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REMEDIAL INVESTIGATION
REPORT
VOLUME I

HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

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recording was marked with a tick to provide reference locations. EM-conductivity measurements perpendicular to the traverse line were collected and recorded to determine variations in the EM-conductivity fields at each station point. Every tenth traverse line was resurveyed to determine the reproducibility of the EM-conductivity readings.

Interferences were often encountered along a traverse line and field observations of these interferences were noted in the field books. Interferences included cars, trucks, railroad cars, chain link fences, railroad tracks and overhead piping. Prior to surveying, traverse lines were located in order to minimize the affects of the interferences, to the extent possible.

2.1.4 Soil-Vapor Survey

Soil-vapor sampling was limited to unpaved areas of the site and was used to determine possible areas of previously undocumented chemical releases. The survey was conducted along parallel traverses on 50-foot spacings. Total volatile organic analysis was performed at each sampling location using a photoionization detector (PID). A gas chromatographic (GC) analysis was used at 100-foot spacings. Soil-vapor sampling locations are presented on plate 2.3.

In the northern half of the site where large undeveloped open spaces are located, PID analysis occurred at 50-foot intervals and GC analysis occurred at 100-foot intervals. In the southern half of the site, a sampling grid could not be maintained and samples were taken as space allowed. PID analysis was performed on every sampling location with GC analysis at every other sampling location. Because various areas of the site were sampled on different days, background levels were established on a daily basis.

Sampling locations where PID readings were 5 mg/l (milligrams per liter) above background, such as SG-12 through SG-8, GC analysis was performed for confirmation. If GC confirmation was negative, no further sampling activity was performed. If GC confirmation was positive, concentrations were checked and recorded.

2.1.4.1 Sample Collection Procedure

To collect the soil-vapor samples, a 1/2-inch hole was driven to a depth of 4 feet using a stainless-steel slide hammer. In areas where soils were tightly packed due to vehicular traffic, a 3/4-inch hammer drill was used to penetrate the hard packed surface. A 1/2-inch by 5-foot stainless-steel sampling probe, connected to flexible (Tygon) tubing, was then inserted the full depth of the hole and sealed against ambient air by packing soil around the top of the probe. An external (peristaltic) pump was used to purge the sampling probe and tubing with in-situ soil vapor with approximately 125 ml (milliliter) of vapor and then to draw a representative sample into the flexible tubing. The sample was then taken by inserting a syringe needle into the flexible tubing and introducing the sample into the GC by the sampling pump in the instrument.

Prior to each sample collection, all sampling lines, slide hammers and sampling probes were decontaminated by washing with analyte-free water and Alconox and then rinsed with analyte-free water. Internal surfaces were flushed dry with ultra-high purity (UHP) Argon and external surfaces were wiped dry with clean paper towels. After reassembly, the whole sampling system was flushed with approximately 200 ml of UHP Argon to remove any remaining ambient air.

2.1.4.2 Analysis Procedures

Each soil-vapor sample was analyzed on an HNU Instruments PID for total volatile organic compounds. Approximately every fourth sample was analyzed on a Sentex Scentograph portable GC equipped with an Argon Ionization Detector using a pre-concentrator loop and Tenax absorbent. Target compounds selected for standardization were trans 1,2-dichloroethane, trichloroethylene and tetrachloroethylene. These compounds were selected due to their utility in determining the presence of suspected volatile organic compounds associated with the site.

Calibration of the GC was performed onsite prior to any morning sampling activity, and again prior to afternoon sampling using certified standards of known concentration. Retention times of known compounds were used to identify unknown compounds in the samples. Field control samples of UHP Argon and matrix spikes were run every ten samples to assure no cross-contamination between samples was occurring and to assure instrument performance. Full QA/QC procedures can be found in the FOP.

2.1.5 Air Sampling

Air sampling was conducted for particulates, Aroclor 1248 on particulates and specific volatile organics, on September 25 and October 23, 1989. Prior to sampling, the meteorological station at the Republic Airport in Farmingdale, New York was contacted to obtain the necessary information regarding wind speed, direction, barometric pressure, temperature and dew point. Field measurements of temperature and relative humidity were made with a Brannan Sling psychrometer. Based upon the prevailing wind speeds and direction at that time, one upwind and two downwind sampling locations were selected for each sampling event. The site-specific air sampling locations for the September 25 and October 23 events are shown on figure 2.4. Duplicate air samples were collected from one downwind sampling location during both events. A field blank, consisting of an unopened charcoal tube for specific volatile organic compounds and an unopened glass fiber filter for Aroclor 1248 on particulates was taken into the field during each sampling event and returned to the laboratory for analysis.

At each sampling location, a temporary platform was constructed and the monitoring equipment was operated at respirable height of approximately 4 feet above grade.

Atmospheric respirable dust/particulate samples were collected on pre-weighed, tarred 37-mm (millimeter), 5-um (micrometers) polyvinylchloride filters using MSA 10-mm nylon cyclones and MSA Model G pumps. Samples were collected at a flow rate of 1.7 liters per minute, as specified in NIOSH Method 0500.

Specific volatile organic vapor samples were collected on SKC, Inc. charcoal tubes, 400 mg by 200 mg, using Gillian LFS 1130 pumps. Specific volatile organic vapor samples were collected at a flow rate of 0.050 liters per minute, as specified in NIOSH Method 1003.

Atmospheric Aroclor 1248 on particulate samples were collected on 13-mm glass fiber filters using MSA Model G pumps. Aroclor 1248 on particulate samples were collected at a flow rate of 1.7 liters per minute, as specified in NIOSH Method 5503.

Sample flow rates were initially set and periodically checked during the sampling period with a Brooks precision rotometer, capable of measuring both high and low air flows. The rotometer had been calibrated against a bubble flow meter prior to field use.

All samples collected during the study were submitted for laboratory analysis. See table 2.7 for a summary of QA/QC samples obtained.

2.1.6 Sediment and Surface-Water Sampling

Surface-water sampling in Sumps 3 and 4 was completed on January 29, 1990 (figure 2.5). Specific surface-water sampling locations are shown on figures 2.6 and 2.7. Measurements of pH, specific conductance and temperature were made in the field at the time of sample collection. Samples were collected by wading into the sump, allowing the disturbed

4.1.11 Buried Metallic Objects

Soil sampling was completed in two areas of the site downgradient of locations established from a geophysical survey.

4.2 Analytical Results

The following sections present the analytical results of sampling the air, sediment, soils, surface water and ground water at the Hooker/Ruco site. Based upon the QA/QC validation, the data has been presented with the following qualifiers: R: the data has been rejected because target compounds were detected in either field blanks, trip blanks and/or method blanks; E: the data was considered estimated because either the concentration of the analyte was outside acceptable calibration windows or the analyte results were identified using CLP criteria at or below the Contract Required Detection Limit. The results of data validation are presented in Appendix 4.

4.2.1 Air Monitoring Results

Air monitoring was completed according to procedures outlined in Section 2.1.3, on September 25 and October 23, 1989. Air monitoring locations for both events are shown on figure 2.4. A summary of meteorological data, including temperature and relative wind directions collected prior to and during air sampling, are presented in table 4.1.

The results of respirable dust, specific volatile organics and Aroclor 1248 on particulates are summarized and presented in table 4.2. The start/stop times, flow rates and sample volumes collected during each sampling event are presented in Appendix 7.

4.2.1.1 Respirable Particulates

Respirable particulates were below the ACGIH threshold limit value of 0.15 mg/m^3 (milligrams per cubic meter) at both upwind and downwind locations during each air sampling event. The contribution from RI activities and/or the site was less than or equal to the upwind background value.

4.2.1.2 Specific Volatile Organics

Specific volatile organics analyzed were tetrachloroethylene (PCE), trichloroethylene (TCE), trans 1,2-dichloroethylene (1,2-DCE) and vinyl chloride monomer (VCM). VCM was not detected. PCE and TCE were not detected (1.0 ppm/v) (parts per million per volume) during either monitoring event. 1,2-DCE was not detected (1.0 ppm/v) during the September 25, 1989 monitoring event, or (0.01 ppm/v) during the October 23, 1989 monitoring event. The contribution from RI activities and/or the site was less than or equal to the upwind background value for these analytes.

4.2.1.3. Aroclor 1248 on Particulates

Aroclor 1248 was detected at 0.00005 mg/m^3 in the upwind sample collected on October 23, 1989. This value is less than the ACGIH time weighed average value of 0.5 mg/m^3. Aroclor 1248 was not detected at a detection limit of (0.00003 mg/m^3) in any other sample during either monitoring event. The contribution from RI activities and/or the site was less than or equal to the upwind background value for Aroclor 1248.

4.2.2 Vadose Zone

4.2.2.1 Soil-Vapor Survey

A total of eighty locations were chosen for volatile organic analysis of soil vapor and labeled SG-1 through SG-80 (plate 2.3). Fifty locations were analyzed by PID only and twenty-five locations were analyzed by PID and GC. Five sampling locations, SG-20 through SG-25, were analyzed by GC only due to a malfunction with the PID. Copies of the soil-vapor chromatograms are presented in Appendix 8. Results of the PID field analysis are summarized on table 4.3. The results of the twenty-five soil-vapor sampling locations, analyzed by both PID and GC, are summarized on table 4.4

Soil-vapor locations, SG-1 through SG-8, showed concentrations greater than 5 mg/l above background on the PID instrument. Soil-vapor sampling, using the GC, however, showed that these samples did not contain detectable concentrations of volatile organic compounds. It is suspected that soil moisture interfered with the PID readings. Sampling Locations SG-66 and SG-67 also contained vapors that were greater than 5 mg/l above background on the PID instrument. These two locations were not further analyzed by GC methods due to the close proximity of adjacent test borings completed in Sump 1. Soil from the remaining seventy sampling locations gave PID readings less than 5 mg/l above background (table 4.3).

Of the soil-vapor samples analyzed by the GC method, only two locations gave detectable concentrations of PCE. PCE was detected in SG-51 and SG-76 at 8 and 7 ug/l, respectively. TCE and 1,2-DCE were not detected (5 ug/l) in any sampling locations (table 4.4).

No areas requiring further investigation were detected by vadose zone analysis.

4.2.2.2 EM-Terrain Conductivity Survey

The geophysical investigation consisted of an EM-terrain conductivity survey of two areas of the Hooker/Ruco site where tanks or trailers were believed to have been buried.

Both in-phase and quadraphase conductivity results were collected during the investigation. Copies of the EM-31