TASK 3 Evaluation of sub-surface disposal and Reuse alternatives

Results from Subsurface and reuse investigations will be coordinated with Town, DEEP and the property owners to provide them with the opportunity to provide comments on the various stages of this task. Soil samples collected from subsurface investigations will be tested by a state certified laboratory.

3.1 Preliminary evaluation and existing site information review:

a. Engineer will gather and review available soil borings, test pits, groundwater and other hydrogeological data for the four identified sites. This information will be utilized to supplement testing results gathered in items 3.2 through 3.4 below.

b. Upon receipt of authorization by property owners, visit each of the four identified sites with soil boring consultant to view terrain, geological features, surface waters and sensitive features to be protected during on-site testing. If necessary, conduct preliminary (limited) soil borings and test pits to establish suitable locations for detailed on-site testing described in items 3.2 through 3.5. This work will be conducted using a MBE surveyor following CT-DEEP CWF requirements.

3.2 Detailed on-site testing:

The testing program will consist of the following tasks for each of the four identified sites and as quickly as possible after receipt of authorization by property owners to do the study at each site:

a. A test pit investigation program by Town and engineer. The program will include up to eight (8) test pits excavated to a depth of eight to twelve feet; installation of standpipes (one in each test pit), and the collection of up to eight (8) soil samples. Test pit locations will be established based on available information including visual observations, information gathered in item 3.1 above and best professional judgment by Engineer. Logs will be prepared for the test pits to characterize the vertical profile at each test pit location. Soil samples will be collected from test pits for analysis for saturated conductivity and grain size distribution. Percolation tests, other pertinent soil properties and presence of rock ledge will be will be evaluated as part of this subtask.

b. If deemed favorable by the test pit results gathered in item 3.2.a. above, a more detailed subsurface investigation program will be conducted. The program will include up to five (5) deep soil auger borings; installation of groundwater monitoring wells (one in each auger boring); and the collection of soil samples from each boring. Boring locations will be proposed based on available information including visual observation from site walks, and will be coordinated with each property owner and approved by CT DEEP. The auger borings will include logging of the samples to characterize the vertical profile at each auger boring location. Groundwater monitoring wells will be fitted with flush bolted or raised locking covers, dependent upon site requirements. Monitoring wells will be developed by the surge and pump method to remove silt and fines from the sand pack.

3.3 Groundwater Monitoring: Following up tasks 3.1 and 3.2 continue to monitor groundwater at each identified sites as follows:

a. Engineer will determine the location and elevation of any geoprobes, test pits/standpipes and auger borings/groundwater monitoring wells, important physical features and groundwater seepage or groundwater discharge points (i.e., approximate inland wetlands) by field survey. Level of effort shall be suitable to prepare a map of these locations for use in the hydraulic capacity analysis only. Topographic survey will be included as part of this task.

b. Engineer will collect groundwater level measurements for determination of groundwater elevations, seasonal high groundwater, and site hydraulic gradients. Groundwater measurements will be gathered utilizing groundwater data loggers to record data at one-hour increments, and data will be downloaded from each logger on a weekly basis.

c. Engineer will conduct in-situ soil hydraulic conductivity tests (slug tests) in each groundwater monitoring well for determination of aquifer hydraulic conductivity. Hydraulic gradient and hydraulic conductivity data will be used for analysis of site hydraulic capacity.

d. USGS monitoring well data will be used to determine when seasonal high groundwater conditions were reached during the groundwater measuring period. Measured groundwater elevations may need to be adjusted in consideration of the USGS data.

3.4 Hydraulic capacity analysis for each site

a. Prepare an analysis of site hydraulic capacity for each site. The analysis will use soil testing results (e.g. grain size distribution of boring samples, permeability of test pit samples, as applicable) to estimate soil hydraulic conductivity and compare to in-situ soil hydraulic conductivity obtained by slug tests. Analysis will also include evaluation of site hydraulic capacity based upon groundwater mounding and travel time analyses in accordance with CT DEEP design criteria.

b. Prepare a hydrogeological model based on soil testing, groundwater measuring data and hydraulic capacity analysis for each site, develop said model to analyze impacts of potential effluent disposal capacities, dosing rates and other key design criteria.

3.5 Conceptual design

Based on the information gathered above, prepare a concept design and opinion of cost (including capital and O&M costs) of the subsurface soil absorption system for each site based on the site hydraulic analyses. Design will identify location of environmentally sensitive receptors and will include hydrogeologic modeling of site conditions. Design output will determine general layout and dimension of the subsurface soil absorption system and resultant mounded seasonal high groundwater under applied design waste water load conditions, including a design safety factor.

3.6 Reuse alternatives (as described in proposed W&C's SOS)