INVESTIGATION WORK PLAN
VCA SITE #V00658-8
FORMER CHURCHVILLE FORD, INC.
111 SOUTH MAIN STREET
CHURCHVILLE, NEW YORK 14428

Prepared for:

Mr. Antonio Gabrielle and Mr. Joseph Ognibene (Volunteers)
New York State Department of Environmental Conservation

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Project No. 7022526

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1.0 INTRODUCTION AND PURPOSE

ENTRIX, Inc. (ENTRIX) has prepared this Investigation Work Plan (Work Plan) on behalf of Mr. Antonio Gabrielle and Mr. Joseph Ognibene (Volunteers) for review and approval by the New York State Department of Environmental Conservation (NYSDEC) prior to its implementation. This Work Plan was generated pursuant to a Voluntary Cleanup Agreement (Index # BB-0540-03-09) between the NYSDEC and the Volunteers, effective October 9, 2003. The Work Plan provides protocols and technical objectives to complete the subsurface investigation at the Former Churchville Ford, Inc. Site (Site # V00658-8) located at 111 South Main Street, Churchville, New York 14428 (Site). The Work Plan contains a comprehensive scope of work which will address all of the investigation requirements of the NYSDEC's Voluntary Cleanup Program (VCP), including:

- Defining the nature and extent of contamination, both horizontally and vertically, both on-Site and, as appropriate, off-Site;
- Identifying source areas for constituents of concern (COCs);
- Producing data of sufficient quantity and quality to support the development of an acceptable qualitative exposure assessment and/or Remedial Action Work Plan, as necessary.

1.1 PROJECT ORGANIZATION AND CONTACT INFORMATION

ENTRIX staff will conduct the management of the Site on behalf of the volunteers, pursuant to the VCP, as follows:

1.1.1 Stephen Tobin, Project Manager

Mr. Tobin will be responsible for the overall coordination and organization of ENTRIX' management of the Site. Mr. Tobin will act as primary Site contact between ENTRIX personnel, Site personnel and the Volunteers, and will coordinate and execute all fieldwork and reporting schedules. Coordinating with Site technical personnel, Mr. Tobin will be responsible for the field implementation of all work plans generated for the Site, and will act as primary contact for field personnel and environmental contractors. Mr. Tobin will further be responsible for the implementation of health and safety protocols during any fieldwork conducted at the Site. Mr. Tobin can be reached at 781-530-3790 or on his mobile phone (508-353-5202).

1.1.2 Tim Douthit, PG, Senior Technical Oversight

Mr. Douthit will be responsible for the overall technical organization of the Site and the generation and/or review of all work plans and summary reports produced for this Site. Mr. Douthit will also be responsible for the review and reduction of field data for use in qualitative exposure assessments and/or the conceptual design of any remedial strategies selected for the Site, if necessary. Mr. Douthit will act as primary Site contact for NYSDEC personnel. He can be reached at 734-302-0081.

1.1.3 Philip Steffan, Project Quality Assurance Officer

Mr. Steffan, as Quality Assurance Officer (QAO) will interface directly with the selected project analytical laboratory services provider to ensure that all field analytical data collected pursuant to the

management of the Site follows the QA/QC guidelines of the VCP. All analytical data collected at the Site will be validated by the QAO prior to use in exposure assessments and/or remedial strategy design. The Mr. Steffan can be reached at 302-395-1919.

Resumes for the above-listed personnel are included as Appendix B.

2.0 SITE DESCRIPTION AND HISTORY

2.1 SITE DESCRIPTION

The Site is defined as one parcel of land (Gabriele Parcel), totaling approximately 10.28 acres, located on the northwestern corner of the intersection of South Main Street and Sanford Road North, in the Village of Churchville, Monroe County, New York. Information regarding the Site is summarized below[i]: A Site vicinity map is presented as Figure 1 and a Site map as Figure 2.

Parcel	Tax ID Number	Size	Zoning	Current Use
Gabriele Parcel	143.17-1-001.121	10.28 acres ±	Highway Services (H)	Former automobile dealership

The Gabriele Parcel is improved with an approximate 22,000 square foot building (main building), and a small, wood-frame storage building. Both buildings are currently vacant. The building and Site in general, has only been operated as an automobile dealership, which included new and used car sales and automotive service from 1987 to 2002. The first building contained the automobile maintenance facilities and business offices and the second building was used by the dealership as a new parts storage facility. The main building was originally under construction from 1986 to 1987 and includes two building additions constructed between 1989 and 1995, which expanded the footprint of the building. The current owners (Volunteers) have owned the property during the entire period of the car sales and service operation. Prior to that, the property was used for agricultural purposes.

Surrounding properties include The Gatherings Catering facility to the north, South Main Street and the Black Watch residential subdivision to the east, Sanford Road North and Interstate 490 to the south and an industrial building known as 456 Sanford Road North is located to the west.

The U.S. Department of Agriculture, Soil Conservation Service classifies the soils in the vicinity of the Subject Property as one of two types, the Hilton loam and/or the Ontario Loam.

The Hilton series is made up of deep, moderately well drained, medium-textured and moderately coarse textured soils that formed in calcareous glacial till. These soils are generally associated with ground moraines and drumlin landscapes.

A representative profile of the Hilton loam includes the following:

- 0 to 10 inches: brown to dark-brown loam, smooth boundary;
- 10 to 17 inches: dark grayish-brown fine sandy loam; stained with light yellowish brown along root channels, clear wavy boundary;
- 17 to 30 inches: reddish-brown loam few, fine, faint, reddish-yellow mottles, clear wavy boundary;
- 30 to 41 inches: reddish-brown gravelly loam, clear wavy boundary; and
- 41 to 50 inches: brown gravelly loam till, massive and platy structure, very firm calcareous.

The Ontario series soils are made up of deep, well drained, medium textured and moderately coarse textured soils, formed in calcareous glacial till dominated by red sandstone and limestone with minor quantities of shale. These soils are generally associated with till plains, glacial moraines, or on drumlins.

A representative profile of the Ontario loam includes the following:

- 0 to 8 inches: dark-brown fine sandy loam, smooth boundary;
- 8 to 25 inches: reddish-brown very fine sandy loam, clear irregular boundary;
- 25 to 39 inches: dark reddish-brown gravelly loam, abrupt wavy boundary; and
- 39 to 50 inches: reddish-brown gravelly loam, platy structure, calcareous.

Available geologic information indicates that bedrock in the Site area is part of an Upper Silurian age, stratified sequence. Available hydrogeologic information indicates that wells are generally "deep" in the Site area. The depth to groundwater at the surface is point specific and the typical depth to groundwater in the Site area is approximately ten to 20 feet. It is expected that additional site-specific geological information will be collected during the course of this investigation.

2.2 SITE ENVIRONMENTAL HISTORY

The Site has operated aboveground storage tanks (AST) containing gasoline, virgin oil and used oil. No underground storage tanks (UST) were ever installed at this Site. Several 55-gallon drums and smaller containers have been used at the Site to store a variety of products, which included virgin and used antifreeze, parts washing solvents, and automobile cleaners and waxes for the car wash.

According to a preliminary environmental site assessments completed by ENTRIX[1] in November 1997 and in August 2001, the following potential environmental issues existed at the Site:

- No secondary containment was provided for an aboveground virgin oil tank in the service area, nor for an aboveground used-oil tank located outside the service area;
- Wastewater generated in the service area was discharged to the municipal sewer system through an oil-water separator;
- Floor wash-down water generated in the service area was flushed into the vehicle exhaust ports in the floor;
- Staining was observed on the concrete surface beneath a plastic drum of spent antifreeze, however the concrete appeared to be free of pits, cracks or fissures at the time of inspection;
- Staining was also observed on the asphalt surface beneath the aboveground used-oil tank. Again, the concrete appeared to be free of pits, cracks or fissures at the time of inspection;
- Staining was observed on the asphalt beneath an air compressor, and the asphalt also appeared to be in good condition at the time of inspection; and
- An empty, abandoned, 250-gallon (AST) was observed near the storage building. The AST was positioned on its side. No leakage from the AST was observed at the time of inspection.

[1] *Phase I – Preliminary Environmental Site Assessment, Rochester Auto Collection, 111 South Main Street, Churchville, NY, 14428, dated August 2001 and Preliminary Environmental Site Assessment, Gabriele Ford, Inc., 111 South Main Street, Churchville, New York 14428, dated November 1997, both prepared by Entrix, Inc.*

A Phase I Environmental Assessment[2] conducted by Sear Brown in 2002 made the following observations:

- Building plans and utility and landscaping plans at the Churchville Village offices indicated that one 500-gallon UST and one 500-gallon used-oil UST were proposed to be installed at the Site. According to Site personnel, however, no USTs were present or being maintained at that time;
- Stains on the asphalt parking lot and side of the main building along the western side were observed. This area of staining was apparently associated with a former storage shed that housed a used-oil AST. Circular and rectangular depressions in the asphalt were observed on the western side of the main building in approximately the same area that ENTRIX had noted used solvent drum storage in their 1997 preliminary environmental site assessment; and
- Construction debris and a 275-gallon AST (likely the same tank identified as a 250-gallon AST by ENTRIX) were observed in the northwestern portion of the Site. The AST appeared to be empty with no spills, stains or odors noted.

As a result of the recommendations/conclusions of the Sear Brown Phase I report, Sear Brown was commissioned to conduct a Phase II ESA investigation of the Site[3]. The Phase II ESA investigation was conducted in July 2002, and offered the following conclusions/recommendations:

- A ground penetrating radar survey was conducted to search for the "proposed" USTs. No anomalies were discovered, and suggested that the proposed USTs were never installed;
- A total of 14 soil borings were installed at the Site. Volatile organic compounds (VOCs) related to petroleum products and degreasing solvents were reported to be present in soil samples from soil borings GP-1 (next to the 200-gallon used oil AST), GP-3 (former used solvent storage area), GP-6 (oil-water separator) and GP-10 at concentrations in excess of NYSDEC allowable soil concentrations. Soil boring locations are presented in Figure 3. Soil analytical results are summarized in Table 1, Appendix A;
- One or more semi-volatile organic compounds (SVOCs) were detected in soil samples collected from soil borings GP-1, GP-10 and GP-13 at concentrations in excess of the NYSDEC allowable soil concentrations. Soil analytical results are summarized in Table 1, Appendix A;
- Temporary 1-inch-diameter monitoring wells were installed in four of the soil boring locations, and approximately 0.30 to 0.5 feet of liquid non-aqueous phase liquid (LNAPL), possibly used motor oil, was present in monitoring well GP-1/MW-1. The well is located near the former 200-gallon used oil AST location;
- One or more VOCs related to petroleum products and/or degreasing solvents were reported in all four monitoring wells in excess of NYSDEC groundwater standards. Locations of monitoring wells are illustrated in Figure 3. Groundwater analytical results are summarized in Table 2, Appendix A; and

[2] *Phase I Environmental Site Assessment, Proposed Meyers Campers Sales & Service Facility, Village of Churchville, New York 14428, dated July 2002 and prepared by Sear Brown.*
[3] *Phase II Environmental Site Assessment, Proposed Meyers Campers Sales and Service Facility, Village of Churchville, New York, dated August 22, 2002 and prepared by Sear Brown.*

- On the basis of liquid level measurements taken from the four temporary monitoring wells, groundwater flow direction was estimated to be to the south. However, this appears to be at odds with the solute distribution at the Site, which would indicate a more northeasterly groundwater flow direction (see Section 3.3).

Finally, the reports prepared by Sear Brown indicate that the Site was considered a Small Quantity Generator. The identification number associated with the generation of Resource Recovery Act (RCRA) hazardous waste is Environmental Protection Agency (EPA) ID#NYD986992527. The wastes generated at the Site were collected and transported by licensed waste haulers for proper disposal.

The results of the groundwater sampling conducted at the Site indicate relatively high concentrations of cis-1,2 dichloroethene (DCE) compared to tetrachloroethene (PCE) and trichloroethene (TCE), especially in wells MW-1 and MW-3. In the presence of reducing conditions and sufficient electron donor concentrations (in this case including petroleum hydrocarbons), PCE undergoes reductive dechlorination to produce TCE and DCE. While the presence of TCE at this Site could be a function of the original use of TCE as a cleaning solvent, it is unlikely that the DCE was a solvent originally used at the Site. More probably, the presence of both TCE and DCE is evidence of cometabolic biodegradation of PCE and/or TCE at this Site during the microbially-mediated oxidation of dissolved petroleum hydrocarbons.

3.0 OBJECTIVES, SCOPE AND RATIONALE

The goals of the investigation include:

- Confirmation of data collected during the Phase II ESA investigation conducted in 2002;
- Assessment of private wells in the immediate vicinity of the Site;
- The delineation of surface and subsurface impact resulting from hydrocarbon use and chlorinated solvent use and storage at the Site;
- Determination of groundwater flow direction;
- Delineation of subsurface utilities and their potential influence on groundwater flow and/or contaminant transport;
- Collection of data to assess potential impacts posed by Site conditions to human health and the environment; and
- Collection of data sufficient for the design and implementation of remedial actions, if necessary.

The broad outline of the strategy to accomplish these goals is provided in the following subsections; technical details of the associated fieldwork are provided in Section 4 of this Work Plan.

3.1 EXISTING DATA CONFIRMATION AND SUPPLEMENTATION

The quality of data collected during the 2002 Phase II ESA is sufficient to conclude that the petroleum hydrocarbon impact which centers on or near the area of GP-1/MW-1 likely originated from the former used-oil AST once located in that area, and that the chlorinated solvent impact which centers on or near the area of GP-3/MW-3 likely originated from the former solvent storage area immediately to the north of the former used-oil AST location. The groundwater analytical data collected; however, need to be supplemented to further assess the horizontal and vertical extent of dissolved hydrocarbon and chlorinated solvent plumes as well as to update data collected in 2002 to assess current conditions. Additionally, the four existing temporary monitoring wells should be replaced with permanent monitoring wells that can be accurately surveyed to better evaluate groundwater flow direction at the Site. These wells will be replaced, sampled and surveyed prior to the installation of additional monitoring wells to ensure that the groundwater delineation effort is targeting the appropriate area(s) of the Site.

The horizontal delineation of unsaturated-zone soil impacts in and around the apparent source area (MW-1 and MW-3 locations) appears adequate to the north, west and east, with low or absent COC concentrations measured in laboratory analyses of GP-8, GP-9 and field screening results from GP-2, GP-4, GP-5, GP-7, GP-12 and GP-14 (GP-11 was installed near the storage building, and also showed no apparent COC concentrations based on field screening). However, additional soil sampling needs to be conducted in the immediate vicinity of MW-1 to assess the distribution of LNAPL in that area. Further, additional soil sampling needs to be conducted between GP-10 and GP-13 as well as to the south of GP-13, where elevated concentrations of petroleum hydrocarbons were measured in laboratory analyses. The details of these tasks are described in following sections.

In addition to analyzing the existing data associated with the Site, ENTRIX will research and identify any private wells in the immediate vicinity of the Site. ENTRIX will research state and local databases to identify the private wells as well as canvass the surrounding properties to identify permitted as well as unpermitted wells. If necessary, ENTRIX will contact property owner/resident of any properties

containing private wells to obtain pertinent information such as purpose, frequency of use, pump rate, condition, depth and any other information that can be provided regarding the well. Private well locations identified during the well search will be plotted on a reduction of a topographic map or geoquadrangle map.

During field activities, subsurface utilities will be identified and assessed, along with data from municipal sources and/or through private utility locators, in order to determine depth and direction of all on-site utility runs. These data will be used to determine the potential that utility runs at the site are influencing groundwater flow patterns, and/or acting as preferential migration pathways for identified contaminants.

3.2 VERTICAL DELINEATION, MONITORING WELL REPLACEMENT AND SURVEY

3.2.1 MW-3

Based on the Phase II ESA conducted at the Site, MW-3 appears to be located in a chlorinated solvent source area, and to date, the vertical extent of chlorinated solvent impact has yet to be determined in this area. To that end, ENTRIX will complete one soil boring at the MW-3 location, collecting soil samples on a continuous basis until the first confining layer is reached, or no additional soil impact is detected via field screening, whichever comes first. A confining layer will be defined as any sediment including clayey silt or finer present in thickness of 12 inches or greater and/or bedrock. The deepest soil sample collected, and the soil sample with the highest VOC concentration based on field screening will be submitted for laboratory analysis of VOCs and SVOCs by EPA methods 8260 and 8270 (OLM 4.2). Soil samples will be described according to the Unified Soil Classification System (USCS) for the generation of lithologic logs.

Following the soil boring installation, MW-3 will be replaced with a monitoring well constructed according to the depth of soil impact detected. If the depth of soil impact is less than 20 feet below grade (approximately 13-14 feet below the water table based on historical data), one two-inch diameter monitoring well will be installed to 20 feet below grade, constructed using ten feet of screen and ten feet of casing. In the event soil impact is detected at depths greater than 20 feet below grade, individual two-inch diameter well points, constructed using ten feet of screen and casing as required, will be installed so that the entire impacted (saturated) interval is adequately represented. For example, if impact is detected to 45 feet below grade, four two-inch diameter well points, screened from five to 15, 15 to 25, 25 to 35 and 35 to 45 feet, respectively, will be installed in the MW-3 location. Well points will be installed in separate boreholes to avoid cross-communication between screened intervals during sampling. Additionally, the deepest well point associated with MW-3 will be fitted with a two-foot sump for potential DNAPL collection. The annulus around the collection sump, from the base of the boring to the bottom of the screen, shall be filled with bentonite. Following installation, MW-3 will be properly developed prior to gauging and sampling.

3.2.2 MW-1, MW-6, MW-13, MW-21 and MW-22

Temporary monitoring wells MW-1 and MW-13, both anticipated to be up- or crossgradient of the solvent storage area represented by the MW-3 location, will be replaced using wells installed to a depth of 17 feet below grade using ten feet of screen and seven feet of casing. The locations of MW-1 and MW-13, based on historical groundwater analytical data, are associated with petroleum hydrocarbon impact (i.e. LNAPL), and therefore, will not require significant vertical delineation beyond the surface of the water table. Since measurable thicknesses of mobile LNAPLs have been detected in MW-1, a four-

inch diameter replacement well will be installed in this location to accommodate interim LNAPL-removal technologies, if necessary. MW-13 will be replaced with a two-inch diameter monitoring well.

Temporary monitoring well MW-6 is expected to be located downgradient of the solvent storage area represented by the MW-3 location, and therefore its replacement may require greater vertical coverage to completely characterize dissolved chlorinated solvents migrating downgradient from the MW-3 location, if any. Under the assumption that groundwater flow at this Site is essentially horizontal over short distances, the replacement MW-6 will be constructed identically to MW-3, using either a single well with ten feet of screen, or multiple well points with ten-foot screens as necessary. Soil samples will be collected on five-foot intervals from grade, field screened using a PID, and described according to the USCS for the generation of lithologic logs. To comply with a NYSDEC request, in addition to the replacement wells MW-1, MW-3, MW-6 and MW-13 and the delineation monitoring wells MW-15 through MW-20 (described below), one monitoring well (MW-21) will be installed on the west side of the storm water drainage ditch located along the southeastern property boundary. This well will be included to assess groundwater conditions near the outfall of the Site's parking lot storm water collection system. Further, a background monitoring well (MW-22) will be installed in the gravel area in the northwest portion of the Site, to the west of the storage shed. Both of these wells (MW-21 and MW-22) will be installed to a depth of 17 feet below grade using ten feet of screen and seven feet of casing. These wells are being installed during the well replacement phase to aid in the determination of groundwater flow directions at the Site. Soil samples will be collected on five-foot intervals from grade, field screened using a PID, and described according to the USCS for the generation of lithologic logs. Additionally, in the event that field screening during the well installations indicates that soil may be impacted, a soil sample from the interval indicating the most impact as well as the deepest unimpacted interval will be collected for laboratory analysis.

Following installation, MW-1, MW-6, MW-13, MW-21 and MW-22 will be properly developed prior to gauging and sampling.

3.2.3 Monitoring Well Survey/Sample/Groundwater Flow Direction

Newly installed replacement monitoring wells MW-1, MW-3, MW-6, MW-13, and background monitoring wells MW-21 and MW-22's top of casing will be surveyed to the nearest 0.01 feet and assigned elevations based on an arbitrary 100-foot benchmark. The elevation data will be measured using the NGVD '88 coordinate system and the horizontal measurements will be identified using the NAD '83 UTM Zone 18 coordinate system. Following the survey, depth to water will be measured in each monitoring well using an electronic interface probe capable of determining water/LNAPL levels to within 0.01 feet. These data will be utilized to evaluate groundwater flow direction at the Site to guide the additional dissolved plume delineation described below.

Following development, each newly installed monitoring well not showing evidence of LNAPL accumulation will be purged and sampled. Groundwater samples will be analyzed for OLM 4.2.

3.3 HORIZONTAL GROUNDWATER DELINEATION

3.3.1 Additional Monitoring Well Installation

Based on the historical groundwater quality data, it is anticipated that groundwater flow at the Site is toward the northeast. Figure 4, presents the total halogenated hydrocarbon concentrations (composed of 1,1-dichloroethane, cis-1,2 dichloroethene, tetrachloroethene, 1,1,1-trichloroethane and trichloroenthene. See Table 2, Appendix A) from samples collected in August 2002. The plume orientation depicted in

Figure 4 relies heavily on data from MW-6, which may be associated with the source area near MW-3, but may also be receiving solute input from the oil-water separator location. While the exact configuration of the additional monitoring well network will be developed pending the outcome of the groundwater flow direction assessment outlined above, ENTRIX anticipates the installation of six new monitoring wells: one in the building (MW-15) located between MW-3 and MW-6, one monitoring well in the upgradient direction (MW-16), one monitoring well on either side of the plume in cross-gradient directions (MW-17 and MW-18), and two monitoring wells in the downgradient direction (MW-19 and MW-20). Of the two downgradient monitoring wells, MW-20 will be installed at the downgradient property boundary as a sentinel well. Figure 5 shows one potential configuration of the delineation monitoring wells in the event that groundwater flow is to the northeast as currently anticipated. The depths of the wells and their screened intervals will depend on the vertical delineation assessment described above for the MW-3 location. Monitoring wells MW-15, and MW-17 through MW-20 will be constructed in identical fashion to the replacement well MW-3. Upgradient monitoring well MW-16 will be a two-inch diameter well constructed identically to the replacement well MW-13: installed to a depth of 17 feet below grade using ten feet of screen and seven feet of casing. Soil samples will be collected on five-foot intervals from grade, field screened using a PID, and described according to the USCS for the generation of lithologic logs.

Following installation, monitoring wells MW-15 through MW-20 will be properly developed prior to gauging and sampling.

Note that during the installation of monitoring wells MW-15 through MW-20, only one soil sample is anticipated to be submitted for laboratory analysis. This sample will be collected from upgradient well MW-16 at the water table interface and submitted for laboratory analysis of total organic carbon as described in Section 3.5. The remaining wells are being installed for the delineation of dissolved-phase COCs and are not expected to be in areas of soil impact not already identified at the Site. However, in the event that field screening during the installation of monitoring wells MW-15 through MW-20 indicate that soil may be impacted, a soil sample collected from the interval indicating the most impact as well as the deepest unimpacted interval will be collected for laboratory analysis. Additionally, based on the data collected from the monitoring well installation and groundwater sampling described in this section, additional monitoring well locations may be necessary and may be completed during the subsequent Phase II investigation.

3.3.2 Additional Well Survey/Gauging/Sampling

Newly installed delineation monitoring wells MW-15 through MW-20 top of casing will be surveyed to the nearest 0.01 feet and assigned elevations relative to monitoring wells MW-1, MW-3, MW-6, MW-13, MW-21 and MW-22. The elevation data will be measured using the NGVD ’88 coordinate system. If a survey monument is not available, an arbitrary benchmark will be utilized following approval by the Department project manager. Following the survey, depth to water will be measured in each monitoring well using an electronic interface probe capable of determining water/LNAPL levels to within 0.01 feet. These data will be utilized to fine-tune the assessment of groundwater flow direction described in Section 3.2.3 above.

Following development, each of the newly installed delineation monitoring wells not showing evidence of LNAPL accumulations will also be purged and sampled. Groundwater samples will be analyzed for OLM 4.2. These data will be combined with the groundwater data collected from replacement monitoring wells MW-1, MW-3, MW-6 and MW-13 and background monitoring wells MW-21 and MW-22 to develop a more comprehensive characterization of dissolved-phase COC distribution at the Site.

3.4 ADDITIONAL SOIL BORING PROGRAM

3.4.1 Subsurface Soil Borings

The LNAPL previously measured in MW-1 appears to be adequately delineated through soil borings to the west (GP-12), north (GP-3) and southeast (GP-10). However, data gaps exist to the east, northwest and southwest. Since one of the ultimate remedial goals for this Site will include the removal of the mobile LNAPL in this area, the extent of the LNAPL needs to be additionally characterized, especially in light of potential impact located beneath the Site building itself. Prior to installing any of the monitoring wells discussed in Section 3.0, ENTRIX will install up to six additional soil borings, two outside of the building to the southwest and northwest of MW-1 and two to four inside of the building to the east and northeast of MW-1 (soil borings SB-E and SB-F will not be installed if field screening of samples from SB-C and SB-D indicate no significant adsorbed hydrocarbon impact beneath the building). Soil samples will be collected on a continuous basis from grade to the top of bedrock, and one soil sample from each boring location representing the highest hydrocarbon impact based on field screening will be submitted for laboratory analysis of OLM 4.2, and for Target Analyte List (TAL) metals by SW-846 Method 6010B (ILM 4.1).

Additionally, ENTRIX will install up to nine soil borings adjacent (within two feet laterally) to a representative number of trench drains, floor drains and vehicle exhaust ports located throughout the inside of the building. Soil samples will be collected on a continuous basis from grade to four fbs, and one soil sample from each boring location representing the highest hydrocarbon impact based on field screening will be submitted for laboratory analysis of OLM 4.2 and for ILM 4.1.

Three additional soil borings will be installed in the vicinity of MW-13, one to the south, one to the east and one to the west. Soil borings SB-G, SB-H and SB-I will be installed approximately 20 feet from MW-13 to further delineate hydrocarbon concentrations detected in soils during the installation of GP-13. SB-H will be installed adjacent to the stormwater catch basin located south of MW-13 and the former used oil AST location Soil samples will be collected on a continuous basis from grade to the top of bedrock and one soil sample from each boring location representing the highest hydrocarbon impact based on field screening will be submitted for laboratory analysis of OLM 4.2 and for ILM 4.1.

Finally, per a request by the NYSDEC, two confirmation soil borings will be installed inside the building to re-assess data collected previously at the Site. One soil boring will be installed near the former parts washer location (former GP-7 location) on the southern side of the building, and one will be installed near the former solvent storage area (former GP-9 location) in the northwestern corner of the building. Soil samples will be collected on a continuous basis from grade to 12 feet below grade and one soil sample from each boring location representing the highest hydrocarbon impact based on field screening will be submitted for laboratory analysis of OLM 4.2 and for ILM 4.1.

Following the completion of subsurface soil borings, horizontal measurements for each of the boring locations will be identified using the NAD ’83 UTM Zone 18 coordinate system.

Based on the data collected from the soil samples described in this section, additional soil boring locations may be necessary and may be completed during the subsequent Phase II investigation.

Figure 6 shows the locations of the proposed soil borings described above.

3.4.2 Shallow Soil Borings

Shallow, surficial soil samples will be collected from the top two inches below the vegetative cover in six locations on the topographically downgradient perimeter of the asphalt parking lot, and in three locations in the stormwater retention basin. These samples will be collected to assess the condition of surficial soils, which may have collected COCs in potential stormwater runoff areas. The locations of the shallow soil borings are shown in Figure 7. One soil sample per boring location will be submitted for laboratory analysis OLM 4.2 and for ILM 4.1. Deeper soil sampling will be considered in the subsequent investigation Phase II depending on the analytical results of these samples.

Following the completion of the shallow soil borings, horizontal measurements for each of the boring locations will be identified using the NAD '83 UTM Zone 18 coordinate system.

3.5 QUALITATIVE EXPOSURE ASSESSMENT/REMEDIAL STRATEGY DATA COLLECTION

For the purpose of determining the potential risk to human health and the environment posed by Site conditions, data will be collected for use in subsequent qualitative exposure assessments. Based on the historical data collected at the Site, identified data gaps include:

- Sub-slab soil gas sampling beneath the building to determine the existence of vapor-phase COCs which could affect building occupants; and
- Aquifer characteristics (hydraulic conductivity, total organic carbon) to evaluate the potential fate and transport of dissolved-phase COCs.

Collectively, these data will allow the evaluation of potential threats to indoor air quality at the Site and the prediction of dissolved-phase COC behavior following the delineation phase of the investigation. Additionally, when these data are combined with the soil and groundwater delineation data, it is expected that sufficient information will exist for the subsequent selection and design of remediation alternatives, if necessary.

3.5.1 Soil Gas Sampling Strategy

Based on building construction records, the main building, constructed in from 1986 to 1987, has been expanded through incorporation of two separate additions, constructed in 1989 and 1995. The main building and its two additions are all expected to have their own foundations that would act as separate accumulation points for vapor-phase COCs. Therefore, the sub-slab soil gas survey will target each section of the building separately. The 1989 addition, located on the west side of the main building, will have three soil gas sampling locations (SG-1 through SG-3), one associated with the former used-oil AST and solvent storage areas on the west side of the building, one associated with the former solvent storage area identified in the interior of the building in the vicinity of GP-9, and one located between the two former parts washer locations on the southern side of the building (near GP-6 and GP-7). The main building will have two soil gas sampling locations (SG-4 and SG-5), one associated with the location of the oil-water separator, and one to assess general sub-slab conditions on the southern side of the original building. The 1995 building addition will have one soil gas sampling location (SG-6) installed to assess general sub-slab conditions in that section of the building. Additional samples, per the NYSDEC's request, will be installed near the trench drain (SG-7) and between SG-1 and SG-2 (SG-8). All soil gas samples will be collected from immediately below the building slabs, in the underlying aggregate material. Additionally, one indoor air sample and one outdoor (ambient) air sample will be collected to evaluate building and background air quality at the Site. All air samples will be analyzed for VOCs by EPA method TO-15. A copy of the EPA method TO-15 target analyte list and method detection limits is

included in Appendix A, Table 1B. Following the completion of the soil gas sampling, horizontal measurements for each of the sampling locations will be identified using the NAD '83 UTM Zone 18 coordinate system.

The soil gas sampling locations are shown in Figure 8.

3.5.2 Aquifer Testing Strategy

Following their delineation, to more accurately assess the potential future fate and transport of COCs at the Site, hydraulic conductivity (K) will be measured through aquifer testing. Rising-head slug tests will be conducted in five of the Site's monitoring wells (MW-15 through MW-19) in order to obtain a representative average value of K for use in subsequent exposure assessment and/or groundwater modeling activities, as necessary. In the event that any of the monitoring wells targeted for aquifer testing were constructed as nested wells, the interval representing the highest concentration of dissolved COCs, based on the groundwater sampling data from MW-3 described above, will be tested. An additional input value to fate and transport models is soil organic carbon concentration, required for the calculation of retardation rates. During the installation of the dissolved-phase COC delineation monitoring wells described in Section 3.3, one soil sample will be collected at the groundwater interface in the upgradient monitoring well MW-16 location. This soil sample will be submitted for laboratory analysis of total organic carbon by EPA method 415.1.

4.0 FIELD ACTIVITIES PLAN

The following is a summary of the procedural aspects of field activities that are described generally in Section 3.0. All referenced Standards of Operation (SOPs) are presented in Appendix C.

- *MW-3 Soil Boring, Well Installation and Development*
    - Coordinate drilling activities according to SOP 3.0.
    - As described in Section 3.2.1 (see also Figure 5), install soil boring using a hollow-stem auger drill rig to first confining layer, bedrock or no additional soil impact by field screening, collecting continuous 2-foot split-spoon soil samples from grade according to SOP 8.0.
        - Conduct lithologic logging of samples according to SOP 6.0
    - Field screen soil samples by headspace method using a photoionization detector (PID) according to SOP 6.1. Ensure that the PID is calibrated according to SOP 22.0.
        - Decontaminate all soil sampling equipment between sampling intervals using a Liquinox wash and potable water rinse (see SOP 20.0).
        - Store decontamination rinsate in DOT-approved 55-gallon steel drums pending waste characterization analysis and disposal.
    - Retain deepest collected soil sample and soil sample with the highest PID reading for laboratory analysis of OLM 4.2 (see SOP 6.1 and 23.0).
        - Collect QA/QC samples as described in Table 3, Appendix A.
    - Install 2-inch diameter SCH 40 PVC monitoring well or well points based on field screening results (see SOP 9.0):
        - Impact < 20 feet below grade (fbg): one well to 20 fbg with 10 feet of 10-slot screen (10 to 20 fbg).
        - Impact > 20 fbg: individual well points with 10-foot, 10-slot screens starting at 5 fbg (5 – 15 fbg, 15 - 25 fbg, etc., with casing to grade. Note that well points shall be installed in separate boreholes, and not nested, to avoid seal failures between screened intervals.
        - Ensure that the deepest well point associated with MW-3 is fitted with a 2-foot DNAPL sump (solid PVC casing with end cap). The annulus around the sump shall be filled with bentonite.
    - Develop MW-3 according to SOP 10.0
        - Store development water in DOT-approved 55-gallon steel drums pending waste characterization analysis and disposal according to SOP 21.

- Decontaminate hollow stem auger flights between drilling locations by steam cleaning in a designated, poly-lined decontamination area according to SOP 20.
    - Contain auger decontamination wash water in DOT-approved 55-gallon steel drums pending waste characterization analysis and disposal.

- *MW-1, MW-6, MW-13, MW-21 and MW-22 Installation and Development*
    - Using a hollow-stem auger drill rig, replace MW-1 with a **4-inch** diameter SCH 40 PVC monitoring well installed to 17 fbg using 10 feet of 10-slot screen and casing to grade according to SOP 9.0.
        - For well locations, see Figure 5.
    - Using a hollow-stem auger drill rig, replace MW-13 and install MW-21 and MW-22 with a **2-inch** diameter SCH 40 PVC monitoring well installed to 17 fbg using 10 feet of 10 -slot screen and casing to grade according to SOP 9.0.
    - Install MW-6 with a hollow stem auger, constructed identically to MW-3 according to SOP 9.0.
    - For MW-1, MW-6, MW-13, MW-21 and MW-22, collect 2-foot split-spoon soil samples every five feet from grade according to SOP 8.0.
        - Conduct lithologic logging of samples according to SOP 6.0
    - Develop MW-1, MW-6, MW-13, MW-21 and MW-22 as described for MW-3 above.
    - Decontaminate drilling equipment between drilling locations as described for MW-3 above.

- *MW-1, MW-3, MW-6, MW-13, MW-21 and MW-22 Survey, Gauging, Sampling*
    - Survey top of casing elevations of MW-1, MW-3, MW-6, MW-13, MW-21 and MW-22 to an arbitrary Site benchmark assigned 100 feet above mean sea level.
    - Gauge depth to water and LNAPL (if present), depth to bottom and DNAPL (if present) in each well using an electronic interface probe to 0.01 feet (see SOP 14.0).
        - Decontaminate interface probe between monitoring wells using a liquinox wash and a potable water rinse according to SOP 20.0.
        - Store decontamination rinsate in DOT-approved 55-gallon steel drums pending waste characterization analysis and disposal.
    - Purge all wells not showing evidence of LNAPL or DNAPL of a minimum of 3 well volumes following SOP 13.0.
    - Retain well purge water in DOT-approved 55-gallon steel drums pending waste characterization analysis and disposal according to SOP 21.0.
    - Collect groundwater samples for laboratory analysis of OLM 4.2 (see SOP 23.0).

        - Decontaminate any non-dedicated purging or sampling equipment between sampling locations using a Liquinox wash and a potable water rinse (see SOP 20.0).
        - Store decontamination rinsate in DOT-approved 55-gallon steel drums pending waste characterization analysis and disposal.
        - Collect QA/QC samples as described in Table 3, Appendix A.

- *MW-15, MW-17 through MW-20 Installation and Development*
    - Using a hollow-stem auger drill rig, install and construct MW-15 and MW-17 through MW-20 identically to MW-3.
        - For monitoring well locations, see Figure 5.
    - For MW-15, MW-17 through MW-20, collect 2-foot split-spoon soil samples every five feet from grade according to SOP 8.0.
        - Conduct lithologic logging of samples according to SOP 6.0
    - Develop MW-15 and MW-17 through MW-20 as described for MW-3 above.
    - Decontaminate drilling equipment between drilling locations as described for MW-3 above.
- *MW-16 Soil Boring, Installation and Development*
    - Using a hollow-stem auger drill rig, install soil boring to the approximate depth of water at the Site (based on gauging data from MW-1, MW-3, MW-6 and MW-13).
        - For the location of MW-16, see Figure 5.
    - For MW-16, collect 2-foot split-spoon soil samples every five feet from grade according to SOP 8.0.
        - Conduct lithologic logging of samples according to SOP 6.0
    - Using a 2-foot split-spoon sampler, collect one soil sample from the water table interface (see SOP 8.0).
        - Retain soil sample for laboratory analysis of TOC by EPA Method 415.1 (see SOP 23.0)
    - Install MW-16 constructed identically to MW-13.
    - Develop MW-16 as described for MW-3 above.
    - Decontaminate drilling equipment between drilling locations as described for MW-3 above.

- *MW-15 through MW-20, Gauging, Sampling*
    - Survey top of casing elevations of MW-15 through MW-20 relative to the identified Site benchmark assigned 100 feet above mean sea level.
    - Gauge depth to water and LNAPL (if present), depth to bottom and DNAPL (if present) in each well using an electronic interface probe to 0.01 feet (see SOP 14.0).
        - Decontaminate interface probe between monitoring wells using a Liquinox wash and a potable water rinse according to SOP 20.0.
        - Store decontamination rinsate in DOT-approved 55-gallon steel drums pending waste characterization analysis and disposal.
    - Purge all wells not showing evidence of LNAPL or DNAPL of a minimum of 3 well volumes according to SOP 13.0.
    - Retain well purge water in DOT-approved 55-gallon steel drums pending waste characterization analysis and disposal (see SOP 21.0).
    - Collect groundwater samples for laboratory analysis of OLM 4.2 (see SOP 23.0).
        - Decontaminate any non-dedicated purging or sampling equipment between sampling locations using a Liquinox wash and potable water rinse according to SOP 20.0.
        - Store decontamination rinsate in DOT-approved 55-gallon steel drums pending waste characterization analysis and disposal.
        - Collect QA/QC samples as described in Table 3, Appendix A.
- *Subsurface Soil Boring Installation*
    - Using a Geoprobe, or other direct-push soil sampling technology, install soil borings to a total depth of 12 fbg in locations SB-A through SB-K (see Figure 6). Note that the installation of soil borings SB-E and SB-F are dependent on the presence of gross hydrocarbon contamination in either SB-C or SB-D.
    - Using a Geoprobe, or other direct-push soil sampling technology, install soil borings to a total depth of 4 fbg in locations SB-L through SB-T (see Figure 6).
    - Collect continuous, 2-foot soil samples from grade according to SOP 8.0.
    - Conduct lithologic borehole logging according to SOP 6.0
    - Field screen soil samples using a photoionization detector (PID) according to SOP 6.1.
        - Decontaminate all soil sampling equipment between sampling intervals using a Liquinox wash and potable water rinse (see SOP 20.0).
        - Store decontamination rinsate in DOT-approved 55-gallon steel drums pending waste characterization analysis and disposal.

- Retain the soil sample from each soil boring location with the highest PID reading for laboratory analysis of OLM 4.2 and ILM 4.1 (see SOP 23.0)
  - Collect QA/QC samples as described in Table 3, Appendix A.
- Abandon the boreholes according to SOP 11.0.

- *Surficial Soil Boring Installation*
  - Using a hand auger (or a direct-push technology, as necessary or available), install soil borings to a total depth of two inches below the vegetative cover in locations SSB-1 through SSB-9 (see SOP 5.0 and/or 8.0).
    - The locations of SSB-1 through SSB-9 are presented in Figure 7.
  - Collect one representative soil sample from each location (see SOP 23.0).
  - Field screen soil samples using a photoionization detector (PID) according to SOP 6.1.
    - Decontaminate all soil sampling equipment between sampling intervals using a Liquinox wash and potable water rinse (see SOP 20.0).
    - Store decontamination rinsate in DOT-approved 55-gallon steel drums pending waste characterization analysis and disposal.
  - Retain the soil sample from each soil boring location for laboratory analysis of OLM 4.2 and ILM 4.1.
    - Collect QA/QC samples as described in Table 3, Appendix A.
  - Abandon the boreholes according to SOP 11.0.

- *Sub-Slab Soil Gas Sampling*
  - Using a percussion drill (e.g. Bosch hammer or equivalent) install small-diameter borings through the floor and floor slab of the building in locations SG-1 through SG-8, into the sub-slab aggregate.
    - The locations of SG-1 through SG-8 are presented in Figure 8.
  - Insert new, clean polyethylene tubing into the hole, and seal the annulus between the tubing and the hole using a VOC-free caulk that will not impact the materials being analyzed.
  - Firmly attach the loose end of the tubing to a laboratory-provided 6-liter Summa canister with in-line vacuum gauge per laboratory specifications.
    - Ensure that the canister is properly flagged/cordoned off to prevent disturbance of the canister during the sampling period.
  - Allow the Summa canister to sit undisturbed for a period of at least 24-hours following installation to allow for sub-slab conditions to equilibrate. Prior to sampling, inspect the seal between the tubing and the hole to ensure integrity.

- Activate the Summa canister per laboratory specifications.
- Record the vacuum on the canister at the beginning and end of the sampling period, monitoring the vacuum periodically during the sampling period to verify that the flow controller is operating properly.
- Following the completion of soil gas sampling (approximately 8 hours), seal the Summa canister and submit for laboratory analysis of VOCs by EPA method TO-15. See SOP 23.0 for Sample ID and chain-of-custody procedures, but note that Summa canisters can be shipped at ambient temperatures.

- *Indoor/Ambient Air Sampling*
  - In the office section of the original building and in one location along the western property boundary (see Figure 8), place laboratory-provided Summa canisters in locations unlikely to be disturbed for 8 hours.
    - Ensure that the canisters are properly flagged/cordoned off to prevent disturbance of the canisters during the sampling period.
  - Activate the Summa canisters per laboratory specifications.
  - Following the completion of soil gas sampling (approximately 8 hours), seal the Summa canisters and submit for laboratory analysis of VOCs by EPA method TO-15. See SOP 23.0 for Sample ID and chain-of-custody procedures, but note that Summa canisters can be shipped at ambient temperatures.

- *Aquifer Testing*
  - Utilizing a data-logger to obtain liquid level data, conduct rising-head slug tests in MW-15 through MW-19 according to SOP 16.0.
    - In MW-15 and MW-17 through MW-19, if nested well points have been installed, utilize the well point representing the aquifer interval with the highest concentrations of dissolved-phase halogenated hydrocarbons based on data collected from MW-3.

5.0 ADDITIONAL QA/QC ELEMENTS

All environmental samples collected according to Sections 3.0 and 4.0 of this Work Plan will be submitted for analysis to:

Lancaster Laboratories
2425 New Holland Pike
PO Box 12425
Lancaster, Pennsylvania 17605-2425
717-656-2300

Lancaster Laboratories (Lancaster) is a NYSDOH ELAP-certified laboratory, and all environmental analytical data for this Site will include NYSDEC ASP Category B deliverables. Data received from Lancaster will be reviewed by the project QAO as outlined in Section 1.1, and data validation will be conducted according to the New York State Division of Environmental Remediation (DER) Data Usability Summary Report (DUSR) guidelines. Tabulated summaries of data collected at the Site will be included in the monthly status reports. ASP Category B deliverables and DUSRs will not be submitted in the monthly status reports but will be included in the final investigation report.

6.0 HEALTH AND SAFETY PLAN

6.1 SITE-SPECIFIC HEALTH AND SAFETY PLAN (HASP)

A HASP designed to protect the health and safety of all field personnel and visitors associated with the field activities described herein is presented as a separate document, included in this Work Plan as Appendix D.

6.1.1 Community Air Monitoring Plan

The Community Air Monitoring Plan (CAMP) requires real-time monitoring for VOCs and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection (see Section 6.0 of the HASP, Appendix D). Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location.

VOC Monitoring, Response Levels, and Actions

VOCs will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified (see above). Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. In the event intrusive work will be performed indoors, VOCs will be monitored continuously at the perimeter of the exclusion zone closest to the location of on-site personnel, whereas indoor air background concentrations will be measured prior to the start of intrusive work. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known to be present (i.e. photoionization detector (PID). The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds five parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below five ppm over background, work activities can resume with continued monitoring;

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average; and

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shut down.

All 15-minute readings will be recorded on field data sheets (Appendix E) and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations during ground intrusive activities as described above. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area; and

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for State (DEC and DOH) personnel to review.

7.0 REPORTING AND SCHEDULE

The following outlines the primary milestones associated with the management of environmental conditions at the Site. These milestones assume an effective date of the Voluntary Cleanup Agreement (VCA) of October 9th, 2003.

VCA Effective Date	10/9/03
Investigation Work Plan Submittal Date	11/18/03 (40 calendar days following VCA effective date)
Community Notification: • Site activity fact sheet will be sent by regular mail to mailing list generated by the NYSDEC.	Completed by the NYSDEC with the Volunteer providing support upon request.
Initiation of **Phase I SI** of Field Investigation Work: • Re-installation of MW-1, MW-3, MW-6, MW-13; Installation of MW-21 and MW-22. o Soil boring at MW-3 location. • Survey, gauge and sample MW-1, MW-3, MW-6, MW-13, MW-21 and MW-22. • Shallow soil borings SSB-1 through SSB-9. • Subsurface soil borings SB-A through SB-T. • Soil gas sampling at locations SG-1 through SG-8; Ambient and indoor air sampling.	*Phase I SI field work will begin within 60 days of NYSDEC approval of Investigation Work Plan.*
Submittal of Subsequent Work Plans, if necessary.	Within 60 days of receipt of complete laboratory analytical results from Phase I.
Initiation of **Phase II SI** of Field Investigation Work: • Installation of MW-15 through MW-20. o Soil boring at MW-16 location. • Survey, gauge and sample MW-15 through MW-20. • Slug testing at MW-15 through MW-19.	*Phase II SI field work will begin within 60 days of receipt of complete laboratory analytical results from Phase I SI activities or within 60 days of receipt of complete laboratory analytical results from subsequent Work Plans that may be submitted following Phase I. SI.*
Progress Report submittals, which will include: • All actions relative to the Site during the previous reporting period and those anticipated for the next reporting period. • All approved activity modifications. • All results of sampling and tests and all other data received or generated by or on behalf of the Volunteer in connection with the Site.	Progress reports will be submitted to the NYSDEC on or before the 10th of each month beginning the month following approval of the Investigation Work Plan and ending with the Site's termination date.
Submittal of Investigation Final Report	Within 90 days of receipt of complete laboratory analytical results from Phase II SI activities.

FIGURES

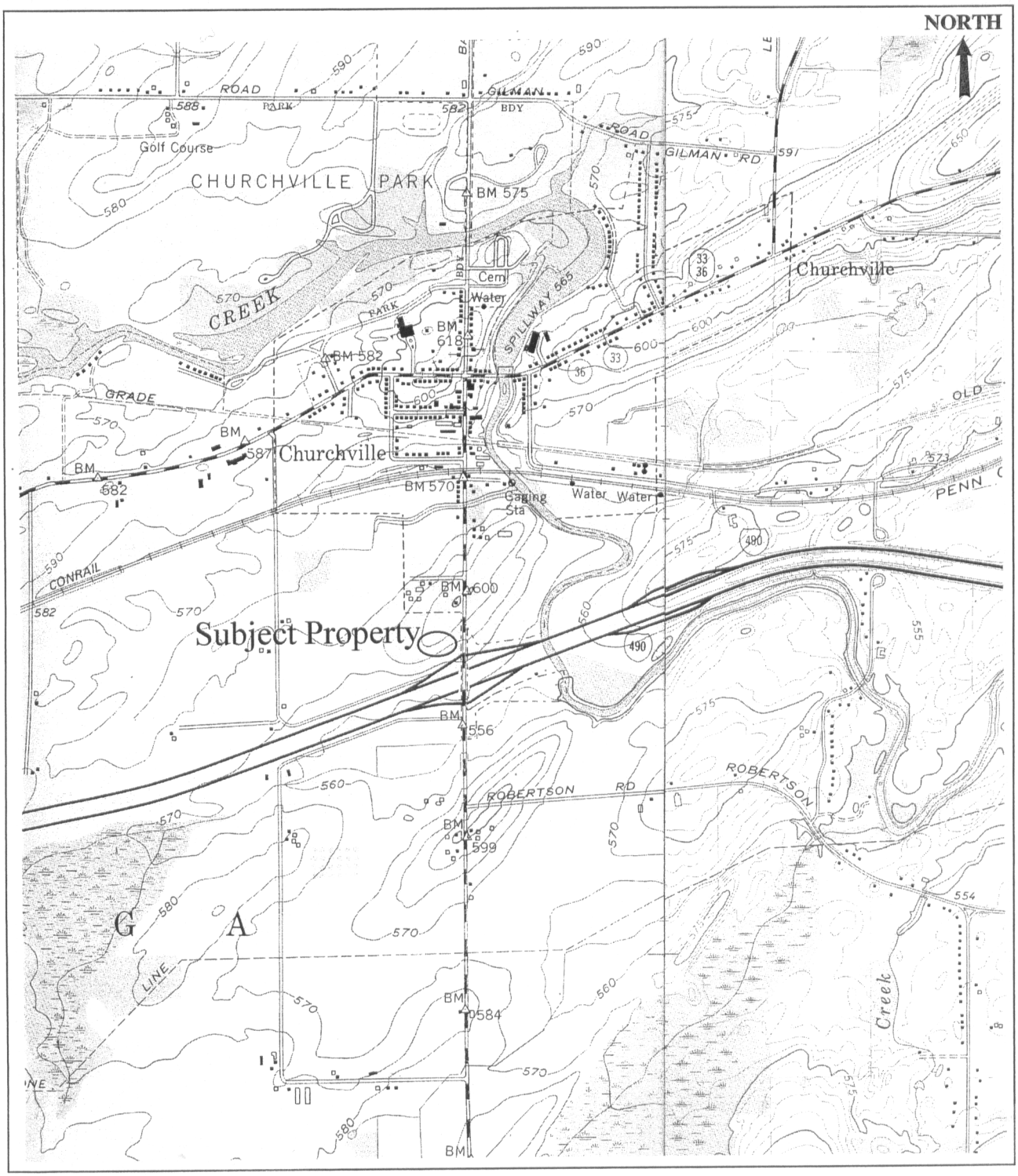
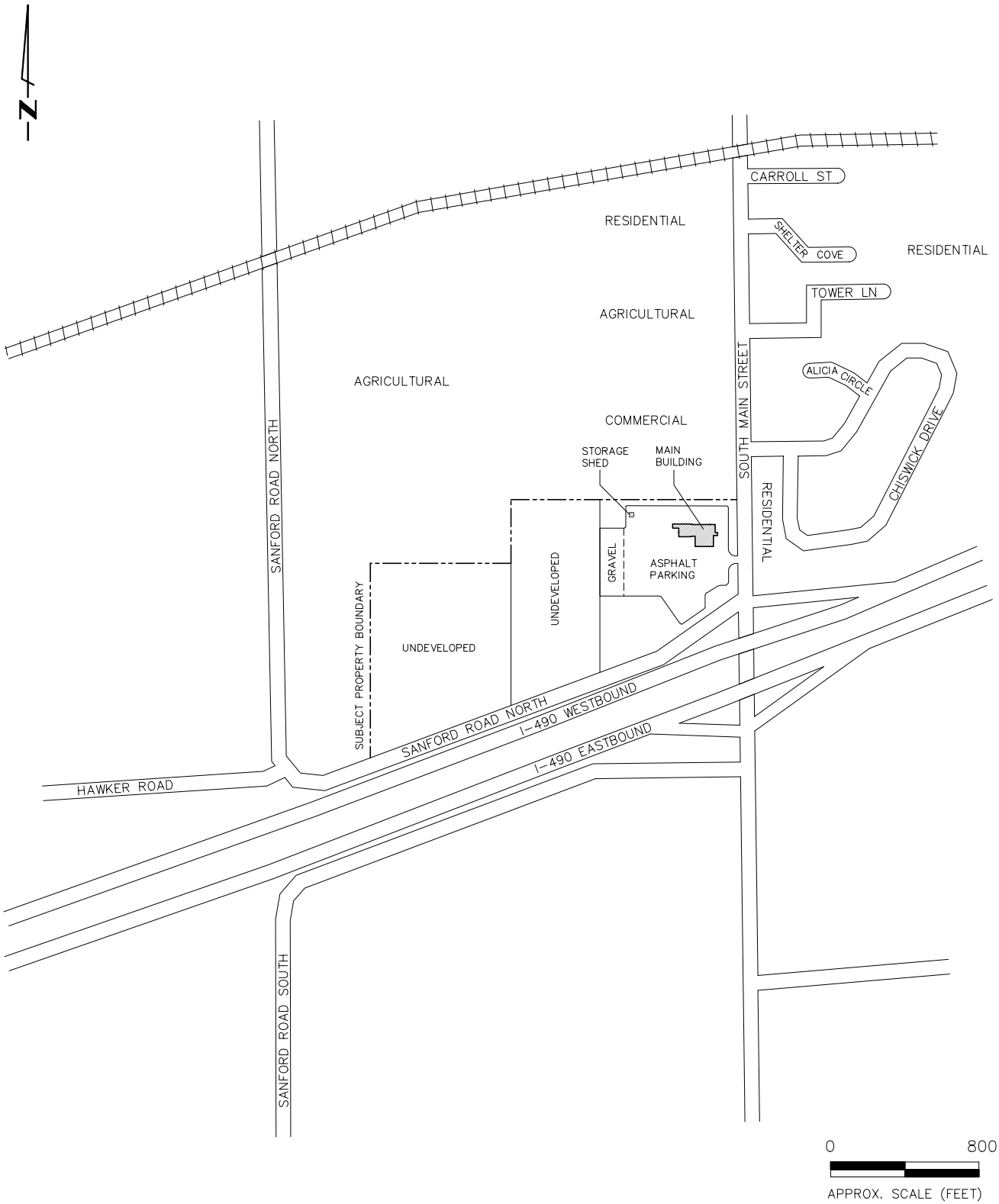


FIGURE 1
Site Location Map

USGS 7.5-Minute Quadrangle
Clifton, New York
Churchville, New York

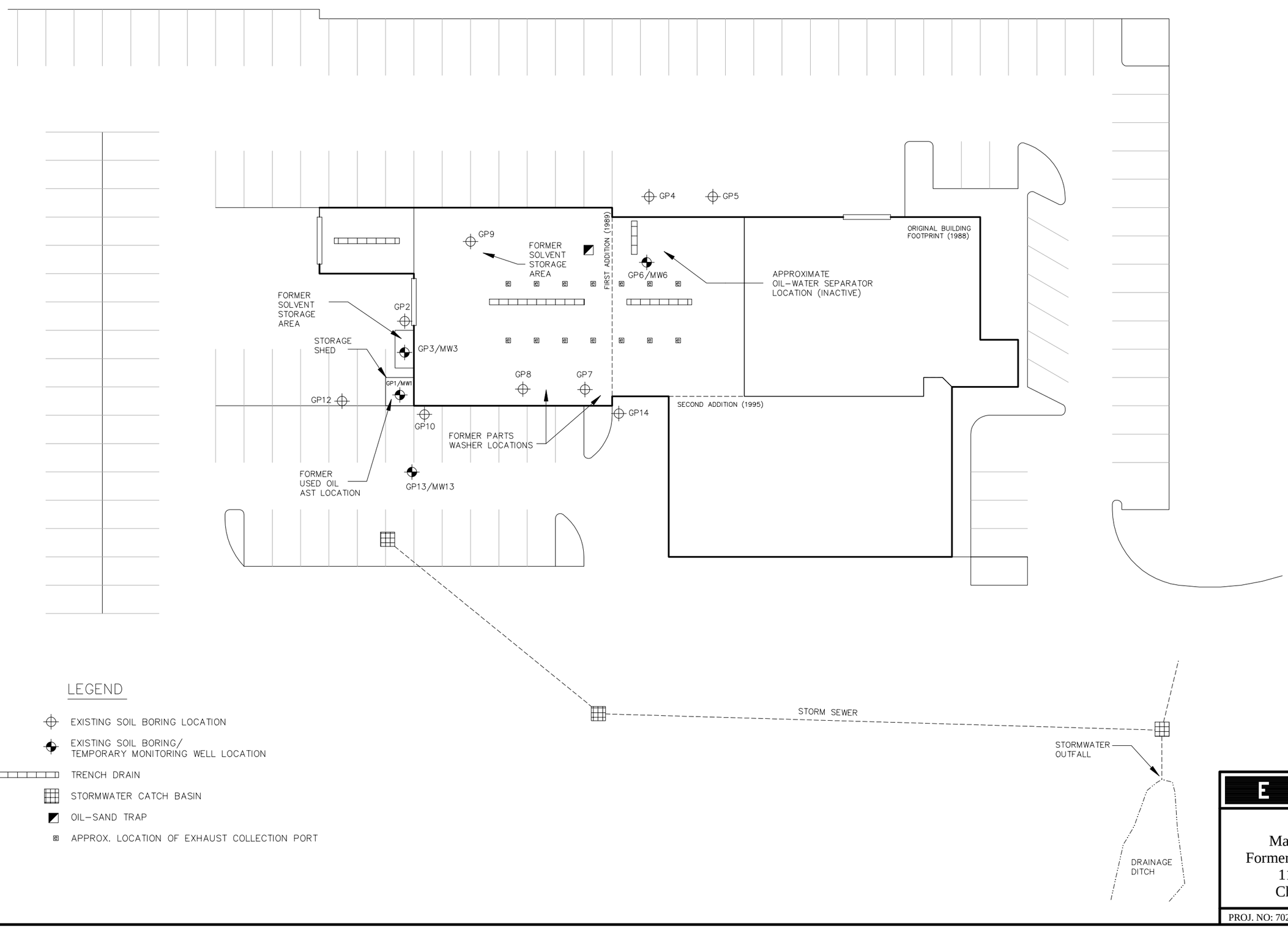
Contour Interval = 10'
Scale: 1: 24,000



ENTRIX

Figure 2
Site Vicinity and Layout Map
Former Churchville Ford Facility
111 South Main Street
Churchville, New York

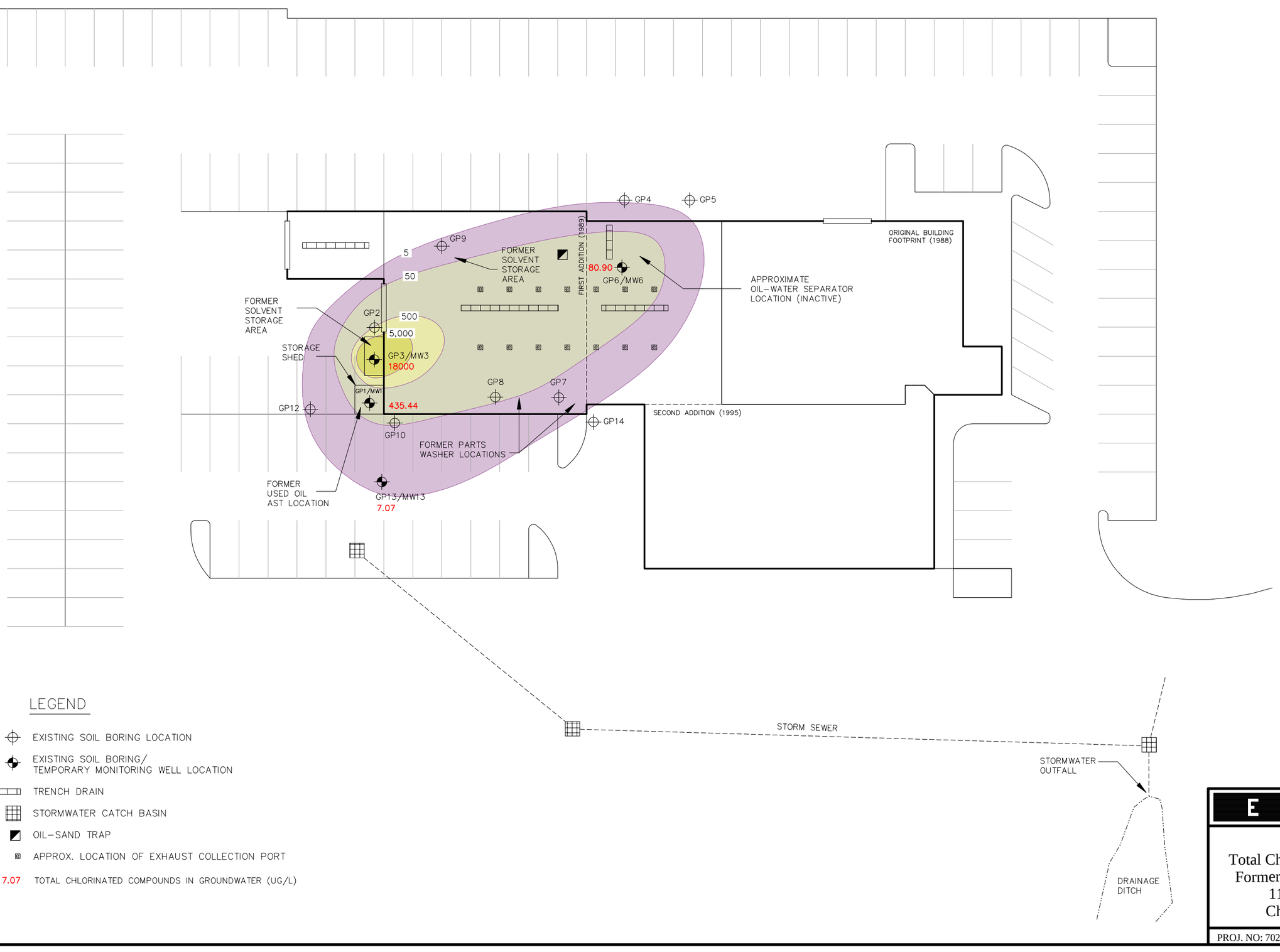
PROJ. NO: 7022526	D/B: TLD	DATE: 11/03



ENTRIX

Figure 3
Main Building Schematic
Former Churchville Ford Facility
111 South Main Street
Churchville, New York

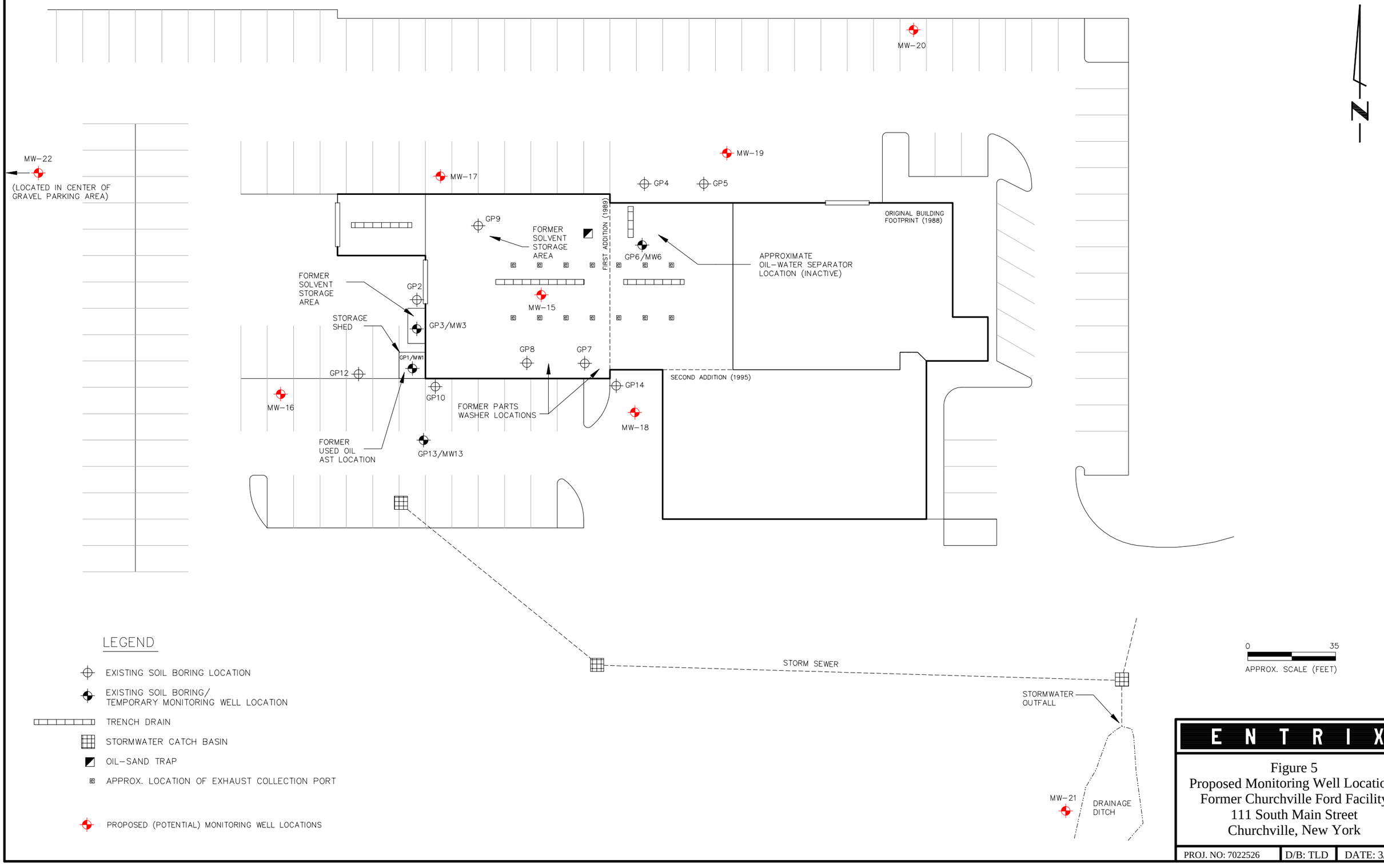
PROJ. NO: 7022526	D/B: TLD	DATE: 3/04



ENTRIX

Figure 4
Total Chlorinated Compounds 8/02
Former Churchville Ford Facility
111 South Main Street
Churchville, New York

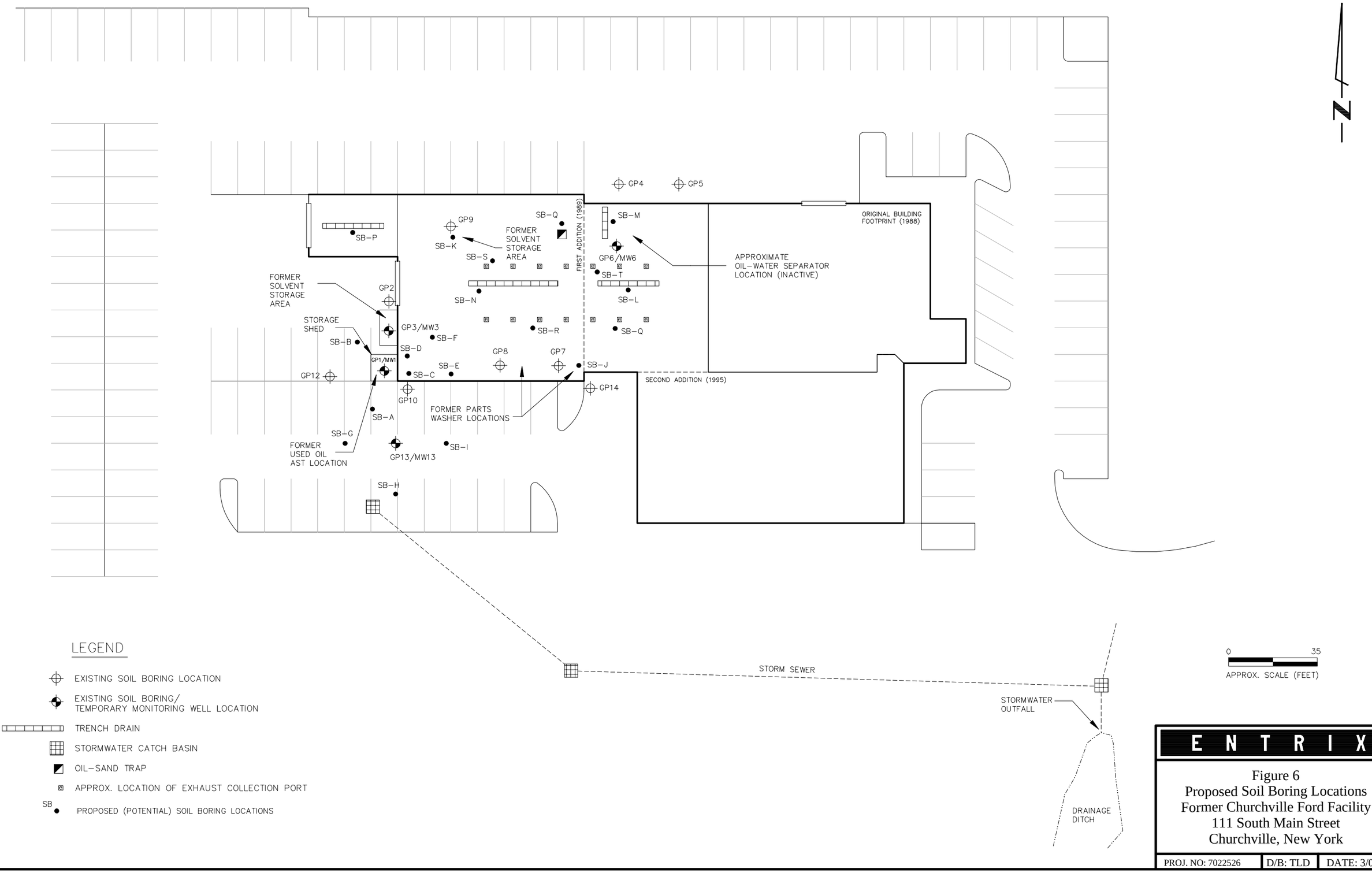
PROJ. NO: 7022526	D/B: TLD	DATE: 3/04



ENTRIX

Figure 5
Proposed Monitoring Well Locations
Former Churchville Ford Facility
111 South Main Street
Churchville, New York

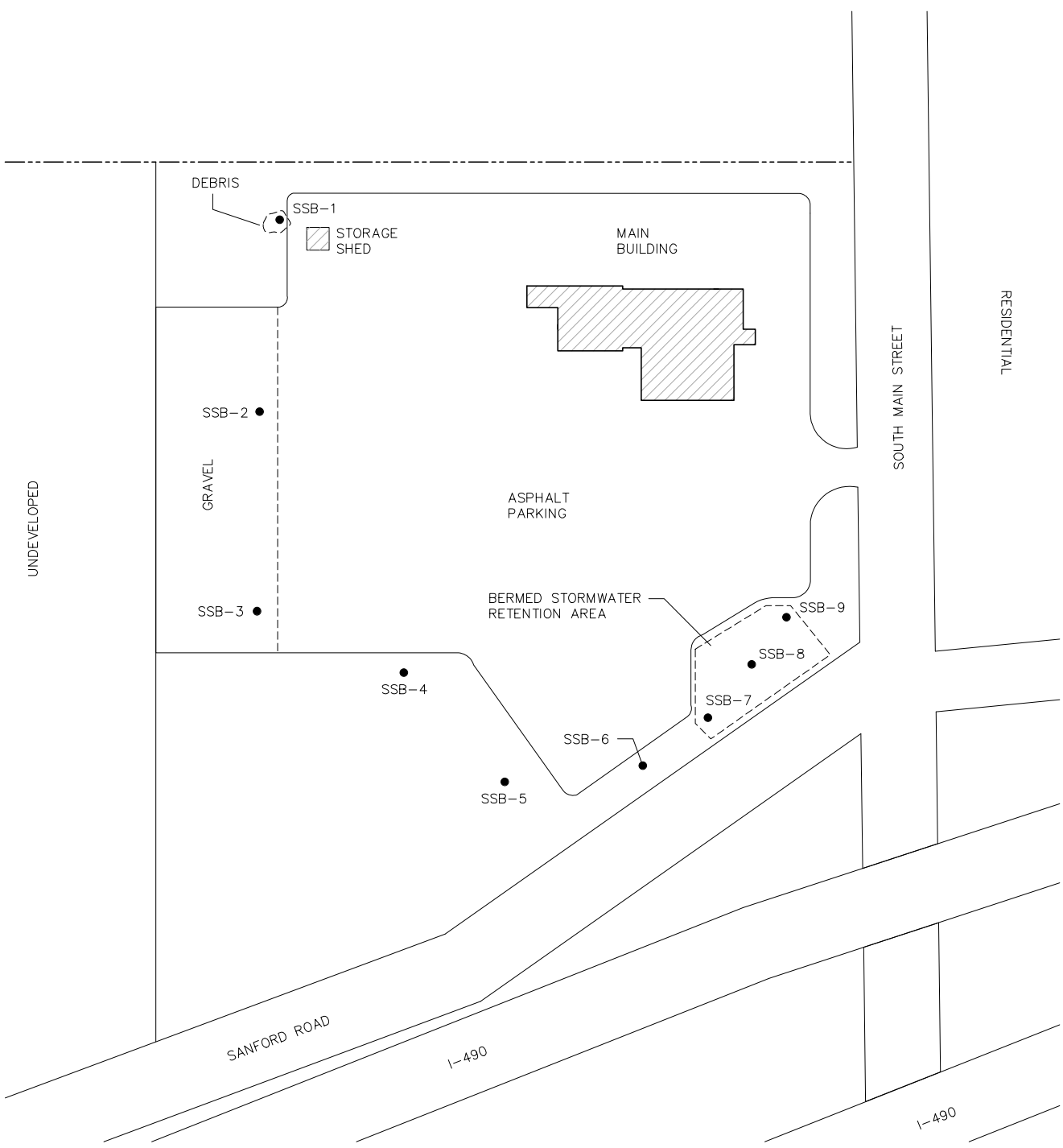
PROJ. NO: 7022526	D/B: TLD	DATE: 3/04



ENTRIX

Figure 6
Proposed Soil Boring Locations
Former Churchville Ford Facility
111 South Main Street
Churchville, New York

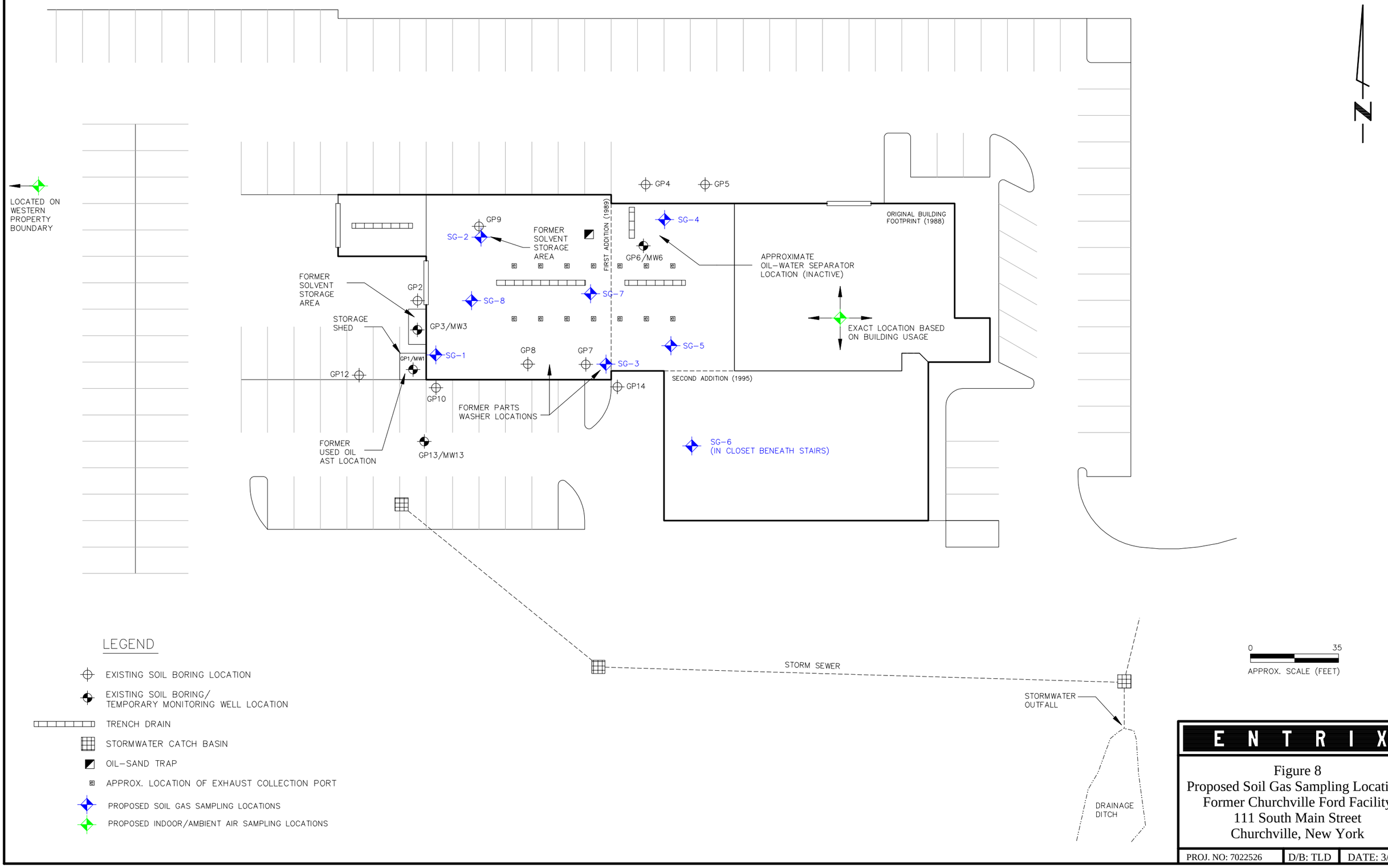
PROJ. NO: 7022526	D/B: TLD	DATE: 3/04



ENTRIX

Figure 7
Proposed Surficial Soil Boring Locations
Former Churchville Ford Facility
111 South Main Street
Churchville, New York

PROJ. NO: 7022526	D/B: TLD	DATE: 11/03



ENTRIX

Figure 8
Proposed Soil Gas Sampling Locations
Former Churchville Ford Facility
111 South Main Street
Churchville, New York

PROJ. NO: 7022526	D/B: TLD	DATE: 3/04

APPENDIX A

TABLES

Table 1
Historical Soil Analytical Results
Former Churchville Ford Site
111 South Main Street
Churchville, New York

Summary of Detected Compounds (8/7/02 and 8/8/02)

Compounds	GP-1 0 - 2' (ug/kg)	GP-3 4 - 6' (ug/kg)	GP-6 0 - 4' (ug/kg)	GP-8 0 - 4' (ug/kg)	GP-9 0 - 2' (ug/kg)	GP-10 4 - 6' (ug/kg)	GP-13 4 - 5' (ug/kg)
Volatile Halocarbons							
cis-1,2 dichloroethene	**162**	**250**	<8.91	**7.53**	<8.93	**136**	<6.41
tetrachloroethene	<152	**211**	**68.9**	<7.06	<8.93	**56.1**	<6.41
trichloroethene	<152	**260**	**9.12**	<7.06	<8.93	**10.0**	<6.41
Volatile Aromatics							
toluene	**381**	<7.96	<8.91	<7.06	<8.93	**129**	**6.70**
ethylbenzene	**186**	<7.96	<8.91	<7.06	<8.93	**60.4**	**8.37**
m,p xylene	**809**	<7.96	<8.91	<7.06	<8.93	**254**	**20.4**
o xylene	**527**	<7.96	<8.91	<7.06	<8.93	**188**	**20.4**
Ketones & Misc.							
Acetone	<758	<39.8	<44.5	<35.3	<44.7	**161**	**66.4**
Additional Compounds							
isopropylbenzene	<119	<10.2	<8.91	<7.06	<8.93	**10.2**	<6.41
n-propylbenzene	**123**	<10.2	<8.91	<7.06	<8.93	**42.7**	**8.01**
1,3,5-trimethylbenzene	**458**	<10.2	<8.91	<7.06	<8.93	**162**	**19.4**
1,2,4-trymethlybenzene	**1420**	<10.2	<8.91	<7.06	<8.93	**654**	**114**
p-isopropyltoluene	<119	<10.2	**17.0**	<7.06	<8.93	**31.5**	<6.41
naphthalene	**1010**	**40.8**	**22.3**	<17.7	<22.3	**336**	**39.7**
Semi-Volatile Compounds							
naphthalene	**1150**	<308	<316			**1160**	<309
fluoranthene	**468**	<308	<316			**933**	**518**
phenanthrene	**648**	<308	<316			**775**	<309
chrysene	<324	<308	<316			**396**	**426**
pyrene	**401**	<308	<316			**643**	**589**
benzo(b)fluoranthene	<324	<308	<316			<321	**489**
SVOC Tentatively Identified Compounds							
Total TICs	**29740**	**465**	**9568**			**32033**	0

Notes:
VOCs by EPA 8260
SVOCs + TICs by EPA 8270
Glycols by EPA 8015

Table 1B. Target Compound List, CAS Numbers, and Contract Required Quantitation Limits for VOCs by EPA Method TO-15

Analyte	CAS Number	MW	CRQL ppbv	CRQL ug/M3	CRQL ug/L	MDL ppbv	MDL ug/M3
Benzene	71-43-2	78.1	1.0	3.5	0.0035	0.2	0.7
Bromomethane	74-83-9	94.9	1.0	4.2	0.0042	0.2	0.8
Carbon Tetrachloride	56-23-5	153.8	1.0	6.9	0.0069	0.2	1.4
Chlorobenzene	108-90-7	112.6	1.0	5.0	0.0050	0.2	1.0
Chloroethane	75-00-3	64.5	1.0	2.9	0.0029	0.2	0.6
Chloroform	67-66-3	119.4	1.0	5.3	0.0053	0.2	1.1
Chloromethane	74-87-3	50.5	1.0	2.3	0.0023	0.2	0.5
1,1-Dichloroethane	75-34-3	99	1.0	4.4	0.0044	0.2	0.9
1,2-Dichloroethane	107-06-2	99	1.0	4.4	0.0044	0.2	0.9
1,1-Dichloroethene	75-35-4	96.9	1.0	4.3	0.0043	0.2	0.9
cis-1,2-Dichloroethene	156-59-2	96.9	1.0	4.3	0.0043	0.2	0.9
trans-1,2-Dichloroethene	156-60-5	96.9	1.0	4.3	0.0043	0.2	0.9
1,2-Dichloropropane	78-87-5	113	1.0	5.0	0.0050	0.2	1.0
cis-1,3-Dichloropropene	10061-01-5	111	1.0	5.0	0.0050	0.2	1.0
trans-1,3-Dichloropropene	10061-02-6	111	1.0	5.0	0.0050	0.2	1.0
Ethylbenzene	100-41-4	106.2	1.0	4.7	0.0047	0.2	0.9
Methylene Chloride	75-09-2	84.9	1.0	3.8	0.0038	0.2	0.8
Styrene	100-42-5	104.2	1.0	4.6	0.0046	0.2	0.9
1,1,2,2-Tetrachloroethane	79-34-5	167.9	1.0	7.5	0.0075	0.2	1.5
Tetrachloroethene	127-18-4	165.8	1.0	7.4	0.0074	0.2	1.5
Toluene	108-88-3	92.1	1.0	4.1	0.0041	0.2	0.8
1,1,1-Trichloroethane (TCA)	71-55-6	133.4	1.0	6.0	0.0060	0.2	1.2
1,1,2-Trichloroethane	79-00-5	133.4	1.0	6.0	0.0060	0.2	1.2
Trichloroethene (TCE)	79-01-6	131.4	1.0	5.9	0.0059	0.2	1.2
Vinyl Chloride	75-01-4	62.5	1.0	2.8	0.0028	0.2	0.6
p-Xylene & m- Xylene	106-42-3 & 108-38-3	106.2 106.2	2.0	9.5	0.0095	0.4	1.9
o-Xylene	95-47-6	106.2	1.0	4.7	0.0047	0.2	0.9

Table 2

Historical Groundwater Analytical Results
Former Churchville Ford Site
111 South Main Street
Churchville, New York

Summary of Detected Compounds (8/12/02)

Compounds	MW-1 (ug/kg)	MW-3 (ug/kg)	MW-6 (ug/kg)	MW-13 (ug/kg)
Volatile Halocarbons				
1,1-dichloroethane	**23.7**	<200	<2.00	<2.00
cis-1,2 dichloroethene	**366**	**8680**	**8.40**	**7.07**
tetrachloroethene	<4.00	**3370**	**47.7**	<2.00
1,1,1-trichloroethane	**6.94**	<200	<2.00	<2.00
trichloroethene	**38.8**	**5950**	**24.8**	<2.00
Volatile Aromatics				
benzene	**3.39**	<70.0	<0.700	<0.700
toluene	**24.4**	<200	<2.00	<2.00
m,p xylene	**16.6**	<200	<2.00	<2.00
o xylene	**23.1**	<200	<2.00	<2.00
Ketones & Misc.				
4-methyl-2-pentanone	**10.2**	<500	<5.00	<5.00
Additional Compounds				
methyl tert-butyl ether (MTBE)	**64.7**	**10.8**	<2.00	<2.00
1,3,5-trimethylbenzene	**6.71**	<2.00	<2.00	<2.00
1,2,4-trymethlybenzene	**17.1**	<2.00	<2.00	**5.43**
naphthalene	**24.3**	<5.00	<5.00	**7.06**

Notes:
VOCs by EPA 8260
SVOCs + TICs by EPA 8270
Glycols by EPA 8015

Table 3
Sampling Summary and QA/QC Sample Requirements
Former Churchville Ford Site
111 South Main Street
Churchville, New York

				QAQC Samples				
Soil Boring	**# Samples**	**Description**	**Analyses**	**Equipment/ Rinsate Blank**	**Field Blank**	**Field Duplicate**	**Matrix Spike/ Matrix Spike Duplicate**	**Trip Blank**
MW-3	2	Deepest and highest PID	EPA 8260 & 8270	1/day/ analysis*/ matrix or 10%	1/day/ analysis*/ matrix	1/week/ analysis*/ matrix or 10%	1/analysis* /matrix on first sampling day	1/ shipment (VOC's ONLY)
MW-16	1	At water table interface	TOC by EPA 415.1					
MW-1, MW-6, MW-13, MW-15 thru MW-22	0 to 22 based on field screening	Deepest and highest PID	EPA 8260 & 8270					
SB-A thru SB-K	9 to 11	Highest PID	EPA 8260 & 8270, TAL Metals					
SB-L thru SB-T	9	6-inches below drain or exhaust port	EPA 8260 & 8270, TAL Metals					
SSB-1 thru SSB-9	9	2-inches below vegetative cover	EPA 8260 & 8270, TAL Metals					
Monitoring Well								
MW-1, MW-3, MW-6, MW-13, MW-15 thru MW-22	12 or more	Groundwater Sample	EPA 8260 & 8270	1/day/ analysis/ matrix or 10%	1/day/ analysis/ matrix	1/week/ analysis/ matrix or 10%	1/analysis /matrix on first sampling day	

*Except for TOC

APPENDIX B

PERSONNEL RESUMES

E N T R I X

STEPHEN J. TOBIN

environmental monitoring
environmental site assessments
site geology
compliance auditing
project management
insurance surveys
site remediation
underground storage tank removal and closure
superfund sampling
permitting
site closure
oil spill response

EDUCATION

University of New Hampshire, B.S., Water Resources Management, 1997

PROFESSIONAL HISTORY

ENTRIX, Inc., *Boston, Massachusetts / Dearborn, Michigan / Wilmington, Delaware*, 1997 to present

REPRESENTATIVE EXPERIENCE

Mr. Tobin has successfully managed projects ranging from $2,000 to $200,000. Mr. Tobin's experience includes project management of due diligence activities including Phase I, Phase II, Phase III, inground hydraulic hoist removals, UST removals, soil remediation and non-domestic wastewater system inspections and repairs. Mr. Tobin's responsibilities in managing projects have included coordination with clients, negotiating contracts and coordination of subcontractors, development and tracking of budgets and schedules, and managing the work of in-house staff members. Mr. Tobin has also participated in other areas such as performing compliance and insurance surveys for major environmental insurance companies, assisted in preparing third-party Environmental Impact Statements (EISs) and assisting in Superfund Site sampling.

PROJECT EXPERIENCE

Buzzards Bay Oil Spill, Buzzards Bay, MA – Performed surface water sampling, sediment sampling, shellfish sampling.

Greenbrier Pipeline Project, WV, VA and NC – Physical science team member for a FERC third-party EIS. The project, which consists of a 280-mile natural gas pipeline system and 2 compressor stations, was the first to formally use the FERC pre-filing process through the Draft EIS.

Tractebel Pipeline Project, FL – Physical science team member for a FERC third-party EIS. The project consists of a 42-mile natural gas pipeline system with approximately 36-miles of the pipeline system located offshore and approximately 6-miles of the pipeline located onshore.

Raytheon Sediment Sampling Project, Wayland, MA – Assisted another environmental consultant during sediment sampling for dioxin analysis in wetland sediments.

Texas Eastern Pipeline Remediation Project, Seymour, IN – Field team manager for quarterly groundwater sampling and remediation system maintenance. Remediation system consists of air sparging and soil vapor extraction as well as recovery pumps for pumping and treating groundwater.

STEPHEN J. TOBIN

Confidential Client / Superfund Site Sampling, Passaic River, NJ – River crew manager for surface water and sediment sampling along the Passaic River. Sampling included surface water, sediment, crabs and fish (gill-netting).

Tasca Volvo, Seekonk, MA – Project manager for release reported under the Massachusetts Contingency Plan (MCP). Project included preparing a Phase I – Initial Site Investigation Report and Tier Classification Submittal and Method 2 Risk Assessment in order to prepare a Response Action Outcome (RAO) Statement and Report to document that a Class B RAO (Permanent Solution without remedial actions) has been achieved at the site.

Regan & Stapleton Lincoln Mercury, Wellesley, MA – Project manager for release reported under the Massachusetts Contingency Plan (MCP). Project included preparing a Phase I – Initial Site Investigation Report, Release Abatement Measure (RAM) Plan and a Response Action Outcome (RAO) Statement and Report to document that a Class A RAO (Permanent Solution with remedial actions) has been achieved at the site.

Ford Motor Company, Dearborn, MI – Contracted to Ford as a Project Manager for over 150 Ford and Lincoln Mercury automobile dealerships located throughout the United States and Canada. Managed due diligence activities at each dealership including Phase Is, Phase IIs, inground hydraulic hoist removals, UST removals, soil remediation and non-domestic wastewater system inspections and repairs. Managed environmental consultants and construction subcontractors while assisting Ford's real estate department and Office of General Council facilitate real estate transactions.

Various Sites throughout United States – Project manager for over 300 projects that included scopes-of- work ranging from performing and preparing Phase I – Environmental Site assessments, Spill Prevention Control and Countermeasure (SPCC) plans, Phase II and Phase III Environmental Site Assessments (soil and groundwater sampling, remedial investigations and remedial actions).

CERTIFICATIONS/AFFILIATIONS

New Jersey Department of Environmental Protection UST Closure Certification (License No. 0024785)
New Jersey Department of Environmental Protection Subsurface Evaluation Cert. (License No. 0024785)
Massachusetts Licensed Site Professionals Association (Non-LSP – Associate Member)
OSHA 40-hour hazardous materials safety training
OSHA 8-hour supervisor training
American Red Cross – Standard First Aid / Adult CPR

E N T R I X

PHILIP T. STEFFAN

environmental chemistry
chemical exposure, fate, and transport assessments
chemical fingerprinting and source allocation
field and laboratory techniques
data validation

EDUCATION

Old Dominion University, Norfolk, Virginia, Chemical Oceanography, M.S., 2000
Millersville University, Millersville, Pennsylvania, Chemical Oceanography, B.S., 1999

PROFESSIONAL HISTORY

ENTRIX, Inc., Staff Scientist, 2001 to present
Old Dominion University, Research Assistant, 2000
Old Dominion University, Teacher's Assistant, 1999 – 2000

REPRESENTATIVE EXPERIENCE

Mr. Steffan possess the knowledge of proper laboratory analyses and reporting requirements to meet project and client needs. He has developed a close working relationship with several nationally accredited laboratories monitoring the analysis, progress, and quality of environmental samples validating data packages as a final quality assurance/control measure.

Mr. Steffan has supported field and laboratory investigations and litigation studies with extensive experience in the analyses, exposure, and fate of organic and inorganic pollutants in aquatic and terrestrial environments. Also, he is proficient in the application of advanced environmental chemical fingerprinting forensic analytical and statistical interpretative techniques including multivariate analysis, such as principal component analysis and hierarchical component analysis, and source identification resolving allocation issues in environmental risk and cleanup cases.

Mr. Steffan has assisted in the preparation of several business development proposals and reports including data summary reports, quality assurance project plans, and human and ecological health risk evaluations meeting the satisfaction and needs of the client. This includes the development of sediment quality criteria as a human health risk management tool for a refinery in a Central American country in which no guidelines or standards had been previously established by the government. Also, he has recently aided in the research and writing of a National Pollutant Discharge Elimination System (NPDES) permit for a large power company.

Mr. Steffan has conducted multimedia sampling ensuring that proper quality assurance/control requirements were achieved. In addition, he has directed management and oversight of a field laboratory for a large petroleum refinery where an acid spill had contaminated surrounding soil and groundwater as required under a Response Action Plan (RAP) by the USEPA. He has participated in oil spill emergency responses working in conjunction with many state and federal officials.

CERTIFICATIONS

OSHA 40-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER) Training
American Red Cross CPR and First Aid Certification

AFFILIATIONS

American Chemical Society (ACS)
Air & Waste Management Association (A&WMA)

CURRICULUM VITAE

Timothy L. Douthit, PG
In Aqua Veritas, LLC
850 Mt. Pleasant Avenue
Ann Arbor, Michigan 48103
Phone: (734) 302-0081
email: tdouthit@iavmail.com

EDUCATION

State University of New York at Stony Brook — *Stony Brook, New York*
Master of Science degree, Geochemistry, 1990
Thesis: "A Geochemical Analysis of the Irish Waulsortian Limestone: Implications for the Strontium Isotopic Composition of Lower Carboniferous Seawater".

University of Michigan — *Ann Arbor, Michigan*
Bachelor of Science degree, Geology, 1984

EMPLOYMENT HISTORY

In Aqua Veritas, LLC, Ann Arbor, Michigan — *Sep. 2001 – Present*
Director of Technical Services

Handex of Michigan, Wixom, Michigan — *Sep. 2000 – Jul. 2002*
Handex of New York, Farmingdale, New York — *Sep. 1998 – Sep. 2000*
Director of Applied Sciences;
Corporate Regional and Marketing Technical Support

Land Tech Remedial, Inc., Farmingdale, New York — *Dec. 1993 – Sep. 1998*
Regional Manager;
Technical Oversight and Advisory Division (chair);
Vice President

Groundwater Technology, Inc., Holbrook, New York — *Nov. 1991 – Dec. 1993*
Hydrogeologist;
Remediation Specialist

RELEVANT EXPERIENCE

As manager of Land Tech Remedial, Inc.'s Farmingdale, New York office since December, 1993, and as Director of Applied Sciences with Handex since their acquisition of Land Tech Remedial, Inc. in September, 1998, Mr. Douthit has been directly involved in all aspects of petrochemical release management, including assessment, remediation system feasibility testing and

implementation, regulatory negotiation and closure. For In Aqua Veritas, LLC, Mr. Douthit is primarily responsible for management and implementation of the technical aspects of the company's environmental fate and transport modeling, risk-based corrective action and natural attenuation services. To that end, recent projects include the regulatory advocacy and application of risk-based corrective action (RBCA) in several states, refinement of air sparging techniques, risk assessment utilizing computer-based dissolved-phase contaminant fate, transport and 3-D visualization modeling, co-producing guidance documents on field analytical methods for the American Petroleum Institute (API), and protocol development for field documentation of in-situ, intrinsic bioremediation at petrochemical release sites for a major oil company. Additional activities include the development, calibration and implementation of proprietary computer software for the application of Domenico (1987), Baetsle (1969) and Johnson and Ettinger (1991) contaminant fate-and-transport equations. A primary focus of these applications is the better understanding and quantification of indoor air exposure scenarios. Mr. Douthit has been a member of the New York State Department of Environmental Conservation (NYSDEC) Risk-Based Corrective Action Advisory Group, the American Society for Testing and Materials (ASTM) Task Group on Remediation by Natural Attenuation (RNA), and was a co-author of the ASTM Standard Guide for Remediation by Natural Attenuation at Petroleum Release Sites (E-1943).

COMPUTER MODELING EXPERIENCE

Visual Modflow/MT3D	3-D Numerical flow and transport model
WinFlow/WinTrans	2-D Analytical flow with numerical transport model
BioPlume II	2-D Numerical fate and transport model with oxygen-limited biodegradation simulation
BioScreen	EPA endorsed treatment of Domenico's (1987) equation for transport evaluations
API DSS	Linked soil leaching model(s) to 3-D analytical transport model and air exposure model(s)
RBCA Toolkit	Domenico (1987) based exposure assessment model
Fate5	Domenico (1987) based natural attenuation calibration model
Visual Groundwater	3-D data visualization model (w/Modflow/MT3D interface)
Surfer	Pseudo 3-D data visualization tool

PUBLICATIONS

Douthit, T.L., Kramer, W.H. and Marr, T.J. (2002) The Importance of Acid Hydrolysis of MTBE to TBA in Properly Handled Groundwater Samples. Proceedings, NGWA Conference, Petroleum Hydrocarbons and Organic Chemicals in Groundwater: Prevention, Assessment and Remediation, Atlanta, Georgia, Nov. 6 – Nov. 8, 2002.

Douthit, T.L., Novick, N.J., Payne, R.E., Malander, M.W. and Taylor, M.B. (1996) Evaluation of Intrinsic Bioremediation in Support of Risk-Based Corrective Action: Data from a New York Remediation by Natural Attenuation Demonstration Site. Proceedings, NGWA

Conference, Petroleum Hydrocarbons and Organic Chemicals in Groundwater: Prevention, Detection and Restoration, Houston, Texas, Nov. 13 – Nov. 15, 1996.

Douthit, T.L., Meyers, W.J. and Hanson, G.N. (1993) Non-monotonic variation of seawater $^{87}Sr/^{86}Sr$ across the Ivorian/Chadian boundary (Mississippian, Osagean): Evidence from marine cements within the Irish Waulsortian Limestone. Journal of Sedimentary Petrology, Vol. 63, No. 3, p. 139 -149.

Douthit, T.L., Meyers, W.J. and Hanson, G.N. (1990) Structure in the secular variation of seawater $^{87}Sr/^{86}Sr$ for the Ivorian/Chadian (Osagean, lower Carboniferous) (Abs.). 13th International Sedimentological Congress, Nottingham, England. Abstracts of Papers, p. 139.

Marr, T.J., Sherding, W. and Douthit, T.L. (2003) The Relevance of MTBE Acid Hydrolysis to TBA Under Standard and Heated-Purge Analytical Methods. Proceedings, NGWA Conference, Petroleum Hydrocarbons and Organic Chemicals in Groundwater: Prevention, Assessment and Remediation, Costa Mesa, California, August 20 – 22, 2003.

Kramer, W.H. and Douthit, T.L. (2000) Water Soluble Phase Oxygenates in Gasoline From Five New Jersey Service Stations. Proceedings, NGWA Conference, Petroleum Hydrocarbons and Organic Chemicals in Groundwater: Prevention, Detection and Restoration, Anaheim, California, November 15 – November 17, 2000.

Clark, T.R., Staudt, W.J., and Douthit, T.L. (1998) Selecting Field Analytical Methods: A Decision Tree Approach. American Petroleum Institute Publication No. 4670, API Publishing Services, Washington, DC.

Payne, R.E., Novick, N.J., Douthit, T.L., Brown, J.A., and Anderson, D.N. (1995) An evaluation of field methods for measuring indicators of intrinsic bioremediation of petroleum hydrocarbons in groundwater. Proceedings, NGWA Conference, Petroleum Hydrocarbons and Organic Chemicals in Groundwater: Prevention, Detection and Restoration, Houston, Texas, November 28 - December 1, 1995.

Novick, N.J., Payne, R.E., and Douthit, T.L. (1995) A practical approach for evaluating intrinsic bioremedation of petroleum hydrocarbons in groundwater. Proceedings, NGWA Conference, Petroleum Hydrocarbons and Organic Chemicals in Groundwater: Prevention, Detection and Restoration, Houston, Texas, November 28 - December 1, 1995.

Novick, N.J., Payne, R.E., and Douthit, T.L. (1995) Evaluating intrinsic bioremediation of petroleum hydrocarbons at service station sites. Annual American Chemical Society, Industrial and Engineering Chemistry Session, Special Symposium on Emerging Technologies in Hazardous Waste Management, Atlanta, Georgia, September 17 - September 20, 1995.

Schoonen, M.A.A. and Douthit, T.L. (1992) Experimental determination of the solubility product of dolomite (abs.). Goldschmidt Conference, May 8 - 10, 1992.

APPENDIX C

STANDARD OPERATING PROCEDURES (SOPs)

3.0 DRILLING METHODS CHECKLIST

This checklist (SOP 3.0) is intended as a reference for use in the office and in the field. However, no sampling should be conducted without first creating a site-specific Site Investigation Work Plan (SIWP). Any deviations from the SOP must be explicitly stated in the site-specific SIWP. All field activities should conform to approved Occupational Safety and Health Act (OSHA) regulations.

____ Prior to going into the field, complete the following activities:

- ____ Prepare SIWP which includes drilling methods, samples, etc.
- ____ Ensure that all permits, approvals, consent agreements, and written access agreements are obtained.
- ____ Schedule all drilling rigs and other subcontractors.
- ____ Obtain written permission from the landowner to remove brush or other surface obstructions that may impede access to the work site.
- ____ Have all work-site preparations completed before drilling begins. These include removing brush or other surface obstructions, staking the boring locations, and locating utilities and other subsurface structures.

____ While in the field, complete the following activities:

- ____ Ensure that all drilling operations are carried out as specified in the SIWP, unless field conditions warrant modification, i.e., refusal, accessibility, etc. Any modifications must be noted in the log.
- ____ Ensure that all samples are taken as specified in the appropriate SOPs and the samples are handled as specified in SOP 23.0.
- ____ Ensure that daily documentation is completed as detailed in SOP 24.0.
- ____ Ensure that all investigation-derived waste is contained, stored, and disposed of properly (See SOP 21.0).
- ____ Ensure that all equipment is decontaminated as needed (See SOP 20.0).
- ____ Ensure that all solids and liquids generated during decontamination are contained, stored, and disposed of properly (See SOP 21.0).
- ____ Ensure that all boreholes/monitoring wells are completed or abandoned properly, as specified in SOPs 9.0 and 11.0.
- ____ Make sure that the all borings are properly marked and that the survey stake is put back in place.
- ____ Restore the site to pre-drilling conditions, as practical.
- ____ Record all final construction details or boring abandonment information as specified in SOPs 9.0 and 11.0.

All steps must be included to comply with the SOP. In order to ensure that all steps are completed, a check (√) may be placed in the space by each step as it is completed.

5.0 HAND AUGERING CHECKLIST

This checklist (SOP 5.0) is intended as a reference for use in the field. However, no sampling should be conducted without first creating a site-specific SIWP. Any deviations from the SOP must be explicitly stated in the site-specific SIWP. All field activities should conform to approved Occupational Safety and Health Act (OSHA) regulations.

____ Decontaminate all equipment to be used during augering with liquinox or equivalent and rinse with distilled water (See SOP 20.0).

____ Assemble the hand auger according to manufacturer's specifications.

____ Go to the sample location, designated by a stake labeled with the surface soil sample number.

____ Remove surficial material (i.e., debris, rocks, wood, etc.) from the area to be sampled.

____ Press down and turn on the auger, digging down 6 to 12 inches.

____ Lift the auger out of the hole and remove the soil from the bucket.

____ Properly contain and store soil cuttings as they are removed from the borehole.

____ Dispose of the soil in drums as discussed in SOP 21.0.

____ Repeat the previous two steps, adding additional shaft sections as needed, until the required depth is reached.

____ Containerize the sample in appropriate jars.

____ Record sample collection information and observations in a field logbook (See SOP 24.0) and complete the required information on the sample jar label (See SOP 23.0).

____ Replace native material in sample hole.

____ Use surveyor's stakes or flags to mark the sampling location clearly to ensure that the surveyors can locate and identify it easily.

____ Repeat the preceding steps until all locations have been augered.

____ All samples will be stored in a cooler at 4 °C until they are shipped under chain-of custody to the laboratory for analysis (See SOP 23.0).

All steps must be included to comply with the SOP. In order to ensure that all steps are completed, a check (√) may be placed in the space by each step as it is completed.

6.0 LITHOLOGIC LOGGING CHECKLIST

This checklist (SOP 6.0) is intended as a reference for use in the field. However, no sampling should be conducted without first creating a site-specific SIWP. Any deviations from the SOP must be explicitly stated in the site-specific SIWP. All field activities should conform to approved Occupational Safety and Health Act (OSHA) regulations.

____ Complete a continuous lithologic log of all boreholes and monitoring wells.

____ Identify the predominant particle size and range of sizes.

____ Determine the percent of gravel, sand, fines, or all three.

____ Describe the grading/sorting of coarse particles, as applicable.

____ Describe the shape and angularity of the particles.

____ Describe the predominant color of the interval.

____ Evaluate the moisture content of the interval.

____ Use the Unified Soil Classification System (USCS) to identify the soil type.

____ Record this information on the boring log for the borehole/monitoring well.

____ Repeat the preceding steps for all intervals in a borehole/monitoring well.

____ Record the following additional information, as applicable:

- ____ Starting and ending time of well or boring;
- ____ Depth to the water table, first encountered groundwater, and potentiometric level after 12 hours;
- ____ Caving or sloughing of the borehole;
- ____ Changes in drilling rate;
- ____ Depths of samples collected for laboratory analysis;
- ____ Presence of organic material, whether natural or anthropogenic;
- ____ Any other noteworthy observations or conditions, such as location of geologic boundaries, joints or faults in consolidated materials, etc.

____ Repeat the preceding steps for all boreholes/monitoring wells onsite.

All steps must be included to comply with the SOP. In order to ensure that all steps are completed, a check (√) may be placed in the space by each step as it is completed.

6.1 SOIL FIELD SCREENING CHECKLIST

This checklist (SOP 6.1) is intended as a reference for use in the field. However, no sampling should be conducted without first creating a site-specific SIWP. Any deviations from the SOP must be explicitly stated in the site-specific SIWP. All field activities should conform to approved Occupational Safety and Health Act (OSHA) regulations.

____ Complete the lithologic logging of the soil sample per SOP 6.0.

____ Immediately following the opening of the split-spoon, place representative aliquot of collected soil sample in a heavy-duty, quart size Ziploc freezer bag for screening.

____ Label freezer bag with sample identification information per SOP 23.0 using an indelible marker.

____ Carefully open a small aperture in the Ziploc bag and insert a calibrated OVA into the opening. Make sure that the tip of the OVA does not come into contact with the soil sample itself. In cool weather, the freezer bag may need to be heated prior to screening with the OVA.

____ Record the maximum OVA reading (see SOP 24.0).

____ Squeeze excess headspace air out of the Ziploc bag and reseal.

____ Select samples for laboratory analyses according to the SIWP immediately after the completion of each soil boring. Collect the most impacted soil sample (based on screening) directly from sampling device. Transfer the selected samples to proper laboratory supplied sample containers and store accordingly (see SOP 23.0). Do not use soil collected for screening purposes from heavy-duty, quart-size Ziploc freezer bag as selected sample.

____ Dispose of unused soil samples according to SOP 21.0.

All steps must be included to comply with the SOP. In order to ensure that all steps are completed, a check (√) may be placed in the space by each step as it is completed.

7.0 Reporting and Schedule

The following outlines the primary milestones associated with the management of environmental conditions at the Site. These milestones assume an effective date of the Voluntary Cleanup Agreement (VCA) of October 9th, 2003.

VCA Effective Date	10/9/03
Investigation Work Plan Submittal Date	11/18/03 (40 calendar days following VCA effective date)
Community Notification: • Site activity fact sheet will be sent by regular mail to mailing list generated by the NYSDEC.	Completed by the NYSDEC with the Volunteer providing support upon request.
Initiation of **Phase I SI** of Field Investigation Work: • Re-installation of MW-1, MW-3, MW-6, MW-13; Installation of MW-21 and MW-22. o Soil boring at MW-3 location. • Survey, gauge and sample MW-1, MW-3, MW-6, MW-13, MW-21 and MW-22. • Shallow soil borings SSB-1 through SSB-9. • Subsurface soil borings SB-A through SB-T. • Soil gas sampling at locations SG-1 through SG-8; Ambient and indoor air sampling.	*Phase I SI field work will begin within 60 days of NYSDEC approval of Investigation Work Plan.*
Submittal of Subsequent Work Plans, if necessary.	Within 60 days of receipt of complete laboratory analytical results from Phase I.
Initiation of **Phase II SI** of Field Investigation Work: • Installation of MW-15 through MW-20. o Soil boring at MW-16 location. • Survey, gauge and sample MW-15 through MW-20. • Slug testing at MW-15 through MW-19.	*Phase II SI field work will begin within 60 days of receipt of complete laboratory analytical results from Phase I SI activities or within 60 days of receipt of complete laboratory analytical results from subsequent Work Plans that may be submitted following Phase I SI..*
Progress Report submittals, which will include: • All actions relative to the Site during the previous reporting period and those anticipated for the next reporting period. • All approved activity modifications. • All results of sampling and tests and all other data received or generated by or on behalf of the Volunteer in connection with the Site.	Progress reports will be submitted to the NYSDEC on or before the 10th of each month beginning the month following approval of the Investigation Work Plan and ending with the Site's termination date.
Submittal of Investigation Final Report	Within 90 days of receipt of complete laboratory analytical results from Phase II SI activities.

9.0 MONITORING WELL CONSTRUCTION (UPPERMOST WATER-BEARING ZONE) CHECKLIST

This checklist (SOP 9.0) is intended as a reference for use in the field. However, no wells should be installed without first creating a site-specific SIWP. Any deviations from the SOP must be explicitly stated in the site-specific SIWP. Any wells to be screened in a deeper interval should be proposed on a site-specific basis in the SIWP. All field activities should conform to approved Occupational Safety and Health Act (OSHA) regulations.

____ Notify utility locating service at least 72 hours prior to drilling boreholes.

____ Use only pipe and screen that are delivered to site pre-cleaned and sealed in plastic bags.

____ Drill to required total depth following the sample collection and lithologic logging SOPs 7.0/8.0 and 6.0.

____ Assemble the risers and screen to be used in the monitoring well, using clean gloves when handling all well materials.

____ Install the risers and screen in the monitoring well with at least 3 feet of screen above the groundwater table.

____ Install the sand pack at the base of the monitoring well above the screened interval to a height of 2 feet for shallow wells and 5 feet for deep wells.

____ Place a bentonite seal two feet above the sand pack.

____ Install the annular well seal (cement-bentonite or bentonite grout) from the top of the bentonite seal to 5 feet below the ground surface. The grout should be mixed so that it is as thick as pumpable and should be tremied into the hole.

____ Allow 12 hours from placement of the bentonite seal and annular well seal prior to placing the surface seal.

____ Use cement grout for the surface seal. The grout should be mixed so that it is as thick as pumpable and should be tremied into the hole.

____ Place protective casing around the monitor well, a locking cap, and a concrete pad sloped away for drainage.

____ Record construction information and observations, including the amount of sand pack cement, bentonite, and water used to mix grout in a field logbook to be included with the well log (See SOP 24.0).

____ Use surveyor's stakes or flags to mark the monitoring well clearly to ensure that the surveyors can locate and identify it easily.

____ Repeat the preceding steps for all monitoring wells onsite.

All steps must be included to comply with the SOP. In order to ensure that all steps are completed, a check (√) may be placed in the space by each step as it is completed.

10.0 MONITORING WELL DEVELOPMENT CHECKLIST

This checklist (SOP 10.0) is intended as a reference for use in the field. However, no wells should be installed and developed without first creating a site-specific SIWP. Any deviations from the SOP must be explicitly stated in the site-specific SIWP. All field activities should conform to approved Occupational Safety and Health Act (OSHA) regulations.

____ Develop the monitoring well no sooner than 24 hours after construction is completed per SOP 9.0.

____ Decontaminate all equipment to be used during development with liquinox or equivalent and rinse with distilled water (See SOP 20.0).

____ Handle all downhole equipment with clean rubber gloves.

____ Open the locking cap and take a breathing zone measurement to ensure that VOCs are within acceptable limits as established in the site-specific Health and Safety Plan.

____ Allow well casing volume to equilibrate with atmospheric pressure and water level to stabilize at static level.

____ Measure and record the depth to water and the total depth of the monitoring well per SOP 14.0.

____ Measure the temperature, specific conductance, and pH of groundwater during development of wells to ensure that an adequate volume has been removed. Remove groundwater from the well until temperature, specific conductance, and pH of groundwater stabilize, turbidity is less than 50 NTU or least ten well volumes have been removed.

____ Containerize all groundwater in properly labeled drums for disposal per SOP 21.0.

____ Record all information and observations in a field logbook (See SOP 24.0).

____ Repeat the preceding steps for all monitoring wells onsite.

All steps must be included to comply with the SOP. In order to ensure that all steps are completed, a check (√) may be placed in the space by each step as it is completed.

11.0 MONITORING WELL AND BOREHOLE ABANDONMENT CHECKLIST

This checklist (SOP 11.0) is intended as a reference for use in the field. However, no abandonment should be conducted without first creating a site-specific SIWP. Any deviations from the SOP must be explicitly stated in the site-specific SIWP. All field activities should conform to approved Occupational Safety and Health Act (OSHA) regulations.

____ Notify any relevant regulatory agencies per their requirements that monitoring wells will be abandoned prior to commencing fieldwork.

____ Monitoring well specific requirements:

- ____ Investigate the monitoring well to determine its condition and the details of its construction. This will include determining if the well is in bedrock or only in overburden, if the overburden is contaminated and whether or not a confining layer is present.
- ____ Ensure that a plan is in place to properly dispose of any well materials that have been exposed to contamination.
- ____ Sound the well immediately before plugging and abandonment (P&A) to ensure that no obstructions are present.
- ____ Choose one of the methods to P&A the well based on the information from the investigation of the monitoring well condition:
  - ____ Over-reaming with a hollow-stem auger, removing all material within the original well, and filling the entire hole with grout; or
  - ____ Leaving the casing in place, pumping in sealing material under pressure to fill the hole, and cutting the casing at the surface.
- ____ Plug the well with bentonite, cement, or equivalent grout using a tremie pipe in one continuous pour. For wells of depth greater than 40 feet, grout must be pumped under pressure.

____ Borehole specific requirements:

- ____ Inspect the borehole prior to filling and sealing to ensure that no obstructions are present.
- ____ Fill completely with bentonite, cement or equivalent grout using a tremie pipe in one continuous pour. For boreholes of depth greater than 40 feet, grout must be pumped under pressure.

____ Repeat the preceding steps for all monitoring wells and boreholes to be abandoned.

____ Record abandonment information and observations in a field logbook (See SOP 24.0).

____ Document abandonment of monitoring wells and boreholes and provide such documentation to regulatory agencies, as required.

All steps must be included to comply with the SOP. In order to ensure that all steps are completed, a check (√) may be placed in the space by each step as it is completed.

13.0 GROUNDWATER (MONITORING WELL) SAMPLING CHECKLIST

This checklist (SOP 13.0) is intended as a reference for use in the field. However, no sampling should be conducted without first creating a site-specific SIWP. Any deviations from the SOP must be explicitly stated in the site-specific SIWP. All field activities should conform to approved Occupational Safety and Health Act (OSHA) regulations.

____ Collect groundwater samples within 30 days of the monitoring well being developed per SOP 10.0. At a minimum, allow the well to set for at least seven days bewteen development and sampling.

____ Decontaminate all equipment to be used during sampling with liquinox or equivalent and rinse with distilled water (See SOP 20.0).

____ Handle all downhole equipment, sampling equipment, and sample jars with clean rubber gloves.

____ Remove locking well and well casing cap. Record location, date, and time.

____ Monitor the headspace of the well with a photoionization detector (PID) to ensure that VOCs remain within acceptable limits (See SOP 22.0).

____ Allow well to remain open and water levels to equilibrate with atmospheric pressure until static water levels are achieved.

____ Measure fluid levels in the well per SOP 14.0.

____ Purge the lesser of three well volumes or until the pH stabilizes to within ± 0.25 units, the temperature stabilizes to within ± 1°C, and the specific conductance stabilizes to within ± 10% with a disposable bailer or decontaminated submersible pump.

____ Containerize all groundwater in drums for proper disposal per SOP 21.0.

____ Collect the sample with a disposable bailer. If VOCs are to be sampled, a low flow sampling pump (bladder pump) and teflon tubing shall be used. Care must be taken to regulate the flow rate of the pump during sample collection to avoid surging caused by cycling within the pump.

____ Complete the required information on the sample jar labels (See SOP 23.0).

____ Repeat the preceding steps for all monitoring wells and boreholes onsite.

____ Record sample collection information and observations in a field logbook (See SOP 24.0).

____ All samples will be stored in a cooler at 4 °C until they are shipped under chain-of custody to the laboratory for analysis (See SOP 23.0).

All steps must be included to comply with the SOP. In order to ensure that all steps are completed, a check (√) may be placed in the space by each step as it is completed.

14.0 GROUNDWATER LEVEL MEASUREMENT CHECKLIST

This checklist (SOP 14.0) is intended as a reference for use in the field. However, no measurement should be taken without first creating a site-specific SIWP. Any deviations from the SOP must be explicitly stated in the site-specific SIWP. All field activities should conform to approved Occupational Safety and Health Act (OSHA) regulations.

____ Decontaminate all equipment with liquinox or equivalent and rinse with distilled water (See SOP 20.0).

____ Handle all downhole equipment with clean rubber gloves.

____ Remove locking well and well casing cap. Record well identification number, location, date, and time.

____ Monitor the headspace of the well with a photoionization detector (PID) to ensure that VOCs remain within acceptable limits (See SOP 22.0).

____ Allow well to remain open and water levels to equilibrate with atmospheric pressure until static water levels are achieved.

____ Make a groove cut with a file on the casing as a survey mark. Measure the distance from the ground surface to the groove cut in order to tie water levels to ground surface. Survey groove cut relative to site specific assumed or actual elevation. Record for all future measurements.

____ Slowly lower the water level measuring device or equivalent into the well until the liquid surface is encountered. If NAPL is suspected to be present, use an oil/water interface probe for measurements.

____ Record the distance from the liquid surface to the survey mark on the well casing. Measure the distance at least twice.

____ If NAPL is present, use an oil/water interface probe to measure the depth to both the NAPL and the groundwater surface in order to obtain the NAPL thickness.

____ Remove all non-dedicated downhole equipment. Replace the well casing cap and locking steel cap.

____ Record sample collection information and observations in a field logbook (See SOP 24.0).

____ Repeat the preceding steps for all wells.

All steps must be included to comply with the SOP. In order to ensure that all steps are completed, a check (√) may be placed in the space by each step as it is completed.

16.0 SLUG TEST CHECKLIST

This checklist (SOP 16.0) is intended as a reference for use in the field. However, no aquifer tests should be conducted without first creating a site-specific SIWP. Any deviations from the SOP must be explicitly stated in the site-specific SIWP. All field activities should conform to approved Occupational Safety and Health Act (OSHA) regulations.

____ Enter the information required by the electronic data logger, which may vary based on manufacturer's specifications and site-specific conditions.

____ Consult the Pressure Transducer Checklist to calibrate this piece of equipment.

____ Decontaminate all equipment to be used during the test with liquinox or equivalent and rinse with distilled water (See SOP 20.0).

____ Handle all downhole equipment, sampling equipment, and sample jars with clean rubber gloves.

____ Determine the static water level in the well by measuring the depth to water three times in succession and taking an average of those readings.

____ Install the transducer and cable in the well following manufacturers instructions.

____ Connect the transducer cable to the data logger and enter the initial water level and transducer design range into the data logger. Record the initial water level on the recording device.

____ Carefully measure the rope tied to slug so that the slug can be completely immersed beneath the surface of the groundwater.

____ Lower the slug or bailer into the well. The transducer readout will indicate when the slug or bailer contacts the water.

____ Allow the water level to restabilize within 0.1 feet and remove the slug or bailer. When using a bailer, remove the entire planned slug test volume as quickly as possible because the analysis assumes an instantaneous change in volume.

____ Continue measuring and recording depth-time measurements for both slug-in and slug-out until the water level returns to at least 85% of equilibrium conditions and enough readings have been taken to clearly show a trend.

____ Repeat the previous three steps as necessary to achieve a successful slug-in and slug-out test.

____ Record the slug test location(s), time(s), water levels, well conditions, and a summary of results form the test(s) (See SOP 24.0).

____ Repeat the preceding steps for each slug test (See site-specific SIWP for number of tests) to be conducted on site.

All steps must be included to comply with the SOP. In order to ensure that all steps are completed, a check (√) may be placed in the space by each step as it is completed.

20.0 DECONTAMINATION CHECKLIST

This checklist (SOP 20.0) is intended as a reference for use in the field. However, no field investigation activities should be conducted without first creating a site-specific SIWP. Any deviations from the SOP must be explicitly stated in the site-specific SIWP. All field activities should conform to approved Occupational Safety and Health Act (OSHA) regulations.

____ Decontaminate all reusable sampling equipment (including split-spoons and shelby tubes) prior to use, between sample locations, and prior to leaving the Site.

____ Use clean, dedicated, disposable gloves, bailers, twine, etc. at each sampling point, as necessary.

____ Decontaminate all hand held equipment in a bucket using liquinox or equivalent mixed with water.

- ____ Use only potable water for decontamination.
- ____ Wash and scrub all hand held equipment using an appropriately bristled brush.
- ____ Store all decontaminated equipment either in Ziploc® bags, clean Visqueen, or wrapped in aluminum foil until use.

____ Construct a decontamination pad to capture, contain, and store decontamination rinsates for proper disposal.

____ Decontaminate all larger equipment, i.e., drill rods, backhoes, etc., in a designated decontamination area prior to use and between each sample location.

- ____ Use only potable water mixed with liquinox or equivalent for decontamination.
- ____ Steam clean, wash or scrub all equipment using an appropriately bristled brush.
- ____ Use equipment immediately unless end of day.

____ Repeat preceding steps between each sampling location, as applicable.

All steps must be included to comply with the SOP. In order to ensure that all steps are completed, a check (√) may be placed in the space by each step as it is completed.

21.0 INVESTIGATION DERIVED WASTE HANDLING CHECKLIST

This checklist (SOP 21.0) is intended as a reference for use in the field. However, no field investigation activities should be conducted without first creating a site-specific SIWP. Any deviations from the SOP must be explicitly stated in the site-specific SIWP. All field activities should conform to approved Occupational Safety and Health Act (OSHA) regulations.

____ Collect and containerize any noninvestigative, noncontaminated waste, such as litter or household garbage, on an as-needed basis, and transport it to the designated disposal site. Containers may include plastic trash bags depending on type of waste.

____ Containerize any IDW in U. S. Department of Transportation-approved 55-gallon steel drums.

____ Segregate solid and liquid IDW into separate drums.

____ Store the drums of IDW in a secure, designated area, as specified in the landowner consent agreement.

____ Arrange for adequate security and protection from weather related damage if drums are to be stored onsite for a long period of time.

____ Label the drums with a tracking number, site and source identification, date, contents, and other pertinent information for handling.

____ Maintain an inventory of the drums used while onsite, including the information listed in the previous step.

____ Arrange for the drums to be shipped to an approved hazardous waste landfill, nonhazardous waste landfill, or appropriate treatment or recycling facility.

All steps must be included to comply with the SOP. In order to ensure that all steps are completed, a check (√) may be placed in the space by each step as it is completed.

22.0 FIELD PHYSICAL/CHEMICAL CHARACTERISTICS CHECKLIST

This checklist (SOP 22.0) is intended as a reference for use in the field. However, no field investigation activities should be conducted without first creating a site-specific SIWP. Any deviations from the SOP must be explicitly stated in the site-specific SIWP. All field activities should conform to approved Occupational Safety and Health Act (OSHA) regulations.

____ Calibrate all meters per the manufacturer's specifications upon arrival at the site and prior to departure from the site at the end of the day.

- ____ Photoionization detector
- ____ Temperature, specific conductance, and pH meter
- ____ Dissolved oxygen meter
- ____ Other meters, as appropriate

____ Record calibration information in a field logbook (See SOP 24.0).

____ Decontaminate all meters that come into contact with potentially contaminated material between uses by rinsing with deionized water and wiping with a dedicated disposable cloth.

____ Measure the temperature, specific conductance, and pH of groundwater during purging of wells to ensure that an adequate volume has been removed by meeting the following criteria or by removing a minimum of 3 well volumes (SOP 13.0):

- ____ Temperature within ± 2 °C;
- ____ Specific conductance within 10%; and
- ____ pH within 0.20 units.

____ Measure the temperature, specific conductance, dissolved oxygen, and pH of groundwater from wells and surface water bodies that are to be sampled. Use aliquots of the same sample for field tests; do not test for these parameters in the samples being shipped to laboratory for analytical testing.

____ Conduct air monitoring in and around all borings to ensure that VOCs remain within the levels specified in the site-specific Health and Safety Plan.

All steps must be included to comply with the SOP. In order to ensure that all steps are completed, a check (√) may be placed in the space by each step as it is completed.

23.0 SAMPLE HANDLING AND CUSTODY CHECKLIST

This checklist (SOP 23.0) is intended as a reference for use in the field. However, no field investigation activities should be conducted without first creating a site-specific SIWP. Any deviations from the SOP must be explicitly stated in the site-specific SIWP. All field activities should conform to approved Occupational Safety and Health Act (OSHA) regulations.

____ Use the following procedure for all sample locations:

- ____ Name a surface soil sample for the sample location from which it results, i.e., SS-1 for surface soil sample one.
- ____ Name a subsurface soil sample for the borehole/monitoring well and the depth interval from which it results, i.e. B-1(4'-6') or MW-1(4'-6').
- ____ Name a groundwater sample for the borehole/monitoring well from which it results and the matrix, i.e. B-1-GW or MW-1-GW.
- ____ Name a surface water or sediment sample for the applicable sampling location, i.e. SW-1 for surface water sample one and SD-1 for sediment sample one.

____ Containerize the sample in pre-cleaned jars provided by the laboratory appropriate for the sample matrix and the analyses to be performed.

____ Complete all information as required by the sample jar label, including sample name, date and time sampled, matrix, preservation, and laboratory analysis to be performed on the sample.

____ Store all samples on ice or Blue Ice® in a cooler to ensure that the sample temperatures remain at 4 °C.

____ Record all samples on a chain-of-custody, including sample name, date and time sampled, matrix, preservation, and laboratory analysis to be performed on the sample.

____ Maintain all samples under chain-of-custody until delivered to the laboratory or relinquished to the courier or other qualified delivery person.

All steps must be included to comply with the SOP. In order to ensure that all steps are completed, a check (√) may be placed in the space by each step as it is completed.

24.0 DOCUMENTATION CHECKLIST

This checklist (SOP 24.0) is intended as a reference for use in the field. However, no field investigation activities should be conducted without first creating a site-specific SIWP. Any deviations from the SOP must be explicitly stated in the site-specific SIWP. All field activities should conform to approved Occupational Safety and Health Act (OSHA) regulations.

____ Record the following information in the dedicated, bound field logbook:

- ____ Label the cover of the field logbook with the appropriate project reference name and project number.
- ____ Write the date at the top of every page and initial. If a logbook is used for multiple projects, include project name and number on every page.
- ____ Names of all personnel onsite, as well as arrival and departure times, as applicable.
- ____ Record arrival and departure times of visitors and the purpose and content subject matter of the visit.
- ____ Record weather conditions at both the start of day and in the afternoon, usually after lunch. Note significant weather changes and any weather-related changes in the work schedule.
- ____ Date and times of all activities, including starting and ending of borings/monitoring wells, and all samples.
- ____ Include sketches of any activities as necessary, especially sample locations relative to one another and a fixed reference.
- _____ Refer to any relevant associated documentation, including boring logs, monitoring well development logs, photographs, site maps, etc.

____ Record information in the field logbook using the procedures discussed below.

- ____ Print all information legibly using a blue or black indelible ink pen.
- ____ Use military time for recording events in logbooks, i.e. 0800, not 8:00 am and 2000, not 8:00 pm.
- ____ Line out and initial incorrect entries, leaving the incorrect entry still visible, and record the correct information. Do not scratch out or erase.
- ____ Use every line on a page in the logbook. Do not skip lines.
- ____ Close a page by drawing a diagonal line from the bottom of the last entry to the end of the page, signing and dating. Indicate the end-of-day by including an EOD.

____ Complete the chain-of-custody, as discussed in SOP 23.0.

____ Maintain custody of the field logbooks, chains-of-custody, boring logs, well completion diagrams, and any other forms completed in the field.

All steps must be included to comply with the SOP. In order to ensure that all steps are completed, a check (√) may be placed in the space by each step as it is completed.

APPENDIX D

HEALTH AND SAFETY PLAN

E N T R I X

SITE-SPECIFIC HEALTH AND SAFETY PLAN
FORMER CHURCHVILLE FORD

Churchville, New York

Prepared for:

Antonio Gabrielle and Joseph Ognibene

Prepared by:

ENTRIX, Inc.
550 Town Center Drive
Dearborn, Michigan 48126

Project No. 4022526

November 2003 (Revised March 2004)

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DISCLAIMER

This document has been prepared for the express use of ENTRIX, Inc (ENTRIX) and its employees and may be used as a guidance document by properly trained and experienced subcontractors. Due to the hazardous nature of this site and the activities occurring on-site, it is not possible to identify, evaluate, and provide protection for all potential hazards that may be encountered. This document does not guarantee the health and safety of any person entering this site. Strict adherence to the health and safety guidelines presented herein will reduce, but not eliminate, the possibility for injury at this site. Guidelines presented herein are site specific and should not be used for other sites without research and evaluation by a qualified health and safety specialist.

Each on-site subcontractor is responsible for his/her own health and safety program and the health and safety of their own employees. This requirement is based on Occupational Safety and Health Administration (OSHA) regulations, which recognize the employer-to-employee responsibility for health and safety. A copy of their written program must be submitted for review to ENTRIX, if requested. In an effort to assist the subcontractors, and to comply with hazard communication requirements, ENTRIX will provide a copy of the site safety and health plan for this project to each subcontractor for implementation for the subcontractor's employees.

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SITE SAFETY PLAN

Former Churchville Ford, Inc.
Churchville, New York
Project Number: 4022526
Project Manager/ Site Safety Officer: Steve Tobin

Date of Issue: March 18, 2004

Authorization: _____
Angie Morrow, ENTRIX Regional Safety Officer

1.0 INTRODUCTION

1.1 SCOPE AND APPLICABILITY OF HEALTH AND SAFETY PLAN

The purpose of this Site-Specific Health and Safety Plan (HASP) is to identify, evaluate, and control potential safety hazards and to provide protocols to be followed at the site during field activities at the former Churchville Ford site (Appendix A). Field activities to be conducted include:

- Field sampling operations
- Soil boring/monitoring well installation

The provisions set forth in the sections of this plan apply to the employees of ENTRIX, Inc. (ENTRIX) and their subcontractors working on project tasks that expose workers to hazardous wastes, hazardous substances or any combination of hazardous wastes or hazardous substances. Other sections of this plan apply to all personnel working on this project. Subcontractors may elect to modify these provisions, but only to upgrade or increase the level of safety.

This HASP has been prepared in accordance with the Occupational Safety and Health Administration (OSHA) standards for Hazardous Waste Operations and Emergency Response (29 Code of Federal Regulations [CFR] 1910.120). During development of this plan consideration was given to current safety standards as defined by Environmental Protection Agency (EPA)/OSHA/National Institute for Occupational Safety and Health (NIOSH), health effects and standards for known contaminants, and procedures defined to account for the potential for exposure to unknown substances.

1.2 SITE BACKGROUND/HISTORICAL OVERVIEW

The Site is improved with a 22,000± square foot building (main building), and a small, wood-frame storage building. Both buildings are currently vacant although being remodeled for camper and recreational vehicle sales. The building (and Site in general) has only been operated as an automobile dealership, which included new and used car sales and automotive service from 1987 to 2002. The first building contained the automobile maintenance facilities and business offices, and the second building was used by the dealership as a new parts storage facility. The main building was originally constructed in 1986 – 1987 and includes two building additions constructed between 1989 and 1995, which expanded the footprint of the building. The current owners have owned the property during the entire period of the car sales and service operation. Prior to that, the property was used for agricultural purposes.

The Site has operated aboveground storage tanks containing gasoline, virgin oil and used oil. No underground storage tanks were ever installed at this Site. Several 55-gallon drums and smaller containers have been used at the Site to store a variety of products, which included virgin and used antifreeze, parts washing solvents, and automobile cleaners and waxes for the car wash.

The results of soil sampling conducted at the Site indicated the presence of one or more semi-volatile organic compounds (SVOCs) above the New York State Department of Environmental

Conservation (NYSDEC) allowable soil concentrations. Further, groundwater sampling conducted at the Site indicated the presence one or more volatile organic compounds (VOCs) related to petroleum products and/or degreasing solvents above NYSDEC groundwater standards. Light non-aqueous phase liquids (LNAPLS), associated with a former used-oil storage area, have also been detected at this site.

1.3 FIELD ACTIVITIES

The activities to be covered by the HASP have been identified and are discussed in the Investigation Work Plan, generated pursuant to the NYSDEC Voluntary Cleanup Agreement (Index # BB-0540-03-09). The planned work has been divided into individual field activities described in detail in Section 3.0, Health and Safety Hazards. The following field activities may occur at the Site:

- Installation of soil borings
  - ✓ Utilization of drill rigs (hollow stem auger and/or Geoprobe®-type rig)
  - ✓ Soil sampling
- Installation of monitoring wells
  - ✓ Utilization of hollow stem auger drill rig
  - ✓ Monitoring well development
- Groundwater gauging and sampling
  - ✓ Monitoring well purging
- Shallow soil sampling
  - ✓ Hand auguring and/or Geoprobe®-type rig
- Soil gas sampling
  - ✓ Rotary hammer drilling
- Aquifer testing
  - ✓ Slug testing

1.4 PERSONNEL REQUIREMENTS

To promote safe work practices, no activity within a potentially hazardous area will be conducted by an individual employee working alone. At least two employees will be present at the site during field operations.

Facility safety regulations require the wearing of flame-resistant coveralls, safety glasses with side-shields, hard hats, and steel-toed boots by personnel while on the Site. Hearing protection and mono-goggles may also be required at certain times in designated areas. The Site Safety Officer

(SSO) will conduct daily site safety meetings to discuss current site conditions, operations, and necessary Personal Protective Equipment (PPE).

2.0 PERSONNEL AND SITE DOCUMENTATION

2.1 KEY PERSONNEL

Personnel responsible for project safety are the Project Manager (PM), the SSO or his/her designee. Table 2-1 lists personnel and organizations critical to the planned field activities at the Site.

The PM is responsible for the provisions and submittal of this plan and for advising the SSO on health and safety matters. The PM has the authority to provide for the auditing of compliance with the provisions of this plan, suspension or modification of work practices, and administration of disciplinary actions for individuals whose conduct does not meet the requirements set forth herein. The PM may elect to give the SSO authority to administer disciplinary actions for individuals whose conduct does not meet the requirements set forth herein.

Table 2-1. Key Personnel

Title	Personnel	Phone Number
ENTRIX, Inc.		
Project Manager/ Site Safety Officer	Steve Tobin	781-530-3790
Client/Facility		
Site Owner	Tony Gabriele	585-303-7875
Site Lessee	Mark Meyers	585-314-4082
New York State Department of Environmental Conservation		
Project Manager	Frank Sowers	585-226-5357
Monroe Co. Health Department		
Public Health Sanitarian	Joseph Albert	585-274-6904

2.2 SITE VISITORS

First time visitors to the Site must receive orientation from the SSO prior to entering the Site. Orientation should include identification of restricted areas, site emergency procedures, equipment, emergency phone numbers, and directions to the local medical facility.

All visitors will be required to read and verify compliance with the provisions of this HASP. In addition, visitors will be expected to comply with relevant OSHA requirements such as medical monitoring, training, and respiratory protection. Visitors will also be expected to provide their own Personal Protective Equipment (PPE).

2.3 SITE SAFETY OFFICER DUTIES

The SSO is responsible for the dissemination of the information contained in this plan to all ENTRIX personnel assigned to the project and to the responsible representative of each subcontractor firm working under ENTRIX on the project. The SSO is also responsible for performing or providing the following as necessary:

- Adequate on-site safety supplies & equipment inventory;

- Verification of medical surveillance program examinations and 40-hour training for all potentially exposed on-site personnel;
- Verification of respirator fit test and/or SCBA training if respirator protection becomes necessary;
- Tail-gate discussion of the HASP;
- Documentation of tail-gate safety meetings in field notebook;
- Provide visitors with a site-safety orientation and distribution of this HASP;
- Verification of visitor/subcontractor training and medical clearance records;
- Documentation of all accidents or safety plan violations;
- Emergency contacts as needed; and
- Implementation of decontamination/contamination reduction procedures.

The SSO or his/her designee has the authority to suspend work any time he or she determines that the health and safety practices at the site are inadequate and shall also inform the PM of individuals whose conduct is not consistent with the requirements of the plan.

3.0 HEALTH AND SAFETY HAZARDS

3.1 HAZARD ANALYSIS FOR WORK ACTIVITIES

This HASP defines the hazards and methods to protect personnel from those hazards as identified by previous site work or background information. The SSO will evaluate potential hazards and discuss during site safety meetings. Personnel will be advised of known potential hazards at the site prior to beginning work and as conditions change. Personnel and site workers will follow designated PPE requirements at all times. Only intrinsically safe communication and monitoring equipment will be operated within work zones and no cell phone usage will be permitted in designated work zones. Fire extinguishers, respirators, first aid kits, blood borne pathogen kits, and eyewash stations will be available for use as needed at the Site. Personnel will be trained in their use prior to arrival on site and visitors/subcontractors will be advised of their availability and location. Work activities to be performed on site include:

- Installation of soil borings
  - ✓ Utilization of drill rigs (hollow stem auger and/or Geoprobe®-type rig)
  - ✓ Soil sampling
- Installation of monitoring wells
  - ✓ Utilization of hollow stem auger drill rig
  - ✓ Monitoring well development
- Groundwater gauging and sampling
  - ✓ Monitoring well purging
- Shallow soil sampling
  - ✓ Hand auguring and/or Geoprobe®-type rig
- Soil gas sampling
  - ✓ Rotary hammer drilling
- Aquifer testing
  - ✓ Slug testing

The remainder of Section 3.0 discusses chemical, physical, biological, and other potential health and safety hazards associated with the work activities to be performed.

3.2 IDENTIFICATION OF POTENTIALLY HAZARDOUS CHEMICALS

Potentially hazardous chemicals present within the work zones at the Site include volatile and semi-volatile organic compounds; benzene, toluene, ethylene, xylene (BTEX); cis-1,2 dichloroethene (DCE), tetrachloroethene (PCE), and trichloroethane (TCE). Table 3-2 lists these chemicals, associated occupational exposure guidelines, potential media sources, and exposure routes. Each occupational exposure limit is based upon known and available medical, biological, engineering, chemical, trade, and other relevant information to reduce or eliminate the adverse health and safety effects of these chemicals. Additional chemical information on potential site chemicals can be found in Material Safety Data Sheets (MSDS) (Appendix B). In the event that additional potentially hazardous chemicals are identified at the site, the appropriate MSDS' will be reviewed with site personnel and added to the safety plan.

Table 3-2. Chemical Hazards of Concern

Constituent	TLV[1] 8-hour TWA	PEL[2] 8-hour TWA	IDLH[3]	Potential Media Source	Routes of Exposure
Benzene	.1 ppm	5 ppm	500 ppm	Air Surface Soil Subsurface Soil Surface Water	Inhalation Ingestion Contact
Toluene	100 mg/m^3	200 mg/m^3	500 ppm	Air Surface Soil Subsurface Soil Surface Water	Inhalation Ingestion Contact
Ethylbenzene	100 ppm	100 ppm	800 ppm	Air Surface Soil Subsurface Soil Surface Water	Inhalation Ingestion Contact
Xylene	100 ppm	100 ppm	900 ppm	Air Surface Soil Subsurface Soil Surface Water	Inhalation Ingestion Contact
DCE	1	5	50	Air Surface Soil Subsurface Soil Surface Water	Inhalation Ingestion Contact
PCE	1	5	100	Air Surface Soil Subsurface Soil Surface Water	Inhalation Ingestion Contact
TCE	10	10	100	Air Surface Soil Subsurface Soil Surface Water	Inhalation Ingestion Contact

[1]*Threshold Limit Value as the airborne 8-hour time-weighted average (TWA) established by the American Conference of Governmental Industrial Hygienists (ACGIH), 1999.*
[2]*Permissible Exposure Limit as the airborne 8-hour time weighted average established by OSHA.*
[3]*Immediately Dangerous to Life and Health level as published in the NIOSH, Pocket Guide to Chemical Hazards, 1994.*

BTEX Compounds – Benzene is a clear, sweet smelling liquid that is highly combustible. Benzene volatilizes easily, presenting an inhalation hazard, but can also be absorbed through the skin. Benzene is a known carcinogen.

DCE - 1,2-Dichloroethene, also called 1,2-dichloroethylene, is a highly flammable, colorless liquid with a sharp, harsh odor. It is used to produce solvents and in chemical mixtures. You can smell very small amounts of 1,2-dichloroethene in air (about 17 parts of 1,2-dichloroethene per million parts of air [17 ppm]).

TCE – Trichloroethane, also called trichloroethylene is a colorless liquid with a sharp, sweet odor. Even though it is usually found as a liquid, it evaporates quickly and becomes a vapor. Harmful by inhalation, ingestion, and through skin absorption. Irritant. **Possible mutagen. Possible risk of harm to the unborn child**. Prolonged exposure may cause dermatitis. Toxic gases are evolved on combustion.

PCE - Although tetrachloroethylene is a liquid at room temperature, some of the liquid can be expected to evaporate into the air producing an ether-like odor; evaporation increases as temperature increases.

3.3 IDENTIFICATION OF POTENTIAL PHYSICAL HAZARDS

Site hazards associated with field activities conducted at the release site may include the following:

- Slipping and/or tripping on tools, equipment, uneven ground surfaces, loose rock, or loose soil;
- Impact hazards from falling objects such as tools or equipment;
- Improper lifting resulting in back strain or injury;
- Slipping on wet surfaces;
- Falling into trenches, pits, or sumps;
- Exposure to vehicular and/or railroad traffic;
- Exposure to falling loads;
- Exposure to steam leaks from active piping;
- Exposure to moving parts of mechanical equipment;
- Entanglement or injury from rotating equipment or energized parts;
- Exposure to noise generated by heavy equipment;
- Electrocution hazards from operating heavy equipment in the vicinity of underground and/or overhead electrical lines;
- Electrocution hazards from operating heavy equipment during lightning or rainstorms;
- Tipping or overturning of heavy machinery and equipment;
- Encountering underground utilities (i.e. gas, electric, water);
- Insufficient or faulty protective equipment;
- Insufficient supports of heavy equipment;
- Pinching or cutting from mechanical equipment; and
- Insufficient or faulty operations, equipment, or tools.

3.4 HAZARD PREVENTION

Respiratory exposure to the listed compounds will be controlled through the use of appropriate dust and vapor control measures and air-purifying respirators, if deemed necessary. The need for air-purifying respirators will be evaluated based on the results of air monitoring (see Section 6.0 Air Monitoring). Dermal exposure will be controlled through the use of appropriate PPE (coveralls, chemically resistant gloves, etc). Ingestion hazards will be avoided by applying basic good hygiene practices, frequent hand washing, and enforcement of site rules regarding eating, drinking, and smoking restrictions. Physical hazards will be avoided by reviewing potential hazards on a daily basis during morning tailgate safety meetings, wearing proper PPE, and by exercising extreme caution while in work zones.

3.5 HAZARD COMMUNICATION PROGRAM

The OSHA Hazard Communication Standard found in 29 CFR 1910.1200 requires that hazard information on workplace chemicals be communicated to workers present at a site. The Health and Safety Coordinator and the SSO will be responsible for the development and administration of the Hazard Communication Program, a warning label system, MSDS information, and employee training.

MSDS information on calibration and decontamination chemicals used during field activities by ENTRIX personnel and subcontractors will be maintained on site and available for all workers. All chemical containers must be labeled. When workers are finished working at the Site, they must dispose or take with them unused chemicals.

3.6 CONFINED SPACES

Entry by ENTRIX employees or contractors into confined spaces are not authorized under this HASP unless they receive prior clearance from the PM who will provide a Confined Space Entry permit, required air monitoring, and other details as required under the ENTRIX Confined Space Entry Program.

Confined spaces are defined as a work area or space that is so configured that an employee can bodily enter, is not designed or intended for continuous employee occupancy, and has a limited means of entrance and exit. A confined space provides the potential for poor natural ventilation which may result in possibly high concentrations of contaminants, low oxygen levels, explosive atmospheres, limited visibility, and restricted movement. Confined space entries are not authorized or anticipated under this HASP.

Confined spaces at this site include the following:

- Any site excavations;
- Tanks and wells; and
- All manholes.

Confined spaces must be identified with a posted warning sign.

3.7 UNANTICIPATED HAZARDS

The following conditions, situations, or activities are not anticipated at this site. If these items are encountered or discovered, the SSO will immediately contact the facility health and safety manager to determine the appropriate response.

- The need to handle, open, sample, or ship drums or containers of hazardous substances (other than the samples to be collected as identified in the Investigation Work Plan).
- The need to handle, enter, open, sample, or ship tanks or vaults containing hazardous substances.
- Activities requiring personal protective equipment more extensive than Level C.

3.8 GENERAL SAFETY PROCEDURES

The following general site safety rules must be followed by all project personnel:

- Safety equipment and appropriate PPE will be worn at all times in the Exclusion Zones, by all persons, in conformance with this Plan and the requirements of 29 CFR 1910.120.
- Unnecessary contact with contaminated surfaces or with surfaces suspected of being contaminated should be avoided.
- Eating, drinking, chewing gum, tobacco, smoking, or such practices that increase the probability of hand-to-mouth transfer and ingestion of material is prohibited in secure or exclusion zones.
- Certain medicines and alcohol can increase the toxic effects of chemicals. Personnel who must be on medication during potential exposure situations must advise the PM prior to beginning work on the site. All medical information will be made available to emergency medical personnel in the case of an emergency.
- Hands and feet must be thoroughly washed upon leaving the work area and before eating, drinking, or other activities.
- Personnel should shower as soon as possible after the protective clothing is removed and the fieldwork for the day has ended.

3.9 ILLUMINATION HAZARDS

Fieldwork in non-illuminated areas should not occur during periods of darkness. If situations require working in the dark, illumination should be provided as appropriate.

3.10 BIOLOGICAL HAZARDS

The potential exists to encounter various reptiles, insects, poison ivy, oak, or sumac during field activities covered by this HASP. Precautions will be taken by all on site personnel to avoid prime

snake and insect habitats, to protect oneself, and assist other personnel during an attack or encounter.

Ants, bees, wasps, mosquitoes, and ticks are considered to be the most common insects that may be encountered. If bitten by insects, remove the stinger by gently scraping it out (do not use tweezers). Apply ice to the affected area, wash with soap, and apply antiseptic. If an allergic reaction occurs, transport worker to the closest medical facility for treatment.

3.11 LYME DISEASE PREVENTION

The prevention of Lyme Disease is important during spring, summer, and fall months. Lyme Disease is a bacterial infection transmitted by the bite of a deer tick. About 50 percent of deer ticks carry the Lyme Disease bacteria.

To prevent the bite of a deer tick, avoid grassy, wooded areas when possible. Wear protective clothing (light colored) with long sleeves and pants tucked inside of socks. Use repellent containing Permethrin or Deet. These repellents should be applied to clothing and not directly on the skin. Always perform a self-inspection following work in an area which may contain deer ticks.

Remove attached ticks immediately. Use tweezers to grasp the tick's head, near the skin, and slowly pull straight out. Warning signs of infection include headache, flu-like symptoms, a spreading ring-like rash, swelling, and pain of the joints. Report incidents involving deer tick bites to the facility health and safety manager.

3.12 PROCEDURES FOR TEMPERATURE-RELATED PROBLEMS

3.12.1 Heat Stress

When temperatures are warm, heat stress or heat related illness may occur. Frequent breaks should be scheduled for personnel during hot and humid weather. Workers wearing coveralls made of Tyvek or Saranex are particularly in danger of heat stress as ventilation and evaporation are greatly reduced. Employees will be advised on the effects of heat stress, be provided with adequate drinking water while on site, and be instructed to observe others for signs of heat stress during hot weather.

Heat exhaustion is an acute reaction to heat with symptoms that include weakness, dizziness, fainting, nausea, headache, cool and clammy skin, profuse sweating, slurred speech, weak pulse, and dilated pupils. Treatment for heat exhaustion includes moving the worker to a cool or shaded location, loosen clothing, and raise the legs above the head.

Heat stroke is a dangerous, life-threatening, acute reaction to heat with failure of the heat-regulating mechanisms of the body. Symptoms of heat stroke include elevated body temperature, cessation of sweating, dry skin, headache, numbness, tingling, confusion, fast pulse, rapid and loud breathing, convulsion, and unconsciousness. Treatment for heat stroke includes immediate removal of the patient from heat, removal of clothing, and rapid body temperature reduction by means of cold water. Heat stroke is a medical emergency and anyone showing signs should be transported to the nearest medical facility immediately.

Workers should be monitored for heat stress in temperatures above 70°F when wearing Tyvek or Saranex coveralls. Heart rate and body temperature should be monitored. If the heart rate exceeds 110 beats per minute at the beginning of a rest period or if oral temperature exceeds 99.6°F, shorten the next work cycle by one-third and keep the rest period the same. If the heart rate still exceeds 110 beats per minute or the oral temperature exceeds 99.6°F at the next rest period, shorten the following work cycle by one-third. Do not allow a worker to wear semi-permeable clothing if the oral temperature exceeds 100.4°F.

Workers should drink plenty of fluids consisting of water, juice, and electrolyte replacement drinks. When working in hot conditions for the first time or following an extended break, NIOSH recommends that workers allow time to acclimate to the hot conditions by working only 50 percent the first day and an additional 10 percent added each following day. If possible, work should be conducted before temperatures reach their highs for the day.

3.12.2 Cold Related Illness

When temperatures are cold, hypothermia or frostbite may occur while working out of doors. Special attention should be paid to air temperature, wind speed, and humidity when planning field activities during cold weather. When temperatures are below 40°F, insulated coveralls, gloves, boots, windbreakers, and hard hat liners should be worn. Work rates should not be so high as to cause excessive sweating when the wind chill falls below 10°F. Heated warming shelter should be available for rest periods. Minimal sitting or standing still should occur.

Hypothermia is the cooling of the body temperature, which causes restricted blood flow to the hands, feet, and skin. Symptoms of hypothermia include shivering, apathy, decreased muscle function, decreased level of consciousness, freezing of the extremities, and decreased vital signs (e.g., slow pulse and slow breathing). Severe hypothermia results in a rapid decline in body temperature and requires immediate medical attention. Keep the patient warm and dry until professional medical attention is available.

Frostbite is the freezing of a body part such as the ears, nose, fingers, cheeks, or toes. Symptoms include tingling and redness, followed by loss of color and numbness. Deep frostbite, where the tissues are cold, pale, and solid, is a serious condition that requires immediate medical attention. To treat frostbite, gradually warm up the affected body part. If numbness and/or paid does not subside, obtain medical attention. Frostbite can be prevented by replacing wet clothing, drinking warm fluids, and taking frequent breaks in warm rest areas.

Work will be suspended during extreme weather conditions such as heavy rains, heavy snowfall, electrical storms, or extreme heat or cold. The SSO is responsible for determining when to suspend work.

4.0 PERSONNEL TRAINING REQUIREMENTS

4.1 TRAINING

All on-site workers (including subcontractors) will have forty hours of documented Hazardous Waste Operations and Emergency Response (HAZWOPER) training pursuant to OSHA 29 CFR.1910.120(e). In addition, workers will have current 8-hour annual refresher training and supervisors will have the additional 8-hour supervisor training. Documentation of all training experience will be readily available while on-site. Any specialty training required for the tasks covered in this HASP will be provided as needed.

4.2 TRAINING AND BRIEFING TOPICS FOR SITE ACTIVITIES

Field personnel from ENTRIX and any subcontractors will review this HASP before beginning work as safety training for this project. The SSO will conduct a tailgate safety meeting to review the HASP prior to the start of field operations, which may substantiate prior review of the HASP or serve as the primary review. Topics that should be discussed during the tailgate safety orientation meeting include the following:

- Description of chemical and physical hazards;
- Medical surveillance and training requirements;
- Levels of PPE required;
- Site control measures and work zones;
- Health and safety chain-of-command;
- Directions to the nearest medical facility, emergency procedures, and important telephone numbers;
- Injury and illness reporting procedures; and
- Tasks and associated potential hazards.

ENTRIX project personnel will certify their review by signing a HASP training record form (Appendix C). Subcontractors will certify their review by signing a HASP training record form or signing the field notebook after the tailgate safety meeting. The PM is responsible for distributing this HASP to appropriate personnel and verifying review by obtaining signed review forms. Signed review forms will be placed in project files. Whenever a change of conditions on-site occurs that may affect safety, the SSO or his/her designee will conduct a tailgate safety meeting if appropriate. Changing site conditions that may affect safety include the following:

- Change of field personnel (ENTRIX or subcontractor);
- Change in work activity;
- Change in weather conditions; and

- Visitors on site.

All training sessions, safety meetings, and safety briefings will be documented by the SSO or his/her designee in the field notebook. Documentation will include a brief description of topics addressed and the signatures of all training attendees.

Training sessions or safety meetings may also be required by the client or property owner. Documentation for completion of this training by each employee will be maintained as part of the project documentation.

5.0 PERSONAL PROTECTIVE EQUIPMENT

The appropriate levels of PPE recommended for the activities defined by this HASP are based on OSHA guidelines, the EPA Occupational Health and Safety Manual, the Hazardous Substances Data Bank of the National Library of Medicine, and site-specific safety requirements.

All field personnel and subcontractors will have their own personal safety equipment and protective clothing, which shall be worn as discussed in this HASP and as deemed necessary by the SSO.

5.1 LEVELS OF PERSONAL PROTECTION

The minimum level of PPE for personnel conducting field activities is Modified Level D, which includes the following:

- Hard hat;
- Shoes with steel toes and rubber soles;
- Nomex, or equivalent, flame-resistant coveralls;
- PVC, nitrile, or other chemically resistant gloves when collecting samples of any matrix; and
- Safety glasses with side shields or safety goggles.

The level of PPE may be upgraded by the SSO based upon work conditions and air monitoring. Level C PPE consists of Modified Level D, fire-resistant coveralls, and air-purifying respirators with particulate/organic vapor/acid gas cartridges. Threshold values of chemical hazards are listed in Table 3-2. The SSO will compare real-time air monitoring results with site-specific thresholds described in Section 6.0 Air Monitoring to ensure that potential compounds are below site action levels.

5.2 MAINTENANCE OF PPE

PPE should be thoroughly inspected initially upon receipt, after use, and periodically while being stored. The primary inspection of PPE will occur prior to immediate use and will be performed by the user.

5.3 SPECIFIC LEVELS OF PROTECTION PLANNED FOR FIELD ACTIVITIES

Modified Level D PPE will be utilized during activities at the site unless air monitoring indicated a higher level of PPE is required. PPE will be stored in a clean, dry area until while not in use.

6.0 AIR MONITORING

Air monitoring will be conducted according to the Community Air Monitoring Plan (CAMP) presented in the Investigation Work Plan, Section 6.2. In addition to the procedures spelled out in the CAMP, for the purposes of determining the appropriate level of PPE during field activities, continuous air monitoring for volatile organic compounds (VOCs) will be conducted using direct reading instruments (e.g., MultiRae Plus). Background VOC readings will be obtained each morning following calibration and prior to the start of field activities. Background readings will be taken in an area away from the work zone and upwind of the site.

If sustained VOC readings of 1 ppm above background are measured, real-time air monitoring for benzene will be conducted using pump-driven chemical detection tubes. Monitoring will be conducted using a MultiRae Plus, which will be set to read benzene. Of the airborne contaminants potentially present at the site, benzene has the lowest TLV-TWA and PEL. Therefore, as a conservative measure, all VOC readings will be assumed to be benzene. Based on appropriate response factors, any sustained readings between 0-5 ppm above background will require personnel to immediately upgrade to Level C PPE, or leave the work zone and cease operations. Any sustained readings at concentrations greater than 5 ppm above background will require all site personnel to leave the work zone until additional monitoring deems it safe to continue work.

Specification sheets for the monitoring equipment will be readily available to reference methods for calibration, operation, troubleshooting, and minor repair. Monitoring equipment will be checked regularly to ensure proper function and a maintenance log will be maintained.

7.0 MEDICAL SURVEILLANCE REQUIREMENTS

7.1 GENERAL OSHA REQUIREMENTS

OSHA requires employees potentially exposed to hazardous wastes to participate in a medical surveillance program designed to monitor and reduce health risks. Under the HAZWOPER standard 29 CFR 1910.120(f), employees must have medical monitoring if they are or may be exposed to hazardous substances or health hazards at or above permissible exposure limits, without regard to the use of respirators, for 30 days or more a year.

The purpose of this program is to provide baseline medical data for employees involved in hazardous waste operations and to determine his/her ability to wear PPE. As required by 29 CFR 1910.134, an individual's ability to wear respiratory protection must be certified before he/she performs duties. Medical examinations must be administered on a pre-employment and annual or biannual basis. Examinations will also be provided to employees upon termination or reassignment to non-hazardous waste site activities. Subcontractors are required to provide compliance documentation of medical surveillance upon request.

7.2 MEDICAL EXAMINATIONS

Medical monitoring should meet or exceed regulatory compliance issues pursuant to OSHA 29 CFR 1910.94, .120, .134, and .1001 through .1050, which include the determination that an individual is physically able to use an air-purifying respirator and is able to perform the tasks outlined in the work plan. The ability of an individual to perform the specified work will be determined from an examination that includes the following:

- Detailed medical and work histories;
- Physical exam;
- Pulmonary function test;
- Chest x-ray (every 3 years);
- Electrocardiogram;
- Eye examination;
- Audiometry;
- Urinalysis; and
- Blood chemistry (hematology, serum analyses, heavy metals toxicology).

The examining physician may perform additional testing to determine fitness or to supplement the above-listed tests.

Personnel covered by this HASP must report injuries and exposures and are encouraged to seek medical attention and physical testing following an injury or possible exposure above established exposure levels.

8.0 SITE CONTROL MEASURES

8.1 GENERAL

Potential hazards will be controlled through the use of standard work practices. Proper PPE will be worn if exposures exceed the PELs and when control measures are inadequate. A PID or other appropriate direct reading instrument will be used during activities where workers are potentially in contact with organic vapors. Areas prone to dust hazards should be monitored for airborne particulates. Facility rules and regulations should be obeyed at all times (e.g., speed limits, restricted access areas).

8.2 SITE SECURITY AND ACCESS

Minimal Site security exists for outdoor areas. Indoor areas are inaccessible to the general public. At the end of any workday, all field equipment remaining on-site will be properly powered down and cordoned off using caution tape, cones, warning barrels, etc. to prevent accidental contact. Any waste material generated at the Site will be stored in properly labeled DOT-approved 55-gallon steel drums.

8.3 SITE COMMUNICATION

Verbal communication and hand signals will be used to maintain communication between field teams and personnel. Table 8-1 lists hand signals that will be used when verbal communication is not available (e.g., Level B and C work).

Table 8-1. Hand Signals for Level B and C

Signal	Definition
Hands clutching throat	Out of air/cannot breath
Hands on top of head	Need assistance
Thumbs up	OK/I am alright/I understand
Thumbs down	No/Negative
Arms waving upright	Send backup support
Grip partners wrist	Exit area immediately

8.4 DECONTAMINATION PROCEDURES

All personnel and equipment will be decontaminated prior to leaving the site in order to remove potential contaminants. Items for disposal will be stored in a plastic-lined container and disposed of properly, following the procedures of the facility. Any chemicals used during decontamination will be collected in appropriate containers and disposed of properly according to Material Safety Data Sheets and facility procedures.

Personnel involved in the decontamination of equipment will wear appropriate PPE including splash-resistant aprons, safety glasses with side shields, and nitrile or rubber gloves. Personnel

decontamination will consist of the removal of disposable PPE (e.g., gloves, boot covers, etc.) and the removal of outer protective clothing. Workers should shower and change into clean clothing as soon as possible.

8.5 LEVELS OF DECONTAMINATION REQUIRED FOR PERSONNEL

The following decontamination steps will be followed for Modified Level D PPE decontamination:

- Step 1: Remove boot covers;
- Step 2: Remove boots;
- Step 3: Remove outer gloves;
- Step 4: Remove coveralls;
- Step 5: Remove inner gloves, and
- Step 6: Wash hands and face thoroughly.

If a medical emergency arises, decontamination should only be performed if it does not interfere with first aid or stabilization of the patient. If a worker is contaminated with an extremely toxic substance that has the potential to cause severe injury or death, decontamination should be performed immediately. If an emergency heat-related injury develops, PPE should be removed to reduce heat stress.

9.0 EMERGENCY PLAN

It is important to review this section of the HASP with all site-workers and visitors prior to the start-up of field activities in order to identify potential hazards that may be associated with the facility and/or tasks.

9.1 LINES OF AUTHORITY

The SSO has the primary responsibility of coordinating response to emergencies on the site. The SSO should be notified in case of any emergency. If the SSO cannot be reached, the facility HSO and emergency services should be notified. The regional ENTRIX HSO should also be notified of all emergencies.

The SSO is responsible for reviewing hazards associated with daily work activities and for disseminating information to all personnel. The SSO has the authority to modify work practices for safety reasons and to dismiss workers from the work areas or site who are not following safety regulations.

9.2 EMERGENCY CONTACTS

In case of any emergency at the facility, the SSO should notify the facility HSO, the project manager and the regional ENTRIX HSO. A list of emergency contacts is provided in Table 9-1.

Table 9-1. Emergency Contact Telephone Numbers

Contact	Phone Number	Alternate Phone Number
SSO/Project Manager – Steve Tobin	781-530-3790	508-353-5202 (cell)
Regional ENTRIX HSO - **Angie Morrow**	302-395-1919	484-410-9976 (cell)
Corporate ENTRIX HSO - **Marla Toma**	925-935-9920	925-383-9400 (cell)
Facility Client Contact – Mark Meyers	585-314-4082	
Tony Gabrielle	585-303-7875	713-907-8136
Lakeside Memorial Hospital	585-637-3131	
Fire, Police, Ambulance	911	
CHEMTRAC	800-424-9300	
Poison Control Center	800-662-9886	800-962-1253
National Response Center	800-424-8802	
Regional USEPA Emergency Response	800-425-8500	

The street address for the facility is:

{Former} Churchville Ford, Inc.
111 South Main Street
Churchville, New York 14428

The closest medical facility to the site is:

Lakeside Memorial Hospital

156 West Avenue #201
Brockport, NY 14420

The directions to the medical facility are listed below:

1: Start out going South on NY-36/S MAIN ST toward SANFORD RD N. 0.01 miles

2: Turn LEFT onto SANFORD RD N 0.10 miles

3: Merge onto I-490 W 2.70 miles

4: Take the RT-33A exit- exit number 2- toward RT-33/BERGEN/BATAVIA. 0.27 miles

5: Keep RIGHT at the fork in the ramp 0.07 miles

6: Turn SLIGHT RIGHT onto NY-33A 0.08 miles

7: NY-33A becomes NY-33 0.37 miles

8: Turn RIGHT onto NY-19/LAKE AVE S. Continue to follow NY-19 10.43 miles

9: Turn LEFT onto WEST AVE/CLARKSON SWEDEN TOWN LINE RD 0.37 miles

Total Estimated Time: 27 minutes
Total Distance: 14.39 miles

A map to the Lakeside Memorial Hospital from the site is included in Appendix D.

Table 9-2 contains phone numbers for site workers, which should be made available to all personnel.

Table 9-2. Contact Information for Site Workers

Contact	Primary Phone Number	Alternate Phone Number
Steve Tobin	781-530-3790	508-353-5202 (cell)

9.3 EVACUATION ROUTES AND PROCEDURES

9.3.1 Work Area Evacuation

Evacuation routes and mustering points are mapped in the attached site map figures. In the event of an emergency, all site personnel should evacuate the work an upwind mustering point.

9.3.2 Facility Evacuation

In the event of a facility emergency, such as severe weather, electrical storms, fire/explosion, or neighboring plant evacuation requirements, personnel should proceed to the nearest facility entrance/exit. An alternative evacuation route should be pre-determined and the SSO should inform personnel of this route. Once evacuated from the facility, the SSO will take a head count.

9.4 INCIDENT REPORTING

Following an accident or incident, a report will be completed by the SSO with cooperation from responding personnel. The incident report should include the following:

- Name(s) of the individual involved or witnesses;
- Date and time;
- Exact location;
- Description of incident;
- Type of exposure suspected or nature of injury;
- Nature of emergency response actions; and
- Corrective actions taken to prevent reoccurrence of the incident.

Incident reports will be filed with the facility HSO, the client, and the Regional ENTRIX HSO. Incident reports should be written as soon as possible following the incident and a report filed within 24 hours.

In the event of a hazardous material spill or chemical release above the reportable limit, the appropriate Federal and State agencies will be notified. The SSO should notify the facility HSO and client contact who will report the incident to the proper authorities.

9.5 EMERGENCY MEDICAL TREATMENT PROCEDURES

All ENTRIX field personnel on-site must have current First Aid and CPR training so that personnel with minor injuries can be treated on site. In the event of a serious injury, the patient can be stabilized until medical assistance arrives. All accidents must be reported to the SSO, PM, and Regional HSO.

Should an accident occur where an employee rendering first aid is exposed to blood, the Regional HSO should be contacted immediately to report the incident, as required under the OSHA Bloodborne Pathogens Standard (29 CFR 1910.1030).

9.6 SPILLS AND LEAKS

Personnel must report spills or leaks to the SSO and the Facility HSO and client contact. In the event of a spill or leak that may pose a threat to human health or a release to air, water, or soil, the observing person is responsible for the following:

- Evacuate or request an evacuation of the persons at risk;
- Inform the Facility HSO, client contact, and the SSO immediately;
- Locate the source of the spill and stop it if it can be done safely; and
- If safe to do so, begin containment and recovery of the spilled materials utilizing appropriate response methodology and PPE.

9.7 EMERGENCY EQUIPMENT

The following emergency equipment will be available to all field teams on site:

- First aid and blood borne pathogen kits;
- Fire extinguisher;
- Portable eye wash; and
- Emergency water supply (minimum of 10 gallons).

APPENDIX A

SITE FIGURES/MAPS

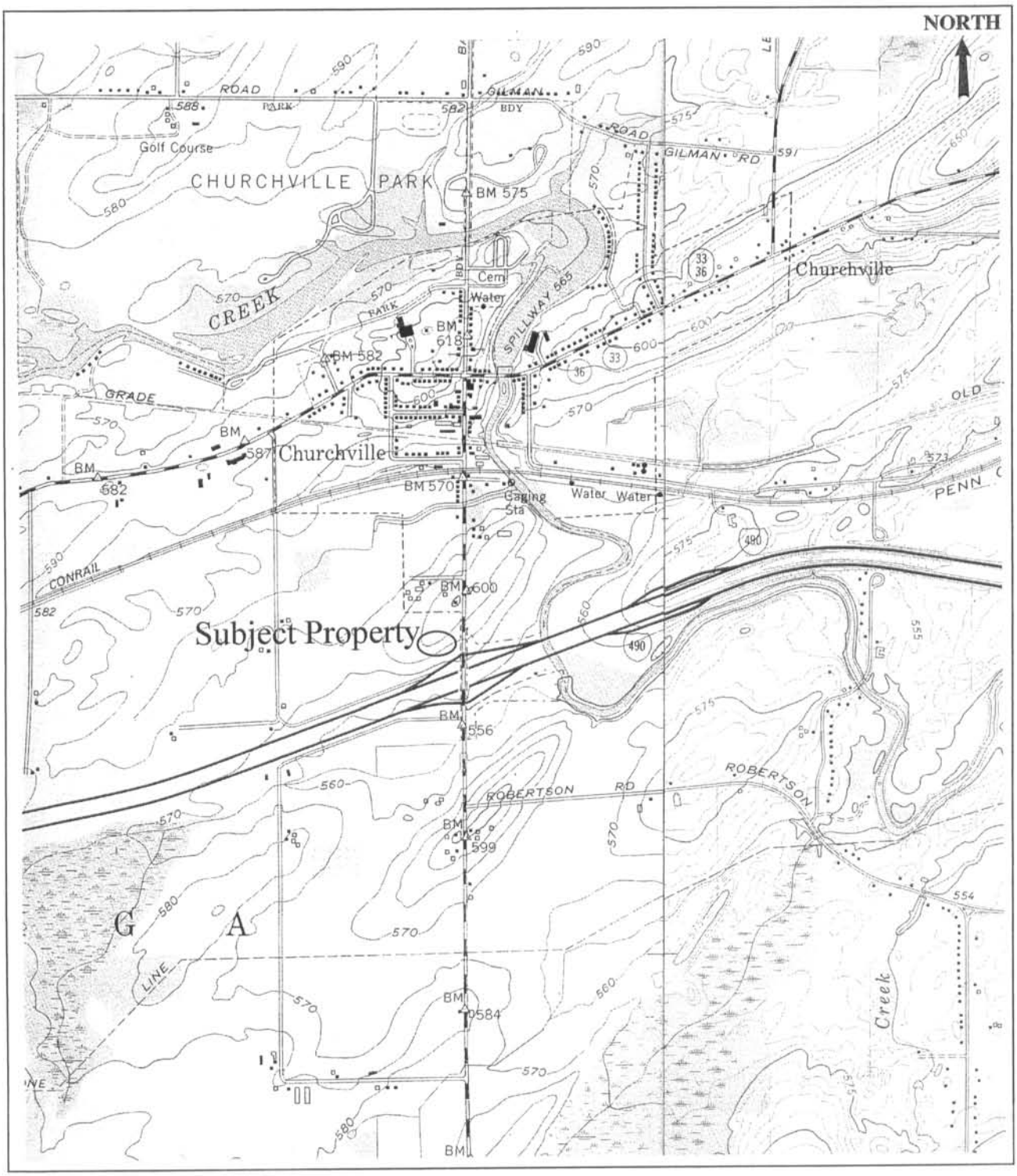
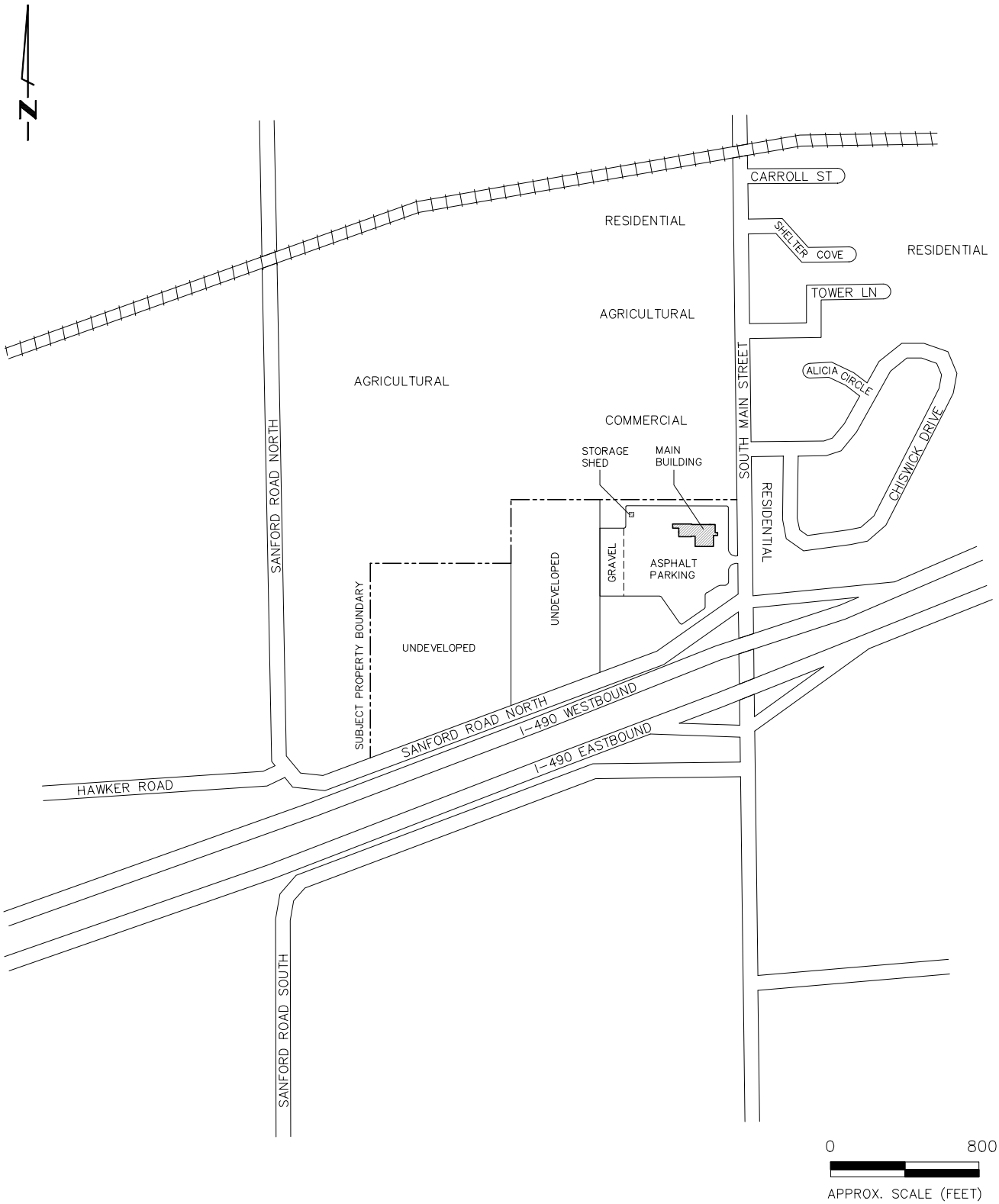


FIGURE 1
Site Location Map

USGS 7.5-Minute Quadrangle
Clifton, New York
Churchville, New York

Contour Interval = 10'
Scale: 1: 24,000



ENTRIX

Figure 2
Site Vicinity and Layout Map
Former Churchville Ford Facility
111 South Main Street
Churchville, New York

PROJ. NO: 7022526	D/B: TLD	DATE: 11/03

APPENDIX B

Sample Material Safety Data Sheets

MATERIAL SAFETY DATA SHEET

VOICE#: CS183545 04/09/98 PO#: 38170

LAST REVISED: January 26, 1995

SECTION I PRODUCT SPECIFICATIONS

T NO. O-663 CAS NO. 127-18-4
trachloroethene
HER NAME: Tetrachloroethylene/Perchloroethylene

pplied by CHEM SERVICE, Inc. PO BOX 599, WEST CHESTER, PA, 19381 (610)692-3026
ERGENCY PHONE: 610-692-3026

SECTION II TOXICITY DATA

RAL RAT OR MOUSE LD50	RTECS#	OSHA PEL (TWA)	ACGIH TLV (TWA)
8850mg/kg	KX3850000	100 ppm	25 ppm(170 mg/m3)

is compound is generally considered to be non-toxic.
is statement is based upon OSHA's assessment of the LD50

RCINOGENICITY: OSHA: (NO) IARC: (YES) NTP: (YES) ACGIH: (NO) NIOSH: (YES) OTHER: (NO)

SECTION III PHYSICAL DATA

OR:	Colorless
:	Liquid
LING POINT:	-22 C
ILING POINT:	121 C
ECIFIC GRAVITY:	1.623
POR PRESSURE:	14 mm@20 C
POR DENSITY:	NOT AVAILABLE
LUBILITY IN WATER:	Very slightly soluble
OR:	NOT AVAILABLE
APORATION RATE (Butyl acetate=1):	NOT AVAILABLE

PA Hazard Rating:

Health	Flammability	Reactivity
2	0	0

- Least, 1 - Slight, 2 - Moderate, 3 - High, 4 - Severe

SECTION IV FIRE AND EXPLOSION HAZARD DATA

ASH POINT: Non-flammable
TINGUISHING MEDIA: Carbon dioxide, dry chemical powder or spray.
explosion limits are available for this compound.

SECTION V HEALTH HAZARD DATA

ntact lenses should not be worn in the laboratory.
hemicals should be considered hazardous - Avoid direct physical contact!
ted Carcinogen-may produce cancer. May be harmful if absorbed through the skin.
be harmful if inhaled. Can cause eye irritation. Can cause skin irritation.
be harmful if swallowed. Exposure can cause liver damage. Exposure can cause kidney damage.
be irritating to mucous membranes.
olonged exposure may cause nausea/headache/dizziness and/or eye damage.
oid consumption of alcohol before and after handling of this compound because it will increase the toxicity of the compound. Can cause delayed adverse health effects.
rcotic at high concentrations.

SECTION V.1 PROPOSITION 65

is chemical is considered to be a CARCINOGEN by the state of California.

SECTION VI FIRST AID

antidote is a substance intended to counteract the effect of a poison. It should be ministered only by a physician or trained emergency personnel. Medical advice can be tained from a POISON CONTROL CENTER.

case of contact: Flush eyes continuously with water for 15-20 minutes. Flush skin with water r 15-20 minutes. If no burns have occurred-use soap and water to cleanse skin.
inhaled remove patient to fresh air. Administer oxygen if patient is having difficulty eathing. If patient has stopped breathing administer artificial respirations.
tient is in cardiac arrest administer CPR.
ue life supporting measures until medical assistance has arrived.

SECTION VII REACTIVITY DATA

compatible with strong bases. Decomposition liberates toxic fumes.
composition products are corrosive. Emits toxic fumes under fire conditions.

SECTION VIII SPILL OR LEAK PROCEDURES

ills or leaks: Evacuate area. Wear appropriate OSHA regulated equipment. Ventilate area.
sorb on vermiculite or similar material. Sweep up and place in an appropriate container.
ld for disposal. Wash contaminated surfaces to remove any residues.
SPOSAL: Burn in a chemicals incinerator equipped with an afterburner and scrubber.

SECTION IX PRECAUTIONS TO BE TAKEN IN HANDLING

is chemical should be handled only in a hood. Eye shields should be worn. Use appropriate HA/MSHA approved safety equipment. Avoid contact with skin, eyes and clothing. Do not eath vapors. Keep tightly closed.
ore in a cool dry place. Store only with compatible chemicals.

SECTION X SPECIAL PRECAUTIONS AND COMMENTS

e above information is believed to be correct on the date it is published and must not be nsidered all inclusive. The information has been obtained only by a search of available ature and is only a guide for handling the chemicals. OSHA regulations require that

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

TRICHLOROETHENE, 0-664

Section 1 - Product and Company Identification
TRICHLOROETHENE, 0-664

Product Identification: TRICHLOROETHENE, 0-664
Date of MSDS: 01/07/1993 **Technical Review Date:** 10/26/1994
FSC: 6810 **NIIN: LIIN:** 00N054683
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: CHEM SERVICE INC
Post Office Box: 3108
Manufacturer's Address1:
Manufacturer's Address2: WEST CHESTER, PA 19381
Manufacturer's Country: US
General Information Telephone: 215-692-3026
Emergency Telephone: 215-692-3026
Emergency Telephone: 215-692-3026
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 84898
Special Project Code: N

Contractor Information

Contractor's Name: CHEM SERVICE INC
Post Office Box: 3108
Contractor's Address1: N/K
Contractor's Address2: WEST CHESTER, PA 19381
Contractor's Telephone: 215-692-3026
Contractor's CAGE: 84898

Contractor Information

Contractor's Name: CHEM SERVICE, INC
Post Office Box: 599
Contractor's Address1: 660 TOWER LN
Contractor's Address2: WEST CHESTER, PA 19301-9650
Contractor's Telephone: 610-692-3026
Contractor's CAGE: 8Y898

Section 2 - Compositon/Information on Ingredients
TRICHLOROETHENE, 0-664

Ingredient Name: ETHYLENE, TRICHLORO-; (TRICHLOROETHYLENE) (SARA III). LD50: (ORAL,RAT) 4920 MG/KG.
Ingredient CAS Number: 79-01-6 **Ingredient CAS Code:** M
RTECS Number: KX4550000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:

% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 100 PPM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 50 PPM;100 STEL **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 100 LBS
DOT Reporting Quantity: 100 LBS
Ozone Depleting Chemical: N

Ingredient Name: OTHER PREC:CAUSE THE FORMATION OF HCL &/OR PHOSGENE (FP N).
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: 9999999ZZ **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: NOT APPLICABLE **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT APPLICABLE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Ingredient Name: SUPDAT:BY MD/TRAINED EMERGENCY PERSONNEL. MEDICAL ADVICE CAN BE OBTAINED FROM A POISON CONTROL CENTER.
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: 9999999ZZ **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K

% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: NOT APPLICABLE **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT APPLICABLE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Section 3 - Hazards Identification, Including Emergency Overview
TRICHLOROETHENE, 0-664

Health Hazards Acute & Chronic: ALL CHEMS SHOULD BE CONSIDERED HAZ - AVOID DIRECT PHYSICAL CONT! SUSPECTED CARCIN - MAY PRDCE CANCER. MAY BE HARMFUL IF ABSORBED THRU SKIN, INHALED/SWALLOWED. LACHRYMATOR - CAUSES SEV EYE IRRIT. VAPS &/OR DIRECT EYE CONT CAN CAUSE SEV EYE BURNS. CAN CAUSE SKIN/EYE IRRIT. CAUSE CAUSE SKIN BURNS. CAN (EFTS OF OVEREXP)

Signs & Symptoms of Overexposure:
HLTH HAZ:CAUSE SEV SKIN BURNS. EXPOS CAN CAUSE LIVER/KIDNEY DMG. CAN CAUSE GI DISTURBS. CAN BE IRRIT TO MUC MEMBS. PRLNG EXPOS MAY CAUSE NAUS, HDCH, DIZZ &/OR EYE DMG. CAN CAUSE SENSIT BY SKIN CONT. C HLOROCARBON MATLS HAVE PRDCD SENSIT OF MYOCARDIUM TO EPINEPHRINE IN LAB ANIMALS & COULD HAVE SIMILAR EFT IN (SUPP DATA)

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: SEE INGREDIENT.

Route of Entry Indicators:
- **Inhalation:** YES
- **Skin:** YES
- **Ingestion:** YES

Carcenogenicity Indicators
- **NTP:** NO
- **IARC:** NO
- **OSHA:** NO

Carcinogenicity Explanation: NOT RELEVANT

Section 4 - First Aid Measures
TRICHLOROETHENE, 0-664

First Aid:
INGEST:CALL MD IMMED (FP N). EYES:FLUSH CONTINUOUSLY W/WATER FOR AT LST 15-20 MINS. SKIN:FLUSH W/WATER FOR 15-20 MINS. IF NO BURNS HAVE OCCURRED - USE SOAP & WATER TO CLEANSE SKIN. INHAL:REMOVE PATIEN T TO FRESH AIR. ADMIN

OXYGEN IF PATIENTIS HAVING DFCLTY BRTHG. IF PATIENT HAS STOPPED BRTHG ADMIN ARTF RESP. IF PATIENT IS IN CARDIAC ARREST ADMIN CPR. CONTINUE LIFE SUPPORTING MEASURES UNTIL(SUPDAT)

Section 5 - Fire Fighting Measures
TRICHLOROETHENE, 0-664

Fire Fighting Procedures:
USE NIOSH/MSHA APPROVED PRESSURE DEMAND SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE HCL & PHOSGENE (FP N).
Extinguishing Media:
CARBON DIOXIDE, DRY CHEMICAL POWDER OR SPRAY.
Flash Point: Flash Point Text: NON-FLAMMABLE

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): 11%
Upper Limit(s): 41%

Section 6 - Accidental Release Measures
TRICHLOROETHENE, 0-664

Spill Release Procedures:
EVACUATE AREA. WEAR APPROPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE OR SIMILAR MATERIAL. SWEEP UP & PLACE IN AN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.

Section 7 - Handling and Storage
TRICHLOROETHENE, 0-664

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
TRICHLOROETHENE, 0-664

Repiratory Protection:
NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
Ventilation:
THIS CHEMICAL SHOULD ONLY BE HANDLED IN A HOOD.
Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).
Other Protective Equipment: USE APPROPRIATE NIOSH/MSHA APPROVED SAFETY EQUIPMENT.

Work Hygenic Practices: CONTACT LENSES SHOULD NOT BE WORN IN THE LABORATORY. ANSI APPRVD EYE WASH & DELUGE SHOWER (FP N).
Supplemental Health & Safety Information: EFTS OF OVEREXP:HUMANS. ADRENOMIMETICS (E.G., EPINEPRHINE) MAY BE CONTRAINDICATED EXCEPT FOR LIFE-SUSTAINING USES IN HUMANS ACUTELY/CHRONICALLY EXPOS TO CHLOROCARBONS (FP N). FIRST AID PROC:MED ASSIST ANCE HAS ARRIVED. NOTE:AN ANTIDOTE IS ASUBSTANCE INTENDED TO COUNTERACT EFT OF A POIS. IT SHOULD BE ADMIN ONLY (ING 2)

Section 9 - Physical & Chemical Properties
TRICHLOROETHENE, 0-664

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 189F,87C
Melting/Freezing Point: Melting/Freezing Text: -125F,-87C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 58 @ 20C **Vapor Density:** N/K
Percent Volatile Organic Content:
Specific Gravity: 1.462
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: INSOL (IMMISCIBLE)
Appearance and Odor: COLORLESS LIQUID.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
TRICHLOROETHENE, 0-664

Stability Indicator: YES
Materials to Avoid:
INCOMPATIBLE W/STRONG BASES, STRONG OXIDIZING AGENTS.
Stability Condition to Avoid:
NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:
DECOMPOSITION LIBERATES TOXIC FUMES. DECOMPOSTION PRODUCTS ARE CORROSIVE. VOLATILE. HCL, PHOSGENE (FP N).
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT

Section 11 - Toxicological Information
TRICHLOROETHENE, 0-664

Toxicological Information:
N/P

Section 12 - Ecological Information

TRICHLOROETHENE, 0-664

Ecological Information:
N/P

Section 13 - Disposal Considerations
TRICHLOROETHENE, 0-664

Waste Disposal Methods:
DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS (FP N). BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AFTERBURNER & SCRUBBER.

Section 14 - MSDS Transport Information
TRICHLOROETHENE, 0-664

Transport Information:
N/P

Section 15 - Regulatory Information
TRICHLOROETHENE, 0-664

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
TRICHLOROETHENE, 0-664

Other Information:
N/P

HAZCOM Label Information

Product Identification: TRICHLOROETHENE, 0-664
CAGE: 84898
Assigned Individual: N
Company Name: CHEM SERVICE INC
Company PO Box: 3108
Company Street Address1: N/K
Company Street Address2: WEST CHESTER, PA 19381 US
Health Emergency Telephone: 215-692-3026
Label Required Indicator: Y
Date Label Reviewed: 10/26/1994
Status Code: C
Manufacturer's Label Number:
Date of Label: 10/26/1994
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES

Respiratory Protection Indicator: YES
Signal Word: DANGER
Health Hazard: Moderate
Contact Hazard: Severe
Fire Hazard: None
Reactivity Hazard: None

8/9/2002 8:48:03 AM

MATERIAL SAFETY DATA SHEET

VOC-1N

04/06/94

LAST REVISED: October 13, 1992

SECTION I PRODUCT SPECIFICATIONS

CAT NO. F29 CAS NO. 75-35-4

1,1-Dichloroethene

OTHER NAME: Vinylidene chloride/inhibited with 100ppm hydroquinone monomethyl ether

Supplied by **CHEM SERVICE, Inc.** PO BOX 3108, WEST CHESTER, PA, 19381 (215)692-3026
EMERGENCY PHONE: 215-692-3026

SECTION II TOXICITY DATA

ORAL RAT OR MOUSE LD50	RTECS#	OSHA PEL (TWA)	ACGIH TLV (TWA)
200mg/kg	KV9275000	1ppm (4mg/m3)	5ppm (20mg/m3)

This compound is considered to be toxic.
This statement is based upon OSHA's assesment of the LD50

SECTION III PHYSICAL DATA

MELTING POINT	BOILING POINT	DENSITY	VAPOR PRESSURE	VAPOR DENSITY
-122.5 C	31.7 C	1.2129	NOT AVAILABLE	NOT AVAILABLE

ODOR	COLOR	PHASE
Fruity/Pleasent	Colorless	Liquid

EVAPORATION RATE Butyl acetate=1	SOLUBILITY IN WATER
NOT AVAILABLE	Insoluble (immiscible)

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: -15 C This is a flammable chemical.
EXTINGUISHING MEDIA: Carbon dioxide or dry chemical powder. DO NOT USE WATER!
No explosion limits are available for this compound.

SECTION V HEALTH HAZARD DATA

Contact lenses should not be worn in the laboratory.
All chemicals should be considered hazardous - Avoid direct physical contact!

SECTION V HEALTH HAZARD DATA CONTINUED

Lachrymator-Causes severe eye irritation. Can cause skin irritation.
Can cause an allergic skin reaction. Can cause sensitization by skin contact.
Can be irritating to mucous membranes. Narcotic at high concentrations.
Exposure can cause liver damage. Exposure can cause kidney damage.
Can cause nervous system injury. Can cause cardiovascular system injury.
Can cause delayed adverse health effects.

SECTION VI FIRST AID

An antidote is a substance intended to counteract the effect of a poison. It should be administered only by a physician or trained emergency personnel. Medical advice can be obtained from a POISON CONTROL CENTER.

In case of contact: Flush eyes continuously with water for 15-20 minutes. Flush skin with water for 15-20 minutes. If no burns have occurred-use soap and water to cleanse skin.
If inhaled remove patient to fresh air. Administer oxygen if patient is having difficulty breathing. If patient has stopped breathing administer artificial respirations.
If patient is in cardiac arrest administer CPR.
Continue life supporting measures until medical assistance has arrived.
Remove and wash contaminated clothing.
If patient is exhibiting signs of shock - Keep warm and quiet.
Contact Poison Control Center immediately if necessary.
Do not administer liquids or induce vomiting to an unconscious or convulsing person.
If patient is vomiting-watch closely to make sure airway does not become obstructed by vomit.
Get medical attention if necessary.

SECTION VII REACTIVITY DATA

Tends to develop pressure on standing. Flammable. May polymerize upon standing.
Sensitive to heat. Air sensitive. Explosive.

SECTION VIII SPILL OR LEAK PROCEDURES

Spills or leaks: Evacuate area. Wear appropriate OSHA regulated equipment. Ventilate area. Absorb on vermiculite or similar material. Sweep up and place in an appropriate container. Hold for disposal. Wash contaminated surfaces to remove any residues.
DISPOSAL: Burn in a chemicals incinerator equipped with an afterburner and scrubber.

SECTION IX PRECAUTIONS TO BE TAKEN IN HANDLING

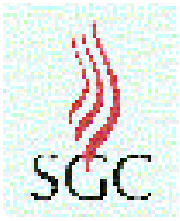
This chemical should be handled only in a hood. Eye shields should be worn. Use appropriate OSHA/MSHA approved safety equipment. Avoid contact with skin, eyes and clothing. Keep tightly closed in a cool dry place. STORE UNDER NITROGEN AND REFRIGERATION. Store only with compatible che

SECTION X SPECIAL PRECAUTIONS AND COMMENTS

The above information is believed to be correct on the date it is published and must not be considered all inclusive. The information has been obtained only by a search of available literature and is only a guide for handling the chemicals. OSHA regulations require that if other hazards become evident, an upgraded MSDS must be made avalible to the employee within three months. Responsibility for updates lies with the employer and not with CHEM SERVICE, Inc. Persons not specifically and properly trained should not handle this chemical or its container. This MSDS is provided without any warranty expressed or implied,

including merchantability or fitness for any particular purpose.

This product is furnished FOR LABORATORY USE ONLY! Our products may NOT BE USED as drugs, cosmetics, agricultural or pesticidal products, food additives or as household chemicals.



SPECIALTY GAS CONCEPTS

4344 South Main **A Division of BMS, Inc.** **(281) 482-7007**
Pearland, TX *77581* **Fax (281) 482-9216**

MATERIAL SAFETY DATA SHEET (MSDS) ISOBUTYLENE

PRODUCT IDENTIFICATION	**D.O.T. SHIPPING NAME**	Isobutylene
	SYNONYM (S)	Liquefied Petroleum Gas, Isobutene, 2 Methylpropene
	DOT. I.D. NUMBER	UN-1055
	DOT. HAZARD CLASS	Flammable Gas
	DOT. LABEL(S)	Flammable Gas
	C.A.S. NUMBER	115-11-7
	CHEMICAL FORMULA	C_4H_8 or $(CH_3)_2C{:}CH_2$

PHYSICAL DATA	**MOLECULAR WEIGHT**	5*6.108*
	FREEZING POINT	-140.4°C, -220.6°F
	BOILING POINT	-6.9°C, 19.6°F
	VAPOR PRESSURE	168 kPa(gauge), 24.3 psig @ 21.1°C
	SPECIFIC VOLUME	0.418 m^3/kg, 6.7ft^3/lb @1atm, 25℃
	RELATIVE DENSITY, (air=1)	1.55 @ 1 atm, 20℃
	SOLUBILITY IN WATER	Negligible

DESCRIPTION At room temperature and atmospheric pressure, isobutylene is a colorless, flammable gas, with a unpleasant odor. It is shipped as a liquefied gas under its own vapor pressure.

FIRE AND EXPLOSION HAZARD DATA

FLAMMABLE LIMITS IN AIR	1.8 – 9.6% by volume
AUTO-IGNITION TEMPERATURE	465?C, 869? F

FIRE FIGHTING PROCEDURES

The only safe way to extinguish an isobutylene fire is to stop the flow of gas. If the flow cannot be stopped, let the fire burn out while cooling the cylinder and the surroundings using a water spray. Personnel may have to wear approach type protective suits and positive pressure self-contained breathing apparatus. Firefighters' turnout gear may be inadequate. Small secondary fires may be brought under control by using carbon dioxide or a dry chemical fire extinguisher and stopping flow.

Date Prepared: June21, 1993Date Revised: March 26, 1999

UNUSUAL HAZARDS

1.Cylinders exposed to fire may rupture with violent force. Extinguish surrounding fire and keep cylinders cool by applying water from a maximum possible distance with a water spray.

2.Flammable gases may spread from a spill after the fire is extinguished and be subject to re-ignition.

HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LIMITS	OSHA TWA None established ACGIH TWA None established
ACUTE EFFECTS OF OVEREXPOSURE	Isobutylene is a simple asphyxiant. Inhalation of high concentrations may cause rapid respiration, dizziness, fatigue, and nauesa. Massive exposure may cause unconsciousness and death. Contact with the liquid phase or with the cold gas escaping from a cylinder may cause frostbite.
CHRONIC EFFECTS OF OVEREXPOSURE	None Known.

FIRST AID INFORMATION

INHALATION	Move victim to fresh air. If not breathing, give artificial respiration, preferably mouth to-mouth. If breathing is difficult, give oxygen. Call a physician.
CONTACT	Treat for frostbite

REACTIVITY DATA

STABILITY	(X)Stable () Unstable
INCOMPATIBILITY	Oxidizing materials and compounds that can add across double bonds.
HAZARDOUS DECOMPOSITION / OXIDATION PRODUCTS	Carbon monoxide, Carbon dioxide
POLYMERIZATION	() Will not occur (X) May Occur

SPILL OR LEAKAGE PROCEDURE

Shut off all ignition sources and ventilate the area. For controlling large flows, personnel may have to wear approach-type protective suits and positive pressure self-contained breathing apparatus.

PRECAUTIONS

STORAGE RECOMMENDATIONS

Cylinders should be stored and used in dry, well-ventilated areas away from sources of heat or ignition. Do not store with oxidizers.

PERSONAL PROTECTIVE EQUIPMENT

1. Eye protection – Safety glasses should be worn.
2. Respiratory protection - Approved respiratory equipment must be worn when airborne concentrations exceed safe levels.
3. Skin protection – No special equipment is required. Gloves are recommended for cylinder handling.

BEFORE USING THE GAS

1. Secure the cylinder to prevent it from falling or being knocked over.
2. Leak check the lines and equipment.
3. Have an emergency plan covering steps to be taken in the event of an accidental release.

DISCLAIMER

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APPENDIX C

HASP Sign-Off Sheet

ENTRIX

Health and Safety Plan (HASP)
TRAINING RECORD

HASP Title_____

Project Number _____

I have read the HASP above and fully understand the material covered. I understand that I am responsible for compliance with the requirements covered in each of the SOPs, and I agree to abide by the same. I also had the opportunity to discuss the information presented in the HASP, and to ask any questions about the information that I want clarified.

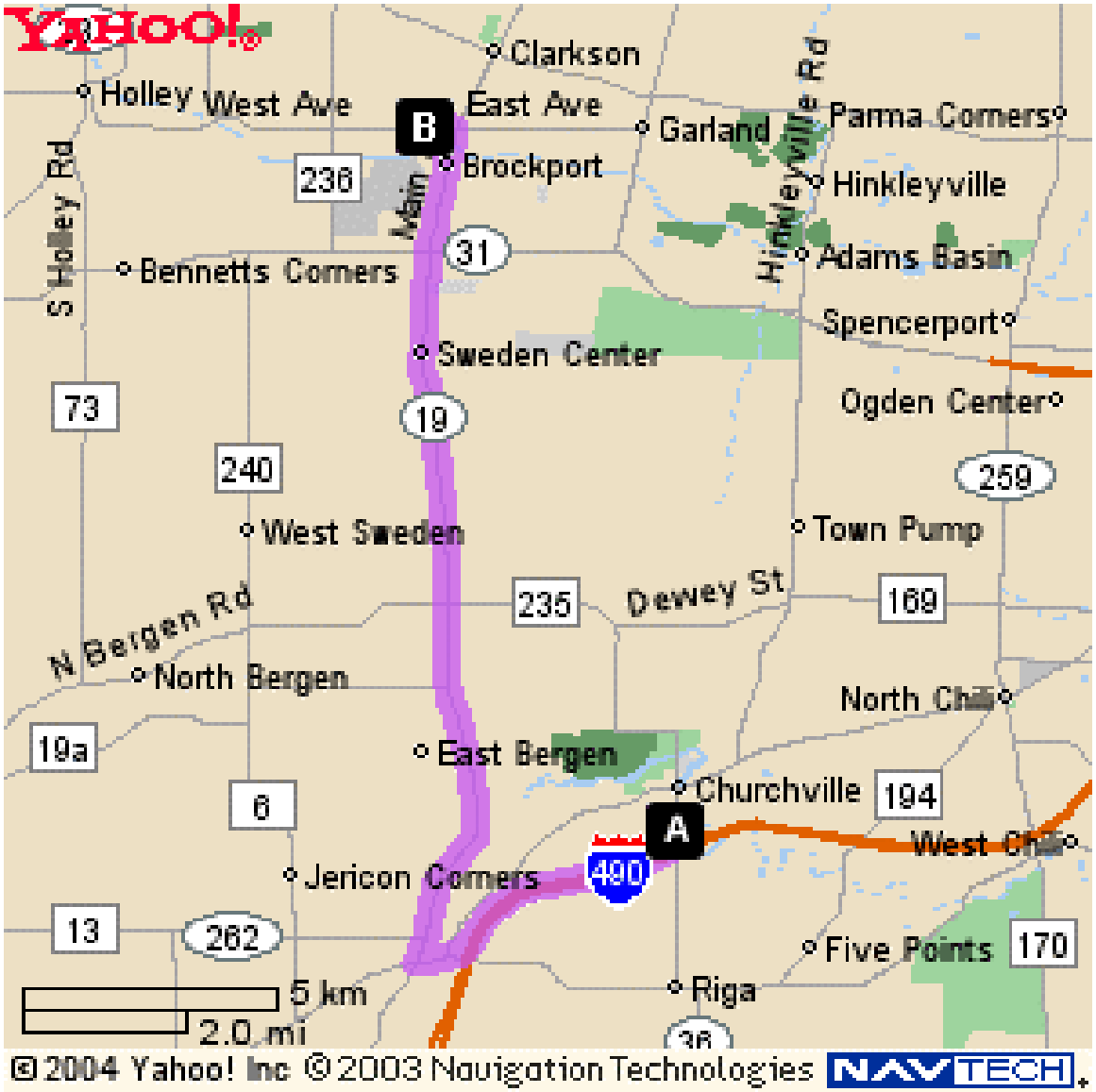
I understand that this record will become a permanent part of my employee health and safety training file.

_____
Print/Type Employee Name

_____ _____
Employee Signature Date

APPENDIX D

Map to Lakeside Memorial Hospital


Clarkson
Holley West Ave
East Ave
B
Garland
Parma Corners
Hinkleyville Rd
S Holley Rd
236
Main
Brockport
Hinkleyville
31
Bennetts Corners
Adams Basin
Spencerport
Sweden Center
73
19
Ogden Center
240
259
West Sweden
Town Pump
235
Dewey St
169
N Bergen Rd
North Bergen
North Chili
19a
East Bergen
Churchville
194
6
A
West Chili
Jericon Corners
490
13
262
Five Points
170
5 km
2.0 mi
Riga
38
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NAVTECH

APPENDIX E

AIR MONITORING FIELD DATA COLLECTION SHEET

Air Monitoring Field Data Collection Sheet

Record Downwind Perimeter 15-minute running averages for both VOCs and particulates
Record Upwind VOC and Particulate (background) instantaneous values every three hours
Record Work Area Breathing Zone VOC instantaneous values on a periodic basis according to the HASP

Time	Downwind Perimeter		Upwind		Work Area Breathing Zone	Comments
	VOCs (ppm)	Particulates (mcg/m3)	VOCs (ppm)	Particulates (mcg/m3)	VOCs (ppm)	
8:00						
8:15						
8:30						
8:45						
9:00						
9:15						
9:30						
9:45						
10:00						
10:15						
10:30						
10:45						
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