between the Gabilan (east) and Santa Lucia (west) mountain ranges. Salinas River watershed extends from the headwaters (south of City of Atascadero, San Luis Obispo County) to the mouth of the river at Monterey Bay, draining approximately 5,000 square miles. Cities in the Salinas Valley include Gonzales, Greenfield, King City, Salinas and Soledad. Populated places that are unincorporated in the Salinas Valley include Bradley, Castroville, Chualar, Jolon, Lockwood, San Ardo, San Lucas and Spreckels. The highest densities of urban development (residential, commercial and industrial) are clustered in the northern part of the Salinas Valley, in the vicinity of Monterey Bay. Urban acreages have also experienced substantial growth, most of which has occurred in Marina, Castroville, Salinas, Gonzales, Greenfield, Soledad, and King City. Figure 2-1 identifies the location of these and other urban areas within Monterey County.

The climate in the Salinas Valley is Mediterranean and is moderated by the Pacific Ocean. Summers are generally mild and winters are cool. Precipitation is almost entirely rain with approximately 87 percent falling from November through April. Mean annual precipitation throughout the mountain ranges surrounding the Salinas Valley ranges from 15 to 60 inches, with about 20 inches occurring near the Gabilan Range to about 25 inches in the Santa Lucia Range.

Mean annual precipitation in the Valley itself ranges from 10 to 15 inches, with about 11 inches occurring in Soledad to approximately 14 inches at Nacimiento and San Antonio Reservoirs.

2.1 Population

As of the census of 2010, the County's population was 415,057, comprising 121,236 households. The population density at that time was 121 people per square mile with an average housing-unit density of 40 units per square mile. Most of the people live near the northern coast and Salinas Valley, while the southern coast and inland mountain regions are almost devoid of human habitation.

2.2 Board of Supervisors

At the local level, the County of Monterey is governed by the Monterey County Board of Supervisors. Like all county governing bodies in California, the Monterey County Board of Supervisors is the chief governing body for all unincorporated areas in the County boundaries.

The Board has five elected members, each of whom represents one of five districts. Taken together, the five districts comprise the entirety of the County. The Board conducts its meetings in the county seat, Salinas. The County is a member of the regional government agency, the Association of Monterey Bay Area Governments.

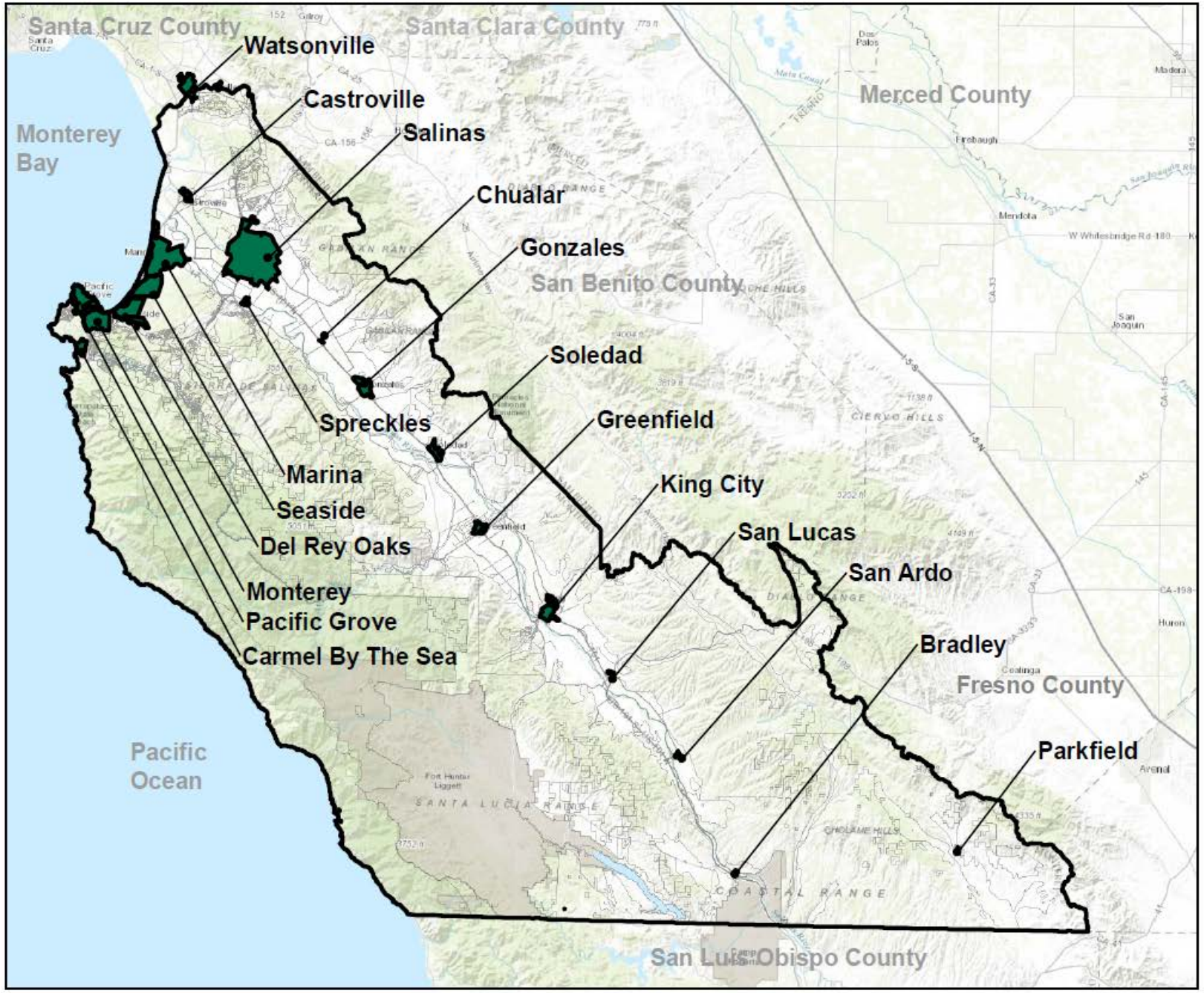
Supervisorial district boundaries are divided roughly equally according to population, using data from the most recent census. Boundaries are adjusted decennially based on data reported by the United States Census Bureau for the most recent census.

2.3 Unincorporated Portions of Monterey County

The majority of land within Monterey County is unincorporated (refer to Figure 2-1). The housing stock in the unincorporated areas of Monterey County is comprised primarily of single-family housing. The agricultural/rural areas of the County typically have single family homes on large parcels of land. More traditional “subdivision-type” homes built in recent decades can be found in several communities, such as Prunedale. There are also other, older communities in the County that have historically significant housing, such as the original factory town of Spreckels. The predominant housing type throughout the County regardless of geographic area is single-family housing.

According to the 2008-2012 American Community Survey (ACS), the total number of units in the unincorporated areas was 38.683 in 2012. Approximately 83 percent (32,143 units) of the housing stock was single-family units, the majority (29,903 units) of which was single-family detached units. Multi-family housing accounted for around 10 percent of the housing stock in 2012.

County-wide, single-family units have accounted for the majority of new construction in the unincorporated areas of the County in recent years. In comparison to the types of units in 2000, there has been a decrease in mobile homes in the unincorporated areas. Table 17 (County General Plan) provides information relating to housing unit growth by type (2000 and 2012).



MONTEREY COUNTY CALIFORNIA • 1850 •

Legend

County Boundary

JOB NO: 1105-0001
MAP DOC: EROSION
CREATED BY: APY
DATE: 2015-11-13

EXHIBIT NOTES:
WALLACE GROUP DID NOT PERFORM SURVEY SERVICES FOR THIS MAP.
IMAGERY PROVIDED BY ESRI.

N
W E
S

0 4.75 9.5 19
Miles

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

612 CLARION COURT
SAN LUIS OBISPO, CA 93401
T 805 544-4011 F 805 544-4284
www.wallacegroup.us

WALLACE GROUP

Local Agency Management Program For OWTS
Monterey County
Figure 2-1
County Map

Figure 2-2: Housing Unit Growth by Type – Unincorporated Areas (2000 and 2012)
(Draft Housing Element 2015-2023, June 2015, Table 17)

Unity Type	2000		2012	
	Number of Units	Percent of Total	Number of Units	Percent of Total
Single-Family	31,065	83.7%	32,143	83.1%
Detached	28,372	76.4%	29,903	77.3%
Attached	2,693	7.3%	2,240	5.8%
Multi-Family	3,143	8.5%	3,912	10.1%
2-4 Units	1,453	3.9%	2,078	5.4%
5+ Units	1,735	4.7%	1,834	4.7%
Mobile Homes	2,864	7.7%	2,628	6.8%
Total	37,117	100.0%	38,683	100.0%

Source: U.S. Census, 2000, and American Community Survey (ACS), 2008-2012.

Nearly 60 percent of the County's unincorporated land area is used for agricultural uses and about 28 percent is reserved for public and quasi-public uses. Approximately 1 percent of unincorporated land in Monterey County is developed with residential (0.7 percent), commercial (0.03 percent) and industrial (0.3 percent) uses. Most of this development is concentrated in the northern part of the County. Approximately 90 percent of the County's population growth between 1990 and 2009 occurred within incorporated cities.

The 2010 Monterey County General Plan, which governs in the non-coastal unincorporated area of the County, directs new residential development primarily to areas that are already committed to some degree of residential development. This emphasis allows the County to balance its commitment to accommodating its fair share of the regional housing needs with water supply and infrastructure limitations, and the need to conserve its extensive agricultural and natural resources.

2.4 Geology and Soils

The soils in Monterey County vary considerably as a result of the extremely varied topography (Figure 2-6a through Figure 2-7b). Silicon/quartz deposits are dominant along the beaches to the west, extending to rich alluvial deposits, prime for croplands, in the Salinas Valley to the east.

Because Monterey County exhibits a Mediterranean climate with warm dry summers and cool moist winters, potential evapotranspiration is greatest during the dry season, and thus soil profiles are rapidly depleted of moisture in the summer months and are recharged in the winter.

Figures 2-3a through 2-3c indicate the approximate soil classification system (“SCS”) soil drainage classes within Monterey County. The term “drainage class” refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. The soil

drainage class assigned to any one area therefore reflects the presence of free water or a water table in the soil. Whether a water table occurs or not is best determined using measurements made from wells. Such data are rare for soils, in part because such data should be collected one or more times per month for several years to ensure that observations include an “average year” of rainfall. In place of water table data, and during periods of low annual rainfall and drought, the depth to gray color or gray mottles is often considered to approximate the depth to the seasonal high water table.

Some soils are seasonally wet or subject to flooding. Some are too unstable to be used to support structures. Clayey or wet soils are poorly suited to use as septic tank dispersal/absorption fields. Although soil survey information is readily available for Monterey County through USDA and Natural Resources Conservation Service (“NRCS”) data sources, onsite investigation is needed. Due to the scale and mapping limitations of the SCS base map, small occurrences of some soil types are not shown, although they may be scattered over the entire area. Great differences in soil properties can occur within short distances.

Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration in Figure 2-3 through 2-3c, unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized. They include: (1) excessively drained, (2) somewhat excessively drained, (3) well drained, (4) moderately well drained, (5) somewhat poorly drained, (6) poorly drained, and (7) very poorly drained. These classes are defined in the "Soil Survey Manual."

The following definitions are provided as they relate to Figure 2-3 through 2-3c.

Excessively Drained:	Water is removed very rapidly and water holding capacity is very low. Soils are usually very sandy or gravelly or are shallow on steep slopes. Irrigation would be needed for crop production.
Well Drained:	Seasonal High Water table is not within the rooting zone long enough during the growing season to adversely affect yields. Gray colors or mottles are absent in the A and B horizons or occur below 48 inches. The B horizon is usually uniform in color.
Moderately Well Drained:	Seasonal High Water table is within the rooting zone for a sufficiently long period of time to adversely affect some crops unless the soil is artificially drained. Gray colors or mottles occur in the lower B and/or C horizons between 24 and 48 inches.
Poorly Drained:	Seasonal High Water table is at or near the surface during a large part of the year. The A horizons are thin (<10 inches), dark gray to black, and subsurface horizons are dominantly gray beginning at 10 inches or just below the A horizon.

Very Poorly Drained:	Seasonal High Water table is at the surface most of the year. The A horizons or O horizons are usually thick (> 10 inches), dark gray or black, and subsoils are gray. Thick A or O horizons and gray subsoil are used to identify this class, not simply gray mottles. These soils can be found on flat landscapes or in depressions. They are frequently flooded or ponded.

Hydrologic Soil Groups ("HSG") within the United Stated are assigned to one of four primary groups (A, B, C, and D) and three dual classes (A/D, B/D, C/D) by the NRCS. The HSG, along with land use, management practices, and hydrologic conditions, determine a soil associated runoff curve number. Runoff curve numbers are used to estimate direct runoff from rainfall. Soils assigned to a specific hydrologic soil group have similar physical and runoff characteristics. The assigned groups can be found by consulting the NRCS Field Office Technical Guide, published soil survey data bases, the NRCS Soil Data Mart Web site (*http://soildatamart.nrcs.usda.gov)*, and/or the Web Soil Survey Web site (http://websoilsurveys.nrcs.usda.gov).

These classes are based on the following factors:

- Intake and transmission of water under the conditions of maximum yearly wetness (thoroughly wet)
- Soil not frozen
- Bare soil surface
- Maximum swelling of expansive clays

Hydrologic Soil Groups are defined as follows:

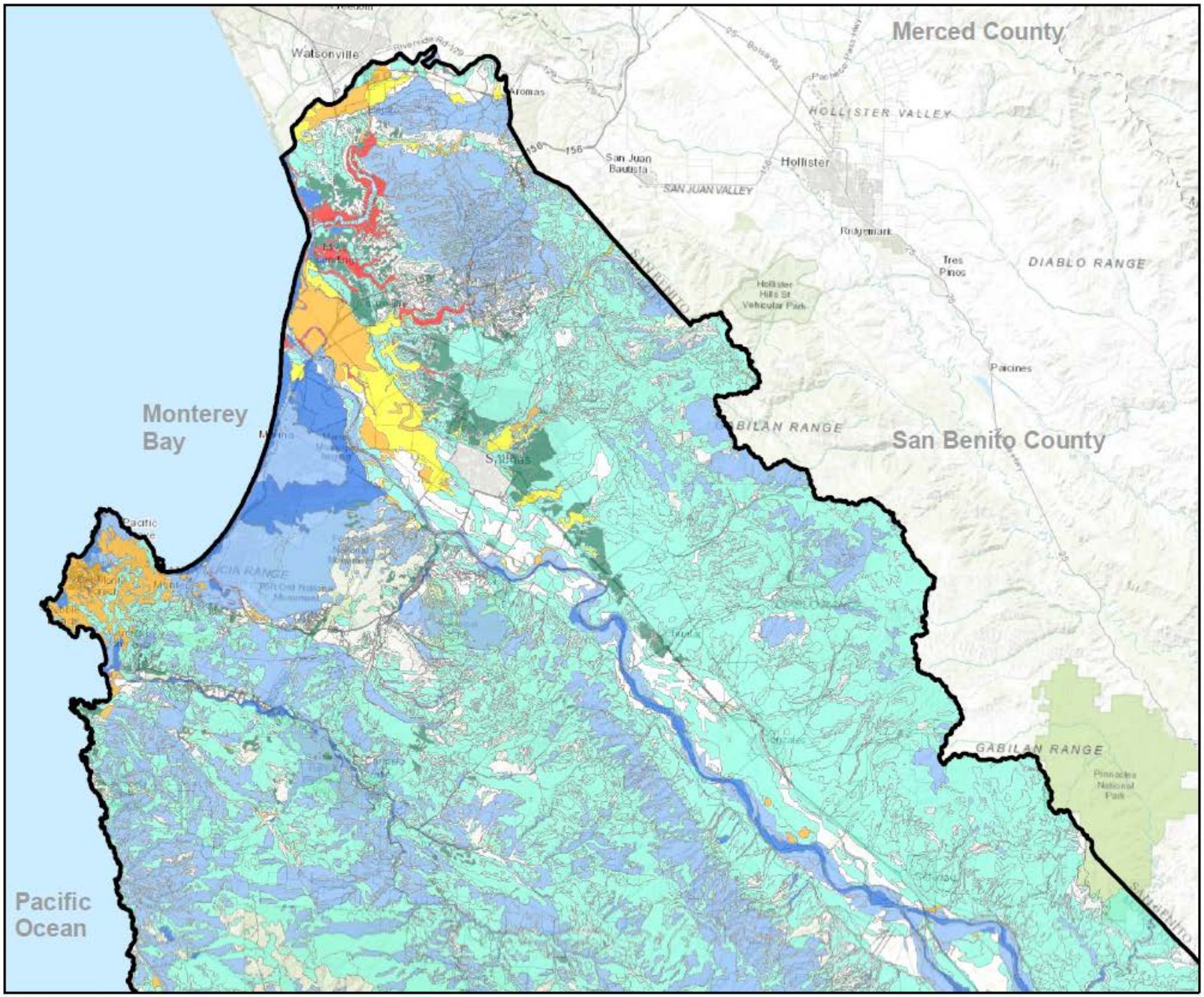
Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission. Water is transmitted freely through the soil. Group A soils typically have less than 10 percent clay and more than 90 percent sand or gravel and have gravel or sand textures. Some soils having loamy sand, sandy loam, loam or silt loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission which is unimpeded. Group B soils typically have between 10 percent and 20 percent clay and 50 percent to 90 percent sand and have loamy sand or sandy loam textures. Some soils having loam, silt loam, silt, or sandy clay loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission, as transmission is typically somewhat restricted. Group C soils typically have between 20 percent and 40 percent clay and less than 50 percent sand and have loam, silt loam, sandy clay loam, clay loam, and sandy silt loam textures. Some soils having clay, silty clay, or sandy clay textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission, as water movement through the soil is restricted or very restricted. Group D soils typically have greater than 40 percent clay, less than 50 percent sand, and have clayey textures. All soils with a depth to water impervious layer less than 20 inches and all soils with a water table within 24 inches of the surface are in this group, although some may have a dual classification, if they can be adequately drained. If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Throughout Monterey County, Hydrologic Soil Groups vary considerably. A site specific analysis is required to identify geology formations present at proposed OWTS locations. As shown in Figure 2-3d, highly infiltrative soils are typically located with the Salinas Valley River Basin and at the mouth of the Salinas River. Soils having a slow infiltration rate with high runoff potential are typically located in the upper elevations of the Monterey mountain ranges.



Legend

- County Boundary
- Excessively Drained
- Somewhat Excessively Drained
- Well Drained
- Moderately Well Drained
- Poorly Drained
- Somewhat Poorly Drained
- Very Poorly Drained
- No Information

JOB NO: 1105-0001
CREATED BY: APY
DATE: 2015-11-13

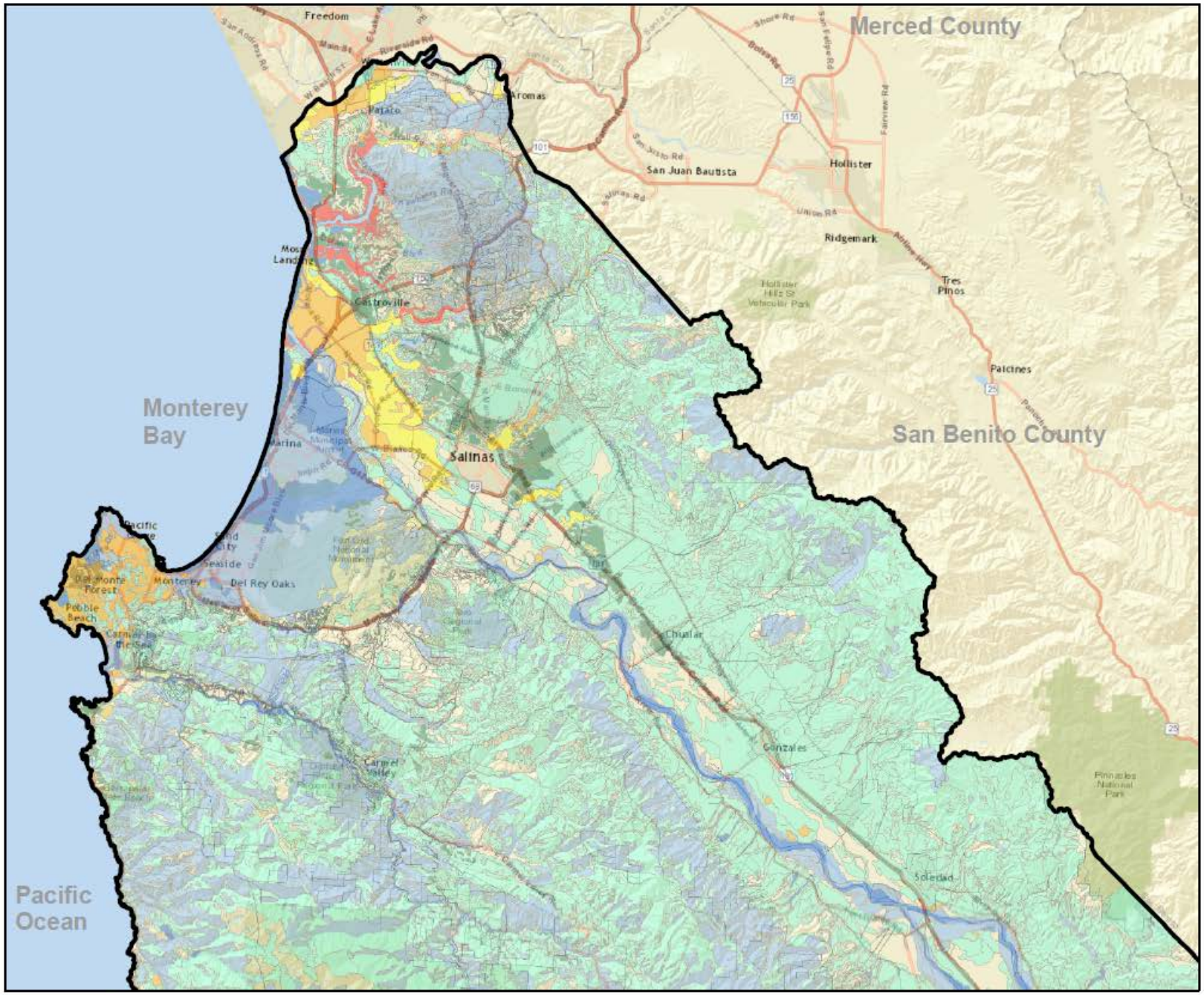
EXHIBIT NOTES:
WALLACE GROUP DID NOT PERFORM SURVEY SERVICES FOR THIS MAP.
IMAGERY PROVIDED BY ESRI.

N
W E
S

0 2.5 5 10
Miles

WALLACE GROUP
CIVIL ENGINEERING
CONSTRUCTION MANAGEMENT
LANDSCAPE ARCHITECTURE
MECHANICAL ENGINEERING
PLANNING
PUBLIC WORKS ADMINISTRATION
SURVEYING/GIS SOLUTIONS
WATER RESOURCES
612 CLARION COURT
SAN LUIS OBISPO, CA 93401
T 805 544-4011 F 805 544-4294
www.wallacegroup.us

Local Agency Management Program For OWTS
Monterey County
Figure 2-3
Soil Drainage Classes



Legend

- County Boundary
- Excessively Drained
- Somewhat Excessively Drained
- Well Drained
- Moderately Well Drained
- Poorly Drained
- Somewhat Poorly Drained
- Very Poorly Drained
- No Information

JOB NO: 1105-0001
CREATED BY: APY
DATE: 2015-11-13

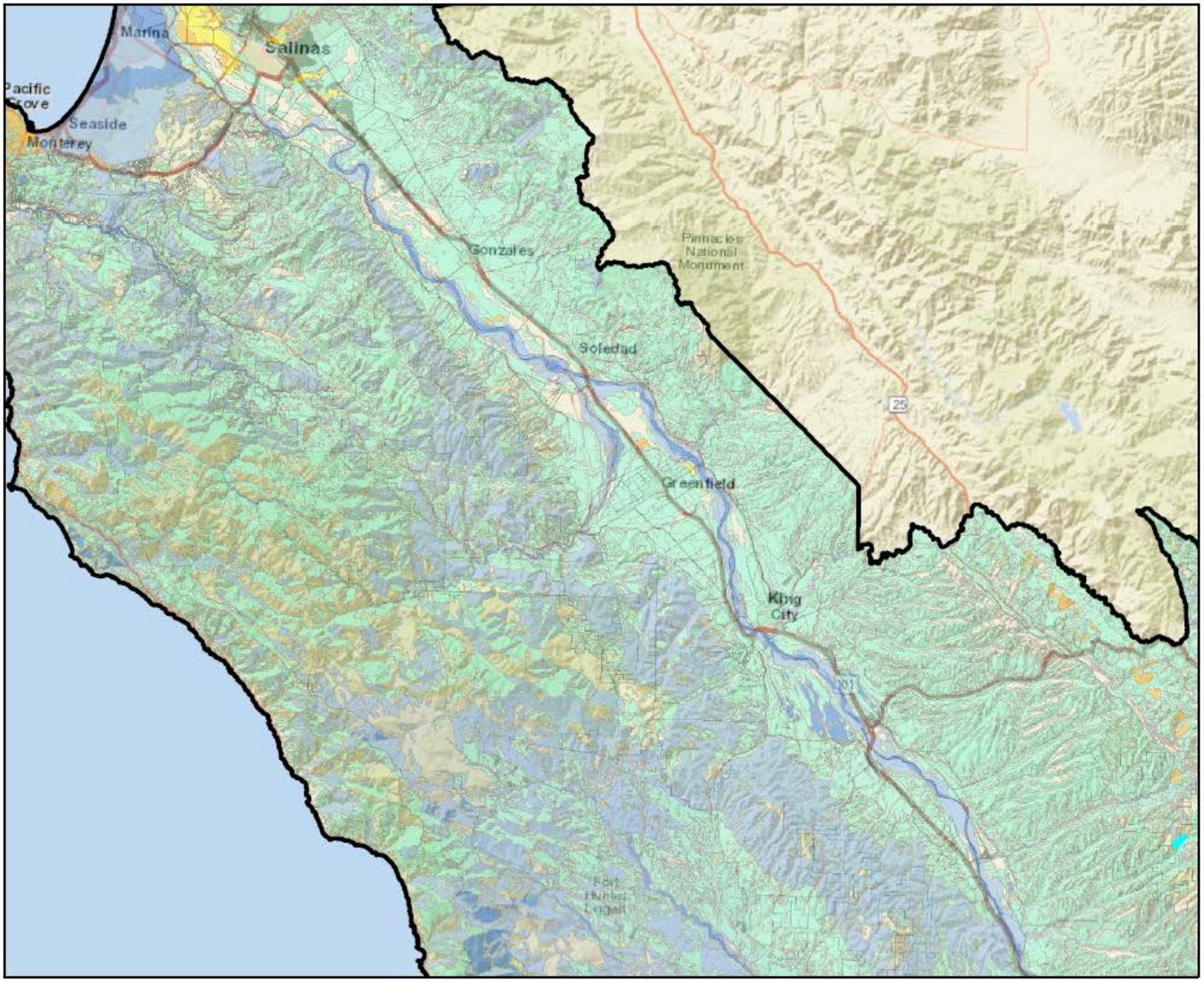
EXHIBIT NOTES:
WALLACE GROUP DID NOT PERFORM SURVEY SERVICES FOR THIS MAP.
IMAGERY PROVIDED BY ESRI.

N
W E
S

0 2.5 5 10
Miles

WALLACE GROUP
CIVIL ENGINEERING
CONSTRUCTION MANAGEMENT
LANDSCAPE ARCHITECTURE
MECHANICAL ENGINEERING
PLANNING
PUBLIC WORKS ADMINISTRATION
SURVEYING/GIS SOLUTIONS
WATER RESOURCES
612 CLARION COURT
SAN LUIS OBISPO, CA 93401
T 805 544-4011 F 805 544-4294
www.wallacegroup.us

Local Agency Management Program For OWTS
Monterey County
Figure 2-3a
Soil Drainage Classes



Legend

- County Boundary
- Excessively Drained
- Somewhat Excessively Drained
- Well Drained
- Moderately Well Drained
- Poorly Drained
- Somewhat Poorly Drained
- Very Poorly Drained
- No Information

JOB NO: 1105-0001
CREATED BY: APY
DATE: 2015-11-13

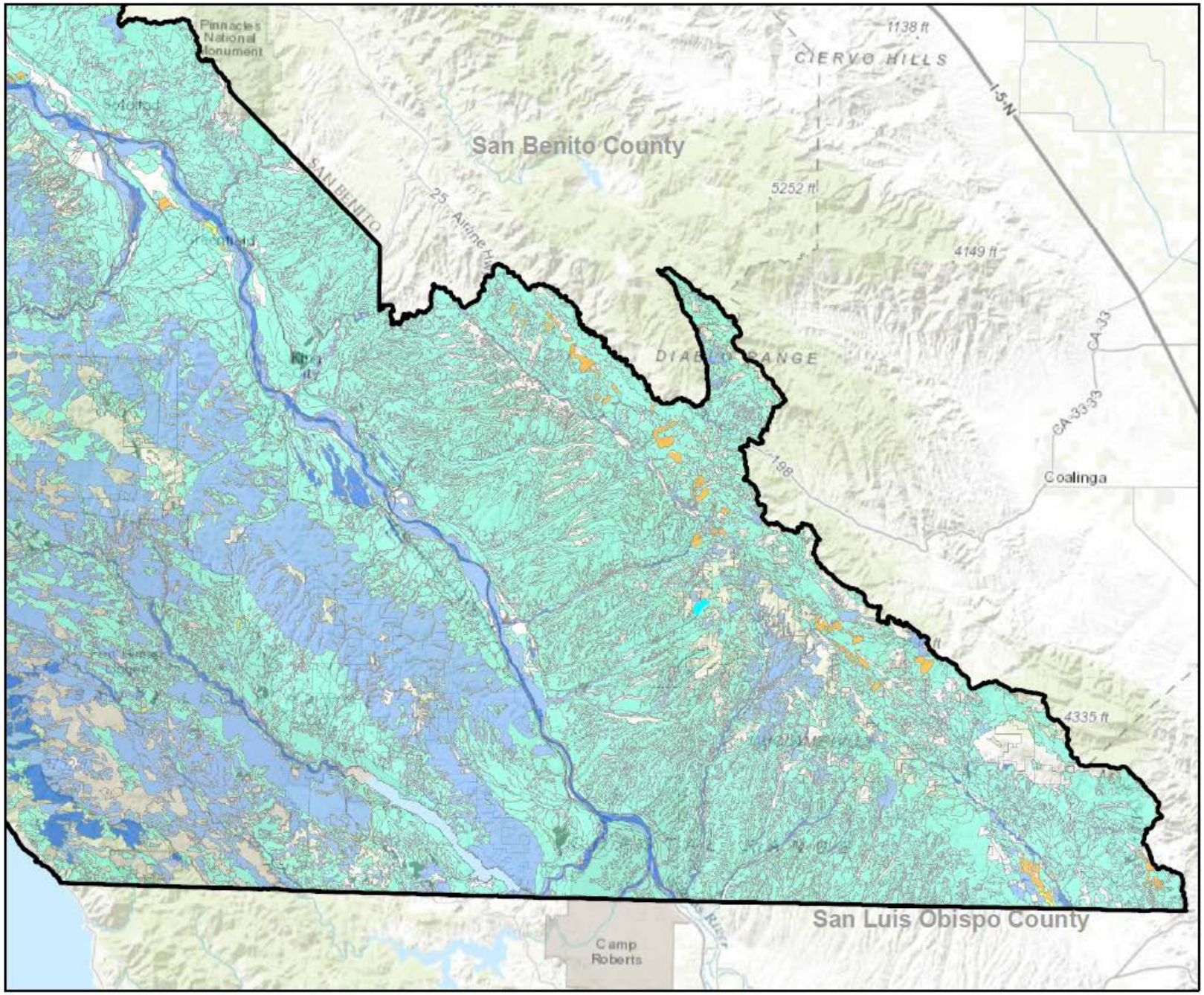
EXHIBIT NOTES:
WALLACE GROUP DID NOT PERFORM SURVEY SERVICES FOR THIS MAP.
IMAGERY PROVIDED BY ESRI.

N
W E
S

0 2.5 5 10
Miles

WALLACE GROUP
CIVIL ENGINEERING
CONSTRUCTION MANAGEMENT
LANDSCAPE ARCHITECTURE
MECHANICAL ENGINEERING
PLANNING
PUBLIC WORKS ADMINISTRATION
SURVEYING/GIS SOLUTIONS
WATER RESOURCES
612 CLARION COURT
SAN LUIS OBISPO, CA 93401
T 805 544-4011 F 805 544-4294
www.wallacegroup.us

Local Agency Management Program For OWTS
Monterey County
Figure 2-3b
Soil Drainage Classes



Legend

- County Boundary
- Excessively Drained
- Somewhat Excessively Drained
- Well Drained
- Moderately Well Drained
- Poorly Drained
- Somewhat Poorly Drained
- Very Poorly Drained
- No Information

JOB NO: 1105-0001
CREATED BY: APY
DATE: 2015-11-13

EXHIBIT NOTES:
WALLACE GROUP DID NOT PERFORM SURVEY SERVICES FOR THIS MAP.
IMAGERY PROVIDED BY ESRI.

N
W E
S

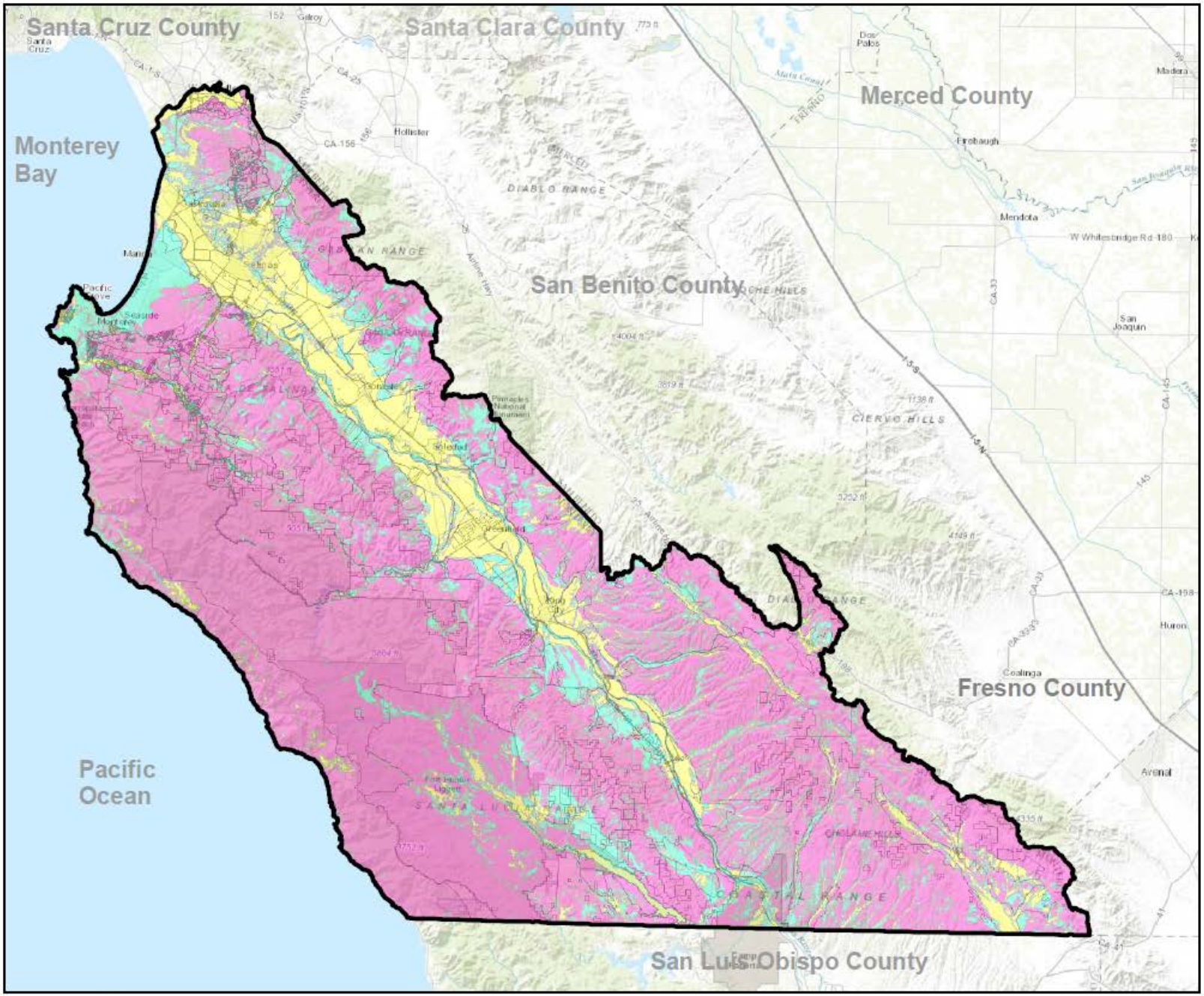
0 2.5 5 10
Miles

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

612 CLARION COURT
SAN LUIS OBISPO, CA 93401
T 805 544-4011 F 805 544-4294
www.wallacegroup.us

WALLACE GROUP

Local Agency Management Program For OWTS
Monterey County
Figure 2-3c
Soil Drainage Classes



Legend

- County Boundary
- Variable
- High
- Moderate
- Low

JOB NO: 1105-0001
MAP DOC: EROSION
CREATED BY: APY
DATE: 2015-11-13

EXHIBIT NOTES:
WALLACE GROUP DID NOT PERFORM SURVEY SERVICES FOR THIS MAP.
IMAGERY PROVIDED BY ESRI.

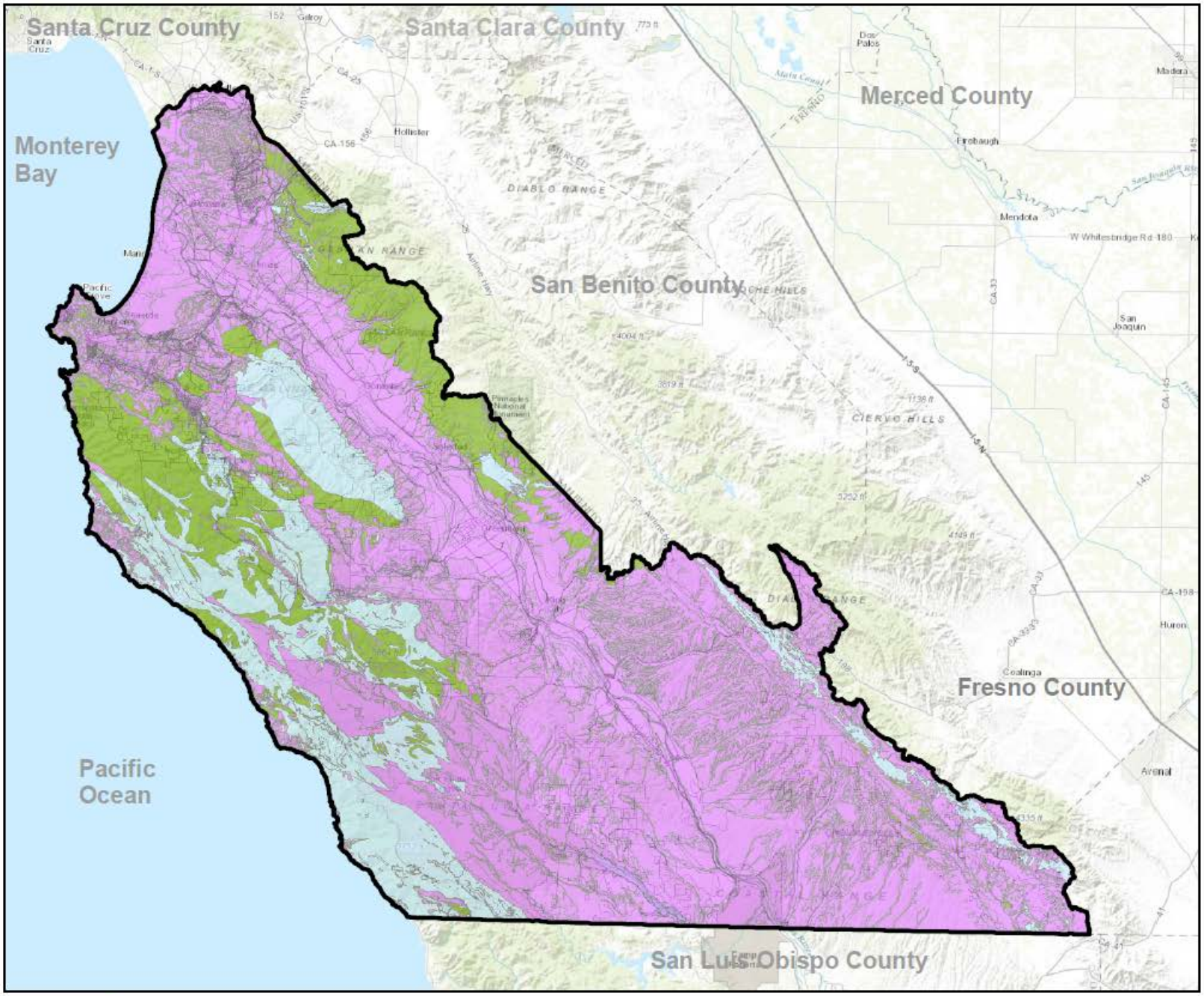
N
W E
S

0 5 10 20
Miles

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

612 CLARION COURT
SAN LUIS OBISPO, CA 93401
T 805 544-4011 F 805 544-4294

Local Agency Management Program For OWTS
Monterey County
Figure 2-4
Soil Erosion Potential



MONTEREY COUNTY CALIFORNIA • 1850 •

Legend

County Boundary

Geology

- Igneous
- Metamorphic
- Sedimentary

JOB NO: 1105-0001
MAP DOC: GEOLOGY
CREATED BY: APY
DATE: 2015-11-13

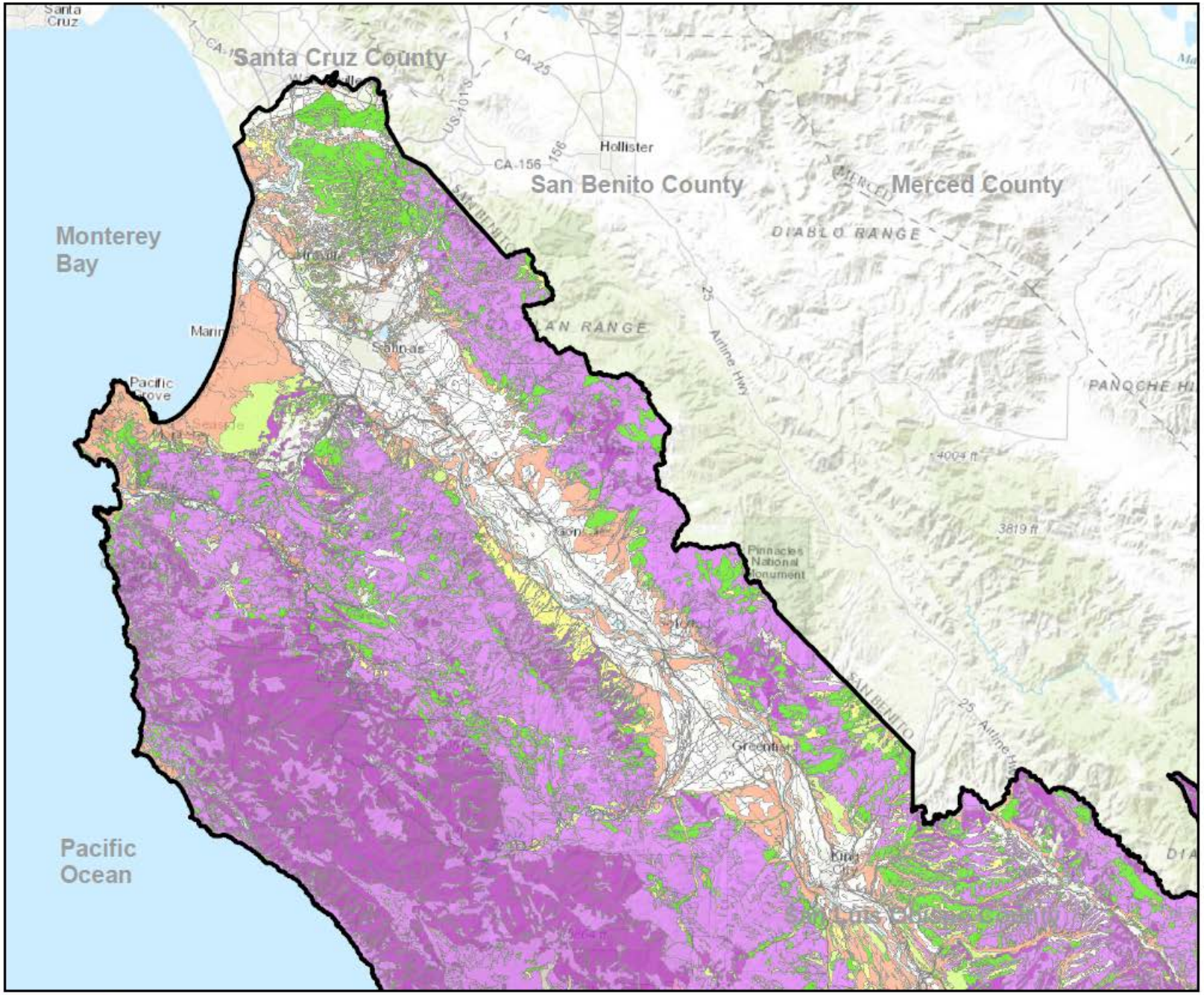
EXHIBIT NOTES:
WALLACE GROUP DID NOT PERFORM SURVEY SERVICES FOR THIS MAP.
IMAGERY PROVIDED BY ESRI.

N
W E
S

0 5 10 20
Miles

WALLACE GROUP
CIVIL ENGINEERING
CONSTRUCTION MANAGEMENT
LANDSCAPE ARCHITECTURE
MECHANICAL ENGINEERING
PLANNING
PUBLIC WORKS ADMINISTRATION
SURVEYING/GIS SOLUTIONS
WATER RESOURCES
612 CLARION COURT
SAN LUIS OBISPO, CA 93401
T 805 544-4011 F 805 544-4294

Local Agency Management Program For OWTS
Monterey County
Figure 2-5
Geology Type



Legend

- County Boundary
- 0%
- 1%
- 2%
- 5%
- 9%
- 15%
- 25%
- 30%
- 40%
- 50%

JOB NO: 1105-0001
MAP DOC: SLOPE
CREATED BY: APY
DATE: 2015-11-13

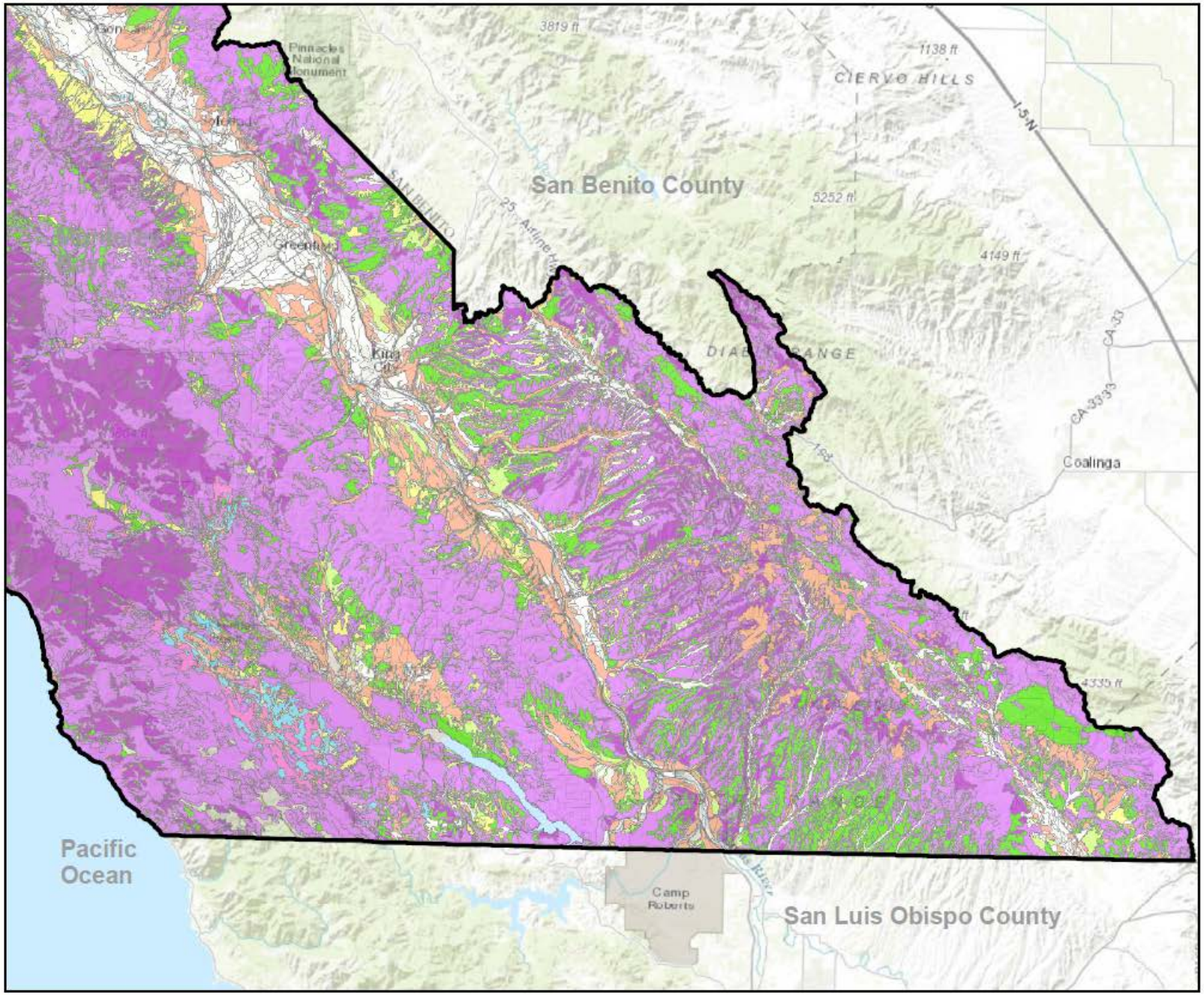
EXHIBIT NOTES:
WALLACE GROUP DID NOT PERFORM SURVEY SERVICES FOR THIS MAP. IMAGERY PROVIDED BY ESRI.

N
W E
S

0 4 8 16
Miles

WALLACE GROUP
CIVIL ENGINEERING
CONSTRUCTION MANAGEMENT
LANDSCAPE ARCHITECTURE
MECHANICAL ENGINEERING
PLANNING
PUBLIC WORKS ADMINISTRATION
SURVEYING/GIS SOLUTIONS
WATER RESOURCES
612 CLARION COURT
SAN LUIS OBISPO, CA 93401
T 805 544-4011 F 805 544-4294

Local Agency Management Program For OWTS
Monterey County
Figure 2-6a
Average Ground Slope



MONTEREY COUNTY CALIFORNIA • 1850 •

Legend

- County Boundary
- 0%
- 1%
- 2%
- 5%
- 9%
- 15%
- 25%
- 30%
- 40%
- 50%

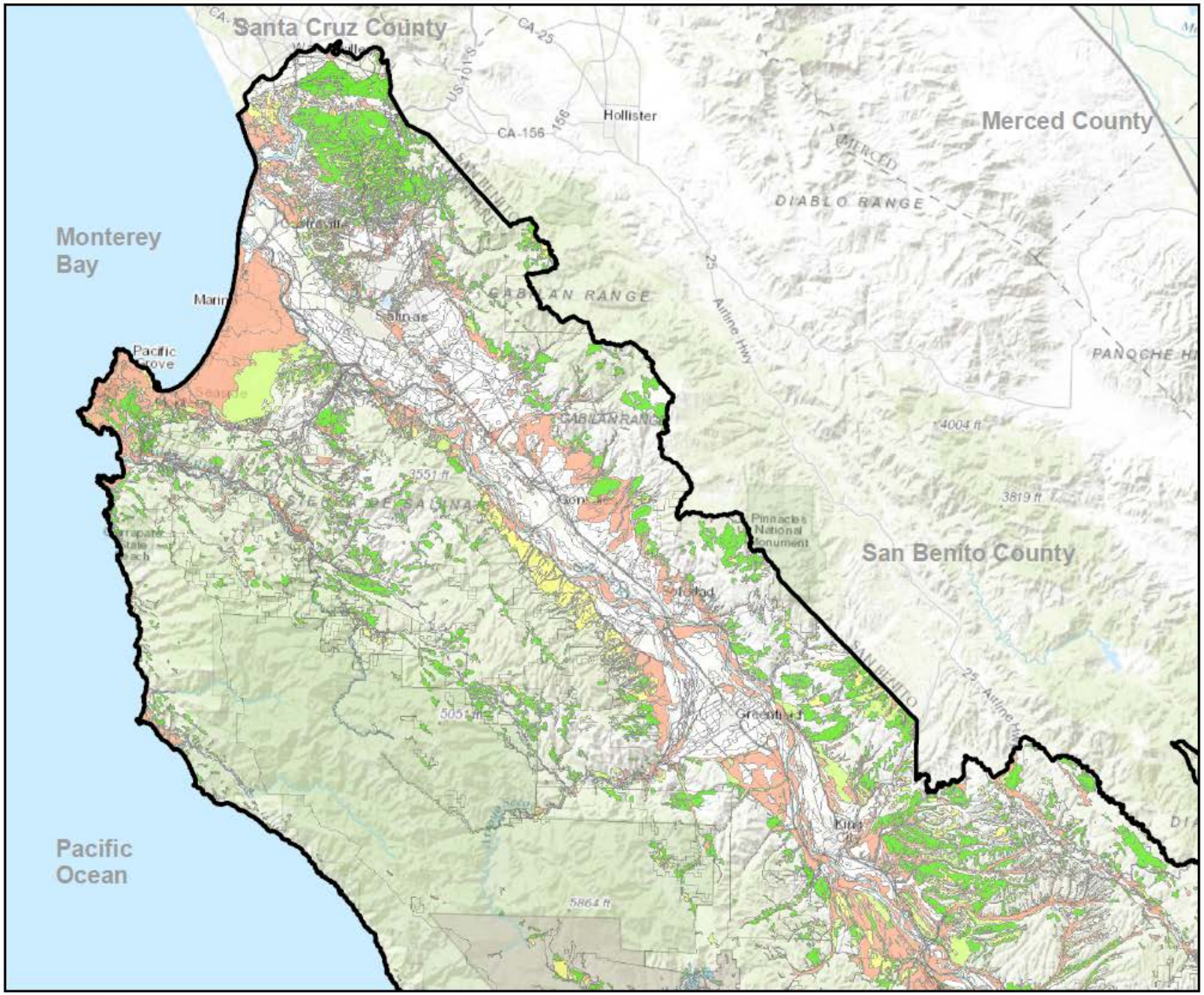
JOB NO: 1105-0001
MAP DOC: SLOPE
CREATED BY: APY
DATE: 2015-11-13
EXHIBIT NOTES:
WALLACE GROUP DID NOT PERFORM SURVEY SERVICES FOR THIS MAP.
IMAGERY PROVIDED BY ESRI.

N
W E
S

0 4 8 16
Miles

WALLACE GROUP
CIVIL ENGINEERING
CONSTRUCTION MANAGEMENT
LANDSCAPE ARCHITECTURE
MECHANICAL ENGINEERING
PLANNING
PUBLIC WORKS ADMINISTRATION
SURVEYING/GIS SOLUTIONS
WATER RESOURCES
612 CLARION COURT
SAN LUIS OBISPO, CA 93401
T 805 544-4011 F 805 544-4294

Local Agency Management Program For OWTS
Monterey County
Figure 2-6b
Average Ground Slope



Legend

- County Boundary
- 0%
- 1%
- 2%
- 5%
- 9%
- 15%
- 25%

JOB NO: 1105-0001
MAP DOC: SLOPE
CREATED BY: APY
DATE: 2015-11-13

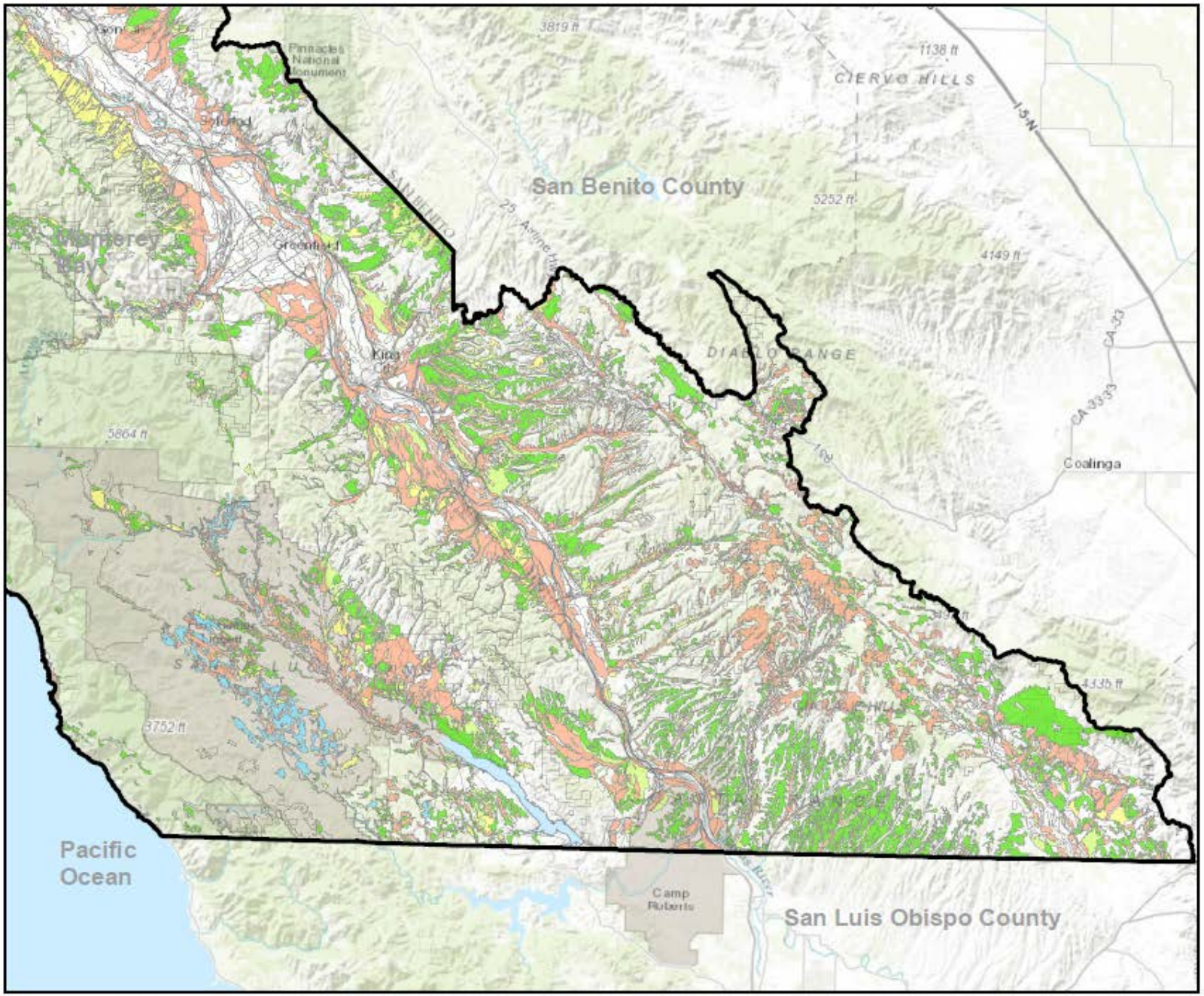
EXHIBIT NOTES:
WALLACE GROUP DID NOT PERFORM SURVEY SERVICES FOR THIS MAP.
IMAGERY PROVIDED BY ESRI.

N
W E
S

0 4 8 16
Miles

WALLACE GROUP
CIVIL ENGINEERING
CONSTRUCTION MANAGEMENT
LANDSCAPE ARCHITECTURE
MECHANICAL ENGINEERING
PLANNING
PUBLIC WORKS ADMINISTRATION
SURVEYING/GIS SOLUTIONS
WATER RESOURCES
612 CLARION COURT
SAN LUIS OBISPO, CA 93401
T 805 544-4011 F 805 544-4294

Local Agency Management Program For OWTS
Monterey County
Figure 2-7a
Average Ground Slope (≤ 25%)



Legend

- County Boundary
- 0%
- 1%
- 2%
- 5%
- 9%
- 15%
- 25%

JOB NO: 1105-0001
MAP DOC: SLOPE
CREATED BY: APY
DATE: 2015-11-13
EXHIBIT NOTES:
WALLACE GROUP DID NOT PERFORM SURVEY SERVICES FOR THIS MAP.
IMAGERY PROVIDED BY ESRI.

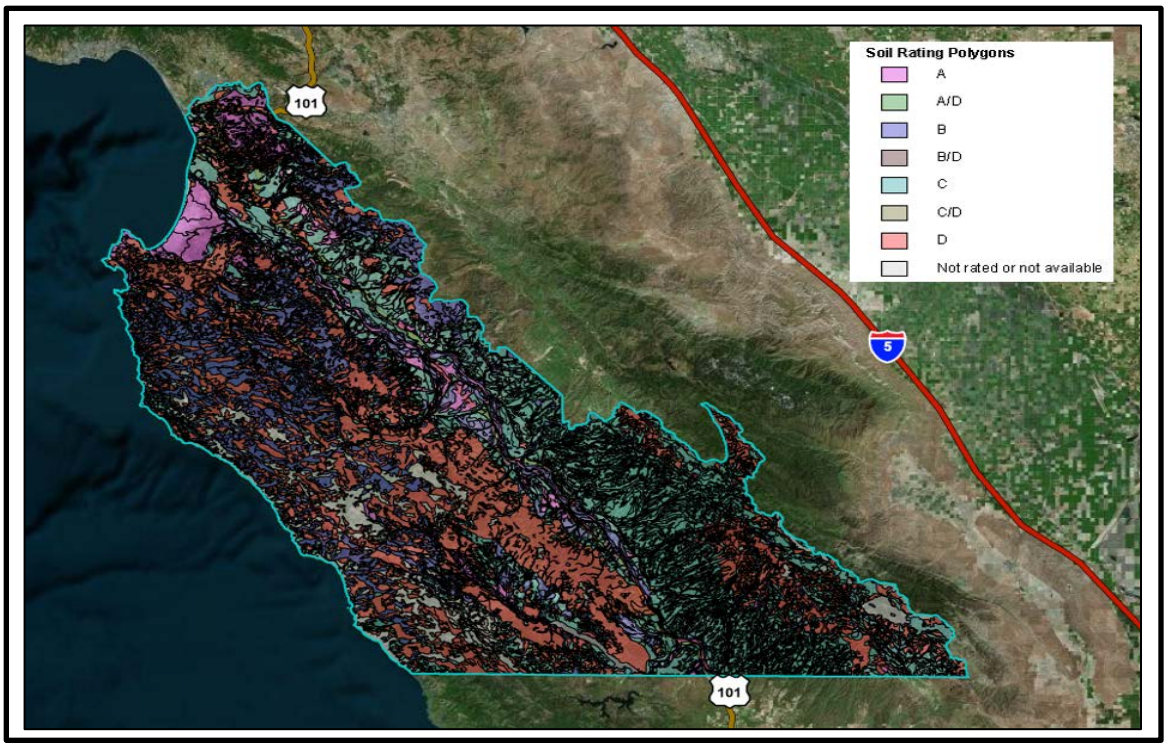
N
W E
S

0 4 8 16
Miles

WALLACE GROUP
CIVIL ENGINEERING
CONSTRUCTION MANAGEMENT
LANDSCAPE ARCHITECTURE
MECHANICAL ENGINEERING
PLANNING
PUBLIC WORKS ADMINISTRATION
SURVEYING/GIS SOLUTIONS
WATER RESOURCES
612 CLARION COURT
SAN LUIS OBISPO, CA 93401
T 805 544-4011 F 805 544-4294

Local Agency Management Program For OWTS
Monterey County
Figure 2-7b
Average Ground Slope (≤ 25%)

Figure 2-3d – Hydrologic Soil Group



Source: United States Department of Agriculture and Natural Resources Conservation Services

Figure 2-4 identifies soil erosion potential within Monterey County. As shown, the majority of the soils within the County are susceptible to high levels of water induced erosion. Erosion potential typically increases with increases in ground slope (refer to Figure 2-6a, 2-6b for average ground slopes throughout Monterey County).

Geology formations by type within Monterey County is identified in Figure 2-5. As shown, the majority of the County is comprised of sedimentary rock formations. Sedimentary rocks are formed from particles of sand, shells, pebbles, and other fragments of materials. Gradually, the sediment accumulates in layers over a long period of time and hardens into rock. Generally, sedimentary rock is fairly soft and may break apart or crumble easily. A site specific analysis is required to identify geology formations present at proposed OWTS locations.

The type and structure of the rock formation has a strong influence on groundwater conditions, which, in turn, affects the suitability and potential impacts of onsite wastewater disposal. In hard rock areas, such as granite, water movement is generally restricted to fracture zones, often referred to as the “secondary” permeability, which may offer little in the way of treatment and the potential for wastewater effects to be transported significant distances. Some rock types, such as sandstones, conglomerates, and limestones, have significant “primary” permeability, which provides for transmission of water through the interstices in the rock itself, where additional filtering and treatment can occur. Contacts between different rock types or layers are often avenues for the movement of subsurface waters; and springs and seeps are often found where

fractures and geologic contacts come to the surface. Where the underlying rock lacks significant primary or secondary permeability, a water table may form near the ground surface that interferes with the suitability and operation of OWTS. Areas of steep slopes and weak rock types generally pose the greatest slope stability concerns and severe limitation for subsurface wastewater disposal.

Figures 2-6a through 2-7b identify average ground slopes within the County. Although soil survey information is readily available for Monterey County through USDA and NRCS data sources, onsite investigation to determine actual ground slope at the proposed OWTS location is needed. Due to the scale and mapping limitations of Figures 2-6a through 2-7b, small occurrences of average ground slope are not shown. Great differences in average ground slope can occur within short distances.

2.5 Water Resources

Monterey County is underlain with aquifers that provide a high quality water source essential for municipal supply and agriculture as well as every other type of land use. Groundwater is the principal source of water in the County, accounting for 95% of the total water use. As a result, Monterey County is dependent on its own local sources of water and does not receive imported water from other regions in California. The County derives all of its total water supply from groundwater with minor exceptions.

The three major watersheds in Monterey County - Salinas River, Carmel River, and Pajaro River - all have significant constraints. Erosion associated with agriculture has deteriorated surface water quality in Salinas and Pajaro Valleys. High nitrate levels have been recorded in the Salinas Valley and in the North County areas. Groundwater overdraft resulting in seawater intrusion is a significant problem in the North County, which was the major driver to develop the extensive, and highly successful, agricultural recycled water program in this area.

According to California Department of Water Resources Bulletin 118, there are five major groundwater basins within Monterey County: Salinas Valley, Carmel Valley, Cholame Valley, Lockwood Valley and Peach Tree Valley, in addition to a portion of the Pajaro Valley basin. Wells that are used to produce groundwater are operated by a variety of different entities (cities, special assessment districts, investor owned utilities, mutual water companies and individual property owners) throughout the County. Increases in groundwater pumping practices have resulted in localized over-drafting and have caused salt water intrusion in the Pajaro and Salinas Valley groundwater basins.

Water is necessary to support domestic, industrial and agricultural demand, recreational uses, as well as sustaining fish and wildlife habitats. Five aquatic areas within Monterey County have been designated by the state as Areas of Special Biological Significance (“ASBS”) and therefore require special protection (Pacific Grove Marine Gardens Fish Refuge and Hopkins Marine Life Refuge; Point Lobos Ecological Preserve; Carmel Bay; Julia Pfeiffer Burns Underwater Park; and the ocean area surrounding the mouth of Salmon Creek).

Water quality problems are predominately related to waste emissions from point and nonpoint sources and geologic limitations. Typical point sources are domestic and industrial wastewater sites. Non-point sources are more difficult to address and may include animal husbandry operations, natural mineralization, automobile emissions, and urban runoff. Three principal problems affect the County's groundwater basins (salt water intrusion, nitrate pollution, natural reactions). Suspected sources of nitrate pollution include wastewater discharges, agriculture return water, and OWTS overloading.

Seawater intrusion into groundwater sources is problematic near Pajaro and Castroville. Some private water system wells in the Granite Ridge area of North County are experiencing a marked reduction in water capacity due to high Total Dissolved Solids ("TDS") concentrations. Presently, the County is exploring the possibility of grant funds and possible future projects to address the situation. Also, arsenic exceeding the maximum contaminant level ("MCL") in water systems is becoming an issue in North County and the El Toro planning area (which overlies the Corral de Tierra Area subbasin), particularly in light of the 2008 revised arsenic maximum contaminant level ("MCL") of 10 part per billion (formerly 50 ppb).

In South County, heavy metals such as cadmium and selenium are exceeding the MCL and are beginning to appear in new wells. High levels of secondary contaminants are also becoming more commonplace. Secondary contaminants are associated with aesthetic nuisances such as odor, taste, and staining (i.e. laundry and porcelain fixtures), and are not a health hazard, but are problematic at and above the established thresholds contained in the secondary MCLs specified by the State Water Board, Division of Drinking Water (formerly California Department of Public Health).

2.6 Wastewater Resources

Wastewater in Monterey County is managed typically by OWTS and centralized wastewater treatment plants. The focus of this management program is OWTS, used primarily in rural areas where there is low density residential development and no available nearby centralized systems. Since groundwater quality is critical for continued operation of OWTS within the County, higher density development and urban areas are required to include wastewater treatment facilities to handle the higher density sewage loads by the policies set forth in Goal PS-4 of the 2010 Monterey County General Plan. The North County Coastal Land Use Plan ("LUP") includes Key Policy 3.2.1 which promotes centralized sewer or treatment facilities in areas designated for high density development concentration and infilling, and in areas which present significant public health hazards due to continued failure of OWTS which cannot be corrected by alternative OWTS. Key Policy 3.3.2 in the Carmel Area LUP specifies that the County should support wastewater disposal systems and the establishment of water quality management and monitoring programs intended to protect and maintain a high level of water quality in the ASBS and in the Carmel area's coastal streams. Policy 115 of the Del Monte Forest LUP states that development shall only be approved if it is first clearly demonstrated that there is adequate, long term public wastewater treatment capacity to serve such development.

Although, the Big Sur Coast LUP does not contain specific policies that require centralized wastewater treatment facilities to serve higher density development, the area is subject to the Porter-Cologne Water Quality Control Act which authorizes the State Water Board, who delegates authority to Monterey County, to regulate all discharges that could affect the water quality and beneficial uses of waters of the State. Therefore, during the development review process the County is able to determine the most appropriate method of wastewater disposal and require that it be implemented.

Wastewater treatment and disposal operations in the County are managed by various entities using a variety of treatment technologies. As indicated earlier, most properties in the unincorporated rural areas utilize OWTS, which are regulated by the County. The majority of development in the more densely populated and incorporated areas of the County are served by regional or municipal treatment and collection systems, regulated by the Central Coast RWQCB.

2.6.1 Monterey One Water

Originally called the Monterey Regional Water Pollution Control Agency, Monterey One Water (M1W) provides wastewater treatment services to 250,000 people in Boronda, Castroville, Del Rey Oaks, Marina, Monterey, Pacific Grove, Salinas, Sand City, Seaside, and unincorporated Monterey County. Formed due to the Clean Water Act of 1972, M1W has been a regional resource in wastewater treatment for decades. To help meet area water needs, M1W uses a tertiary process to turn wastewater into usable water for irrigation. This process creates recycled water that is distributed through the Castroville Seawater Intrusion Project (CSIP) to irrigate 12,000 acres of prime farmland in northern Monterey County. This was accomplished through a partnership with the Monterey County Water Resources Agency. Since

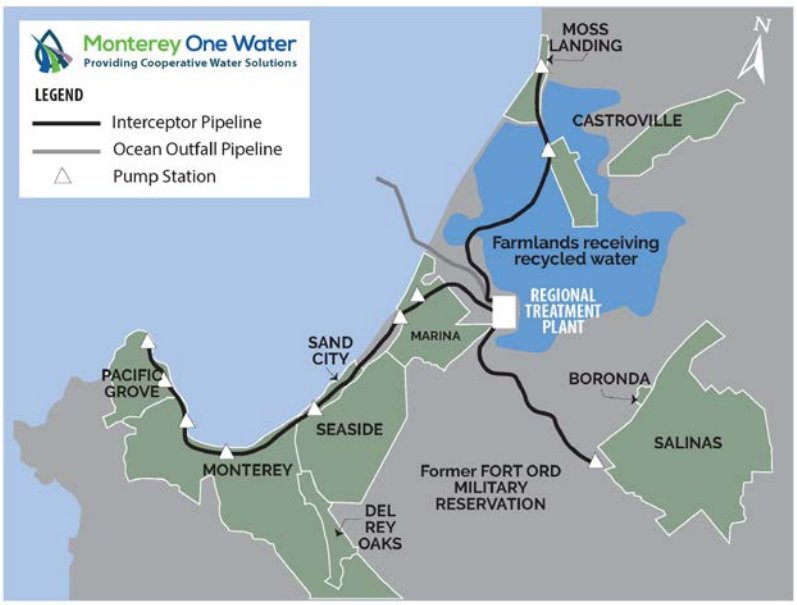


Figure 2-8 Monterey One Water (M1W) Service Area Map
Source: M1W

the project's inception in 1998, 76.3 billion gallons of recycled water have been applied to high value food crops that include lettuce, celery, broccoli, cauliflower, strawberries, and artichokes. CSIP reduces seawater intrusion by supplying about two-thirds of the water used to irrigate crops in the project area and reducing the reliance of groundwater for the growers in the project area. In addition to wastewater treatment and water recycling, M1W is currently in the construction phase of an Advanced Water Purification Facility to produce potable groundwater. This project - Pure Water Monterey (PWM) - will use new and existing waste water sources to provide a safe, environmentally sustainable, and economically responsible water supply for use by urban communities on the Monterey Peninsula as well as increase the amount of water available for agriculture irrigation. M1W is governed by a Board of Directors representing each of its jurisdictions, and the urban and agricultural areas it serves are shown in Figure 2-8

2.6.2 Carmel Area Wastewater District

Carmel Area Wastewater District ("CAWD") is owned, operated, and managed by the community via an elected Board of Directors. Like the majority of wastewater treatment facilities in California, CAWD is a Publicly Owned Treatment Works or POTW. CAWD provides wastewater treatment services within its service area boundary. Current wastewater flows to the plant are approximately 1.1 million gallons per day. CAWD is a full reclamation facility providing tertiary treatment of its wastewater. Reclaimed wastewater from the CAWD facility

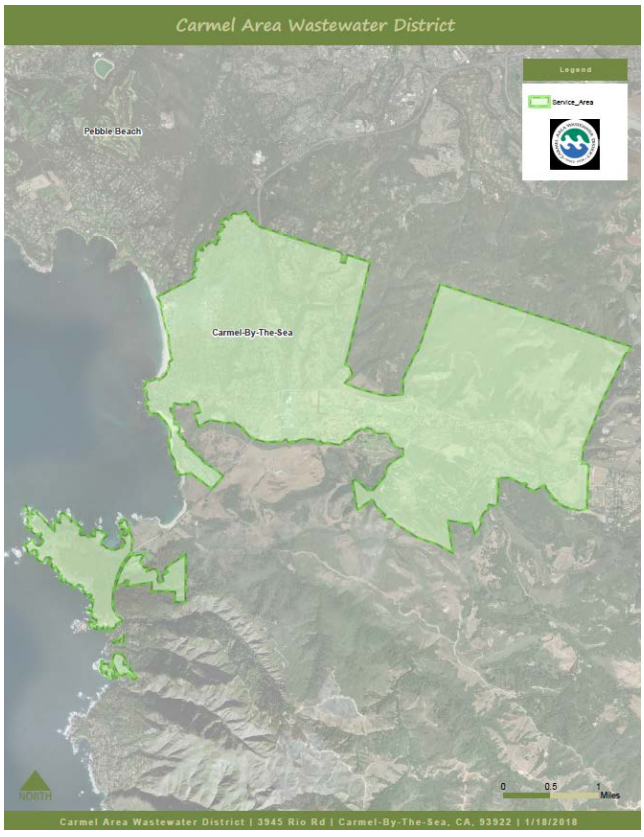


Figure 2-9 Carmel Area Wastewater District (CAWD) Service Area Map

Source: CAWD

provides 100% of the irrigation needs for all of the golf courses located in Del Monte Forest. The CAWD service area is delineated in Figure 2-9.

2.7 Groundwater Recharge Areas within Monterey County

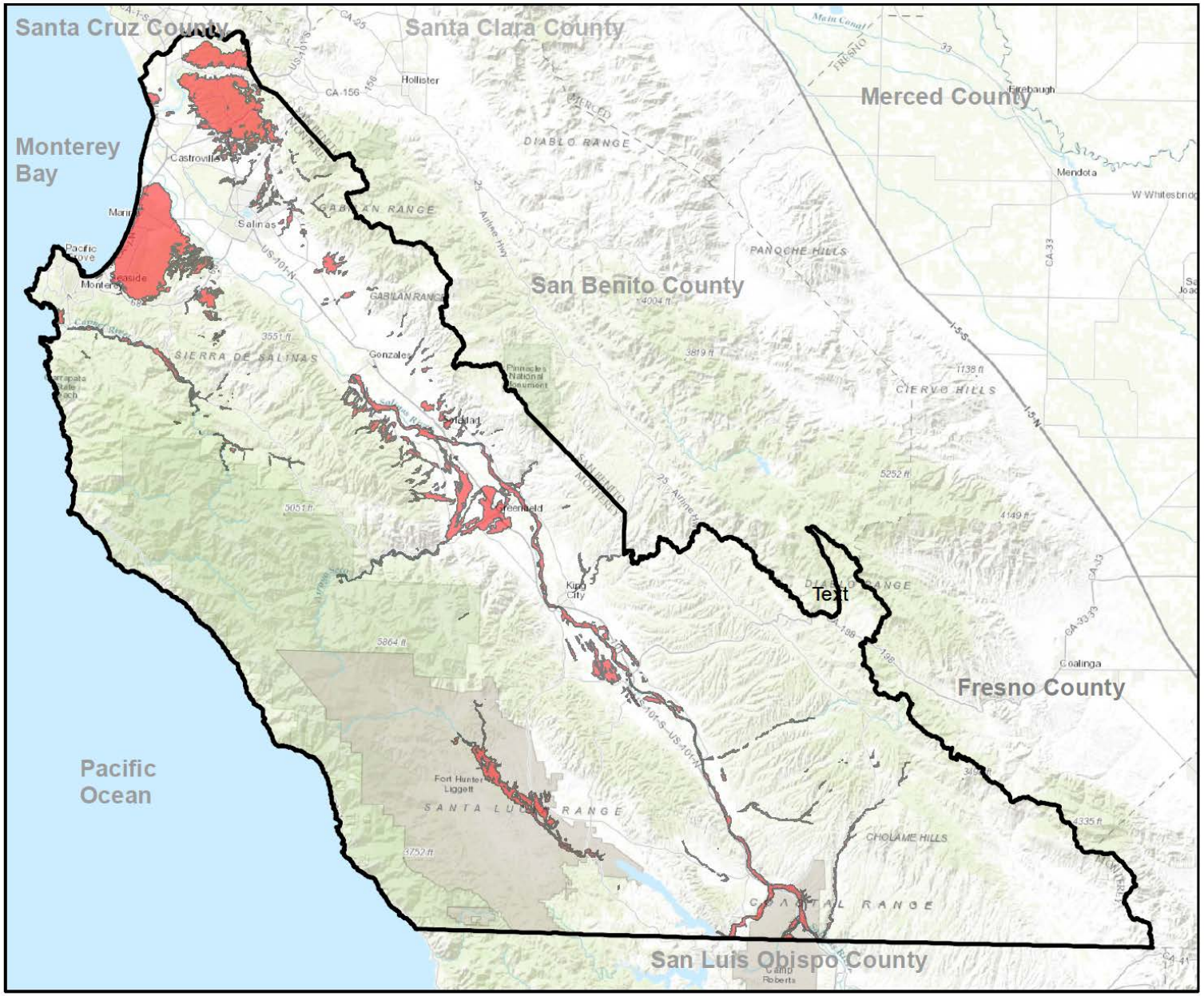
Recharge to the aquifer systems of Monterey County is from two main sources. The primary source of natural aquifer recharge is from infiltration of surface water through the beds of rivers and creeks; the secondary source is from the infiltration of precipitation. Sources of human-induced recharge include agricultural irrigation and to a lesser degree, wastewater systems. The portion of irrigation water that does not evaporate or is not taken up by plants eventually makes its way back to the groundwater table as recharge. The Monterey County Farm Bureau reports on their website that 478,113 acre-feet of groundwater to be used for irrigation was extracted from the Salinas Valley Groundwater Basin in 2015, a 15% reduction in pumping compared to 1996. This annual pumping reduction is due largely to more efficient irrigation methods, such as drip tubing, which also represents a reduction in the amount of recharge irrigation contributes to the groundwater basin. A particular area is not necessarily a valuable recharge area simply because it overlies a viable aquifer system. The soil type, and the amount and timing of precipitation are critical factors in determining how much recharge will occur. The other factor affecting recharge is the water-holding capacity of a given soil. Water held in the soil matrix is removed by the plant root systems supporting vegetation demands. Ground water recharge only occurs when the water holding capacity of the root zone is exceeded and water moves downward below the depth of the plant roots. The water that moves below the root zone continues to the water table and is referred to as deep percolation. This deep percolation becomes ground water recharge (Rosenburg, 2001, p. 37).

Despite several areas in Monterey County with highly permeable soils that could provide an excellent resource for recharge, as evidenced by Figures 2-3, 2-3a, 2-3b. and 2-3c, the limited amounts of rainfall in those areas make incremental areal recharge very small (Rosenburg, 2001, p.41). Figure 2-10 identifies potential groundwater aquifer recharge areas within Monterey County but the various factors that affect groundwater recharge make it impossible to generalize the extent to which an individual site or property will generate recharge. Section 5.2 of this LAMP imposes requirements that assure a new OWTS will not contribute to nitrogen loading that will exceed 40 grams per gross acre per day. New conventional OWTS dispersal systems installed in the potential recharge areas identified by Figure 2-10 shall be designed with shallow trenches no deeper than 5 feet total depth, mounds or at-grade systems and utilize pressure-distribution when necessary to maximize nutrient and hydraulic uptake through in the root zone. Alternative OWTS with supplemental treatment will be required when site evaluation standards specified by Chapter 5 cannot be met and issuance of a variance would pose undue risk to water quality or public health.

2.8 Primary Receiving Waters by Type

Impervious surfaces in urban areas, such as roofs, constructed hardscapes, and certain compacted soils result in urban runoff, which may contain pollutants such as sediment, oil and grease, pesticides and pathogens, such as those from improperly functioning OWTS. During the dry months of summer and fall, surface runoff is at a minimum and therefore, existing pollutants remain concentrated until the early parts of the rainy season when they are transported as surface and subsurface flows to downstream water features, and infiltrated into groundwater basins and recharge areas.

Figure 2-11 identifies surface drainage by receiving water type within the more populated urban areas of Monterey County. The type of receiving waters includes streams, rivers, wetlands, lakes, and ocean. This figure is included to assist OWTS owners, developers, and designers to better understand potential impacts that a malfunctioning or failing OWTS may have on nearby surface waters.



Legend

- County Boundary
- Potential Aquifer Recharge Areas

JOB NO: 1105-0001
MAP DOC:SUBBASINS
CREATED BY: APY
DATE: 2015-11-13
EXHIBIT NOTES:
WALLACE GROUP DID NOT PERFORM SURVEY SERVICES FOR THIS MAP.
IMAGERY PROVIDED BY ESRI.

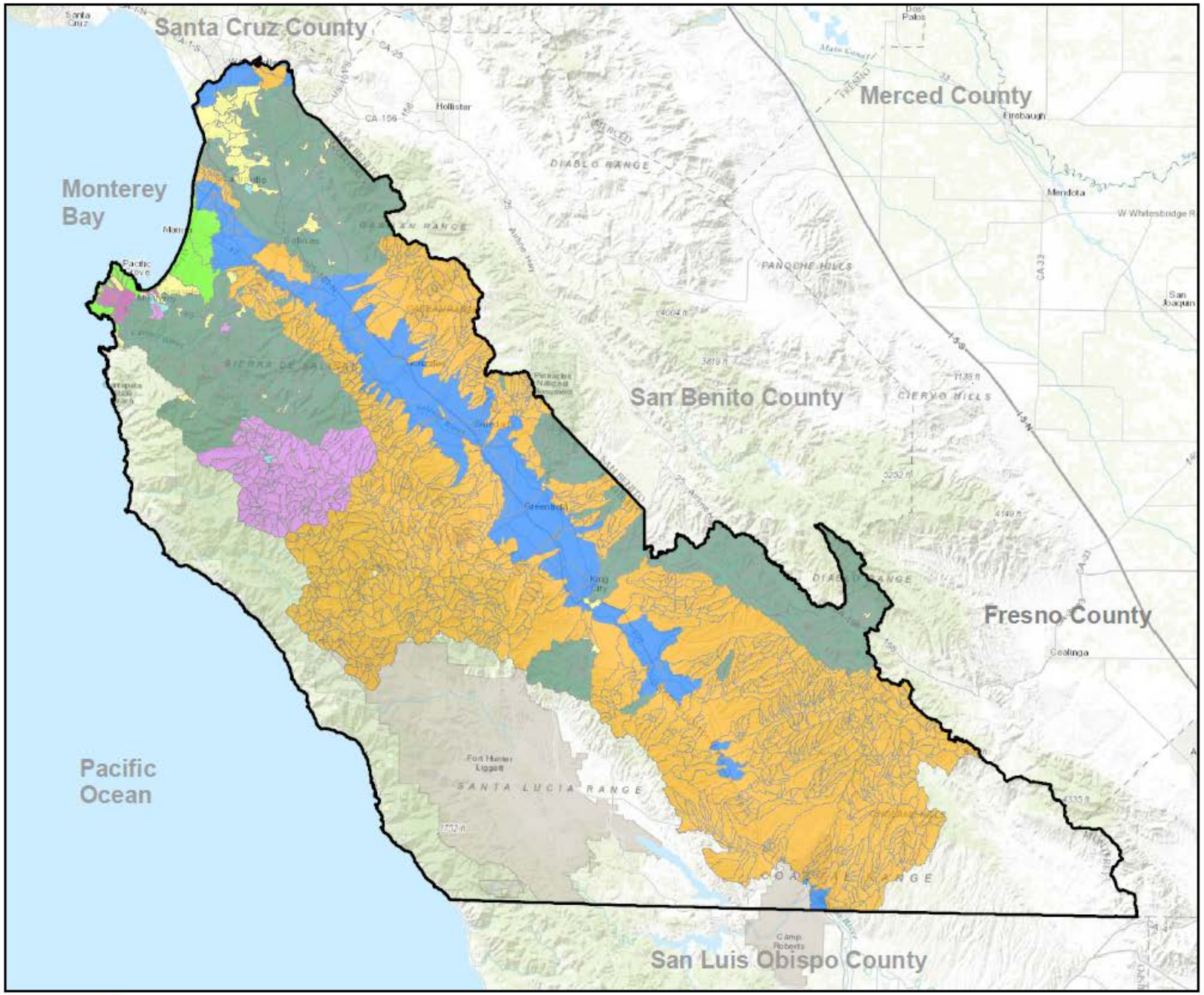
N W E S

0 5 10 20
Miles

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

612 CLARION COURT
SAN LUIS OBISPO, CA 93401
T 805 544-4011 F 805 544-4294
WALLACE GROUP

Local Agency Management Program For OWTS
Monterey County
Figure 2-10
Potential Aquifer Recharge Areas



Legend

- County Boundary
- Drains Direct to River
- Drains Direct to Lake
- Drains Direct to Ocean
- Drains Direct to Wetland
- Drains to Stream to River
- Drains to Stream to Lake
- Drains to Stream to Ocean
- Drains to Stream to Wetland

JOB NO: 1105-0001
MAP DOC: BASINS
CREATED BY: APY
DATE: 2015-11-13
EXHIBIT NOTES:
WALLACE GROUP DID NOT PERFORM SURVEY SERVICES FOR THIS MAP.
IMAGERY PROVIDED BY ESRI.

N
W E
S

0 5 10 20
Miles

WALLACE GROUP
CIVIL ENGINEERING
CONSTRUCTION MANAGEMENT
LANDSCAPE ARCHITECTURE
MECHANICAL ENGINEERING
PLANNING
PUBLIC WORKS ADMINISTRATION
SURVEYING/GIS SOLUTIONS
WATER RESOURCES
612 CLARION COURT
SAN LUIS OBISPO, CA 93401
T 805 544-4011 F 805 544-4294

Local Agency Management Program For OWTS
Monterey County
Figure 2-11
Receiving Water By Type

SECTION 3: WATER QUALITY MONITORING

The purpose of this LAMP is to establish standards and policies for the proper 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 stored in the form of reservoirs such as Nacimiento Reservoir and San Antonio Reservoir. The Salinas River is the largest river in Monterey County and all of the Central Coast of California, running 170 miles and draining 4,160 square miles. It flows north-northwest and drains the Salinas Valley. The Salinas River is a wildlife corridor, and provides the principle source of water from its reservoirs and tributaries to the farms and vineyards in the valley. Numerous other rivers are located in Monterey County, including the Nacimiento, Big Sur, Carmel, Pajaro, and San Antonio Rivers, as well as numerous other creeks.

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. In general, these creeks are ephemeral in nature and contain water for only a short period of time during and 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.

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 high percolation soils or areas with a high density of OWTS where the use of these systems could impact 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, a number of smaller public and water systems operate in Monterey 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. The EHB proposes to utilize this data, specifically, bacteria, total dissolved solids and nitrate results, to observe trends in groundwater quality as it relates to potential OWTS impacts.

All new domestic wells are already required to conduct water quality analysis pursuant to 2010 Monterey County General Plan, Policy PS-3.3. In addition, the EHB will require testing of existing water wells as a condition of OWTS permit issuance when a water well is located on the same property and within 250 feet of a proposed OWTS.

Installation of a monitoring well will be required when an alternative OWTS with supplemental treatment is required to overcome an insufficient vertical separation to groundwater. Over time, a network of shallow groundwater monitoring wells will be take shape, allowing the EHB to more

accurately assess groundwater flow and quality. When a monitoring well is required pursuant to a condition of approval for an Alternative OWTS, and after it has been developed, the depth to shallow groundwater shall be measured and water quality testing shall be completed and submitted to the EHB. The frequency of ongoing monitoring and water quality testing of the monitoring well will be specified by a corresponding Alternative OWTS operating permit.

Water quality testing shall include (1) nitrogen series (nitrate, nitrite, ammonia and total kjeldahl nitrogen); (2) total dissolved solids and (3) bacteriological constituents (total coliform, enterococcus and *E*. *coli*).

SECTION 4: REQUIREMENTS FOR EXISTING OWTS

4.1 Existing Functioning Onsite Wastewater Treatment Systems

Consistent with the criteria outlined in Tier 0 of the OWTS Policy, systems that are functioning properly will not be affected by this LAMP as long as they continue to function properly and are not proposed to be expanded to support additional development. 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 or replaced consistent with the criteria outlined in this LAMP and County standards.

As part of education and outreach, the EHB will promote voluntary maintenance for conventional OWTS (see Section 8 of this LAMP). There will not be a requirement for routine maintenance; however, the EHB will implement a mandatory reporting program to require liquid waste haulers to provide a report for each septic tank pumped in the County. Whenever an OWTS is serviced, the liquid waste hauler or other qualified professional must examine the tank to look for signs of deterioration, corrosion or evidence that the dispersal system is not functioning adequately. The liquid waste hauler must submit a report to EHB on an approved form, either hard copy or electronic, within 30 days of servicing an OWTS. This program is planned to commence in July 2018.

EHB must maintain these liquid waste hauler reports in a database, such as EnvisionConnect or Questys. If the report identifies an overt failure of either the tank or dispersal system, a notice will be generated and mailed to the property owner. Otherwise, the reports will be retained in accordance with the Monterey County's record retention policy for future reference at time of OWTS replacement application or during EHB review of planning or construction permit applications from the Monterey County Resource Management Agency (RMA).

4.2 Failed Onsite Wastewater Treatment Systems

Evidence of a failed OWTS ranges from the most severe and obvious form of failure such as surfacing effluent, to the less obvious sign of very slow-draining plumbing in a structure.

Conditions that represent a threat to public health and safety and must be replaced regardless of operational status, include:

- Hollow, non-gravel filled seepage pits (also known as dry wells) and cesspools. Hollow seepage pits and cesspools are a significant threat to groundwater and a physical safety threat due to the tendency to collapse. Cesspools shall be properly abandoned upon discovery. Hollow seepage pits may be retroactively brought into compliance by filling in the void space with EHB-approved rock when vertical and horizontal setbacks can be met. When the setbacks cannot be met, hollow seepage pits shall be properly abandoned.

- Severely damaged or deteriorated tanks. Bottomless or otherwise non-watertight tanks can allow surface and groundwater to infiltrate the tank, interfering with the separation of solid and liquid wastes and shall be replaced with one that meets County and State standards.
- Any OWTS that has affected, or will affect, ground water or surface water to a degree that it makes it unfit for drinking or other uses, or is causing a human health or other public nuisance condition shall be modified or upgraded to abate its impact.

Upon discovery of a failing OWTS that has pooling effluent, or has wastewater backed up into the plumbing fixtures or discharges wastewater to the surface, and that is located within the horizontal setback distances to a public water supply well described in Table 5-8 of this LAMP, the EHB shall notify the owner of the public well or water intake and the California Department of Public Health as soon as practicable, but not later than 72 hours.

4.3 Onsite Wastewater Treatment System Replacements or Repairs

Certain corrective measures shall be taken when an inspection finds a substandard OWTS or a component thereof that requires repair or replacement to meet current standards. Monterey County Code, Chapter 1.20, Enforcement, provides EHB authority to enforce compliance with this LAMP and OWTS permit regulations. Replacements or repairs of an existing OWTS must be performed by a qualified professional and must comply as closely as practical with the standards in MCC, Chapter 15.20 and this LAMP, and must be protective of human health and the environment. In cases of a failure that creates a health and safety hazard where effluent is discharging to the surface of the ground, repairs must be made immediately.

A qualified professional may apply for a variance to the requirements of Monterey County Code, Chapter 15.20, and this LAMP, for repairs or replacements of existing OWTS, for consideration by the Director. The variance request shall be signed by the property owner and submitted in writing with payment for the applicable fee, accompanied by a report prepared by the qualified professional to evaluate if groundwater, surface water, or public health impacts could result from the requested variance. A replacement system that cannot be considered for approval by variance may require supplemental treatment to ensure groundwater, surface water, or public health is protected.

When a replacement OWTS is approved by variance with less septic tank capacity or dispersal field area than is required by Section 5 of this LAMP, a deed restriction shall be recorded to the property on a form approved by the EHB and at the property owner's expense to notify the current and future property owners that the OWTS does not meet minimum OWTS standards for the structure it serves and that no building permit will be approved by EHB for a structure that would increase the estimated daily wastewater generation unless the OWTS is expanded or replaced to meet current standards.

No OWTS permit will be required to perform the following maintenance work and/or minor repairs provided all materials are approved for use in Monterey County and installed in a "like for like" configuration to maintain the design specifications and location of the existing OWTS:

- minor repairs to a septic tank, such as patching of minor cracks in a septic tank that do not degrade structural integrity and do not cause wastewater to exfiltrate or groundwater is infiltrate; or
- replacing an existing pump with an equivalent new pump or the clearing of blockages; it is the responsibility of the property owner to confirm if an electrical permit is required to first be obtained from RMA-Building Services; or
- replacing the solid or perforated piping in the dispersal system to alleviate blockages or damaged piping.

The property owner or individual completing the maintenance or minor repairs shall disclose the maintenance or minor repair activities to the EHB using an approved form.

4.4 Onsite Wastewater Treatment System Evaluation

Failure of an existing OWTS component, either the septic tank or dispersal system, can be attributed to many causes. Septic tanks are known to corrode and degrade over time and dispersal systems are known to clog, whereas a properly cited, designed and maintained OWTS can remain functional for decades. The EHB will require a performance evaluation prior to issuance of OWTS permits in accordance with Table 4-1.

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 that increases the sewage flow or changes the characteristics of the sewage generated.

The EHB will require a performance evaluation of an existing OWTS when a building remodel or building addition permit application is received in accordance with Table 4-1. When the installed location and dimensions of an existing OWTS are not available in official records, the qualified professional shall provide an assessment for consideration by the EHB, based on information including but not limited to the results of a video snake & locate, excavation of the end of a dispersal field, historical receipts for drain rock, etc. A performance evaluation will not be required for reductions of habitable space, detached garages, decks, sheds, ground-mounted solar panels, or when a previous performance evaluation has been completed within a reasonable period of time and which indicates the system was operating in an acceptable manner at the time of the evaluation.

When a building remodel or addition will increase the wastewater flow or strength as determined by County Code, the OWTS may need to be expanded so that the wastewater generation anticipated with the new construction can be received and treated reliably. Examples of changes that would indicate an increased flow to the system include the addition of a bedroom(s) or for commercial systems, increased occupancy and/or fixture units.

Additionally, improvements on a property that intrude upon the physical location of the OWTS or the designated reserve area for the dispersal system would trigger the need for review and may require replacement or expansion of the OWTS to comply with County Code. When a building remodel or addition will encroach upon the minimum horizontal setback to an OWTS

component, a variance shall be required and a civil engineer or other qualified professional shall first determine that the proposed structure will not negatively impact the OWTS component(s) and in the case of a dispersal system, that the hydraulic load of effluent will not negatively impact the proposed structure.

Any OWTS component that is deemed to be in unacceptable condition (failed) shall be repaired or replaced in accordance with the minimum standards of this LAMP prior to final inspection of the building permit that prompted the requirement for a performance evaluation. During review of RMA-Planning and Building permit applications, EHB reviews the proposed project in conjunction with all existing structures or uses on the property, any existing EHB records of the existing system, the OWTS performance evaluation as well as any additional information/data provided by the applicant. If it is concluded by the EHB that there is no impact or that the existing system is adequate, no modification is required.

The EHB will also require a septic tank performance evaluation when a dispersal system replacement or expansion is proposed to demonstrate that the tank is still capable of functioning as designed so that solids will not pass through to the new dispersal system, regardless of the infiltrative area of the proposed dispersal field. When a performance evaluation deems a septic tank to be in unacceptable condition (failed), the OWTS permit application shall be amended to include both components. The failed septic tank shall be properly abandoned in place or destroyed and replaced.

A performance evaluation of the existing dispersal system will not be required for a septic tank replacement because the act of replacing the tank will improve upon the overall condition of the existing OWTS.

Table 4-1. Performance Evaluation Requirements

Permit Application Type	Is a performance evaluation required to be conducted by a qualified professional?	
	Tank	**Dispersal System**
Septic tank replacement to allow for a building remodel or addition	Not applicable	Yes
Septic tank replacement that does not exceed the minimum standards of Table 5-3, Minimum Capacity of Septic Tanks	Not applicable	No. Existing dispersal system shall be allowed to remain in use.
Dispersal system replacement to allow for a for a building remodel or addition	Yes	Not applicable
Dispersal system replacement that does not exceed the minimum infiltrative area as calculated using Tables 5-2 and Tables 5-4 or 5-5	Yes	Not applicable
Building remodel or addition proposing additional bedrooms (provided the minimum lot size requirements specified by Table 5-2 of this LAMP can be met) or that will increase wastewater generation	Yes	Yes
Building remodel or addition proposing to increase the habitable area of a structure by 500 square feet or more	Yes	Yes

4.4.1 Replacement of Non-Conforming Septic Tanks

For the purposes of this subsection, a non-conforming septic tank is one that is constructed from materials that are prohibited by Section 5 or is otherwise not watertight. These tanks shall be replaced with a septic tank that meets current standards prior to final inspection of a construction permit that prompted a performance evaluation or concurrent with the dispersal system replacement or expansion.

4.4.2 Increased Wastewater Strength or Volume and Existing Dispersal Systems

For the purposes of the subsection and Table 4-2, a conforming dispersal system is one that meets all water-related horizontal or vertical setback requirements, is not covered by an impermeable surface and is less than 10 feet total depth. Conforming dispersal systems shall be allowed to remain in use when a building addition or remodel, or a change of use in a commercial/industrial facility, will result in increased wastewater strength or volume.

For the purposes of this subsection and Table 4-2, a non-conforming dispersal system is one that does not meet all minimum water-related horizontal or vertical setback requirements, is covered by an impermeable surface or is greater than 10 feet total depth, including but not limited to seepage pits. Non-conforming dispersal systems shall be allowed to remain in use when a building addition or remodel, or a change of use in a commercial/industrial facility, will not result in increased wastewater strength or volume.

When a building addition or remodel, or a change of use in a commercial/industrial facility, will result in increased wastewater strength or volume, a non-conforming dispersal system may be eligible to remain in use provided a supplemental treatment system is incorporated into the OWTS and vertical setback requirements specified by Table 5-9 can be met. The supplemental treatment system shall reduce total nitrogen (TN), biological oxygen demand (BOD) and total suspended solids (TSS) prior to dispersal to the standards specified in Table 5-10.

4.4.3 Existing Dispersal System Capacity Assessment

Prior to adoption of this LAMP, Monterey County enforced a standard soil application rate of 0.3 gallons of wastewater per square foot of dispersal system per day. Existing, conforming dispersal systems and certain non-conforming dispersal systems as specified by Table 4-2 are eligible to have their dispersal capacity reassessed by reevaluating the soil application rate in accordance with in Tables 5-4 and 5-5 to determine if the system can increase its daily design flow. A qualified professional may conduct soil analysis or percolation testing in the direct vicinity of the existing dispersal system, or consider information in a soil or percolation testing report, to determine if it is appropriate to reassess its capacity in accordance with the application rates specified by Tables 5-4 and 5-5.

When the information necessary to reassess the capacity of the existing dispersal system is unavailable, the soil application rate shall remain the same as was applied during design of the original system, usually but not always 0.3 gallons of wastewater per square foot of dispersal system per day. Any portion a dispersal system that does not conform to depth limitations or is covered by an impermeable surface shall not be eligible for capacity reassessment, whereas conforming portions of the system are eligible.

Table 4-2 Retention and Reassessment of Existing, Non-Conforming Dispersal Systems

Does the Project Propose to Increase Wastewater Generation or Strength? Or Electively Increase Capacity?	Does the Dispersal System Meet Water-Related Horizontal Setbacks?	Does the Dispersal System Meet Vertical Groundwater Setbacks?	Can Existing, Non-Conforming OWTS Dispersal System be Retained?	Can the Existing Dispersal Capacity be Reassessed?
No	No	No	Yes: Supplemental Treatment Required[2,3]	No
		Yes[1]	Yes[3]	No
	Yes	No	Yes: Supplemental Treatment Required[2]	No
		Yes[1]	Yes[3]	No
Yes	No	No	Yes: Supplemental Treatment Required[2,3]	No
		Yes	Yes: Supplemental Treatment Required[3]	Yes
	Yes	No	Yes: Supplemental Treatment Required[2]	No
		Yes	Yes: Supplemental Treatment Required	Yes

[1] When the EHB determines that there is a high potential for perched water or high seasonal groundwater, based on EHB records or site conditions, a groundwater monitoring boring may be required at the discretion of the EHB. The timing of the boring (i.e. wet weather testing) will be determined on a case by case basis by the EHB in consultation with the qualified professional.

[2] The existing dispersal system is eligible to remain in use provided a supplemental treatment system with nitrogen reduction is incorporated into the OWTS and adequate vertical separation exists between the bottom of the existing dispersal system and high seasonal groundwater as determined by Table 5-9.

[3]The existing dispersal system is eligible to remain in use provided the qualified professional demonstrates to the satisfaction of the EHB that continued use of the dispersal system will not pose a risk to surface water, groundwater or public health impacts.

4.4.4 Expansion of an Existing OWTS

Expansion of an existing OWTS means installation of a supplemental septic tank or construction of additional dispersal system area to increase the capacity of the existing system. Expansions shall be designed by a qualified professional to meet the standards in Section 5 for new OWTS and must be protective of human health and the environment.

4.5 Onsite Wastewater Treatment System Abandonment and Demolition Standards

Unless properly abandoned, an OWTS that is no longer used can present a safety hazard. The top and lids of a septic tank or the cement cover of a hollow seepage pit tend to deteriorate over time and may collapse should a vehicle drive or an individual walk over it leading to a serious injury or death. Therefore, the EHB makes it a priority to ensure that these structures are properly demolished to minimize the risk of such accidents.

An existing OWTS or a portion thereof shall be properly abandoned or demolished, 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 within a reasonable period of time as approved by the EHB.

The demolition 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 bottom shall be punctured or cracked to allow for drainage and the shell filled with inert material such as clean soil, sand, pea gravel, cement etc.

Standards for abandoning the dispersal field include:

- Leach fields and seepage pits 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 EHB approval.

4.5.1 Option to use Septic Tank/Leach Field as On-Site Rain Water Cistern

Under the scenario where an OWTS is no longer needed due to the connection of the property to a public sewer system, the County may allow the Owner to convert the on-site septic tank into a rain water or gray water cistern. Currently, the San Luis Obispo County Department of Public Works has developed a program for septic tank conversions for such septic tanks to be abandoned. Information can be found at the following website:

- http://www.slocounty.ca.gov/Departments/Public-Works/Forms-Documents/Projects/LOWWP/Septic-System-Decommissioning-and-Reuse-Plan.aspx

The Property Owner may propose to re-purpose their on-site septic tank/leach field system for rain water or gray water capture/reuse, and shall propose a plan with timeline for construction for review and approval by EHB.

4.6 Onsite Wastewater Treatment Systems in Degraded Basins

If the Central Coast RWQCB or EHB identifies a groundwater basin or subbasin in Monterey County where the use of OWTS is causing or contributing to groundwater degradation, the County will develop an Advanced Groundwater Protection Management Program ("AGPMP") in close consultation with and approved by the Central Coast RWQCB. The AGPMP shall provide the same level of protection as the Tier 3 standards in the OWTS Policy and should include: 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, including supplemental treatment standards, to the greatest extent practicable. The requirements for existing systems will be consistent with Tier 4 of the OWTS 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 OWTS Policy are not allowed in areas covered by an AGPMP.

4.7 Advanced Protection Management Plan

The OWTS 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 Total Maximum Daily Load ("TMDL") and its implementation program, by special provisions contained in a LAMP or by the specific requirements of Tier 3.

If a water body in the County is designated by the Central Coast RWQCB as "impaired" or significantly degraded as a result of the use of OWTS, the 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 RWQCB and may include, but will not be limited to, requirements for supplemental treatment for existing systems and mandatory, routine inspections as determined by the Central Coast RWQCB in order to be consistent with the OWTS Policy. In the absence of a TMDL or an APMP approved by the Central Coast RWQCB, the provisions of Tier 3 of the

OWTS Policy shall apply to OWTS adjacent to water body segments listed in Attachment 2 of the OWTS Policy.

SECTION 5: NEW AND REPLACEMENT OWTS REQUIREMENTS

5.1 Development Review Processes

EHB review of OWTS occurs on two levels. An initial review to verify OWTS feasibility shall occur as part of the discretionary process for proposals to an existing lot of records or to create new lots with the County's RMA - Planning Department. A second, more detailed review would happen when an application to construct an OWTS is submitted, for both a new OWTS on an existing lot of record, or a newly created lot. The review of the application and the issuance of an OWTS permit are ministerial.

EHB staff interact with the RMA - Planning Department in the discretionary review process of applications for land use entitlements. The role of EHB is to review project applications within the unincorporated portions of the County to ensure conformity with State and local regulations and policies enforced by the EHB 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 subdivision and other discretionary land use permit applications a determination must be made as to whether adequate water and sewer services are available. If public services are available, the EHB will recommend that as a condition of project approval, the project 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, the EHB will review well and soil test data to confirm their feasibility for the proposed project. Presence of existing groundwater impacts and/or existing groundwater quality will also be considered as part of EHB's review of the proposed project.

If the EHB determines that the use of an OWTS is feasible, the EHB will recommend project approval. A condition of approval will be added when additional documentation is required prior to OWTS construction permit issuance, such as a slope cross-section report or evidence that the Central Coast RWQCB has assigned Waste Discharge Requirements for the project. The applicant will be required to submit an OWTS construction permit application to EHB prior to issuance of the construction permit for the structure it will serve. The site plan submitted with applications for new OWTS on an undeveloped property shall include an aerial image overlay to facilitate site evaluation.

OWTS feasibility is currently determined by reviewing the proposed site configuration, the preliminary engineering and layout of the system to ensure that adequate space for both the primary field as well as the future reserve area is available, and that setbacks from watercourses and steep slopes are met. Additional site evaluation requirements are proposed with this LAMP and are intended to be equally as protective of water quality and public health, as the standards set forth in Tier 1 of the OWTS Policy. Separate site evaluation requirements

will exist for new OWTS and for replacements or expansions of existing OWTS. All OWTS permits will require a deep boring (refer to Section 5.9) in order to define soil strata, mottling and the presence or absence of groundwater or bedrock relative to the bottom of the dispersal field. Subdivisions and new OWTS on vacant, existing lots of record will necessitate percolation tests in the area of the proposed dispersal systems to determine if the soils are suitable for long-term wastewater dispersal. Staff will conduct a site visit 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 an OWTS, even with implementation of alternative OWTS with supplemental treatment or dispersal methods, then the project cannot move forward until a suitable location on site is identified. Alternatively, an applicant could pursue a connection to a public sewer system.

Amendments to the Monterey County Code to conform to these requirements will be presented to the Board of Supervisors for adoption within 18 months of adoption of the LAMP.

5.2 Minimum Lot Size Requirements

For new subdivision applications submitted to the County after the effective date of this LAMP and for any pending subdivision applications that were not determined to be complete, prior to the effective date of this LAMP, the average density for any proposed land division shall not exceed the allowable density values in Table 5-1 for a single-family dwelling unit, or its equivalent, for those units that rely on OWTS.

Table 5-1 Allowable Average Densities per Subdivision

Average Annual Rainfall (inches per year)	Allowable Density (acres per single family dwelling unit or equivalent)
0 - 15	2.5
>15 - 20	2
>20 - 25	1.5
>25	1

Monterey County Code Section 15.20.060.E requires a minimum lot size for issuance of a septic tank system permit and will be proposed to be amended to include the new requirements of this LAMP as follows: “On new divisions of land, when the lot is to be served by an OWTS and domestic water is served by a water system of two or more connections, the lot size shall not be less than one gross acre, provided the lot size criteria (in addition to other siting criteria in this Section) in Table 5-2 of the LAMP are met.” (Monterey County Code Section, 15.20.060.E.1.a.)

On lots of record, existing, permitted dwelling units that request a construction permit to increase the total number of bedrooms shall be subject to the limitations specified by Table 5-2. Wastewater strength varies in other uses, such as commercial, multi-family, industrial, etc., and shall be evaluated on a case-by-case basis to ensure that new or expanded development does not exceed the estimated nitrogen loading values specified by Table 5-2. When proposed

development is expected to exceed the daily wastewater generation or nitrogen loading limits based on the size of the lot, a qualified professional shall prepare a technical report at the property owner's expense, which verifies by calculation of nitrogen loading and wastewater flows, that total nitrogen loading does not exceed 40 grams per gross acre per day. The qualified professional shall propose OWTS expansion criteria to handle additional wastewater loading that meet the standards of this LAMP, including but not limited to incorporating supplemental treatment with denitrification.

For new development on undeveloped lots of record that are less than one gross acre, and for new development or a bedroom addition to an existing single family dwelling that will result in a bedroom count that exceeds the minimum lot size specified by Table 5-2, a qualified professional shall prepare a technical report at the property owner's expense, which determines the proportionate quantity of nitrogen loading allowable based on acreage, and verifies that the proposed OWTS, which may include an alternative OWTS supplemental treatment and/or dispersal system, will not exceed that determined value.

Table 5-2. Minimum Lot Size for New Development and for Additions to Single Family Homes

# Bedrooms		Estimated Nitrogen Loading (grams per day)	Minimum Lot Size when a Water Well Does Not Exist on Site[3][4]
1		20 g	1 acre
2		30 g	1 acre
3		40 g	1 acre
4		50 g	1.25 acres
5		60 g	1.5 acres
6		70 g[1][2]	1.75 acres[2][3]

[1] Add 10g Nitrogen per additional bedroom
[2] Add 0.25 acres per additional bedroom
[3] When a well is either proposed or already exists on the property. This standard shall not be construed to conflict with or supersede the minimum lot sizes specified by Table PS-1 (footnote 5) and PS-2 of the 2010 Monterey County General Plan

5.2.1 Cumulative Impacts Analysis

Where OWTS may have cumulative impacts on groundwater and/or watershed conditions due to such factors as the constituent levels (e.g., nitrogen content) in the wastewater, the volume of wastewater flow, the density of OWTS discharges in a given area, and/or the sensitivity and beneficial uses of water resources in the discharge area, the EHB may require additional technical studies (also termed "cumulative impact studies") or other information demonstrating to the satisfaction of the Director, that use of the proposed OWTS will not create adverse cumulative effects on water quality, public health or safety. The primary issues to be addressed in cumulative impact assessments will normally include the following:

- Groundwater Mounding. A rise in the water table, referred to as "groundwater mounding", may occur beneath or down-gradient of OWTS as a result of the concentrated or high volume of hydraulic loading from one or more systems in a limited area.
- Groundwater Nutrient Loading. OWTS discharges contain high concentrations of nutrients that may contribute to rises in the nutrient levels of local and regional aquifers, such as total nitrogen.
- Groundwater Salt Loading. OWTS discharges can increase the concentration of dissolved solids in wastewater, including various salts and other minerals such as calcium, chloride, magnesium, potassium and sodium; the impact is greater when water softener brine is added to the waste stream (Crites and Tchobanoglous, 1998). Total Dissolved Solids (TDS) are not removed to any appreciable degree through OWTS or by passage through the soil, thereby contributing to incremental increase in the TDS levels in the groundwater beneath and down-gradient of a wastewater dispersal system.

Cumulative impact studies shall be mandatory for any OWTS with wastewater flows of 2,500 gallons per day or more. Until such time that the EHB has established a standard methodology, the scope of work for a cumulative impact study shall be submitted to the EHB for review and acceptance prior to commencing the analysis. The cumulative impacts study must be completed a qualified professional with experience in onsite wastewater analysis and shall include, but is not limited to, the following:

1. Circumstances requiring cumulative impact assessment;
2. Minimum qualifications of individuals performing the work;
3. Data needs and assumptions;
4. Analytical methods and calculations;
5. Evaluation methods and criteria;
6. Recommendations and/or mitigations; and
7. Provision for inclusion of specific requirements or recommendations of the California Regional Water Quality Control Board having jurisdiction.

For individual cases, the Director may identify and require analysis of cumulative impact issues other than those listed above which, in his/her judgment, could pose potential water quality, public health, or safety risks.

5.3 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 up to 30 days per calendar year for special events. Seasonal, open-space businesses that generate a relatively low volume of wastewater per day, such as pumpkin patches or tree lots, do not have a

limitation on the number of operating days each year using chemical toilets. Hand washing facilities with soap, water and paper towels are always recommend but shall be required when food is available for consumption or sale. Chemical toilets are not acceptable as a permanent method of wastewater management.

Composting or incinerating toilets are not currently considered a viable option for sewage management for sites that preclude the use of a conventional or alternative OWTS because a gray water system intended to handle wastewater from a lavatory or shower would be restricted by similar site constraints as would a conventional OWTS.

In the interest of public health, vault toilets (watertight, lined privvys) maintained by a public agency may be considered for use to serve remote, toilet-only structures when there is no existing infrastructure to supply potable water and it would be prohibitive to construct, such as trailheads on public land or remote military operations. Vault toilets may also be considered for use on private land when recycled water irrigation is in place and there is no existing potable water infrastructure because installation of potable water distribution system would increase potential for cross-connection between the potable and recycled water systems. All vault toilets that are installed on private land will be required to maintain a service contract with a licensed liquid waste hauler and obtain an annual operating permit from the EHB.

Since the Basin Plan was originally adopted on March 14, 1975, significant strides have been made towards reducing indoor potable water demands. It is noted that the Central Coast RWQCB considers 375 gallons per day (gpd) as a conservative standard estimate of domestic wastewater from a 3-bedroom home. While Monterey County Code, Chapter 15.20, currently assumes that flows are more on the order of 300 gpd per 3-bedroom home or equivalent dwelling unit, Monterey County has increased the estimated daily flow from 300 to 375 gpd to be consistent with RWQCB and assure that implementation of a variable soil application rate (Tables 5-4 and 5-5) does not result in dispersal systems with insufficient infiltrative capacity to reliably accept wastewater. Regardless of the daily wastewater generation rate that is used, the organic loading remains the same. For commercial and industrial, institutional and multi-family units that exceed the typical demand of a residential home, careful consideration must be given to the estimated loading, hydraulically and organically, for the proposed unit to be served by an OWTS. The qualified professional responsible for the design of such an OWTS must make reasonable estimates of both flow and organic waste strength, including a calculation of the anticipated nitrogen loading from the proposed OWTS treatment/disposal system. Wastewater flow from multi-family and commercial structures will be determined by peak design flow as listed in the most recent edition of the California Plumbing Code (“CPC"), the U.S. Environmental Protection Agency’s Onsite Wastewater Treatment Systems Manual or other sources acceptable to the EHB.

The provisions of this LAMP and Monterey County Code, Chapter 15.20, apply to wastewater flows of 10,000 gpd or less. Projects with flows calculated to exceed 10,000 gpd, from non-domestic wastewater streams or from recreational vehicle/mobile homes will be regulated by the Central Coast RWQCB.

It is the intent of the EHB to maintain an open dialogue with the Central Coast RWQCB 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 OWTS Policy.

5.4 OWTS Component Access and Protection of Future Dispersal Area

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 OWTS that utilize supplemental treatment. To facilitate inspection and maintenance, OWTS components and appurtenances, such as distribution boxes or dispersal field monitoring ports, must be accessible through watertight risers brought to or within 6 inches of finished grade.

Currently the primary dispersal system must be installed with a designated reserve area set aside for future use; 100 percent reserve area for lots created prior to June 26, 1981 and 200 percent reserve area for lots created after June 26, 1981. Upon implementation of this LAMP, new OWTS will be required to install the primary and secondary dispersal systems (formerly the initial and 100 percent reserve area) at initial construction, each meeting the minimum infiltrative area specified by this LAMP and separated by a diversion valve.

1. Switching from one dispersal field to the other on a regular basis, every 9 to 12 months, allows one field to rest while the second is being used, prolonging the useful life of both fields.
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. Eliminates the possibility that suitable dispersal area would be lost to future development of the property.

Lots created after June 26, 1981, shall also designate an area for a third dispersal system (formerly the second 100 percent reserve area) to remain available. EHB may require that the tertiary dispersal field be installed at initial construction if the area will be inaccessible upon site build-out.

The requirement to install the primary and secondary dispersal system shall not apply to existing OWTS, even when it is proposed to receive additional wastewater, i.e. bedroom addition, additional employees, etc., provided a qualified professional has determined that the existing OWTS is eligible to remain in use or be expanded pursuant with Section 4.

5.5 Prohibitions

The following prohibitions specified in Section 9.4 in Tier 2 of the OWTS Policy will become effective upon adoption of this LAMP, and amendments to Chapter 15.20 of the Monterey County Code will be proposed to reflect these prohibitions:

- Cesspools or hollow seepage pits of any kind or size.
- OWTS receiving a projected flow over 10,000 gpd.

- 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.
- Installation of OWTS on slopes greater than 30 percent without a slope stability report approved by a qualified professional and a variance issued by the EHB, authorizing construction at that location. A variance shall not be required for engineered alternative OWTS dispersal systems that meet the requirements for Allowable Ground Slope specified by Table 5-7.
- Discharges from point of entry or centralized water treatment systems to an OWTS, unless specifically approved by the Central Coast RWQCB.
- Decreased leaching area for International Association of Plumbing and Mechanical Officials ("IAPMO") certified dispersal systems using a multiplier less than 0.70.
- OWTS utilizing supplemental treatment without requirements for periodic monitoring or inspections.
- OWTS dedicated to receiving wastes dumped from RV holding tanks.
- Separation of the bottom of dispersal system to groundwater less than two feet, and no less than 10 feet of separation for rock-filled seepage pits preceded by supplemental treatment.
- Issuance of a conventional OWTS permit where the soil formation directly beneath the proposed dispersal system contains continuous cracks, channels, or fractures when a water well is located less than 250 feet from any portion of the OWTS.
- Installation of new or replacement OWTS where public sewer is available. The public sewer may be considered not available under one or more of the following circumstances:
    1. The public sewer main or lateral is located more than 300 feet from the proposed/existing structure that necessitates wastewater disposal on any lot or premises that abuts and is served by such public sewer;
    2. The public sewer purveyor refuses to permit such connection and/or annexation into the service area is not supported by the Monterey County Local Agency Formation Commission;
    3. The owner or lawful possessor of the proposed/existing structure that necessitates wastewater disposal is unable to obtain any necessary easement for the connection pipe;
    4. For replacement OWTS only, where the connection fees and construction cost are greater than twice the total cost of the replacement OWTS, either conventional or alternative OWTS as deemed necessary to comply with the minimum standards of this LAMP, when a qualified professional has determined the replacement OWTS can meet the standards of this LAMP and that the continued use of OWTS will not impact groundwater or surface water to a degree that makes it unfit for drinking or other uses.

5.6 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 an OWTS is 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 are required to design, construct, maintain, repair and/or replace an OWTS in Monterey County. Design, construction, maintenance, repair and replacement of an OWTS shall be conducted by a qualified professional or service provider who is retained by the owner at the owner's cost, and shall be made in accordance with the following requirements:

- **Qualified consultants** conduct site evaluations, soil investigations and percolation testing. A qualified consultant shall be a registered California professional, including Civil Engineer, Professional Geologist, or Certified Engineering Geologist or other qualified professional as approved by the EHB.
- **Qualified designers** design an OWTS using information prepared by a qualified designer. A qualified designer shall be a California Registered Civil Engineer, Registered Environmental Health Specialist, or other qualified professional as approved by the EHB.
- **Qualified installers** construct, modify, repair, replace, abandon, or demolish an OWTS. A qualified installer shall be a contractor duly licensed by the California State Contractor's Board to install OWTS, such as an A, C-36, C-42 or B license holder (provided the B-license holder is installing the OWTS in conjunction with a new construction project as appropriate under applicable State contractor's law. An owner/builder may abandon or demolish an OWTS septic tank under permit from the EHB without a contractor's license.
- **Qualified liquid waste haulers** facilitate routine and emergency maintenance of a septic tank by pumping septage and hauling it to an approved wastewater treatment facility. Liquid waste haulers are required to maintain a separate license to operate in Monterey County and shall not be required to register as qualified professionals.
- **Qualified service providers** operate, maintain and service alternative OWTS. A qualified service provider shall be an individual or company certified by an alternative OWTS manufacturer or proprietor to conduct operation, maintenance and service activities for each type of supplemental treatment or alternative dispersal system they service, or other qualified service provider as approved by the EHB.

The EHB will develop a Qualified Professional annual registration program that requires all qualified professionals to demonstrate that their professional certification is in good standing and will be subject to EHB discretion.

5.7 Tank Requirements

The construction standards for septic and treatment tanks must be consistent with standards contained in the State regulations. As required 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 IAPMO,

National Sanitation Foundation ("NSF") or American Society for Testing and Materials ("ASTM") standards. All tanks shall be capable of being pumped out completely without the need to backfill with water to maintain structural integrity.

All new and replacement septic tanks shall conform to the standards in Table 5-3. Septic tanks must have a minimum of two compartments and each compartment shall be accessible through a manway or port that is a minimum 20 inches in diameter.

Table 5-3. Minimum Capacity of Septic Tanks

Number of Bedrooms	Volume of Wastewater for OWTS Design	Septic Tank Capacity	Septic Tank Capacity (Kitchen Garbage Grinder Installed)
1 or 2 Bedrooms	300 gallons	1,000 gallons	1,500 gallons
3 or 4 Bedrooms	450 gallons	1,500 gallons	2,000 gallons
5 or 6 Bedrooms	600 gallons	2,000 gallons	2,500 gallons
Each Additional Bedroom	75 gallons	Add 250 gallons	Add 250 gallons
Each Additional Garbage Grinder	not applicable		Add 500 gallons

The capacity of septic tanks proposed to serve structures that will include residential occupancy shall be at least 3 times the maximum anticipated daily volume of wastewater. The capacity of septic tanks proposed to serve commercial, industrial or institutional development shall be at least 2 times the maximum anticipated daily volume of wastewater.

The use of garbage disposal units is discouraged because they (1) contribute substantial quantities of detrimental solids to the wastewater load, increasing the rate of sludge and scum accumulation in the septic tank; (2) result in a greater need for and frequency of septage removal; and (3) result in higher amounts of solids and biochemical oxygen demand ("BOD") discharged to the dispersal system, increasing the potential for soil clogging and system failure. An additional 500 gallons of septic tank capacity is required when a garbage grinder is installed in the structure that the OWTS serves.

In general, all tanks should be buried as shallow as practicable. Septic tanks should be installed no deeper than six inches below finished grade. If it is demonstrated that a septic tank must be placed deeper than six inches below finish grade, then each compartment shall be fitted with watertight risers that extend to within six inches of finish grade. Owners shall maintain access openings so as to be readily accessible for observation, maintenance and pumping.

When it is necessary to extend septic tank risers to finished grade, corrosion resistant, tamper resistant fasteners shall be used to secure the lid to the riser.

The septic tank must be designed with adequate separation from structures, patios and decks so that both the inlet and outlet compartments of the septic tank are accessible for inspection, servicing and maintenance.

If the OWTS design calls for placing a tank beneath an area subject to vehicular traffic, such as a driveway, traffic rated tank lids shall be used with risers that extend to finished grade and the tank must be either rated to withstand such conditions or the installation shall be engineered to support the additional weight.

5.7.1 Pump Chambers

When a pump chamber or tank is utilized to deliver effluent to the dispersal field, the tank shall meet industry accepted standards. Some alternative OWTS dispersal systems, such as a mounds or drip dispersal, require smaller doses of effluent while most conventional leachfields can accept larger volumes at once. Dosing a large volume of effluent to the dispersal field just one or two times per day provides an opportunity for the field to rest in a well-drained state prior to the next dose and may help to limit constant saturation. Due to variable uses of pump chambers, the capacity shall be shall be at least 300 gallons and specified by the qualified professional so that the tank will have surge capacity equal to at least 200% of the estimated daily design flow. All pump chambers shall be equipped with an audible and visible alarm to alert when the high-water level in a tank is reached. Electrical connection should be made outside of the dosing tank and riser in a weather proof box. An electrical permit shall be obtained from the Monterey County Resource Management Agency – Building Services Department prior to commencing construction.

Any pump chamber preceding a septic tank (e.g. lift station, ejection basin) must be capable of handling solids of a minimum size, as specified by Section 710.3 of the California Plumbing Code, and macerating (grinder) pumps shall not be allowed. Grinding sewage into a slurry of small particles has the potential to affect normal settling and digestive processes. When pumping of raw sewage cannot be avoided, the qualified professional shall incorporate additional design measures to mitigate negative effects, primarily surging and turbulence, on overall treatment system performance. Options that may be considered include:

a) Pumping to gravity sewer some minimum distance upstream of the septic tank instead of directly into the septic tank.
b) Install an inlet baffle in the septic tank to deflect the inlet discharge.
c) Install more septic tank capacity or a surge tank prior to the septic tank.
d) Install multiple septic tanks in series or compartmented septic tanks.

5.7.2 Watertight Tank Testing

Watertight, structurally sound tanks are essential to the performance of OWTS. Wastewater that leaks out of a septic tank or pump chamber that is not watertight may not be adequately treated and can contaminate ground and surface waters. In addition, infiltration of ground water into a leaky tank can hydraulically overload the dispersal system. Infiltration can also cause the tank contents to mix, disturbing the settling of solids and allowing them to be carried out to the dispersal field, resulting in clogging and premature dispersal system failure. To ensure that a tank will adequately perform as intended, field testing of the tank for watertightness is essential.

New or replacement septic tanks and pump chambers shall be tested for watertightness by a qualified professional, using either a vacuum test or water test, prior to backfilling the tank with soil. EHB retains the authority to specify if EHB staff will be required to witness the testing on a permit by permit basis. Upon completion of the testing, a qualified professional shall submit a Watertight Tank Certification Form to the EHB prior to or concurrent with final inspection of the OWTS.

When an existing septic tank and/or pump chamber meets the eligibility requirements in Section 4 to remain in use or be expanded upon, and a performance evaluation prepared by a qualified professional indicates that the tank is watertight, watertight tank testing is not required. When a performance evaluation indicates that the tank is not watertight, it shall be replaced under permit.

5.8 Dispersal Systems

The infiltrative surfaces of dispersal systems shall be located in permeable, unsaturated natural soil material so wastewater can infiltrate and percolate through the underlying soil. Permeable, unsaturated soil is native soil material that is not inundated by groundwater. The minimum depth of soil required below a proposed dispersal system is dependent upon the stabilized percolation rate or soil observations that correspond with the effective depth (bottom) of the system. As wastewater infiltrates and percolates through the soil, a variety of physical, chemical, and biochemical processes and reactions can filter or biodegrade some of the organic materials that remain after conventional (primary) treatment in the septic tank. Many different dispersal system designs and configurations are used, but all incorporate soil infiltrative surfaces that are located in buried excavations. Historically, Monterey County has relied primarily on leachfield dispersal systems that range in effective depth from 3 – 12 feet deep and on deep seepage pits. The infiltrative area of dispersal systems has been calculated utilizing only the side wall areas and not the bottom of the dispersal system, with an exception for leachfields ranging from 36 to 60 inches wide that have been calculated using both the sidewalls and bottom of the leachfield. A formal study of the functional life of a dispersal system in Monterey County, that is the duration of time it operates before failure, has not been completed. However, EHB staff routinely review the OWTS permit history of a parcel prior to issuance of a replacement permit and approximate the functional life of a dispersal system to be on the order of 30-40 years.

The most biologically active area in a soil column is the aerobic environment at or near the ground surface. An aerobic environment (oxygen rich) is desired for most wastewater treatment and dispersal systems. The Environmental Protection Agency's Onsite Wastewater Treatment System Manual (EPA 2002) cites that 2 to 4 feet of permeable, unsaturated soil is adequate to protect against potential pathogen contamination. Because many existing lots of record in Monterey County are constrained by slopes and trees, the LAMP provides dispersal system modifications that most efficiently utilize land area available to accommodate a dispersal system while conforming with Monterey County's perceived intent of OWTS Policy Sections, which is to encourage the design and use of shallow systems.

Excerpts from the OWTS Policy:

"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…"

"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."

The use of shallow leachfields is the preferred method of dispersal because the septic tank effluent is passively distributed by gravity and discharged at a shallow soil depth. Supplemental treatment shall be incorporated into a dispersal system when it is proposed to be installed to a depth greater than 10 feet, or when minimum vertical setbacks to groundwater or an impermeable layer cannot be met.

The minimum infiltrative area required for a conventional dispersal system shall be calculated using the daily wastewater volume specified by Table 5-3 of this LAMP for residential development, or as calculated by the qualified professional for commercial, industrial, institutional or multi-family units, divided by the soil application rate specified by Table 5-4, and/or Table 5-5. The maximum soil application rate shall be determined from stabilized percolation test results or soil observations (i.e. texture, structure shape and grade) that correspond with the effective depth (bottom) of the proposed dispersal system.

Table 5-4. Soil Application Rate as Determined from Stabilized Percolation Rates
Source: Modified version of Table 3, OWTS Policy, Tier 1

Percolation Rate (minutes per Inch)	Maximum Soil Application Rate (gallons per day per square foot)
< 1	1.2 (Requires Alternative OWTS with Supplemental Treatment)
1 – 5	1.2
6 – 10	0.8
11 – 17	0.7
18 – 24	0.6
25 – 33	0.5
34 – 42	0.4
43 – 51	0.3
52 – 60	0.2
61 – 66	0.18
67 – 72	0.16
73 – 78	0.14
79 – 84	0.12
85 – 90	0.1

> 90 – 120[1]	0.1 (Requires Alternative OWTS with Supplemental Treatment)

[1]When percolation testing yields slower than 90 MPI, the qualified professional shall incorporate alternative OWTS with supplemental treatment to further reduce BOD and TSS beyond primary treated effluent to slow down the development of biomat and extend the life of the disposal field; nitrogen reduction is not required. No OWTS permits shall be issued when the percolation rate is slower than 120 MPI.

Table 5-5. Soil Application Rate as Determined from Soil Texture, Structure and Grade
(Source: OWTS Policy Tier 1 Table 4, based on US EPA 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)	Vertical Groundwater Separation (feet)
Coarse Sand, Sand, Loamy Coarse Sand, Loamy Sand	Single grain	Structureless	0.8	20
Fine Sand, Very Fine Sand, Loamy Fine Sand, Loamy Very Fine Sand	Single grain	Structureless	0.4	8
Coarse Sandy Loam, Sandy Loam	Massive	Structureless	0.2	8
	Platy	Weak	0.2	8
		Moderate, Strong	Prohibited	n/a
	Prismatic, Blocky, Granular	Weak	0.4	8
		Moderate, Strong	0.6	20
Fine Sandy Loam, very fine Sandy Loam	Massive	Structureless	0.2	8
	Platy	Weak, Moderate, Strong	Prohibited	n/a
	Prismatic, Blocky, Granular	Weak	0.2	8
		Moderate, Strong	0.4	8
Loam	Massive	Structureless	0.2	8
	Platy	Weak, Moderate, Strong	Prohibited	n/a
	Prismatic, Blocky, Granular	Weak	0.4	8
		Moderate, Strong	0.6	20
Silt Loam	Massive	Structureless	Prohibited	n/a
	Platy	Weak, Moderate, Strong	Prohibited	n/a
	Prismatic, Blocky, Granular	Weak	0.4	8
		Moderate, Strong	0.6	20
Sandy Clay Loam, Clay Loam, Silty Clay Loam	Massive	Structureless	Prohibited	n/a
	Platy	Weak, Moderate, Strong	Prohibited	n/a
	Prismatic, Blocky, Granular	Weak	0.2	8
		Moderate, Strong	0.4	8
Sandy Clay, Clay, or Silty Clay	Massive	Structureless	Prohibited	n/a
	Platy	Weak, Moderate, Strong	Prohibited	n/a
	Prismatic, Blocky, Granular	Weak	Prohibited	n/a
		Moderate, Strong	0.2	8

5.9 Site Evaluation and Soil Characteristics

The depth and type of unsaturated soil below the dispersal system are the most important factors in the treatment process. Deep unsaturated soils provide for relatively long detention times and are ideal conditions for promoting die-off of pathogens. Conversely, relatively porous, sandy soils allow OWTS effluent to move into local groundwater and other receiving waters very quickly and therefore, with little treatment.

A comprehensive site evaluation shall be summarized in an OWTS Feasibility Report prepared by the qualified professional that describes the soil profile and absorptive characteristics of the soil, indicates the presence of groundwater or bedrock, evaluates topography and confirms horizontal setback requirements, as each of these subjects pertain to the design aspects of the OWTS dispersal system. All borings, excavations and/or percolation test locations shall be reasonably accurate, field verified or measured, and plotted on the submitted site plan which shall be to scale.

For subdivisions and new OWTS on vacant lots of record, the following requirements apply:

- A minimum of one deep groundwater monitoring boring per lot.
- A site evaluation, soil profile analysis and percolation testing shall be completed for each lot in each of the areas proposed to accommodate the required dispersal systems: primary dispersal field area and expansion area(s).
- The soil application rate shall be determined by Table 5-4.
- The OWTS feasibility report shall demonstrate the feasibility of the proposed lot design and density.

For subdivisions, soil profile analysis and percolation testing may be reduced at the discretion of the EHB if conformity to a given soil type can be established to the satisfaction of the EHB. In all cases, at least one soil profile excavation and percolation test shall be completed for each proposed lot to identify suitable dispersal system locations and reserve areas on each proposed parcel. Alternative OWTS or gravel-filled seepage pits shall not be used to demonstrate OWTS feasibility for new subdivisions.

For replacement or expansion of an existing OWTS dispersal system, the following requirements apply:

- A soil profile analysis shall be completed in the area proposed to accommodate the dispersal system replacement or expansion.
- The absorptive characteristics of the soil may be evaluated by either direct inspection or percolation testing and shall be used to determine the soil application rate specified by either Table 5-4 or Table 5-5. If both methods are completed, the qualified professional shall make a recommendation of the appropriate soil application rate.
- An excavation or boring shall extend sufficiently beyond the final depth of proposed dispersal field to demonstrate adequate vertical groundwater separation per Table 5-5 or Table 5-6. The qualified professional may elect to evaluate the depth to groundwater with the same boring or excavation used to evaluate the soil profile or absorptive characteristics or complete a separate boring or excavation.

5.9.1 Soil Depth and Characteristics

The site evaluation shall determine that adequate soil depth (and separation to groundwater) is present in the dispersal area. Soil depth is measured vertically to the point where bedrock, hardpan, impervious soils, or saturated soils/groundwater 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, or as viewed in excavations exposing the soil profiles in representative areas.

Historical or regional information indicating that a specific soil profile is unwarranted may be submitted to the EHB by the qualified professional for review. Such information shall include a written narrative, prepared by the qualified professional, indicating why, in his or her opinion, such an evaluation is unwarranted. The EHB will review the information provided to determine if a specific site evaluation is warranted.

5.9.1.1 Soil Profile Analysis

A soil profile analysis shall be completed by the qualified professional to be included in an OWTS feasibility report. The boring or excavation shall extend at least 3' beyond the bottom of the proposed dispersal system. The following observations shall be made and recorded by a qualified professional:

1. Thickness, depth and texture of soil layers encountered
2. Depth to bedrock, hardpan or impervious layer
3. Depth to groundwater – as determined by direct observation and/or the highest extent of soil mottling.
4. Evidence of soil mottling or gleying
5. Other conditions affecting the potential use of the soil for sewage disposal, including but not limited to the evidence of roots, fissures, and dampness.

5.9.1.2 Assessment of Absorptive Characteristics of Soil

The absorptive characteristics of the soil are used to determine the soil application rate and shall evaluated at the depth of the bottom of the proposed dispersal field.

1. Absorptive Characteristics of Soil by Direct Inspection
   A trench or excavation shall be completed by a qualified professional to determine the soil texture, soil structure shape and grade.
   a. The minimum depth shall be at least 8 feet beyond the proposed dispersal field depth but will be determined by the vertical groundwater separation requirement specified by Table 5-5. The qualified professional shall make a determination that at least 3' of soil is present above any impervious layer.
   b. The soil application rate shall be determined by Table 5-5

2. Absorptive Characteristics of Soil by Percolation Testing
   A percolation test shall be completed at the depth of the proposed dispersal field.
   a. An additional boring that extends sufficiently beyond the final depth of proposed dispersal field shall be completed to demonstrate adequate vertical groundwater separation per Table 5-6.

b. The soil application rate shall be specified by Table 5-4

5.9.1.3 Groundwater Monitoring

The minimum depth of a groundwater monitoring boring or excavation is dependent on the absorptive characteristics of the soil. Since soil moisture and groundwater do not always immediately flow into a test boring, EHB may require a minimum of 24 hours to pass before an accurate groundwater measurement is taken. If groundwater is immediately observed after drilling or digging, the EHB shall be notified and the groundwater measurement shall be taken no sooner than 24 hours later.

During periods of below average rainfall, or after periods of drought where there has not been sufficient groundwater recharge, the absence of groundwater in test borings in areas where groundwater is suspect may not mean that approval to issue a septic tank permit can be granted. In this case, the qualified professional shall supplement the field investigation with reference to past groundwater and hydrogeologic studies, and review of historic groundwater levels. The qualified professional shall recommend the highest probable groundwater elevation based on review of this historic information, for review by the EHB. The EHB may either approve the recommendation or require that groundwater monitoring occur during the wet weather conditions.

When groundwater is encountered, the qualified professional shall determine if the construction of subsurface drainage improvements would be sufficient to divert the water away from the dispersal system area and protect against comingling of the wastewater effluent and groundwater.

It is recommended that all test borings that encounter groundwater be converted to observation wells so the groundwater conditions can be monitored over time. Such conversion of soil borings to observation well will be required as a permit condition for alternative OWTS. Community dispersal systems shall demonstrate that at least 15 feet of vertical separation will exist between the bottom of the proposed dispersal system and groundwater, regardless of the minimum separation specified in Table 5-5 or 5-6.

The qualified professional and the property owner maintain full responsibility for protecting the public from any hazards related to the test borings or excavations.

5.9.2 Percolation Testing

Percolation testing is conducted to estimate the soils absorptive characteristics and determine the size of the dispersal field for the project. All percolation tests must be conducted at the level of the deepest trench depth proposed in the dispersal system design. An alternative method would be to allow the percolation test holes to be at a depth midway between the shallowest trench depth proposed and the maximum trench depth proposed, providing the soil is of a consistent type throughout the trench depth range. The final, stabilized percolation rates obtained for each dispersal area shall be averaged to determine the soil application rate utilizing Table 5-4. When the highest and lowest percolation rates vary by more than 30 minutes per

inch, the qualified professional shall determine if additional testing is necessary or recommend an appropriate soil application rate based on the information available.

An applicant must hire a qualified professional to conduct the percolation tests. It will be necessary to submit a workplan to EHB prior to commencing a site and soil evaluation for:

- A commercial operation or employee housing facility that will generate more than 1,000 gallons of domestic wastewater each daily; or
- A new or expanded dispersal system for a wastewater treatment facility; or
- A proposed subdivision of land.

The EHB will determine the level of oversight to be provided during the testing. The workplan must include:

1. A thorough project description and estimate of wastewater generation based on Monterey County Code, Chapter 15.20.
2. A site plan that delineates property lines, easements, wells (all types), bodies of water, watercourses, drainage ways, existing and proposed structures, trees, downhill embankments and slopes greater than 25%.
3. The location, depth, type of excavation (boring, pit, etc.) and type of testing (groundwater observation hole, percolation test hole, soil profile pit, etc.) proposed throughout the site, that meet the requirements on Monterey County Code, Chapter 15.20.

In instances that EHB is required to witness the soil investigation, it will be necessary to contact the EHB at least 72 hours in advance of moving on site to commence work to coordinate the site evaluation. The qualified professional shall make necessary arrangements to assure that adequate water is available for the required 24-hour pre-soaking and for refilling during the testing.

Percolation testing will normally be conducted at the time of or shortly following the soil profile investigation. No permit for a conventional OWTS shall be issued unless the property to receive the sewage effluent has a minimum percolation rate of 90 minutes per inch and a maximum percolation rate of 1 minute per inch. Alternately, a visual assessment of the soil profile may be completed in accordance with Section 5.9.1. An alternative OWTS with supplemental treatment shall be required when the percolation rate is less than 1 minute inch or greater than 90 minutes per inch. No OWTS permit shall be issued when then the percolation rate is greater than 120 minutes per inch.

It is important to distinguish between soil saturation and soil swelling. Saturation means that the voids between soil particles are full of water. This can happen in a short time. Swelling is caused by intrusion of water into individual soil particles. This is a slow process. Expansive soils with high shrink-swell soils may exhibit suitable soil percolation rates during the dry season due to shrinkage cracks in the soil, but when they become wet, the same soils may swell to the point of providing little or no percolation. If the qualified professional determines expansive soils with high shrink-swell characteristics are present, based on either the soil profile or on

observations of the ground's surface, percolation testing shall include a prolonged soaking period or be completed during the normal wet weather season.

5.9.3 Vertical Separation to Groundwater or Impervious Layer

The minimum depth to the anticipated highest level of groundwater below the bottom of the leaching trench, shall not be less than prescribed in Table 5-6.

Table 5-6. Minimum Vertical Separation to Groundwater for Conventional OWTS Dispersal Systems

Percolation Rate	Minimum Vertical Separation to Groundwater
Percolation Rate ≤1 MPI	Not Authorized without Alternative OWTS with Supplemental Treatment
1 MPI < Percolation Rate < 5 MPI	Twenty (20) feet
5 MPI < Percolation Rate ≤ 30 MPI	Eight (8) feet
30 MPI < Percolation Rate ≤ 90 MPI	Five (5) feet
Percolation Rate > 90MPI	Not Authorized without Alternative OWTS with Supplemental Treatment

When the minimum vertical separation to groundwater cannot be met, an alternative OWTS with supplemental treatment, including Total Nitrogen reduction and disinfection, shall incorporated into the proposed OWTS. When the percolation rate is either 1 minute per inch or faster, or slower than 90 minutes per inch, or when the minimum vertical separation to groundwater cannot be met, supplemental treatment, including total nitrogen reduction, shall be incorporated into the proposed OWTS and the vertical groundwater separation requirements specified by Table 5-9 shall apply.

When the horizontal distance from a dispersal system to a cut bank or downhill slope that exceeds 30 percent is greater than 50 feet, a minimum of 3 feet of soil that percolates in the range of 1 – 120 minutes per inch is required between the dispersal system and an impervious layer. When the horizontal distance from a dispersal system to a cut bank or downhill slope that exceeds 30 percent, or when the dispersal system is proposed to be installed on a slope that exceeds 30 percent, is 50 feet or less, a minimum of 5 feet of soil that percolates in the range of 1 – 120 minutes per inch is required beneath the dispersal system. When supplemental treatment is incorporated into the OWTS, the vertical separation may be reduced in accordance with Table 5-9.

5.9.4 Slope Analysis

A slope means the shape that land takes with a decrease in elevation. The slope percentage is measured by dividing the vertical change in elevation (rise) by the horizontal distance over

which the vertical change occurred (run), multiplied by 100. A cut slope means the soil surface that remains after materials has been removed from a natural slope. A steep slope means land with a slope greater than 50%.

Historically, Monterey County has allowed dispersal systems to be installed in areas where the slope is 30 percent or less. Provided horizontal setbacks have been maintained, the incidence of surfacing effluent or slope instability in areas ranging from 25 to 30 percent slopes is very low and thus the practice shall be allowed to continue.

The maximum ground slope for various types of wastewater disposal systems are presented in Table 5-7 below.

Table 5-7. Maximum Allowable Ground Slope by Dispersal System Type

Type of Dispersal System	≤ 20%	21-30%	31-40%[1]	41-50%[2]
At-Grade	X			
Cover Fill	X			
Mound	X			
Conventional Leach Field		X		
Seepage Pit with Supplemental Treatment		X		
Raised Sand Filter Bed			X	
Shallow-Pressure-Distribution			X	
Subsurface Drip Dispersal				X

[1] Supplemental treatment is required for slopes greater than 30%

[2] Supplemental treatment with disinfection is required for slopes greater than 40%

5.9.4.1 Slope Stability Analysis

The design of dispersal systems on slopes requires the experience and expertise of a qualified professional to address conditions relative to soil, slope stability, and subsurface conditions. A Slope Stability Analysis, including additional soil testing beyond the requirements specified by Section 5.9.1, shall be required when a dispersal system is proposed to be:

1. installed in an area where the slope is 30 percent or less and the minimum setback to an impervious layer cannot be met; or
2. installed in an area where the slope does not conform to Table 5-7; or
3. located closer to a steep slope than the minimum setback specified by Table 5-7; or

A Slope Stability Analysis means a report prepared by a California registered geologist in conformance with California Division of Mines and Geology standards that includes the following:

- Certification that installation of the proposed OWTS will not contribute to failure of the slope causing earth movement or landslide and will not adversely affect water resources; and

- Determination of the maximum contour loading rate; and
- Analysis of impact to slope stability due to effluent and irrigation water; and
- Assessment of stability of structures on said parcel and any affected adjoining parcels; and
- Demonstrate that leachate will remain subsurface; and
- A detailed grading map, including stabilization or mitigation plans during the development of the slope; and
- Cross sections of slopes, including stabilization or mitigation plans (generalized sections are not appropriate). These cross sections must represent the entire slope, width, height, and length;
- Results of soil sampling and percolation testing specified below.

Soils testing must provide data representative of the entire disposal area and demonstrate that conditions are uniform below the entire disposal area.
The minimum testing requirements are:

a. Two soil profile borings that extend 5 feet beyond the proposed trench depth to confirm the minimum setback to an impervious layer can be met; and
b. Two percolation tests at a depth equal to the proposed trench depth; and
c. Two percolation tests five feet below the proposed trench depth; and
d. Percolation testing must show rates of 90 minutes per inch or less; and
e. When required by Zoning Ordinance and/or local Area Plan or Land Use Plan, a Use Permit shall be obtained from the Monterey County Resource Management Agency – Planning Department prior to issuance of an OWTS construction permit.

Formulas and methods used for slope stability analysis, all assumptions shall be stated. Enough information should be provided to allow the reviewer to repeat the calculations. Appropriate factors of safety shall be applied. Reference must be provided to support the slope analysis method. A variance request application shall be submitted for consideration by the Director.

5.9.5 Horizontal Setback Distances

The setback from a proposed OWTS dispersal system to nearby drinking wells or surface waters are of significant concern. Frequently, properties served by OWTS are also served by private on-site water wells. In other cases, properties with OWTS may be located within the groundwater capture zone of a public drinking water well. Depending on the direction of the groundwater flow, nearby wells may be in the path of the OWTS effluent. Monterey County Code, Chapter 15.20, Table A, specifies minimum horizontal setbacks distances. Table 5-8 specifies changes indicated with strikethrough and underline, and sets forth additional setbacks that new OWTS shall be required to meet.

Table 5-8 (part 1 of 2) Minimum Horizontal Setback Requirements for Conventional OWTS

Setback Element	Septic Tank (feet)	Dispersal Field (feet)
1. Wells: Potable, Irrigation, Monitoring, Cathodic Protection	100	100[a]
2. Wells: Geothermal	50	50
3. Domestic Water Supplies (that do not serve a public water system)	100	100[a]
4. Public Water System Supply Wells (Existing)		
Where the dispersal system is less than or equal to 10 feet deep	100[d]	150
Where the dispersal system is deeper than 10 feet and supplemental treatment, including disinfection, has been incorporated	100[d]	150
5. Public Water Systems' Surface Water Intake		
Where the effluent dispersal system is less than 1,200 feet from a public water systems' surface water intake, 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 (measured from high water mark of the reservoir, lake or flowing water body)	100[d]	400
Where the effluent dispersal system is more than 1,200 feet but less than2500 feet from a public water systems' surface water intake, 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 (measured from high water mark of the reservoir, lake or flowing water body)	100[d]	200
6. Bodies of Water: Vernal Pools, Wetlands, Lakes, Ponds or other Surface Water Bodies)	100[d]	200
7. Watercourse: measured from the high-water mark	100	100
8. Springs, natural or any part of man-made spring	100	100[a]
9. Drainageway: measured from edge of flow path		
Up slope (when elevation of the bottom of the drainage way is at or above the elevation of the effluent distribution pipe)	25	25
Down slope (when elevation of the bottom of the drainage is below the elevation of the effluent distribution pipe)	25	50
10. Curtain Drains		
Up slope	<u>10</u>	<u>Requires Site Specific Engineering</u>
Down slope	10	50
11. Domestic Water Line	10	10
12. Building, Structure, or Mobile Home	5	10
13. Property Line	5	10

Table 5-8 (part 2 of 2) Minimum Horizontal Setback Requirements for Conventional OWTS

Setback Element	Septic Tank (feet)	Dispersal Field (feet)
14. Large trees (when diameter of trunk is greater than or equal to 5 inches, measured 2 feet from ground level)	10	10
15. Downhill Embankment with change in slope greater than 20% or Cut Slope	10	4 x H[bc]
16. Steep slopes >50 percent (measured from the break of the slope)		
Height of steep slope is less than 12 feet	10	25
Height of steep slope is greater than or equal to 12 feet	10	50
17. In ground Swimming Pools/Spas		
Up slope (when the elevation of the bottom of the pool or spa is at or above the elevation of the OWTS component)	10	10
Down slope	10	25
18. Unstable Land Mass or Areas Subject to Landslides	100[c]	100[c]

[a] The required setback distance for existing seepage pits without supplemental treatment shall not be less than 150 feet.

[b] H equals the height of cut or embankment, in feet. The required setback distance shall not more than 50 feet, measured from the distribution pipe.

[C] This distance may be reduced if recommended by a Geotechnical Report.

[d] All new or replacement septic tanks, pump tanks and supplemental treatment system tanks will be tested and confirmed to be watertight prior to final inspection; therefore, a 100 feet horizontal setback is adequate to protect public water supply wells, bodies of water and public water system intake points from contamination.

When the minimum horizontal setback distance to a well, spring, surface water intake, body of water or watercourse cannot be met, an alternative OWTS with supplemental treatment, including Total Nitrogen reduction, shall incorporated into the proposed OWTS design.

Amendments to the Monterey County Code to conform to these requirements will be presented to the Board of Supervisors for adoption within a year of adoption of the LAMP, but in the interim period following adoption of the LAMP, the requirements in the Table A of MCC, Chapter 15.20, shall control.

5.10 Dispersal System Design and Construction

The infiltrative surfaces of dispersal systems shall be located in permeable, unsaturated natural soil material so wastewater can infiltrate and percolate through the underlying soil. Permeable, unsaturated soil is native soil material that is not inundated by groundwater. The minimum depth of soil required below a proposed dispersal system is dependent upon the stabilized percolation rate or soil observations that correspond with the effective depth (bottom) of the system. As wastewater infiltrates and percolates through the soil, a variety of physical, chemical, and biochemical processes and reactions can filter or biodegrade some of the organic materials that remain after conventional (primary) treatment in the septic tank. Many different

dispersal system designs and configurations are used, but all incorporate soil infiltrative surfaces that are located in buried excavations.

Historically, Monterey County has relied primarily on leachfield dispersal systems that range in effective depth from 3 – 12 feet deep and on deep seepage pits. The infiltrative area of dispersal systems have been calculated utilizing only the side wall areas and not the bottom of the dispersal system, with an exception for leachfields ranging from 36 to 60 inches wide that have been calculated using both the sidewalls and bottom of the leachfield.

Monterey County's perceives that OWTS Policy Sections 8.1.6 and 8.1.7 are in place to encourage the design and use of shallow dispersal systems.

> *Excerpts from the OWTS Policy:*
>
> **"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…"**
>
> **"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."**

This LAMP allows for the infiltrative area of replacement dispersal systems that receives primary treated wastewater from a conventional septic tank to vary up to 10 square feet per linear foot of trench. It is appropriate to allow more infiltrative area than 4 square feet per linear foot of trench for replacement dispersal systems because in no case shall the vertical separation between trench bottom and groundwater be less than 5 feet and dispersal systems installed into soils that percolate faster than 1 minute per inch shall be preceded by supplemental treatment to ensure satisfactory wastewater treatment will occur before effluent comes into contact with groundwater. When a qualified professional demonstrates that an existing lot of record is constrained by existing conditions, such as steep slopes or trees, a replacement dispersal system may be credited up to 10 square feet of infiltrative area per linear foot of trench in order to utilize available land more efficiently without putting groundwater or public health at risk.

When a new OWTS dispersal system is proposed within a potential groundwater recharge area specified by Figure 2-10 of this LAMP, the dispersal system shall not be deeper than 5 feet. When the dispersal system excavation in a will be deeper than 5 feet, the qualified professional shall incorporate supplemental treatment, including reduction of total nitrogen, into the OWTS design that meets or exceeds the effluent standards specified in Table 5-10. Replacement dispersal systems located within a potential groundwater recharge area shall conform to requirements of this LAMP.

5.10.1 Soil Cover

1. All conventional dispersal systems shall have at least 12 inches of soil cover per OWTS Policy 8.1.4.

2. Soil cover requirements must also conform to those allowed by the manufacturer of any gravel-less/chamber design.
3. New, expansion or replacement OWTS dispersal systems shall not 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 unless supplemental treatment is incorporated into the system to reduce BOD and TSS to the standards specified in Table 5-10 of this LAMP. Dispersal systems covered by an impervious surface require nitrogen reduction when minimum vertical separation to groundwater cannot be met or when the Director determines that the wastewater effluent has potential to contribute to nitrate contamination in groundwater. Pervious concrete, also called porous concrete, permeable concrete, no fines concrete and porous pavement, shall be allowed to cover a dispersal system because it is a special type of concrete with a high porosity that allows the transfer of both air and water.
4. When an existing dispersal system that is covered by an impermeable surface is proposed to accept additional wastewater, i.e. a residential building remodel or addition, or a commercial change of use, a qualified professional shall first verify the dispersal system is eligible to remain in use per Table 4-2 and then incorporate supplemental treatment into the OWTS to reduce total suspended solids ("TSS") and biological oxygen demand ("BOD"). Reduction of total nitrogen ("TN") will also be required when determined necessary per Table 4-2 to mitigate water-related horizontal and vertical groundwater setbacks in the wastewater.

5.10.2 Leachfields

The use of shallow leachfields is the preferred method of dispersal because the septic tank effluent is passively distributed by gravity and discharged at a shallow soil depth. Soil microbes that breakdown or utilize wastewater effluent are more numerous at shallow soil depth and nitrogen in the effluent is available for uptake by plants.

When parallel distribution is used for wastewater dispersal, leachfields trenches shall be of equal length to the greatest extent possible. To facilitate future inspections of the leachfield, tracer wire shall be laid along the length of the distribution pipe and inspection ports are to be installed at the end of each trench. The EHB retains the authority to require the installation of additional inspection ports at different locations of the leachfield.

<u>New or Expansion Leachfields</u>

New and expansion leachfields shall be designed and installed according to the following specifications:

- Effective depth shall be at least 1 foot.
- Total depth shall not exceed 10 feet
- The bottom of a trench shall be between 1.5 feet and 36 inches wide
- Infiltrative area shall be limited to 4 square feet per linear foot.
- Infiltrative area shall be calculated using the bottom of the trench and up to 6 inches of sidewall area.

- Separation between trench sidewalls shall be measured sidewall to sidewall and be at least equal to the trench width or 2 times the effective depth of the trench or, whichever is greater. An additional 1 foot of separation is required for each 5% increase in slope greater than 30%.

Replacement Leachfields

Replacement leachfields are different from expansion leachfields because they will not receive additional wastewater volume or be subject to increased strength wastewater beyond existing conditions. Replacement leachfields shall be designed and installed according to the following specifications.

- Effective depth shall not exceed 5 feet
- Total depth shall not exceed 10 feet.
- The bottom of a trench shall be between 18and 36 inches wide
- Infiltrative area for a replacement dispersal system shall not exceed 10 square feet (s.f.) per linear foot. Example configurations include:
  - 3.5 feet effective depth x 3 feet wide = 10 s.f. per linear foot
  - 5 feet effective depth x 1.5 feet wide = 10 s.f. per linear foot
- Infiltrative area shall be calculated using sidewall area only, unless the trench bottom is 36 inches wide, in which case the bottom may also be included in the calculation.
- Separation between trench sidewalls shall be measured sidewall to sidewall and be at least equal to the trench width or 2 times the effective depth of the trench or, whichever is greater. An additional 1 foot of separation is required for each 5% increase in slope greater than 30%.

Because beneficial soil microbes and potential for evaporation are significantly reduced in deep trenches, the qualified professional shall incorporate supplemental treatment, including total nitrogen reduction, into the OWTS design when the total depth of a leachfield is greater than 10 feet. No limit on infiltrative area shall apply, as calculated using sidewall area only, when an OWTS includes supplemental treatment that meets the standards specified by Table 5-10.

5.10.3 Seepage Pit Construction

Gravel-filled seepage pits have been used historically throughout Monterey County for a variety of reasons, including poor percolating soils in the top 10 feet of soil, limited area to accommodate OWTS (small lots) and as a way to mitigate for steep slopes. Each seepage pit is gravel filled and typically 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 are prohibited. Seepage pits are generally 3 to 6 feet in diameter while the depth varies depending on the soil conditions and the depth to groundwater but typically is 40 to 50 feet deep.

Seepage pits shall not be utilized for new, expansion, or replacement OWTS on existing lots of record. A variance to this standard may be considered for approval by the Director provided the following minimum criteria have been met:

1. The qualified professional has demonstrated to the satisfaction of the EHB that there is no other area on the lot that will accommodate a conventional leach field or drip dispersal with supplemental treatment; and

2. The qualified professional shall incorporate supplemental treatment, including reduction of total nitrogen, into the OWTS design that meets or exceeds the effluent standards specified in Table 5-10, including total nitrogen reduction. When the separation to groundwater is less than 10 feet, bacterial disinfection shall also be required. In no case shall the distance between a seepage pit and groundwater be less than 5 feet, even when the alternative OWTS utilizes supplemental treatment and disinfection.

Seepage pits may not be used as the basis to demonstrate OWTS feasibility for new subdivisions.

Prior to issuance of a new OWTS permit that includes seepage pits, an exploratory boring shall be conducted and logged by a certified geologist or other qualified professional as approved by the EHB, to a depth at least 10 feet past the proposed final depth of the seepage pit. The qualified professional shall determine if standard penetration test(s), also known as blow counts, are necessary to characterize the strata and propose the intervals(s) that they should occur for consideration by EHB. The certified geologist or other approved qualified professional shall submit a report to the EHB with findings that the installation and use of a seepage pits system(s) will be adequate to accommodate wastewater dispersal from the proposed development and include a recommended soil application rate. The qualified professional shall recommend the appropriate soil application rate in accordance with Table 5-5. When soil testing indicates that multiple seepage pits are necessary 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.

An exploratory boring is not required when a seepage pit(s) has been utilized previously on the site and there is no evidence that deep soil conditions preclude the continued use of seepage pits, i.e. premature failure. However, it will be necessary to over-drill the seepage pit excavation at time of construction so that it extends at least 10 feet past the proposed final depth to demonstrate that the vertical separation to groundwater has been met. Once the excavation has been backfilled to the proposed final depth, and compacted to the extent practical, the perforated pipe shall be placed in the center of the boring and backfilled with drainrock or other approved material to the depth of the dispersal system distribution piping.

In the event groundwater is encountered, the boring shall remain open for a minimum of 24 hours to allow the groundwater level to stabilize. Once the groundwater level has been determined by the qualified professional and accepted by the EHB, the boring shall be backfilled, and compacted to the extent practical, to 10 feet above groundwater, or 5 feet when an approved disinfection unit is incorporated into the alternative OWTS with supplemental treatment. A 6-inch layer of bentonite pellets, cement slurry or other impermeable material as approved by EHB shall be deposited into the boring to reestablish an impervious layer. The perforated pipe shall be placed in the center of the boring on top of the layer of bentonite and backfilled with drainrock or other approved material to the depth of the distribution pipe.

EHB reserves the right to require an exploratory boring when the previous seepage pit system failed prematurely. Seepage pits that are greater than 60 feet deep are not recommended and may require special review.

5.10.4 Pressurized Dispersal Fields

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 and include a separate pump chamber in accordance with Section 5.7.1.

5.10.5 Certified Installation

Whenever an OWTS is designed or engineered to overcome site-specific constraints or includes a supplemental treatment system or alternative dispersal system, the qualified professional that designed or engineered the system shall conduct inspections throughout the installation as necessary in order to certify that it has been installed in substantial conformance with the EHB-approved plan. Upon completion of the installation, the qualified professional shall submit an as-built diagram that reflects any changes made in the specifications and EHB-approved plans during the construction process, and show the exact dimensions, geometry, and location of all elements of the OWTS.

5.11 Drainage Improvements

Surface drainage flows from buildings, yards, drives, etc., shall and subsurface drainage waters shall be diverted away from the dispersal area. This may require site grading and installation of a diversion ditch or berm on the upslope side of the dispersal area. Subsurface drainage flows, or sheetwater, may be intercepted by a curtain drain and diverted around the dispersal system provided the following conditions exist:

1. Natural ground slope is greater than or equal to 5 percent.
2. Site investigations show groundwater to be perched on a clearly definable layer of bedrock, hardpan or impervious soil.

Curtain drains shall be designed by a qualified engineer or geologist with demonstrated experience in design of subsurface drainage diversion systems.

5.12 Alternative Onsite Wastewater Treatment Systems

Alternative OWTS are used to overcome specific site constraints that limit the use of a conventional septic tank and dispersal system. Alternative OWTS utilize either a method of wastewater treatment other than a conventional septic tank and/or a method of wastewater dispersal other than a conventional leach field or seepage pit for the purpose of producing a higher quality wastewater effluent and improved effluent dispersal performance and siting options. Typically, the most significant site constraint resulting in the need for supplement treatment and an alternative dispersal system is a lack of adequate soil depth below the dispersal field.

Alternative OWTS may be utilized for new construction and in situations where replacement or expansion of the existing OWTS is necessary. Alternative OWTS are not to be used as the basis of approval for creation of new lots, i.e. subdivisions.

Alternative OWTS must be designed by a qualified professional in conformance with State guidelines. However, the EHB will adopt local design standards in consultation with the Central Coast RWQCB.

Prior to final inspection of an Alternative OWTS, the property owner shall be required to record a deed restriction indicating that an alternative OWTS has been installed on the property. This notification shall run with the land and will act as constructive notice to any future property owner that the property is served by an alternative OWTS and is therefore subject to an operating permit with regular maintenance, monitoring and reporting requirements. A copy of the recorded document and a valid operation and maintenance contract with a qualified service provider shall be provided to the EHB before final inspection of the system.

To ensure that the system continues to function properly, a qualified service provider must inspect the system at least annually. Maintenance frequencies will be directed based upon manufacturer specifications or industry standards. Inspection reports must be submitted to the EHB detailing the findings of the inspection within 30 days of its completion so that the EHB can track routine inspections and assure owner is conducting the required maintenance.

5.12.1 Vertical Separation to Groundwater

A supplemental treatment system to reduce wastewater strength, total nitrogen and/or provide disinfection may be required to be incorporated into the OWTS depending on the type of dispersal system proposed and the vertical separation to groundwater. Table 5-9 specifies the minimum vertical separation to groundwater and describes the specific wastewater constituents that must be reduced to meet the effluent concentrations specified by Table 5-10, prior to dispersal. 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 5-9.

Table 5-9. Minimum Vertical Separation to Groundwater for Alternative OWTS Dispersal Systems and Conventional Dispersal Systems that Exceed 10 Feet Total Depth

Type of Dispersal System	2 feet*	3 feet*	5 feet*	10 feet*
At-Grade System			Supplemental Treatment Not Required	
At-Grade System with Supplemental Treatment		BOD, TSS, TN, Disinfection		
Conventional Dispersal Trench More Than 10 Feet Total Depth		BOD, TSS, TN, Disinfection	BOD, TSS, TN	

Mound System		BOD, TSS, TN, Disinfection	Supplemental Treatment Not Required	
Raised Sand Filter Bed with Supplemental Treatment	BOD, TSS, TN, Disinfection	BOD, TSS, TN		
Seepage Pit with Supplemental Treatment			BOD, TSS, TN, Disinfection	BOD, TSS, TN
Shallow Pressure Distribution			Supplemental Treatment Not Required	
Shallow Pressure Distribution with Supplemental Treatment	BOD, TSS, TN, Disinfection	BOD, TSS, TN		
Subsurface Drip Dispersal with Supplemental Treatment	BOD, TSS, TN, Disinfection	BOD, TSS, TN		

** measured from the bottom of the disposal trench, bed or piping (in the case of drip dispersal).*

5.12.2 Horizontal Setback Distances for Alternative OWTS

Horizontal setback distances for alternative OWTS should be the same as those specified for conventional septic tanks and dispersal systems in Table 5-8 of this LAMP to the extent practical. The qualified professional designing the alternative OWTS shall indicate how the proposed alternative OWTS component(s) will allow for a horizontal setback reduction without compromising water quality and/or public health.

5.12.3 Alternative OWTS with Supplemental Treatment Systems

Supplemental treatment is generally required to be incorporated into an OWTS when effluent quality has potential to impact groundwater or surface water, or when use of an alternative dispersal system is necessary to overcome a limiting site constraint and requires an alternative dispersal system with clarified effluent to prevent clogging of the system. A variety of supplemental treatment technologies are available to meet specific objectives. In addition to meeting site and design requirements, alternative OWTS utilizing supplemental treatment shall be designed to meet the minimum effluent constituent limitations specified by Table 5-10.

Biological Oxygen Demand (BOD), Total Suspended Solids (TSS), Fats, Oils & Greases (FOG) and Total Nitrogen (TN) are constituents in wastewater that can be measured to evaluate the relative strength of wastewater. High concentrations of BOD, TSS and FOG are known to contribute to increased OWTS failure rates by creating a clogging mat along the infiltrative surface of the dispersal system. Total nitrogen is first converted to ammonium in an OWTS, then to nitrite and finally nitrate. Hydrophilic, water-loving nitrate bonds with water and is carried through the soil, eventually coming into contact with groundwater. Groundwater throughout

many parts of Monterey County are currently known to be contaminated by nitrate. It is important to manage TN from OWTS discharges to prevent further contamination of local drinking water supplies. The maximum allowable concentration of BOD, TSS and TN varies depending upon the type dispersal system proposed and the distance between the bottom of the dispersal system and groundwater and is specified by Table 5-10. FOG is not commonly monitored in residential OWTS and therefore, no standards are proposed with this LAMP.

Table 5-10. Effluent Constituent Limitations for Supplemental Treatment Systems

Type of Dispersal System	Average Effluent Concentrations (mg/L)		
	5-Day Biological Oxygen Demand (BOD)	30-Day Average Total Suspended Solids	Total Nitrogen (TN)[1,2]
Conventional Dispersal Systems with More Than 3 Feet of Effective Depth, including Seepage Pits	30	30	50% reduction or 25 mg/L, whichever is lower
Conventional Dispersal Systems with 3 Feet or Less of Effective Depth	30	30	Not required
Drip Dispersal Systems	20	20	Not required when vertical separation to groundwater per Table 5-6 can be met, otherwise 50% reduction or 25 mg/L, whichever is lower
Alternative Dispersal Systems Installed to Overcome Minimum Horizontal Setbacks to Groundwater, per Table 5-6	30	30	50% reduction or 25 mg/L, whichever is lower
Detection Limit (mg/L)	2	5	1

[1] Determined as the sum of nitrate-nitrogen plus total kjeldahl nitrogen

[2] Unless specifically required by this LAMP or MCC, Chapter 15.20, supplemental treatment systems are not required to meet effluent limitations for Total Nitrogen.

When disinfection is required, the add-on component to the supplemental treatment system shall be designed to meet a minimum fecal coliform concentration of 200 Mean Probable Number (MPN) per100 milliliters, log mean value. Disinfection units shall be operated in accordance with manufacturer recommendations and NSF Standard 46. UV disinfection systems may require additional reduction of TSS and BOD to meet manufacturer specifications.

5.12.4 Alternative OWTS Installation Requirements

1. Any component of an alternative OWTS must be installed by a qualified professional that has been certified by the manufacturer or proprietor to install the specific alternative OWTS component in accordance with the specifications for location, components, size and depth as designed by the qualified professional and approved by the EHB.
2. An alternative OWTS treatment unit tank shall include a sample tap on the dosing pump discharge line or other suitable location as agreed upon by the EHB for effluent sampling.
3. All components of the alternative OWTS shall be accessible upon installation. Watertight risers to grade shall be installed for each
4. All components of the alternative OWTS shall be qualified in writing by the qualified professional who designed the system that the installation was completed per the approved design and manufacturers' recommendations. An as-built drawing of the system that reflects any changes made in the specifications and/or to the approved plans during the construction process, and shows the exact dimensions, geometry, and location of all elements of the system. The written qualification and as-built drawing must meet the satisfaction of the EHB prior to final inspection of the system.
5. The qualified professional shall prepare Homeowner's Manual for the alternative OWTS, including the following:
    a) license and contact information for the certified designer, installer, and service provider
    b) as-built drawing with installation and system start-up dates
    c) treatment process and performance expectations
    d) lists of typical materials, tools, equipment and spare parts
    e) routine cleaning and maintenance procedures
    f) effluent testing procedures
    g) troubleshooting tips

5.12.5 Effluent Dosing Methods

Current and best practice recognizes the importance and benefit of reducing instantaneous hydraulic and organic loading. Small doses followed by resting periods spread evenly throughout the day enhances microbial activity, improves treatment, and system longevity. Control of pumping units by means of programmable timers is preferred.

Time dosing in conjunction with pressure distribution is required for all soil dispersal systems over 1,000 gpd. Time dosing is strongly encouraged for all systems whenever a pump is used to dose a soil dispersal system. Time dosing provides a means of monitoring the treatment system and can also provide a means for detection of leaking plumbing fixtures (e.g. leaking toilet), infiltration, and inflow. Should the volume within the dosing tank exceed the design surge volume, a high-level alarm will activate.

Demand dosing of wastewater effluent w provides for delivery of hydraulic and organic loads which more closely match diurnal flow patterns. Demand dosing delivers flows to downstream components in predetermined amounts only controlled by the established dosing tank's liquid

level control settings. While acceptable, demand dosing is not encouraged in situations where dosing is required. Demand dosing should only be considered when flows are less than 1,000 gpd. Unless flows are carefully monitored, demand dosing will not provide protection of the dispersal system from leaking fixtures and infiltration, unlike time dosing.

5.12.6 Monitoring Well Required

When the presence of groundwater prompts the requirement for an alternative OWTS with supplemental treatment, a permanent groundwater monitoring well shall be installed to evaluate groundwater level and quality over time. A separate monitoring well permit is required to be obtained from the EHB, subject to applicable fees. All standards for monitoring wells specified by MCC, Chapter 15.08 shall be met. The monitoring well shall be covered with an appropriate cap to prevent infiltration of surface water.

When an insufficient horizontal setback to a water well prompts the requirement for an alternative OWTS with supplemental treatment, or when the OWTS will be installed in soil formations that contain continuous cracks, channels or factures and is located less than 250 feet to a water well, the water well shall be monitored for quality over time.

The extent and frequency of groundwater quality monitoring, and groundwater level depth when applicable, will be developed by the EHB in consultation with RWQCB.

5.12.7 Subsurface Drip Systems

All wastewater discharged to a subsurface drip system shall have supplemental treatment. Subsurface drip dispersal 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 and installed by a qualified professional. The maximum slope allowed for the installation of a drip dispersal system shall be 50 percent.

The drip fields must be placed in native soil, unless fill material has been specifically engineered for that purpose, and installed as level as possible and parallel to elevation contours. Soil cover shall be at least 6 inches. Fill material may be placed over the drip lines in order to meet the minimum cover requirements provided the slope of dispersal area is not more than 20%. The area of the drip dispersal system shall be designed, located and maintained to prevent vehicular traffic over it and planted with appropriate vegetation upon installation to allow for uptake of nutrients from the wastewater.

The setbacks for subsurface drip systems shall be the same as for conventional dispersal fields except that they may be reduced to two feet for structures and property lines. If a reduced tree setback is proposed, an arborist or other qualified professional must prepare a report indicating that neither the tree nor the subsurface drip system would be negatively impacted by the setback reduction.

Additional drip dispersal system design and installation standards that shall be required are as follows:

1. Head loss calculations shall be provided to ensure proper hydraulic pressure at the emitter since drip dispersal systems are pressure distribution systems.
2. Emitter lines shall be designed as a continuous loop circuit with no dead-ends.
3. Vacuum release valves shall be installed at the highpoint of the emitter lines.
4. The maximum emitter longitudinal spacing on an emitter line shall be two feet. The maximum spacing between adjacent emitter lines in an absorption bed configuration shall be two feet.
5. Drip dispersal systems shall be time dosed over a 24-hour period. Demand control dosing shall override timed dosing in periods of flow where timed dosing cannot accommodate the excessive flow.
6. All drip dispersal systems shall incorporate an automatic mechanism for backwashing or flushing the drip lines and filters.
7. Drip dispersal systems shall be designed, installed, operated and maintained in accordance with manufacturer's recommendations, notwithstanding the requirements specified above.

5.13 Use of Proprietary Alternative OWTS

The EHB must approve any proposed method of supplemental treatment or alternative dispersal system prior to approval for use in the County. Alternative dispersal systems shall be certified by the International Association of Plumbing and Mechanical Officials (IAPMO). All supplemental treatment systems submitted for EHB approval 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 TSS, BOD and TN. Any supplemental treatment system shall be listed by the 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.

Alternative OWTS 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 total suspended solids of 30 milligrams per liter and shall further achieve an effluent fecal coliform bacteria concentration less than or equal to 200 Most Probable Number ("MPN") per 100 millimeters.

A manufacturer, distributer or other applicant may request that the EHB review a proprietary alternative OWTS supplemental treatment or dispersal system component for conformance with the County's minimum requirements by submitting to the EHB a "Request for Service" application with a deposit to recover costs associated with staff time to review the application materials in accordance with Health Department Fee Article I.E. as adopted by the Board of Supervisors. The application materials may include, but are not limited to the following:

- NSF certification
- Product specifications, design standards and treatment objectives
- Installation manual
- Operation & Maintenance manual
- Sample Service Contract
- List of Qualified Service Providers within 250 mile radius of Alternative OWTS site
- Parts and/or service distributor information
- List of jurisdictions where the system is currently approved for use
- 5 years of 'live operation' performance history

5.14 Operating Permits

Supplemental treatment is a newer technology that reduces constituents of concern in wastewater such as BOD, TSS and TN. While this technology is very effective, systems utilizing supplemental treatment are more dependent on periodic inspections, proper maintenance and servicing as compared to conventional OWTS.

Alternative OWTS would typically be used on constrained sites where standard setbacks from groundwater or a water course could not be met. When they are used as a mitigation measure, the failure of an Alternative OWTS using supplemental treatment and/or an alternative dispersal system would likely have a greater potential to negatively impact the environment and public health.

Consequently, operating permits from the EHB will be required for OWTS that utilize a supplemental treatment unit or alternative dispersal system to ensure that they are functioning properly and as designed. Permit conditions will require regular inspections of the system by a qualified service provider. In addition, a report detailing the findings of the inspection must be submitted to the EHB for review.

SECTION 6: SPECIAL AREAS OF CONCERN

This section discusses four specific areas of concern in Monterey County that have been identified as problem areas with respect to OWTS management. These areas are the Carmel Highlands, Carmel Valley, Toro and North County areas. These areas are already established as areas of concern that require special considerations to achieve the goals of this LAMP, to protect public health and water quality. Refer to Section 3 for discussion on recommendations for groundwater nitrogen assessment and monitoring.

6.1 Carmel Highlands

In response to direction by the Central Coast RWQCB, in 2009 the County commissioned an onsite wastewater management study of the Carmel Highlands and subsequently prepared and adopted an onsite wastewater management plan ("OWMP"). The OWMP addressed OWTS and wastewater disposal in the Carmel Highlands area with respect to OWTS and on-going concerns of individual septic systems in this area. The Monterey County Board of Supervisors adopted the Carmel Highlands OWMP on December 15, 2009 by way of Resolution No. 09-446. This OWMP was subsequently approved by the Central Coast RWQCB. Prior to EHB amending the County Code to address specific recommendations in the approved OWMP, the OWTS Policy was adopted by the State Water Board in 2012. This LAMP has been prepared in conformance with Tier 2 of the OWTS Policy and has been determined by EHB to meet or exceed the recommendations in the OWMP. The OWMP shall remain in effect irrespective of adoption of this LAMP. In the event of discrepancy between standards in the OWMP and the LAMP, the more restrictive standard shall govern as determined by the Director of Health.

The Carmel Highlands area is located about three miles south of Carmel and 18 miles north of Big Sur along State Highway 1, refer to Figure 6-1. The area is bounded by Point Lobos State Reserve on the north and Malpaso Creek on the south. Carmel Highlands lies within the Carmel Area Local Coastal Program Land Use Plan area and consists of properties with the zoning designation low density residential. At the time of development of the Carmel Highlands OWMP there were approximately 450 existing developed residential parcels plus some commercial uses, including the Highlands Inn and Tickle Pink Inn. There were an estimated 105 undeveloped residential parcels in Carmel Highlands with potential for future development. This area in general poses moderate to severe constraints to the proper siting and operation of OWTS due to shallow soils and fractured bedrock.

The 2009 wastewater study included a water balance and nitrate loading analysis for the study area and developed nitrate-nitrogen loading rates for each of the drainage sub-basins in the area, accounting for both contributions from landscape fertilizer use and OWTS. The calculated nitrogen loading rate throughout the study area assuming buildout conditions ranged from approximately 18 to 22 grams of nitrogen per acre per day, below the Central Coast Basin Plan's limit of no more than 40 grams of nitrogen per day. An additional nitrate loading analysis was completed for a localized area at the northern end of Yankee Point Drive, including the

tributary drainage area extending into the upland areas east of Highway 1, where alluvial soil and geologic conditions had the greatest potential for groundwater nitrate impacts to occur. The analysis for this area, now called the Carmel Highlands Nitrogen Management Area, estimated that under buildout conditions the groundwater nitrate-nitrogen concentrations would exceed the primary drinking water standards of 10 mg/L nitrate-nitrogen. In particular, this localized area is known to have very shallow soil underlain by granitic bedrock; the characteristic decomposed granite, commonly encountered throughout the Carmel Highlands, a permeable rock material, is largely absent in this area. These conditions allow more readily for vertical percolation of wastewater than in other areas of the Carmel Highlands. (Questa, 2009) The OWMP concluded that properties within the Carmel Highlands Nitrogen Management Area must incorporate a supplemental treatment system with nitrogen reduction into the OWTS as a condition of new or replacement OWTS permit issuance.

The site and soil evaluation requirements specified by this LAMP will ensure that new and replacement OWTS are installed in areas that have adequate soil characteristics and separation between the bottom of the dispersal system and either groundwater or an impervious layer, such as granitic bedrock to prevent nitrogen impacts. Alternative OWTS with supplemental treatment including nitrogen reduction will be required when minimum standards for a conventional OWTS cannot be met. Nitrogen management will also be addressed for all new and replacement OWTS permits issued throughout Monterey County, including the Carmel Highlands area, by limiting the number of bedrooms a property can have based on the acreage of the property, as specified by Table 5-2.

The Carmel Highlands study also identified potential impacts to ocean water quality due to documented direct sewage discharges from several systems, and also to coastal streams due to inadequate setbacks between OWTS and these surface water bodies. As a result, EHB staff actively sought OWTS records for all coastal properties and conducted site evaluations to identify inadequately sited dispersal systems and direct ocean discharges. OWTS improvements were mandated when these either of these conditions was encountered.

Key recommendations and requirements identified in this OWMP include:

- **Management of Existing OWTS**. Although the Carmel Highlands area does not have a documented high rate of overt failures of OWTS, information on the design, age, replacement history, and septic tank pumping data indicate chronic operational difficulties, severe problems in specific areas, and a likelihood of significant upgrade, replacement needs in the foreseeable future. Management of existing systems can be improved by: (1) identifying and taking abatement action for the existing ocean discharge systems; (2) instituting a new septic tank pumper inspection/reporting program; (3) adopting performance evaluation and other requirements for system expansions and remodel projects; and (4) implementing a water quality monitoring program to provide baseline information and ongoing tracking of OWTS impacts on the environment.
- **Conventional OWTS**. Conventional OWTS can be effective in portions of the Carmel Highlands. However, the historical practices that rely on deep trenches and seepage pits are not well suited to the soil and geologic conditions of the area. Measures to improve the siting and design of conventional OWTS were identified, including modification of soil percolation testing methods, emphasis on shallow trench design, and specific criteria for drainage mitigation.
- **Alternative OWTS**. Various supplemental treatment and alternative dispersal technologies are available that offer a range of possibilities for addressing many of the difficult site conditions and onsite wastewater management problems for existing lots in Carmel Highlands. Alternative OWTS do not necessarily provide solutions for all parcels and conditions, but they can provide a substantial improvement over conventional OWTS and a viable solution for many situations. Including, for example:
    - Steeply sloping sites, using subsurface drip dispersal which spreads the treated wastewater more evenly and less intensively over a larger land area, similar to irrigation systems.
    - Shallow soils underlain by slowly permeable decomposed granite or perched groundwater using supplemental treatment and shallow pressure distribution or drip dispersal methods to compensate for limited soil depth.
    - Areas requiring enhanced nitrogen removal, which can be provided by a variety of available supplemental treatment systems (e.g., aerobic treatment units, textile filters).
- **Alternative OWTS Prohibition**. Alternative OWTS are not recommended to be used as a basis for creation of new lots.
- **Sewerage of High Risk Areas**. Engineering feasibility and environmental studies for extension of a sanitary sewer system to serve high risk areas of Carmel Highlands are recommended. The sewerage study should consider a limited-capacity collection system (approximately 100 connections) to serve properties located on the west (ocean) side of Highway 1. targeting existing developed parcels with OWTS considered to be high risk or problem systems due to existing ocean discharges, surface failures, and faulty operation related to high groundwater or difficult site constraints in this area. A study should evaluate connecting the limited-capacity sewer system to the existing Highlands sewer line, and making use of available, unused hydraulic capacity in the line. The study

should also consider possible expansion of sewer service to the remaining areas of Carmel Highlands, including whether a new stand-alone sewer trunk line between the Carmel Highlands and the Carmel Area Wastewater District facility in Carmel would be needed in order to have the capability of serving the entire Carmel Highlands area.

- **Domestic Water Wells**. Individual water wells. although limited in production capacity. can continue to be considered a viable water source for individual residential parcels. provided appropriate water quality testing and aquifer analysis is completed for each installation and the wells meet applicable setbacks to existing or proposed OWTS. Water quality testing and aquifer analysis is not required routinely in Monterey County and other areas of California for individual domestic water wells. However, the conditions in Carmel Highlands are unique due to the high number and density of OWTS, the relatively small lot sizes, the fractured granitic bedrock aquifer, the recent shift from the historical dependence on public water supplies to the use of individual water wells, and the relatively scant amount of groundwater data for the area. These factors pose significant constraints for the siting of individual wells and the ability to replace a well in the future, should it ever be needed. It should also be noted that the presence of domestic water wells results in additional constraints for the siting of new or replacement OWTS components. Accordingly, a higher level of care should be taken in the siting and initial testing and validation of individual domestic water wells in the Carmel Highlands study area. The data collected from these analyses will be beneficial for validating the adequacy of water supply for individual properties, as well as identifying and assessing any water quality conditions or trends related to wastewater management practices.

6.1.1 Actions Completed by EHB Since Completion of 2009 OWMP

Since adoption of the OWMP, Monterey County conducted outreach and a field survey to identify and abate all identifiable ocean discharges in the Carmel Highlands. Several practices have been implemented prior to issuance of an OWTS permit in the Carmel Highlands, including a performance evaluation requirement for any portion of the OWTS proposed to remain in use when an OWTS dispersal fields expansion or replacement is proposed and site specific soil evaluation to ensure adequate soil exists to accommodate a conventional or alternative OWTS. When building additions or remodels are proposed, existing seepage pits proposed to remain in use have been required to verify compliance with vertical and horizontal separation requirements and incorporate supplemental treatment if the seepage pit is to remain in use, or be abandoned if the separation requirements cannot be met.

The following OWTS permits were issued in the Carmel Highlands area since December 2009:

- Conventional OWTS 1 Component (Tank or disposal field only) – 38 permits
- Conventional OWTS 2 Components (Tank and disposal field) – 8 permits
- Alternative OWTS (Tank or disposal field only) – 2 permits
- Alternative OWTS (Tank and disposal field) – 5 permits

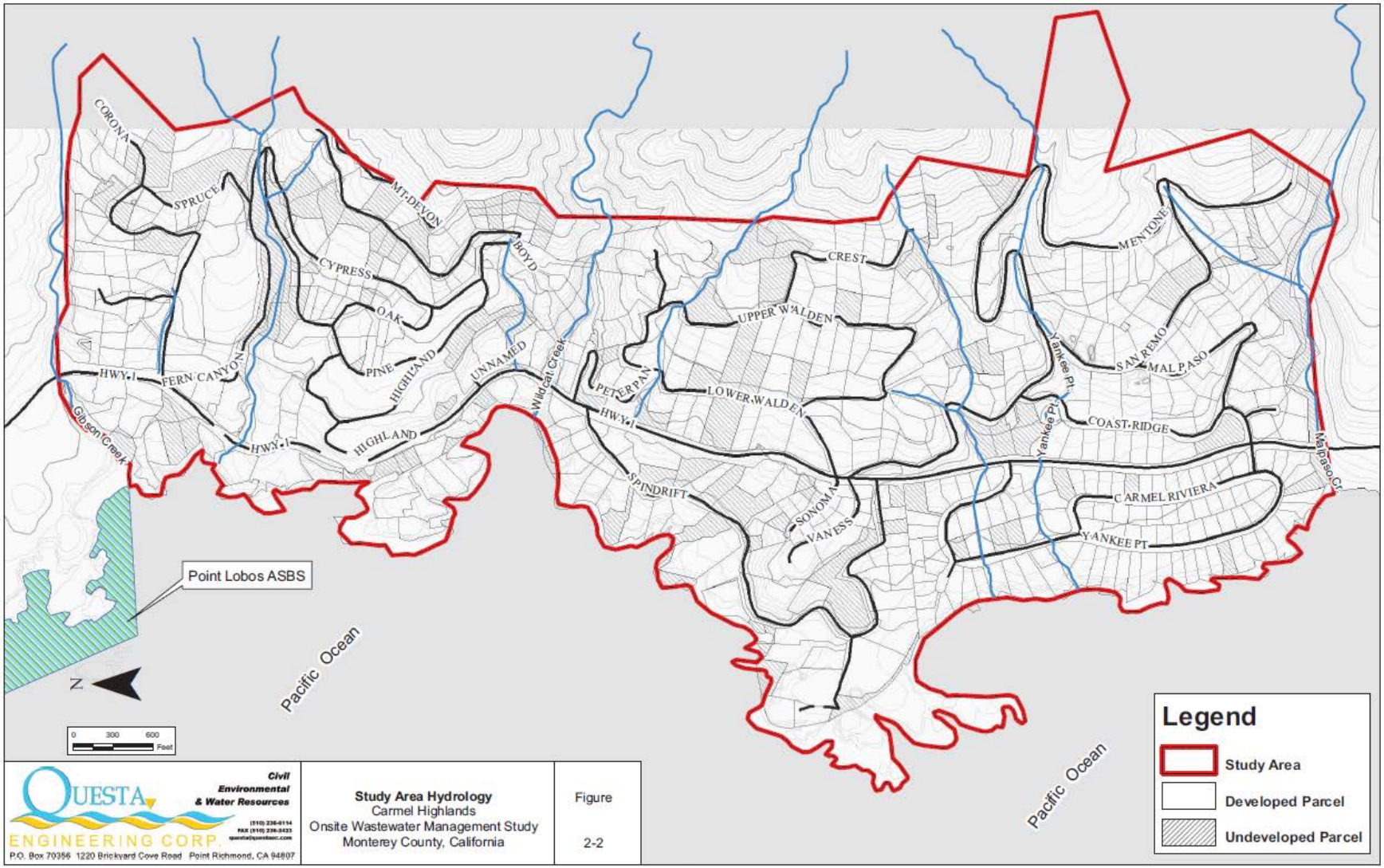
This LAMP implements the septic tank pumper reporting program and takes strides toward the water quality monitoring program recommended by the Carmel Highlands OWMP.

6.1.2 Summary

The Carmel Highlands area has identified constraints with septic tank treatment/disposal systems. Each individual OWTS proposed will require careful consideration by the County as to the viability of conventional OWTS, and whether alternative OWTS systems are warranted to adequately protect public health and water quality. The requirements of the Carmel Highlands OWMP combined with this LAMP should adequately address the goals of the OWTS Policy for proper OWTS management in this area. Groundwater monitoring in this area may be helpful to further assess the effectiveness of operating septic systems in this area. This sampling program should include surface waters/drainage in this area, and include nitrogen compounds, Total Coliform, E. coli, and Enterococcus. As discussed in the prior study, existing and new groundwater supply wells should be more closely evaluated and monitored given the site conditions in this area.

Figure 6-1 Carmel Highlands Special Area of Concern

(Source: Carmel Highlands Onsite Wastewater Management Plan (OWMP), December 2009)

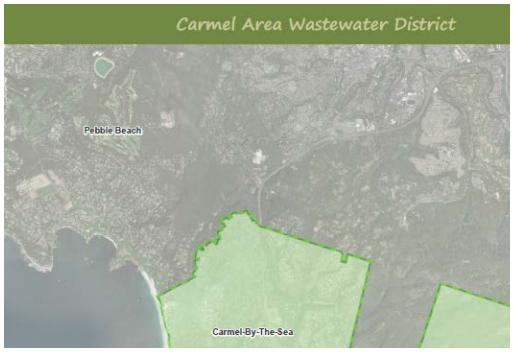


6.2 Carmel Valley Area

The Carmel Valley Planning Area is in the northwest portion of Monterey County, as shown in Figure 6-2. A detailed map of the Carmel Valley area is shown in Figure 6-3.

Figure 6-2. Carmel Valley Planning Area

(Source: Monterey County General Plan Figure #3, Monterey County Planning Areas}



In Carmel Valley, wastewater service is accomplished by several means:

- Centralized wastewater treatment facility (Carmel Area Wastewater District)
- Dedicated wastewater treatment and disposal facilities.
- Community "master" septic systems (or clustered systems) managed by qualified professionals.
- Individual OWTS.

Groundwater samples collected in the late 1970s showed the presence of septic tank indicator constituents (ammonium nitrogen and orthophosphates). Based on this finding, the Central Coast RWQCB limited septic tank effluent discharge to 300 gallons/day-acre, and requested that the Carmel Valley Wastewater Study be undertaken.

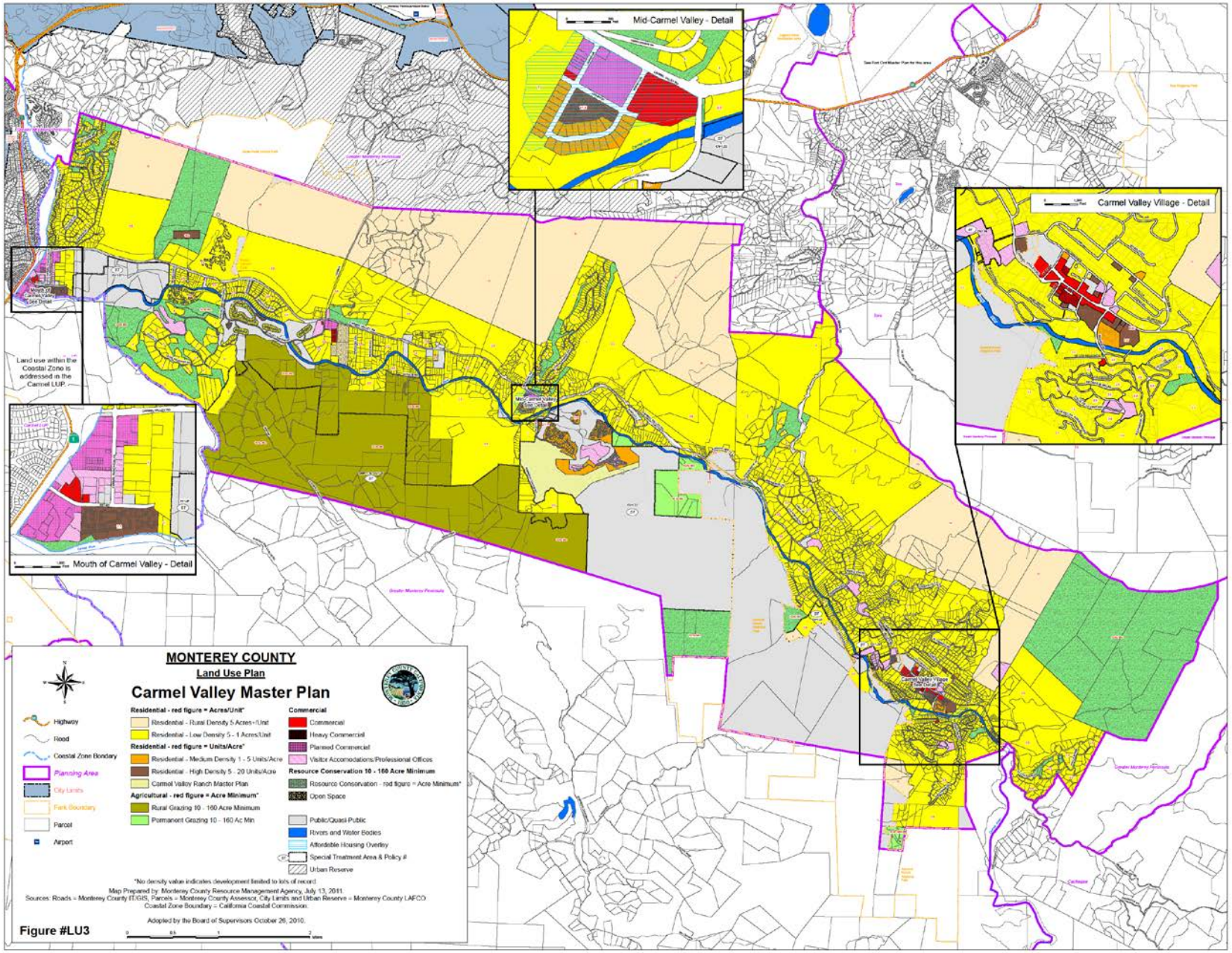
In 1982, Montgomery Engineers prepared the Carmel Valley Wastewater Study ("CVWS"). The purpose of the study was to provide a planning tool for the evaluation of the cumulative impacts of using on-site wastewater facilities in the study area, based upon an analysis of soil percolation rates, soil depths, topography, groundwater, water quality, lot sizes, and septic system operations. The CVWS used this information to determine septic tank capacity in Carmel Valley relative to ultimate build-out projections in the 1980 Master Plan for this area. The CVWS area comprises approximately 30,000 acres which correlates to the 1980 Master Plan boundary. It was noted that the study area is characterized by very steep topography, with slopes frequently exceeding 30 percent.

The 1980 Carmel Valley Master Plan contemplated intensive growth in currently developed areas of the lower Carmel Valley near State Highway 1, the mid-valley area near Mid-Valley Shopping Center, and near Carmel Valley Village. Future land use proposed in the County's zoning ordinance, established prior to the 1980 Master Plan, allowed a majority of the vacant land to be developed with minimum 1 acre parcel sizes; however, the majority of vacant land was increased to a minimum lot size of 2.5 acres/parcel in accordance with the Rural Residential designation of the 1980 Master Plan.

Largely developed areas required community septic tank/disposal systems due to poor siting and soils conditions coupled with the high groundwater conditions that made it difficult to adequately suit individual OWTS.

Figure 6-3 Carmel Valley Area Map

(Source: 2010 Monterey County Land Use Plan, Figure #LU3)



The CVWS had significant findings:

- In 1980 the study area included 4,000 existing dwelling units;
- The 1980 Master Plan projected an addition 2,500 units by 2000, for a total of 6,500 dwelling units.
- Prior to the initiation of the CVWS, Carmel Valley area was under a building moratorium until such time the 1980 Master Plan was eventually adopted, pending completion of the environmental impact report addressing final revisions to the Master Plan.
- Ultimate build-out was estimated to be 10,400 units; however, the area would be limited to 9,540 units in order to protect groundwater quality.
- The site characteristics analysis determined that suitable sites for individual OWTS have soil percolation rates of 1 to 12 inches/hour, soil depths of at least 15 feet, soil depths above groundwater and/or bedrock of at least 20 feet, maximum slopes of 30 percent, and an effective density of at least 1 acre per dwelling unit.

In 2015, an on-line search indicated a population of 6,133, which suggested that only 2,500 occupied dwellings existed at that time based on an average density of 2.45/household. Thus, population may have actually declined since 1980.

As part of the CVWS, Montgomery reviewed historical records of failing septic systems in the area, interviewed septic system contractors, and conducted surveys with owners of OWTS. The CVWS identified the area of highest failure rate (10 percent to 20 percent), with the majority of failures caused by high groundwater, high density, and age of systems. Also of importance, the surveys suggested that the majority of home owners did not adequately maintain their septic systems, sometimes leading to irreversible damage to leach fields.

A cumulative impact analysis and detailed water balance was conducted in the study area, with the area divided in to 47 sub-basins. The analysis considered a variety of factors including precipitation, groundwater seepage/recharge, surface runoff, septic system effluent, irrigation, chemical constituent loading, and other factors. Based on this analysis, the relationship between septic system operations versus soil type, groundwater and slope were better understood. It was found that subbasin with steep bedrock canyons and groundwater recharge areas require lower septic system application rates than areas with more favorable soils and flatter terrain. Nutrient removal was found to be higher in clayey soils than in highly permeable soils. Many areas within the study area were found to have slopes greater than 30 percent, and soil percolation rates less than 1 inch/hour, and therefore not conducive to OWTS. The remaining areas were considered either favorable, or constrained by the following factors:

- High winter groundwater elevations to within 15 feet of the ground surface;
- Rapid percolation rates greater than 12 inches/hour;
- Rock, fractured or unfractured, to within 15 feet of the ground surface;
- Groundwater recharge.

This water quality analysis further defined recommended septic system effluent loading rates for the 47 subbasins in Carmel Valley, ranging from 100 gal/acre-day in the least favorable conditions, to 300 gal/acre-day in the most favorable conditions.

Other recommendations for OWTS were as follows:

- Soil percolation rates of 1 to 12 inches per hour.
- Minimum separation below bottom of leach field or seepage pit to seasonally high groundwater, 10 feet.
- Minimum separation below bottom of leach field or seepage pit to bedrock (defined as sandstone, siltstone, mudstone, shale, or granite which does not form small particles when wet), 10 feet.
- Slopes less than 30 percent.
- Leach field application rate in favorable soils, 0.3 gpd/sf.
- Leach field application rate in soils >12 inches/hour, 0.2 gpd/sf.
- Leach field application rate in areas of direct groundwater recharge, 0.15 gpd/sf.

The updated/amended Carmel Valley Master Plan (2/12/13) included a number of land use element updates that should be carefully reviewed relative to the proper siting and design of new OWTS. Key relevant attributes of this land use element are summarized as follows:

CV-1.5 In the residential areas, maximum densities are as shown on the Carmel Valley Master Plan Land Use Map. However, attainment of maximum density in these areas is dependent upon conformity of the proposed project to plan goals and policies.

CV-1.6 New residential subdivision in Carmel Valley shall be limited to creation of 266 new lots with preference to projects including at least 50 percent affordable housing units. The County shall develop a tracking system and shall present an annual report before the Planning commission.

CV-1.8 Cluster development:

d. Should be consistent with wastewater application rates of the Carmel Valley Wastewater Study that generally would require clustering of five units or less on a minimum of five acres of land.

CV-1.10 The Val Verde Drive area is planned for residential use at a basic density of one unit per acre. With suitable clustering, up to two units per acre may be allowed. However, a density of up to four 4 units per acre may be allowed provided that 25 percent of the units are developed for individuals of low and moderate income or for workforce housing. This policy is intended to be independent from *Policy CV-1.11*, and not counted in conjunction with the density bonus identified in that policy.

CV-1.15 Visitor accommodation uses shall follow the following guidelines:

- Bed and breakfast facilities shall be counted as visitor accommodation units and be limited to a maximum of five units clustered on five acres in accordance with Monterey County Code Chapter 15.20, unless sewered by public sewers.

6.2.1 Summary

Irrespective of the Carmel Valley Land Use Element, the Carmel Valley Master Plan and the CVWS, new, replacement and expansions of OWTS shall be permitted in accordance with the requirements of this LAMP. Additional consideration shall be given to OWTS siting and permitting relative to lot densities and allowable developments during the development review and OWTS permit application processes. Densities referenced in CV-1.5, CV-1.8, CV-1.10 and CV-1.15 shall be reviewed relative to site constraints and findings of the CVWS, and if OWTS are proposed on these lots, OWTS design shall conform to the requirements of this LAMP for new construction, and specific site soil and groundwater studies should be performed on each individual parcel. Should minimum density per the County land use regulations not be attainable, OWTS shall be approved only if such systems meet the design and siting requirements of this LAMP, including calculations and technical report demonstrating the proposed OWTS will achieve a maximum nitrogen loading of 40 grams/acre-day. Such approval may also require alternative OWTS systems to adequately protect public health and water quality. If the site is located in an unfavorable area, OWTS discharges may need to be limited to somewhat less than 300 gpd/acre.

Given the variability of site conditions, each individual OWTS proposed shall be required to carefully consider the specific site conditions in the area of the proposed OWTS. New development should be limited to land use and zoning currently specified by the land use plan for this. These designations describe the uses that are allowed, those allowed with an administrative or use permit. Zoning includes dimensional standards which specify building height, setback requirements, etc.

Each individual OWTS proposed shall be carefully considered by the EHB as to the viability of conventional OWTS, and whether alternative OWTS systems are warranted to adequately protect public health and water quality. Although the technical details in the CVWS hold true, the requirements of this LAMP will adequately address the goals of proper OWTS management in this area. Therefore, OWTS shall be designed and constructed in accordance with the requirements of this LAMP, the land use policies and zoning requirements, without any additional restrictions inferred by the CVWS.

In order to assess the effectiveness of operating septic systems in the Carmel Valley area, EHB will begin to monitor water quality data collected from Carmel Valley as specified by Section 3 of this LAMP. During the five year evaluation of this LAMP, EHB will determine whether a sampling program should be developed to include surface waters and drainage in Carmel Valley.

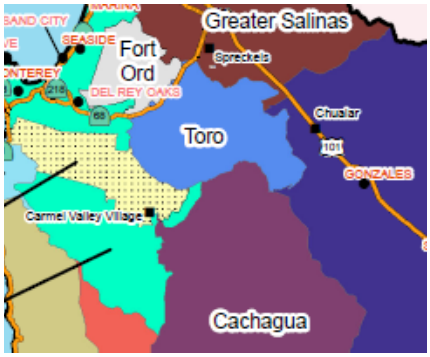
6.3 Toro Area

The Toro area is located south of the City of Salinas and is generally bounded by River Road on the north, Highway 68 (Monterey-Salinas Highway) and Laureles Grade on the west, River Road on the east and the Cachagua community on the south. Refer to Figure 6-4 for the location of the Toro Area in northern Monterey County. Figure 6-5 provides a detailed map of this Planning Area. The topography in the area is varied with flat, river front land and hilly

terrain, with a mix of primarily agricultural activities near the river and residential development along the roads that serve the area. Much of Toro is served by OWTS, with exception of the residential community along Portola Drive that receives sewer services from California Utilities Service and properties west of San Benancio Road and the Las Palmas subdivision at River Road that receive sewer service from California American Water.

Figure 6-4. Toro Planning Area

(Source: Monterey County General Plan Figure #3, Monterey County Planning Areas}



A comprehensive wastewater study of the Toro area has not been completed to date. However, the EHB has identified general characteristics that can be problematic for proper siting and functioning of OWTS, such as:

- Areas with small lots of record served by OWTS, many of which have private wells or are served by local small water systems (2-4 connections)
- Areas with a high density of wells and properties served by OWTS
- Dense soils (sandstone) overlain by shallow soils
- Fractured rock overlain by shallow soils
- Seasonal perched water on impervious or slowly-permeable lenses
- Heavy tree cover
- Springs

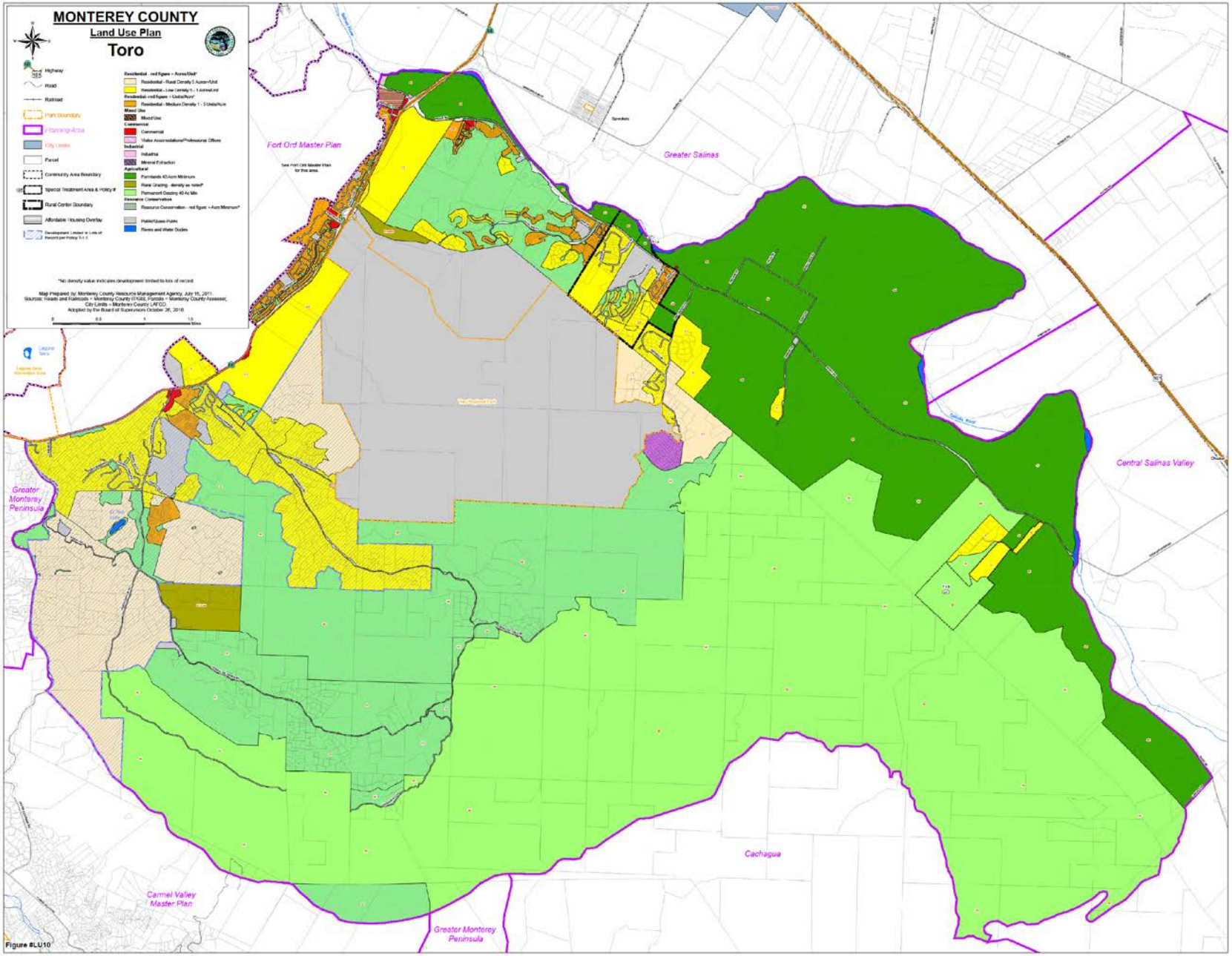
The County has applied B-8 zoning overlays to portions of the area due to potential water supply limitations. The B-8 zoning designation generally limits development to single-family dwellings on existing lots of record and additions and/or expansions of commercial uses that do not affect the constraints which caused the B-8 overlay to be applied. (See Monterey County Code section 21.42.030.H.) Toro Area Policy T-1.7 of the 2010 General Plan reaffirms that properties with residential land use designation within the Toro Groundwater Basin shall be limited to the first single family home on a legal lot of record.

6.3.1 Summary

The requirements of this LAMP combined with the existing standards set forth in Monterey County Code Chapter 15.20 require site-specific evaluation to determine which of the conditions listed above exist and impose design requirements to ensure the new OWTS will operate in a manner that does not negatively impact water quality or the environment. Therefore, area specific recommendations for El Toro are not proposed at this time. During annual reporting and the five year evaluation and monitoring report to the Central Coast RWQCB, the EHB will evaluate the new information that this LAMP will generate, such as septic tank pumper reports, site specific soil and percolation testing to determine if trends can be identified and if the need to impose area specific recommendations for the Toro Planning Area exists.

Figure 6-5 Toro Planning Area Map

(Source: 2010 Monterey County Land Use Plan, Figure #LU8)

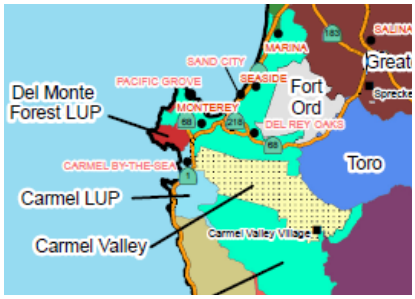


6.4 North County Planning Area

North Monterey County is generally bounded by the Pajaro River on the north, the San Benito-Monterey County line on the east, Espinosa and Rodgers Road on the south and the Southern Pacific Railroad line, Elkhorn Slough and Monterey Bay on the west. Refer to Figure 6-6 showing the North County Planning Areas. The area is predominantly hilly and rural, with a wide mix of residential and agricultural development throughout. Most of North County is served by OWTS, with exception of a densely residential portion of the Las Lomas community that is served by a sewer system. Several package wastewater treatment plants have been constructed to serve commercial developments.

Figure 6-6. North County Planning Areas

(Source: Monterey County General Plan Figure #3, Monterey County Planning Areas}



A comprehensive wastewater study of the North County area has not been completed to date. However, the EHB has identified general characteristics that can be problematic for proper siting and functioning of OWTS, such as:

- Areas with small lots of record served by OWTS, many of which have private wells or are served by local small water systems (2-4 connections)
- Areas with a high density of wells and properties served by OWTS
- Domestic wells that exceed the MCL for nitrates
- Steep slopes
- Dense soils (sandstone or siltstone) overlain by shallow soils
- Clay-rich soils
- Seasonal perched water on lenses of dense or clay-rich soils
- Heavy tree cover
- Springs

Existing, residential properties in the inland portion of North County are limited to development of the first single-family dwelling and subdivisions are not allowed, pursuant to 2010 General Plan Policy NC-1.5. Section 21.64.030.C.2 of Monterey County Code Title 21, Inland Zoning expressly restricts accessory dwelling units in the North County Planning Area. In the Coastal zone, accessory dwelling units are not allowed pursuant to Section 20.64.030.D of Monterey County Code Title 20, Coastal Zoning. The County's Local Coast Program ("LCP") for the North County area includes regulations (Section 20.144.070 – Water Resources Development Standards – of Title 20) prohibiting development that would generate a water demand exceeding or adversely impacting the safe, long-term yield of the local aquifer. Although not expressly prohibited, the County reviews any subdivision application in the North County LCP for consistency of this policy against known constraints in the area which include overdraft, saltwater intrusion and nitrate contamination issues. Development in the North County area must be consistent with the policy and code sections referenced above, with the exception of

properties located within designated community plan areas, which must meet the development standards specific to the respective community plan area.

On November 8, 2017, the Greater Monterey County Regional Water Management Group voted to approve the *Integrated Plan to Address Drinking Water and Wastewater Needs of Disadvantaged Communities in the Salinas Valley and Greater Monterey County IRWM Region.* The plan sought to identify water and wastewater problems in disadvantage communities throughout Monterey County. A total of 21 disadvantaged and suspected disadvantaged communities within the region have been identified, 14 of these have been classified as high priority. A disadvantaged community means a community with an annual median household income that is less than 80 percent of the statewide annual median household income. A high priority disadvantaged community is one that has known drinking water or wastewater issues, for example nitrates or arsenic in drinking water over the Maximum Contaminant Level (MCL) or an unsafe method of disposing of human waste, including overflowing septic systems.

Table 6-1 identifies communities within the North County are that were designated as high priority disadvantaged or suspected disadvantaged communities.

Table 6-1. High Priority Disadvantaged or Suspected Disadvantaged Communities Identified by the *Integrated Plan to Address Drinking Water and Wastewater Needs of Disadvantaged Communities in the Salinas Valley and Greater Monterey County IRWM Region.*

Community or Small Water System Name	Geographic Area	Households or Estimated No. of Individuals[1]	Disadvantaged Community Status[2]	Drinking Water and Wastewater Problems
Johnson Rd, McGinnis Rd, lower Live Oak Rd.	Las Lomas area	85 Households	EDA, Suspected DAC	Nitrate above the MCL. No known wastewater problems.
Hudson Landing Rd.	Las Lomas area	80 Households	Suspected DAC	Nitrate above the MCL. Potential wastewater problems.

Springfield, Struve, and Giberson Rds (including Springfield Mobile Home Park)	Moss Landing area	163 Households	DAC	Nitrate above the MCL. No known wastewater problems.
Bluff, Jensen Rds	North County	35 Households	DAC	Nitrate above the MCL. No known wastewater problems.

[1] The estimated number of households or individuals represents the targeted community, not necessarily the entire block group. Number of individuals rather than number of households is reported for communities that do not primarily consist of discrete households, such as farm labor camps.

[2]Definitions:

DAC: A community identified as being a disadvantaged community based on ACS 2015 five-year estimates (MHI less than $49,454).

EDA: Economically Distressed Area, defined by the Department of Water Resources as: "a municipality with a population of 20,000 persons or less, a rural county, or a reasonably isolated and divisible segment of a larger municipality where the segment of the population is 20,000 persons or less, with an annual median household income that is less than 85 percent of the statewide median household income, and with one or more of the following conditions as determined by the department: (1) financial hardship, (2) unemployment rate at least 2 percent higher than the statewide average, or (3) low population density (Water Code §79702(k))."

Suspected DAC: A community whose MHI according to ACS data is above the "disadvantaged community" threshold, but which has indications of being disadvantaged. Typically, the community is a smaller neighborhood or complex within a larger block group. MHI surveys will likely be conducted to determine the status of "suspected DACs."

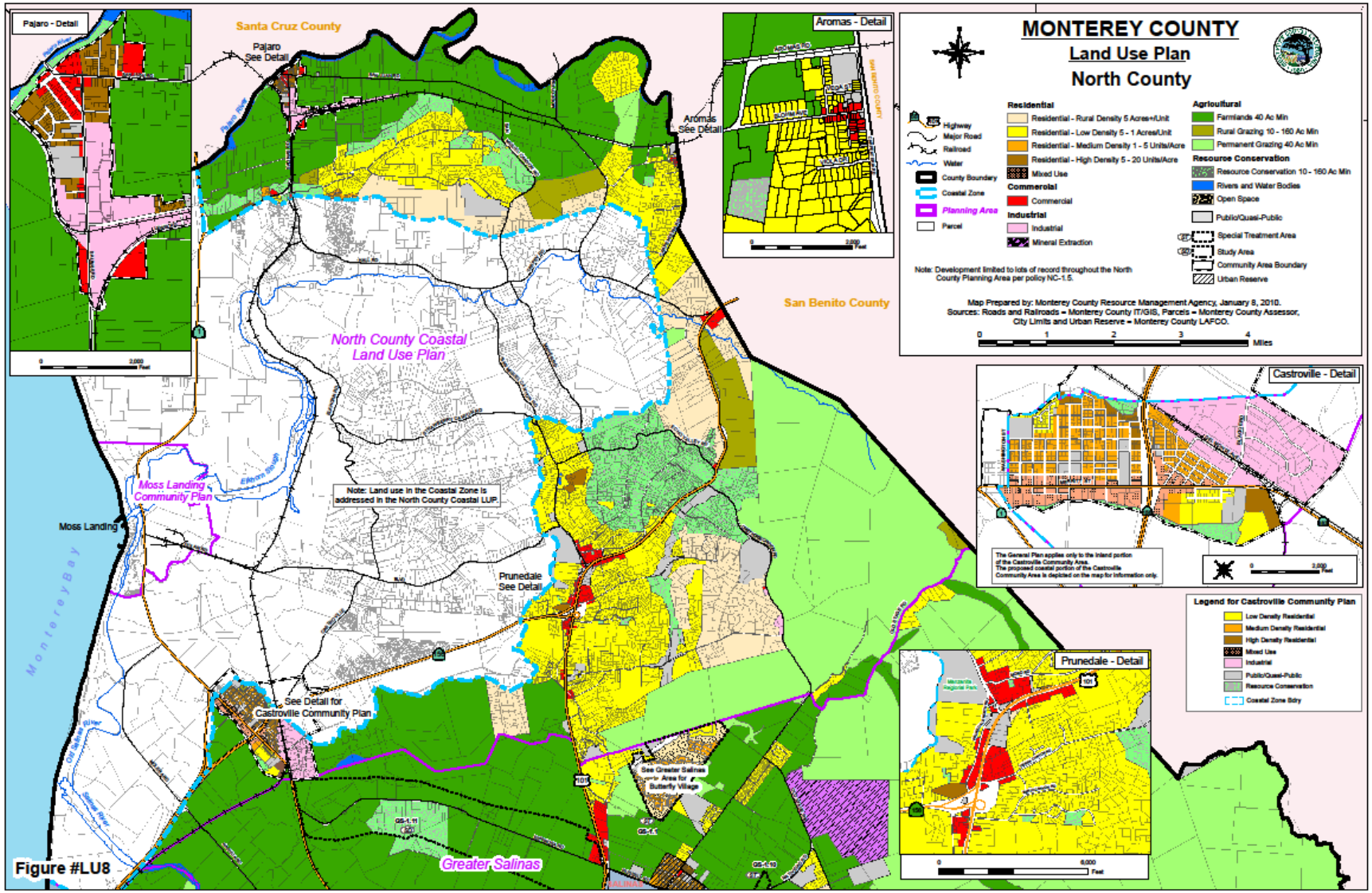
While these communities represent the North County area only, nitrate contamination of groundwater is observed throughout Monterey County. A 2012 US Davis report, *Addressing Nitrate in California's Drinking Water* found that 96 percent of the 207 gigagrams (Gg) (equivalent to 220,000 tons) of nitrate that makes its way to groundwater annually in the Tulare Lake Basin an Salinas Valley study areas comes from irrigated agriculture. The same study estimated that septic tank systems contributed approximately 2.3 Gg of nitrate each year.

Nitrate impacts on groundwater from OWTS are be small compared to irrigated agriculture; regardless, the LAMP strives to prevent further degradation of drinking water through proper siting, design, operation and maintenance of OWTS throughout Monterey County.

6.4.1 Summary

This LAMP, combined with applicable policies of the 2010 General Plan, the North Coast Coastal LUP and the existing standards set forth in Monterey County, Chapter 15.20, requires site-specific evaluation to determine if any of the conditions listed above exist and impose design requirements to ensure the new OWTS will operate in a manner that does not negatively impact water quality or the environment. Therefore, area specific recommendations for North County are not proposed at this time. During annual reporting and the five year evaluation and monitoring report to the Central Coast RWQCB, the EHB will evaluate the new information that this LAMP will generate such as septic tank pumper reports, and site specific soil and percolation testing to determine if trends can be identified and if the need to impose area specific recommendations for North County exists.

Figure 6-7 North County Planning Area Map
(Source: 2010 Monterey County Land Use Plan, Figure #LU10)



SECTION 7: ALTERNATE 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 replacement. When replacement is necessary the OWTS should be upgraded to the standards in effect at the time of the failure to the extent feasible.

A number of OWTS in use in the County 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 impermeable horizons.

When the existing OWTS on these lots fail, it is often not possible to make repairs or install a replacement system that meets all current standards. It has been and will remain the policy of the EHB to be flexible when dealing with pre-existing systems on existing lots of record. Accordingly, the repair or replacement system shall 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. Haul away systems shall not be used as the basis for demonstrating OWTS feasibility for new subdivisions or new development on an existing lot of record.

There may be instances when a parcel in need of an OWTS repair or replacement 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 alternate 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 another alternative OWTS 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, including alternative dispersal systems, then a haul away system may be utilized with concurrence of the Monterey County Director of Health and Building Official.

In addition to repairs or replacements of OWTS on lots with severe constraints, new OWTS in any other areas identified in the future by the Central Coast RWQCB as having groundwater basins with significant degradation as a result of the use of OWTS would require the use of supplemental treatment as a mitigation factor in order to perform to a standard equivalent to or better than Tier 1.

SECTION 8: EDUCATION AND OUTREACH

Public outreach and education can significantly enhance proper operations of OWTS, advancing the objectives of the OWTS Policy to protect public health and water quality. Pursuant to this LAMP, the EHB will develop several new programs, including a mandatory septic tank pumper reporting program, an alternative OWTS permit structure and operating permit program, and a water quality monitoring element. In addition, the degree of complexity for site and soil evaluation required related to new, replacement and expansion OWTS permits applications will increase compared to current practices. Communicating the science and purpose behind these changes is critical so that property owners, OWTS professionals and the development industry may more readily accept and understand them. Education and outreach is vital to supporting an informed consumer who is better able to assure proper maintenance that reduces the chance of pre-mature system failure.

8.1 Current Practices

The extent of the EHB's current education and outreach program includes the following:

Direct Staff Contact

The primary method of education and outreach is by direct interaction between EHB staff and the public. The EHB routinely receives and responds to phone calls and office visits by private property owners, consultants and contractors with questions about the regulations and the permit process.

EHB Website

The EHB website includes many OWTS resources, including application materials, lists of approved materials, contractors and designers, operation and maintenance tips among other thing, covering a wide variety of topics. www.mtyhd.org/OWTS

8.2 Education and Outreach Program Development

The EHB seeks to improve the current program by development and implementation of the following:

Stakeholder/Community Meetings

Conduct stakeholder or community meetings that will provide general information and answer questions about new regulations. The number of meetings and locations throughout the County will vary depending on the nature of the information that is being discussed.

Ongoing Education

The EHB 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.

The education and outreach program can be updated and expanded by EHB over time, subject to funding authorization from the Monterey County Board of Supervisors, to include OWTS-related actions such as:

- Emphasize the need to prevent fats, oil and grease from entering the OWTS. Include information on how fats, oil and grease should be managed, avoiding discharge to the OWTS, and information on where the resident may take such waste for proper disposal.
- Discourage the use of garbage disposal units and explain the reasons to system users, namely: (1) they contribute substantial quantities of detrimental solids to the wastewater load, increasing the rate of sludge and scum accumulation in the septic tank; (2) this results in a greater need for and frequency of septage removal; and (3) it results in higher amounts of solids and BOD discharged to disposal field, increasing the potential for soil clogging and system failure.
- Maintain a current list of qualified septic tank pumper/haulers within the Monterey County area, for easy reference.
- Update description of OWTS maintenance, inspection and reporting requirements.
- Provide educational information on the environmental concerns related to disposal of unused pharmaceuticals, including advice on appropriate handling and disposal practices. Discourage disposal of unused pharmaceuticals into OWTS. Notify the public where such materials can be taken to for proper disposal, including taking unused pharmaceuticals back to any local pharmacy.
- Provide information to residents not to flush items such as dental floss, feminine hygiene products, condoms and other plastics, diapers, cotton swabs, cigarette butts, coffee grounds, cat litter, paper towels, and hazardous chemicals.
- Provide information on the availability and benefits of low-flow plumbing fixtures and other high efficiency water saving devices. This would be done in coordination with the local water companies and the Monterey Peninsula Water Management District.
- Inform the public of the benefits of fixing leaky plumbing, thus conserving water, saving on water costs, and reducing hydraulic load to the OWTS.
- Provide information on the environmental concerns related to water softener brine discharges, including a list of suitable alternatives to conventional onsite self-regenerating water softeners.
- Advise the public to minimize or refrain from using caustic drain openers to un-clog drains. Such chemicals are harmful to bacteria in the septic tank and can upset the biological system needed for sewage treatment.

8.3 Inter-Agency Coordination

The EHB should seek out partnerships with governmental or other non-profit organizations that share similar goals and objectives as the EHB. For example, the Greater Monterey County Integrated Regional Water Management Program brings government agencies, nonprofit organizations, educational organizations, water service districts, private water companies, and organizations representing agricultural, environmental, and community interests to solve local water management problems.

SECTION 9: ENFORCEMENT

Monterey County has established procedures for response to OWTS complaints and code enforcement. The County generally initiates formal enforcement action only after providing notice and an opportunity to cure. However, the County could take immediate action to address situations that pose an immediate threat to public health and safety. The County Code authorizes a range of actions for enforcement of the County Code and County plans and regulations. Violations that could trigger code enforcement include, but are not limited to, the following:

9.1 Failure to Obtain a Permit

The County Code requires that a permit be obtained before an OWTS is constructed, replaced, modified or abandoned. The Code further states that it is unlawful to cover, conceal or put into use an OWTS or any part thereof, without having first obtained a final inspection from the EHB.

If the EHB is made aware of or discovers that an OWTS is being installed, modified, replaced or abandoned without a permit, and the work is in progress, the County could issue a Notice of Violation 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 recommence.

An OWTS that was installed, modified, replaced or abandoned without benefit of a permit and inspection has no legal standing. Should the EHB discover or be made aware of a system that was constructed or modified "after the fact," the County may require the property owner 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 meets current standards or repeat the work in order to satisfy the EHB that the system meets all applicable provisions of the County Code.

If an OWTS was replaced or abandoned without a permit, the property owner must provide evidence that the work was completed properly. Examples of such evidence include a letter from the contractor that performed the work, photographs of the work, and bills for materials and supplies.

9.2 Surfacing Effluent

When the EHB responds to a confirmed complaint of surfacing sewage, the property owner is notified to pump the tank immediately. The County may issue a Notice of Violation indicating that the septic tank must be continually pumped as needed to prevent surfacing effluent until the necessary OWTS repair or replacement is made under a valid permit from the EHB.

When a structure is tenant-occupied and the effluent is unable to be contained by either pumping the tank or damming/berming the sewage to prevent negative impacts to water quality

or the environment, it may be necessary to prohibit occupancy and give a 24-hour notice to vacate. The tenant is notified that water use in the structure should be strictly limited to prevent further contamination of the surrounding environment. Every effort is made to contact the property owner to have the tank pumped and initiate an OWTS replacement permit application. In such situations, a Notice of Violation is posted on the dwelling and a copy is mailed to the property owner's address on file with the Monterey County Assessor.

SECTION 10: 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 accumulate to the point where the biologically active clarified area is minimized. When this occurs the tank should be pumped. The liquid waste pumped from the tank is referred to as septage. Septage is essentially sewage, and like sewage, it must be disposed of in a manner that protects public health.

Once removed from the tank by a registered pumper, septage must be transported by the registered pumper to a centralized wastewater treatment facility that operates under the authority of a permit by the Central Coast RWQCB.

SECTION 11: PROGRAM ADMINISTRATION

11.1 Administrative Manual

In addition to the proposed County Code amendments to address this LAMP, the EHB intends to prepare an Administrative Manual for adoption by the Board of Supervisors. The Administrative Manual would establish guidelines and procedures as needed to implement the LAMP and County Code and could be updated periodically by the Board of Supervisors. The EHB plans to develop the proposed guidelines and procedures in consultation with appropriate practitioners, such as contractors, designers, geologists, and other qualified professionals, as further described in this LAMP.

11.2 Administrative Amendments

The Director may consider and administratively approve minor, non-substantive amendments to the LAMP without first obtaining approval from the Monterey County Board of Supervisors or the Central Coast Water Board. Examples include correction of typos, removal of duplications, and incorporation of approved policies and/or ordinances.

11.3 Staffing

EHB staff has the professional expertise to oversee the plan check/review, permitting and construction/operation elements of this LAMP, and to review and maintain the data and performance information required in the OWTS Policy document. The staff may require, from time-to-time, technical assistance from outside consultants to review specific issues or design questions on specific sites, specialty services such as fate and transport modeling for nitrogen impacts on underlying groundwater in specific regions, advanced plan check reviews for alternative OWTS systems, and other matters. Continuing education for EHB staff in the field of OWTS and domestic water wells is recommended.

With respect to performance of the investigative, design and operation, and maintenance and monitoring activities, the LAMP intends to require owners of properties served by OWTS to utilize the EHB-approved and qualified professionals and service providers to provide these services (Section 5.6). Specifically, the routine inspection of existing OWTS is proposed to be conducted by licensed liquid waste haulers during regular septic tank servicing. Liquid waste haulers and owners will be required to provide periodic reports to EHB of the results of such inspections, as further explained in section 11.3 below.

11.4 Record Keeping and Reporting

As a condition of the EHB oversight of OWTS within Monterey County, the EHB has certain responsibilities related to data collection and reporting to the Central Coast RWQCB as well as in some instances to the owners of water systems and to the State Water Board. This Section

describes the data that must be collected and the procedure for reporting to the Central Coast RWQCB, and providing notifications to owners of OWTS and the State Water Board.

11.4.1 Reporting to Central Coast RWQCB

11.4.1.1 Annual Reporting Requirements.

On an annual basis, the EHB will collect data for and report the information listed in this subparagraph. A copy of the report will be provided to the Central Coast RWQCB and will summarize whether any further actions are warranted to protect water quality or public health.

1. The number and location of complaints pertaining to OWTS operation and maintenance, and identification of those which were investigated and how they were resolved.
2. The number, location and description of permits issued for new and replacement OWTS, the Tier under which the permit was issued, and the design flow of the OWTS. The Tier designations can be found in the OWTS Policy.
3. The number, location and description of permits issued for OWTS where a variance from the approved LAMP was granted.
4. The applications and registrations issued for sewage haulers as part of the local septic tank cleaning registration program pursuant to the California Health and Safety Code Sections 117400, et seq.

11.4.1.2 Water Quality Monitoring Program.

In accordance with the OWTS Policy requirements, the EHB will maintain a water quality assessment program to determine the general operational 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 new groundwater quality monitoring information will be summarized and submitted to the Central Coast RWQCB in EDF format for inclusion into Geotracker on an annual basis on or before February 1st. Any surface water monitoring data generated by the EHB shall be submitted to CEDEN in a SWAMP compatible format. An evaluation of the monitoring program and an assessment of whether water quality is being impacted by OWTS will be submitted by the EHB to the Central Coast RWQCB every five years. As necessary, the EHB will identify potential amendments to this LAMP and the County Code for Board of Supervisors' consideration and adoption to address impacts to groundwater from OWTS. Refer to Section 3 for requirements for groundwater and nitrogen assessment and monitoring.

11.4.1.3 11.3.1.3 Other Reporting Requirements.

EHB will retain permanent records of their permitting actions and will make those records available within 10 working days upon written request for review by Central Coast RWQCB staff.

11.5 Existing OWTS Permit Files

Digital copies of existing OWTS documentation is available upon request by Central Coast RWQCB or the public; however, site specific information is not digitized in an electronic database.

For sites that do not have an existing OWTS permit on file, the County will consider developing a Homeowner OWTS Questionnaire to document missing information on existing OWTS systems throughout the County. Through the Homeowner OWTS Questionnaire the County may obtain information relating to the following: 1) the type of dispersal system; the age of the system; the pumping history and frequency; the replacement history; the problems encountered; and other homeowner comments. EHB would require the property owner to complete this questionnaire in conjunction with the applicant's OWTS permit application at the time of expansion, upgrade or replacement.

11.6 Inspection Files and Reporting

The EHB will maintain a detailed database to track and monitor alternative OWTS that will be subject to an operating permit and regular maintenance by a qualified professional. Existing and new conventional OWTS do not and will not have ongoing monitoring requirements, other than septic tank pumper reports. These reports will be logged into an electronic database, and the information will be kept to a minimum to be manageable. Such information will include a count of pumper reports for each property, and basic information as to any observations of disrepair or malfunction. A digital copy of the report will also be retained so it can be referenced as needed in the future.

11.7 Alternative OWTS System Maintenance Agreements and Permits

11.7.1 Alternative OWTS Maintenance Contract

Because supplemental treatment is used as a mitigation factor to overcome site constraints such as high groundwater or shallow soils, it is essential that the treatment system receive regular maintenance by a qualified professional to ensure that it is operating as designed. The EHB requires that a maintenance contract be signed and in place prior to final inspection of the system. This agreement is to remain in force for the life of the supplemental treatment system.

11.7.2 Alternative OWTS Deed Restriction

Prior to the EHB's final inspection of an alternative OWTS, the owner must record a notice of the installation of the system or component in the Office of the Recorder of the Count of Monterey. This notice shall run with the land and is intended to serve as notice to all future owners that the property is served by an alternative OWTS that is subject to operating permits as a well as maintenance, monitoring and reporting requirements. The owner must provide a copy of the recorded document to the EHB as a perquisite to the final inspection.

11.7.3 Alternative OWTS Operating Permit

Operating permits will be required for OWTS that utilize supplemental treatment or an alternative dispersal system to ensure that they are functioning properly and as designed. Permit conditions would require regular (at a minimum, annually) inspection of the system by a Qualified Professional at recurring intervals. Water quality testing may be required for on-site potable water wells and/or community water systems to monitor groundwater conditions as deemed necessary by EHB. A report detailing the findings of the inspection must be submitted to EHB for review in accordance with the operating permit conditions. An OWTS inspection report, similar to that described in Section 5 of this LAMP, should be developed; requirements for reporting shall follow the recommended requirements in Section 5.

11.8 Complaint, Failure Files

The EHB 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. These files are currently generated and updated electronically.

11.9 Funding Mechanisms for Implementation of the LAMP

The EHB will need to update the existing fee schedule for OWTS for funding of the LAMP program. The OWTS Policy does not address funding requirements, which will be up to each local agency to determine how best to fund the additional costs associated with implementation of the OWTS Policy and LAMP. However, funding to cover the costs incurred by the EHB will be based on reasonable fees for the services provided by the County in support of the LAMP program.

SECTION 12: REFERENCES

1. California Code of Regulations Title 24, Part 5. 2013 California Plumbing Code Appendix K (Effective January 1, 2014). California Building Standards Commission.

2. California State Legislature. Assembly Bill 885: Onsite Wastewater Treatment Systems. Chapter 781.2000.

3. Central Coast Regional Water Quality Control Board. Water Quality Control Plan, Central Coast Basin. Resolution No. R3-2008-0005. Attachment A. (Adopted May 9, 2008).

4. Crites, R. W., and G. Tchobanoglous. 1998. Small and Decentralized Wastewater Management Systems. WCB/McGraw-Hill, New York, NY.

5. Environmental Protection Agency (EPA). Onsite Wastewater Treatment and Disposal Systems. (EPA 625/1-80-012). Washington DC. Clements, E. V., Otis, R. J., Bauer, D. H., Siegrist, R. L., & Stewart, D. E. October 1980.

6. Environmental Protection Agency. Onsite Wastewater Treatment Systems Manual. (EPA 625/R-00/008). February 2002.

7. Environmental Protection Agency, Source Water Protection Practices Bulletin: Managing Septic Systems to Prevent Contamination of Drinking Water. (EPA ###). 2001.

8. Fugro West, Inc., North Monterey County Hydrogeologic Study: Monterey County Water Resources Agency. October 1995.

9. Geosyntec Consultants, Inc. El Toro Groundwater Study: Monterey County Resource Management Agency. July 2007.

10. Greater Monterey County Integrated Regional Water Management Program, Integrated Plan to Address Drinking Water and Wastewater Needs of Disadvantaged Communities in the Salinas Valley and Greater Monterey County IRWM Region: Greater Monterey County Integrated Regional Water Management Program. November 2017.

11. Monterey County Code of Regulations. Chapter 15.20 Sewage Disposal. County of Monterey.

12. Montgomery Consulting Engineers, Inc. Carmel Valley Wastewater Study: Monterey Peninsula Water Management District & Monterey County. February 1981.

13. 2010 Monterey County General Plan

14. Questa Engineering Corporation. Carmel Highlands Onsite Wastewater Management Study. November 2009.

15. Rosenburg, L.I., Geologic Resources and Constraints: Monterey County. April 2001.

16. State Water Resources Control Board. OWTS Policy: Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems. June 2012.

17. Elke Ursin and Eberhard Roeder. An Assessment of Nitrogen Contribution From On-site Wastewater Treatment Systems (OWTS) in the Wekiva Study Area of Central Florida (date of publication unknown, 2007 approximate).