PART 2

SITE EVALUATION METHODS AND INVESTIGATION REQUIREMENTS
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A: Site Evaluation Field Forms and Soil Guides
B: Santa Clara County Wet Weather Groundwater Investigation
C: Santa Clara County Percolation Test Procedures, Consultant Conducted Tests
D: Geotechnical Report and Engineering Installation Plan Requirements
E: Guidelines for Cumulative Impact Assessment
A. GENERAL

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 identified in the Ordinance and this Onsite Systems Manual.

For new divisions of land, soil profiles, percolation tests and groundwater determinations will be required on every parcel unless the director determines, on a case-by-case basis, that such testing is not necessary due to the availability of sufficient information to demonstrate conformance with applicable siting criteria for all proposed OWTS locations.

Site evaluations shall be conducted by a qualified professional, and evaluations shall be made in accordance with the following requirements and referenced attachments.

For sites where a conventional OWTS is appropriate, the site assessment and soil profile evaluation may be conducted entirely by DEH staff. For more difficult sites (e.g., steeper terrain) and for any site requiring the use of an alternative OWTS, the site evaluation and system design will require the involvement of an OWTS consultant (civil engineer, professional geologist, or registered environmental health specialist), who is retained by the owner. All percolation testing shall be conducted by or under the direct supervision of a qualified OWTS consultant. Where the work is conducted by a consultant, the DEH shall be notified prior to the site evaluation to coordinate with and allow for verification by department staff. To be able to provide optimum service to our land use customers the Department will develop a scheduling structure to provide the best service in the appropriate amount of time based on staffing and workload. Please go to www.EHinfo.org for more information.

B. SITE ASSESSMENT

The first step in the site evaluation process is a preliminary review of the physical features of the site by DEH staff, including the slope of the land, proximity to cuts, steep slopes, watercourses and drainage swales, wells, and other features that may limit the available dispersal area.

Prior to conducting the site assessment, a Land Use Service Application form must be completed, along with a preliminary site plan. This form must be signed by the owner of the property, or their authorized agent, in order to gain access to the parcel.

Site features determined by the field inspection and review of available maps and file information include:

(1) Land area available for treatment components and for primary and secondary/reserve dispersal fields.
(2) Ground slope in the primary and secondary/reserve dispersal area(s).

(3) 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 secondary/reserve dispersal area(s).

(4) Location of wells, watercourses, drainage swales and other bodies of water within 150 feet of the primary and secondary/reserve dispersal area(s).

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

Following the site assessment, a written report will be provided by DEH. The report will briefly describe any limitation to development of the site using an OWTS.

C. SOIL PROFILES

After the initial site assessment, soil conditions in the area(s) identified for the dispersal field require evaluation through soil profile observations. A soil profile typically consists of a backhoe excavation or soil boring to a depth extending below the anticipated dispersal trench bottom. For conventional OWTS, the backhoe excavation should extend a minimum of 5 feet below trench bottom; for alternative OWTS this depth may be reduced to 3 feet below trench bottom.

The purpose of the soil profile is to:

(1) Determine the suitability of the soils for absorption of wastewater in the dispersal trench zone; and

(2) Verify that there will be adequate vertical separation between the bottom of the dispersal trench and bedrock, groundwater, or impermeable soil strata.

A minimum of one excavation in the primary dispersal field and one in the secondary/reserve area shall be required for this purpose. Additional soil profiles may be required if the initial two profiles show conditions which are dissimilar to the extent that they do not provide sufficient information for design and/or determination of code compliance.

Auger test holes may be an acceptable alternative to backhoe or hand-dug test pits where the DEH determines either that:

(1) the use of a backhoe or similar excavating machinery is impractical because of access or because of the fragile nature of the soils; or
(2) it is necessary only to verify conditions expected on the basis of prior soils investigations;

(3) soil profiles are required to be no greater than 3-feet deep (e.g., for mounds or drip dispersal); or

(4) it is done in connection with geologic investigations.

Also, where groundwater separation of more than 5 feet is required (e.g., for conventional OWTS in areas of rapid percolation rates), additional (deeper) subsurface exploration may be required for groundwater determination; and this can be done with an auger boring rather than backhoe excavation.

The following factors should be observed and reported from ground surface to the bottom of soil profile:

- Thickness and coloring of soil layers, soil structure, and texture according to United States Department of Agriculture (USDA) classification.

- Depth to a limiting condition such as hardpan, rock strata, impermeable soil layer, or saturated soil conditions.

- Depth to observed groundwater.

- Depth to and description of soil mottling (redoximorphic features).

- Other prominent soil features which may affect site suitability, such as coarse fragments, consistence, roots and pores, and moisture content.

Soil profile inspections should follow guidance provided in manuals such as:


Various aids for soil profile observations and logging are provided in Attachment A.

**D. DEPTH TO GROUNDWATER DETERMINATION**

The anticipated highest level of groundwater in the primary and secondary/reserve area shall be estimated either:
(a) As 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 period as defined by the DEH.

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

If there are site characteristics or historical documentation indicating that a shallow water table is likely to occur during the rainy season, a wet weather groundwater investigation will be required. This investigation must be conducted during normal wet weather ground water conditions in accordance with DEH policy and procedures (see Attachment B). DEH staff should be contacted early in the site evaluation process to determine if wet weather groundwater observations are likely to be required for a particular site and to coordinate the work.

E. PERCOLATION TESTING

Percolation testing is conducted to confirm the groundwater separation requirement for the proposed site and to determine the size of the dispersal field for the project. The applicant must hire a consultant to conduct the percolation tests. DEH will determine the level of oversight to be provided during the testing. Percolation testing shall be completed in accordance with procedures detailed in Attachment C.

With respect to percolation testing, the applicant is responsible for:

1. Contracting with an OWTS contractor or other qualified individual to excavate and setup the percolation test holes in locations designated by the DEH and/or the applicant’s OWTS consultant;
2. Contracting with an OWTS design consultant to run the percolation tests;
3. Making necessary arrangements to assure that adequate water is available for the required 24-hour pre-soaking and for refilling during testing.

Percolation testing will normally be conducted at the time of or shortly following the soil profile investigation. However, if the soil profile observations indicate the presence of expansive soils with high shrink-swell characteristics, percolation testing during the normal wet weather season will be required. This is because expansive, 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. Field judgment of the need for wet weather percolation testing will be made based on: (a) visual evidence of soil shrinkage cracks; and/or (b) soils exhibiting high clay content (e.g., exceeding
40 percent) in combination with massive, columnar or angular blocky soil structure.

F. GEOTECHNICAL REPORT/SLOPE STABILITY ANALYSIS

For any site where the ground slope in the proposed dispersal field area exceeds 20%, and for recommended reduction in horizontal setbacks from cuts, embankments, steep slopes or an unstable land mass, additional geotechnical evaluation of slope stability, drainage, and other 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 Attachment D for details pertaining to this additional geotechnical evaluation requirement.

G. 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 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 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 as may otherwise be designated by the director for certain situations of geographical areas of the county.

The requirements and guidelines pertaining cumulative impact assessments are detailed in detailed in Attachment E.

H. REPORTING

All site evaluation information shall be submitted to the DEH with the OWTS permit application, including, as applicable:

(1) soil profile and percolation test results, with map and written document attesting to the validity that the tests were set up and conducted in accordance with county standards for primary and secondary/reserve dispersal areas (per Attachments A and C);
(2) Floor plans of proposed structures. If structure is existing, provide existing and proposed floor plans.

(3) wet weather groundwater observations per Attachment B (if required);

(4) geotechnical report per Attachment D (if required);

(5) cumulative impact assessment per Attachment E (if required); and

(6) other project-specific information required by the director.
Site Evaluation

Field Forms and Soil Guides
# SITE ASSESSMENT REPORT

<table>
<thead>
<tr>
<th>Site Address:</th>
<th>Assessment Date:</th>
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<tbody>
<tr>
<td>City/Zip Code:</td>
<td>SR#:</td>
</tr>
<tr>
<td>APN:</td>
<td>☐ Existing Septic Permit (SP#: )</td>
</tr>
</tbody>
</table>

Items marked below represent constraints to designing a septic system or information that is required to determine the feasibility for designing a septic system on this property. This report represents a preliminary review based on a visual inspection of the property. It should be used only as a guide for more in-depth evaluation of the property for development.

1. Before proceeding with soils investigations, it must be demonstrated on a site plan that a minimum dual dispersal field (primary + secondary) could be installed for a 1 bedroom house if very good percolation test results are obtained. **Percolation studies may dictate a larger system**, which may preclude development.

2. It appears that the slope on a portion of the property exceeds 50%. Dispersal fields may not be installed on slopes that exceed 50%. Submit a topographical map and survey showing 2-foot contours.

3. It appears that the slope in the proposed dispersal fields will exceed 20%. Approval for the use of a septic system will be contingent upon submittal of an engineered plan and a geotechnical report that demonstrates that the specific septic system design will not result in soil instability, surfacing effluent, contamination of water or creation of a nuisance.

4. Existing or propose easements or rights-of-way (driveway, roadway, etc.) may limit the available dispersal fields.

5. Soils test pits and percolation tests must be conducted under the oversight of this Department. The results of these investigations will determine the suitability of the soil for a septic system and will determine the required dispersal fields.

6. Cuts and steep banks (for driveway, house, retaining walls, roads, etc) downslope from the proposed dispersal area (either on the subject or adjacent property) may limit the available dispersal area.

7. Wells located on the subject or adjacent property may limit the available dispersal area.

8. The watercourse/drainage swale on the subject or adjacent property may limit the dispersal area.

9. Large trees on the property may limit the available dispersal area. Maintain a setback of at least 15 feet between dispersal field and trees over 12 inches diameter (when measured at a height of 4.5 feet above the ground). See County or City for Tree Protection Requirements.

10. The proposed dispersal area may be subject to seasonal high groundwater. A wet weather groundwater test may be required. Contact the DEH Land Use Senior at 408-299-5748 to be placed on the wet weather groundwater testing window notification list.

11. There appears to be considerable surface drainage onto the proposed dispersal area.

12. There is fill in the proposed dispersal area. A maximum of 1 foot of fill is allowed over a dispersal area.

13. There may be unpermitted or illegal structures on the subject property.

14. Other:

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For more information regarding the septic system approval process and design requirements, see Santa Clara County Ordinance Division B-11 and the OWTS Technical Manual, available on our website.

Specialist Name

Signature

Date

Sent to ☐Mail / ☐Fax / ☐E-mail
# REPORT OF OBSERVATIONS

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| PAGE | OF |
## TABLE 3-4

**TEXTURAL PROPERTIES OF MINERAL SOILS**

<table>
<thead>
<tr>
<th>Soil Class</th>
<th>Feeling and Appearance</th>
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<tbody>
<tr>
<td><strong>Dry Soil</strong></td>
<td><strong>Moist Soil</strong></td>
</tr>
<tr>
<td><strong>Sand</strong></td>
<td>Loose, single grains which feel gritty. Squeezed in the hand, the soil mass falls apart when the pressure is released.</td>
</tr>
<tr>
<td><strong>Sandy Loam</strong></td>
<td>Aggregates easily crushed; very faint velvety feeling initially but with continued rubbing the gritty feeling of sand soon dominates.</td>
</tr>
<tr>
<td><strong>Loam</strong></td>
<td>Aggregates are crushed under moderate pressure; clods can be quite firm. When pulverized, loam has velvety feel that becomes gritty with continued rubbing. Casts bear careful handling.</td>
</tr>
<tr>
<td><strong>Silt Loam</strong></td>
<td>Aggregates are firm but may be crushed under moderate pressure. Clods are firm to hard. Smooth, flour-like feel dominates when soil is pulverized.</td>
</tr>
<tr>
<td><strong>Clay Loam</strong></td>
<td>Very firm aggregates and hard clods that strongly resist crushing by hand. When pulverized, the soil takes on a somewhat gritty feeling due to the harshness of the very small aggregates which persist.</td>
</tr>
<tr>
<td><strong>Clay</strong></td>
<td>Aggregates are hard; clods are extremely hard and strongly resist crushing by hand. When pulverized, it has a grit-like texture due to the harshness of numerous very small aggregates which persist.</td>
</tr>
</tbody>
</table>
Santa Clara County

Wet Weather Groundwater Investigation
SANTA CLARA COUNTY
WET WEATHER GROUNDWATER INVESTIGATION

Background

The Santa Clara County Sewage Disposal Ordinance requires that soil investigations be conducted on each building site to be served by an onsite sewage disposal (septic) system. One function of these soil investigations is to determine if there will be adequate separation between the bottom of the dispersal field and seasonal high groundwater. For conventional systems, the ordinance requires groundwater to be at least 5 feet below the dispersal field in soils that exhibit slow to moderate percolation rates (31 to 120 mpi), 8 feet for faster rates (5 to 30 mpi), and 20 feet in highly permeable soils (<5 mpi). For alternative OWTS a 2 to 5-foot separation to groundwater is required.

Failure to provide the required separation to seasonal high groundwater may potentially result in groundwater contamination from the septic system or failure of the septic system itself. A septic system failure could manifest itself, among others things, by effluent surfacing on the ground and/or sewage backing up into the house fixtures. Installing a septic system on a site that appears to have adequate separation to groundwater in the dry season but experiences shallow groundwater during the rainy season may result in a septic system which functions properly only part of the year.

The Department of Environmental Health (DEH) has developed a policy that describes the wet weather groundwater investigation process. This process is used to identify sites with elevated seasonal groundwater tables which may preclude development using onsite sewage disposal systems.

A seasonal groundwater table may be suspected where 1) previous soil investigations have indicated evidence of high groundwater (soil mottling); 2) the site is at the base of a hill, near a creek or otherwise located where water is likely to accumulate; 3) riparian type plant life is present indicating prolonged soil moisture; 4) the Santa Clara Valley Water District (SCVWD) records indicate high groundwater conditions in the area; and/or 5) the presence of any other condition that may indicate a seasonal high groundwater table.
Wet Weather Investigation Process

A typical wet weather investigation will consist of a test pit, or with the approval of DEH, a test boring witnessed by DEH. The test must be conducted when sufficient rainfall has occurred in the area to establish the normal seasonal groundwater table. Prior to conducting the wet weather groundwater investigation, the percolation rate of the soil should be determined by DEH in order to assure that the wet weather investigation is conducted at the proper depth. DEH uses data from four SCVWD rainfall-monitoring stations to determine when sufficient rainfall has occurred. The testing window will open for a 30-day period when at least 60% of historical seasonal average rainfall has occurred, and 14% of that average has occurred in the last 30 days. The window will be extended for two-week periods provided that at the end of each testing period at least 14% of historical seasonal average rainfall has occurred in the previous 30 days.

In lieu of test pits or borings, the applicant may choose to construct at least two test wells in locations specified by DEH. The wells must be constructed to the same depth as would be required for the test pit. The wells must be constructed by an individual or company knowledgeable in the proper construction of these wells, and approved by DEH. The casing must be perforated from four feet below the surface to the depth of the well and the annular space at the surface must be sealed to prevent the introduction of surface water into the well. DEH will monitor the well during the wet weather investigation window.

The District Environmental Health Specialist should be consulted to determine whether a wet weather groundwater investigation would be required on a specific site. Appropriate fees must be paid to DEH prior to conducting the wet weather investigation.

Wet Weather Test Alternative

As an alternative to conducting the wet weather test, the applicant may elect to retain a hydrogeologist to investigate the site for evidence of seasonal high groundwater and submit a written report to the Department of Environmental Health. The investigation must include a field examination of test borings or excavations in the drainfield area and must address the topography and drainage of the area, including surface and subsurface drainage. Borings and excavations must be extended from 2 to 20 feet below the bottom of the proposed drainfield (based on the percolation rate of the soil and the type of OWTS proposed). The report must be submitted to the Land Use Senior who will request that the County Geologist review the report and comment. The County Geologist charges a fee for this review. Contact the County Geologist at 408-299-5774 for the fee schedule. These requirements should be discussed with the Land Use Senior at 408-299-5748 prior to conducting the investigation. A fee is also required by DEH for review of the hydrogeologist’s report.
Santa Clara County

Percolation Test Procedures

Consultant Conducted Tests
PERCOLATION TEST PROCEDURES
CONSULTANT CONDUCTED TESTS

The person verifying the validity of the percolation tests must attest, in writing, that the test was set up and conducted in accordance with county standards, including the presoak procedure that he/she personally observed the site and at least a portion of the tests.

Test results shall be submitted on forms provided by or equivalent to those provided by the Department of Environmental Health.
General Information

Percolation tests must be conducted by or under the supervision of a California state registered environmental health specialist, a California state registered civil engineer, or a California state professional geologist.

The Department of Environmental Health will review and approve the number of percolation holes, their depths, and locations. Department of Environmental Health staff may elect to witness the installation of the percolation holes, verify presoaking, and be present during all or part of the testing. Upon satisfactory review of the data, department staff will determine the appropriate leachfield length.

Contact this department or visit our website at www.ehinfo.org for our current fee schedule. Extended service will be charged at an hourly rate.

The consultant shall notify the appropriate Department of Environmental Health office at least 24 hours prior to installing the percolation holes and 48 hours prior to conducting the percolation tests. Percolation tests may be conducted Tuesday through Friday.

Test readings, along with a site plan and letter of certification, are to be submitted on forms approved by the Department of Environmental Health.

Hole construction (see the attached diagram)

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Pipe Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>–12-inches</td>
<td>–4-inches</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth</th>
<th>Gravel Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>as determined by the Department of Environmental Health.</td>
<td>½ to ¾ inch clean washed drain rock.</td>
</tr>
</tbody>
</table>

Number & Distribution – the minimum number of percolation holes shall be 6 per site, distributed to provide a reasonable representation of conditions throughout the proposed dispersal field area. Additional holes will be charged at the same rate as the initial 6 holes. Only those holes agreed upon prior to the test will be used to determine the leaching system requirement. Check with your local Department of Environmental Health office for more details.

for a 4-hr period, refilling approximately once per hour. Alternatively, presoaking can be divided into 2-hr morning, 2-hr afternoon period or other schedule to achieve 4-hr total presoak period.

Pre-soak

Percolation test hole locations must be reviewed and approved by Department of Environmental Health staff prior to starting the work. A site map, showing the location of all percolation holes must be provided by the consultant. At the completion a site map, letter of certification and percolation reading will be submitted to DEH for review.

All percolation holes must be pre-soaked before the test begins. Pre-soaking is to consist of filling each percolation hole to at least 12 inches above the gravel bottom, for a 4-hr period, refilling approximately once per hour. Alternatively, presoaking can be divided into 2-hr morning, 2-hr afternoon period or other schedule to achieve 4-hr total presoak period.

Filling each percolation hole is best accomplished by adding water through the pipe rather than into the gravel.
**Materials**

Adjacent to each percolation hole there should be a hose connected to a plumbed water source or a water-filled container of 5 gallons or larger. Fifty (50) gallon drums or garbage cans are often preferred for faster percolating soils.

A water truck or other water source is to be available for refilling containers as needed during the course of the percolation test.

During the percolation test, holes may best be filled and re-filled to 6 inches above the gravel bottom, ideally using a small, easily managed bucket of ½ to 1-gallon capacity.

**Test Procedures (for use with attached percolation test form)**

1. On the day of the test, if more that 6 inches of water above the gravel bottom remains in any test hole. This constitutes a failure; and no further testing of the hole is warranted. If less than 6 inches of water remains in the test hole, proceed with steps 2 through 7.
2. Carefully fill the holes to 6 inches of water above the gravel bottom.
3. Measure the distance from the top of the pipe to the water surface with a 1/8-inch accuracy. This is water surface measurement A (“Start”). Record the measured distance. Record the time.
4. Allow 30 minutes to pass.
5. Measure the distance from the top of the pipe to the water surface with a 1/8-inch accuracy. This is water surface measurement B (“Finish”). Record the measured distance. Record the time.
6. Determine water level drop. The water level drop is the difference in inches between water surface measurements A and B (“Δ INCH”). Determine the amount of time between Start and Finish readings (“Δ MIN”). Calculate the rate in minutes per inch (MPI) as the product of “Δ MIN” divided by “Δ INCH”.
7. Refill each hole to 6 inches of water above the gravel bottom and repeat the procedures of steps 3 through 6 above.
8. Continue these water refill and water level drop measurement procedures for a period of at least two (2) hours and until the water level drop (step 6) stabilizes and three (3) consecutive water level drop determinations are within 10% or 1/8 inch of each other. **Note:** The water level must be readjusted to 6 inches above the gravel bottom after each reading.
9. If after one hour the water level is dropping so rapidly to make 30-minute readings infeasible, switch to 10-minute readings. Refill the hole to 6 inches above the gravel bottom and repeat the water level drop measurement procedures (steps 3 through 6) using a 10 minute interval instead of 30 minutes. Continue these 10-minute tests for at least one hour and until the water level drop stabilizes and three (3) consecutive water level drop determinations are within 10% or 1/8-inch of each other.
10. If, during the course of step 9, the water drains so rapidly that 10-minute readings are infeasible: (a) reduce the interval further (e.g., to 5 minutes); or (b) measure the time it takes for the water to drop exactly one inch, and report that time as the resultant rate (i.e., minutes
per inch). As above, repeat the measurements a sufficient number of times to achieve a stabilized rate over three consecutive readings.

11. All readings are to be reported in minutes per inch.

12. Complete calculations at the bottom of the percolation test form by: (a) entering the final stabilized rate for each test hole; (b) multiplying the stabilized rate by 1.4 to adjust for the displacement of water by the gravel-pack; and (c) calculating the average adjusted stabilized rate as the sum of the individual results divided by the total number of tests completed.

13. The average percolation rate determined per step 11 is used as the basis for dispersal system design and for determination of applicable groundwater separation requirements. See Additional Notes for dealing with individual outlier percolation values, including excessively fast, excessively slow or out-right failures.

14. Data for all percolation holes must be submitted to the Department of Environmental Health for evaluation. This data is to be included with a copy of the site map showing the location of the numbered percolation holes and a letter of certification.

Additional Notes on Percolation Testing

Number/Depth of Test Holes:

- Minimum of 6 tests in dispersal field area (spread over primary and secondary/reserve) for system design; 6 tests total for each parcel in new subdivisions.
- Minimum of 3 tests at proposed trench bottom; others within sidewall infiltration zone

Presoak Procedure:

- Required on the day prior to testing, except during wet weather period when the presoak may occur on the same day as testing.
- Fill test hole to 12 inches above gravel bottom and maintain for 4-hr period, refilling approximately once per hour. Alternatively, presoaking can be divided into 2-hr morning, 2-hr afternoon period or other schedule to achieve 4-hr total presoak period.
- Date and note level on perc pipe for verification at presoak inspection.

Use and Interpretation of Results

- Apply 1.4 gravel adjustment factor to determine final rate for each test hole.
- Calculate average mpi of all test holes
- If there are one or two failing test results, three options are available:
  1) Include the failing result(s) in the calculated average and 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 failing and nearby passing test holes to determine the area to be excluded.

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

- 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.
### County of Santa Clara – Department of Environmental Health

**SOIL PERCOLATION TEST RECORDED MEASUREMENTS**

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<th>HOLE #1 DEPTH</th>
<th>TIME</th>
<th>WATER LEVEL</th>
<th>Δ MIN</th>
<th>Δ INCH</th>
<th>MPI</th>
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<td>TIME</td>
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<td>Δ MIN</td>
<td>Δ INCH</td>
<td>MPI</td>
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<td>WATER LEVEL</td>
<td>Δ MIN</td>
<td>Δ INCH</td>
<td>MPI</td>
</tr>
<tr>
<td></td>
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<tr>
<td>HOLE #6 DEPTH</td>
<td>TIME</td>
<td>WATER LEVEL</td>
<td>Δ MIN</td>
<td>Δ INCH</td>
<td>MPI</td>
</tr>
<tr>
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<table>
<thead>
<tr>
<th>HOLE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tbody>
<tr>
<td>Stabilized MPI</td>
<td>R</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted Stabilized MPI</td>
<td>R = R x 1.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Adjusted Stabilized MPI</td>
<td>R₂ = (Σ R₁) / # Holes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># Bedrooms:</td>
<td>FOR OFFICE USE ONLY</td>
<td>Tank Size (Gal)</td>
<td>Leach line (Ft)</td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>
1. Hand auger or machine auger a 12-inch hole.
2. Scarify the glazed sidewall, if any.
3. Insert the perforated pipe in the center of the 12-inch hole.
4. Gravel-pack the hole around the pipe with 1/2-inch to 3/4-inch clean washed gravel to the ground surface.
1. An additional fee will be charged for this method of construction.
2. Backhoe excavation with the bottom of the excavation no greater than 5½ feet in depth.
3. Hand auger or machine auger a 12-inch hole.
4. Scarify the glazed sidewall, if any.
5. Insert the perforated pipe in the center of the 12-inch hole.
6. Gravel pack the hole around the pipe with ¼-inch to ¼-inch clean washed gravel.
7. The excavation shall be back filled prior to conducting the percolation test.
Geotechnical Report and

Engineering Installation Plan

Requirements
Geotechnical Report & Engineering Installation Plan
Requirements for:
➢ Slopes Exceeding 20%
➢ Reduction of Horizontal Setbacks

When it is proposed to install an OWTS on slopes over 20% the County OWTS Ordinance, Code Section B11-83, requires that it be demonstrated “through a geotechnical report and complete engineering installation plan ... that use of the subsurface dispersal system will not permit sewage effluent to surface, degrade water quality, create a nuisance, affect soil stability, or present a threat to the public health or safety. The geotechnical report shall include, but not be limited to, soil percolation rates, contours, soil depth, seasonal groundwater elevation(s), location of all existing or proposed ground cuts, rock formations, soil stability, drainage, and other data as determined by the director and the County geologist.”

Also, under Section B11-67(i)(6) regarding horizontal setback distances between the dispersal field and cut banks, embankments, steep slopes and unstable land masses, the Code allows for reduction of the required setback distance “...in accordance with recommendations provided in a geotechnical report by a registered civil engineer or professional geologist...”.

The following are the minimum requirements for the preparation of the geotechnical report and engineering installation plan pertaining to the above provisions of the Code.

1. The geotechnical report must be prepared by a state registered civil engineer or a professional geologist certified as an engineering geologist or having similar geotechnical expertise as determined by the County geologist. The engineering installation plan must be prepared by a state registered civil engineer, professional geologist, or registered environmental health specialist. The report and plan may be prepared by different authorized professionals.

2. Engineering Installation Plan Requirements:

   a) The plan must be wet-stamped by the designer and initialed or signed.

   b) The plan must include cross section(s) through the dispersal field that show dispersal line depths and details, and any benching that will be necessary to install the system.

   c) Any OWTS proposed for installation on slopes between 30% and 40% shall require the use of pressure distribution methods, designed in accordance with applicable guidelines in Part 4 of the Onsite Systems Manual.

   d) Any OWTS proposed for installation on slopes between 40% and 50% shall require the use of subsurface drip dispersal methods, designed in accordance with applicable guidelines in Part 4 of the Onsite Systems Manual.

   e) The plan must include an erosion control plan, incorporating measures consistent with guidelines and requirements contained in Division C12, Chapter III of the Santa Clara County Code (County Grading Ordinance).
f) The plan shall incorporate applicable recommendations contained in the geotechnical report regarding the avoidance or mitigation of slope stability concerns, including, as applicable, recommended horizontal setback distance(s) from cut banks, embankments, steep slopes, or any identified unstable land mass within 100 feet the dispersal field.

3. Geotechnical Report Requirements:

a) The report must specifically reference the engineering installation plan. If, at some future date, the dispersal field is appreciably modified an amended report must be submitted that references the modified plan.

b) The geotechnical report must discuss the geology, slope stability and seismic hazards, soils, groundwater, drainage, percolation rate, topography, cuts, vegetation and other pertinent site features.

c) The report shall include any recommendations deemed appropriate or necessary to mitigate potential slope stability, drainage or seepage concerns associated with either the installation or on-going operation of the proposed OWTS, including, as applicable, recommended horizontal setback(s) from any cut banks, embankments, steep slopes or any identified unstable land mass.

d) The report must state specifically in the conclusion that the proposed OWTS will not (or other wording such as not likely to, risk is very low, etc.):

   1) Permit sewage effluent to surface
   
   2) Degrade water quality
   
   3) Affect soil stability
   
   4) Present a threat to the public health or safety
   
   5) Create a public nuisance

e) The geotechnical report shall be wet-stamped and signed by the responsible licensed professional.
Guidelines for

Cumulative Impact Assessment
GUIDELINES FOR CUMULATIVE IMPACT ASSESSMENT

A. General Provisions. Code section B11-74 authorizes the director 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 (e.g., proximity to vernal pool). Cumulative impact assessments to address potential concerns shall be conducted in accordance with the requirements outlined in these guidelines. The results of the assessment shall be submitted for review by the Director 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.

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.

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, 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.

C. Qualifications. Cumulative impact assessments required for alternative system proposals shall be performed by or under the supervision of one of the following licensed professionals:

1. Registered Civil Engineer
2. Registered Environmental Health Specialist
3. Registered 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. Additionally, the Director reserves the right to require the completion of a cumulative impact assessment in any case where, in his/her opinion, special circumstances related to the size, type, or location of the OWTS warrant such analysis.

**Table 1**  
Projects Requiring Cumulative Impact Assessment*

<table>
<thead>
<tr>
<th>Type of Project</th>
<th>Geographic Location</th>
<th>Lot Size (acres)</th>
<th>Design Wastewater Flow (gpd)</th>
<th>Groundwater Mounding Analysis</th>
<th>Nitrate Loading Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Residence</td>
<td>Countywide</td>
<td>-</td>
<td>-</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Residence with Second Unit</td>
<td>Countywide</td>
<td>-</td>
<td>-</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>San Martin Area</td>
<td>&lt; 5</td>
<td>-</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Multiunit and Non-residential</td>
<td>Countywide</td>
<td>&lt; 1</td>
<td>-</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Countywide</td>
<td></td>
<td>1,500+</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Countywide</td>
<td></td>
<td>2,500+</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>San Martin Area</td>
<td>&lt; 5</td>
<td>-</td>
<td>Per Countywide requirements</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5+</td>
<td>1,000+</td>
<td>above</td>
<td></td>
</tr>
<tr>
<td>Subdivisions</td>
<td>Countywide</td>
<td>2.5+</td>
<td>-</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Countywide</td>
<td>&lt;2.5</td>
<td>-</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Any OWTS &lt;200 feet from a vernal pool</td>
<td>Countywide</td>
<td>-</td>
<td>-</td>
<td>Yes**</td>
<td>Yes**</td>
</tr>
</tbody>
</table>

*Note: Director 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 hydrogeologic 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 OWST 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;
ATTACHMENT E

(4) soils 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 hydrogeologic 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.

The Director may require the use of more conservative values than cited above if, in his/her opinion, the values are 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 section B11-67 or B11-95, as applicable, for the type of OWTS and site conditions. For example, where a 3-foot vertical separation to the native groundwater level is required, a short-term “mounding” rise of the water table to within 1.5 feet of trench bottom would be acceptable during peak wet weather conditions.

b. Requirement for Large Systems. Notwithstanding (a) above, for all OWTS of 2,500 gpd or more (i.e., "large systems"), the groundwater mounding analysis shall demonstrate that the minimum required groundwater separation, per B11-67 or B11-95 as applicable, will be maintained beneath the system during peak wet weather conditions.

The Director reserves the right to require, in any individual case, up to 24 inches 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. The director 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).

(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.

The Director reserves the right to require, in any individual case, 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. The director 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.