SECTION 2
SITE INVESTIGATION REQUIREMENTS AND PROCEDURES

CONTENTS

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SITE INVESTIGATION REQUIREMENTS AND PROCEDURES

A. SITE EVALUATIONS FOR OWTS

Prior to approving the use of an OWTS, a site evaluation is required in all instances to allow proper system design and to determine compliance with the site suitability criteria specified in the San Mateo County OWTS Ordinance and this manual. Site evaluations shall be conducted by Environmental Health staff performed in accordance with the following general requirements and referenced attachments.

1. **General Site Features**

Site features to be determined by inspection shall include:

a. Land area available for treatment components and for primary and reserve dispersal fields;

b. Ground slope in the primary and reserve dispersal area(s) and in those areas within relevant setbacks of the proposed OWTS;

c. Location of cut banks, fills, or evidence of past grading activities, natural bluffs, sharp changes in slope, soil landscape formations, and unstable land forms within 100 feet of the primary and reserve dispersal area(s);

d. Location of wells, streams, and other bodies of water within 200 feet of the primary and reserve dispersal area(s); and

e. To the extent possible, the location of existing OWTS within 100 feet of the primary and reserve dispersal area(s).

2. **Soil Profiles**

a. Soil characteristics shall be evaluated by soil profile test pit observations. A minimum of one test pit in the most limiting area of the dispersal field area shall be required for this purpose. Additional soil profiles may be required if:

(1) the initial profile indicates conditions which do not provide sufficient information for design and/or determination of code compliance, or
(2) the area proposed for the dispersal fields cannot be adequately represented by a single soil profile test pit, or

(3) it is determined by Environmental Health that additional soil profile test pits are needed.

b. An augured test hole may be an acceptable alternative to a test pit where adequate soil profile can be determined given the limited visibility within the boring and where Environmental Health staff determines that:

(1) The use of a backhoe/excavator is impractical because of access or because of the fragile nature of the soils;
(2) It is necessary only to verify conditions expected on the basis of prior soils investigations; or
(3) It is done in connection with geotechnical investigations.

c. The following factors shall be observed and reported from the ground surface to a limiting condition, up to a minimum of three to five feet below the bottom of the proposed dispersal system. **Note that these observations must be made and reported by a <u>Qualified OWTS Design Professional</u>** (in compliance with California Business and Professions Code and California Health and Safety Code).

(1) Thickness and coloring of soil layers, soil structure, and texture according to United States Department of Agriculture (USDA) classification (see U.S. EPA Design Manual for Onsite Wastewater Treatment and Disposal Systems, 1980);
(2) Depth to a limiting condition such as hardpan, rock strata, impermeable soil layer, or saturated soil conditions;
(3) Depth to observed groundwater or soil mottling; and
(4) Other prominent soil features which may affect site suitability, such as coarse fragments, soil consistency, roots and pores, and moisture content.

3. **Soil Percolation Testing**

Determination of a site's suitability for dispersal of effluent and OWTS design shall be made by the completion of soil percolation testing in accordance with procedures detailed in Section 2.2.

4. **Depth to Groundwater Determination**

The anticipated highest level of groundwater in the primary and reserve area shall be estimated:

a. Base on the highest extent of soil mottling observed in the examination of soil profiles; or

b. By direct observation of groundwater levels during the time of year when the highest groundwater conditions are expected or known to occur, i.e., wet weather testing timeframe as defined by the Environmental Health (see Section 2.3 - Wet Weather Groundwater Observations).

Where there is a discrepancy between soil profile indicators (mottling) and direct observations, the direct observations shall govern.

5. **Geotechnical – Slope Stability Analysis**

For sites where the ground slope exceeds 20% or other geotechnical constraints exist, additional technical evaluation of slope stability, drainage, and other similar factors shall be required to verify that the proposed dispersal system will not degrade water quality, create a nuisance, affect soil stability or present a threat to the public health or safety (See Section 2.4 – Geotechnical Requirements).

6. **Cumulative Impacts**

For certain projects, typically non-residential and large flow OWTS, the completion of additional technical studies, termed “cumulative impact assessment”, may be required. This is to address the cumulative impact issues, mainly groundwater mounding and nitrogen loading, from OWTS that can result from such factors as the constituent levels in the wastewater (e.g., nitrogen content), 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 a particular location (See Section 2.5 – Cumulative Impact Assessment, and guidelines in Attachment A).

7. **Reporting**

All site evaluation information, including test results for primary and reserve dispersal areas, shall be submitted to the Environmental Health upon completion of the work (and a copy included with the OWTS installation permit application).

B. SOIL PERCOLATION TEST PROCEDURES

1. General

In accordance with the provisions of Section 4.84.115 of the San Mateo County Ordinance, the following standards have been developed for conducting percolation tests. Soil percolation testing must comply with these standards and the test results must satisfy the requirements for OWTS in Section 3 of this Manual before a permit to install/construct an OWTS will be issued or a building permit application approved.

Soil percolation tests other than those described below may be used with prior approval of Environmental Health, provided that such tests are verifiable and the results can be expressed in inches/hour for a twelve (12) inch deep test hole, twelve (12) inches in diameter.

2. Procedure for Standard 8-foot Deep Dispersal Trench

The following procedure shall be used where soil is acceptable for a drain field trench with a standard depth of eight (8) feet.

a. The standard soil percolation test of Environmental Health involves a backhoe excavation to a depth of four (4) to five (5) feet, with a slanted end-wall for ingress/egress. A minimum of six (6) test holes per building site in the area to be used for dispersal fields shall be provided. Three (3) holes must be in the primary area and three (3) must be in the proposed reserve area.

b. At the bottom of each excavation, a twelve (12) inch diameter hole must be dug to a depth of (12) inches.

c. The sides of the hole must be scratched or roughened to remove smeared surfaces and all loose materials removed from the hole. Two (2) inches of coarse clean sand or fine gravel must be added to the bottom of the hole to protect the bottom from scouring and sediment.

d. The 12-inch diameter hole must be filled with clear water and the water maintained in the hole for at least four (4) hours prior to the start of the test, normally on the afternoon of the day before the test. This presoak of the holes must be observed by Environmental Health staff.

e. The test is begun by adding clear water to bring the depth of water to approximately eight (8) to ten (10) inches over the sand/gravel. From a fixed reference point, the drop in water level is measured at thirty (30) minute

intervals for four (4) hours, refilling six inches over the gravel as necessary. The drop that occurs during the final thirty (30) minute period is used to calculate the percolation rate. This rate must be a stabilized rate over the last three (3) readings. The testing shall continue until a stabilized rate has occurred. The final three (3) 30-minute intervals must be observed by Environmental Health staff.

f. For the soil percolation rate to be considered "stabilized", variation in last three readings must be as follows:

(1) For maximum readings up to 1 inch in last ½-hour, three readings must vary by less than 35% of maximum of the three readings;

(2) For maximum reading greater than 1-inch and less than 5-inches, three readings must vary by less than 25% of maximum of the three readings; and

(3) For maximum reading greater than 5-inches in last ½-hour, three readings must vary by less than 15% of maximum of the three readings.

g. All soil percolation test holes, trenches and excavations must be filled upon completion of testing.

h. All soil percolation test data shall be verified and submitted to Environmental Health staff upon completion of the test.

i. The soil percolation rating (size) for the area represented by the soil percolation test holes, to be used in design of the OWTS, is determined by Environmental Health staff once the soil percolation test has been completed. This information will be provided in writing, and must be included on any plot plans with the application for the installation permit.

3. **Auger/Drilled Method**

A twelve (12) inch diameter hole drilled to a depth of six (6) feet may be used as an alternative soil percolation testing method. All other aspects of the soil percolation test are the same for this alternate method as described above for the standard test method. While this method will be accepted, the applicant or his agent should realize the difficulties inherent in this method, which are unfavorable to the successful conduct of the soil percolation test.

Care must be exercised in:

- addition of the two (2) inches of sand or fine gravel to the bottom of the hole six (6) feet deep so as to evenly cover and protect the bottom soil from erosion during the test;

- scratching or equivalent roughening of the bottom and side wall so as to return it to approximately the original percolation capacity since drilling usually causes a smearing or sealing of the borehole walls;

- introduction of water into the hole so as to avoid turbulence, erosion, and increased turbidity of the test water;

- construction of the borehole and the conduct of the test to avoid sloughing of soil from the sidewalls into the bottom of the borehole; and

- maintenance of a maximum depth of twelve (12) inches of water.

4. **Soil Percolation Test Methods to Evaluate for Shallower Trenches**

Both test methods as described above can be used for measuring percolation rates in soil for distribution trenches shallower than the standard 8-foot deep trench, including for mid-depth and/or chambered (rockless) trenches. However, the target depth at which to measure percolation rates may need to be shallower than the 4- to 6-foot depth range measure as described above. The targeted depth interval should be described and justified with the application for percolation testing for such projects.

5. **Soil Percolation Test Methods to Evaluate for Shallow Subsurface Drip**

There are a variety of methods for determining soil percolation rates and associated application rates when evaluating and designing for shallow subsurface drip distribution systems. While rough soil percolation rates and application rates can be estimated based on soil lithology and structure, it is always preferred that these rates are confirmed with direct-reading field measurements. Therefore, methods proposed to be used for direct-reading field testing of soil percolation rates and associated application rates must be submitted to Environmental Health for evaluation/approval prior to use.

6. **Use and Interpretation of Results**

For comparison with applicable OWTS standards, soil percolation test data from the various test holes should be evaluated and interpreted as follows:

a. Calculate average of all test holes in inches per hour (also MPI) to verify that the rate falls within the acceptable range and to determine system design/sizing requirements.

b. If there are one or two failing test results (i.e. too fast or too slow), three options are available:

(1) Include the failing result(s) in the calculated average and evaluate/design the system accordingly;

(2) Exclude the area represented by the failing test hole(s), and design the system according to the average of the other test holes. Split the difference between the locations of failing and nearby passing test holes to determine the area to be excluded; or

(3) Conduct additional testing in an alternate area or to refine the exclusion area represented by the failed test result(s).

c. If there are more than two failing test results, additional testing will be required to define the limits of acceptable soil areas for the dispersal system.

7. **Observation of Soil Percolation Test**

Soil percolation test data must be verified and the soil percolation test card must be signed by a representative of Environmental Health to be valid. The person conducting the soil percolation test shall notify the Environmental Health office two (2) working days prior to the time of such test to permit Environmental Health staff to observe portions of the test as needed.

With permission from Environmental Health staff, soil percolation testing may commence prior to arrival of Environmental Health field inspector observing the soil percolation testing. However, Environmental Health staff must be present for at least the final three readings collected. All readings taken during the soil percolation test must be submitted to Environmental Health for incorporation in the site file.

8. **Observation of Soil Conditions Three (3) to Five (5) Feet Below Proposed Standard Drainfield Trench Bottom**

An eleven (11) to thirteen (13) foot deep test hole shall be excavated in the presence of Environmental Health staff to determine soil conditions three (3) to five (5) feet or greater below the bottom of the proposed dispersal trench. If it is determined that seasonal ground water conditions exist at a depth within three (3) to five (5) feet of the bottom of the proposed dispersal trench or field, wet weather or seasonal groundwater testing shall be required using methods described later in this section.

9. **Reporting of Results**

When a Qualified OWTS Design Professional submits data for review regarding onsite wastewater treatment and disposal systems, they shall interpret such soil percolation tests, borings and similar information in terms of conformance with current standards. The Qualified OWTS Design Professional shall also state that geological conditions, historical and seasonal ground water fluctuations, topography and other factors covered in the regulations have been investigated and based on this information, in their professional judgment, the OWTS will be in compliance with the County OWTS Ordinance and this Manual.

10. **Soil Percolation Testing for Proposed Subdivision**

A Qualified OWTS Design Professional shall submit all percolation test data for each of the proposed parcels of the subdivision. They shall interpret such soil percolation tests, borings and similar information in terms of conformance with current regulations. They shall also state fluctuations, topography and other factors covered in the regulations have been investigated and, based on this information, in their professional judgment, the OWTS will be in compliance with the County OWTS Ordinance and this Manual.

C. WET WEATHER GROUNDWATER OBSERVATIONS

County Ordinance Sections 4.84.120 and 4.84.165 specify minimum vertical separation requirements between the bottom of the dispersal trench and seasonal high groundwater levels. If general observations during soil percolation testing and evaluation of soil profile are not definitive of seasonal high groundwater conditions, wet weather testing may be required. Wet weather testing is designed to verify compliance with applicable groundwater separation requirements from base of effluent distribution to seasonal high groundwater.

Procedures for wet weather groundwater observations are as follows:

1. **Timeframe.** Wet weather groundwater observations during any given year:

   a. can commence once 50% of the annual rainfall has been obtained for a particular area, as measured for the water year from October 1st – September 30th, per rainfall data as reported by the National Weather Service; and

   b. can continue through March 20th of the water year, unless the observation period is extended by Environmental Health based on the rainfall conditions for the given year.

2. **Testing Methods.** Wet weather groundwater observations may consist of one of the following. Alternate methods other than those described below may be used, with approval of Environmental Health prior to the testing, provided that such methods are verifiable.

   a. For immediate monitoring: An 11- to 13-foot deep hole shall be drilled or excavated under the supervision of a qualified professional, who will observe the static level of infiltration of groundwater (if any) in the hole; or

   b. For extended monitoring, a piezometer (observation monitoring well) of appropriate depth and screened interval may be permitted through Environmental Health and installed at the site. Proper installation and abandonment of the piezometer must be completed under permit from Environmental Health.

3. **Where Required.** Determination of whether an area requires wet weather groundwater observations will be as follows:

   a. When an area has been known to have shallow levels of groundwater, as previously observed; and
   b. When conditions in the soil (i.e., mottling, moisture) indicate that shallow groundwater levels have occurred in the past.

D. GEOTECHNICAL REQUIREMENTS

OWTS dispersal systems, including repairs to existing dispersal systems, shall not be permitted where steep or unstable slopes, rock outcropping, cuts in banks, underground clay lenses or similar topographic and geologic conditions could be expected to result in the surfacing of the liquid effluent or cause instability in the slope. Requirements and investigation procedures established to ensure

appropriate consideration of geotechnical issues in the siting, design and operation of OWTS are described below.

1. **Ground Slope**

   a. Any OWTS dispersal system located on ground slope greater than 20% shall require the completion of a geotechnical slope stability study as described below under Geotechnical Report Requirements.

   b. For conventional (gravity) dispersal systems, maximum ground slope in the dispersal system area shall not exceed thirty-five (35) percent.

   c. Any dispersal system located on ground slope greater than 35% shall require the use of pressure distribution or subsurface drip dispersal to distribute the wastewater effluent uniformly throughout the dispersal area. Both of these dispersal methods fall in the category of "Alternative OWTS".

   d. No dispersal system will be permitted to be located where ground slope is 50% or greater.

2. **Proximity to Cuts, Embankments, and Steep Slopes**

   a. Dispersal systems shall not be installed where deep cuts exist, which can be expected to later cause sewage seepage from dispersal systems installed at a higher elevation.

   b. Dispersal systems shall be located in conformance with the following horizontal setbacks from geological/landscape features.

      (1) Setback equal to 4 x height of a cut or embankment; the required setback distance shall be at least 25 feet and no more than 50 feet.

      (2) Setback from Steep Slopes (lower in elevation than OWTS) shall be at least 25 feet where the height of the steep slope is less than 12 feet, and at least 50 feet where the height of the steep slope is greater than 12 feet. Steep slope is considered to be land with a slope of greater than or equal to fifty percent (50%). Where there is clearly discernable embankment and/or break in slope, the setback should be treated as Cut or Embankment. Any setback of less than 50 feet must be confirmed by appropriate geotechnical evaluation, including but not limited to

investigation of slope stability, evidence of rock or impermeable soil layers intersecting slope, seeps, or spring.

(3) 100 feet from an unstable land mass. Horizontal setback distance from unstable land mass may only be reduced in accordance with recommendations provided in a Geotechnical Report prepared by a California civil engineer or professional geologist consistent with this Manual.

3. **Fill**

No dispersal of effluent shall be allowed within fill.

4. **Trench Spacing**

In sloping terrain, spacing between dispersal trench sidewalls shall be increased beyond minimum design requirements as follows:

a. For dispersal trenches less than the standard 8-feet deep, minimum trench spacing (based on twice the trench sidewall) shall be increased by one (1) foot for each 5% incremental increase in ground slope above 20%; and

b. Where geological conditions present special constraints, an increase in standard trench spacing requirements may be necessary in accordance with recommendations contained in the Geotechnical Report.

5. **Geotechnical Report**

“Geotechnical Report” means a written document used to communicate soil and geologic site conditions, interpretations, analysis and recommendations pertinent to the design, installation and operation of an OWTS in areas of steeply sloping terrain or near landscape features of geologic concern. A primary emphasis of the Geotechnical Report is the evaluation of potential slope stability issues that may be affected by or result in impacts to the operation of the proposed OWTS. An additional purpose of a Geotechnical Report may be to provide site-specific recommendations regarding appropriate horizontal setbacks from cuts, steep slopes and unstable land masses.

Where slopes in excess of twenty percent (20%) are proposed for use, substantiating detailed geotechnical data shall be provided to demonstrate that

wastewater surfacing and/or slope instability will not occur throughout the primary and designated reserve dispersal system areas or down-slope areas. Data shall include, but not be limited to:

- topography (by means of contours);
- subsurface lithological and structural data;
- all existing or proposed grading, including OWTS dispersal fields;
- accurate cross-sections showing all soil bedrock zones, etc.;
- seasonal groundwater elevation determination;
- surface drainage and soil erosion hazards; and
- any other appropriate factors.

For slopes of greater than thirty-five percent (35%), the Geotechnical Report shall include static and seismic analyses with safety factors of 1.5 and 1.2+, respectively, using residual strengths under saturated conditions.

As applicable, the Geotechnical Report shall present recommendations addressing horizontal setbacks to geologic/landscape features of concern, trench spacing, drainage and erosion control, and other pertinent design or construction issues.

Environmental Health staff may rely upon a third-party consultant to assist in the review of a Geotechnical Report. Costs for retaining a third-party consultant would be the responsibility of the project applicant.

E. CUMULATIVE IMPACT ASSESSMENT

For certain projects, typically non-residential and large flow OWTS, the completion of additional technical studies, termed “cumulative impact assessment”, may be required. This is to address the cumulative impact issues (mainly groundwater mounding and nitrogen loading) from OWTS that can result from such factors as the constituent levels in the wastewater (e.g., nitrogen content), 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 a particular location (e.g., proximity to impaired water bodies or vernal pools). These issues are not necessarily addressed by conformance with standard OWTS siting and design criteria.

Cumulative impact assessment is mandatory for any OWTS with projected wastewater flows of 2,500 gpd or more.

Cumulative impact assessment is not required for normal residential OWTS, regardless

of the type of system (conventional or alternative), except where the design flow exceeds 1,000 gpd (more than 6 bedrooms) or as may otherwise be determined by Environmental Health staff for certain situations or geographical areas of the county (e.g., Impaired Areas).

Cases where cumulative impact assessments shall be required are listed in Table 1 below**.**

Additionally, Environmental Health staff reserves the right to require the completion of a cumulative impact assessment in any case where, special circumstances related to the size, type, or location of the OWTS warrant such analysis.

Requirements and guidelines pertaining to cumulative impact assessments are detailed in Attachment A of this Section.

Table 1
Projects Requiring Cumulative Impact Assessment*

Type of Project	Geographic Location	Lot Size (acres)	Design Wastewater Flow (gpd)	Groundwater Mounding Analysis	Nitrate Loading Analysis
Residence, including 2nd dwelling unit	Countywide	-	< 1,000 (<7 bedrooms)	No	No
	Impaired Areas	**TBD - Per TMDL/Advanced Protection Mgt Criteria**			
Residence, including 2nd dwelling unit	Countywide	< 1	1,000 + (7+ bedrooms)	No	Yes
	Impaired Areas	**TBD - Per TMDL/Advanced Protection Mgt Criteria**			
Multiunit and Non-residential	Countywide	< 1	1,000 +	No	Yes
		-	1,500+	Yes	No
		-	2,500+	Yes	Yes
	Impaired Areas	**TBD - Per TMDL/Advanced Protection Mgt Criteria**			
Subdivisions	Countywide	2.5+	-	No	No
		<2.5	-	No	Yes
	Impaired Areas	**TBD - Per TMDL/Advanced Protection Mgt Criteria**			
Any OWTS <200 feet from a vernal pool	Countywide	-	-	Yes**	Yes**

*Note: Environmental Health may also require cumulative impact assessment based on project or site specific conditions.

** The hydrological and water quality analysis requirements may be modified depending on site specific conditions and the extent to which the OWTS discharge contributes flow to catchment area supporting the vernal pool.

ATTACHMENT A
GUIDELINES FOR CUMULATIVE IMPACT ASSESSMENT

A. **GENERAL PROVISIONS.** San Mateo County Ordinance Code, Section 4.84.180 authorizes Environmental Health to require the completion of additional technical studies ("cumulative impact assessment") for OWTS proposals in situations where cumulative impacts on groundwater and/or watershed conditions are of potential concern. Cumulative impacts from OWTS may occur due to such factors as the constituent levels in the wastewater (e.g., nitrogen content), the volume of wastewater flow, the density of OWTS discharges in a given area, and/or the sensitivity and beneficial uses of water resources.

Cumulative impact assessments to address potential concerns shall be conducted in accordance with the procedures and criteria outlined in this Manual. The results of the assessment shall be submitted for review by Environmental Health staff and may be the basis for denial, modification or imposition of specific conditions for the OWTS proposal, in addition to other siting and design criteria.

The findings from cumulative impact evaluations may also be used for the County designation of certain geographical areas as "Impaired Areas", under the provisions of San Mateo County Ordinance, Section 4.84.170. This may result in the establishment of additional protections related to OWTS siting, design, installation, monitoring and reporting in such areas.

B. **CUMULATIVE IMPACT ISSUES.** The primary issues to be addressed in cumulative impact assessments will normally include the following:

1. 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; and

2. Groundwater Nitrate Loading. Discharges from OWTS contain high concentrations of nitrogen that may contribute to rises in the nitrate level of local and regional aquifers.

   For individual cases, Environmental Health staff may identify and require analysis of cumulative impact issues other than those listed above which, could pose potential water quality, public health, or safety risks.

C. **QUALIFICATIONS.** Required cumulative impact assessments shall be performed by or under the supervision of one of the following licensed professionals:

1. California Civil Engineer; or

2. California Professional Geologist

Additionally, the licensed professional assuming responsibility for the cumulative impact assessment should have training and experience in the fields of water quality and hydrology.

D. **CASES REQUIRING CUMULATIVE IMPACT ASSESSMENT.** Cases where cumulative impact assessments shall be required are listed in Table 1 below. Additionally, Environmental Health staff reserves the right to require the completion of a cumulative impact assessment in any case where special circumstances related to the size, type, or location of the OWTS warrants such analysis.

Table 1
Projects Requiring Cumulative Impact Assessment*

Type of Project	Geographic Location	Lot Size (acres)	Design Wastewater Flow (gpd)	Groundwater Mounding Analysis	Nitrate Loading Analysis
Residence, including 2nd dwelling unit	Countywide	-	< 1,000 (<7 bedrooms)	No	No
	Impaired Areas	**TBD - Per TMDL/Advanced Protection Mgt Criteria**			
Residence, including 2nd dwelling unit	Countywide	< 1	1,000 + (7+ bedrooms)	No	Yes
	Impaired Areas	**TBD - Per TMDL/Advanced Protection Mgt Criteria**			
Multiunit and Non-residential	Countywide	< 1	1,000 +	No	Yes
		-	1,500+	Yes	No
		-	2,500+	Yes	Yes
	Impaired Areas	**TBD - Per TMDL/Advanced Protection Mgt Criteria**			
Subdivisions	Countywide	2.5+	-	No	No
		<2.5	-	No	Yes
	Impaired Areas	**TBD - Per TMDL/Advanced Protection Mgt Criteria**			
Any OWTS <200 feet from a vernal pool	Countywide	-	-	Yes**	Yes**

*Note: Environmental Health may also require cumulative impact assessment based on project or site specific conditions.

** The hydrological and water quality analysis requirements may be modified depending on site specific conditions and the extent to which the OWTS discharge contributes flow to catchment area supporting the vernal pool.

E. **METHODS.**

1. Groundwater Mounding Analysis
   a. Analysis of groundwater mounding effects shall be conducted using accepted principles of groundwater hydraulics. The specific methodology shall be described and supported with accompanying literature references, as appropriate.
   b. Assumptions and data used for the groundwater mounding analysis shall be stated along with supporting information. A map of the project site showing the location and dimensions of the proposed system(s) and the location of other nearby OWTS, wells and relevant hydrogeological features (e.g., site topography, streams, drainage channels, subsurface drains, etc.) shall be provided.
   c. The wastewater flow used for groundwater mounding analyses shall be the design sewage flow, unless supported adequately by other documentation or rationale.
   d. Groundwater mounding analyses shall be used to predict the highest rise of the water table and shall account for background groundwater conditions during the wet weather season.
   e. All relevant calculations necessary for reviewing the groundwater mounding analysis shall accompany the submittal.
   f. Any measures proposed to mitigate or reduce the groundwater mounding effects shall be presented and described as to their documented effectiveness elsewhere, special maintenance or monitoring requirements or other relevant factors.
   g. For OWTS located <200 feet from and within the catchment area of a vernal pool, an annual water balance analysis will also ordinarily be required to assess the extent of potential OWTS impacts on vernal pool hydrology.

2. Nitrate Loading
   a. Analysis of nitrate loading effects shall, at a minimum, be based upon construction of an annual chemical-water mass balance. The specific methodology shall be described and supported with accompanied literature references as appropriate.
   b. Assumptions and data for the mass balance analysis shall be stated,

along with supporting information. Such supporting information should include, at a minimum:

(1) climatic data (e.g., precipitation, evapotranspiration rates);
(2) groundwater occurrence, depth and flow direction(s);
(3) background groundwater quality data, if available;
(4) soil conditions and runoff factors;
(5) wastewater characteristics (i.e., flow and nitrogen content); and,
(6) other significant nitrogen sources in the impact area (e.g., livestock, other waste discharges, etc.)

c. A map of the project siting showing the location and dimensions of the proposed system(s) and the location of other nearby OWTS, wells and relevant hydrogeological features (e.g., site topography, streams, drainage channels, subsurface drains, etc.) shall be provided.
d. The wastewater flow (average) used for nitrate loading analyses shall be as follows, unless adequately supported by other documentation or rationale:
   (1) For individual residential systems: 75 gpd/bedroom;
   (2) For multi-family residential systems and other non-residential systems: average monthly wastewater flow for the proposed OWTS;
e. Minimum values used for the total nitrogen concentration of septic tank effluent shall be as follows, unless supported adequately by other documentation or rationale:
   (1) Residential wastewater: 50 mg/l
   (2) Non-residential wastewater: as determined from sampling of comparable system(s) or from literature values.

   Environmental Health staff may require the use of more conservative values than cited above if the values are judged (by EH) not likely to be representative of the proposed system(s).
f. All relevant calculations necessary for reviewing the nitrate loading analysis shall accompany the submittal.
g. Any measures proposed to mitigate or reduce the nitrate loading effects shall be presented and described as to their documented effectiveness elsewhere, special maintenance or monitoring requirements or other relevant factors.

F. EVALUATION CRITERIA

1. Groundwater Mounding. The maximum acceptable rise of the water table for short periods of time (e.g., one to two weeks) during the wet weather season, as estimated from groundwater mounding analyses, shall be as follows:

a. General Requirement for all OWTS. Groundwater mounding shall not result in more than a 50-percent reduction in the required minimum depth to seasonally high groundwater per the County Ordinance Sections 4.84.120 and 4.84.165, as applicable, for the type of OWTS and site conditions. For example, where a 5-foot vertical separation to the native groundwater level is required, a short-term “mounding” rise of the water table to within 2.5 feet of trench bottom would be acceptable during peak wet weather conditions. Where a 3-foot vertical separation is required, a short-term rise to within 1.5 feet of trench bottom would be acceptable.
b. Requirement for Large Systems. Notwithstanding (a) above, for all OWTS with design flows of 2,500 gpd or more (i.e., "large systems"), the groundwater mounding analysis shall demonstrate that the minimum required groundwater separation, per the County Ordinance Sections 4.84.120 and 4.84.165, will be maintained beneath the system during peak wet weather conditions.

Environmental Health staff may require, in any individual case or in specific geographical areas (e.g., designated impaired areas), a minimum of 2 feet of groundwater clearance (“mounded” conditions) where deemed necessary for protection of public health, or based upon specific requirements or recommendations of the applicable California Regional Water Quality Control Board.

Criteria for assessing hydrological impacts to vernal pools will be considered on a case-by-case basis. Environmental Health staff may rely upon Regional Water Quality Control Board staff or a third-party consultant to assist in the review. Costs for retaining a third-party consultant would be the responsibility of the project applicant.

2. Nitrate Loading. Minimum criteria for evaluating the cumulative nitrate loading from proposed OWTS shall be as follows:

a. For Areas Served By Individual Water Wells.
(1) Existing Lots of Record: New OWTS on existing lots of record shall not cause the groundwater nitrate-nitrogen concentration to exceed 7.5 mg-N/L at the nearest existing or potential point of groundwater withdrawal (e.g., water well location);
and

(2) New Subdivisions: The total loading of nitrate from new subdivisions shall not result in an average groundwater nitrate-nitrogen concentration over the geographical extent of the subdivision that exceeds 7.5 mg-N/L.

b. For Areas Not Served by Individual Water Wells.

(1) Existing Lots of Record: OWTS installed on existing lots of record shall not cause the groundwater nitrate-nitrogen concentration to exceed 10 mg-N/L at the nearest existing or potential point of groundwater withdrawal (e.g., water well location).

and

(2) New Subdivisions. The total loading of nitrate from new subdivisions shall not result in an average groundwater nitrate-nitrogen concentration over the geographical extent of the subdivision that exceeds 10 mg-N/L.

Environmental Health staff may require, in any individual case or specific geographical areas (e.g., designated impaired areas), more stringent nitrate-nitrogen compliance criteria where deemed necessary for protection of public health, or based upon specific requirements or recommendations of the applicable California Regional Water Quality Control Board.

Criteria for assessing nitrate or other water quality impacts to vernal pools will be considered on a case-by-case basis. Environmental Health staff may rely upon Regional Water Quality Control Board staff or a third-party consultant to assist in the review. Costs for retaining a third-party consultant would be the responsibility of the project applicant.

FORMS AND FIGURES

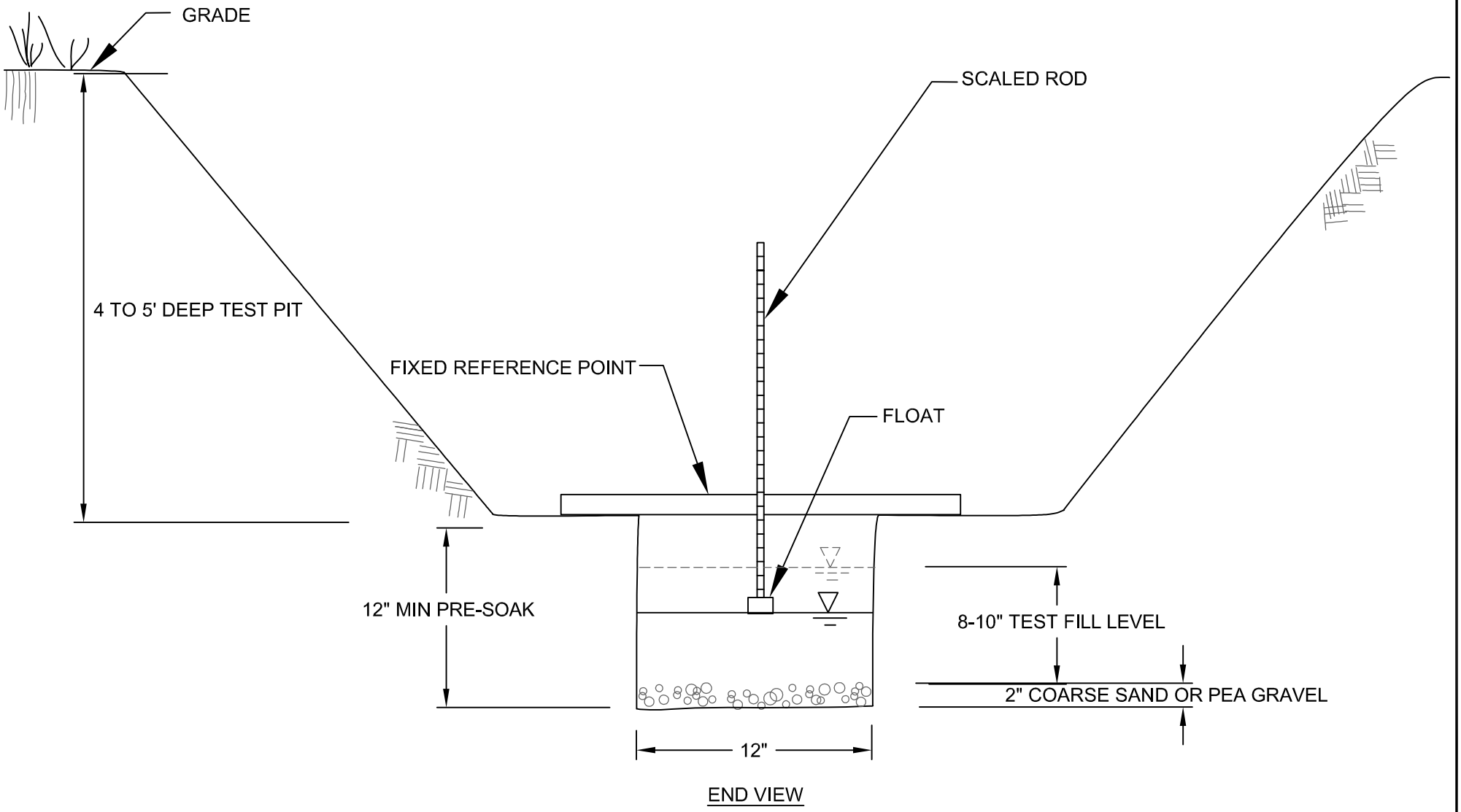

DIAGRAM OF A PERCOLATION TEST

FIGURE 2-1

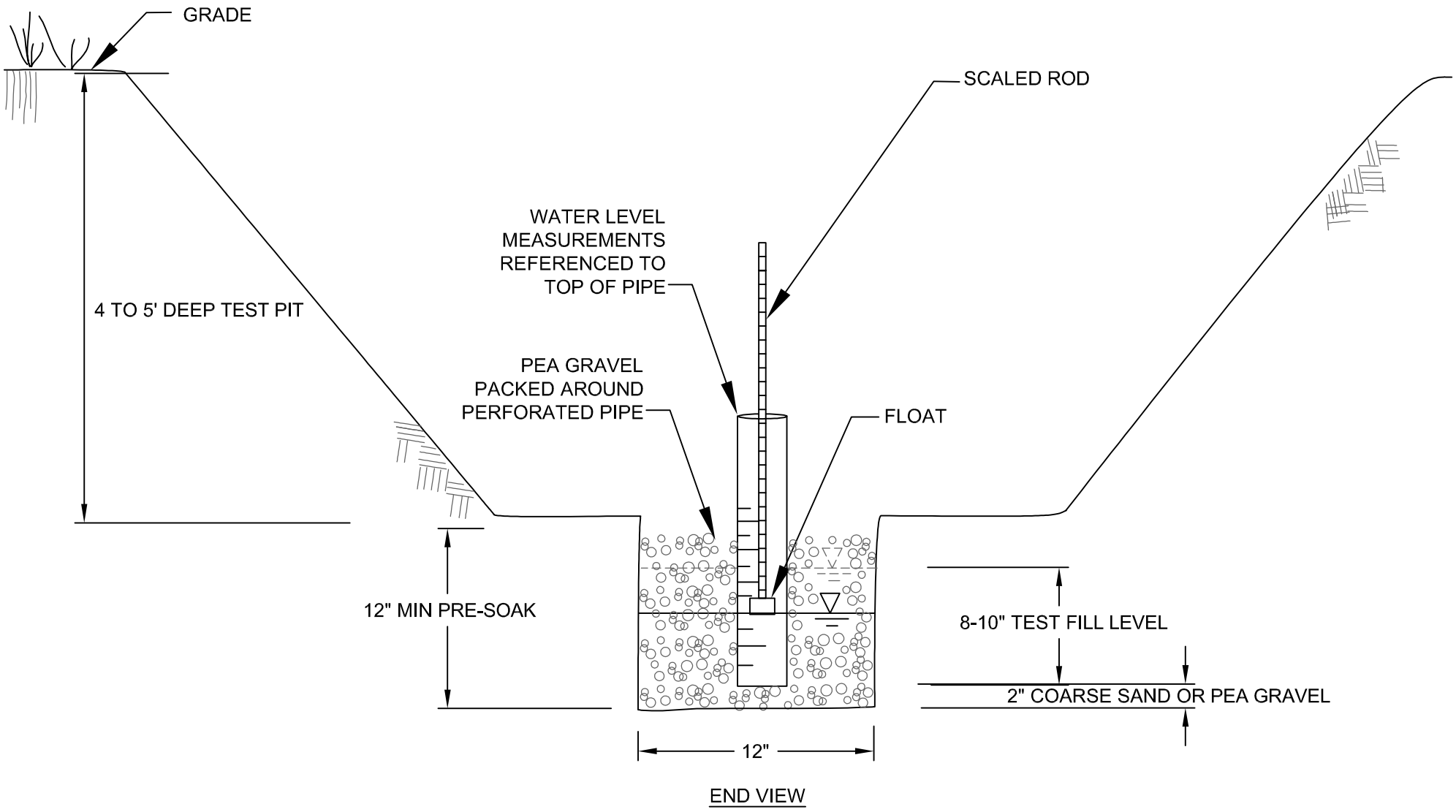

DIAGRAM OF A GRAVEL-PACKED PERCOLATION TEST

FIGURE

2-2

SAN MATEO COUNTY
ENVIRONMENTAL HEALTH SERVICES DIVISION

MEASUREMENTS

½ HOUR INTERVALS	READINGS	HOLE #1	HOLE #2	HOLE #3	HOLE #4	HOLE #5	HOLE #6
1	FINISH						
	START						
	DIFF.						
2	FINISH						
	START						
	DIFF.						
3	FINISH						
	START						
	DIFF.						
4	FINISH						
	START						
	DIFF.						
5	FINISH						
	START						
	DIFF.						
6	FINISH						
	START						
	DIFF.						
7	FINISH						
	START						
	DIFF.						
8	FINISH						
	START						
	DIFF.						

SITE INFORMATION

Site Address:_____ APN:_____

Size Of Parcel:_____ Subdivision Number:_____

Soil Log:_____ Water Source:_____

Depth To Ground Water:_____

Wet Weather Testing Required? ☐ YES ☐ NO

Tested By:_____ Tester #:_____

Observed in Field By:_____ Date:_____