C.T. MALE ASSOCIATES, P.C.

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Engineering
Land Surveying
Architecture
Landscape Architecture
Environmental Services
Computer Services

INTERIM REMEDIAL MEASURES INVESTIGATION REPORT ACTIVE INDUSTRIAL UNIFORM CO., INC. 63 WEST MERRICK ROAD LINDENHURST, LONG ISLAND

NOVEMBER 26, 1990

C.T. MALE ASSOCIATES, P.C.

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ELIZABETH W. ROVERS
Environmental Engineering

Engineering
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Prepared by:

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CTMA Project No.: 88.2594

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INTERIM REMEDIAL MEASURES INVESTIGATION REPORT ACTIVE INDUSTRIAL UNIFORM CO., INC. 63 WEST MERRICK ROAD LINDENHURST, LONG ISLAND

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APPENDICES

1.0 INTRODUCTION

This report presents the findings of the interim remedial investigations/soil gas survey conducted at the Active Industrial Uniform Co., Inc. facility located at 63 West Merrick Road in Lindenhust, Long Island. A site location map, Figure 1, and a site plan, Figure 2, are included in Appendix A. The investigation was performed as outlined in the NYSDEC approved work plan entitled "Proposed Interim Remedial Measures Investigation Work Plan," dated September 5, 1990 and prepared by C. T. Male Associates, P.C. The work plan was submitted on September 10, 1990, to Mr. John Conover of the New York State Department of Environmental Conservation (NYSDEC), Region 1 Office, Division of Hazardous Waste Remediation. A copy of the approval letter from NYSDEC is enclosed in Appendix B. Mr. Conover was also notified by C. T. Male of the scheduled date of investigation prior to the onset. C. T. Male submitted a site specific health and safety plan for the investigation concurrent with the work plan.

The purpose of this investigation was to initiate interim remedial measures by defining the sources or source areas of volatile organic solvent contamination at the site; to define the approximate horizontal extent of contamination at the site; to define the type of contamination present; and to assist in placement of monitoring wells at the site.

The investigation was based on reported findings of soil sampling conducted by Twin City Testing of St. Paul, Minnesota, in 1987, and on background research conducted by C. T. Male Associates, P.C.. This information suggested that contamination at the site is expected to consist of three different chlorinated volatile organic compounds and that these compounds were introduced to the site as a result of past site storage and use of dry cleaning fluids. Based on this information and a review of physical site conditions, it was determined that a

soil gas survey would render information that would be useful in locating site contaminated areas, contamination sources, and areas which should be further investigated and/or remediated.

In order to perform this investigation, C. T. Male Associates retained the services of a subconsultant HRP Associates, Inc. of Plainville, Connecticut to provide the necessary instrumentation and field laboratory services. All field investigation work was coordinated and supervised by a representative of C. T. Male Associates. This report has been prepared by C.T. Male Associates, P.C. as requested by Active Industrial Uniform Co., Inc..

2.0 FIELD INVESTIGATIONS

On September 24, 1990, Mr. John Conover of the NYSDEC, two representatives of HRP Associates and Mr. Kim Baines of C. T. Male Associates all met at the site to discuss the investigation and to mark out the sampling grid location points. In setting up the sampling grid, sample collection points were oriented in such a way that sampling would show representative values of on-site contamination, potential contaminant sources, as well as showing trends for horizontal contaminant movement from the source areas and downgradient (anticipated to be to the south, southwest), and reported contaminant levels at the site boundaries. Some of the underground utility locations conflicted with the proposed sampling locations. Sampling point locations were adjusted to compensate for the location of these utilities. On the south side of the building, where sampling locations were proposed adjacent to the loading dock door, the points were moved to the south to avoid a large concrete paved surface. The actual sample locations as they were located during the investigation are shown on Drawing No. 90-513, sheet 1 and 2 of 2 enclosed in Appendix C. These locations were measured in the field during the investigation with a tape measure referenced to the site building and other prominent site features.

On September 25, 1990, the site investigation began at 7:30 AM when the field team from HRP Associates began installing the sampling points on the northeast corner of the site. In general, the study consisted of the installation of 4 foot long glass thieves sealed at the top with a clay gasket. The air in the soil pore spaces was evacuated by drawing soil gas from the sample point through flexible tubing with a small vacuum pump. This methodology provided for the collection of soil gas samples at sample points throughout the site. The sampling point installation and sample collection was performed as described in the enclosure under Appendix D entitled "HRP's Headspace Soil

Screening and Sampling Techniques". During the course of the investigation, sampling syringe blanks and machine column blanks were run according to HRP's protocol and no evidence of cross contamination, residual "carry-over column contamination" or ambient air contamination was observed as reported by HRP. See HRP's letter dated October 12, 1990 enclosed in Appendix D. In areas where soil gas contamination was detected at high concentrations, extra column blanks and syringe blanks were run on the gas chromatograph to ensure that contamination was not "carried over" to subsequent samples.

At the onset of the sample point installation and intermittently during the investigation, the ambient air in the areas of investigation was tested with a Microtip photoionization detector organic vapor meter. No evidence of organic vapor contamination was detected in the breathing zone in any of the site work areas at any time.

Throughout the day of September 25, 1990, samples were collected from a total of 35 sampling point locations as shown on Sheets 1 and 2 of CTMA Drawing No. 90-513 in Appendix C. Two of these locations were chosen to collect representative field samples for laboratory analysis. The locations selected were sampling points #10 and #29. These sampling points were chosen due to the fact that a maximum number of contaminants at relatively high concentrations were noted by the field gas chromatograph (G.C.) on the chromatograms. The purpose for obtaining these samples was to confirm that the field G.C. had correctly identified the contaminants present and that the concentrations of the contaminants noted in the field was relatively similar to those that would be detected by laboratory analysis. Collection of the laboratory samples and the results are discussed in Section 4.0 of this report.

3.0 FINDINGS OF FIELD INVESTIGATIONS

The concentration of contaminants detected during the field investigations are presented in the table attached to HRP's October 12, 1990 letter enclosed in Appendix D and also presented on the following page. Based on the field results, contaminant plume maps were generated showing "isopleths" or plume contour lines of the two most prominent contaminants detected at the site (i.e., tetrachloroethylene and trichloroethylene). Isopleths are lines drawn between points of similar or identical concentration levels extrapolated from the sampling data points to illustrate the concentration of contamination over distance. In some instances insufficient data points were available to draw the contour and so a dashed line is shown. The contaminated plume maps are enclosed in Appendix C as CTMA Drawing No. 90-513, sheet 1 and 2 of 2.

The results of the soil gas survey indicate the following:

1. Tetrachloroethylene (PCE) was detected in the soil gas at concentrations ranging from non-detect to 120,000 parts per billion (ppb) or 120 parts per million (ppm).

2. Trichloroethylene (TCE) was detected in the soil gas at concentrations ranging from non-detect to 41,000 ppb.

3. 1,1,1-Trichlorethane (1,1,1-TCA) was detected in the soil gas at concentrations ranging from non-detect to 2,800 ppb.

4. Trans 1,2-dichlorethylene was detected in the soil gas at concentrations ranging from non-detect to 132 ppb.

SOIL GAS SURVEY PERFORMED SEPT. 25 1990

LINDENHURST, NY.
PREPARED FOR C.T. MALE ASSOC., P.C.
LATHAM, NEW YORK
Active Industrial Uniform Co., Inc.
ALL RESULTS ARE REPORTED IN
PARTS PER BILLION.
THESE RESULTS ARE SIGNIFICANT
ONLY TO THE SURVEY ITSELF AND
SHOULD NOT BE COMPARED TO ANY
LABORATORY RESULTS OR ANY
OTHER QUANTIFYING ANALYSES.

SAMPLE POINT NUMBER	G.C. LOG NUMBER	INJECTION VOLUME (UL) MICROLITERS	T-1,2 DICHLOROETHYLENE	1,1,1 TRICHLOROETHANE	TRICHLOROETHYLENE	TETRACHLOROETHYLENE
1	6	500 UL	1.5	116	340	61
2	7	"	1.3	94	278	113
3	8	"	0.2	6	50	78
4	9	"	0.7	-	80	219
5	10	"	2.3	-	56	6650
6	15	250 UL	-	-	63	21,720
7	17	100 UL	22	-	3050	120,000
8	19	"	-	-	-	105
9	25	500 UL	1.1	43	94	487
10	26,29	500,100 UL	132	2800	41,000	35,300
11	30	100 UL	-	-	26	213
12	31	"	5.2	-	37	178
13	34	50 UL	15	361	1040	1850
14	35	"	-	-	-	53
15	37	"	-	-	8	169
16	36	100 UL	4.2	-	341	424
17	38	50 UL	-	-	17	144
18	39	"	-	-	-	-
19	32	100 UL	-	-	-	-
20	33	"	43	208	2700	32,180
21	42	50 UL	1.8	-	396	1690
22	43	"	9.4	-	1120	3060
23	45	100 UL	65	1790	4160	24,550
24	46	50 UL	-	-	288	367
25	47	"	25	144	2480	23070
26	48	"	47	1000	3270	39030
27	49	"	-	-	62	2540
28	50	"	1.5	-	205	1820
29	51	"	19.5	-	2160	1420
30	52,54	"	-	-	-	-
31	53	"	-	-	271	2210
32	55	"	-	-	-	550
33	56	"	-	-	-	-
34	57	"	-	-	-	-
35	58	"	-	-	-	-

5. The areas of most significant chlorinated solvent contamination were in the area of the former underground PCE storage tank in the northwest corner of the property; in the area surrounding and downgradient from the former above ground PCE storage tanks off the southwest corner of the building; and in the area south of the main building on-site (i.e., south and southwest of the abandoned septic tank).

6. No chlorinated solvent contamination was detected along the western and southwestern property boundary, and no contamination was detected in the southeast corner of the the property. Contamination was detected along portions of the southern property boundary.

7. Low levels of chlorinated solvent contamination (up to 350 ppb) were detected in the front of the main building (i.e., north and northeast portion of the site) which is anticipated to be upgradient on the site based on reported groundwater flow direction in the area. This contamination may be from horizontal migration of gases through the soil from the significant contamination detected in the area of the former underground PCE storage tank to the west.

4.0 SAMPLING AND LABORATORY ANALYSIS RESULTS

As discussed in Section 2.0, two quality assurance samples were collected in the field by a C. T. Male representative during the study. The samples were collected at two sample points which when analyzed by the field G.C. exhibited evidence of a variety of contaminants at relatively high concentrations. It was assumed that analysis of these samples would provide data regarding the diversity of contamination at the site as well as contribute general data concerning the relative concentrations of these contaminants.

The samples were collected with the same sampling apparatus, but with a different methodology. The laboratory samples were collected by drawing the soil vapors through a charcoal absorption tube between the sampling point and the vacuum pump, during the two minute sampling point evacuation period. The field sample was collected with a gas tight syringe from the sampling tube at the end of the two minute period. Although the sampling methods varied, this method was considered to be a reliable and relatively simple means of obtaining the samples for laboratory analysis. The charcoal absorption tubes were submitted to CTM Analytical Laboratories, Ltd. for analysis. The samples were analyzed for halogenated volatile organic compounds by NIOSH Method 1003. The laboratory analyzed the samples for those compounds anticipated to be present, based on field G.C. results and other similar halogenated volatile organic solvents. Copies of the laboratory analysis report and chain of custody record are attached in Appendix E. A comparison of the laboratory results with the field sample results from the same sampling points is presented in Table 4.0-1 on page 9.

Table 4.0-1
Summary of QA Sample Results(1)

Sample ID	PCE	TCE	1,1,1-TCA
Hole #10 Field Sample	35.3	41.0	2.8
Hole #10 Lab Sample	609.0	136.0	125.0
Hole #29 Field Sample	1.4	2.2	ND
Hole #29 Lab Sample	169.0	21.0	56.0

(1) Sample results are presented in parts per million (ppm) as soil gas.

- TCE = Trichloroethylene
- PCE = Tetrachloroethylene
- 1,1,1-TCA = 1,1,1-Trichlorethane

As shown in Table 4.0-1, the three compounds identified in the field samples were verified in the laboratory sample. In all cases, the lab samples showed higher concentrations of these compounds, but this is not unreasonable, since the laboratory sample represents a two minute average sample duration, and the field sample was collected at the end of the two minute period when much of the soil gas had been evacuated from the hole. Although the sample values vary in concentration, they did show that the compounds identified in the field were correct and had some continuity with laboratory analyzed samples. Even though the field values are consistently lower than the laboratory analyzed samples, they both illustrate that the contaminants are in parts per million levels which in all but one case vary not more than 200 ppm. In further comparing the field result with the lab results it should also be noted that 1,1-dichloroethane was detected in the laboratory samples and not in the field samples, and trans 1,2-dichloroethylene was detected in the

field samples and not in the lab samples. Both of these compounds were detected in trace amounts and are considered to be decomposition compounds typically associated with the three primary compounds noted in Table 4.0-1.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Our conclusions and recommendations are based entirely on the information presented to C. T. Male concerning the potential origin of the site contamination; and, the results of this investigation as presented in this report.

The soil gas survey proved to be an essential "tool" in this investigation, to provide preliminary information about the primary contaminated areas and how the contamination has moved laterally from these areas. It has also indicated the concentrations that can be expected from a soil vapor extraction (venting) system and will be useful in design of a soil venting system to remediate site soil if this method is determined to be the most feasible.

Our conclusions and recommendations are presented below:

1. As a result of this investigation, it is evident that along the northwest and south sides of the site, there are areas where soil gas contamination is present near and at the site boundary. Initially it is recommended that the extent of groundwater contamination on-site be determined since it is important to first address the source of contamination and establish actual concentrations on-site.

2. In general, three primary areas of contamination were noted as depicted in the CTMA Drawing No. 90-513 in Appendix C. The sources for the contamination are assumed to be leakage or spillage of dry cleaning fluids from storage tanks historically located in the northwest corner of the site

and adjacent to the southwest corner of the site building, and potentially discharges of dry-cleaning fluids to an abandoned septic tank system on the south side of the site building in the area of Tompkins Lane.

Based on the extent of soil gas contamination encountered at the site and its proximity to site buildings, soil removal as an interim remedial measure is not recommended. If soil were removed, the excavation would have to be filled in to enable operations at the site to continue. The clean fill could then become contaminated since there is groundwater contamination at the site based on the Twin City Testing Report, creating a similar situation as started with. Therefore, it is recommended that site soils be remediated in place in conjunction with remediating the groundwater beneath the site. The next phase of investigation should then be to assess the quality of groundwater and determine the levels of contamination present, and to perform some aquifier tests to narrow down available options to remediate the site soils and groudwater. It is recommended:

a) That the extent of groundwater contamination be determined on site through the installation of groundwater monitoring wells, sampling and laboratory analyses.

b) That soil sampling be conducted during drilling and samples analyzed in the laboratory to determine the extent of soil contamination; and that some of the samples be analyzed for TCLP (Toxicity Characteristic Leaching Procedure) volatiles to determine if the soil would be considered a hazardous waste to evaluate the option of soil removal and disposal off-site.

c) That permeability testing of the aquifer be conducted through constant head and/or falling head field permeability tests, in selected overburden wells to be installed, to be able to estimate the groundwater flow rate and to estimate if contamination has migrated off-site and, if so, to what extent.

d) That a pump test be performed in a selected overburden well to determine de-watering characteristics of the aquifer to determine if sufficient drawdown of the water table will be able to be accomplished through pumping wells to enable contaminated soils above the depressed water table to be treated through soil venting (i.e., vapor extractions methods). The pump test will also provide information needed to design a groundwater pumping system to treat contaminated groundwater (i.e., necessary spacing between pumping wells).

e) That a reverse pump test be performed in a selected overburden well to determine how much water the aquifer could handle, without mounding occurring, to assist in evaluation of the soil remediation option of soil flushing.

f) That some of the proposed monitoring wells be installed as paired points (one deep and one shallow) to assess vertical contaminant migration. The purpose of paired points is to determine the vertical component of contaminant migration by sampling at different depths and comparing the values. The wells would be screened at different depths so that the water enters at different depths. Since the contaminants detected by the soil gas survey were heavier than water and, therefore, will also have a tendency to migrate vertically as well as

horizontally with the groundwater, it is important to install the shallow and deep well to determine the vertical extent of groundwater contamination. At least two cluster wells (paired points) are recommended, one to be installed in the area of contamination in the northwest corner of the property and the other to be installed near the south property line downgradient from the former above ground PCE storage tanks. An upgradient shallow well is recommended to establish background water quality and two additional downgradient shallow wells are recommended to define the extent of groundwater contamination on-site. The monitoring wells will also enable us to determine actual groundwater flow direction beneath the site.

g) That groundwater sampling and laboratory analyses of the samples for volatile organics, pH and iron (T) be conducted.

3. Although minor concentrations of soil gas contaminants were detected in the northeast corner of the site, it is assumed that these gases may have been "trapped" beneath the building and paved surface in this area and that the soil gas sampling in this area may not be showing a significant soil contamination condition, but may simply be showing residual soil gasses which have migrated from the contamination detected in the northwest corner of the site. The potential for soil contamination in this area would be clarified by soil sampling during the installation of the recommended monitoring well.

In summary, with the data obtained from this study, it is evident that an organic solvent contamination problem is present at this site. The contaminated soil is present in such a quantity that excavation and disposal as a hazardous waste would

appear to be uneconomical. Based on this information, C. T. Male recommends that treatment of this soil be performed on site in conjunction with groundwater remediation. It has therefore been recommended that the degree and extent of groundwater contamination at the site be determined along with aquifer testing to determine if soil remediation via vapor extraction or soil flushing are feasible alternatives and to provide design information for a groundwater remediation/pumping system.

If you have any questions or require any additional information please do not hesitate to contact myself or Liz Rovers at this office.

Respectfully submitted,

C.T. MALE ASSOCIATES, P.C.

Elizabeth W. Rovers for

Kim L. Baines
Environmental Scientist

Reviewed and Approved by:

David W. Roecker, P.E.
Department Head/ Environmental Engineering

KLB/DWR/lmw

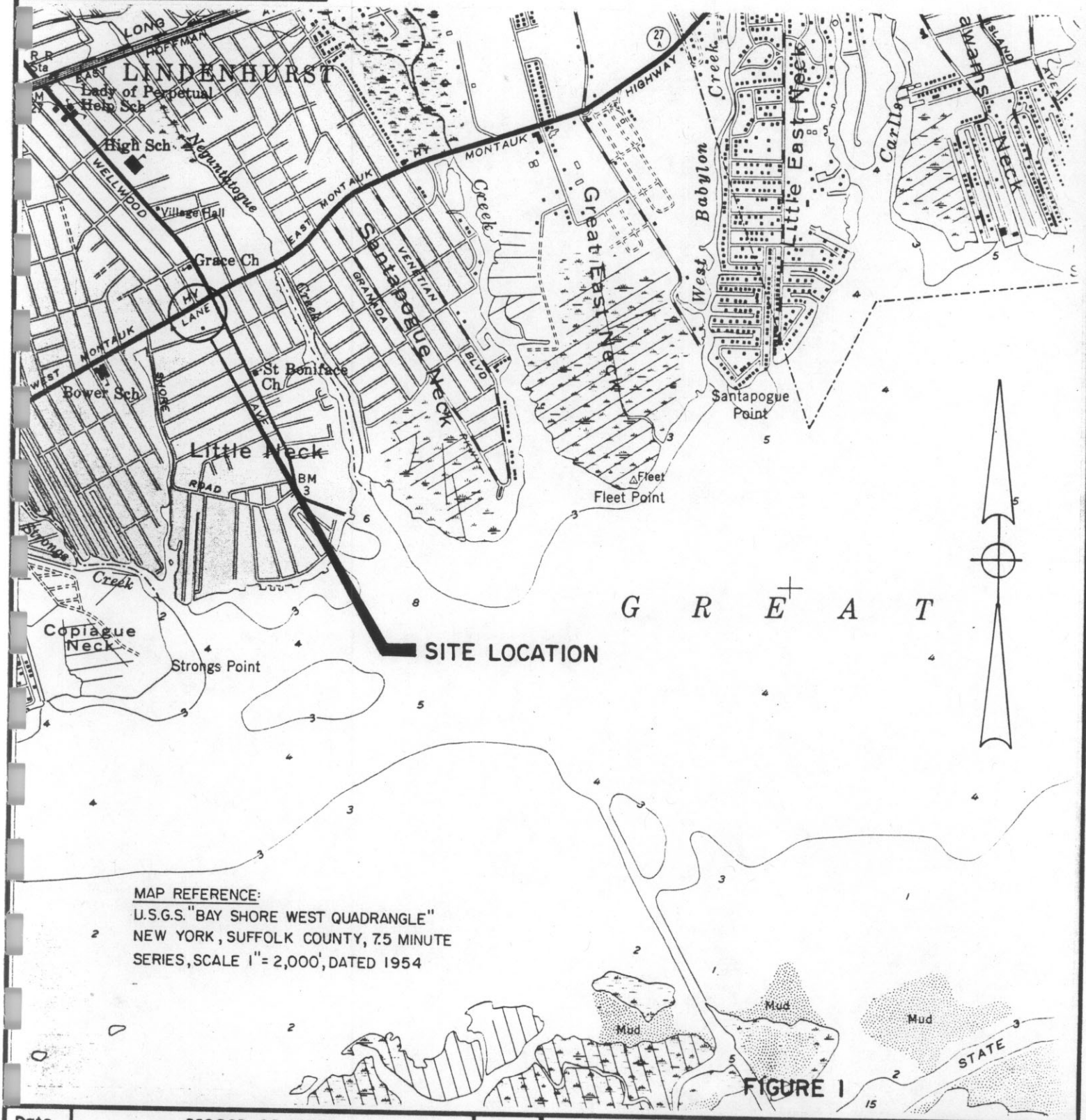
APPENDIX

A

APPENDIX A

FIGURES

1. SITE LOCATION MAP
2. SITE PLAN



MAP REFERENCE:
U.S.G.S. "BAY SHORE WEST QUADRANGLE"
NEW YORK, SUFFOLK COUNTY, 7.5 MINUTE
SERIES, SCALE 1" = 2,000', DATED 1954

FIGURE 1

Date	RECORD OF WORK	Appr.

Drafter: MJ | Checker:

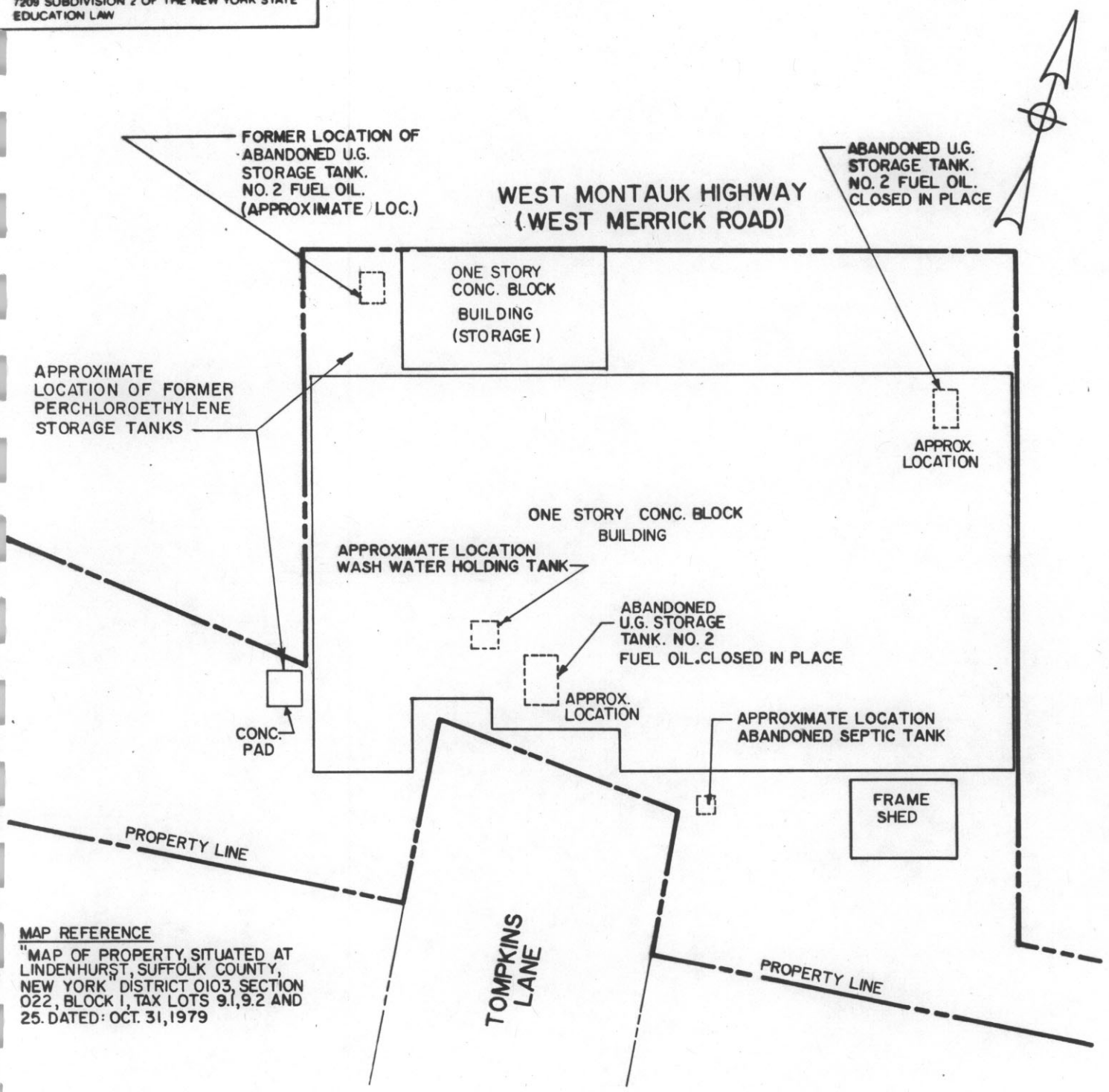
Appr. by: | Proj. No. 88.2594

ACTIVE INDUSTRIAL UNIFORM CO, INC.
63 WEST MERRICK ROAD
REMEDIAL INVESTIGATION

VILLAGE OF LINDENHURST | COUNTY OF SUFFOLK, N.Y.

C. T. MALE ASSOCIATES, P.C.
50 Century Hill Drive, P.O. Box 727, Latham, NY 12110
(518) 786-0976
Engineering Surveying Architecture Landscape Architecture
Laboratory Services Computer Services

SCALE: 1" = 2,000' | DATE: JANUARY 31, 1989



MAP REFERENCE
"MAP OF PROPERTY, SITUATED AT LINDENHURST, SUFFOLK COUNTY, NEW YORK" DISTRICT 0103, SECTION 022, BLOCK 1, TAX LOTS 9.1, 9.2 AND 25. DATED: OCT. 31, 1979

FIGURE 2

Date	RECORD OF WORK	Appr.

Drafter: MJA | Checker:

Appr. by: | Proj. No. 88.2594

ACTIVE INDUSTRIAL UNIFORM CO., INC.
63 WEST MERRICK ROAD
REMEDIAL INVESTIGATION

VILLAGE OF LINDENHURST | COUNTY OF SUFFOLK, N.Y.

C. T. MALE ASSOCIATES, P.C.
50 Century Hill Drive, P.O. Box 727, Latham, NY 12110
(518) 786-0976
Engineering Surveying Architecture Landscape Architecture
Laboratory Services Computer Services

SCALE: 1" = 30' | DATE: JANUARY 27, 1989

B

APPENDIX B

CORRESPONDENCE FROM NYSDEC

New York State Department of Environmental Conservation
Building 40—SUNY, Stony Brook, New York 11790-2356

Thomas C. Jorling
Commissioner

Sept 12, 1990

Elizabeth W. Rovers
C.T. Male Assoc., P.C.
50 Century Hill Drive
Latham, New York
12110

Re: Interim Remedial Measures Investigation Work Plan (9/5/90)
American Linen Supply, Site # 152125

Dear Ms. Rovers,

This work plan, which details your proposed methods for collecting soil vapor samples on site, has been received, reviewed, and approved. As stated in this workplan, future work (which will include remediation activities) will be addressed after the results of this soil gas survey have been reviewed.

Please start this work as soon as possible and call us 4 days in advance.

Sincerely,

Anthony Candela, P.E.
Regional Hazardous Waste Remediation Engineer

cc: M. O'Toole
M. Chen
J. Swartwout
J. Conover
R. Rusinko
amlin4

C

APPENDIX C

CONTAMINANT PLUME MAPS

D

APPENDIX D

HRP ASSOCIATES INC.:

1. LETTER DATED OCTOBER 12, 1990 - INVESTIGATION SUMMARY AND DATA

2. HRP'S HEADSPACE SOIL SCREENING TECHNIQUES

HRP

ASSOCIATES, INC.

November 27, 1990

Mr. Kim Baines
Project Engineer
C.T. Male Associates, P.C.
50 Century Hill Drive
P.O. Box 727
Latham, New York 12210

RE: ACTIVE INDUSTRIAL UNIFORM CO. INC., 63 WEST MERRICK ROAD, LINDENHURST, LONG ISLAND, SUFFOLK COUNTY, NEW YORK (HRP #CTM0001.MI)

Dear Mr. Baines:

At your request, this letter serves as a summary report of the soil gas survey conducted at the above referenced property on September 25, 1990 by HRP Associates, Inc. Thirty five sample test points were installed at locations approximately 30 feet apart as shown on Figure 1. The methodologies outlined in the proposal provided to C.T. Male Associates and incorporated into the C.T. Male Associates' Proposed Interim Remedial Measures Investigation Work Plan Proposal dated September 5, 1990 to Active Industrial Uniform Co. Inc. were employed.

The results of the survey are listed in Table 1 and show mainly Tetrachloroethylene contamination (highest main contaminant). Several other unknown peaks were found in conjunction with these results, however they were not identified. Their determination was not found owing to; the calibration of the machines computer to chlorinated solvents commonly found in cleaning operations, (Tetrachloroethylene (PCE), Trichloroethylene, 1,1,1-Trichloroethane and T-1,2-Dichloroethylene). Degradation of these know cleaning solvents by weathering and biological action vary from site to site and therefore only the above listed solvents were used in calibration and analysis of results.

The quality control during this project was a success and the results yielded good data for soil gas examination purposes. No needle or sampling equipment contamination, or machine carry over was exhibited when these results were examined for quality control. Ambient air sample checks were non-detectable for the contaminants of concern.

167 New Britain Ave. ■ Plainville, CT 06062 ■ (203) 793-6899 ■ FAX (203) 793-6871

As shown by isopleth mapping, the extent of the contaminant plumes may exceed this site's property boundaries, so the full extent of contamination from traced sources are unknown at this time. (It is assumed that the contamination moved along with ground water flow but cannot be ascertained without a hydrogeologic study at this site).

The results provided in this report are relative to the survey itself and should not be used in comparison to more precise analytical laboratory analyses or any other definitive, quantitative EPA laboratory methodology. In addition, soil gas analyses conducted in this manner may not be indicative of soil or ground water contamination detected by conventional laboratory methodologies, nor is the soil gas survey currently an accepted EPA method for determining contamination.

Since the survey is only a preliminary tool for screening, further soil boring investigations and EPA certified analyses are prudent in determining the accuracy of the soil gas survey itself. HRP makes no assertions that the soil gas survey can stand alone as definitive at any site.

Please contact me with any questions.

Sincerely,

HRP ASSOCIATES, INC.

for George B. Hoag
Project Scientist

GBH/dh
G\CTM-1-MI.GBH

SOIL GAS SURVEY PERFORMED SEPT. 25 1990

LINDENHURST, NY.
PREPARED FOR C.T. MALE ASSOC., P.C.
LATHAM, NEW YORK
Active Industrial Uniform Co., Inc.
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SAMPLE POINT NUMBER	G.C. LOG NUMBER	INJECTION VOLUME (UL) MICROLITERS	T-1,2 DICHLOROETHYLENE	1,1,1 TRICHLOROETHANE	TRICHLOROETHYLENE	TETRACHLOROETHYLENE
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31	53	"	-	-	271	2210
32	55	"	-	-	-	550
33	56	"	-	-	-	-
34	57	"	-	-	-	-
35	58	"	-	-	-	-

HRP'S HEADSPACE SOIL SCREENING AND SAMPLING TECHNIQUES

A Photovac Model 10S55 Portable Gas Chromatograph with a precolumn, backflush, oven, and PID detector (10.6ev) is used to analyze the "headspace gas" obtained from each soil sample (collection procedure described below). The peak amplitudes and retention times obtained from each sample are compared to standard peaks and retention times obtained from prepared (in house) pure substances expected to be present. Based on a comparison of the sample results with the standards, the amounts and types of contaminants in each sample are determined.

The headspace screening can be performed both on the site and at HRP's in-house laboratory. This is an initial semi-quantitative "headspace" screening only and is not a State certified laboratory analysis performed using standard EPA methods.

"Ultra zero air" certified to contain less than 0.1 ppm total hydrocarbons is used as the carrier gas. The gas chromatograph's oven runs isothermally at 40°C. The total run time for each sample is sufficient to allow analysis of the targeted volatile organics. A fused silica (CPSil 5CB) Photovac capillary column 9 meters long and a precolumn 1 meter long and measuring 530 micrometers in diameter are employed. Both sample and standard injection volumes are recorded to allow direct quantification between standards and unknowns. Carrier gas flow rate is also held constant at approximately 10 cc/min. to assure constant retention times.

During the screening a Quality Assurance/Quality Control (QA/QC) program is followed to assure that any soil contamination detected in the soil samples did not arise from interferences and to provide a semi-quantitative basis for sample evaluation.

The QA/QC program consists of periodic injection of "headspace" gas obtained from water standards and analysis of "blanks". Water standards are prepared in HRP's in-house laboratory for certain targeted volatile organic compounds (as described in the main report) and injected into the GC. These targeted compounds are then stored in the GC's "memory" prior to sample collection. Various "blank" analyses were performed to evaluate potential avenues of cross-contamination.

"Blank" analyses consist of:

1. Instrument blanks (no injection) to check the potential for column carryover;
2. Syringe blanks;
3. Soil sample container blanks; and
4. Ambient "background" air blanks in both the sample collection and instrument areas to check the potential for cross contamination from surficial air sources.

All chromatograms are printed on hard copy. Peak areas are integrated by the GC's mini-computer by comparison with standards pre-programmed into the library. Preparations containing selected potential site contaminants are generally injected into the GC to "check" retention times on a twice daily basis.

The objectives of the QA/QC program should be achieved on the sampling dates in that :

1) GC column carryover is not significantly interfering with any of the analyses;
2) Carryover syringe contamination is not detected after any sample injection;
3) No interfering volatile organic contamination is detected in any container (4 oz. septa soil sampling jars) blanks; and
4) Ambient air in the sample analysis area and the sample collection area does not significantly interfere with the soil sample analyses.

Sampling of shallow soil gas is performed on-site using probe insertion methods, and gas extraction equipment. The soil gas is analyzed on-site with a portable gas chromatograph and supporting equipment which can be temporarily housed at a secure area on-site.

Each test point is advanced using a clean slam bar. The slam bar is a ½" diameter steel rod with a sliding weight used to drive the rod vertically into the ground. The slam bar is advanced approximately three to four feet below the ground surface, removed and a 7/16" diameter glass thief is then inserted into the hole. The soil around the thief is then tamped down in order to prevent short circuiting of the sample. In order to prevent test point cross-contamination, the slam bar rod is decontaminated between each test point by rinsing with distilled water, wiping with methanol, and air drying. A personal air sampling pump is attached to the end of the glass thief via tygon tubing and operated at a rate of 1 liter/minute for 2 minutes in order to draw soil gas from the subsurface pore spaces. A 100 to 500 microliter gas-tight Hamilton syringe is then inserted into the tubing in order to draw a sample of the soil gas after the pump is operating for 2 minutes. This process is repeated at each sampling location.

E

APPENDIX E

LABORATORY ANALYSIS REPORT AND CHAIN OF CUSTODY RECORD FOR QUALITY ASSURANCE SAMPLES

CTM ANALYTICAL LABS, LTD
Laboratory Analysis Report
17 OCT 1990

C.T. MALE ASSOCIATES, P.C.
50 CENTURY HILL DRIVE
LATHAM NY 12110

CTM PROJECT #: 90.00652

CTM Task #: 900926C

Attention: LIZ ROVERS

Purchase Order Number: 88.02594
Date Sampled: 09/25/90 Time: 5:10 PM
Sampled By : K. BAINES
Sample Id: HOLE NO. 29
Location : Active Industrial Uniform Co., Inc.

CTM Sample No: 900926C 02
Date Received: 09/26/90
Collection Method: GRAB
Matrix: AIR

Parameters and Standard Methodology Used		Results		Analyst Reference
TRICHLOROETHENE	NIOSH 1003	21	PPM	MV B:63 10/12
TETRACHLOROETHENE	NIOSH 1003	169	PPM	MV B:63 10/12
1,1-DICHLOROETHANE	NIOSH 1003	* 1.0	PPM	TM E:13 10/17
1,1,1-TRICHLOROETHANE	NIOSH 1003	* 56	PPM	TM E:13 10/17

REMARKS:

AUTHORIZED FOR RELEASE: T. Mulcahy

LEGEND: < = LESS THAN, > = GREATER THAN
MG/KG=PPM, MCG/KG=PPB, MG/L=PPM, MCG/L=PPB, MCG/G=PPM

CTM ANALYTICAL LABS, LTD
Laboratory Analysis Report
17 OCT 1990

C.T. MALE ASSOCIATES, P.C.
50 CENTURY HILL DRIVE
LATHAM NY 12110

CTM PROJECT #: 90.00652

CTM Task #: 900926C

Attention: LIZ ROVERS

Purchase Order Number: 88.02594
Date Sampled: 09/25/90 Time: 1:11 PM
Sampled By : K. BAINES
Sample Id: HOLE NO. 10
Location : Active Industrial Uniform Co., Inc.

CTM Sample No: 900926C 01
Date Received: 09/26/90
Collection Method: GRAB
Matrix: AIR

Parameters and Standard Methodology Used		Results		Analyst Reference
TRICHLOROETHENE	NIOSH 1003	136	PPM	MV B:63 10/12
TETRACHLOROETHENE	NIOSH 1003	609	PPM	MV B:63 10/12
1,1-DICHLOROETHANE	NIOSH 1003	* <1.0	PPM	TM E:13 10/17
1,1,1-TRICHLOROETHANE	NIOSH 1003	* 125	PPM	TM E:13 10/17

REMARKS: (*) Calculated from 1 point calibration curve.
Note: Unable to quantify trans-1,2-dichloroethylene.

LEGEND: < = LESS THAN, > = GREATER THAN
MG/KG=PPM, MCG/KG=PPB, MG/L=PPM, MCG/L=PPB, MCG/G=PPM

T. MALE ASSOCIATES, P.C.
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(518) 785-0976

LABORATORY SERVICES

90.652

CHAIN OF CUSTODY RECORD

CLIENT AND PROJECT NAME: ACTIVE INDUSTRIAL UNIFORM
Linden hurst Facility CTMA 88.2594

SAMPLERS: (Signature)

CTM SAMPLE NUMBER	SAMPLE IDENTIFICATION & LOCATION	DATE	TIME A = a.m. P = p.m.	SAMPLE TYPE: MATRIX	COMP	GRAB	NUMBER OF CONT'S	ANALYSIS REQUIRED
900926(01)	HOLE No. 10	9/25/90	1:11 A/P	AIR		✓	1	NIOSH 1003 (ZL)
02	HOLE No. 29	9/25/90	5:10 A/P	AIR		✓	1	NIOSH 1003 (ZL)
	1LPM X 2MIN		A/P					
	SAMPLE TIME ON TAPE		A/P					

Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by Mobile Laboratory for field analysis: (Signature)	Date/Time

Dispatched by: (Signature)	Date/Time	Received for Laboratory by:	Date/Time
	9/26/90 830		9/26/90 0830
Method of Shipment: HAND Delivered			

Distribution: Orig. – Accompany Shipment
1 Copy – Coordinator Field Files