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December 20, 2007

Ashley Holt, P.G., Manager
State Remediation Program
Division of Solid Waste Management
Tennessee Department of Environment and Conservation
5th Floor, L&C Tower
401 Church Street
Nashville, Tennessee 37243-1535

Re: Investigative Workplan
Egyptian Lacquer Manufacturing Company
Franklin, Tennessee
TriAD Project No. 07-ELM01-01

Dear Ms. Holt:

On November 20, 2007, the Tennessee Department of Environment and Conservation (TDEC) issued a Notice of Deficiency (NOD) to the Egyptian Lacquer Manufacturing Company (ELMCO) identifying deficiencies in the *Groundwater Corrective Action Plan* (CAP), dated August 28, 2007, that had been prepared and submitted on behalf of ELMCO by TriAD Environmental Consultants, Inc (TriAD). The NOD requires ELMCO to submit to TDEC within 30 days an Investigative Workplan describing additional environmental investigations to be performed at and around ELMCO's facility located at 113 Fort Granger Drive in Franklin, Tennessee. The additional investigations are to address the following identified deficiencies in the CAP:

1) the extent of the groundwater contaminant plume (which exists in the limestone bedrock) needs further delineation;
2) soil confirmation sampling and analysis in the BIOX-treated area near the tank farm is needed to ascertain the effectiveness of the soil treatment in remediating the contaminated soil source area;
3) collection and analysis of soil samples from under the concrete pad of the tank farm is needed to determine if additional untreated soil contamination is present;
4) additional site characterization is needed to demonstrate that natural attenuation processes are occurring; and
5) additional air monitoring is needed to further address potential chronic exposure to local residents and students.

On behalf of ELMCO, EnSafe Inc. has recently prepared and submitted a separate document dated December 14, 2007, that describes the additional air monitoring proposed to address deficiency #5 identified above.

This document has been prepared by TriAD, also on behalf of ELMCO and through its attorneys Stites & Harbison, PLLC, to be the Investigative Workplan that addresses the first four deficiencies listed above. It describes the field investigations (including collection of samples of soil, groundwater and surface water), the laboratory analyses, and the data evaluation that will be performed, and provides the planned schedule by which these efforts will be implemented. ELMCO understands that the NOD establishes strict time frames for implementation and completion of the work.

Further Delineation of Groundwater Contamination

As discussed with TDEC personnel in meetings on December 4 and 7, 2007, ELMCO proposes to install and monitor two additional groundwater monitoring wells in the vicinity of the site to allow further delineation of the groundwater contaminant plume. These wells will be installed, if access agreements and physical access for a drilling rig can be obtained, at the following locations:

1) on the west side of Liberty Creek, near the parking lot of BGA Lower School, and
2) on the northwest side of, and in the public right-of-way of, Daniels Drive, in front of the home at 111 Daniels Drive.

These approximate locations are shown on the attached Vicinity Map. The purpose of installing wells at these locations is to determine whether Liberty Creek is acting as an effective hydraulic barrier to westward plume migration (the BGA well), and to allow further refinement of the northern extent of contaminant migration (Daniels Drive well). To this end, the BGA well will be screened across the uppermost water-bearing zone, provided (as strongly expected) that the potentiometric level of this zone indicates a relationship with water entering Liberty Creek (roughly 611 feet above mean sea level). The Daniels Drive well will be screened across the first water-bearing zone encountered at or below approximately elevation 620 feet above mean sea level (the average water-level elevation in wells MW-2 and MW-3 at the site).

The wells will be installed by a Tennessee-licensed professional well driller under the supervision of an experienced TriAD professional geologist. The geologist will maintain a field log describing the activities performed, the subsurface conditions encountered, field measurements, and other pertinent field information.

Each well will be installed in a borehole drilled using the air-rotary method, with potable water added as needed to either stabilize the borehole or to minimize

dust generation. Each borehole will be sampled continuously in the soil overburden using split-spoon or equivalent sampling techniques, and the retrieved soil cores will be screened for the presence of organic vapors using a calibrated organic vapor meter (OVM). This organic vapor screening will be performed by passing the probe tip of the OVM slowly along the length of the soil core immediately upon opening the split spoon sampler. The depths represented by the soil cores and OVM readings will be recorded in the field logbook. If this OVM screening detects organic vapors at greater than atmospheric background conditions, then a soil sample will be promptly collected from that point of the soil core exhibiting the highest organic vapor concentration. The sample will be collected using gloved hands and a decontaminated stainless steel knife or spoon to separate that portion from the soil core and transfer it into a laboratory-supplied, unpreserved, 2-oz. or 4-oz. glass sample container equipped with a Teflon-lined screw-on lid. The sample jar will be completely filled with the soil sample and then tightly closed, labeled, and placed in an ice-chilled cooler for storage. Using this procedure, a boring may yield several or no collected soil samples.

Upon completion of the soil boring, at least that sample collected from the soil core zone exhibiting the highest OVM reading will be submitted, under proper chain of custody procedures, to Environmental Science Corporation of Mount Juliet, Tennessee (ESC) for analysis for volatile organic compounds (VOCs) by US EPA SW846 Method 8260B. If the OVM screening does not detect the presence of organic vapors at greater than atmospheric background concentrations in the retrieved soil cores, then no samples will be collected and submitted for analysis.

During drilling of the boreholes, efforts will be made to contain all the drill cuttings and water. Plastic sheeting will be placed around the borehole to limit contact of the cuttings with the ground surface and, if deemed necessary by the drilling contractor and TriAD personnel, full-containment equipment, including a well-head diverter, will be employed to enable better control of the discharge of cuttings, water, and/or vapor. Cuttings and formation water will be contained in 55-gallon steel drums which will be kept closed except when materials are being added. At the end of each day's drilling effort, these drums will be securely closed and transported to ELMCO's facility for storage until it can be determined how to properly dispose of their contents (which will depend upon the laboratory analytical results of soil and groundwater samples and perhaps additional sampling and analysis).

Boreholes will be a minimum of 6-inch diameter, with larger diameter boreholes as needed to accommodate surface or diverter casings. It is anticipated that the wells will be constructed of 2-inch diameter, schedule 40 PVC. However, if free-product solvent, or strong indication of the presence of free-product solvent is encountered during drilling, then stainless-steel well materials will be used to ensure the continued, long-term, physical integrity of the well casing. Each well

will be completed with a traffic-rated, flush-mount security cover set in a 2-foot-square concrete pad.

The monitoring well screens will be constructed of 0.010-inch, factory-slotted (or, in the case of stainless-steel materials, factory-wrapped) screens surrounded by clean silica sand filter packs extending to at least 2 feet above the top of screen. A minimum 2-foot thick sodium bentonite seal will be placed in the annular space above the filter pack and hydrated, if necessary, using potable water. Above the bentonite seal, the annular space will be filled with a cement-bentonite grout consisting of approximately 95 percent Portland cement and 5 percent sodium bentonite. Well screen lengths are proposed to be 10 feet; however, longer screen lengths may be used if site conditions dictate. Screens longer than 10 feet will not be used without consulting with TDEC personnel.

Following completion of construction, each of the two new wells will be located vertically (to within 0.01-foot accuracy) and horizontally (to within 0.1-foot accuracy) by topographic survey performed by a Tennessee-licensed surveyor. This will enable accurate comparison and interpretation of water level and stratigraphic data.

Each new well will be developed by purging and surging until readings of pH, conductivity and temperature are stable (within ±10%) and the water is visibly clear. Development will take place no sooner than 24 hours after completion of the well. Initial sampling of the new wells will take place no sooner that 24 hours after development, and will involve first purging the well until readings of pH, conductivity, and temperature are again stable. The purge method will be determined based on the well characteristics, including yield and apparent presence of contamination, and will be either by bailing using new, disposable, polyethylene bailers or by pumping using a decontaminated submersible bladder pump equipped with new, disposable discharge tubing and bladder. Micropurge, or minimum-drawdown, purging may be used as needed. All development and purge water will be contained in 55-gallon steel drums which will be managed in the same way as described above for soil cuttings.

Contemporaneously with the purging and sampling of the new wells, all previously existing wells at the ELMCO facility will also be purged as described above and sampled, and the samples will be similarly analyzed, to allow comparison of results across the groundwater contaminant plume. One groundwater sample from each well will be collected by using freshly gloved hands to carefully discharge water from the bottom-loading bailer, or from the bladder pump discharge hose, into laboratory-supplied 40-ml glass vials equipped with screw-on caps (with Teflon septums). The vials will be completely filled, and their caps will be securely applied. The filled vials will then be labeled and placed in an ice-chilled cooler for storage and transport to ESC for VOC analysis by Method 8260B.

Prior to the purging and sampling of each new well, and prior to the purging and sampling of any of the wells at the ELMCO facility, water level measurements will be obtained and recorded using either an electronic interface probe or an electronic water level indicator. These data, in combination with the well elevation data obtained from topographic survey, will allow further evaluation of groundwater flow direction.

Confirmation Soil Sampling in the BIOX Treatment Area and Under the Tank Farm

The soil sampling in the BIOX Treatment Area and under the Tank Farm will be performed in a single mobilization of equipment and personnel. Soil samples will be collected using direct-push technology equipment (i.e., a Geoprobe rig) supervised by an experienced TriAD professional geologist. The geologist will maintain a field log describing the activities performed, the subsurface conditions and soil types encountered, the results of field measurements, and other pertinent field information.

In the BIOX treatment area, three Geoprobe boreholes will be advanced to bedrock. As shown on the attached Site Plan, one boring will be placed near the upgradient (east) end of the treated area, one near the center of the treated area (near the point at which the former underground pipelines leaked), and one near the downgradient (west) end of the treated area. In each case, care will be taken to place the borings between the BIOX injection points, and continuous soil samples will be collected from ground surface to refusal on bedrock. The retrieved soil cores will be logged and screened, with "worst case" and top-of-rock samples collected for potential laboratory analysis, as described above for soil cores collected from the monitoring well boreholes.

At least two samples from each boring will be selected and submitted to ESC for laboratory analysis of VOCs by EPA Method 8260B. One selected sample will be the top-of-rock sample, because the pre-treatment soil investigation showed higher VOC concentrations at the top-of rock. If the top-of-rock sample exhibits the highest OVM reading, or if none of the soil samples in a boring exhibit significant OVM readings, the second selected sample will be either that which exhibits the second-highest OVM reading or a sample representative of the horizon most likely to have been impacted by the release of solvents. From the borehole near the center of the treated area, one of the selected samples will be collected from about 8.5 feet below ground surface, which is the depth of the "Pump Pit" soil sample collected on March 5, 2007, and which exhibited high concentrations of acetone, toluene, naphthalene, and 1,2,4-trimethylbenzene.

In addition to the analysis of the six selected soil samples for VOCs, the three samples exhibiting the highest total VOC concentrations will also be tested to evaluate the potential for VOCs to leach into the underlying groundwater. This will be accomplished by subjecting the samples to EPA's Synthetic Precipitation Leaching Procedure (SPLP – EPA SW-846 Method 1312) and analyzing the

resulting leachate for VOCs by Method 8260B. Because the samples targeted for this SPLP testing will be selected based on the results from the initial VOC analyses, the laboratory will be directed to perform the analyses in a timely manner so that recommended sample holding times are not exceeded.

Investigation of the soil beneath the tank farm concrete pad will also be performed using Geoprobe boreholes. Five locations are proposed, as shown on the attached Site Plan; one near the center of the south edge of the pad, near where the former underground pipes exited the tank farm; and four arranged in a square pattern approximately 20 feet inside the edge of the pad. At each location, continuous soil cores will be collected from ground surface (beneath the tank pad) to refusal on bedrock, and logged and screened for organic vapors, with "worst case" samples collected for potential laboratory analysis, as described above. Up to two samples from each boring will be selected for laboratory analysis of VOCs by Method 8260B; the sample exhibiting the highest OVM reading and the sample from the top of rock. If the top-of-rock sample exhibits the highest OVM reading, or if all samples exhibit equal OVM readings, only the top-of-rock sample will be submitted for analysis.

If OVM screening or other field indicators show evidence of obvious soil contamination in any of the five boreholes, additional boreholes will be added to effectively define the limits of soil contamination under the former tank farm. Drilling and sampling methodology for such additional boreholes will be the same as that used for the initial five.

All Geoprobe boreholes will be abandoned by filling with sodium bentonite chips, and all soil cuttings will be contained in 55-gallon steel drums, which will be managed as described above.

Additional Site Characterization for Natural Attenuation

While the above-described Plan elements will in themselves provide significant additional information regarding site conditions and, potentially, evidence of degradation of solvent constituents, additional site characterization is required by TDEC to demonstrate whether natural attenuation of the groundwater contaminants is occurring, and within what time frame such remediation will be accomplished. These additional data will also be needed to more fully evaluate remedial alternatives, as will be required in the revised CAP. To accomplish these objectives, the following investigations are proposed.

1) "Bioremediation Feasibility Studies" will be performed on groundwater and surface water samples to determine the chemical and biological characteristics of these media as they apply to biological degradation of the solvent constituents.
2) Aquifer hydraulic conductivity will be measured and typical fractured and karst aquifer characteristics will be referenced to allow estimation of approximate contaminant mass and average migration rates.

Microbe Inotech Laboratories (MiL) of St. Louis, Missouri will be retained to perform Bioremediation Feasibility Studies on samples from the site. A fact sheet describing MiL's methodology for these tests is attached. These studies include:

1) total heterotrophic plate counts (growth of indigenous microbial population)
2) endpoint assays (determination of which microbes are degrading the contaminants of concern)
3) gas-chromatograph identification of microbial strains present
4) chemical profile of the groundwater (nitrogen as ammonia, nitrate, nitrite, sulfate, o-phosphate, pH, total organic carbon, and total iron)

ELMCO plans to perform two separate Bioremediation Feasibility Studies, one on groundwater and one on seep and surface water, for aerobic microbial populations. Each study will analyze four samples for the above-listed parameters. Samples will be collected into appropriate unpreserved containers for shipment to MiL in ice-cooled containers under chain-of-custody procedures. For groundwater, samples from MW-1, MW-2, MW-3, and AR-1 will be studied. For seep and surface water, samples from LC-MS, LC-PC, HR-2, and the upstream Liberty Creek (Driskill) Crossing will be studied. In addition to the chemical parameters analyzed by MiL, TriAD will use direct-reading portable field instruments to obtain measurements of dissolved oxygen and oxidation-reduction potential (ORP) at each sampling location.

If the results of the Bioremediation Feasibility Studies for aerobic populations indicate the need, additional studies may be performed for anaerobic microbial populations. Endpoint assays will be performed for both toluene and acetone, the principal constituents of concern. MiL will also provide, if possible given site-specific data, degradation rates for the contaminants of concern.

To allow estimates of average migration rates, the aquifer hydraulic conductivity will be measured by performing slug tests in wells MW-1, MW-2, MW-3, and RW-1. If well development data indicate significantly different aquifer characteristics in the proposed new Daniels Drive or BGA wells, or if significant variation is noted between wells MW-1, MW-2, and MW-3, additional slug tests may be performed at the BGA and/or Daniels Drive wells. Slug test data will be collected using pressure transducers and will be analyzed using computer software designed for that purpose. The measured hydraulic conductivity data will be used in conjunction with hydraulic gradients measured in both the fractured bedrock between the source area and Liberty Creek and within the Hermitage Formation to obtain estimates of average groundwater flow velocities for both the free-product and dissolved-phase portions of the contaminant plume.

Estimated ranges of approximate contaminant mass will be developed based on the refined delineation of the extent of contamination; contaminant concentrations measured in monitoring wells, seeps, and surface water; the measured average hydraulic conductivity; and published references for porosity of fractured and/or karst aquifers. The resulting contaminant mass estimates will be used to evaluate remediation times and alternate remediation technologies as required by TDEC in the revised CAP.

Schedule

As noted in the introduction to this Plan, ELMCO and TriAD understand that, unless an extension is granted for good cause shown, implementation of this Plan must be initiated within 7 working days of Plan approval by TDEC, and must be completed – including submission of the Site Investigation Report to TDEC – within 45 days of plan approval by TDEC.

Discussions with officials from BGA have been initiated to obtain an access agreement for the purpose of installing and sampling the monitoring well proposed for their property. TDEC will be apprised of any difficulties in obtaining such permission, and TriAD will work with TDEC to identify an alternate location if necessary. Permission is also being sought from the City of Franklin for the purpose of installing and sampling the monitoring well proposed for Daniels Drive. Again, should permission not be granted or should other access issues prevent drilling at this location, TriAD will work with TDEC to identify a suitable alternate location.

It must be noted that an alternate schedule for implementing the efforts described above in the section titled "Confirmation Soil Sampling in the BIOX Treatment Area and Under the Tank Farm" has already been approved by TDEC. In an exchange of emails between TriAD's Dwight Hinch and TDEC's Ashley Holt on December 17 and 18, 2007, ELMCO requested and TDEC approved deferral of these soil investigations until May 2008 to provide ELMCO with sufficient time to use up most, if not all, of the remaining solvent inventory in the tank farm and then to decontaminate and remove the tanks and remaining aboveground piping. ELMCO's request was based on the fact that the proposed soil investigations are not particularly time critical components of the overall efforts at the site, and that the soil investigations would be complicated by the presence of the tanks, piping, and flammable solvents. ELMCO's request and TDEC's approval require the soil investigations to be completed and the report submitted to TDEC by May 30, 2008.

Please contact attorney William L. Penny with Stites and Harbison, PLLC, or Dwight Hinch of TriAD should you need additional information. Formal responses to this submittal should be directed to Mr. Penny.

TriAD Environmental Consultants, Inc.

Chris Scott, P.G.
Senior Hydrogeologist

T. Dwight Hinch
Senior Project Manager

Attachments: Vicinity Map
Site Plan
MiL Bioremediation Feasibility Study fact sheet

cc: Mr. Kerry Mattox, ELMCO
Mr. William L. Penny, Stites and Harbison

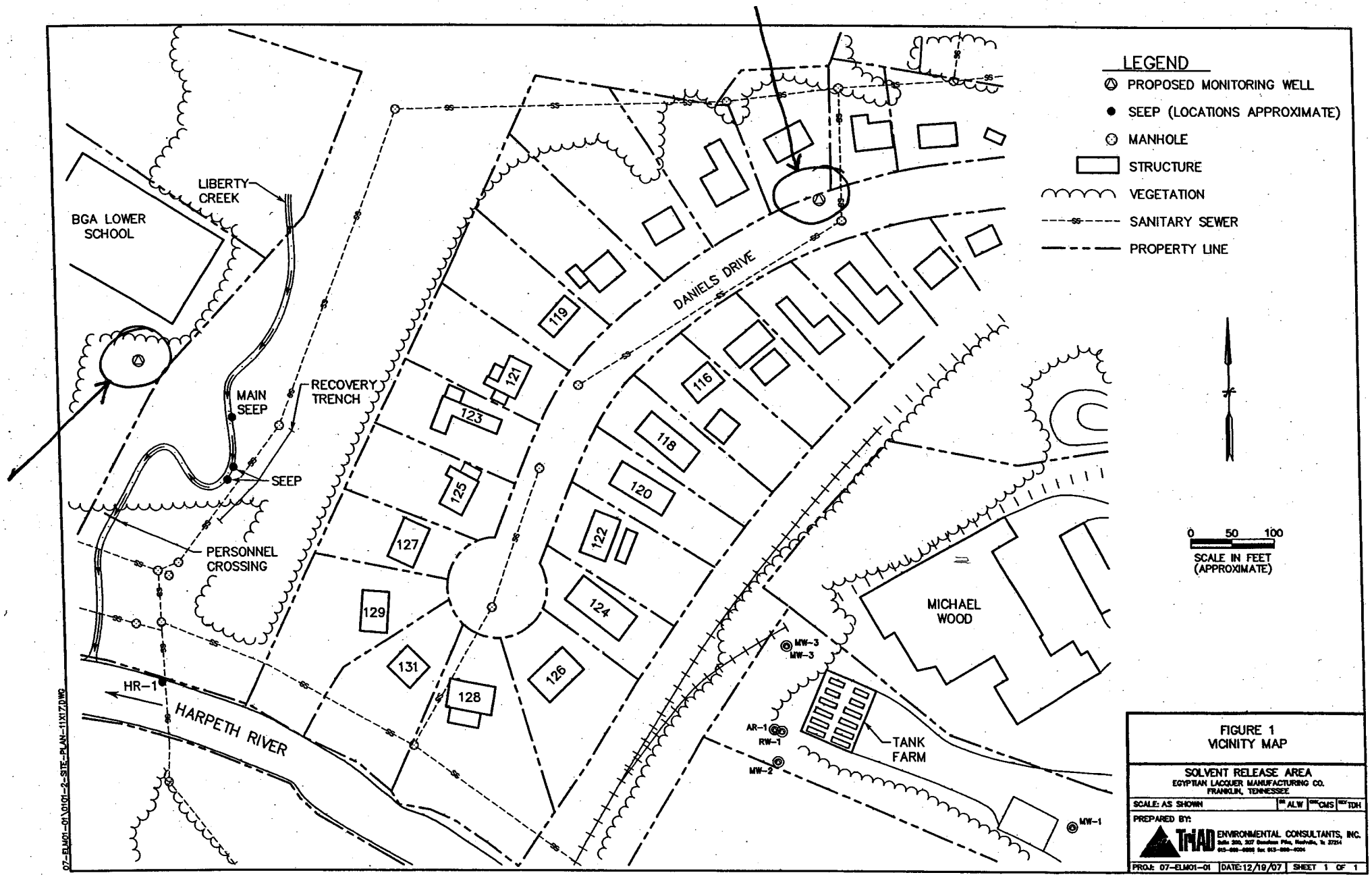

FIGURE 1
VICINITY MAP

SOLVENT RELEASE AREA
EGYPTIAN LACQUER MANUFACTURING CO.
FRANKLIN, TENNESSEE

SCALE: AS SHOWN	BY: ALW	CHK: CMS	REV: TDH

PREPARED BY:
TRIAD ENVIRONMENTAL CONSULTANTS, INC.

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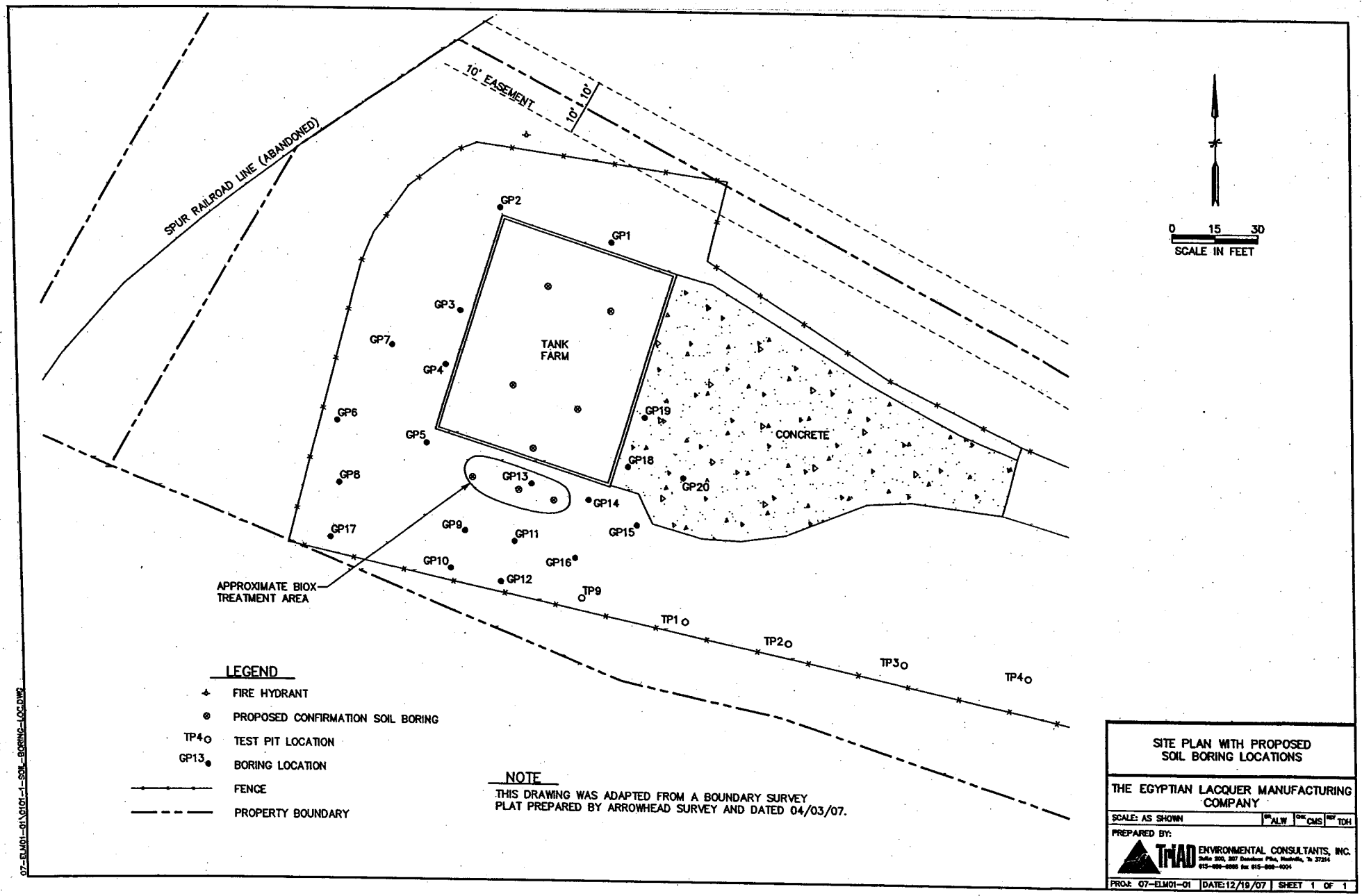

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SITE PLAN WITH PROPOSED SOIL BORING LOCATIONS

THE EGYPTIAN LACQUER MANUFACTURING COMPANY

SCALE: AS SHOWN | BY: ALW | CHK: CMS | REV: TDH

PREPARED BY:

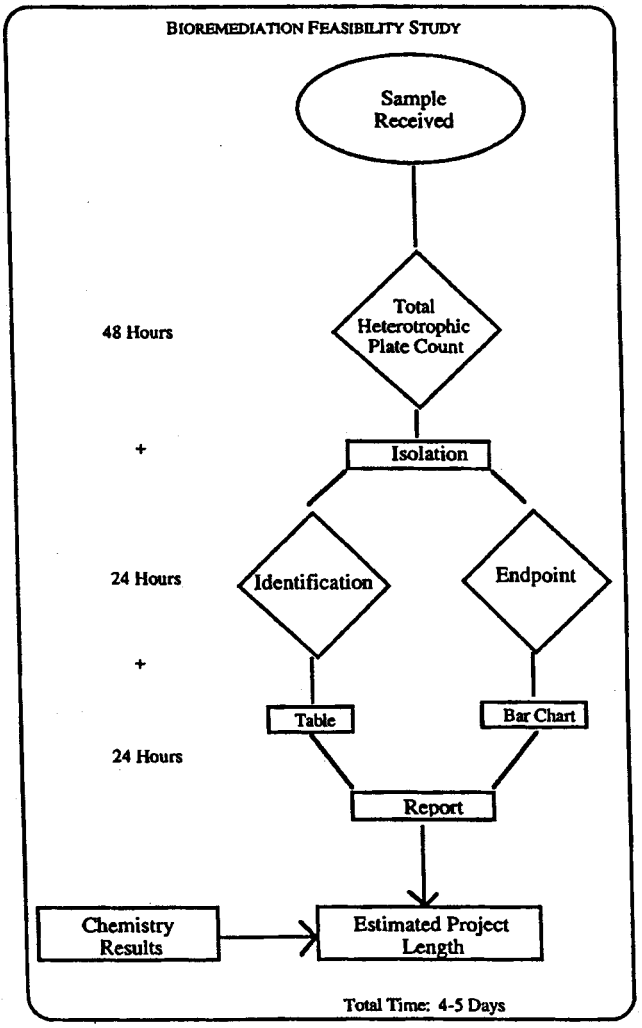
TRIAD ENVIRONMENTAL CONSULTANTS, INC.

PROJ: 07-ELM01-01 | DATE: 12/19/07 | SHEET 1 OF 1

BIOREMEDIATION FEASIBILITY STUDY

One of the most frequently requested set of tests is the Bioremediation Feasibility Study. It is a straight forward series of analyses that provide an objective evaluation of a site for bioremediation. The flow-chart shows the progression of tests as they are performed.

The **Sample** can be soil, water, or sludge. When the sample is received at the laboratory, it is immediately prepared for the **Total Heterotrophic Plate Count**. Over the next 48 hours the Petri plates containing dilutions of the samples are incubated for optimum bacteria growth. The populations are counted twice, once at 24 hours and again at 48 hours. At the end of 48 hours, each bacterium has grown into a colony. Each colony is distinguishable by size, color and texture. It is at this time we determine, by colony morphology, the number of different types of bacteria in the soil or water. The next step is **Isolation.** Each type of bacterial colony is picked, using a setrile loop, and then streaked onto a new Petri plate. These plates are then incubated for 24 hours in order to produce sufficient quantities of the strain. The isolated strains of bacteria are then harvested for processing in the **Endpoint Assay** and for identification by GC-FAME and Biolog™.



The **Endpoint Assay** tests the individual bacterial strains for their ability to use a specific substrate/contaminant as its only carbon source. This custom designed test uses a negative control of water and a positive control of a nutrient broth. The growth success of the bacteria is illustrated in a bar chart report. The **Identification** of the bacterial strains takes place while the Endpoint assay is running. Two methods are employed as a cross-check for precision and to provide an exact profile of the strain. The GC-FAME method provides a profile of the fatty acid composition of the bacteria and the Biolog™ method provides a characterization of the bacteria by the carbon sources the strain can consume. Next, the raw data is compiled and a summary **Table** of the bacterial identifications and a **Bar Charts** of the **Endpoint Assay** raw data are created. These two items are incorporated in the full **Report** at the conclusion of all tests.

The **Bioremediation Feasibility Study** is complete at this point. If either the client or the MiL provides nutrient **Chemistry Results**, we will integrate the results within the **Bioremediation Feasibility Study** in order to provide an **Estimated Project Length** report. This report estimates the time it would take your site to reach specified clean-up goals under ideal conditions.