5.9 Characterization of Halogenated VOCs

The initial phase of this investigation includes the drilling of four soil borings around the location of the halogenated VOC detection in soils (LBG-TB-4). The soil borings would be located approximately 40 feet north, south, east and west of soil boring LBG-TB-4. In addition, a soil boring would be drilled immediately adjacent to soil boring LBG-TB-4. All soil borings would be drilled to the top of the wetland organic layer. If the layer is not encountered, soil borings would be drilled at least 3 feet below the base of the fill, and at least 6 feet below the base of any appreciable VOC measurement identified with the PID (20 ppm or higher). The primary purpose of the initial soil borings would be to identify the depth and extent of the top of the wetland organic layer in this area.

Once the top of the wetland organic layer has been characterized, soil borings would be drilled adjacent to the aforementioned locations with a direct push drill rig equipped with a multi-interface probe (MIP). The MIP utilizes a laboratory grade photoionization detector (PID), flame ionization detector (FID) and electron capture device (ECD) to provide real time total concentrations of VOCs (detection limit of 250 parts per billion (ppb)) and conductivity data. The MIP detects VOC concentrations as low as 250 parts per billion. The conductivity data is used to identify lithologic changes (i.e. sand, gravel, silts, clays, etc.) in the formation. The conductivity data would be used to identify the top of the wetland organic layer, and will be compared to the lithology logged in the initial borings.

The purpose of incorporating the direct push drill rig equipped with the MIP is to expedite the investigation. Once results of the initial MIP borings have been reviewed in the field, additional soil borings would be drilled with the MIP equipped drill rig to determine the extent of the VOC source area. If no VOCs are identified in the initial four surrounding soil borings, soil borings will be drilled closer to LBG-TB-4 (spaced approximately 20 feet around the soil borings). However, if halogenated VOCs are detected in all the initial surrounding soil borings, additional soil borings would be drilled around the initial set of soil borings (eight soil borings approximately 40 feet outside of initial soil borings). However, if halogenated VOCs are identified in only some of the soil borings, a more focused soil boring layout would be developed to adequately characterize the halogenated VOCs in the soil. This iterative drilling approach would continue until the limits of the VOC source area has been clearly identified in the field.

After the limits of the VOC source area has been characterized with the MIP equipped drill rig, soil samples for laboratory testing would be collected within and around the identified source area. Soil samples would be collected with use of a direct push drill rig equipped with a 4-foot macro-core containing an acetate liner. The number of soil samples to be collected would be dependant on the size and shape of the VOC source, however, a minimum of 20 samples would be collected for analyses. Assuming reasonable recovery, duplicate soil samples would be collected from each 2-foot split spoon and placed in properly labeled laboratory supplied containers and stored in a chilled cooler. One of the sets of samples would be delivered to the laboratory for analyses of halogenated VOCs by EPA Method 8021B. The second set of samples would be stored at the laboratory until the results of the VOC analyses has been reviewed.

Duplicate soil samples identified to contain halogenated VOCs would be sent to Xenobiotic Detection Systems of Durham, North Carolina to be stored for potential analyses of dioxins and furans using the Xenobiotic Detection System's Calux Bio-Assay. A subset of the samples identified to contain VOCs would be analyzed for dioxins and furans after guidance for the frequency and analyses is provided by the CTDPH and CTDEP. The Xenobiotic Detection System's Calux Bio-Assay provides a detection limit of 1 part per trillion for a full list of dioxins and furans. This analysis is utilized in the United States by the Food and Drug Administration has been certified in the European Union as an acceptable analysis for dioxins, furans and PCBs. Information concerning the Calux Bio-Assay is provided in Appendix V. Note that dioxins and furans have a hold time of one year.

After completion of the source investigation, monitor wells will be installed around the source area to further evaluate ground-water quality. A determination of monitor well locations and screen depths would be determined after review of the soil data results. Monitor wells would also be installed downgradient and/or along the edges of the plume to further define plume extent. Again, the location and quantity of monitor wells would be determined after review of the soil investigation data. As described in Section 5.7, a monitor well has been proposed for the southwestern portion of the site. Data from this well will aid in the characterization of the lateral extent of the plume.

The halogenated VOC plume will also be characterized offsite through the installation of monitor wells in areas of "right of way." Locations will be determined after the plume at the exit point of the Middle School Site has been further delineated. Considering compliance monitoring

results suggests relatively low levels of halogenated VOCs are exiting the Middle School Site, LBG anticipates the offsite monitor well network to include approximately three to four monitor wells.

Ground-water samples will be collected from the monitor well network as it is developed. All samples will at minimum be analyzed for VOCs by EPA Method 8260 plus MTBE. As discussed in Section 5.8, the network would likely also be utilized to further define ETPH in ground water.