APPENDIX D

SME PHASE II ESA FIELD PROCEDURES

Soil and Groundwater Sampling

Soil Sampling

Direct-push soil borings were advanced using track-mounted, hydraulically-driven, direct-push coring equipment. Soil samples were collected using a four-foot long, two-inch outside-diameter, Geoprobe® MacroCore Sampler fitted with a single-use, disposable, acetate liner. Soil samples were collected continuously from the direct-push borings for visual classification in general accordance with the Unified Soil Classification System (USCS).

A portion of each soil sample was screened for potential ionizable volatile organic compounds (VOCs) using a calibrated photoionization detector (PID) equipped with a 10.6 eV lamp. Field screening consisted of placing a portion of the sample in a sealed plastic bag and allowing the sample to warm and release ionizable VOCs. The tip of the PID was inserted into the headspace of the bag and PID readings were recorded on SME's soil boring logs (Appendix E).

The amount of soil collected was dependent on chemical analyses requirements. Soil samples intended for VOC laboratory analyses were removed from the direct-push boring liner or hand auger bucket first and placed in methanol-preserved 40-milliliter glass vials following U.S. Environmental Protection Agency (EPA) Method 5035A. Soil volumes sufficient for analyses of additional parameters were then removed from the boring liner or auger bucket and homogenized prior to transfer to pre-cleaned, glass jars provided by the analytical laboratory.

Residual soil cuttings generated from the direct-push soil borings were returned to the corresponding borehole after sampling activities were completed. The remaining space in the boreholes was filled with bentonite chips and patched with asphalt, concrete, or soil to match surrounding surfacing materials.

Groundwater Sampling

Groundwater was encountered at depths ranging from approximately 3.5 to 15 feet below ground surface. A temporary groundwater monitoring well, constructed of a five-foot long, one-inch diameter, 0.01-inch mill-slotted PVC screen attached to a one-inch diameter PVC riser, was installed in each borehole in which a well was installed. After gauging the depth to groundwater and total well depth, the well was purged using a variable flow rate, portable peristaltic pump with 3/8-inch outside diameter polyethylene and silicone tubing, at a low flow pumping rate of approximately 100 to 200 milliliters/minute (mL/min).

Purge water from each temporary monitoring well which would produce continuous water at a low flow rate was measured for stabilization of pH (+/-0.1 s.u.), temperature (+/-0.2 deg C), and conductivity (+/-3%). Upon stabilization of the parameters for three consecutive readings, a grab sample was collected from the well. Any well which purged dry during sampling was allowed sufficient time to recover prior to collecting a grab sample from the well.

After well purging, a grab groundwater sample was collected from the temporary groundwater monitoring well using the portable peristaltic pump and 3/8-inch outside diameter polyethylene and silicone tubing. The groundwater sample was transferred directly into the following laboratory-supplied containers: 40-mL glass vials preserved with hydrochloric acid (VOC analyses), 500-mL plastic bottles preserved with nitric acid (metals analyses), 500-mL plastic unpreserved bottles (hexavalent chromium analyses), and 1-L amber glass unpreserved bottles (polynuclear aromatic hydrocarbons analyses).

After purging and groundwater sampling, the development water was placed back into the temporary groundwater well, the well screen and riser were then removed, and soil cuttings were placed into the borehole. The remaining space in the bore holes was filled with bentonite chips and patched with asphalt, concrete, or soil to match surrounding surfacing materials.

Sampling Quality Assurance and Quality Control (QA/QC) and Decontamination

Samples collected for analytical testing were transferred to an ice-packed cooler, and were kept cool until delivery to the Fibertec Environmental Services analytical laboratory. SME followed chain-of-custody protocol. One field blank sample, one trip blank sample, one methanol blank sample, two duplicate soil samples, and one duplicate groundwater sample were submitted for QA/QC purposes. Analytical methods were consistent with Michigan Department of Natural Resources and Environment (MDNRE) – Remediation and Redevelopment Division (RRD) Operational Memorandum No. 2, dated October 22, 2004. The laboratory report, which includes chain-of-custody documentation, laboratory analytical methods, and detection limits, is included in Appendix F.

In order to minimize cross-contamination, a new pair of disposable nitrile or latex sampling gloves was used for collection of each sample. New temporary well materials and sample tubing was used at each boring location to prevent potential cross contamination between borings. Boring equipment used during this assessment was decontaminated using a high pressure, high temperature water wash before each use. Other non-disposable equipment was washed in a phosphate-free detergent and tap water solution followed by a triple rinse with distilled water.