

Appendix UT-2

Sewer Feasibility Study

Sewer Feasibility

Sacramento County WattEV Innovative Freight Terminal (SWIFT)

Prepared for:
WattEV Sacramento, Inc.

Prepared by:

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September 2023

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Introduction

Kimley-Horn and Associates, Inc. has prepared this Preliminary Onsite Wastewater Treatment System (OWTS) Due Diligence Study addressing known items related to the proposed mixed-use development located along Bayou Way near Interstate 5 and Powerline Road in Sacramento, California, on property owned by Sacramento International Airport (SMF). This memo analyzes the estimated sewer generation demand at the proposed Sacramento County WattEV Innovative Freight Terminal (the Project).

Proposed Project

The development will include an electric vehicle charging facility to provide electric charging for light duty passenger vehicles, transit buses, and heavy-duty freight trucks. The elements of the proposed site include a 94-acre solar field, a 7.8-acre charging pad area for trucks, a 2.8-acre parking stall area, and buildings. The proposed buildings include a 3,000 square foot site and vehicle maintenance workshop, a 14,000 square foot convenience store, food outlet, restroom, and resting lounge, and a 3,000 square foot office building. A vicinity map of the proposed site can be seen in **Figure 1** below.

Figure 1 Vicinity Map



Existing Site Conditions

A desktop study of the existing soils was performed using the United States Department of Agriculture (USDA) Web Soil Survey which can be seen in **Appendix B**. The existing tract is comprised of capay clay loam and cosumnes silt loam with slopes ranging from 0-2%. The site is composed of clay loam and two areas of silt loam at the northeast side of the site and at the west and southwest portions of the site. Clay loams are classified by the USDA Textural Classification as a Group E Hydrologic Soil Group (HSG). This group has the highest runoff potential as Group E soils have very low infiltration rates. The application rate for this soil group is 0.4-0.1 gdp/ft². These soils are likely to have permanent high-water tables and high swelling potential. Silt loams are classified as a Group D soil with moderate infiltration rates. This type of soil allows for a better effluent loading requirement (gallons/square foot/day) than clay loams, but still has relatively low application rates (0.6-0.4 gdp/ft²). The general locations of each soil on the proposed site can be seen in the Onsite Wastewater Treatment Exhibit located in **Appendix A**. Groundwater levels in this area are around 7 feet below the surface per a Geotechnical Feasibility Report completed by ENGEO on March 28th, 2018.

Based on the latest available aerial imagery and survey completed by Morrow Surveying on May 7th, 2022, the site does not contain any existing structures or objects other than existing farmland. An existing road (Bayou Way) follows the perimeter of the property.

Regulatory Background

Onsite Sewage Facilities within Sacramento County are regulated by the Sacramento County Environmental Management Department Liquid Waste Program. The authority for Sacramento County Environmental Management Department to develop and adopt OWTS regulations is established in the California Health and Safety Code, Section 101000 et seq. and Sacramento County Code (SCC), Section 2.15.030. The County's Board of Supervisors adopted Chapter 6.32 (On-site Management of Wastewater) of the Sacramento County Code (SCC) which regulates OWTS. A full set of regulations can be found in the Onsite Wastewater Treatment System Guidance Manual.

Onsite Wastewater Treatment Regulations

The Proposed site is, per the Septic System Test Drill Map located in **Appendix B**, located within a Percolation Test and System Design Required Area. The required pit length is 35 feet per the Septic System Flow Chart located in **Appendix B**. Setback requirements that pertain to the proposed site are 5 feet away from any property line for both septic tanks and leach pits, 10 feet from any structure, and 50 feet from any drainage pond, swale, etc. Leach fields have the same setback requirements as septic tanks but have different design regulations depending on the type of system proposed. Excerpts from the design manual showing these requirements can be found in **Appendix D**.

Septic tank capacity for commercial applications shall be determined by doubling the calculated average daily sewer flow with a minimum size requirement of 1,200 gallons. Septic tanks shall have an anti-buoyancy component installed when site conditions are such that the tank may move out of its original position due to flood waters or other high-water conditions.

Permit Requirements

To apply for an OWTS, a permit application located in **Appendix C** must be completed and be accompanied by a plot plan showing the proposed location of the OWTS and that it meets all setback requirements.

A site evaluation is required before design of an OWTS and is composed of an assessment of parcel characteristics to determine suitability for a system. This is required prior to submitting an application for a parcel map and can be completed by a registered professional. If one had been completed previously, the site evaluation will be waived. A site evaluation application shall be submitted to and approved by the Department prior to performing the evaluation and can be found on the County’s website.

Any site that proposes a flow of over 10,000 gallons-per-day is required to notify the Regional Water Quality Control Board and does not fall under the Sacramento County Onsite Wastewater Treatment System Guidance Manual.

Design and Sizing

Population

Chapter 12 of the Sacramento County Onsite Wastewater Treatment Manual includes a table for projected wastewater flows based on the type of development. It was assumed the flows would equal 5 gallons per day per parking stall and another 15 gallons per day per person working in 8-hour shifts per correspondence with the County of Sacramento.

Table 1 Population Calculations

Population per Building

	People Working	Shift (hrs)	Hours in Day	Total Shifts in a Day	Total Employees
Building 1 (Truck Maintenance)	2	8	24	3	6
Building 2 (Convenience Store)	4	8	24	3	12
Building 3 (3000 SF Office) (a)(b)	15	8	8	1	15
Total Employees					33

(a) The office building was assumed to have one employee per 300 SF of office space. For a 3,000 SF proposed space that equals 15 employees.

(b) It was assumed that the employees in the office building would work one 8 hours shift each day while the other two buildings would operate 24 hours a day

Sewage Generation

The total sewage generation was calculated using **Table 2** and **Table 3** below.

Table 2 Sewage Generation for Buildings

Sewage Generation (Employees)			
	Total Employees	Flow (gal/day/person)	Total Flow (gal/day)
Employees	33	15	495

Table 3 Sewage Generation per Stall

Sewage Generation (Stalls)			
	Total Stalls	Flow (gal/day/stall)	Total Flow (gal/day)
Stalls	409	5	2,045

The total sewage generated from the employees and from each parking stall were summed up resulting in a total sewage generation of 2,540 gallons per day.

Septic Tank Sizing

Per the Sacramento County Design Manual Chapter 15, septic tanks capacity for commercial applications shall have double the capacity of the calculated daily average flow. According to this, a septic tank of at least 5,080 gallons is required. A septic tank of this size will require close to 500 square feet of undisturbed space.

Leach Field Sizing

The Sacramento Design Guide’s Chapter 13 lays out soil application rates based on the soil group and is show in **Figure 1** below.

Figure 2 Soil Application Rates

USDA Textural Classification	Soil Group	Application Rate (gdp/ft ²)
Course to medium sand	A	1.2 or less
Fine sand, loamy sand	B	1.1 to 0.8 or less
Sandy loam, loam	C	0.8 to 0.6 or less
Silt loam	D	0.6 to 0.4 or less
Clay loam, sandy or silty clay loam, sandy clay	E	0.4 to 0.1 or less

As explained in the existing conditions section, the proposed site contains soils in Groups D and E. Because a percolation test has not been conducted yet, the leach field required area was sized using **Figure 1** above. The total required area pertaining to each soils group using the average application rate can be seen in **Table 4** below.

Table 4 Required Leach Field Areas

Group D Soils

Application Rate (gpd/SF)	Sewage Flow (gpd)	Required Area (SF)
0.5	2,540	5,080

Group E Soils

Application Rate (gpd/SF)	Sewage Flow (gpd)	Required Area (SF)
0.2	2,540	12,700

Recommendations

Leach Field and Septic Tank System Options

The proposed site has fairly shallow groundwater levels (7 feet) and soils which do not allow for effective infiltration. The following system options are best suited for these site constraints:

Option 1: Shallow Trench System with Low Pressure Dosing

A shallow trench system with low pressure dosing would be an effective system with high groundwater levels.

The maximum length for a shallow trench is 100 feet. The width must be between 18-36 inches and the depth can be anywhere between 18-60 inches. 12 inches of backfill is required along with 10 feet of undisturbed soil between trenches. Drain rock shall extend the full width and length of the disposal field trench. There shall be at least 6 inches of drain rock under the distribution pipe and at least 2 inches over the distribution pipe. A soil barrier must be placed on top of the drain rock to exclude fines. The barrier will consist of filter fabric, straw, or untreated building paper.

The total area required for Group D soils would be 5,080 square feet, but an additional area would be required to meet the 10-foot minimum separation between trenches requirements. The total required footprint can be seen in **Appendix A**.

A pump chamber would be needed after the septic tank to pump effluent at low pressure and distribute it evenly throughout the leach field system.

Option 2: Cap and Fill System with Low Pressure Dosing

A cap and fill system also meets the requirements of an onsite wastewater treatment system with the proposed site constraints with an absorptive sidewall area that begins at the ground surface. This type of disposal field requires cover (cap) of approved soil to be placed over the disposal field rock to achieve the same cover as a properly designed shallow disposal field. The requirements for sizing of this type of system are the same as the shallow trench system explained above.

A pump chamber will also be needed after the septic tank to distribute effluent evenly throughout the leach field system.

While this system is a good solution for the soil conditions of the site, it does warrant periodic maintenance and would require imported soils for the mounding which can make it more expensive due to fill and installation costs.

Leach Field Sizing

The final OWTS disposal type is based upon soils, groundwater elevation, separation requirements, and surface drainage analysis. Final design decisions should be made after percolation tests for the site are obtained as sizing can vary greatly depending on the percolation rates. The sizes of disposal fields in this memo are based on assumptions and shall be verified once percolation tests are completed.

The approximate sizes of leach fields required using USDA soil data along with the Sacramento County Design Manual are 5,080 square feet for Group D soils and 12,700 square feet for Group E soils.

Overall, the total required sizes of the leach fields are the largest constraint for the onsite wastewater treatment system. These can be reduced by reusing water where possible and installing low flow fixtures.

Leach Field Location

Possible locations and total footprint areas for the leach fields have been called out on the Onsite Wastewater Exhibit located in **Appendix A**. An alternative replacement leach field location is required when installing this type of system that equals the total required area of the primary leach field. One of the three possible locations called out on the exhibit will be designated for the primary leach field and another will be designated as the secondary leach field. All three possible locations have been placed within Soil Group D areas to minimize the amount of trenching that will be needed for the system. There is also space within the Soil Group E area for a leach field system if desired, but the necessary disposal area would increase significantly. Overall, there are multiple options for the locations of the leach fields and only 2 areas in total must be set aside for design.

Currently, the site proposes drainage swales within the open spaces adjacent to the parking lots and setback requirements for disposal systems require 50' from the nearest drainage pond or swale. These will need to be relocated to leave enough room for the disposal fields if the open spaces adjacent to them are chosen as leach field locations.

Septic Tank Sizing

The design manual states that a proposed septic tank should be two times the amount of the daily average flow. In following this, the proposed septic tank should be at a minimum of 5,080 gallons.

Septic Tank Location

The septic tank will need roughly 500 square feet of undisturbed space. Due to the large size of the site, there are multiple locations that the septic tank could be installed. Ideally, the location should be somewhere near the building to reduce the depth needed for installation as the piping from the buildings to the septic tank will be gravity flow. The septic tank will likely need an anti-buoyancy component installed due to the high ground water levels.

Appendix A - Onsite Wastewater Treatment Exhibit



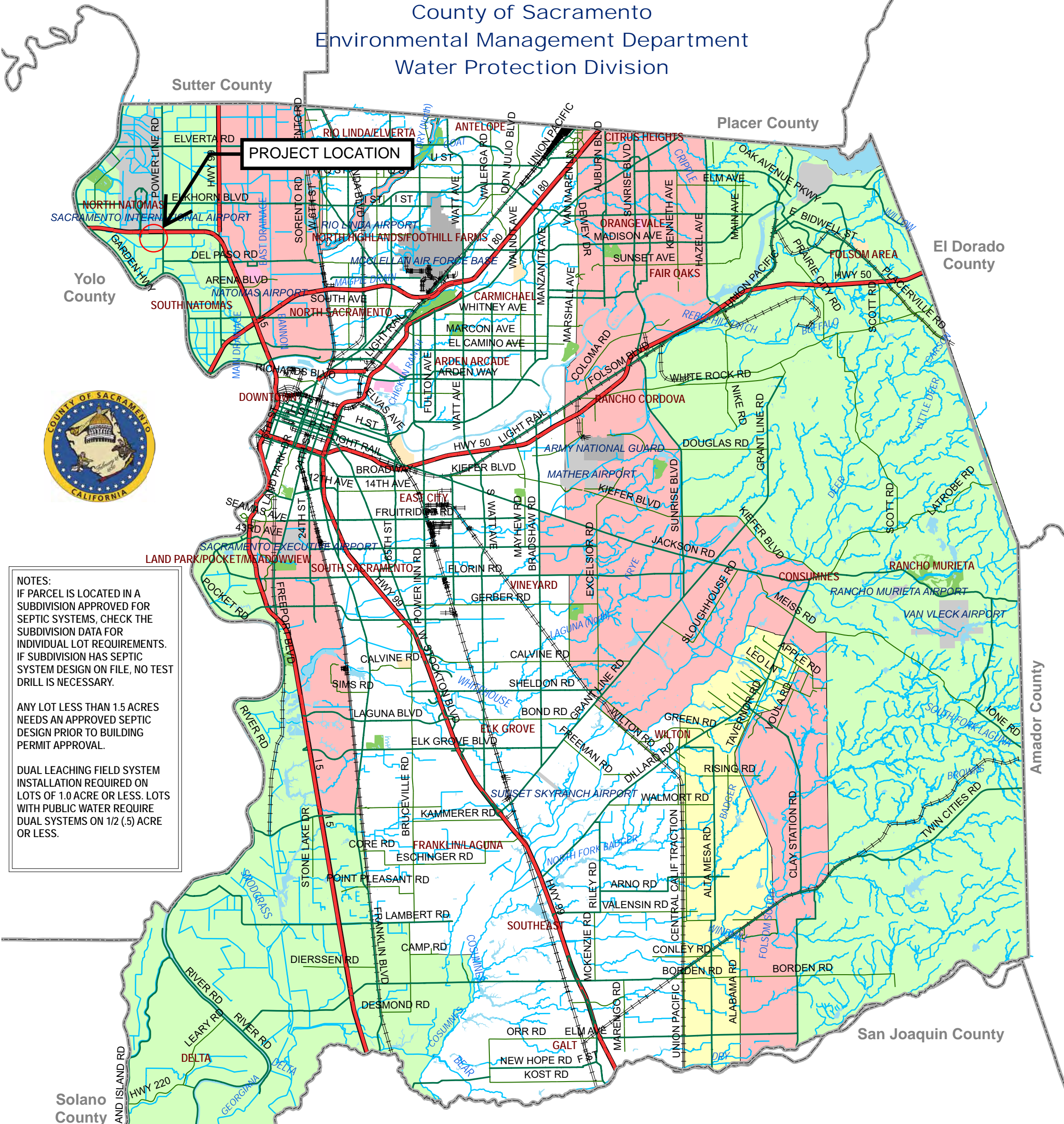
LEGEND

	CENTER LINE
	PROPERTY LINE
	RIGHT-OF-WAY LINE / LEASE LINE
	EASEMENT / SETBACK LINE
	SOIL TYPE SEPARATION LINE
	LEACH FIELD FOOTPRINT - OPTION 1
	LEACH FIELD FOOTPRINT - OPTION 2
	LEACH FIELD FOOTPRINT - OPTION 3

ONSITE WASTEWATER TREATMENT EXHIBIT

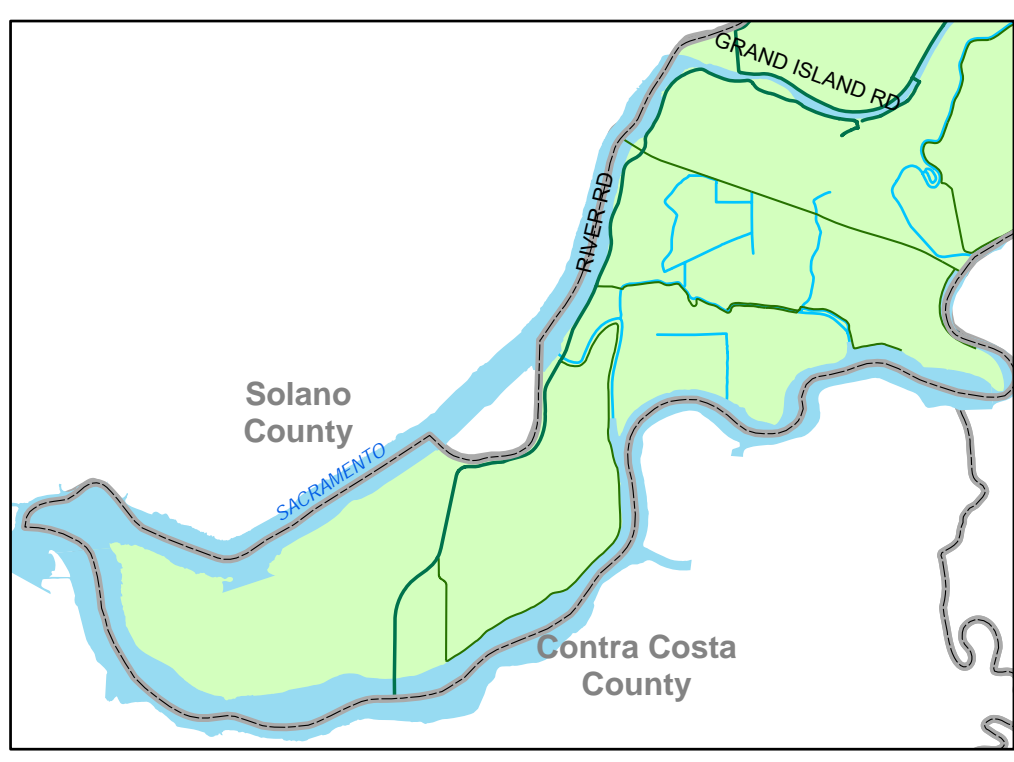
Appendix B – Septic System Resources

County of Sacramento
 Environmental Management Department
 Water Protection Division



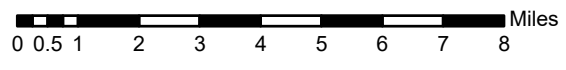
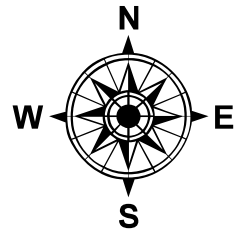
NOTES:
 IF PARCEL IS LOCATED IN A SUBDIVISION APPROVED FOR SEPTIC SYSTEMS, CHECK THE SUBDIVISION DATA FOR INDIVIDUAL LOT REQUIREMENTS. IF SUBDIVISION HAS SEPTIC SYSTEM DESIGN ON FILE, NO TEST DRILL IS NECESSARY.
 ANY LOT LESS THAN 1.5 ACRES NEEDS AN APPROVED SEPTIC DESIGN PRIOR TO BUILDING PERMIT APPROVAL.
 DUAL LEACHING FIELD SYSTEM INSTALLATION REQUIRED ON LOTS OF 1.0 ACRE OR LESS. LOTS WITH PUBLIC WATER REQUIRE DUAL SYSTEMS ON 1/2 (.5) ACRE OR LESS.

Septic System Test Drill Map
 (Effective 04/01/2006)



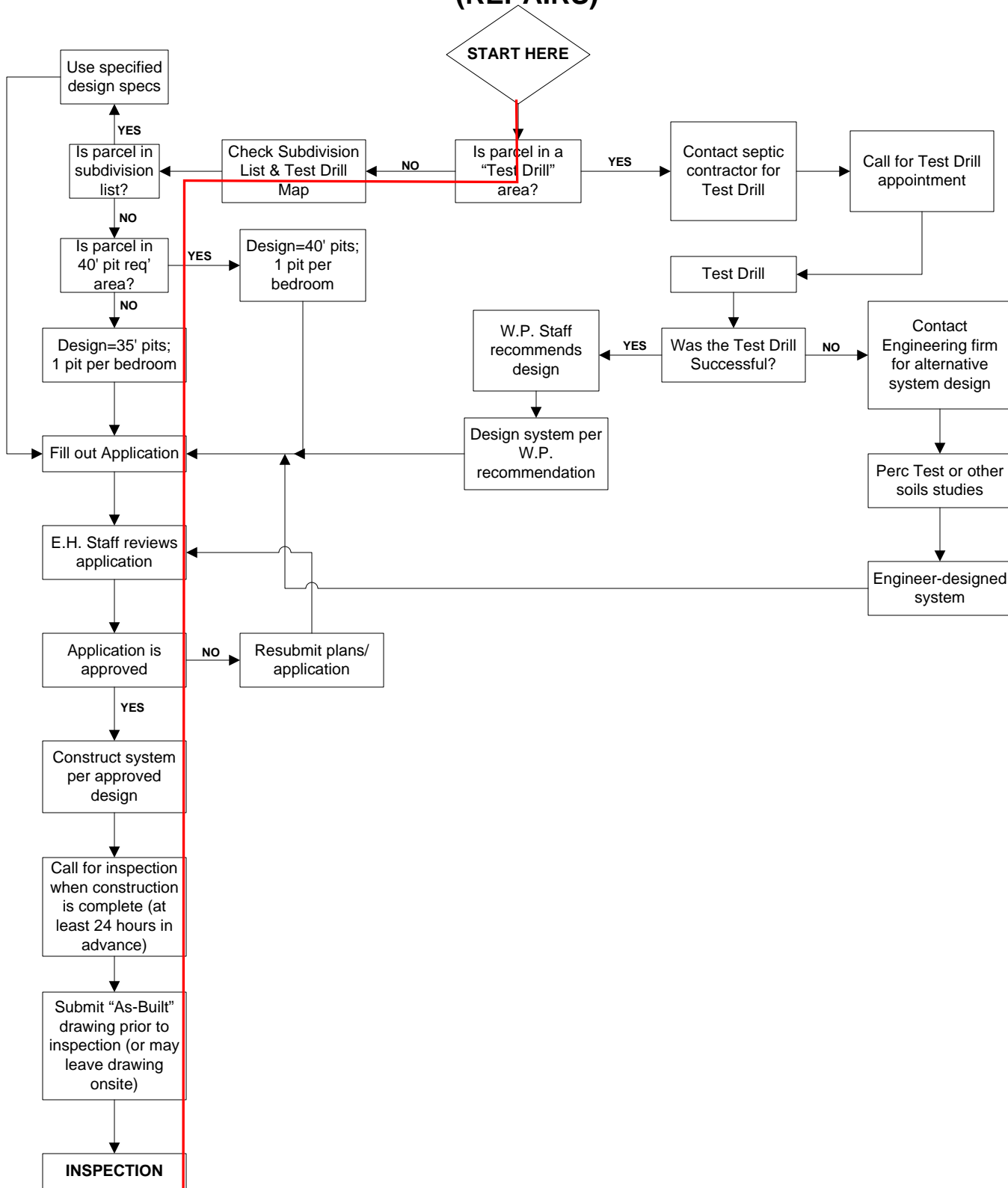
Test Drill Map Legend

[White Box]	No Test Drill Required
[Yellow Box]	40 Foot Deep Leaching Pits Required
[Green Box]	Perc Test & System Design Required
[Red Box]	Test Drill & System Design Required

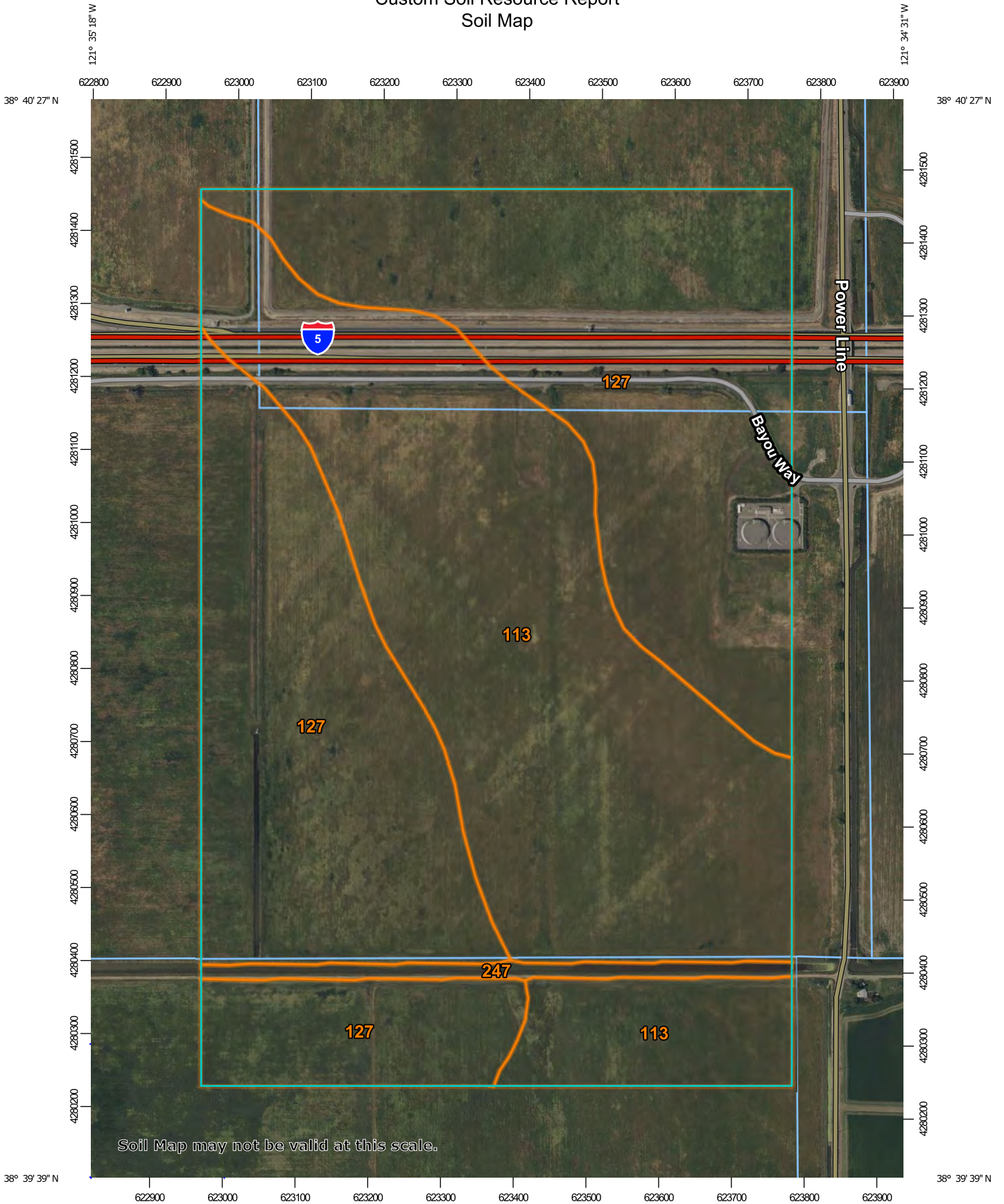


Updated 03/20/2006

HOW TO OBTAIN A SEWAGE DISPOSAL SYSTEM PERMIT (REPAIRS)



Custom Soil Resource Report Soil Map




Map Scale: 1:7,200 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)




















Soils







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features


-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sacramento County, California
 Survey Area Data: Version 22, Sep 1, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 23, 2022—Apr 24, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
113	Capay clay loam, 0 to 2 percent slopes, occasionally flooded	103.7	41.9%
127	Cosumnes silt loam, partially drained, 0 to 2 percent slopes	139.5	56.4%
247	Water	4.3	1.7%
Totals for Area of Interest		247.5	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The

Appendix C – Permit Application



LIQUID WASTE PERMIT APPLICATION
ENVIRONMENTAL MANAGEMENT DEPARTMENT • ENVIRONMENTAL COMPLIANCE DIVISION

11080 WHITE ROCK ROAD • SUITE 200 • RANCHO CORDOVA, CA 95670
 TELEPHONE (916) 875-8550 • FAX (916) 875-8513

LIQUID WASTE INSPECTION LINE: (916) 875-1500

GENERAL INFORMATION

<input type="checkbox"/> Standard System Install (4220)	<input type="checkbox"/> Standard System Repair/Modification (4230)	<input type="checkbox"/> Septic Tank Destruction (4264)	<input type="checkbox"/> Holding Tank-Tem (4280)
<input type="checkbox"/> Alternative System Install (4221)	<input type="checkbox"/> Alternative System Repair/Modification (4231)	<input type="checkbox"/> Tank Replacement (4232)	<input type="checkbox"/> Holding Tank- Fix (4281)
If Repair, age and design of system: _____			
Reason for failure: _____			

SITE INFORMATION

Address: _____	City: _____	Zip: _____
Cross Street: _____	APN #: _____	Lot size: _____ acres
Property Owner Name: _____	Phone Number: _____	
Soil studies (perc test / test drill) _____	Date: _____	ON#: _____
		By: _____

RESPONSIBLE PARTY (Billing)

<input type="checkbox"/> Contractor <input type="checkbox"/> Property owner <input type="checkbox"/> Consultant	Name: _____	Mailing address: _____

	Preferred method of contact: <input type="checkbox"/> Mail <input type="checkbox"/> Phone /Fax <input type="checkbox"/> Email:	

SYSTEM INFORMATION

Intended Use:	<input type="checkbox"/> Residential Use – Number of bedrooms: _____ (<input type="checkbox"/> Single family / <input type="checkbox"/> Mobile home)
	<input type="checkbox"/> Commercial Use – Type of business: _____ Gallons per day: _____
	<input type="checkbox"/> Other, please explain: _____
Water source:	<input type="checkbox"/> Private Well <input type="checkbox"/> Public Water
	Subdivision: _____
Tier: _____	Variance: <input type="checkbox"/> Yes <input type="checkbox"/> No

DESIGN INFORMATION

Septic Tank:	<input type="checkbox"/> New <input type="checkbox"/> Existing	Size: _____ gallons	Tank Pumped: Yes <input type="checkbox"/> No <input type="checkbox"/>
		Make: _____	
Leaching Pits	<input type="checkbox"/>	Quantity: _____ pits	Diameter: _____ ft
			Depth: _____ ft
Deep Trench:	<input type="checkbox"/>	Total linear feet _____	# of laterals _____
Leach Line:	<input type="checkbox"/>	Length _____ ft	Width: _____ in / ft
			Depth _____ in / ft
Other	<input type="checkbox"/>	Submit engineer's design specifications	

PROVIDE A PLOT ON PLAN SHEET AND ATTACH.

I HEREBY CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND CORRECT AND THAT THE PROPOSED WORK WILL BE DONE TO MEET THE REQUIREMENTS OF SACRAMENTO COUNTY CODE, CHAPTER 6.32 AND ALL REGULATIONS OF THE COUNTY HEALTH OFFICER. A FEE FOR THE SEWAGE DISPOSAL SYSTEM PERMIT IS SUBMITTED HEREWITH. THIS PERMIT WILL EXPIRE ONE YEAR FROM DATE OF ISSUE. I AGREE TO NOTIFY EMD 24 HOURS IN ADVANCE FOR FINAL INSPECTION.

Print Name: _____ Signature: _____ Date: _____

Property Owner Contractor Lic No: _____ Lic Type: _____ Field Phone# _____

OFFICE USE ONLY

Permit Approved Yes <input type="checkbox"/> No <input type="checkbox"/>	By: _____	Date: _____
Permit conditions / comments: _____		

AR# _____	INVC# _____	Amt Paid _____	Date _____	ON# _____
Finaled by: _____		Date: _____	GPS: 38 _____	-121.. _____
Comments _____				

Appendix D – Excerpts from the Onsite Wastewater Treatment System Guidance Manual

PART TWO
Sizing and Design

CHAPTER 9 – STANDARD VS. ALTERNATIVE SYSTEMS (SCC 6.32.340, 240)

The Department discourages the use of alternative OWTS in lieu of a standard gravity flow or standard pressure-dosed system when the proposed site can meet the requirements for the installation of such system. Alternative OWTS require an annual operating permit issued by this Department.

CHAPTER 10 – DESIGN CONSIDERATIONS (SCC 6.32.340)

All OWTS shall be designed based on the following:

- A. Available effective absorptive area in both primary and reserve disposal fields;
- B. Separation between disposal field bottom and groundwater or a restrictive soil layer;
- C. Ground slope in both the primary and reserve disposal field areas;
- D. Influent wastewater strength and quantity;
- E. Setback requirements; and
- F. The required level of wastewater treatment so as to not adversely affect water quality or endanger public health.

CHAPTER 11 – SOIL REQUIREMENTS (SCC 6.32.340)

	Percolation Rates	Soil Texture¹	Separation to Groundwater	Separation to Restrictive Layer	Ground Slope
Standard Leach Line/Bed (shallow trench)	5-60 mpi	A-D	5 Feet	5 Feet	<30%
Standard Deep Trench	5-60 mpi	A-B	5 Feet	5 Feet	<30%
Standard Seepage Pit	5-60 mpi	A-B	10 Feet	5 feet	<30%
Pressure Dosed Leach Line/Bed	0-120 mpi	A-D	3 Feet	3 Feet	30% <30%
Alternative	<5, >120 mpi	A-D	<3 to 2 feet	N/A	<30% ²

1. All effective absorptive soil shall be non-cemented.
2. See requirements for steep slope systems in Chapter 26 of this Manual

PART TWO

Sizing and Design

CHAPTER 12 – PROJECTED DAILY WASTEWATER FLOW (SCC 6.32.340 E)

Residential

2 Bedroom	350 gallons
3 Bedroom	400 gallons
Each additional bedroom after 3	100 gallons
Second dwelling (guest home), condominium, multifamily (duplex, triplex, etc.)	Same as for full single-family residence

Commercial

Type of Business or Facility	Minimum Flow (Gallons per Day)
Barbershop/salon	100 (per chair)
Camps (4 persons per campsite, where applicable)	
with central comfort stations	35 (per person)
with flush toilets, no showers	25 (per person)
construction camps (semi-permanent)	50 (per person)
day camps (no meals served)	15 (per person)
resort camps (night and day) with limited plumbing	50 (per person)
Churches	
with kitchen	15 (per seat)
without kitchen	5 (per seat)
Country clubs	
per resident member	100
add per nonresident member present	5
add per employee	15 (per 8-hour shift)
Dentist office	
per wet chair	200
add per non-wet chair	15
Factories	
with shower facilities, no food service or industrial wastes	35 (per person, per shift)
without shower facilities, no food, service or industrial wastes	15 (per person, per shift)
Hospitals	250 (per bed space)
Hotels or motels	

PART TWO*Sizing and Design*

Type of Business or Facility	Minimum Flow (Gallons per Day)
with private baths	100 (per room)
without private baths	80 (per room)
Institutions other than hospitals	125 (per bed)
Laundries, self-service washing machines	500 (per machine)
Limited agricultural building	100 (per building)
Mobile home parks	250 (per space)
Parks, public picnic areas	
with toilet wastes only	5 (per person)
with bathhouses, showers and flush toilets	10 (per person)
Restaurants	
with multi-use utensils	50 (per seat)
with single service utensils	25 (per seat)
with bars and/or cocktail lounges	50 (per seat)
Retail stores	
for customer	Use comparable flows from similar businesses and population
add for each employee	15 (per 8-hour shift)
Shopping center	2 (per parking space)
Schools	
boarding	100 (per person)
day (without gyms, cafeterias or showers)	15 (per person)
day (with gyms, cafeterias and showers)	25 (per person)
day (with cafeteria, no gym or showers)	20 (per person)
Service stations	500 for 1st pump set, 300 for each additional
Swimming pools and bathhouses	10 (per person)
Theaters	
movie	5 (per seat)
drive-in	20 (per car space)
Recreational vehicle parks	
without individual water and sewer hookups	50 (per space)
with individual water sewer hookups	100 (per space)

Source: SCC 1465 § 2, 2010

Minimum Flow: In no case shall an OWTS be designed for a flow of less than 100 gallons per day.

Maximum Flow: In no case shall an OWTS be designed for a flow over 10,000 gallons per day.

PART TWO
Sizing and Design

Other Approved Methods

If proposed, the projected daily flow may be calculated by actual potable water meter readings, or facility wastewater influent or effluent meter readings if such records are available from the service provider or from water meters certified to be accurate within 2 percent by the water purveyor or, in the case of wastewater metering, the meter read values are certified as “correct” by a registered professional and agreed to by the Department. Average daily flows shall be calculated from peak flow days as follows:

- A. If the water meter records are recorded on a daily basis, the highest 10 day flows for a 12 month period may be averaged and used for the design flow.
- B. If the water meter records are recorded on a weekly basis, the design flow shall be calculated by dividing the number of days the facility was in use into the highest weekly flow over a t 12 month period and then multiplying by 1.2.
- C. If the water meter records are recorded on a monthly basis, the design flow shall be calculated by dividing the number of days the facility was in use into the highest monthly flow over a 12 month period and then multiplying by 1.5.
- D. If the water meter records are recorded on a quarterly basis, the design flow shall be calculated by dividing the number of days the facility was in use into the highest quarterly flow over a 12 month period and then multiplying by 2.0.

CHAPTER 13 – REQUIRED ABSORPTIVE FIELD AREA (SCC 6.32. 340 D)

Required absorptive field area shall be calculated by using available effective absorptive soil and the applicable soil application rate depicted in Table 2 (below) if effective absorptive soil is determined by soil textural classification, or by referring to Figure 1 of this chapter if percolation testing was conducted.

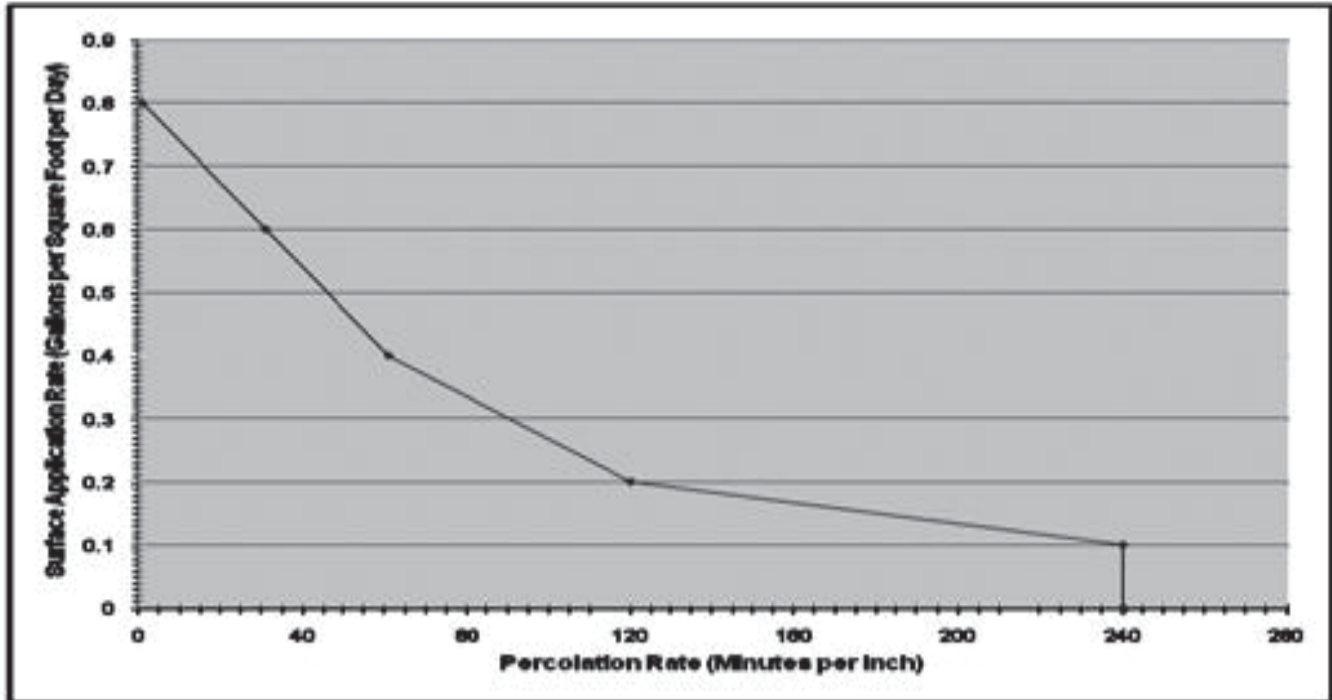
Table 2
Soil Application Rate Based on USDA Textural Classification

USDA Textural Classification	Soil Group	Application Rate (gdp/ft ²)
Course to medium sand	A	1.2 or less
Fine sand, loamy sand	B	1.1 to 0.8 or less
Sandy loam, loam	C	0.8 to 0.6 or less
Silt loam	D	0.6 to 0.4 or less
Clay loam, sandy or silty clay loam, sandy clay	E	0.4 to 0.1 or less

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Figure 1
Soil Application Rate Based on Percolation Rate



Soil application rates derived from percolation test results shall be calculated by using the slowest percolation test result obtained from all percolation soil profile borings in the area in which the disposal field will be located.

Soil application rates derived from soil textural classification, if permitted by the Department, shall be determined by using the most restrictive effective absorptive soil group encountered within five feet from the bottom of a shallow trench or disposal field bed. Soil application rates for deep trench or seepage pit type disposal fields shall be determined by using the most restrictive effective absorptive soil encountered within the trench or pit profile below the point at which effluent leaves the disposal piping.

Only sidewall or bottom area but not both shall be used when calculating the required disposal field area for a shallow trench or bed type disposal field. Only sidewall area shall be used with deep trench or seepage pit type disposal fields.

Installation of a standard OWTS on parcels less than 1 acre in size requires that a reserve disposal field be installed concurrently with the primary field. The disposal fields are to be separated by an approved valve to divert flow from field one to field two at the recommended interval.

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Repair to the existing disposal field of an OWTS shall require 100 percent replacement of the required disposal field area. At the Department's discretion, a valve or distribution box shall be installed in the tight line to allow the flow of effluent between each disposal field.

CHAPTER 14 – RESERVE DISPOSAL FIELD AREA (SCC 6.32.340 F)

A reserve disposal field area with suitable site conditions must be set aside for the future installation of a replacement disposal field. The reserve area must be:

- A. Equal to 100 percent of the capacity required for the primary disposal field;
- B. Separate from the primary disposal field area;
- C. Able to meet all current design requirements for the type of disposal field proposed, including soil depth, soil type, slope restrictions, and setbacks, etc.;
- D. Fully protected to prevent damage to soil and any adverse impact on the immediate surroundings that may affect the installation of the reserve disposal field or its function.

CHAPTER 15 – SEPTIC TANK (SCC 6.32.340 H)

- A. Septic tank capacity shall be a minimum of 1000 gallons and a maximum of 10,000 gallons. Tanks in excess of 3000 gallons shall have design specifications conforming to the most current version of the Uniform Plumbing Code (UPC) submitted to the Department for approval.
- B. For residential dwellings, the minimum liquid capacity of any septic tank shall be 1200 gallons for up to a three bedroom residence, 1500 gallons for up to a five bedroom residence, and an additional 200 gallons for each bedroom thereafter.
- C. Septic tank capacity for commercial applications shall be determined by doubling the calculated average daily flow.
- D. All septic tanks, pump tanks, and distribution boxes shall be watertight and installed level on a stable surface to prevent settling. All tanks may be subject to a water tightness test at the Department's discretion.
- E. All septic tanks and pump tanks shall have water tight pumping risers extending to ground surface or above on all compartment access ports of the tank. Risers shall be a minimum of 24 inches in diameter and have gas-tight tamper-proof lids. Tanks and/or risers in potential traffic areas shall be traffic rated and capable of supporting all anticipated loads. The original tank compartment access port lids shall remain in place or Department approved safety grates shall be positioned over access port openings within each riser.
- F. Pump tanks shall have a minimum liquid capacity equal to or greater than one day's projected sewage flow.
- G. Designs for new OWTS serving commercial establishments capable of generating wastewater containing fats, oils, grease (FOG), grit, or sand shall be required to incorporate an outdoor grease trap and/or sand-oil separator into

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the system design. Grease trap or sand-oil separator size and installation requirements shall comply with the UPC.

- H. Septic tanks shall have an anti-buoyancy component installed when site conditions are such that the tank may move out of its original position due to flood waters or other high water conditions.

CHAPTER 16 – SETBACK REQUIREMENTS (SCC 6.32.340)

New OWTS shall conform to the setbacks described below. Systems requiring repair shall conform to these setbacks to the greatest extent possible. An inability to maintain required setbacks shall require an alternative OWTS or a design proposed by a registered professional with experience in OWTS design. For OWTS, installed on parcels of record existing at the time of the OWTS Policy that cannot meet the horizontal separation associated with public water supply wells and public water supply surface water intake requirements, the OWTS shall meet the horizontal separation to the greatest extent possible and shall utilize supplemental treatment for pathogens.

		Pre June 2010	Post June 2010	LAMP Requirements
SEPTIC TANK, PUMP TANK, Aerobic Treatment Unit	TO: WATER WELL	100'	100'	
	LAKE OR RESERVOIR	50'	50'	
	FLOWING STREAM OR CREEK	30'	50'	
	PONDS³	----	50'	
	DRAINAGE COURSE OR EPHEMERAL STREAM	25'	50'	
CURTAIN DRAINS - VERTICAL CURTAIN DRAINS		----	20'	
UP-GRADIENT		----	25'	
DOWN-GRADIENT				
CUT OR FILL BANK (IN EXCESS OF 2.5')		25'	20'	
STRUCTURE¹		5'	5'	
EASEMENT		----	CLEAR	
PROPERTY LINE		5'	5'	
D-BOX		3'	3'	
WATER SUPPLY LINES		10' laterally, 1' above leach line		
ON-SITE DOMESTIC WATER SERVICE LINE			5' (UPC)²	
PRESSURE PUBLIC WATER MAIN			10'(UPC)²	
LEVEE (TOE) – CCR TITLE 23		10'	10'⁴	
D-BOX	TO: PROPERTY LINES	10'	5'	
	BUILDINGS¹	5'	5'	
	SEPTIC TANK, PUMP TANK OR DISPOSAL FIELD	3'	3'	
	LEVEE (TOE) – CCR TITLE 23	10'	10'⁴	

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		Pre June 2010	Post June 2010	LAMP Requirements
	DISPOSAL FIELD (PIT, LEACH LINE, TRENCH)	3', ----, ----	3'	
LEACH PITS	TO: WATER WELL (DOMESTIC AND PUBLIC)	150'	150'	
	WATER WELL - PUBLIC			200'*
	PUBLIC WATER SURFACE WATER INTAKE			1,200' and 400' High water mark**
	LAKE OR RESERVOIR	200'	200'	
	FLOWING STREAM OR CREEK	50'	100'	
	PONDS³	----	100'	
	DRAINAGE COURSE OR EPHEMERAL STREAM	25'	50'	
	CURTAIN DRAINS - VERTICAL CURTAIN DRAINS			
	UP-GRADIENT	----	20'	
	DOWN-GRADIENT	----	50'	
	CUT OR FILL BANK (IN EXCESS OF 2.5')	25'	4 x the height of the bank, to a maximum of 50'	
	STRUCTURE¹	10'	5'	
	EASEMENT	----	CLEAR	
	PROPERTY LINE	5'	5'	
	D-BOX	3'	3'	
	SIDEWALLS OF PITS	16'	16'	
	PIT BOTTOM TO GROUNDWATER	10'	10'	
	WATER SUPPLY LINES	10' laterally, 1' above leach line		
	ON-SITE DOMESTIC WATER SERVICE LINE		5' (UPC)²	
	PRESSURE PUBLIC WATER MAIN		10'(UPC)²	
	LEVEE (TOE) – CCR TITLE 23	10'	10'⁴	
SHALLOW TRENCH	TO: WATER WELL (DOMESTIC AND PUBLIC)	100'	100'	
	WATER WELL-PUBLIC			150'
	PUBLIC WATER SURFACE WATER INTAKE			1,200' and 400' High water mark**
	LAKE OR RESERVOIR	100'	200'	
	FLOWING STREAM OR CREEK	30'	100'	

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	Pre June 2010	Post June 2010	LAMP Requirements
PONDS³	----	100'	
DRAINAGE OR EPHEMERAL STREAM	25'	50'	
CURTAIN DRAINS - VERTICAL CURTAIN DRAINS			
UP-GRADIENT	----	20'	
DOWN-GRADIENT	----	50'	
CUT OR FILL BANK	25'	4 x the height of the bank, to a maximum of 50'	
STRUCTURES¹			
EASEMENTS	----	CLEAR	
PROPERTY LINE	5'	5'	
D-BOX	----	3'	
LEACH LINE ON CENTER	10'	10'	
TRENCH BOTTOM TO GROUND WATER	----	5'	
WATER SUPPLY LINES	10' laterally, 1' above leach line		
ON-SITE DOMESTIC WATER SERVICE LINE		5' (UPC)²	
PRESSURE PUBLIC WATER MAIN		10' (UPC)²	
LEVEE (TOE) – CCR TITLE 23	10'	10'⁴	
DEEP TRENCH TO:			
WATER WELL (DOMESTIC OR PUBLIC)	100'	150'	
WATER WELL - PUBLIC			200'
PUBLIC WATER SURFACE WATER INTAKE			1,200' and 400' from high water mark**
LAKE OR RESERVOIR	200'	200'	
FLOWING STREAM OR CREEK	30'	100'	
PONDS³	----	100'	
DRAINAGE OR EPHEMERAL STREAM	25'	50'	
CURTAIN DRAINS - VERTICAL CURTAIN DRAINS			
UP-GRADIENT	---	20'	
DOWN-GRADIENT	----	50'	

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	Pre June 2010	Post June 2010	LAMP Requirements
CUT OR FILL BANK	25'	4 x the height of the bank, to a maximum of 50'	
STRUCTURES¹	10'	5'	
EASEMENTS	----	CLEAR	
PROPERTY LINE	5'	5'	
D-BOX	----	3'	
TRENCHES ON CENTER	10'	10'	
TRENCH BOTTOM TO GROUNDWATER			
<15' DEEP	5'	5'	
>15' DEEP	10'	5'	
WATER SUPPLY LINES	10' laterally, 1' above leach line		
ON-SITE DOMESTIC WATER SERVICE LINE		5' (UPC)²	
PRESSURE PUBLIC WATER MAIN		10' (UPC)²	
LEVEE (TOE) – CCR TITLE 23	10'	10'⁴	

*Setbacks to public water wells less than 600 ft and greater than 20 ft in depth requires a 2-year travel time for microbiological contaminants shall be evaluated.

** If located 1,200 to 2,500 ft the dispersal field can be reduced to 200 ft from the high water mark.

1. Includes foundation lines for any structure including garages, out-buildings, in-ground swimming pools, porches, steps, breezeways, etc. (SCC 6.32, 2010 UPC).
2. Setback is for parallel construction. EMD approval required when crossing lines (1' above may be option).
3. Ponds less than 5000 gallons exempt from setback.
4. Verify setback requirement with applicable reclamation district.

CHAPTER 17 – GENERAL OWTS INSTALLATION REQUIREMENTS

- A. Septic tanks must be installed on a level, stable base of either pea-gravel or sand.
- B. Septic tanks located in high groundwater areas must incorporate anti-buoyancy measures to prevent flotation.
- C. All septic tanks must be installed with watertight risers extending to finished grade. Grading of the surrounding soil shall facilitate drainage away from the riser.
- D. Septic tanks must be installed in a location that provides access for servicing and pumping.
- E. Systems shall not be installed when moist or wet conditions cause trench sidewall or bottom area degradation of