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NR 716 Site Investigation Work Plan

N89 W16744-46 Appleton Avenue Site
Menomonee Falls, Wisconsin

STS Project No. 5-87210XA

THE INFRASTRUCTURE IMPERATIVE

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STS CONSULTANTS

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October 4, 2002

Ms. Vicki Stovall
Program Assistant
Remediation and Redevelopment Program
Wisconsin Department of Natural Resources
2300 North Martin Luther King Drive
Milwaukee, WI 53212

RE: NR716 Work Plan for the Property Located at N89 W16744-46 Appleton Avenue, Menomonee Falls, Wisconsin – STS Project No. 5-87210XA

Dear Ms. Stovall:

On behalf of Bence Family Limited Partnership, please find enclosed a Site Investigation Work Plan for the referenced facility, prepared by STS Consultants, Ltd (STS). This Work Plan was prepared to provide information required under Chapter NR716.09 of the Wisconsin Administrative Code. If you have any questions or comments concerning the information contained herein, please feel free to contact us at your convenience.

Respectfully submitted,

STS CONSULTANTS, LTD

Mark M. Mejac

Mark M. Mejac, P.G.
Senior Hydrogeologist

Thomas W. Kroeger /MMM

Thomas W. Kroeger, P.H.
Principal Hydrologist

Enclosure

cc: Mr. Todd Bence
Ms. Pamela L. Gergens, Esq.

Table of Contents

1.0 INTRODUCTION

1.1 Purpose and Scope

The purpose of this Work Plan is to describe the intended work scope to complete a NR716 Site Investigation of soil and groundwater conditions in the area of the Bence Family Limited Partnership (Bence) property located at N89 W16744-46 Appleton Avenue, Menomonee Falls, Wisconsin. This Work Plan is prepared to provide information required under Section NR716.09 of the Wisconsin Administrative Code (WAC). The Work Plan provides background information, a description of existing site conditions, proposed field and laboratory procedures, and a schedule for execution of the Work Plan and Site Investigation Report submittal.

1.2 Involved Parties

Parties currently involved with this project are listed in Appendix A.

1.3 Objectives and Scope of Work

The objectives of the scope of work presented herein are as follows:

- Direction of local groundwater flow;
- Horizontal extent of affected groundwater quality;
- Contaminant fate and transport characterization; and
- Evaluation of risk to potential receptors.

To address the above stated objectives, STS has developed the following scope of work:

- Install two groundwater monitoring wells using a conventional drill rig at the locations identified as MW-2 and MW-3 on Figure 2. The monitoring wells will be set to approximately 20 feet below ground surface (bgs).
- Conduct a location and elevation survey of, and obtain groundwater elevations from, all three new and existing monitoring wells to determine the local direction of groundwater flow.
- Collect soil samples from both new monitoring well installation borings for laboratory analysis.
- Collect groundwater samples from all three new and existing monitoring wells for laboratory analysis.

2.0 SITE AND VICINITY SCOPING

2.1 Physical Site Description

The site is currently occupied by a two-story commercial building that formerly operated as a dry cleaning facility. The site location is depicted on Figure 1 and is described as follows:

Bence Family Limited Partnership
N89 W16744-46 Appleton Avenue
Village of Menomonee Falls, Wisconsin 53051
NE1/4, SE1/4, and SW1/4 of SW1/4 of Sec. 3, T. 8N, R. 20E.

The subject site is located on the east side of Appleton Avenue and the west side of Church Street, between Roosevelt Drive and Cleveland Avenue in Menomonee Falls, Waukesha County, Wisconsin. The site includes a two-story commercial building and an asphalt-paved parking area on the northeast side of the facility building. The first story of the building is currently used as a music store, and the second story is used for apartment rental.

2.2 Project History

The two-story commercial building at the subject property operated as a dry cleaning facility from approximately 1975 to 1985. Maxim Technologies, Inc. (Maxim) was retained by Bence in 2001 to evaluate potential impacts associated with the former dry cleaning operations. As part of their investigation, Maxim advanced three hydraulic probes (identified as GP-1, GP-2 and GP-3) on the property. The hydraulic probes encountered dolomite bedrock at a depth of 1.5 to 7.5 feet below grade at the site. A soil sample collected from Maxim hydraulic probe GP-1 (located on the loading dock ramp on the east side of the facility building) in December 2001 revealed 71,000 micrograms per kilogram (μg/kg) of tetrachloroethene (PCE), and lesser concentrations of other chlorinated and aromatic volatile organic compounds (VOCs). Soil samples collected from GP-2 (located in the northern portion of the property) and GP-3 (located in the eastern portion of the property) did not reveal detectable VOC concentrations. The Wisconsin Department of Natural Resources (WDNR) was subsequently notified by Bence that a release of hazardous substances on the property had occurred.

Approximately 7 cubic yards of impacted soil near GP-1 were excavated by Maxim in February 2002. Two soil samples collected from the base of the excavation revealed 99,000 and 11,000 μg/kg of PCE; however, additional excavation beyond 2 feet below grade was precluded by the bedrock surface. Soil samples collected from the walls of the excavation revealed 240 to 500 μg/kg of PCE. The excavated soil was removed from the property and disposed off-site by Onyx Environmental Services in March 2002.

Monitoring well MW-1 was installed in the northern portion of the property by Maxim in March 2002; this well was screened from 15 to 35 feet bgs. The measured depth to groundwater in this well was approximately 13 feet bgs. Published regional information indicates a possible easterly or southeasterly direction of groundwater flow across the site. Groundwater samples were collected from this monitoring well on two occasions in April 2002. These groundwater samples revealed a maximum PCE concentration of 780 μg/L, a maximum trichloroethene (TCE) concentration of 24 μg/L, a maximum cis-1,2-dichloroethene (cis-1,2-DCE) concentration of 12 μg/L, and a maximum vinyl chloride concentration of 0.27μg/L.

2.3 Potential Receptors

The major potential receptors to affected groundwater quality at the subject site are the dolomite aquifer and the Menomonee River. The Maxim investigation revealed that dolomite bedrock was encountered at a depth of 1.5 feet to 7.5 feet below grade. The Menomonee River is located approximately 700 feet to the east of the subject site.

3.0 SITE GEOLOGIC AND HYDROGEOLOGIC SETTING

3.1 Regional Geology

Relatively thin sequences of local soils are derived from Pleistocene-aged glacial drift. Underlying the Pleistocene glacial deposits in the site vicinity are Silurian-age dolomites (Niagaran Aquifer) and shale (Maquoketa Formation), Ordovician-age limestones, dolomites and sandstones, Cambrian-age sandstones, and Precambrian basement rocks (USGS, 1953).

3.2 Regional Hydrogeology

The land surface elevation of the property is approximately 860 feet above mean sea level, and slopes toward the northeast across the site. Stormwater runoff eventually discharges to the Menomonee River (located approximately 700 feet to the east of the property), which in turn flows east into Lake Michigan. Regional groundwater flow is to the east, toward Lake Michigan. Groundwater occurs in the Silurian-age dolomites (Niagaran Aquifer), and the Ordovician and Cambrian-age sandstones (Sandstone Aquifer). The Maquoketa Formation acts as a confining unit, which hydraulically separates the Niagaran and Sandstone Aquifers.

3.3 References

United States Geological Survey, 1953, Groundwater Conditions in the Milwaukee-Waukesha area, Wisconsin, Water-Supply Paper 1229.

4.0 FIELD INVESTIGATION

4.1 Pre-Field Activities

STS will contact Digger's Hotline for the location of public utilities in the area of the investigation. STS will also review maps and other information provided by Bence Family Limited Partnership regarding the locations of private utilities in the area.

4.2 Monitoring Well Installation

Existing monitoring well MW-1 is located to the northeast of the recently excavated impacted soil, which may not be directly hydraulically downgradient of the former excavation. Two additional monitoring wells will therefore be installed on the property, at the locations shown on Figure 2. The installation of two additional wells will result in a total of three monitoring wells at the site, which will allow for an evaluation of local groundwater flow direction and hydraulic gradient. Groundwater data from new monitoring well MW-2 will provide an understanding of groundwater quality at the identified former source area. Assuming a southeasterly, easterly or northeasterly local groundwater flow direction, groundwater data from monitoring well MW-3 will be used to determine if any impacted groundwater may be exiting the property. Soil samples will be collected from the two monitoring well installation borings, to determine if VOCs are present in the vadose zone at those locations.

The two new monitoring wells (MW-2 and MW-3) will each be installed to approximate depths of 20 feet, as the reported depth to groundwater is 13 feet at the site. The monitoring wells will be screened from 10 to 20 feet below ground surface using schedule 40 polyvinyl chloride (PVC) well casing and screen materials. The wells will be flush-mounted, and will be installed in accordance with WAC Chapter NR 141 (as described in Appendix B).

4.3 Soil Sampling and Analysis

Soil samples will be collected at 2.5-foot intervals to the bedrock surface from the two monitoring well installation borings. Soil samples will be described and classified in the field by STS personnel in accordance with the USCS. Soil samples will be screened with a PID or FID using headspace screening techniques.

4.4 Well Development

Upon installation of each well, it will be developed in accordance with WAC NR 141. Well development will generate water that will be contained in 55-gallon drums until laboratory results from the water sampling are obtained. The drums will be stored on-site at a location to be identified by Bence.

4.5 Groundwater Sampling and Analysis

After development, groundwater samples will be collected from all new and existing monitoring wells. Collected groundwater samples will be submitted for laboratory analysis of VOCs. All collected groundwater samples will be transported to the project laboratory and analyzed in accordance with WDNR requirements concerning proper chain-of-custody procedures (as described in Appendix A).

4.6 Investigative Waste Handling/Disposal

Soil cuttings generated during advancement of the monitoring wells will be placed into 55-gallon drums that will be temporarily staged on-site until the cuttings are properly characterized and managed. The subsequent Site Investigation Report will discuss handling of any wastes generated during this investigation.

4.7 Surveying

STS will conduct a location and elevation survey of PVC well casing and ground surface elevation at each new and existing monitoring well location. The new and existing monitoring wells will be referenced to the existing site datum. STS will obtain one round of water level measurements in all existing and new monitoring wells to determine the local groundwater flow direction.

4.0 DATA EVALUATION/REPORT PREPARATION

Analytical laboratory results obtained as part of this investigation will be reduced and compared to relevant standards or criteria. A WAC NR716 Site Investigation Report will be prepared that will document and discuss the investigative work, results and our conclusions and recommendations as appropriate. Sample location, groundwater flow and quality diagrams will be included in the report.

5.0 PROJECT SCHEDULE

The field investigation activities will be completed within a 1 to 2 week timeframe, and laboratory results of collected soil and groundwater samples will be available approximately 1 to 2 weeks thereafter. Approximately 2 weeks will be required to complete the Site Investigation Report, such that the report will be available approximately 5 to 6 weeks after start-up of the field investigation.

Bence Family Limited Partnership
STS Project No. 5-87210XA
October 4, 2002

NR700 CERTIFICATIONS

"I, Mark Mejac, certify that I am a hydrogeologist as that term is defined in s.NR712.03(1), Wis. Adm. 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 chs. NR700 to 726, Wis. Adm. Code."

Mark M. Mejac — 10-4-02

Mark M. Mejac, P.G.
Senior Hydrogeologist

Date

"I, Thomas Kroeger, certify that I am a hydrogeologist as that term is defined in s.NR712.03(1), Wis. Adm. 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 chs. NR700 to 726, Wis. Adm. Code."

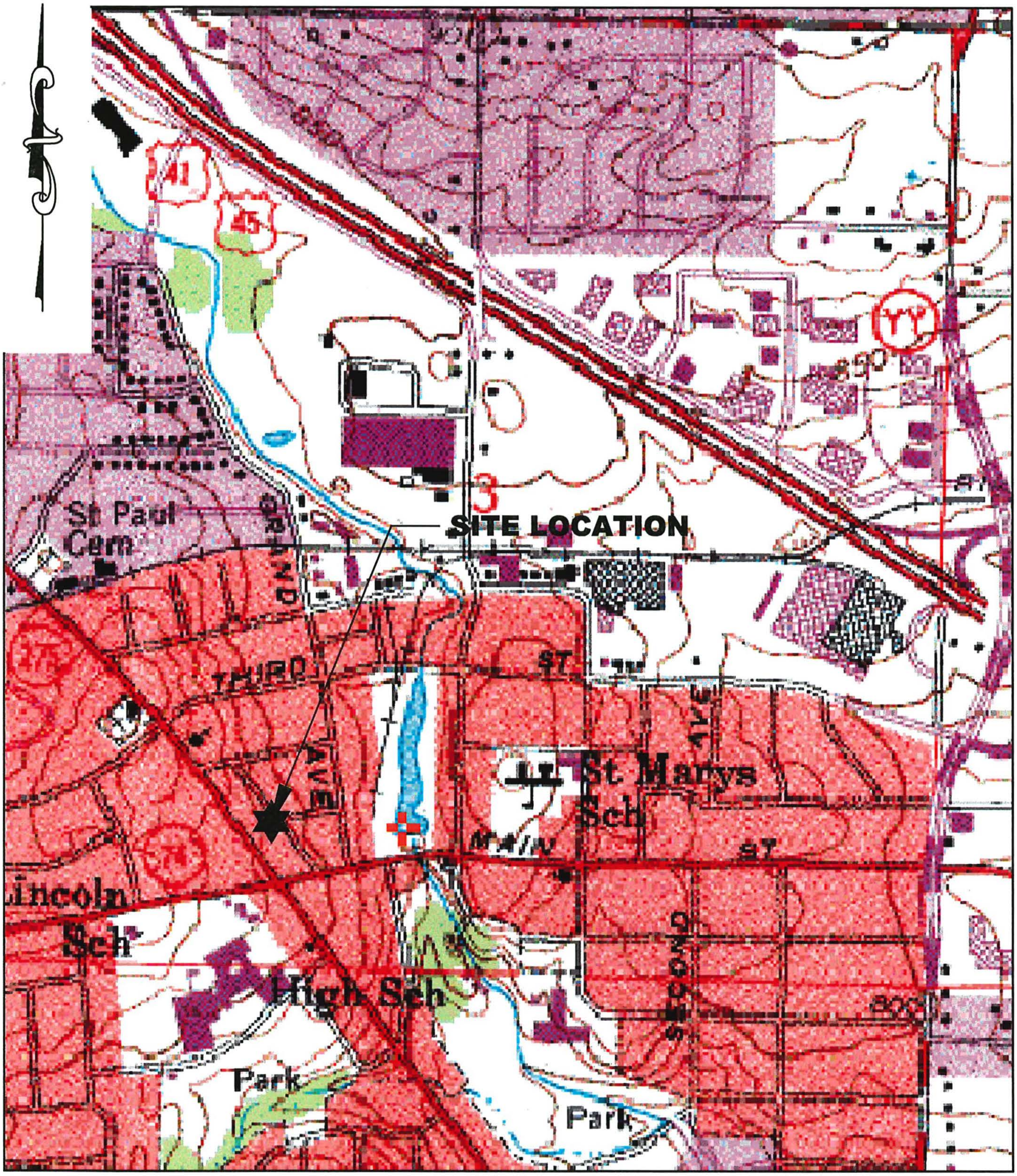
Thomas W. Kroeger/mmm — 10-4-02

Thomas W. Kroeger, P.H.
Principal Hydrologist

Date

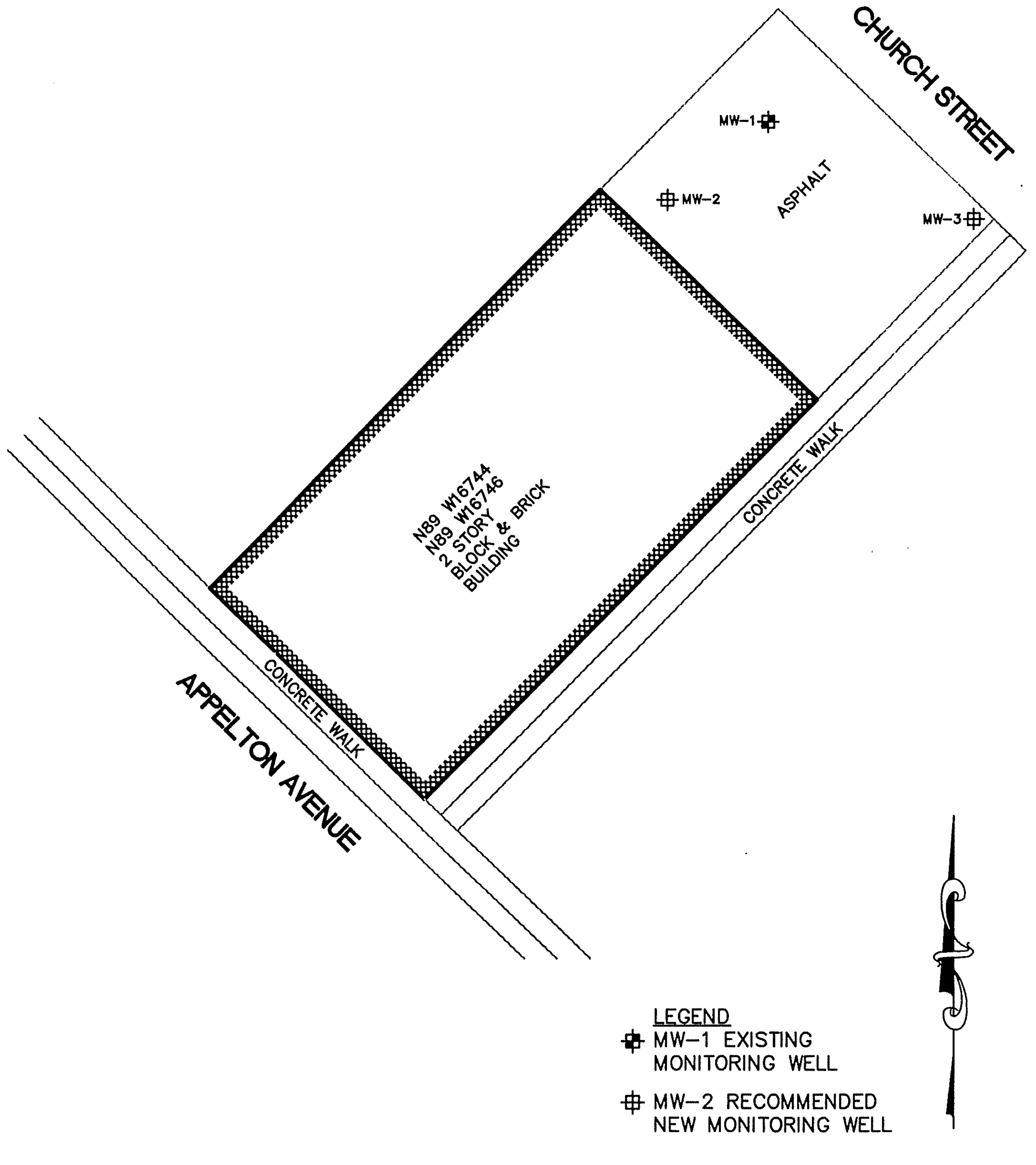
Bence Family Limited Partnership
STS Project No. 5-87210XA
October 4, 2002

FIGURES



STS Consultants Ltd. Consulting Engineers 11425 W. Lake Park Dr. Milwaukee, WI 53224 414.359.3030	SITE LOCATION N89 W1644-46 APPLETON AVENUE SITE MENOMONEE FALLS, WISCONSIN	DESIGNED BY	MOM	10/1/02
		DRAWN BY	WDB	10/1/02
		APPROVED BY	MOM	10/1/02
		CADFILE 0587210XA	SCALE N. T. S.	
		STS PROJECT NO. 87210	FIGURE NO. 1	

W:\0587210XA\dwg\0587210XA.dwg, FIG 1, 10/04/2002 03:12:00 PM, BARNES, Letter, 1:1



STS Consultants Ltd. Consulting Engineers 11425 W. Lake Park Dr. Milwaukee, WI 53224 414.359.3030	RECOMMENDED NEW MONITORING WELL LOCATIONS N89 W1644-46 APPLETON AVENUE SITE MENOMONEE FALLS, WISCONSIN	DESIGNED BY	MOM	10/1/02
		DRAWN BY	WDB	10/1/02
		APPROVED BY	MOM	10/1/02
		CADFILE 0587210XA	SCALE N. T. S.	
		STS PROJECT NO. 87210	FIGURE NO. 2	

APPENDICES

Bence Family Limited Partnership
STS Project No. 5-87210XA
October 4, 2002

APPENDIX A

Involved Parties List

APPENDIX A

INVOLVED PARTIES LIST

N89 W16744-46 Appleton Avenue Site, Menomonee Falls, Wisconsin

Site Owner:	Bence Family Limited Partnership Menomonee Falls, Wisconsin 53051 Contact: Mr. Todd Bence (262) 251-0660
Attorney:	Michael Best & Friedrich LLP 100 East Wisconsin Avenue Milwaukee, WI 53202-4108 Contact: Ms. Pamela L. Gergens, Esq. (414) 223-2525
Consultant:	STS Consultants, Ltd. 11425 West Lake Park Drive Milwaukee, WI 53224 Contact: Mr. Thomas W. Kroeger Mr. Mark M. Mejac (414) 359-3030
Department of Natural Resources:	Department of Natural Resources 2300 N. ML King Drive, PO Box 12436 Milwaukee, WI 53212-0436 Contact: Ms. Vicki Stovall (414) 263-8500

Bence Family Limited Partnership
STS Project No. 5-87210XA
October 4, 2002

APPENDIX B

STS Operating Procedures

1.0 SOIL SAMPLING PROCEDURES

1.1 Auger Drilling

Typically, 6-1/4 inch hollow stem augers are utilized to advance boreholes during auger drilling. The augers are advanced using a truck or all-terrain vehicle (ATV) mounted auger drilling rig. Soil samples are collected at 2.5-foot intervals, using standard split-barrel sampling procedures. Drilling equipment is decontaminated in accordance with procedures outlined in Section 4.1. Soil cuttings generated during the drilling procedure are handled in accordance with the procedures outlined in Section 5.1.

1.2 Soil Screening

Each soil sample collected as part of auger drilling methods is split to form duplicate samples, upon collection. A portion of the sample, to be utilized for screening purposes and classification is placed in an 8-ounce glass jar, covered with aluminum foil and sealed with a screw-on lid. The remainder of the sample is placed in laboratory provided jars, if the sample is to be submitted to a laboratory for analytical testing.

1.2.1 PID Screening

STS utilizes a HNu Model PI-101 photoionization detector (PID) equipped with a 10.2 electron volt (eV) lamp or a MiniRae Plus (PGM-76) Professional PID equipped with a 10.6 eV lamp. Both instruments are capable of detecting certain volatile organic compounds (VOCs), including many of the volatile organic components characteristic of petroleum products and common solvents with ionization energies less than or equal to 10.6 eV.

PID screening is performed by first allowing the screening sample to warm to approximately room temperature (70° F). The sample is shaken vigorously for several seconds. This procedure breaks up the soil and increases the surface area of the soil particles exposed to the air inside of the jar. The tip of the PID probe is inserted about one inch into the jar through the aluminum foil. The highest value read off of the meter during the first few seconds after inserting the probe tip is recorded as the PID reading for the soil sample.

Because organic compounds have varying ionization potentials, the response of the PID depends on the compounds being ionized. In addition, because the PID responds only to compounds which are present in the vapor phase, the relative volatility is also a factor in the response. As a result, when a variety of VOCs are present in the screening sample, the meter reading does not necessarily indicate the concentrations of any specific VOC, but a response to total VOCs present relative to the concentrations and ionization potential of each compound.

Prior to screening, the meter is zeroed and calibrated to an isobutylene standard per the manufacturer's specifications. All PID readings are reported in PID Instrument Units (IU). The readings are similar to parts per million, using an isobutylene equivalent to address the variability of the response factor. This nomenclature is recommended by the equipment manufacturer and required by the Wisconsin Department of Natural Resources (WDNR) field screening procedures guidance document.

1.2.2 FID Screening

The FID screening procedures are similar to the PID procedures. The sample is warmed and shaken before the FID probe is inserted into the jar. The highest reading is the FID reading recorded for the sample.

The Sensidyne flame ionization detector (FID) is a portable instrument used to measure organic vapors and gasses in the air. The air containing organic vapors is mixed with hydrogen and burned in a hydrogen flame near two high-voltage electrodes. Organic compounds in the gas stream cause an increase in electric current proportional to the concentration. The FID is calibrated with methane, but responds to nearly all volatile compounds containing carbon.

Prior to screening, the FID is calibrated to a methane standard per the manufacturer's specifications. All FID readings are reported in FID Instrument Units. The readings are in parts per million based on the methane standard.

1.3 Soil Classification

The soil samples are preliminarily classified in the field, at the time of collection. Drilling notes regarding soil types, drilling conditions, PID or FID screening, depth to water and location of stratigraphic changes are documented on the field boring logs. The soil samples are re-classified in the STS laboratory by a geologist or engineer. Soil classification is based upon the texture and plasticity of the soil, in general accordance with the Unified Soil Classification System (USCS).

1.4 Sample Preservation

Soil samples to be submitted for analytical testing are collected in accordance with standard WDNR protocol. For soil samples to be tested for VOCs, each soil sample is weighed immediately after collection. Approximately 25 to 35 grams of soil is placed in a pre-weighed laboratory provided 60-milliliter (ml) vial. A pre-measured amount (25-ml) of laboratory grade methanol is added to the sample. The entire soil sample is covered with the methanol. Each sample is labeled with the sample designation, sample date and time, sampler's initials, project No. and preservative added. The sample is placed in a cooler on ice to maintain a temperature of 4° C or less and submitted to the laboratory on the sample collection date, if possible.

1.4.1 Chain of Custody

A chain-of-custody form is completed immediately after sample collection and accompanies the samples from time of collection until received by the laboratory. Any notes regarding soil sample collection are included in the field book while in the field.

1.5 Bore Hole Abandonment

Each borehole advanced at the site which is not converted to a groundwater monitoring well will be abandoned in accordance with the procedures outlined in Ch. NR141 of the Wisconsin Administrative Code. Typically, borings which are not converted to groundwater monitoring wells are backfilled with bentonite chips from the bottom of the boring to the surface. If surface improvements are present (i.e., concrete or asphalt), bentonite is placed up to the bottom of the improvement and the surface is repaired with a similar material.

The STS representative present in the field during abandonment procedures will complete WDNR form 3300-5B. A copy of this form will be prepared for each location and submitted with the final report prepared for WDNR review.

2.0 WELL INSTALLATION PROCEDURE

2.1 NR 141 Well Construction

Monitoring wells are installed in general accordance with the installation procedures in Wisconsin Administrative Code Chapter NR 141. This section describes the typical well installation procedure. Any deviations from this procedure will be discussed in the text of this report.

Groundwater monitoring wells are installed at locations in which a borehole has been advanced using 6-1/4 inch diameter hollow stem augers through unconsolidated sediments and/or 6 inch diameter drill bits (using air rotary drilling) through bedrock. The well materials are placed while the augers are in the ground, and the well material is inserted inside of the hollow stem augers. If the borehole was advanced beyond the depth the well is to be installed, the borehole is backfilled with bentonite chips prior to installing the well materials. The well consists of a two-inch diameter, 10-foot long section of Schedule 40 polyvinyl chloride (PVC) screen threaded onto an end cap. The slot size of the screened portion depends upon the characteristics of the soil, though typically 0.006-slot screen is used in clayey and silty soils and 0.010-slot screen is used in sandy soils or bedrock. The screened portion is threaded onto 5 or 10 foot sections of two-inch diameter PVC pipe (unscreened) which extends to either the ground surface or to no more than 2-feet above the ground surface at locations in which a stick-up well protector is required. A cap fitted with an expandable gasket and a lock is placed on top of the well casing.

The material filling the annular space between the borehole walls and the well casing is poured inside of the augers and the augers are pulled up during placement of the fill material. Approximately 6-inches of fine grained, washed silica sand is placed below the well screen. Silica sand is placed as a filter pack, around the screened portion of the well. The grain size is selected to retain a minimum of 50% of the surrounding formation. The filter pack is placed from 6-inches below the well to approximately 2-feet above the well screen. Above the filter pack, two feet of fine-grained sand is typically placed. If the depth to groundwater prohibits the placement of two feet of filter pack and/or fine sand, the thickness of these layers are reduced to no less than 6-inches of each material above the top of the well screen. Above the fine sand, a bentonite seal is placed and consists of a minimum of 2-feet of chipped bentonite or bentonite pellets (the type of material used depends upon the depth to groundwater). Bentonite is used to fill the remaining annular space from the top of the seal to the bottom of the protector pipe which is placed at the top of the well to protect the well from damage.

At the top of the bentonite, either a flush mounted or a stick-up protector pipe is installed over the well. Typically, flush mounted protector pipes are used in areas in which a concrete or asphalt surface is present. In some instances, it is necessary to install a flush mounted protector pipe in a gravel traffic area. In these instances, a concrete pad is constructed around the pipe. The flush mounted protector pipe consists of a 10- or 12-inch diameter steel casing, 12-inches in length which is cemented flush with the surrounding concrete or asphalt improvement. The stick-up protector pipe consists of either a 5-foot or a 7-foot steel pipe inserted over the well casing that extends above the ground surface. A 5-foot pipe is used when a shallow water table is present. For PVC wells, the standard stick-up above the ground surface is approximately two feet. The steel protector pipe is installed over the PVC, with the top at 2.5 feet above the surrounding ground surface (PVC is approximately 6-inches below the top of the protector pipe). The remainder of the protector pipe is installed below ground. No fill material is placed between the well and the protector pipe, to eliminate heaving due to frost. Either bentonite or cement is used around the outside of the protector pipe, to secure it in place.

During well installation, a field boring log is completed as outlined in Section 1.4 and WDNR form 4400-113A (monitoring well construction form) are completed in the field. Copies of the boring logs (4400-133A) are provided to WDNR in the final report. Soil cuttings generated during the advancement of the borehole are handled in accordance with the procedure outlined in Section 5.1. All well material used in the well construction is new and care is taken to prevent contaminating the well material during installation.

Upon completion of the well installation activities, an elevation survey referenced to Mean Sea Level (MSL) or a local benchmark is completed. The elevation of the PVC casing and the ground surface are recorded. This survey information is used to determine the elevation of the groundwater surface and to determine groundwater flow direction at the site.

3.0 GROUNDWATER SAMPLING PROCEDURES

3.1 Well Development

Well development is conducted using either a bailer or a pump. Typically, when it is necessary to remove a large volume of water, or the water is very turbid, a pump is used. If the well is anticipated to bail dry, due to low aquifer hydraulic conductivity, a bailer is used.

Prior to developing the well, the water level is measured, using an electronic water level indicator (m-scope). The water level is measured to the nearest 0.01-foot. Each well is developed by surge and purge methods and by removing 10 well volumes of water, calculated using the formula provided in chapter NR 141, WAC. If 10 well volumes of water can not be removed from the well because it bails dry (due to the presence of low permeability soils), the well is slowly purged dry several times or until the turbidity of the water is reduced. WDNR form 4400-113B (monitoring well development form) is completed in the field, during the development activities. A copy of the form is provided to WDNR with the final project report. Handling of well development purge water is discussed in Section 5.3.

3.2 Groundwater Sampling

Typically, more than 24-hours are allowed between well development and the first groundwater sampling event. The following section provides details relating to groundwater sampling.

3.2.1 Purging

Prior to collection of groundwater samples, the water level is again measured and each well is purged. If possible, four well volumes of water are removed from the well. If the well bails dry, the stagnant water is removed from the well and water is allowed to recharge into the well. Time permitting, the well is bailed dry again and allowed to recharge prior to collection of samples.

Typically, wells are purged using a Teflon© bailer or a disposable polyethylene bailer. In some instances, when it is necessary to remove a large volume of water from the well, a pump is used to purge the well. In these instances, a small submersible pump is used to purge the well. The pump and the hosing are decontaminated prior to inserting into the well. Handling of purge water is discussed in Section 5.3.

3.2.2 Well Sampling

Typically, wells are sampled using a disposable polyethylene bailer or a Teflon© bailer. In order to minimize disturbance of the water in the well, the bailer is slowly lowered using a rope tied to the top of the bailer, to the water table. The bailer is allowed to fill from the bottom of the bailer. Once the bailer is filled, it is gently brought to the surface and emptied into sample containers.

Duplicate samples and equipment blanks are collected from each site at a minimum of 10% of the total number of samples collected. This procedure complies with WDNR quality assurance/quality control requirements. The equipment blank is collected at the site by pouring distilled water through an unused bailer and collecting it in the specific vials required by the analytical method. If metals samples or other samples that require filtering are to be collected the equipment blank is run through filtering equipment just as the other samples are collected.

Each cooler is sent to the laboratory with a trip blank and a temperature blank. The trip blank is prepared by the laboratory by filling a VOC vial with distilled water and sealing the bottle. The bottle remains sealed and stays with the sample bottles through shipment from the laboratory until it reaches the laboratory again. The water sample contained in the trip blank is analyzed by the laboratory, to verify that the samples were not affected by contaminants during transportation. The temperature blank is used to verify that the samples reached the laboratory at a temperature of 4ºC, or less. The blank consists of a water sample in an unspecified type of container. No other analytical tests are performed on this sample.

<u>VOC Sampling</u> - A VOC sampling port is inserted into the bottom of the bailer, to allow for regulation of water flow from the bailer. This allows for minimization of disturbance of the sample.

The water is slowly discharged directly into laboratory provided 40-ml VOC vials containing hydrochloric acid (HCl) preservative. The bottle is filled to a positive meniscus and covered with a cap fitted with a Teflon© septum. The bottle is inverted and gently tapped to verify that air bubbles are not present in the sample. Each bottle is labeled, typically with a label provided by the laboratory, with the well No., sample No., date, sampler's initials, project No. and preservatives added. After labeling, the samples are placed in a cooler with the chain of custody, on ice, for shipment to the analytical laboratory.

3.2.3 In-Field Testing

Several in-field tests are often conducted prior to completion of sampling at each well location. These tests include testing the conductivity, pH and temperature of each sample after it is collected. The testing for pH, conductivity and temperature are usually conducted using one instrument that records all three measurements. Various brands of instruments are available and used for conducting this testing. Water color, odor and turbidity are also recorded by the technician in the field, for each sample.

The water sample to be collected for in-field testing is collected at the time of well sampling. The sample is collected after the samples to be laboratory tested are collected and placed in coolers. The field tested sample is collected using the same bailer used to collect the samples for analytical testing. The water is discharged from the bailer into an 8-ounce clear glass container. The instrument probe is inserted into the water sample and slowly swirled in the water until the instrument equilibrates. The measurements are recorded in a field book. The visual observations noted at this time are recorded in the field book.

4.0 DECONTAMINATION PROCEDURES

4.1 Drilling

To avoid cross-contamination between borings, the drilling equipment (i.e., augers and rig) is decontaminated using a high pressure hot-water washer after each boring. The down hole sampling equipment is decontaminated using a wash of Alconox© soap and clean water, followed by a rinse with clean water. Equipment is scrubbed with a brush during each step of the decontamination process to remove soil particles which may adhere to the equipment.

4.2 Groundwater Sampling

Typically, disposable bailers are used during well sampling. A new bailer is used to sample each well, therefore there is no need to decontaminate down hole equipment between locations. The in-field testing equipment (pH, conductivity and temperature meter and m-scope) are decontaminated between samples using a double rinse of distilled water. The water is containerized with the decontamination water generated during the advancement of the boring/well or purge water.

If disposable bailers are not used at the site, the Teflon© bailer is decontaminated using a wash of Alconox© soap and distilled water, followed by a double rinse using distilled water. The bailers are scrubbed with brushes during the washing process and during the first rinse to remove sediment or other particles which may adhere to the bailer.

New rope and gloves are used at each well location; therefore no decontamination of this equipment is necessary. If sample filters are used (i.e., for metals analysis), a new disposable filter and new tubing are used for each sample.

During hydraulic conductivity testing, all downhole equipment is decontaminated using the double wash procedure (Alconox© wash followed by clean water rinse). In addition, the tests are typically conducted in order from the least contaminated well location to the most contaminated well location.

5.0 WASTE HANDLING PROCEDURES (SITE INVESTIGATION)

5.1 Soil Cuttings

Typically, soil cuttings generated during the advancement of borings are containerized in 55-gallon Department of Transportation (DOT) approved barrels. Refer to the text for any project or site specific arrangements. Each barrel is labeled with the date it was filled, contents (soil cuttings) and telephone No. of the contact or owner. The barrel is sealed with a lid and ring assembly. Depending upon site usage, the barrels either remain adjacent to the boring locations or are placed in secured storage on the site, at a location approved by the owner or operator of the site.

The cuttings remain on-site until disposal options are reviewed and proper disposal arrangements can be made. The cuttings are the responsibility of the owner.

5.2 Decontamination Water

Water generated during the decontamination of field equipment is containerized in 55-gallon DOT approved barrels or as specified in the text of this report. If placed in barrels, each barrel is labeled with the date it was filled, contents (decontamination water) and telephone No. of the contact or owner. The location of the barrel and disposal of the contents are handled in the same manner as described in Section 5.1.

5.3 Well Development and Purge Water

Since each project is different, handling or purge water depends upon site-specific arrangements. This water could be containerized in 55-gallon drums, discharged to the storm sewer or sanitary sewer or treated.