Final Site Investigation Work Plan

Submitted to

MODINE
APPLIED THERMAL INNOVATION™

Modine Manufacturing Company

August 25, 2006

467462
RCRA RECORDS

Prepared by

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August 25, 2006

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Environmental Engineer
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St. Louis, MO 63126-4839

Subject: Final Site Investigation Work Plan
Modine Manufacturing Company
Camdenton, Missouri

Dear Ms. Kump-Mitchell:

CH2M HILL is submitting, on behalf of Modine Manufacturing Company, two copies of the Final Site Investigation Work Plan for the Camdenton facility. The final work plan incorporates input provided by the Missouri Department of Natural Resources regarding the subsurface soil investigation beneath the existing manufacturing building. Please feel free to call Tom Sanicola (262-636-1649) or me (314-421-0313 Ext. 265) with any questions you may have.

Sincerely,

CH2M HILL

Daniel J. Price, R.G.
Project Manager

stl\Final Work Plan Cover Letter.doc

c: Thomas Sanicola - Modine Manufacturing Company
Bob King - Modine Manufacturing Company
Steven Poplawski - Bryan Cave LLP
David Garrett – EPA Region VII
Rick Nussbaum – Missouri Department of Natural Resources

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1.0 Introduction

This Final Work Plan outlines the objectives, approach, and procedures for conducting a subsurface soil investigation beneath the existing manufacturing building at Modine Manufacturing Company, 221 Sunset Drive Camdenton, Missouri. A site location map is provided as Figure 1. The site investigation procedures described in this Work Plan will be managed by CH2M HILL on behalf of Modine to comply with Missouri Department of Natural Resources (MDNR) correspondence dated April 7, 2006 and June 5, 2006.

1.1 Background

A meeting was held between MDNR and Modine to discuss site progress and any future site activities on August 16, 2005. The meeting resulted in an agreement between Modine and MDNR for a historical summary of the past site activities and additional information on indoor air to be submitted to MDNR. The document, *Comprehensive Historical Summary Document Modine Manufacturing Company Camdenton, Missouri Facility* was submitted to MDNR in December, 2005. Letters from MDNR dated April 7, 2006 and June 5, 2006, in response to historical summary and comments from MDNR, provide the basis of this Work Plan.

1.2 Objectives

The primary objective of the activities presented in this Work Plan is to address the additional site investigation requirements put forth in the MDNR correspondence dated April 7, 2006 and June 5, 2006. The Health and Safety Plan (HSP) prepared for field work at the Modine facility has been updated to address potential health and safety issues associated with site investigation activities included in this Work Plan. The updated HSP is presented in Attachment 1. The approach for meeting project objectives during the site investigation is described below.

1.3 Approach

A subsurface investigation beneath the building will be completed to assess potential soil contamination in the areas of the former Mudpits #1 and #3 (part of SWMU 2) and the former Monorail Vapor Degreaser and Still M567 (SWMU 26) as related to contamination identified by past site investigative activities. See Figure 2 for the location of the SWMUs.

1.3.1 Horizontal Boring

One (1) 200 foot horizontal boring will be advanced beneath the building floor so that five (5) discreet soil samples can be collected using EnCore® samplers. The soil samples will be collected at the following distances within the horizontal borehole: 15 feet (immediately under the building footing and adjacent to the former mudpit locations), 50 feet (approximately half-way between the former mudpits and the former monorail degreaser),

100 feet (northwest of the former monorail degreaser), 150 feet (center of the formerly recessed area that housed the former monorail degreaser), and 200 feet (the end of the boring, immediately southeast of the eastern end of the former monorail degreaser). These specific soil sample locations are shown on Figure 2. The five proposed sampling locations have been selected to address areas of MDNR concern as discussed in the April 7, and June 5, 2006 correspondence. Collection of groundwater samples will not be possible from the horizontal boring, since a water-based drilling fluid (trade name BioBore™, composition 88% water) is used to maintain the integrity of the borehole.

1.3.2 Geoprobe Boring

Two direct push Geoprobe borings (probes) will be advanced in the vicinity of the former Mudpits #1 and #3 (part of SWMU 2). The probes will be advanced at a 30 degree angle to collect soil samples beneath the building. Advancement of the probes will continue to the depth at which bedrock is encountered (assumed to be approximately seven (7) to nine (9) feet below ground surface (bgs)). Four (4) soil samples will be collected using Geoprobe Direct Push technology and EnCore® samplers from two (2) sample locations (two samples at each location) beneath the west wall of the manufacturing building. The samples will be analyzed for volatile organic compounds (VOC) using EPA Method 8260. If groundwater is encountered during the Geoprobe advancement, a groundwater sample from each location will be collected and analyzed for VOC by EPA Method 8260.

2.0 Scope of Work

This section provides the tasks to be performed and the field procedures that will be followed during the completion of the single horizontal boring to be advanced beneath the manufacturing building.

2.1 Pre-investigation Activities

A foundation construction plan of the manufacturing building will be provided to the horizontal drilling subcontractor. With the assistance of Modine facility personnel, the exact boring path and depth will be planned in order to avoid any potential subsurface building structures (utilities, etc.).

A site visit is scheduled for September 14, 2006 to confirm that horizontal drilling is achievable at the site and to determine if the advancement of a probe is possible in the area of Mudpit #1 (space constraints may not allow access for the Geoprobe equipment in this area).

Before conducting drilling activities, Modine facility personnel will assist Missouri One-call in locating utilities in the boring vicinity and refer to facility drawings to identify any potential subsurface building structures. Drilling activities will not begin until utilities have been clearly marked. Once the utilities are cleared, the boring path and sampling locations will be finalized and MDNR will be contacted for approval of the final sampling locations. Once approved by MDNR, the boring path and sampling locations will be surveyed and marked using a subcontracted surveyor.

2.2 Boring Activities

2.2.1 Horizontal Boring

The horizontal boring will be advanced with a CME 500 DD horizontal directional drilling rig with a three man crew. The horizontal drilling rig is a rotary type drilling rig operated using Bio Bore™, which is a biodegradable drilling rig fluid. Bio Bore™ is a free flowing, nontoxic white powder that is mixed with fresh water to provide a clay free, biodegradable drilling fluid. During operation, the Bio Bore™ will circulate through the drill rig, entraining and removing soil cuttings from the boring with the solution being accumulated in a separate collection tank. The Bio Bore™ will be vacuumed out of the collection tank and will be properly disposed of when drilling activities are complete.

The CME 500 DD horizontal directional drilling rig will be stationed approximately 30 feet west of the manufacturing building. The horizontal boring will begin at grade level and will initially be advanced in a downward diagonal direction. The slope of the diagonal will be approximately 1 ½ feet of drop per 10 foot of horizontal distance, resulting in a depth of

approximately 4.5 feet below grade at the west wall of the manufacturing building. The boring will be advanced in a further downward diagonal direction until the determined depth for the boring path is reached (approximately 6 feet below grade). Once the determined depth is reached, the boring will be advance horizontally along the planned surveyed path underneath the manufacturing building.

2.2.2 Geoprobe Boring

A Geoprobe using Direct Push technology will be used to collect samples in the vicinity of the former Mudpits #1 and #3. Direct Push technology refers to tools and sensors that are "pushed" into the ground without the use of drilling to remove soil or to make a path for the tool. The probes will be advanced at a 30 degree angle to collect soil and groundwater (if present) samples from beneath the building. Probes will be advanced to the depth at which bedrock is encountered.

2.3 Subsurface Sampling

The seven proposed sampling locations have been selected to address areas of MDNR concern as discussed in the April 7, 2006 and June 5, 2006 correspondences. Field documentation of the site investigation activities will be recorded in a logbook. Photographs will also be taken during the site investigation for documentation purposes.

2.3.1 Horizontal Boring

The horizontal boring will be advanced along the surveyed path and depth until the first sampling location is reached. Coordinates for each sampling location will be identified via the initial survey and the horizontal drilling bit will be tracked to match these coordinates through the use of sensors. The drilling bit is equipped with a transmitter and an employee of the drilling contractor will be stationed in the manufacturing building with a receiver that will allow for tracking the progress of the drill bit. Once it is determined that a proposed sampling location is reached, the drilling equipment will be removed from the horizontal borehole. A split spoon sampling device with an acetate liner will be inserted into the borehole. The split spoon sampler will not open to collect a sample until there is detectable resistance (soil to be sampled), therefore the desired sample will be free from drilling fluid and/or water to the greatest extent possible. The split spoon sampling device will be extracted from the borehole, the acetate liner will be opened to reveal the sample which will then be collected using an EnCore® sampler and analyzed for VOC using EPA Method 8260. The drilling equipment will then be reinstalled into the borehole to continue the advancement of the horizontal boring. The sampling procedure will be repeated until all five proposed samples are collected.

Upon completion, the 6-inch diameter borehole will be grouted with high solids bentonite grout or with concrete as specified by Modine facility personnel. After the borehole has been grouted, soil will be placed in the upper two feet of the borehole and compacted to bring the surface back to grade. The surface will be repaired with materials similar to those covering the surrounding area.

2.3.2 Geoprobe Boring

Two probe locations in the vicinity of the former Mudpits #1 and #3 will be sampled for soil and groundwater (if any is present). The samples will be analyzed for VOC using EPA Method 8260. Two soil samples and one water sample (if encountered) will be collected for submittal to an off-site analytical laboratory from each probe location. Soil will be continuously sampled as the probe is advanced. Soil samples will be selected for laboratory submittal based on photoionizaion detector (PID) readings. The two soil samples from depths exhibiting the highest PID readings will be selected for submittal to the laboratory. If elevated PID readings are not observed, then a sample will be collected midway (approximately four (4) feet bgs) and directly above bedrock (approximately seven (7) to nine (9) feet bgs).

The soil sampling procedure is the same as the horizontal drilling procedure described above. Groundwater samples will be collected in glass vials.

2.4 Investigation Derived Waste

Soil cuttings will be entrained using the Bio Bore™ solution and will be removed from the horizontal boring via circulation of the Bio Bore™. The soil-laden Bio Bore™ will be collected in a separate collection tank, vacuumed out of the collection tank and containerized for proper future disposal based on a waste characterization analysis. CH2M HILL will collect a single sample from the containerized material for a waste characterization analysis by a contract laboratory. The drilling fluid and entrained investigation derived waste (IDW) generated from the advancement of the directional boring will be collected, solidified and taken to a Subtitle D landfill for disposal. There will be no cuttings to be disposed of using the Geoprobe.

2.5 Site Restoration

The site will be returned to its original condition after completion of the horizontal boring and soil sampling activities. Following the completion of work at the site, all drums, trash, and other waste, excluding the soil stockpile, will be removed to the designated staging area for disposal.

2.6 Site Investigation Summary Report

Following completion of site investigation activities and receipt of final analytical reports from the laboratory, CH2M HILL will prepare a report that summarizes the excavation activities and results. The report will consist of a discussion of the horizontal drilling activities, Geoprobe activities, laboratory analytical results from the characterization sampling, and conclusions. Field documentation, photographs, and laboratory reports will be included as attachments or appendices.

3.0 Sample Handling and Laboratory Analysis

This section is designed to provide direction with regard to sample handling and laboratory analysis during the Site Investigation at Modine.

3.1 Sampling Equipment Decontamination Procedures

All equipment that may directly or indirectly contact samples will be decontaminated in a designated decontamination area. Accumulated decontamination water will be disposed via the on-site Modine wastewater treatment system.

For hand-held sampling devices, the following procedures will be used to decontaminate the equipment. The equipment will be scrubbed with a solution of potable water and Alconox, or equivalent laboratory-grade detergent. The equipment will then be rinsed with copious quantities of potable water followed by an ASTM Type II Reagent Water.

For the split spoon sampling, the following procedures will be used for decontamination between samples. The external surfaces of the sampling equipment will be washed with high-pressure hot water wash and if necessary, scrubbed until all visible dirt, grease, oil, etc., have been removed. The sampling equipment will be rinsed with potable water.

3.2 Sample Management Procedures

During the Site Investigation, a consistent sample identification system will be employed to ensure uniqueness and clarity in sample names. The samples collected along the extent of the horizontal boring will be designated as follows - the sample from point that is 100 feet of the total 200 foot boring extent will be labeled MO-HB-100′ (MO-Modine, HB-horizontal boring, 100-100 feet of 200 foot total). Samples collected using a Geoprobe will be labeled MO-MP1 or MP3- and the depth of the sample. For example, a sample collected at Mudpit #3 at a depth of five feet would be labeled MO-MP3-5.

Procedures to ensure the custody and integrity of the samples begin at the time of sampling and continue through transport, sample receipt, preparation, analysis and storage, data generation and reporting, and sample disposal. Records concerning the custody and condition of the samples are maintained in field and laboratory records. Chain-of-custody records will be maintained for all field and field QC samples. All sample containers will be sealed in a manner that will prevent or detect tampering if it occurs.

3.3 Laboratory Analysis

Soil and water samples will be submitted to a contract laboratory for VOC analyses (Method 8260). Severn Trent Laboratories has been tentatively selected as the analytical laboratory. Samples will be shipped to the analytical laboratory on a daily basis as collected.

3.4 Quality Control Samples

Quality Control (QC) samples will be collected during the sampling portion of the Site Investigation to evaluate precision and bias during field activities and subsequent laboratory analysis. QC samples will consist of one field duplicate and trip blanks.

3.4.1 Field Duplicates

A field duplicate sample is a second sample collected at the same location as the original sample. Duplicate samples are collected simultaneously or in immediate succession, using identical recovery techniques, and treated in an identical manner during storage, transportation, and analysis. A field duplicate will be collected at a frequency of approximately 25 percent of the total number of samples. We anticipate collection of five soil samples horizontal boring and collection of four soil samples from the Geoprobe borings in the vicinity of former Mudpits #1 and #3. Therefore, two duplicate soil samples will be collected. One duplicate sample will be collected during the advancement of the horizontal boring and one duplicate sample will be collected during the advancement of the Geoprobe borings.

3.4.2 Trips Blanks

The trip blank consists of a VOC sample vial filled in the laboratory with ASTM Type II reagent grade water, transported to the sampling site, handled like an environmental sample and returned to the laboratory for analysis. Trip blanks are not opened in the field. Trip blanks are prepared only when VOC samples are taken and are analyzed only for VOC analytes. Trip blanks are used to assess the potential introduction of contaminants from sample containers or during the transportation and storage procedures. One trip blank will accompany each cooler of samples sent to the laboratory for analysis of VOCs. Therefore, we expect that three trip blanks will be required, one for each day of sample collection.

3.5 Quality Assurance Project Plan (QAPP)

To provide continuity with data collected during the previous activities at the site, the QAPP from Dames and Moore's *RCRA Facility Investigation Work Plan, Modine Manufacturing Company, Camdenton, Missouri* (Dames and Moore, 1999) will be used for this investigation.

4.0 Project Schedule

The Project Schedule, summarized below, assumes that field activities will not be interrupted by inclement weather or other unforeseeable delays.

Notification shall be made to MDNR 15 days prior to conducting fieldwork to allow MDNR department personnel to observe sampling activities described in this Work Plan.

Mobilization to the field will occur within two weeks of receipt of approval of this Work Plan from the MDNR.

Field activities are anticipated to be completed in five working days.

Analytical results are anticipated to be available in 4 weeks.

Site Investigation Summary Report will be submitted to the MDNR within four weeks of receipt of the analytical data from the laboratory.

Assuming there are no delays, the total time required from commencement of the work through submittal of the Site Investigation Summary Report will be approximately 10 weeks.

5.0 Project Organization

This site investigation project will be coordinated by Modine. The Modine individuals directly involved with the management of the project will be Mr. Thomas Sanicola, an environmental engineer with Modine's corporate office in Racine, Wisconsin and Mr. Bob King, the Quality/ Environmental Manager with the Modine facility in Camdenton, Missouri. Modine has selected CH2M HILL as the consultant for the project.

5.1 CH2M HILL Team

CH2M HILL roles and responsibilities have been identified for the implementation of this Work Plan at Modine Manufacturing Facility and are presented below:

The Project Manager will be Mr. Dan Price. Mr. Price has been involved with the activities at the site since 1995. He has approximately 18 years experience in the environmental industry and is a Registered Geologist in the State of Missouri.

The Field Engineer/Scientist will be a qualified individual experienced in conducting environmental drilling oversight. This individual will be responsible for directing the drilling subcontractor, collection of soil from four sampling locations, and communication with the on-site Modine representative and the Project Manager.

5.2 Subcontractor

Modine and CH2M HILL have selected the following subcontractor to assist in completing this project.

MATECO Drilling Company of Rockford, Michigan has been selected as the horizontal drilling contractor. MATECO personnel assigned to the project will have the appropriate health & safety training (HAZWOPER). MATECO will be responsible for the advancement of the horizontal boring, sample extraction, and site restoration.

Severn Trent Laboratories located in Earth City, Missouri has tentatively been selected as the contract analytical testing laboratory. Samples will be delivered to 13715 Rider Trail North, Earth City, Missouri 63045 under chain-of-custody for analysis.

Heritage Environmental Services of Saint Louis, Missouri has been selected to dispose of the drilling fluid and IDW.

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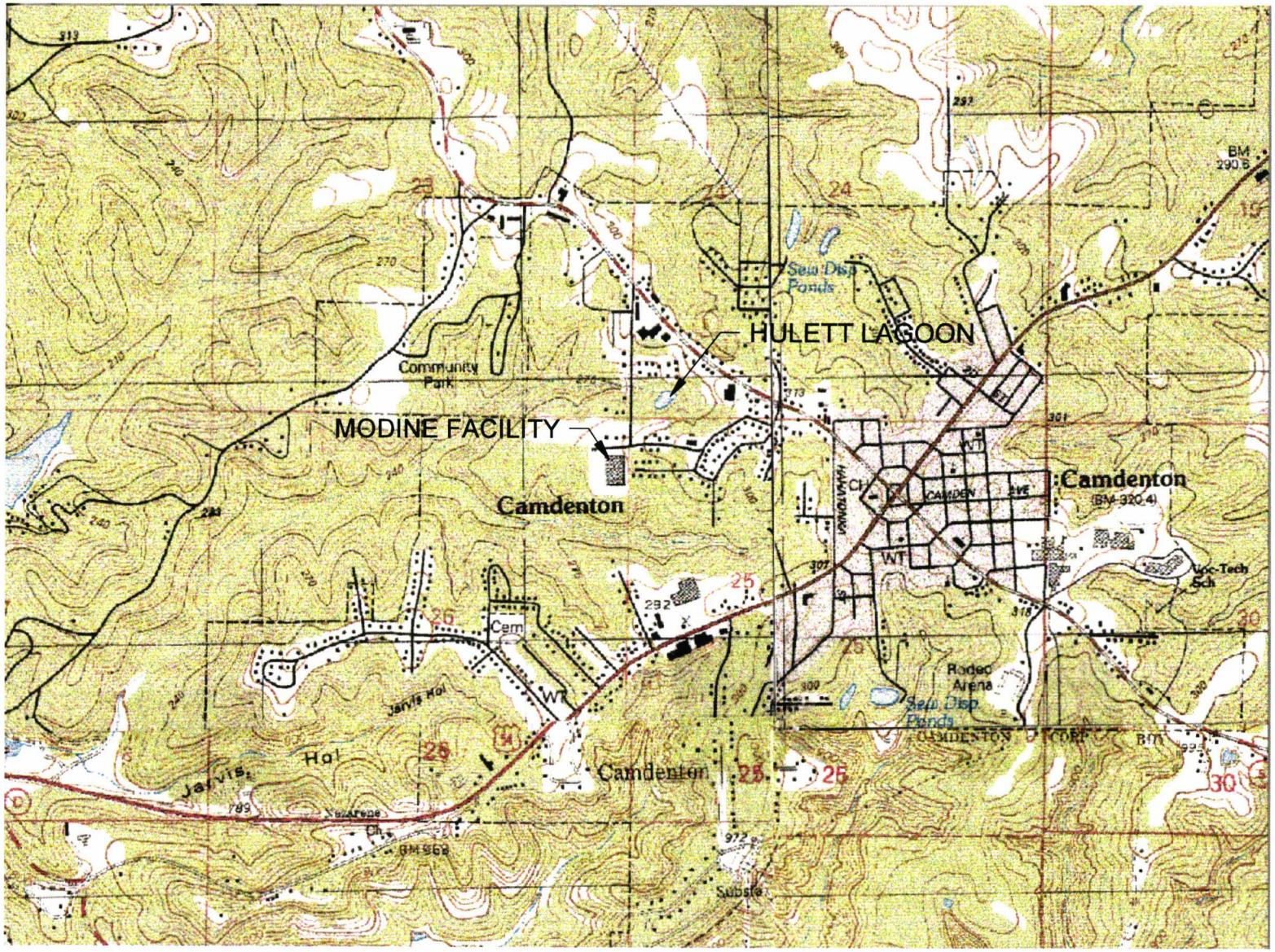

NOT TO SCALE

FIGURE 1
SITE LOCATION MAP
MODINE MANUFACTURING COMPANY
CAMDENTON, MISSOURI

CH2MHILL

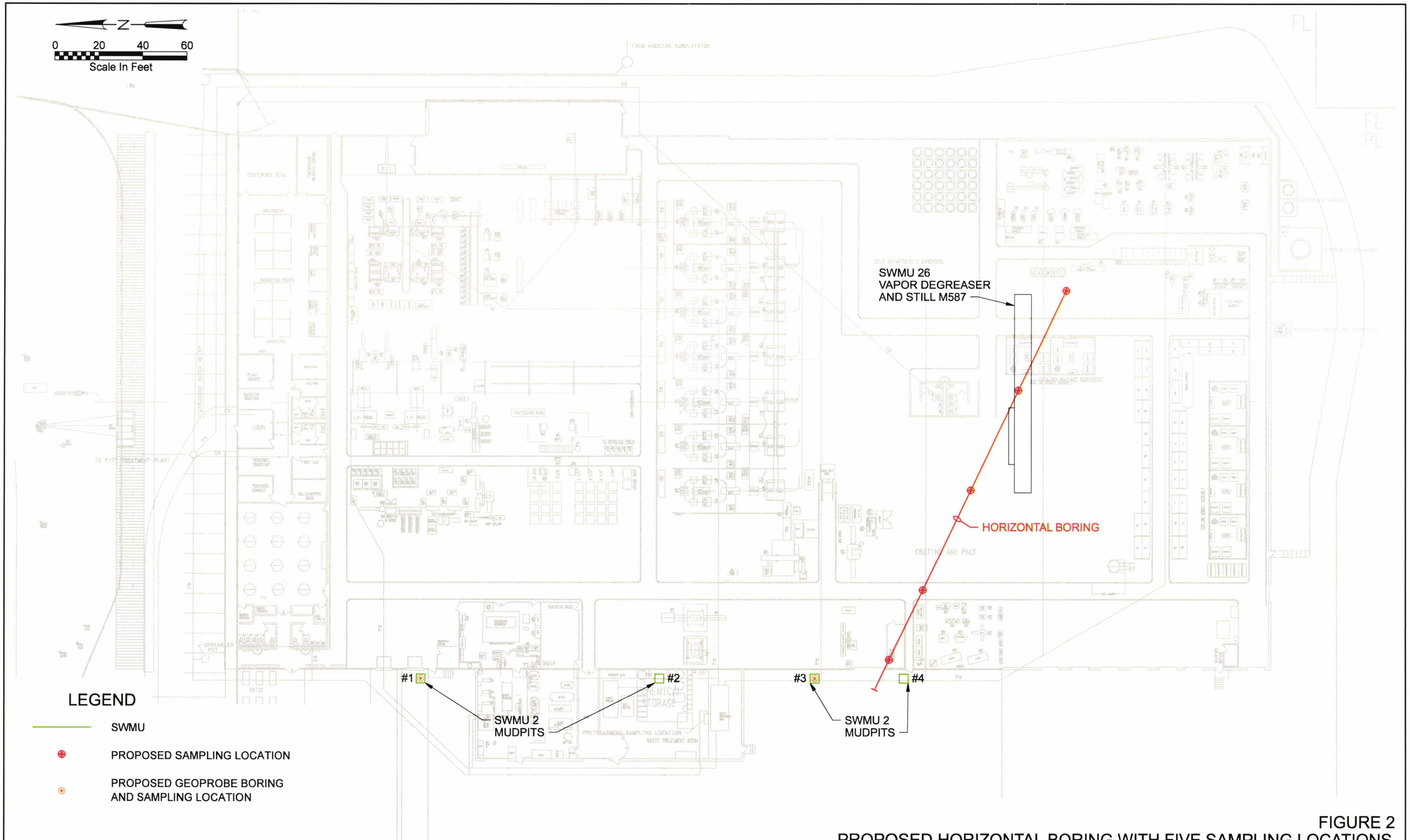

FIGURE 2
PROPOSED HORIZONTAL BORING WITH FIVE SAMPLING LOCATIONS
AND TWO GEOPROBE SMAPLING LOCATIONS
MODINE MANUFACTURING COMPANY
CAMDENTON, MISSOURI
CH2MHILL

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