

# Soils Evaluation Training Day – Two Day Workshop

## Day One - Classroom

This two day workshop is comprised of one day in the classroom and one day in the field. Time in the classroom is spent obtaining the following outcomes:

- Understand basic treatment mechanisms in soil used to treat sewage.
  - Filtration
  - Adsorption – binding or holding of contaminants to soil
  - Chemical – chemicals in soils changing contaminants to a form that is not harmful or that can be held in soil.
  - Flora, fauna microbial role in treatment
- Understand the effect of saturated and unsaturated flows on basic treatment processes..
- Basic knowledge of what conditions will enhance soil treatment and what conditions deter treatment.
- Understand the depth of effective soil needed for treatment.
- Know where the highest population of microbes/flora-fauna/biota live in the soil.
- Where does the water go (vertical movement and horizontal movement) when it meets a restricting layer?
- How fast does water move in soil (very basic vertical and horizontal movement of groundwater).
- What affects the movement of water volume and speed?
  - Pore space, void space relative to soil texture, matric potential of soils (suction – capillary action) 20
  - Structure 20
  - Hydraulic head 5
  - Affect of SAR on clays and recognition of expandable clays – reference in SOP
- Desired movement of wastewater (saturated vs. unsaturated) video.
- Water holding capacity of soil (water holding capacity of various soils).
  - Field capacity, upper and lower water limits
  - Saturation
  - Saturation percentage test
- Percolation test, general method, limits, locations, depths, outside effects on results, relation to soil texture and structure.
- Infiltration into soil vs. percolation within the soil and the effect of biomat formation.
- Recognition of ground water mounding occurring and what it is.



- Understanding the conditions that affect movement of water in soil and that it will affect the sizing of a soil absorption system.

**Day 2 – Field Day – Instructor will demonstrate all required outcomes prior to participants demonstrating to the instructor the proper processes for site and soil evaluation.**

**Soil evaluation identifying characteristics that affect sewage systems.**

- Understand the general method of how to evaluate soil characteristics that affect water movement.
  - Excavate soil pit – depth, location (don't ruin site)
  - Available tools – soil auger, probe
- Basic knowledge of how to examine the soil profile and identify
  - Major soil structure features (why it is important is covered in soil/water)
  - Colour – mottles and gleyed soils (washed out gray) identified high water table or saturated soils (reason saturated/unsaturated flow in previous module)
  - Soil texture, make up of sand/silt/clay, don't count gravel component
  - Effect of gravel component
  - Where to take sample
  - Basic hand texturing procedures
  - Trial hand texturing
  - Lab testing availability and basic knowledge of lab testing method
  - Recognize changes in soil horizons and understand effect on sewage system design.
  - Soils logging using various soils logs
- Understand and apply the soil texture triangle.
- Able to determine effluent-loading rate for a soil texture set in Standard of Practice.
- Know what restricting/limiting layers are and able to recognize major characteristic.
- Ability to recognize major soil characteristic and determine soil effluent loading rates or limitations.

