REMEDIAL CONSTRUCTION COMPLETION REPORT
SOIL VAPOR EXTRACTION AND AIR SPARGING SYSTEM

FORMER RUNOFF BASIN AREA
KENTUCKY AVENUE WELLFIELD SITE
OPERABLE UNIT NO. 3
HORSEHEADS, NEW YORK

Prepared for:

Viacom Inc.
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Pittsburgh, PA 15222-1384

Prepared by:

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December 28, 2000

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A Member of The IT Croup

December 29, 2000

Mr. Mark Purcell
U.S. Environmental Protection Agency
Region II
290 Broadway, 20th Floor
New York, NY 10007-1866

Subject: **Remedial Construction Completion Report**
Kentucky Avenue Wellfield Site
Horseheads, New York
IT Corporation Project No. 811595

Dear Mr. Purcell:

On behalf of Mr. Leo Brausch of Viacom (formerly GBS Corporation)* IT Corporation is. pleased to submit this Remedial Construction Completion Report for the Soil Vapor Extraction and Air Sparge . System at the Kentucky Avenue Wellfield Site located in Horseheads, New York. We are supplying a total of three copies to the USEPA and five to Mr. Salvatore Priore of the NYSDEC for use. Should additional copies be needed, please contact me or Leo Brausch of Viacom.

If you have any questions, please contact Leo Brausch at (412) 642-3922. Thank you.

Sincerely,

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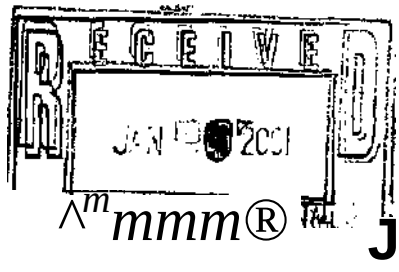
Emily J. Gaspich
Project Engineer



Attachments - 3 copies

cc: Leo Brausch — Viacom
Bruce Geno - Cummings/Riter
Salvatore Priore - NYSDEC - 5 copies
Project File

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FT Corporation
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LETTER OF TRANSMITTAL

To; Mr. Salvatore Priore
NYSDEC
(518) 457-4343 phone
(518) 457-3972 fax

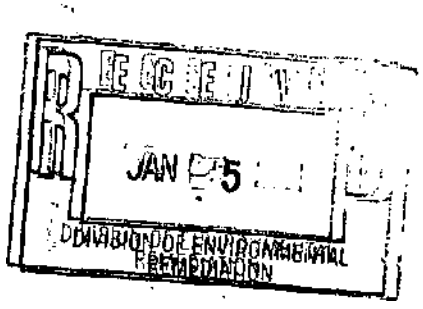
From: Emily Jo Gaspich
(412)372-7701 phone
(412) 858-3979 fax
egaspich@theitgroup.com

Project: Kentucky Avenue Wellfield Site
Horseheads, New York

Remarks:

I have enclosed five copies of the Remedial Construction Completion Report for the Kentucky Avenue Wellfield Site.

If I can be of further assistance, please call or e-mail. My number and address are listed above.



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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

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1.0 INTRODUCTION

IT Corporation (IT), on behalf of Viacom Inc. (Viacom), successor by corporate merger to CBS Corporation, has prepared this Remedial Construction Completion Report for the soil vapor extraction and air sparging (SVE/AS) system installed for the former Runoff Basin area at the former Westinghouse Electric Corporation plant site in Horseheads, New York. This report summarizes the remedial construction activities undertaken by Viacom to comply with the Consent Decree, Civil Action No. 97-CV-6555T, entered between CBS Corporation and the U.S. Environmental Protection Agency (USEPA) on March 2, 1998. The remedial construction was performed in accordance with the Finat Remedial Design Report and Work Plan (Cummings/Riter Consultants, Inc. [Cummings/Riter], July 19, 2000) prepared on behalf of Viacom and approved by USEPA. This work was conducted as part of the remedial action for the Kentucky Avenue Wellfieid Site, Operable Unit No. 3. This Remedial Construction Completion Report describes the construction, start-up, and initial testing of the SVE/AS system.

1.1 System Information

The design of the SVE/AS system is presented in the "Final Design Engineering Report" dated April 28, 2000 and the "Remedial Systems Operations Plan" dated April 2000, both prepared by IT (collectively referred to as the "Final Design"). The SVE/AS system is designed to remove 99% of the trichloroethene (TCE) associated with vadose zone and saturated soils within the treatment area of the former Runoff Basin. The level of TCE reduction will allow for compliance with the remedial action objective of 800 micrograms per kilogram (ug/kg) TCE, as specified in the Record of Decision. The design treatment time is one year.

1.2 Project Field Team

The project field team for remedial construction consisted of the construction manager, the quality assurance team, the remedial action contractor, and USEPA. IT served as a design/construct contractor with primary responsibility for the system installation, start-up testing, Initial Testing Program (ITP), and quality assurance (QA). Cummings/Riter served as the Viacom site representative and provided independent QA oversight. CDM Federal Programs Corporation represented USEPA and provided full-time regulatory oversight. Mr. Leo Brausch, a consultant to Viacom, served as the Supervising Contractor. Viacom retained Encotech, Inc. (Encotech) of Eighty-Four, Pennsylvania to provide the vapor-phase carbon treatment system and Fagan Engineers, PC of Elmira, New York for survey work. IT employed several subcontractors, as described in this report.

1.3 Health and Safety

IT field personnel were trained in accordance with applicable U. S. Department of Labor, Occupational Safety and Health Administration requirements (29 CFR 1910.120) and were familiar with system operation and components through review of project documents and prior field experience with similar systems. IT issued its Site-Specific Health and Safety Plan, consistent with the project Health and Safety Contingency Plan (HSCP), on September 12, 2000.

Field personnel, at a minimum, used Modified Level D Personal Protection Equipment including a hard hat, safety glasses, steel-toed shoes, and a traffic vest. Field personnel reported through the current production facility manager, Cutler-Hammer, to promote site security and personnel safety.

1.4 Report Organization

The Remedial Construction Completion Report is divided into four sections. Section 2.0 describes the SVE/AS system remedial construction activities. Section 3.0 describes the baseline data collection activities conducted in conjunction with construction. Section 4.0 describes start-up and ITP implementation.

2.0 SVE/AS System Construction

2.1 Well Installation

Under subcontract to IT, Maxim Technologies, Inc. (Maxim) installed the eight new sparge points and three new vent points required for the SVE/AS system. These points were installed using a truck-mounted rotary drill rig and hollow-stem augers. The points were installed at the locations shown on **Figure** 2-1. SVE and AS wells were constructed per **Figures 2-2 and 2-3** and according to the Final Design. Boring logs for the AS points, plus two additional boreholes (labeled "AS-10 "and "AS-11"), are provided in **Appendix** A.

The AS portion of the system required the installation of eight new sparge wells (AS-2 through AS-9). One of the existing sparge wells, AS-1 D, was incorporated into the system. The locations of the new air sparge points were selected to remediate known areas of impacted groundwater and to inhibit further migration of volatilized constituents beyond these areas. AS points were spaced at 40-foot intervals. AS wells were installed to a depth of 21feet below ground surface, which is approximately 10 feet below the water table.

The SVE portion required the installation of three SVE wells (SVE-2, SVE-3, and SVE-4). The spacing of these wells (80 feet) was selected to maximize the recovery of TCE vapor from soil and sparged vapor while minimizing the competition for air between the wells. Existing well SVE-1 was connected to the SVE system. The three new SVE wells were installed to a depth of approximately 11 feet bgs.

Split spoon soil samples were collected during installation of the air sparge wells at the sparge points and two other locations designated as AS-10 and AS-11. These samples were collected and visually assessed to confirm that the sparge wells were not installed below a confining layer. The visual assessment indicated that the subsurface lithologies in the area sparge point installation consist primarily of gravel, sand, and silt. The well construction logs provided in **Appendix** A show subsurface lithology.

2.2 Trenching and Pipe Installation

After the wells were completed, IT began trenching and installing the pipe. Sparge and vent points were connected via individual subgrade conveyance piping to the treatment facility. The trenching layout was slightly modified from the design, as illustrated in **Figure** 2-1.

IT contracted with Maxim to perform compaction testing on the backfilled trenches. Compaction test locations and results are provided in **Appendix B.**

Certain sections of trench crossed facility access roads. It was necessary to cut 250 lineal feet of asphalt and replace it after pipe had been installed. IT subcontracted John F. & John P. Wenzel, Inc., (Wenzel) to repair

the asphalt in accordance with **Detail 2 of Sheet Y5** of the Final Design. The Bituminous Asphalt Plant Certificate of Compliance is provided in **Appendix B.**

Due to an oversight by field personnel, the subsurface AS pipng was not pressure tested prior to backfilling. Without this testing, data are not available to confirm that the AS lines will not leak air during system operation. Any such air leaks would reduce the quantity of injected air reaching the treatment zone and could extend the time required to achieve the treatment levels set in the Final Design. During system operation and maintenance, pressure readings will be taken to assess the degree, if any, of air leaks from the subsurface AS pipng. Unless severe air leaks are detected; however, corrective action would not be warranted.

2.3 Treatment Building Construction

SVE/AS system was installed within a 10- by 12- by 10-foot wooden building. An Encotech subcontractor, Miller's Home Improvement, constructed the building. Because the building is a temporary facility, no building permits were required.

The treatment building was erected on top of an 11- by 18-foot concrete slab as shown in **Figure 2-4.** The foundation location was excavated and compacted by IT. Wenzel placed the concrete slab. Details and quality control documents for foundation and shed construction are provided in **Appendix B.**

2.4 SVE/AS Equipment Installation

IT contracted with Encotech to provide and install the SVE and AS equipment. **Appendix C** provides the as-built system component layout and cut sheets for the following system components:

- Regenerative blower;
- Moisture separator;
- Inline filter;
- Compressor;
- Compressor relief valve;
- Compressor inlet filter; and
- Pressure gauges.

3.0 Data Collection

3.1 Background

To allow for the ongoing assessment of system performance, background (baseline) data were collected for comparison with data gathered during and after testing the system. The baseline data collection schedule is presented as **Table 3-1.** The collected information included ambient air monitoring and subsurface parameters. These data were used for the following evaluations.

- **Ambient Air Monitoring:** Before initiating the ITP, ambient air monitoring was conducted in the main site building proximal to the SVE/AS system in accordance with Section 7.3.1 of the HSCP. These data were used to generate baseline conditions for evaluation of air monitoring data during system testing and operation. Ambient air monitoring was initiated on September 27, 2000. Details and results pertaining to ambient air monitoring, including a sketch of SUMMA canister sampling and photoionization detection (PID) monitoring locations, can be found in **Appendix D.**

- **Subsurface Parameters:** Before the SVE/AS system was activated, IT collected groundwater levels, groundwater quality data, dissolved-oxygen (DO) concentrations, and volatile organic compound (VOC) concentrations in soil gas from monitoring wells within the area of influence of the remediation system **(Figures 2-1 and 4-1).** These data were collected to document background conditions from this area. The collection of the background data occurred on October 26, 2000. These data have been recorded in the field notes and on the Data Collection Logs contained in **Appendix E.**

- **Groundwater Levels:** Collection of water table level data provided the information required to assess groundwater flow direction and to assess dewatering, groundwater displacement, or groundwater upwelling created during system operation. This data is presented on **Table 3-2.**

    - **Groundwater Quality:** Prior to system testing, samples were collected from monitoring wells TMP-1-SAT, TMP-1D, TMP-2D, MW-7S, MW-7D, MW-11S, and MW-11D (Figure 3-1) and analyzed for select VOCs. These results are summarized on **Table 3-3A.**

    - **Dissolved-Oxygen Concentrations:** DO readings were obtained from groundwater wells local to the SVE/AS system (TMP-1-SAT, TMP-1D, TMP-2D, MW-11S and MW-11D). The data provided a means of assessing the air injection radius of influence.

    - **VOCs in Soil Gas:** VOCs were measured within the unsaturated zone. IT's goal was to maximize this parameter to provide a means to assess and optimize effectiveness of the remediation system.

3.2 Data Collection During Testing

During system testing, periodic monitoring of remediation parameters was required to assess remedial effectiveness. The following list outlines the data that were collected during the testing period. Data were recorded on the data collection forms included in **Appendix E.**

ambient temperature and barometric pressure {regional conditions);
groundwater levels in monitoring wells **(Table 3-2);**
ambient air monitoring **(Table 3-5** provided in electronic format);
VOC concentrations in soil gas in monitoring wells;
helium concentrations in soil gas in monitoring wells;
vacuum at each SVE well;
extraction rate from each SVE well;
VOC concentrations in extracted soil gas from each SVE well;
pressure at each AS well;
injection rate to each AS well;
DO concentrations in monitoring wells; and
VOC concentrations in SVE system effluent before, after, and between carbon units.

IT personnel were unable to measure the induced vacuums in monitoring wells as proposed in the ITP. The wells could not accommodate the vacuum gauges while being equipped with dedicated monitoring pumps. Vacuums were measured at hand driven temporary points as depicted on the sketch in **Appendix E.**

IT personnel used the following procedures to collect the data.

- **Groundwater Elevation:** Groundwater monitoring wells were gauged to assess groundwater elevations using an ORS electronic interface probe (or equivalent). The instrument accuracy was +\- 0.01 foot.

- **Dissolved-Oxygen Concentrations:** DO data were collected from monitoring wells with a portable DO meter.

- **Ambient Air Quality:** Ambient air quality was monitored with a PID and recorded in accordance with the protocols in Attachment 1 of **Appendix D.**

- **VOCs in Soil Gas and Treatment Stream:** VOCs were measured in soil gas samples collected from the SVE blower discharge and monitoring wells using a portable PID equipped with a 10.2 eV lamp.

- **Helium Concentrations in Soil Gas:** Helium concentrations were measured in soil gas samples collected from monitoring wells during AS testing using a Mark Helium Detector.

- **Vacuum at Each SVE Well:** Vacuum at each SVE well was read from gauges permanently mounted in the piping manifolds.

- **Pressure at Each AS Well:** Pressure at each AS well was read from gauges permanently mounted in the piping manifolds.

- **Flow Measurements:** Extraction rate for each SVE well was measured using an anemometer. Injection rates for each AS well will be measured using rotometer type flow meters permanently mounted in the piping manifold.

- **Ambient Temperature and Pressure:** Ambient temperatures and pressures were recorded every 4 hours during testing by field instrument.

4.0 System Start-up and Testing

4.1 Summary of the Initial Testing Plan

After collecting background data, SVE wells were tested independently to verify actual operating parameters and areal influence. SVE wells were then tested in combination to assess optimum system operating conditions, including valve settings, extraction flow rates and vacuums for each SVE well, net system extraction flow rate and vacuum, concentrations of VOCs in extracted vapor, and net system areal extent (based on subsurface vacuum). Data were collected using existing groundwater and vadose zone monitoring wells. Hand-driven monitoring points were used to augment vadose zone monitoring wells (sketch in **Appendix E).**

The AS system was tested after SVE system testing was completed. Prior to AS system activation, groundwater monitoring wells identified for the SVE/AS system were sampled for VOCs (reference **Section 3.1).** Then, while the SVE system was operating, AS wells were activated to verify actual operating parameters. For testing purposes, helium was introduced into the sparged air stream as a tracer gas. AS wells were tested individually and in combination to assess optimum system operating conditions, including valve settings, sparge flow rates and pressures for each AS well, net system sparge flow rate and pressure, VOCs in soil vapor, and net system areal extent (based on DO in groundwater and helium concentrations in soil vapor). Data were collected using existing groundwater and vadose zone monitoring wells and hand-driven points. While testing the AS system, vadose zone wells, and hand-driven points were monitored to confirm a net vacuum in the vadose zone, indicating that sparged air was being collected by the SVE system. Additionally, ambient air monitoring was conducted in site buildings proximate to the SVE/AS system to further confirm vapors are being controlled by the SVE system **(Appendix D).** At the conclusion of the ITP, groundwater wells identified to monitor the SVE/AS system were again sampled for VOCs.

4.2 Start-up and Testing

Before system testing, the following initial inspection and operation check was completed:

- equipment, piping, and controls labeled;
- equipment items properly mounted, supported, and tagged;
- correct rotation direction, voltage, and amperage of motors;
- zero pressure gauges;
- one-way piping appurtenances (i.e. check valves) piped with proper orientation;
- test switches;
- test alarm conditions and control functions to confirm proper operating sequences; and
- verification of operation of the programmable logic controller (PLC) and remote computer.

After the system passed the initial check, a controlled test was performed. Equipment was activated and

tested in accordance with Section 3.0 of the Initial Testing Plan dated August 8, 2000.

Field data are provided in **Appendix E.** No irregularities were observed during field data collection, indicating that the SVE/AS was functioning properly. Therefore, the SVE/AS system will remain in operation following the ITP testing.

4.3 Troubleshooting

Once the AS/SVE system was optimized and operational, piping and vessels were re-checked for leaks. IT personnel monitored readings from flow, pressure, vacuum, and temperature instruments to confirm that the system was operating within design parameters and manufacturers' literature, checking for data anomalies that indicated potential operational abnormalities. Key parameters that were closely monitored for safety and compliance are the following:

- vacuum in vadose zone monitoring wells;
- ambient air quality and helium concentrations in the main building local to the system; and
- system effluent air quality and flow rate.

Two interlocks were incorporated into the system design to automatically shut down components in the following events:

- Upon high water level in the moisture separator, SVE blower B1 will shut down; and
- To prevent sparging air without coincidental vapor collection, air compressor AC1 will shut down upon low flow or no flow to SVE blower B1.

Based on previous system installations, the most likely causes of system shut down are high water level in the moisture separator, SVE blower B1 particle filter being plugged, or some other problem restricting flow to SVE blower B1.

Following completion of the ITP field work, testing data from monitoring wells and system components were evaluated to verify proper system operation and air flows. These data are included in **Appendix E.**

4.4 Data Evaluation

A formal system evaluation was performed with the objective of verifying system design parameters and includes review of the following data:

- flow rates and pressures/vacuums **(Table 4-1);**
- helium concentrations **{Table 4-2);**

- dissolved VOC concentrations **(Table 4-3);**
- dissolved oxygen (DO) concentrations **(Table 4-4);**
- groundwater level data **(Table 3-2);**
- soil gas concentrations **(Table 3-4).**

Data measured in the field during the initial start-up testing was compared to the design criteria in order to determine if design specifications had been met. Design criteria consisted of SVE well head vacuum pressures and flows, air sparge well pressures and flows, and extracted subsurface air concentrations. These design data were based on the results of the SVE/AS pilot test conducted at the site and were used to determine well spacing and air flow rates. **Tables 4-1 through 4-4** present baseline and startup data from the SVE/AS system.

SVE well design criteria were for each of the 4 SVE wells to receive between 86 and 172 SCFM at a design vacuum pressure of 5.8 inches water column yielding a total SVE field extraction rate of 344 SCFM. Field data (Table 4-1) indicate the wells were able to be balanced and generate approximately equal flow except for well SVE-4, which was only able to achieve approximately 60% of its design flow despite increasing the vacuum pressure to 21 inches of water. The other SVE wells were able to maintain their design flow rates at vacuum pressures between 3.0 and 4.0 inches of water. Total extraction from the SVE wells was 314 SCFM.

AS well design criteria were for each of the 9 SVE wells to receive 2 SCFM at a design pressure of at least 5.5 psig yielding a total SVE field extraction rate of 18 SCFM. Field measurements (Table 4-1) indicate the design injection rate of 2 SCFM per well was able to be met. In order to achieve this flow rate, the AS wells were partially closed in order to restrict flow and balance the flows between them. System pressures at the well heads after balancing ranged from 0.5 to 3.8 psi, although the AS compressor is capable of yielding in excess of 5.5 psi, as specified in the design. Total injection into the AS wells was 18 SCFM, or 1080 SCFH. Thus, the extraction (SVE) to injection (AS) ratio for the system is approximately 17:1, indicating a net negative subsurface pressure can be maintained.

Helium tracers were used to determine the effective influence of each air sparge well and also the ability of the SVE system to capture sparged air. All nine AS wells were tested, with helium being detected in the SVE system for all of the AS well tests, ranging from 0.02 to 0.84% concentration in the SVE discharge (Table 4-2). The low concentrations detected are indicative of the low injection rate in the AS wells (1 SCFM) and the large extraction rate (344 SCFM) from the SVE wells. For all but two of the AS wells, AS-2 and AS-8, helium was

detected in outlying monitoring wells/points during the testing, indicating the AS wells were having an influence away from the injection points. AS-2 and AS-8 may not have shown distance effects due to the close proximity of well SVE-1 and the lack of any nearby monitoring points.

Subsurface air concentrations during start-up of the SVE/AS system showed a large reduction once the SVE system was started, as shown in **Tables 4-1 and 4-3.** Initial subsurface background concentrations of VOCs ranged from 3.1 to 274 ppm, with the majority of monitoring wells/points in the 3 to 9 ppm range. Once the system was started, concentrations dropped significantly, down to 1.0 to 2.9 ppm in the SVE discharge air and 0.0 to 2.7 ppm in the monitoring wells/points. Monitoring points MP-5 and MP-6 showed less of an influence after the system was started, possibly due to their proximity to SVE-4, which was installed in a lower permeability zone and has a lower extraction rate than the other SVE wells.

Laboratory VOC data **(Table 3-5)** were used to evaluate the VOC mass removal rate. The removal rate was calculated by multiplying the rate of soil vapor extraction by the concentration of TCE contained in the soil vapor. Compounds other than TCE were not used to assess the total mass of contaminants removed by the remediation system, as their concentrations were insignificant when compared with the concentration TCE. The removal rate during full system operation was determined to be 0.002 lbs./day. Calculations to evaluate the mass removal rate of TCE can be found in **Appendix F.**

Dissolved oxygen concentrations from the monitoring wells/points were monitored to assess the effect of the AS wells on the groundwater at the Site. Background DO concentrations prior to sparging ranged from 0.05 to 10.45 mg/L, with most measurements in the 2 to 5 mg/L range **(Table 4-4).** Following the onset of sparging on 11/27/00, DO concentrations increased to between 6.42 to 15.25 mg/L for all the monitoring wells/points, with all locations showing an increase above any previously recorded values. This data indicates that sparged water is able to circulate away from the AS well points after it has been treated and move into adjacent areas. This circulation is important for treatment of groundwater away from the direct influence of the AS wells, and shows an extended treatment zone for the SVE/AS system.

The following observations are based on data collected in the field **(Appendix E):**

- The average drawdown in groundwater level measured at the monitoring wells is 0,80 feet **(Table 3-2).**
- Slight decreases of VOC concentrations, specifically TCE, in the groundwater were observed. **(Tables 3-3A and 3-3B)**
- Soil vapor VOC concentrations decreased once the system was operational **(Table 3-4).**

- Ambient air monitoring data **(Table 3-5)** collected prior to and during system start-up remained relatively steady. Minor fluctuations in concentrations may be attributed to calibration, instrument sensitivity, or the operation of the heating system of the building in which the instruments are stationed.
- Flow rates and pressures were set as per the Final Design **(Table 4-1).**
- Helium was detected in the sparge wells and at certain monitoring points **(Table 4-2).**
- VOC concentrations measured at the monitoring points and wells decreased **(Table 4-3).**
- DO concentrations increased slightly **(Table 4-4).**

Based on the data collected to date, revisions to the "Remedial Systems Operations Plan" are not necessary. The "Remedial Systems Operations Plan" shall become the governing document for full system operation.

TABLES

TABLE 3-1

AS-COMPLETED DATA COLLECTION DURING TESTING
Initial Testing Plan
Soil Vapor Extraction and Air Sparge System
Former Runoff Basin at the Former Westinghouse Facility,
Kentucky Avenue Wellfield Site, Operable Unit #3, Horseheads, New York

TASK/DATA	DATE{S) PERFORMED
Ambient Temperature and Pressure.	10/18/00-12/05/00
VOC concentrations in the building interiors.	9/27/00-ONGOING
VOC concentrations in groundwater in monitoring wells by analytical laboratory analysis.	10/17/00 and 12/05/00
Groundwater levels in monitoring wells.	10/18/00-12/05/00
Induced vacuums in monitoring wells.	
VOC concentrations in soil gas in monitoring wells by field instrument.	10/26/00-11/27/00
Vacuum and extraction rate from each SVE well.	10/26/00-12/05/00
DO concentrations in monitoring wells.	10/26/00-12/05/00
Helium concentrations in monitoring welis and the SVE blower effluent.	11/14/00-11/28/00
Injection rate and pressure to each AS well.	11/9/00-11/29/00
VOC concentration in SVE system effluent before, after and between carbon units, by field instrument.	10/26/00-11/29/00
VOC concentration in SVE system effluent before, after and between carbon units, by analytical laboratory analysis.	11/17/00 and 11/28/00.

Legend: *AS = Air Sparge DO = Dissolved Oxygen SVE = Soil Vapor Extraction VOC = Volatile Organic Compounds*

** Ambient Air Monitoring is conducted by Pagan Engineers, PC.*

TABLE 3-3A

Kentucky Avenue Wellfield Site - Former Run-off Basin
Validated Background Groundwater Analytical Summary

	10/17/00		5.0U	10U	5.0U	2.5U	2.5U	5.0U	10U
MW-11D									
MW-11S	10/17/00		5.0U	10U	5.0U	2.5U	**2.5U**	**2.5J**	10U
MW-7D	10/17/00		5.0U	10U	5.0U	2.5U	2.5U	**5.0U**	10U
MW-7S	10/17/00		5.0U	10U	5.0U	2.5U	2.5U	**4.9J**	10U
TMP-1D	10/17/00		5.0U	10U	5.0U	3.6	2.5U	**64**	10U
TMP-2D	10/17/00		5.0U	10U	5.0U	2.5U	2.5U	5.0U	10U
TMP-1-SAT	10/17/00		5.0U	10U	5.0U	2.5U	2.5U	**16**	10U

Notes: 1. All concentrations reported in ug/L

2. U - Indicates compound was analyzed for but not detected in sample.

3. J - Indicates and estimate value.

4. NA - Compound not analyzed for.

5. Qaulity control samples are TMP-2D MS, TMP-2D MSD, TRIP BLANK, and DUP-1.

6. Matrix Spike/Matrix Spike Duplicate samples were also analyzed for Toluene and Chlorobenzene. These concentrations have not been reported.

TABLE 3-3B

Kentucky Avenue Wellfield Site - Former Run-off Basin
Validated Post Start-up Groundwater Analytical Summary

MW-11D	12/05/00		5.0U	10U	5.0U	2.5U	2.5U	5.0U	10U
TMP-1D	12/05/00		5.0U	10U	5.0U	5.0	2.5U	32	10U
TMP-1-SAT	12/05/00		5.0U	10U	5.0U	2.5U	2.5U	14	10U
TMP-2D	12/05/00		5.0U	10U	5.0U	2.5U	2.5U	2.7J	10U
MW-11S	12/05/00		5.0U	10U	5.0U	2.5U	2.5U	2.5J	10U

Notes: 1. All concentrations reported in ug/L

2. U - Indicates compound was analyzed for but not detected In sample.

3. J - Indicates and estimate value.

4. NA - Compound not analyzed for.

5. Qaulity control samples are TMP-2D MS, TMP-2D MSD, TRIP BLANK, and DUP-1.

6. Matrix Spike/Matrix Spike Duplicate samples were also analyzed for Toluene and Chlorobenzene. These concentrations have not been reported.

Table 3-4

KENTUCKY AVENUE WELLFIELD SITE - FORMER RUNOFF BASIN

VOC Concentrations in SVE System by Laboratory Analysis

Sample ID	**CARBONINF**	**CARBONMID**	**CARBONEFF**	**INFLU**	**MIDFL**	**CARBONEFF**
Description	Influent Tedlar Bag	Midfluent SUMMA Canister #0165	Effluent SUMMA Canister #0140	Influent Tedlar Bag	Midfluent SUMMA Canister #0047	Effluent SUMMA Canister #0145
	SVE WELLS ONLY			FULL SYSTEM OPERATION		
Date Collected	11/07/00	11/07/00	11/07/00	11/28/00	11/28/00	11/28/00
Chloromethane	1	1U	1U	7D	1U	1U
Pentane	1	1U	1U	23D	1U	1U
Acetone	5	**4**	2U	10D	**4**	2
Hexane	5	1U	1U	110D	1U	1U
2-Butanone	4	23	1U	5U	10	15
1,1,1-Trichloroethane	6	1U	1U	5U	1U	1U
Heptane	1U	1U	1U	6D	1U	1U
Trichloroethene	720D	1U	1U	310D	1U	1U
Toluene	2	1U	1U	23D	1U	1U
Tetrachloroethane	3	1U	1U	5U	1U	1U
Ethylbenzene	1U	1U	1U	6D	1	1U
m/p - Xylene	1U	1U	1U	20D	2	2
o-Xylene	3	1U	1U	6D	1U	1U

Notes: 1.) All concentrations reported in parts per billion (ppb) by volume.

2.) Compounds and anaiytes that were not detected are not presented in this table.

3.) B - Compound was found in method blank.

4.) D- Analysis of diluted sample.

5.) U - Compound was undetected at the specified limit of quantitation.

TABLE 3-5

KENTUCKY AVENUE WELLFIELD SITE
FORMER RUNOFF BASIN

PID DATA IN AN ELECTRONIC FORMAT

FILENAME: HHD AIR

TABLE 4-1

KENTUCKY AVENUE WELLFIELD SITE - FORMER RUNOFF BASIN
SUMMARY OF DESIGN PARAMETER FIELD MEASUREMENTS

		BACKGROUND			11/27/00			11/28/00			11/29/00			12/01/00			12/05/00		
		PRESSURE	FLOW		PRESSURE	FLOW		PRESSURE	FLOW		PRESSURE	FLOW		PRESSURE	FLOW		PRESSURE	FLOW	
		in. H2o Vacuum	SCFM	ppm	in. H2o Vacuum	SCFM	ppm	in. H2o Vacuum	SCFM	ppm	in. H2o Vacuum	SCFM	ppm	in. H20 vacuum	SCFM	ppm	in. H2O Vacuum	SCFM	ppm
SVE-1	am	0	0	3.1	3.5	87.2		3.6	B7.2		3.7	B7.2	11.5		87.2	1.2	40-160	87.2	1.0
	pm				3.5	87.2		3.6	B7.2										
SVE-2	am	0.0	0.0	98.2	4.2	87.2		4.1	B7.2		3.9	B7.2	12.0		87.2	1.5	4.0	87.2	1.1
	pm				4.2	81.6		4.0	B7.2										
SVE-3	am	0	0.0	35.4	3.0	87.2		3.1	B7.2		3.0	B7.2	14.4		87.2	3.5	3.2	B7.2	2.9
	pm				3.0	87.2		3.0	87.2										
SVE-4	am	0.0	0.0	274	21.0	33.1		21.0	37.5		21.5	39.3	3.3		48.0	1.3	210	52	2.7
	pm				21.0	38.4		21.5	38.4										
					psig	SCFH	ppm	psig	SCFH	ppm	psig	SCFH	ppm	piig	SCFH	ppm	psig	SCFH	ppm
AS-ID	pm	0	0.0	3.6	0.2	60		0.55	120	OB	0.5	120	0.8		120	0.0	0.5	120	0.4
	pm				0.6	120		0.60	120	1.1									
A5-2	am	0.0	0.0	3.5	3.7	60		3.75	120		3.6	120			120		3.6	120	
	pm				3.7	120		3.7	120										
AS-3	am	0.0	0.0	3.5	1.1	60		3.75	120		3.3	80			120		3.0	120	
	pm				3.B	120		3.35	120										
AS-4	am	0	0.0	9.6	3.35	60		3.40	120		9.5	120			120		2.6	110	
	pm				3.35	120		3.35	120										
AS-5	am	0.0	0.0	3.7	0.1	60		0.70	120		0.5	120			120		0.5	110	
	pm				0.7	120		0.70	120										
AS-B	am				3.45	60		3.50	120		3.4	120			120		3.3	115	
	pm				3.45	120		3.45	120										
AS-7	am				3.3	60		3.60	120		3.6	120			120		3.2	120	
	pm				3.3	120		3.30	120										
AS-B	am				0.2	60		0.75	120		0.8	120			120		0.6	110	
	pm				0.8	120		0.80	120										
AS-9	am				3.55	60		3.60	120		3.6	120			120		3.5	120	
	pm				3.6	120		3.65	120										

TABLE 4-2

KENTUCKY AVENUE WELLFIELD SITE - FORMER RUNOFF BASIN
SOIL VAPOR HELIUM CONCENTRATIONS

		HELIUM DETECTED IN SVE BLOWER EFFLUENT																	
		%	#	£	tf	#	#	#	£	#	#	£	*	#	#	#	#	#
11/14/00	11:00	0.22	AS-2	0.00	0.00	0.00							0.00	0.00	0.00	0.00	0.00	0.00
	12:05	0.27	AS-2	0.00	0.00	0.00							0.00	0.00	0.00	0.00	0.00	0.00
11/15/00	11:00	0.87	AS-8	0.00	0.00	0.00							0.00	0.00	0.00	0.00	0.00	0.00
	11:30	0.93	AS-8	0.00	0.00	0.00							0.00	0,00	0.00	0.00	0.00	000
	12:00	0.33	AS-8	0.00	0.00	0.00							0.00	0.00	0.00	0,00	0.00	000
11/16/00	10:30	0.02	AS-7		0.00	0.00	0.00	0.00						0.00	000	0.00	37.00	001
	11:00	0.05	AS-7		0.00	0.00	0.00	0.00						0.00	0.00	0.00	39.00	0.00
	11:30	0.05	AS-7		0.01	0.00	0.00	0.00						0.00	0.00	0.00	38.00	0.00
	17:15	0.06	AS-6			0.00	0.00	0.00						0.00	0.00	0.00	0.07	0.01
	17:45	0.06	AS-6			0.00	0.00	0.00						0.00	0.00	0.00	13.00	0.00
	18:15	0-08	AS-6			0.00	0.00	0.00						0.00	0.00	0.00	19.00	o.ao
11/17/00	16:10	0.63	AS-5				000	0.00	0.11	0.00				0.02	0.00	0.00	0.16	0.02
	1645	0.78	AS-5				0.01	0.03	0.11	0.01				0.00	0.00	0.00	0.18	0.01
	17:15	0.81	AS-5				0.01	0.03	0.11	0,02				0.00	0.02	0.03	0,17	0.00
11/20/00	17:20	0.02	AS-9		0.02	0.01		0.01		0,01				0.00	0.00	0,01	0.04	0,03
	17:50	0.12	AS-9		0.01	0.00		0.00		0,00				0.00	0,00	0.02	6,60	0,00
	18:20	0.19	AS-9		0.00	0.00		0.00		0,01				0.00	0.00	0.02	6,60	0,00
11/21/00	15:16	0.32	AS-3					001		0,00	0,00	0.00		0.00	0.00	0.00	0.26	0,00
	15:45	0.70	AS-3					0.00		0.01	0,00	0.00		0.00	0.00	0.02	0.25	0,00
	16:15	0.75	AS-3					0.00		0.00	0.00	0.00		0.00	0.00	0.00	0.25	0.00
11/21/00	16:50	0.17	AS-4					0.00	0.00	0.00	000			0.00	0.00	0.02	0.19	0.00
	17:20	0.16	AS-4					0.00	0.00	0.00	0.00			0.00	0.00	0,02	0,19	0.01
	17:50	0.26	AS-4					0.00	0.00	0.00	0.00			0.00	0.00	0.01	0.20	0.01
11/22/00	9:52	0.89	AS-1D	0.00	0.00	0.00		0.04					000	0.00	0.01	0.00	0.49	0,00
	10:22	0.85	AS-1D	0.00	0.00	0.00		0.00					0 00	0.00	0.00	0.00	0.26	0,00
	10:52	0.84	AS-ID	0.00	0.01	0.00		0.00					000	0,00	0.00	0.00	0.19	0.00
11/28/00	10:02	0.19	AS-1D		0,00	0.00	0.00	0.00	0.00	0,00		0.01		0.00	0.00	0.00	2.40	0.00
	10:36	0.34	AS-1D		0.01	0.00	0.00	0.00	0.00	0.00		0.00		0.00	0,00	0,01	8,90	0.00
	11:08	0.36	AS-1D		0.00	0.00	0.00	0,00	0.00	0.00		0.00		0.00	0.00	0.00	9.10	0.00
	11:30	0.35	AS-1D		0.00	0.04	0.00	000	0.00	0.00		0.00		0.00	0,00	0,00	5,00	0.00
	12:04	0.42	AS-1D		0.00	0.00	0.00	0.00	0.00	000		0.00		0.00	0.00	0,01	900	0.00
	12:36	0.45	AS-1D		0.02	0.00	0.00	0.00	0.00	0.00		0.00		0.00	0.00	0.00	9.30	0.00

TABLE 4-3

KENTUCKY AVENUE WELLFIELD SITE - FORMER RUNOFF BASIN
VOC CONCENTRATIONS IN SOIL VAPOR MEASURED AT MONITORING POINTS AND WELLS

O	E i-	vll >	til >	111 >	HI >	a. S	CM CL 5	d. 5	Q.	CL 5	QL 2	d. 5	CO CL s	en a. S	o a. 5	i 5	a i s	• a.	< QL 1-	a CM CL 5 I-
		ppm	ppm	ppm	ppm	PPm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
10/26/00	14:20	3.1	98.2	35.4	274.0	3.6	3.5	3.5		9.6					3.7					
	19:00					1.8	1.1	2.8		8.9					2.0					
10/27/00	10:00	1.4	33.9	17.1	105.0							1.5		0.9	0.8	4.4	4.8	3.5	3.9	4.9
	13:45											1.7		0.3	1.4	NM	NM	NM	NM	NM
	15:30											3.8		3.5	3.7	2.8	2.5	3.2	2.9	3.4
10/30/00	13:00									5.7	2.9	2.3	1.2			0.4	0.6	0.2	0.6	0.4
10/31/00	13:00							3.1	4.2	8.0	4.4					1.9	2.8	1.9	2.0	4.2
11/09/00	17:10					0.0	0.0	0.0							0.0	NM	0.0	0.0	0.0	0.0
11/10/00	14:45									5.2	3.5	1.2	0.6			0.3	0.2	0.2	0.3	0.0
11/13/00	19:15									5.7		0.6		0.6	0.4	0.8	0.7	0.3	0.7	0.3
11/14/00	16:40					0.0	0.0	0.0							0.0	0.0	0.0	0.0	0.0	0.0
11/15/00	17:10						0.5	0.2	0.3	6.1						0.4	0.3	0.0	0.5	0.0
11/16/00	16:10							0.8	0.8	7.9						0.0	0.5	0.0	1.0	0.0
11/17/00	15:00								0.0	6.6	2.6	0.0				0.0	0.0	0.0	0.0	0.0
11/20/00	16:15						0.1	0.0		4.4		0.0				0.0	0.0	0.0	0.0	0.0
11/21/00	14:20									4.1		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
11/27/00	17:25						1.1	0.7	0.8	2.7	2.3	0.2		1.6		0.0	0.0	0.0	0.1	0.0

Notes: 1.) Replaced risers on SVE-2,3,and 4 on 10/24. VOC spikes may be attributed to glue fumes.

2.) NM - Not Measured.

3.) Blank cells indicate data was not collected at that point.

TABLE 4-4

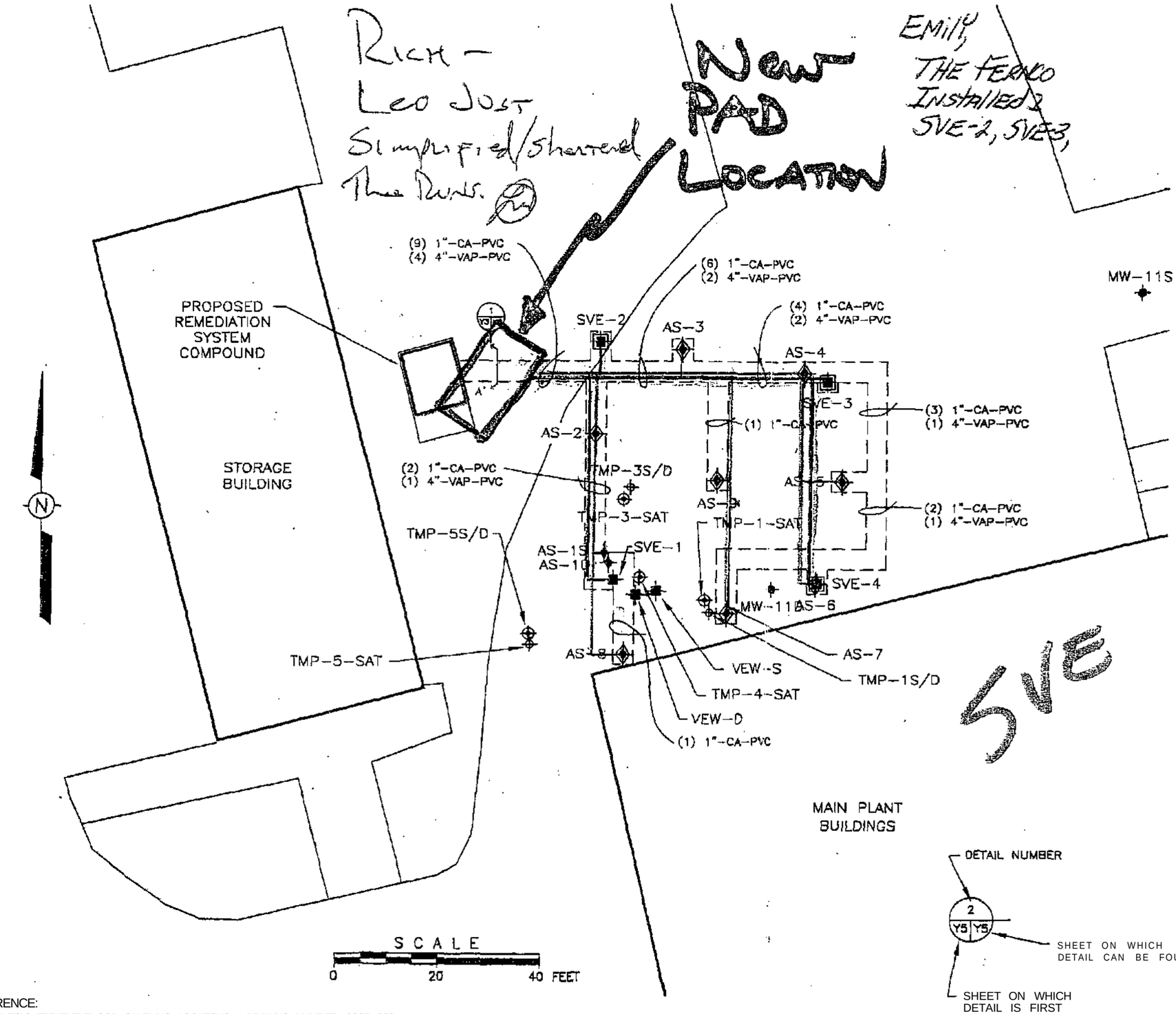
KENTUCKY AVENUE WELLFIELD SITE
FORMER RUNOFF BASIN

DO CONCENTRATIONS MEASURED AT MONITORING POINTS AND WELLS

		mg/L	mg/L	mg/L	mg/L	mg/L
10/26/00	8:50	1.49	0.88	1.44	2.64	3.55
10/30/00	10:10	NM	1.71	1.32	1.80	3.44
11/08/00	10:00	3.64	3.61		2.31	5.17
11/09/00	8:00	4.51	0.92		1.74	4.89
	16:30	2.44	0.84		1.73	4.80
11/10/00	8:00	4.92	0.84		0.31	3.65
	15:30	5.11	1.11		0.66	3.29
11/13/00	12:00	3.44	0.76		0.52	9.81
	20:15	4.53	1.40		0.05	10.13
11/14/00	8:00	2.72	2.03		0.31	9.90
	17:35	2.25	2.56		1.51	9.91
11/15/00	8:00	3.51	1.90		0.04	9.80
	16:15	3.30	2.41		9.55	9.74
11/16/00	8:00	2.40	2.52		3.67	9.62
	15:10	2.67	2.25		8.72	9.74
11/17/00	8:00	2.46	2.47		1.36	9.53
	14:20	3.06	2.20		1.13	9.60
11/20/00	9:30	2.59	2.24		1.28	9.52
	15:45	3.10	2.56		1.36	9.89
11/21/00	8:00	2.60	2.73		1.49	10.45
	13:45	3.69	2.41		1.33	10.10
11/27/00	11:00	3.14	2.31		1.09	9.58
	17:15	3.80	2.36		9.31	9.69
12/05/00	See Note 1.	12.00	6.42	13.43	15.25	13.22

Notes: 1.) DO readings collected on 12/5 are averages of several readings taken at each monitoring well.

FIGURES



LESENQ

-m-	SOIL VAPOR EXTRACTION POINT EX.: VEW-1
#	PROPOSED SOIL VAPOR EXTRACTION POINT EX.: SVE-2
	PROPOSED AIR SPARGE POINT EX.: AS-2
-f	MONITORING WELL EX.: MW-11D
4-	MULTI-LEVEL MONITORING POINT EX.: TMP-1S/D
.1.	AIR SPARGE POINT EX.: AS-1S
$•	SATURATED ZONE MONITORING POINT EX.: TMP-3-SAT
ZZ~—	PROPOSED TRENCHING LOCATION

NOTES;

1) LOCATIONS ARE APPROXIMATE.
2) S INDICATES SHALLOW. D INDICATES DEEP.
3) PLANT DRAWNGS DO NOT SHOW THE PRESENCE OF ANY. UNDERGROUND UTILITIES IN THE REMEDIATION WORK AREA.
4) TRENCHING MAY NEED TO CONTAIN ELECTRICAL CONDUITS TO PROVIDE 240/120V OR 480 V. 3-PHASE ELECTRICAL SERVICE FORM NEAREST AVAILABLE SOURCE. TO BE DETERMINED.
5) ALL DISTURBED AREAS SHALL BE RESTORED TO A CONDITION COMPARABLE TO PRE-CONSTRUCTION CONDITIONS.
6) IN AREA WITH CURRENT GRASS SURFACE COVER. DISTURBED AREAS SHALL BE RESTORED BY REPLACING TOPSOIU GRADING TO BLEND WITH THE SURROUNDING GROUND SURFACE AND PLANTING A MIX OF RAPID-EMERGENT AND PERENNIAL GRASS SEED FREE OF NOXIOUS WEEDS. SEEDED AREAS SHALL BE MULCHED WrTH STRAW OR SIMILAR MATERIALS.
7) ALL ELECTRICAL CONNECTIONS SHALL BE INSPECTED AND APPROVED PRIOR TO COVERING WORK OR OTHERWISE HINDERING INSPECTION.

REFERENCE:
POST SVE/AS TREATMENT SOIL SAMPLING LOCATIONS DRAWING NUMBER: 9325+330
DRAWN BY: T.T.MCKEE DATE: 3/23/00 SCALE: t"=>30' PREPARED Btt CUMMINGS WITTER CONSULTANTS, INC.

Symbol	P*acrtpUofl>	Oofc«	Approved
	RELOCATE COMPOUND	1/25/00	
	INCORPORATE EPA COMMENTS	3/27/M	
	UPDATE SHE MAP, ADJUST FONTS	4/12/00	
	REVISE POINTS	4/1 a/00	

ITCORPOMnOi

DMlgnad by.

Dnwn by: UA

Ch«ck#d by: ASP

R«vk«wad by:

Approved by!

VIACOM INC.

FORMER RUNOFF BASIN
FORMER WESTINGHOUSe FACILITY
OPERASLE UNIT #3
HORSEHEADS, NY

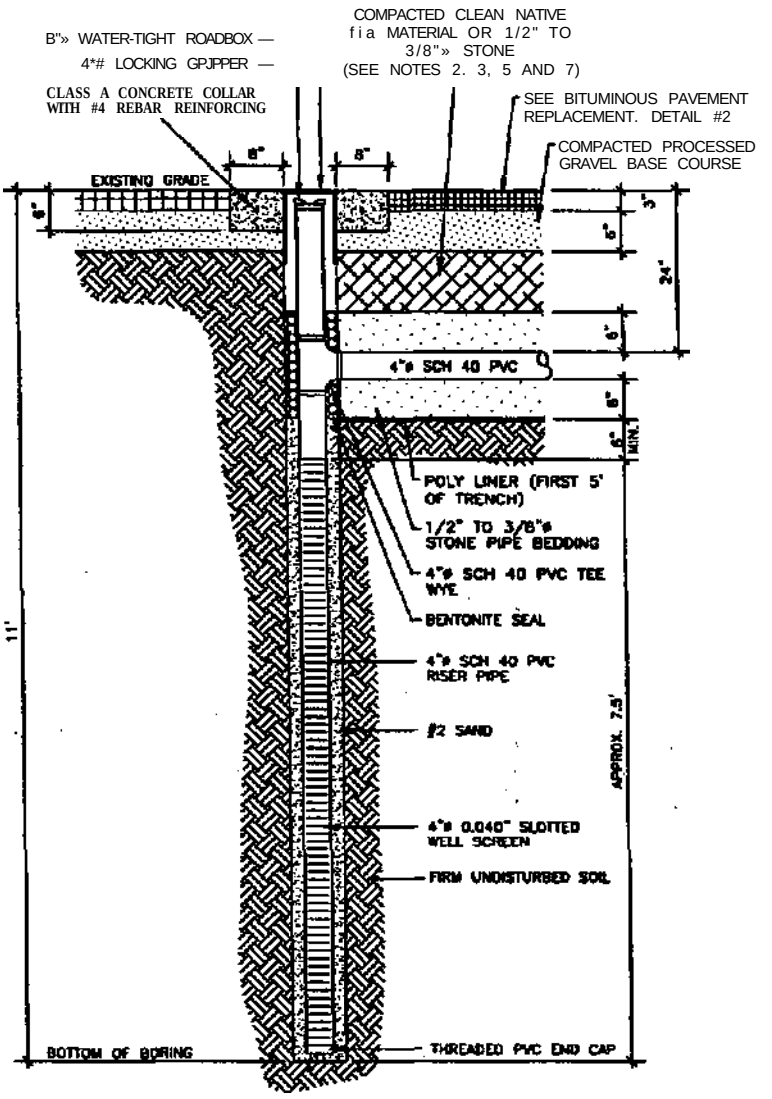
FIGURE 2-1

REMEDIATION SYSTEM SHED CONSTRUCTION, TRENCHING, AND WELL INSTALLATION LAYOUT

SCOIK AS SHOWN
Etta; 12/15/00
browing NumtW B06OTI-D

Spec No.
Contract No.

Sheet 1 of 1



SOIL VAPOR EXTRACTION WELL DETAIL
NOT TO SCALE

03

IT CORPORATION

VIACOM INC.
FORMER RUNOFF BASIN
FORMER WESTINGHOUSE FACILITY
OPERABLE UNIT #3
HORSEHEADS, NY

FIGURE 2 - 2

SOIL VAPOR EXTRACTION WELL DETAIL
KENTUCKY AVE.
WELL FIELD SITE

8"» WATER-TIGHT. ROADBOX

!"• GAL RISER WITH THREADED END CAP

CLASS A CONCRETE WFTH —i §* HEBAR REINFORCEMENT

EXISTING GRADE

COMPACTED CLEAN NATIVE FILL MATERIAL OR 1/2" TO 3/8"« STONE (SEE NOTES 2. 3. 5 AND 7)

' SEE BITUMINOUS PAVEMENT REPLACEMENT. DETAIL #2

•COMPACTED PROCESSED GRAVEL BASE COURSE

POLY UNER (SEE NOTE 15)

•1"# GALVANIZED STEEL (SEE NOTE 1*)

1/2" TO 3/8"* STONE PIPE BEDDING

1"# TEE

- NATIVE BACKFILL

- FIRM UNDISTURBED SOIL

GROUNDWATER SURFACE (APPROX. 10' BELOW GRADE)

• 1"# CALVANI2EO STEEL

•HYDRAULIC CEMENT

'BENTONTTE

•f00 SAND

fl SAND

• 1 1/4* X 1" REDUCER

AIR

GAL. WELL POINT WITH 1 1/4 "» STAINLESS STEEL ISO GAUZE (TYPICAL)

AIR

BOTTOM OF "BORING

AIR SPARGE WELL CONSTRUCTION DETAIL
NOT TO SCALE

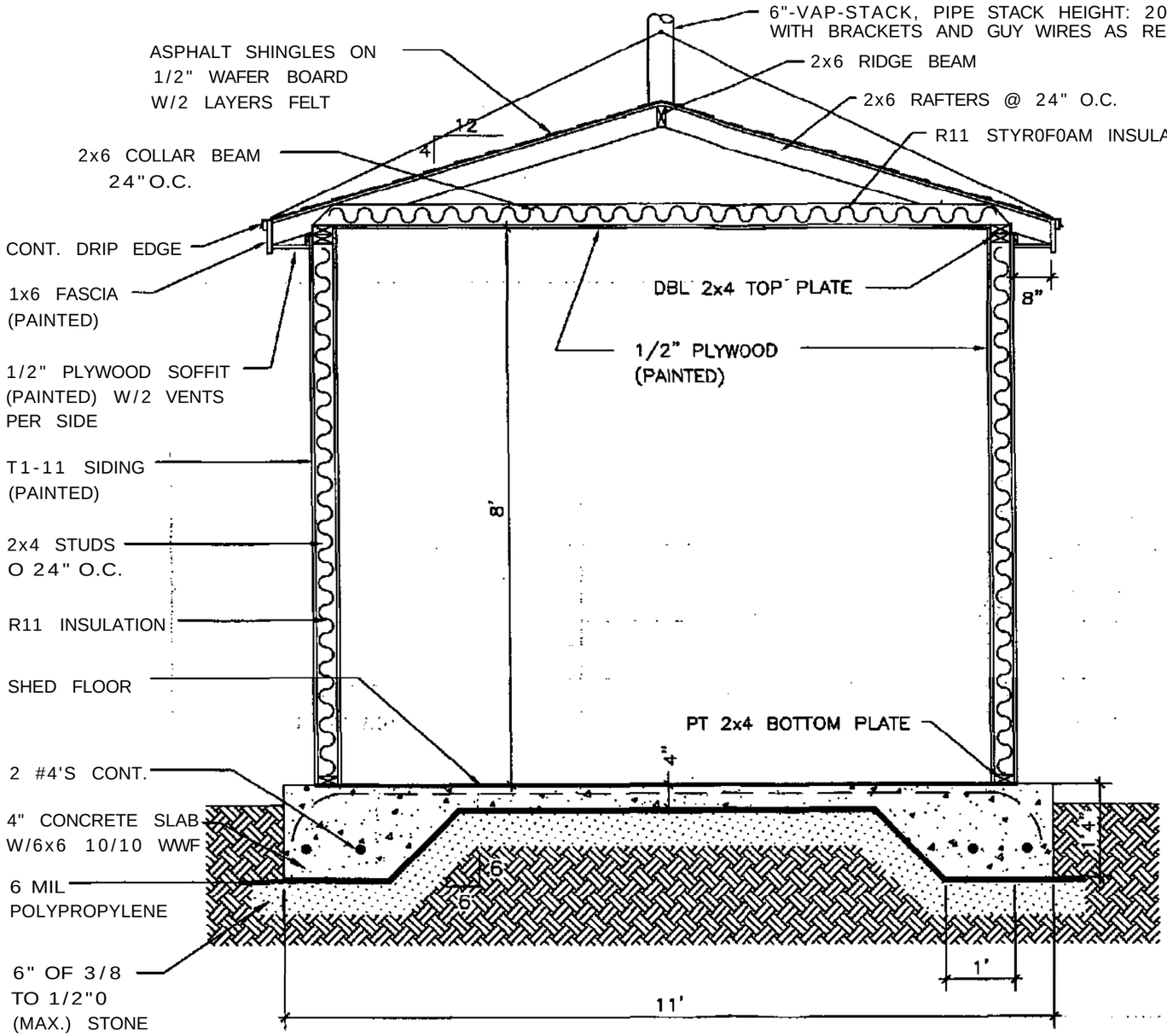
EE3
IT CORPORATION

VIACOM INC.
FORMER RUNOFF BASIN
FORMER WESTINGHOUSE FACILITY
OPERABLE UNIT #3
HORSEHEADS, NY

FIGURE 2 - 3

AIR SPARGE WELL CONSTRUCTION DETAIL
KENTUCKY AVE.
WELL FIELD SITE

J 1 J 2 I 2



SECTION VIEW

NOT TO SCALE

NOTES:

1) BUILDING FOUNDATION WAS EXCAVATED IN NATIVE SOIL AND NOT PLACED ON FILL.
2) CONCRETE HAD A MAXIMUM 4-INCH SLUMP AND MAXIMUM WATER-TO-CEMENT RATIO OF 0.5.
3) CONCRETE SLAB WAS FINISHED BY STEEL TROWEL AND BRUSHING TO FORM A FLAT, UNIFORM, SKID-RESISTANT SURFACE.
4) ALL STUD REINFORCING BARS AND WIRE MESH WERE SET WITH MINIMUM OF 2 INCHES OF CONCRETE COVER.

Symbol	Rtfnslora Daacriptlona	Date	Approved
	INCORPORATE EPA COMMENTS	3/27/00	

VIACOM INC.

FORMER RUNOFF BASIN
FORMER WESTINGHOUSE FACIUTY
OPERABLE UNIT #3
HORSEHEADS. NY

rrconraunai

Dmlgnad by: SHI
Drawn by*. LM
Chocksd by: AEP
Revlswsd by:
Approved by:

FIGURE 2 - 4

AS-COMPLETED REMEDIATION BUILDING

ScaET AS SHOWN | ShMt reference numben | Spec No.
Data: i/Voo | Contract No.
Drawing Humbf BOBMra-A | Y6 | Sheet 1 of 1

DRAWING NUMBER 98245B25

MW-7S
MW-7D
TMP-2D
MW-11S
MW-11D
TMP-1D
TMP-1-SAT

LEGEND:

APPROXIMATE PROPERTY BOUNDARY (FORMER WESTINGHOUSE FACILITY)

FENCE

MW-140 Q ON-SITE DEEP MONITORING WELL LOCATION

BARRIER WELL GROUNDWATER TREATMENT BUILDING

TMR-1D + MULTI-LEVEL MONITORING POINT

TMP-1-SAT^. SATURATED ZONE MONITORING POINT
• EX: TMP-1-SAT

SCALE
0 200 400

REVISION DATE DESCRIPTION

DRAWN BY: N. SUMMITT/M2
CHECKED BY g./\
APPROVED BY: ft^

DATE 7-28-00
DATE -Vx/an
DATE s/3./c*

FIGURE 4 - 1

GOUNDWATER SAMPLING LOCATIONS

KENTUCKY AVENUE WELLFIELD SITE – OU3
HORSEHEADS, NEW YORK

PREPARED FOR
CBS CORPORATION
PITTSBURGH, PENNSYLVANIA

nUMMINGS KniTER