

325 East Chicago Street Milwaukee, Wisconsin 53202 414/291-8840 Fax: 414/291-8841

June 7, 1996

Ms. Pamela Mylotta % ERR/ERP Wisconsin Department of Natural Resources 4041 North Richards Street P.O. Box 12436 Milwaukee, WI 53212

Dear Ms. Mylotta:

RE: Buildings 44-B and 44-C Preliminary Remedial Investigation Work Plan Chrysler Corporation, Kenosha Engine Plant FID #230139360 ERR/ERP

Enclosed for your review is a work plan prepared by Triad Engineering Inc. (Triad) on behalf of Chrysler Corporation (Chrysler). The work plan addresses areas within Buildings 44-B and 44-C at the Chrysler Kenosha Engine Plant property.

If you have any questions or comments, please do not hesitate to call us at (414) 291-8840 or Mr. Greg Rose of Chrysler at (810) 576-7362.

Sincerely,

TRIAD ENGINEERING INC.

Richard J. Binder, P.G., CGWP Senior Hydrogeologist

c: Curt Chapman/Chrysler Jack Bugno/Chrysler TRIAD ENGINEERING INC.

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Ross M. Creighton, P.G. ProjectManager/Hydrogeologist

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FID 230139360 ERA/EAP BUILDINGS 44-B AND 44-C PRELIMINARY REMEDIAL INVESTIGATION WORK PLAN CHRYSLER CORPORATION KENOSHA ENGINE PLANT KENOSHA, WISCONSIN

PREPARED FOR:

CHRYSLER CORPORATION 800 CHRYSLER DRIVE AUBURN HILLS, MICHIGAN 48326-2757

PREPARED BY:

TRIAD ENGINEERING INCORPORATED PROJECT NO. W963873.EP3

JUNE 1996



TRIAD ENGINEERING INCORPORATED

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Edward T. Manning, Jr., P.E. Vice President

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"I, Ross M. Creighton, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wisconsin Administrative Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in Chapters NR 716, Wisconsin Administrative Code."

Ross M. Creighton, P.G. No. 858 Project Manager/Hydrogeologist



"I, Sarah E. Levin, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of Chapter A-E4, Wisconsin Administrative Code; that this document has been prepared in accordance with the Rules of Professional Conduct in Chapter A-E8, Wisconsin Administrative Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in Chapters NR 716, Wisconsin Administrative Code."

E-29769

Sarah E. Levin, P.E. No. F-29 Project Engineer



LIST OF ACRONYMS

| bgs | below ground surface |
|----------|---|
| Chrysler | Chrysler Corporation |
| cm/s | centimeters per second |
| DOT | Department of Transportation |
| DRO | diesel range organics |
| FID | flame ionization detector |
| GRO | gasoline range organics |
| HSI | Hydro-Search, Inc. |
| KEP | Kenosha Engine Plant |
| msl | mean sea level |
| OSHA | Occupational Health and Safety Administration |
| PID | photoionization detector |
| Plan | Investigation Work Plan |
| QA . | quality assurance |
| QC | quality control |
| RI | Remedial Investigation |
| SVE | soil vapor extraction |
| SVOCs | semi-volatile organic compounds |
| Triad | Triad Engineering Incorporated |
| USCS | Unified Soil Classification System |
| VOCs | volatile organic compounds |
| WAC | Wisconsin Administrative Code |
| WDNR | Wisconsin Department of Natural Resources |

1.0 INTRODUCTION/BACKGROUND

1.1 Purpose and Scope.

Triad Engineering Incorporated (Triad) was retained by Chrysler Corporation (Chrysler) to prepare a preliminary Remedial Investigation (RI) Work Plan (Plan) for the Buildings 44-B and 44-C area at the Chrysler Kenosha Engine Plant (KEP) located in Kenosha, Wisconsin (Figure 1). The preliminary RI will be conducted within Buildings 44-B and 44-C to evaluate subsurface soil and groundwater conditions prior to planned floor excavation and hydromation system construction activities.

Soil sampling will be completed before excavation activities related to Buildings 44-B and 44-C floor removal and new hydromation system construction. Appropriate documentation will be submitted to the Wisconsin Department of Natural Resources (WDNR).

In order to complete the above-described objectives, the following two tasks will be conducted:

- Preliminary Soil Probe Investigation.
- Preliminary RI Report Preparation.
- 1.2 Plan Organization.

This Plan is divided into seven sections. General information is presented in Section 2.0. Scoping information, which includes site history, previous investigations, and potential receptors are described in Section 3.0. Basic hydrologic and geologic information are summarized in Section 4.0. The investigation techniques, methodologies, sampling parameters, analytical methods, detection limits, and quality assurance/quality control (QA/QC) procedures are addressed in Section 5.0. The schedule is presented in Section 6.0 and the references cited are listed in Section 7.0.

2.0 GENERAL INFORMATION

Buildings 44-B and 44-C are located within the KEP Property in Kenosha, Wisconsin (Figures 1 and 2). The property is bounded by 60th Street to the south, 30th Avenue to the west, and the Kenosha Main Plant property to the north and east. Surrounding land use is industrial, commercial, and residential. Buildings 44-B and 44-C are located in the Southeast Quarter, Section 36, Township 2 North, Range 22 East, Kenosha County, Wisconsin. Additional site information is provided below.

| FACILITY: | Chrysler Corporation, Kenosha Engine Plant | | |
|------------------|---|--|--|
| ADDRESS: | 5555 30th Avenue Kenosha, Wisconsin 53144-2800 | | |
| OWNER: | Chrysler Corporation 800 Chrysler Drive Auburn Hills, Michigan 48326-2757 | | |
| CONTACTS: | Mr. John P. Bugno, Site Administrator, Kenosha, Wisconsin Mr. Gregory M. Rose, Supervisor, Environmental Remediation, Auburn Hills, Michigan | | |
| TELEPHONE: · | (414) 658-6000 (Kenosha, Wisconsin) (810) 576-7362 (Auburn Hills, Michigan) | | |
| FACSIMILE: | (414) 658-6904 (Kenosha, Wisconsin) (810) 576-7369 (Auburn Hills, Michigan) | | |
| CONSULTANT: | Triad Engineering Incorporated | | |
| ADDRESS: | 325 East Chicago Street Milwaukee, Wisconsin 53202 | | |
| CONTACTS: | Mr. Ross M. Creighton, Project Manager/Hydrogeologist Ms. Sarah E. Levin, P.E., Project Engineer Mr. Richard J. Binder, P.G., CGWP, Senior Hydrogeologist | | |
| TELEPHONE: | (414) 291-8840 | | |
| FACSIMILE: | (414) 291-8841 | | |
| WDNR FID NUMBER: | 230139360 ERR/ERP | | |

3.0 SCOPING INFORMATION

3.1 Site History.

The KEP property has been used for automobile production and assembly operations since the early 1900s. During World War II, the plant was used to manufacture military equipment, including aircraft engines. Automobile production resumed following the war.

As part of the KEP expansion and upgrading, portions of Buildings 44-B and 44-C will be reconfigured to facilitate installation of new machining equipment for the 2.7L Engine. The buildings were previously used as a tooling area for die repair and try-out as well as light production. The buildings are currently used only for storage. Activities will include excavation of the floor in Buildings 44-B and 44-C, construction of a new hydromation system.

3.2 Adjacent Properties.

The Kenosha Main Plant property is located immediately east and north of the KEP property (Figure 1). As part of deactivation and demolition of the Main Plant, environmental investigations and remedial actions were conducted at the property. The Main Plant property was divided into 16 areas (Sites MP-1 through MP-16; Figure 2) to allow investigations to focus on areas of concern. Volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and cyanide have been detected in subsurface soil and groundwater samples at various locations.

As part of remedial activities, fourteen groundwater recovery and six treatment systems were installed. The systems were installed to provide hydraulic control, expedite the recovery of product and groundwater containing VOCs, and treat the recovered groundwater prior to discharge to the City of Kenosha Water Utility. In addition, three soil vapor extraction (SVE) systems were installed and one ex-situ/in-situ bioremediation system is scheduled for start-up during Spring 1996. Other historical remedial activities have included soil excavation and off-site disposal/treatment. Previous investigative and remedial activities are documented in previous reports submitted to the WDNR.

There are no access restrictions to the site or neighboring properties, since Chrysler owns the properties adjacent to Buildings 44-B and 44-C.

3.3 Potential Receptors.

The City of Kenosha currently obtains its drinking water from Lake Michigan. There are no known public or private water wells within a 1200 foot radius of the site. According to city engineers, however, domestic wells may be in operation within the city limits. No records documenting domestic wells currently exist (Hydro-Search, Incorporated [HSI], 1989). Domestic wells are also found in outlying areas, several miles from the site.

There are on-site underground utilities that are located near the Buildings 44-B and 44-C. These will be identified prior to conducting subsurface work.

There are no known state or federally listed threatened or endangered species, sensitive species habitats, or ecosystems that will be impacted at the site. In addition, there are no known wetlands, outstanding water resources or areas of historical or archeological significance on-site.

4.0 HYDROLOGIC AND GEOLOGIC INFORMATION

The following sections present regional and site-specific topographic, geologic, and hydrogeologic information. The majority of the information has been adapted from previous reports (HSI, 1989 and 1991).

4.1 Topography and Surface Water.

Topography surrounding the KEP property is generally flat (Figure 1). Topographic relief within 0.5 miles of the site is less than 50 feet, with elevations ranging from approximately 650 feet above mean sea level (msl) to the west to approximately 600 feet above msl in the Pike Creek Valley north of the KEP. Surface drainage from the site is to city storm sewers, which drain to Pike Creek and Lake Michigan. All storm water/non-contact cooling water is currently routed through an on-site treatment system prior to discharge to Pike Creek. A secondary storm water overflow relief outfall tie-in is located on 60th Street, in the event flooding/surcharging occurs. Surface water bodies in the vicinity of the facility include Pike Creek, approximately 0.5 miles north, a pond located in Lincoln Park, approximately 0.6 miles southeast , and Lake Michigan, approximately 1.25 miles to the east (HSI, 1989).

4.2 Regional Geology and Hydrogeology

Unconsolidated sediments in the Kenosha area consist predominantly of Quaternary-age glacial and preglacial sediments deposited during the later stages of glaciation that occurred within the Lake Michigan Basin (about 15,000 years ago). The deposits are composed of glacial lake organic materials, stratified clay, silt, and sand with an approximate thickness of 20 to 100 feet (Mickelson et al., 1984).

Bedrock underlying the unconsolidated glacial deposits in the Kenosha area consists of Silurian-age sedimentary rocks. Available published information suggests that the Silurian system is predominantly composed of the Niagara Dolomite (Skinner and Borman, 1973). The Silurian system dips gently to the east towards the Lake Michigan Basin.

The Silurian system conformably overlies a sequence of Ordovician-and Cambrian-age rocks that also dip gently to the east toward the Lake Michigan Basin. The Ordovician-age rocks include the Maquoketa Formation (shales, dolomitic shales, and minor dolomite), Sinnipee Group (dolomites with minor limestones and shale), St. Peter Sandstone (well-sorted sand with a basal conglomerate and minor shale), and Prairie du Chien Group (dolomite with minor sandstone and shale). The Cambrian-age rocks are composed mainly of sandstones of the Tunnel City and Elk Mound Groups. Cambrian sandstones unconformably overlie Precambrian-age crystalline basement rock (Skinner and Borman, 1973).

Two major groundwater producing aquifers are present in the Kenosha area (Skinner and Borman, 1973). The upper unconfined aquifer system consists of Quaternary-age unconsolidated glacial and preglacial deposits and the underlying Silurian-age dolomite bedrock. The deeper confined aquifer system, which consists of Ordovician- and Cambrianage dolomites and sandstones, is located at a depth of approximately 250 feet beneath the

upper aquifer. This lower aquifer is confined between the overlying Ordovician-age Maquoketa shale and the underlying Precambrian-age crystalline rock. Regional groundwater flow for both aquifers is eastward towards Lake Michigan (Skinner and Borman, 1973).

The City of Kenosha currently obtains its drinking water from Lake Michigan. Domestic wells in the outlying areas generally obtain potable water from the Niagara Dolomite (HSI, 1989).

4.3 Site Geology and Hydrogeology.

Based on information collected during previous investigative activities at the Main Plant, surficial materials at the site generally consist of approximately 0 to 10 feet of fill material which overlie varying thicknesses of silty sand, sandy silt, silt, clayey silt, and silty clay. the deepest boreholes installed at the Main Plant were two 51-foot boreholes, MP-20 and MP-2R, located at site MP-2. At these locations, the subsoil generally consisted of sandy silt and silty sand to a depth of 15 to 24 feet. Underlying these sandy units was a silty clay glacial till unit identified to be the Oak Creek Formation. The Oak Creek Till is a regionally extensive unit, on the order of 130 feet thick, which underlies the entire plant site (Mickelson, et al., 1984). This unit is very dense and exhibits low hydraulic conductivity on the order of 10⁻⁷ centimeters per second (cm/s). The Oak Creek Till acts as an aquitard between a shallow water table observed at the site and deeper bedrock aquifers (HSI, 1989).

Groundwater level measurements from the Main Plant monitoring wells indicate that groundwater generally occurs at approximately 2 to 15 feet below ground surface (bgs). Based on groundwater levels obtained from the northern and eastern portions of the site, the horizontal hydraulic gradient for the water table surface varies from approximately 0.01 to 0.003 foot per foot. The local groundwater flow direction at the property is influenced by the on-site groundwater recovery systems.

Hydraulic conductivity testing was performed at 36 monitoring well locations. Calculated site hydraulic conductivities ranged from approximately 3×10^{-7} cm/s to approximately 5×10^{-4} cm/s (HSI, 1989).

The linear groundwater flow velocity for the site can be estimated using the horizontal hydraulic gradient, hydraulic conductivity and an assumed effective porosity for site aquifer materials. Porosity values for silty clay are on the order of 35 to 70 percent (Freeze and Cherry, 1979). Due to poor sorting and relatively high silt and clay content in the soils, a porosity of 35 percent was used. Based on the calculated hydraulic conductivities, horizontal groundwater flow velocities at the site are anticipated to range from less than 1 to 13 feet per year. Hydraulic testing and water elevation data and estimated groundwater flow velocity calculations are contained in a previous report (HSI, 1989). Recent construction and investigations at the KEP property indicate that geologic and hydrogeologic conditions are similar to those at the Main Plant.

5.0 SCOPE OF WORK

This section describes the proposed preliminary investigation of subsurface soil to be excavated at Buildings 44-B and 44-C. Elements of the planned field activities discussed in this section include soil and groundwater sampling. Field activities will be conducted under the observation of qualified on-site personnel. Activities will be under the supervision of a hydrogeologist meeting the definition contained in s. NR 712.03(1), Wisconsin Administrative Code (WAC).

Utility clearance will be confirmed by Digger's Hotline and with Chrysler representatives prior to initiating site activities. A site-specific health and safety plan will also be prepared, in accordance with Occupational Health and Safety Administration (OSHA) requirements.

5.1 Preliminary Soil Probe Investigation.

Approximately 15 GeoProbe[™] soil borings will be installed at the general locations presented on Figure 3. The following sections describe the GeoProbe[™] soil-boring installation procedures, soil-sampling methods, groundwater-sampling methods, documentation, QA/QC procedures, decontamination, and waste generation.

5.1.1 Field Procedures.

Soil Sampling

The soil borings will be advanced using a portable, truck-mounted GeoProbe[™]. Approximately 15 borings will be advanced to a depth of 8 to 10 feet bgs. Two borings will be advanced to approximately 14 feet bgs and will be installed in the area of the future hydromation system process tanks. Exact locations and boring depths will be determined in the field. Soil samples will be obtained by advancing a 2-foot long, 1-inch diameter, GeoProbe[™] sampling device containing a clean, disposable, plastic liner for each depth interval. Soil samples will be collected continuously in 2-foot intervals at each boring location. Upon completion, each GeoProbe[™] soil boring will be abandoned with hydrated bentonite granules in accordance with Chapter NR 141, WAC, requirements.

Each soil sample will be divided into subsamples for geologic classification, field screening, and possible laboratory analysis. WDNR-approved EN-CORE samplers will be rented for temporary soil sample storage to reduce the number of methanol-preserved soil samples generated during GeoProbe[™] usage. (As of March 1, 1996, the WDNR no longer allows temporary storage of soil samples on ice prior to methanol preservation unless brass tubes or EN-CORE samplers are used.) Soil samples collected for possible laboratory analysis will be placed in laboratory-supplied containers upon collection, preserved as appropriate, and immediately placed on ice. Soil samples selected for laboratory analysis will be shipped to a WDNR-certified laboratory following standard chain-of-custody procedures.

The soil types observed at each boring location will be logged on WDNR Soil Boring Log Information Forms by the on-site geologist. Soil types will be described according to the Unified Soil Classification System (USCS) Standards.

A representative portion of each sample obtained from the split spoon will be fieldscreened for the presence of VOCs by using a photoionization detector (PID) equipped with a 10.6 eV lamp and/or a flame-ionization detector (FID) and the headspacescreening methods described in WDNR guidance. The field-screening samples will be allowed to equilibrate near room temperature for at least one-half hour prior to screening. Following equilibration, the PID and FID probes will be inserted into the headspace of the sample container and the highest reading will be recorded. Visual and olfactory observations will also be made.

One sample from each of the sampled intervals within a boring will be submitted to a WDNR-certified laboratory for analysis of diesel range organics (DRO; WDNR modified DRO Method, 5-minute extended window), gasoline range organics (GRO; WDNR Modified Method), and VOCs (Method 8260). In addition, select soil samples will be collected for Waste Management Protocol B analysis. Table 1 presents a summary of the anticipated laboratory analytical methods.

Groundwater Sampling

As previously discussed, the GeoProbe[™] borings installed in the area of the future hydromation system will be advanced to a depth of approximately 14 feet bgs each. Upon reaching this depth, plastic tubing will be placed into the open boring and, pending groundwater recovery, a peristaltic pump will be used to obtain groundwater samples from the borings. Groundwater samples will be submitted to a WDNR-certified laboratory for analysis of DRO (WDNR Modified Method), GRO (WDNR Modified Method), and VOCs (Method 8021). Table 1 presents a summary of the laboratory analytical methods.

5.1.2 Documentation.

Soil-boring information, soil boring and well abandonment, well construction and well development will be documented by completing the appropriate WDNR forms. Completed forms will be provided in either the quarterly reports or the preliminary report.

5.1.3 Quality Assurance/Quality Control Procedures.

One equipment blank will be collected for each day of sampling from down-hole sampling equipment following decontamination of the equipment (unless disposable or dedicated sampling devices are used).

All QA/QC samples will be processed through the sampling equipment in a manner identical to actual samples. Results of the analyses of QA/QC samples will be included in the preliminary RI report, and will be taken into account in the data assessment portion of the report. Chain-of-custody documents will be completed for all samples collected and submitted for laboratory analysis.

5.1.4 Decontamination Procedures and Cross-Contamination Prevention Procedures.

Drilling equipment will be steam-cleaned prior to arrival on site and between soil-boring locations at an area identified by Chrysler representatives. Sampling equipment will be washed with trisodium phosphate substitute (Alconox) solution, followed by tripledistilled water rinses prior to arrival on site and between successive sample intervals in an area identified by Chrysler representatives.

Decontamination wash water will be contained in labeled, Department of Transportation (DOT) approved, 55-gallon drums and treated in one of the on-site air strippers.

5.1.5 Waste Generation.

Cuttings generated during soil boring activities will be placed in DOT-approved, 55-gallon drums. The method for disposing of the cuttings will be determined upon receipt of analytical results from the soil-sampling program.

5.2 Preliminary RI Report.

Following review and reduction of the preliminary RI analytical data, an RI report will be prepared. The report will include general background information, methods of investigation, investigation rationale and results, soil-boring documentation, conclusions and recommendations, and associated tables and figures, as required under NR 716.15, WAC.

6.0 SCHEDULE

A description of the major mileposts and their anticipated completion dates are provided below.

| TASK DESCRIPTION | ANTICIPATED DATE |
|---------------------------|------------------|
| Preliminary Investigation | April 1996 |
| Preliminary RI Report | July 1996 |

Note: This schedule is tentative. The actual schedule for this project will be dependent upon subcontractor availability and Chrysler construction priorities.

7.0 REFERENCES CITED

- American Society for Testing and Materials, 1984, Standard Method for Penetration Test and Split-Barrel Sampling of Soils D1586-84, p. 298-303.
- Freeze, R. A., and Cherry, J. A., 1979 <u>Groundwater</u>, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 07632, 604 p.
- Mickelson, D. M., Clayton, L., Baker, R. W., Mode, W. N., and Schneider, A. F., 1984; Pleistocene Stratigraphic Units of Wisconsin: Wisconsin Geographic and Natural History Survey, Miscellaneous Paper 84-1, 15 p.
- Skinner, E. L. and Borman, 1973: Water Resources of Wisconsin (Lake Michigan Basin); Hydrologic Investigation Atlas HA-432, United States Geological Survey.
- Wisconsin Department of Natural Resources, 1991, Groundwater Monitoring Well Requirements: Wisconsin Administrative Code, Chapter NR 141, p. 690-7-690-30.
- Wisconsin Department of Natural Resources, 1994, Investigation and Remediation of Environmental Contamination: Wisconsin Administrative Code, Chapters NR 700 -736.
- Wisconsin Department of Natural Resources, September 1987, Groundwater Sampling Procedures Field Manual, PUBL-WR-168.
- HSI, 1989 and 1991, Subsurface Site Environmental Assessment Report, Chrysler Corporation, Main Plant and Support Sites, Kenosha, Wisconsin (Phases 1, II, and III).

TABLES

TABLE 1 SAMPLING RATIONALE/ANALYTICAL PROTOCOL BUILDINGS 44-B AND 44-C PRELIMINARY RI CHRYSLER CORPORATION

| MEDIUM | NUMBER OF BORINGS | NUMBER OF SAMPLES | ANALYTICAL PARAMETERS (METHOD) | PRACTICAL QUANTITATION LIMIT (µg/kg or µg/l) |
|-------------|----------------------|----------------------|-----------------------------------|---|
| Soil | 15 | 15 | VOCs (8260) | 5 |
| | | 15 | DRO (WI mod. ext. window) | 10,000 |
| | | 15 | GRO (WI modified) | 10,000 |
| | | 4 | Protocol B (various) | various |
| Groundwater | 2 | 2 | VOCs (8260) | 1 |
| | | 2 | DRO (WI mod. ext. window) | 100 |
| | | 2 | GRO (WI modified) | 100 |
| | | 2 | PCBs (8080) | 0.50 |

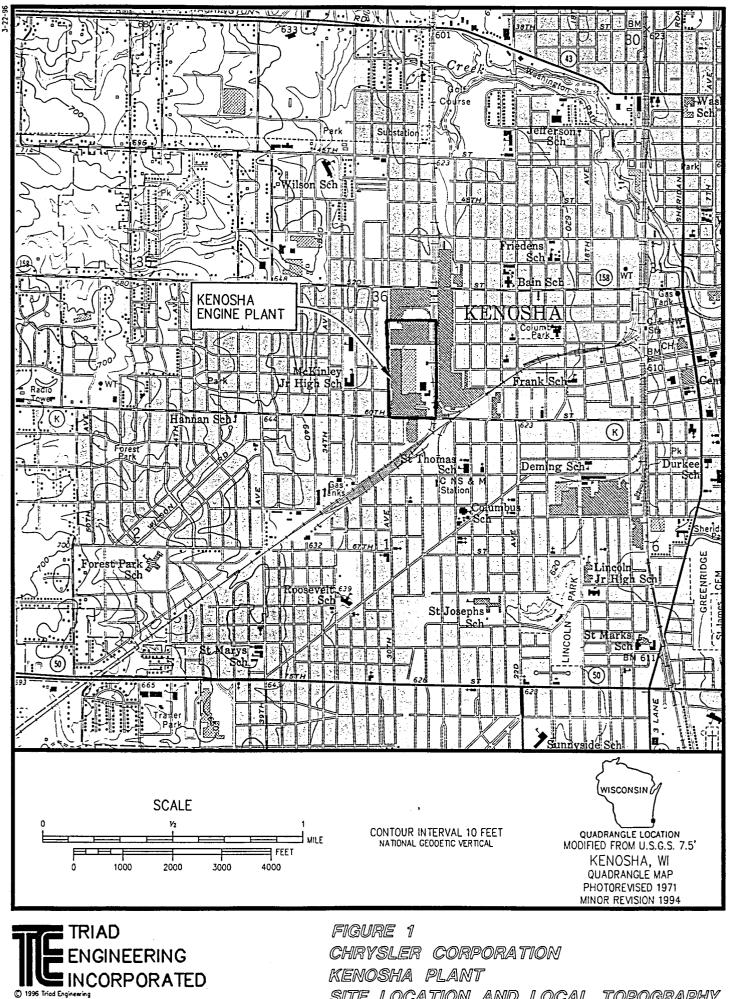
VOC - volatile organic compounds

DRO - diesel range organics

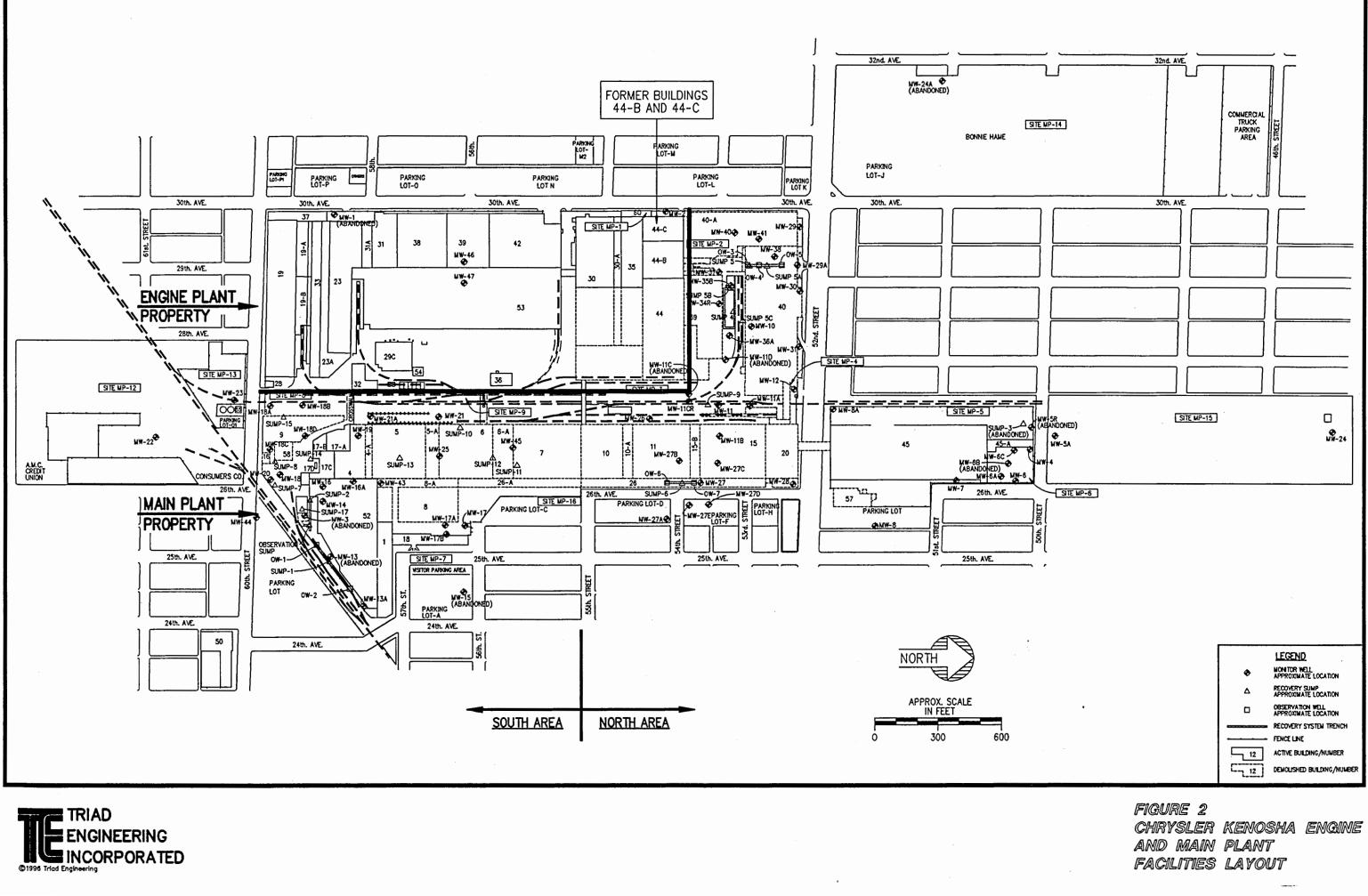
GRO - gasoline range organics

FIGURES

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SITE LOCATION AND LOCAL TOPOGRAPHY





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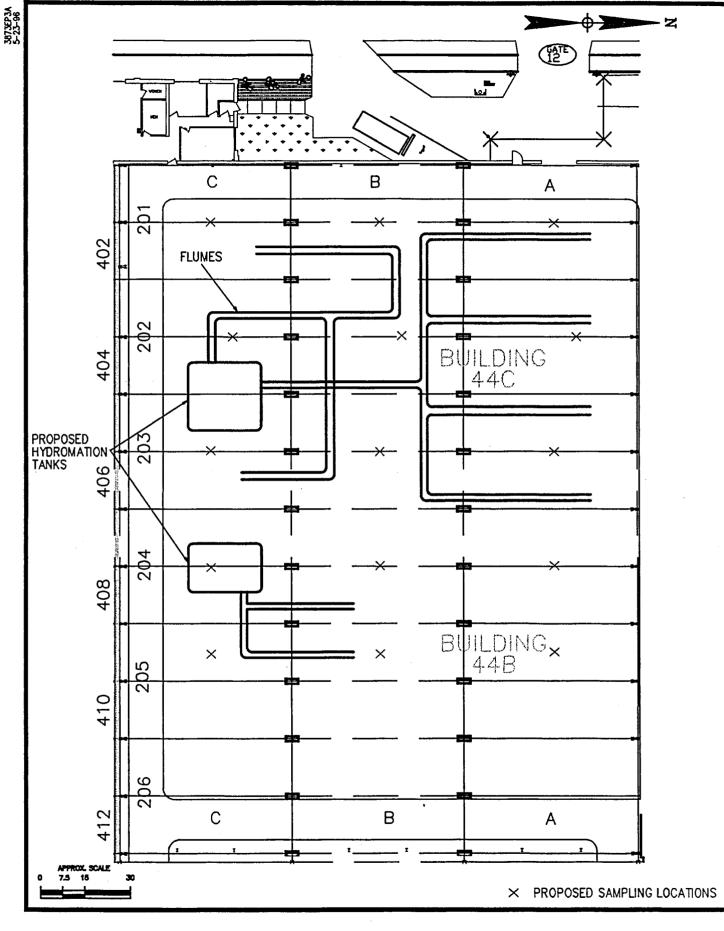




FIGURE 3 PROPOSED SAMPLING LOCATIONS BUILDINGS 44-B & C CHRYSLER KENOSHA ENGINE PLANT