KING OF PRUSSIA

ADMINISTRATIVE RECORDS

INDEX

KING OF PRUSSIA LANDFILL SITE

REMOVAL ACTION

ADMINISTRATIVE RECORDS

DOCUMENT INDEX

Document Number: 1-1.10-01

Title:	Request for Evaluation of the King of Prussia Landfill Site for a Removal Action.
Author:	John V. Czapor, Chief, Site Compliance Branch, EPA
Recipient:	Fred N. Rubel, Chief, Response and Prevention Branch, EPA
Date:	March 27, 1987
Type:	Correspondence
Category:	1.10 Site Identification - Correspondence

Document Number: 1-1.10-02

Title:	Request for Evaluations of the NL Industries site and the King of Prussia Landfill Site for a Removal Action.
Author:	John V. Czapor, Chief, Site Compliance Branch, EPA
Recipient:	Fred N. Rubel, Chief, Response and Prevention Branch, EPA
Date:	November 20, 1987
Type:	Correspondence
Category:	1.10 Site Identification - Correspondence

Document Number: 1-1.10-03

Title:	Assessment of the King of Prussia Landfill Site for a Removal Action.
Author:	George Pavlou, Associate Director for Enforcement Programs, EPA
Recipient:	Richard Salkie, Associate Director for Removal Programs, EPA
Date:	March 1989
Type:	Correspondence
Category:	1.10 Site Identification - Correspondence

Document Number: 1-1.20-01

Title: Background material for the King of Prussia Landfill Site

Author: Kevin Burger, Environmental Scientist, EPA
Recipient: Richard D. Spear, Chief, Surveillance and Monitoring Branch, EPA
Date: January 29, 1980
Type: Letter Report
Category: 1.20 Site Identification - Background

Document Number: 1-1.20-02

Title: Organics and Metals Results for the King of Prussia Landfill Site

Author: Francis T. Brezenski, Chief, Technical Support Branch, EPA
Recipient: Fred Rubel, Chief, Emergency Response and Hazardous Materials Inspection Branch, EPA
Date: January 89, 1980
Type: Letter Report
Category: 1.20 Site Identification - Background

Document Number: 1-1.30-01

Title: Preliminary Assessment Report/Sampling Plan, King of Prussia Landfill Site

Author: Don Graham, Technical Assistance Team Project Manager, Roy F. Weston, Inc.
Recipient: Eugene Dominach and John Witkowski, On-Scene Coordinators, Response and Prevention Branch, EPA
Date: May 18, 1988
Type: Letter Report
Category: 1.30 Site Identification - Preliminary Assessment

Document Number: 2-2.10-01

Title: Preliminary Assessment and CERCLA/SARA Removal Funding Request for the King of Prussia Landfill Site, Action Memorandum

Author: Eugene Dominach, On-Scene Coordinator, Response and Prevention Branch, EPA
Recipient: William J. Musynski, P.E., Acting Regional Administrator, EPA
Date: May 11, 1988
Type: Memorandum
Category: 2.10 Removal Response - Action Memorandum

Document Number: 2-2.60-01

Title: Pollution Report # 1
King of Prussia Landfill Site

Author: Eugene Dominach, On-Scene Coordinator, Removal Action Branch, EPA
Recipient: See Polrep distribution list
Date: June 10, 1988
Type: Polrep
Category: 2.60 Removal Action - Pollution Report

Document Number: 2-2.60-02

Title: Pollution Report # 2
King of Prussia Landfill Site

Author: Eugene Dominach, On-Scene Coordinator, Removal Action Branch, EPA
Recipient: See Polrep distribution list
Date: August 26, 1988
Type: Polrep
Category: 2.60 Removal Action - Pollution Report

Document Number: 2-2.60-03

Title: Pollution Report # 3
King of Prussia Landfill Site

Author: Eugene Dominach, On-Scene Coordinator, Removal Action Branch, EPA
Recipient: See Polrep distribution list
Date: April 5, 1989
Type: Polrep
Category: 2.60 Removal Action - Pollution Report

Document Number: 2-2.60-04

Title: Pollution Report # 4
King of Prussia Landfill Site

Author: Eugene Dominach, On-Scene Coordinator, Removal Action Branch, EPA
Recipient: See Polrep distribution list
Date: September 12, 1989
Type: Polrep
Category: 2.60 Removal Action - Pollution Report

Document Number: 2-2.60-05

Title: Pollution Report # 5
King of Prussia Landfill Site

Author: Eugene Dominach, On-Scene Coordinator, Removal Action Branch, EPA
Recipient: See Polrep distribution list
Date: September 13, 1989
Type: Polrep
Category: 2.60 Removal Action - Pollution Report

Document Number: 2-2.60-06

Title: Pollution Report # 6
King of Prussia Landfill Site

Author: Eugene Dominach, On-Scene Coordinator, Removal Action Branch, EPA
Recipient: See Polrep distribution list
Date: September 14, 1989
Type: Polrep
Category: 2.60 Removal Action - Pollution Report

Document Number: 2-2.60-07

Title: Pollution Report # 7
King of Prussia Landfill Site

Author: Eugene Dominach, On-Scene Coordinator, Removal Action Branch, EPA
Recipient: See Polrep distribution list
Date: September 15, 1989
Type: Polrep
Category: 2.60 Removal Action - Pollution Report

Document Number: 2-2.60-08

Title: Pollution Report # 8
King of Prussia Landfill Site

Author: Eugene Dominach, On-Scene Coordinator, Removal Action Branch, EPA
Recipient: See Polrep distribution list
Date: September 19, 1989
Type: Polrep
Category: 2.60 Removal Action - Pollution Report

Document Number: 2-2.60-09

Title: Pollution Report # 9
King of Prussia Landfill Site

Author: Eugene Dominach, On-Scene Coordinator, Removal Action Branch, EPA
Recipient: See Polrep distribution list
Date: September 20, 1989
Type: Polrep
Category: 2.60 Removal Action - Pollution Report

Document Number: 2-2.60-10

Title: Pollution Report # 10
King of Prussia Landfill Site

Author: Eugene Dominach, On-Scene Coordinator, Removal Action Branch, EPA
Recipient: See Polrep distribution list
Date: September 21, 1989
Type: Polrep
Category: 2.60 Removal Action - Pollution Report

Document Number: 2-2.60-11

Title: Pollution Report # 11
King of Prussia Landfill Site

Author: Eugene Dominach, On-Scene Coordinator, Removal Action Branch, EPA
Recipient: See Polrep distribution list
Date: September 22, 1989
Type: Polrep
Category: 2.60 Removal Action - Pollution Report

Document Number: 2-2.70-01

Title: Sampling Plan
King of Prussia Landfill Site

Author: Anibal Diaz, Analytical Services Coordinator, Technical Assistance Team, Roy F. Weston, Inc.
Recipient: Eugene Dominach, On-Scene Coordinator, Removal Action Branch, EPA
Date: October 5, 1989
Type: Report
Category: 2.70 Removal Action - Sampling Plan

Document Number: 2-2.70-02

Title: Sampling QA/QC Plan
King of Prussia Landfill Site

Author: Anibal Diaz, Analytical Services Coordinator, Technical Assistance Team, Roy F. Weston, Inc.
Recipient: Eugene Dominach, On-Scene Coordinator, Removal Action Branch, EPA
Date: October 5, 1989
Type: Report
Category: 2.70 Removal Action - Sampling Plan

Document Number: 2-2.80-01

Title: Work Plan
King of Prussia Landfill Site

Author: Haztech
Recipient: Eugene Dominach, On-Scene Coordinator, Removal Action Branch, EPA
Date: June 16, 1989
Type: Report
Category: 2.80 Work Plan

Document Number: 3-3.10-01

Title: Letter of acknowledgement of commencement of work activities at the King of Prussia Landfill Site

Author: Joe Hochreiter, CGWP, Environmental Resources Management, Inc.
Recipient: Mayor and Township Committee, Town of Winslow, NJ
Date: May 10, 1988
Type: Correspondence
Category: 3.10 City Coordination - Correspondence

Document Number: 4-4.10-01

Title: Cover letter for the Administrative Order to the Responsible Parties of the King of Prussia Landfill Site

Author: Stephan D. Luftig, Director, Emergency and Remedial Response Division, EPA
Recipient: See document distribution list
Date: July 19, 1988
Type: Correspondence
Category: 4.10 Enforcement - Correspondence

Document Number: 4-4.20-01

Title: Agreement and Consent Order Between the Responsible Parties of the King of Prussia Landfill Site and the EPA

Author: Cristopher J. Daggett, Regional Administrator, EPA
Recipient: See document distribution list
Date: April 17, 1985
Type: Legal Document
Category: 4.20 Enforcement - Order to Comply

Document Number: 4-4.30-01

Title: Administrative Order to the Responsible Parties of the King of Prussia Landfill Site

Author: William J. Muszynski, P.E., Acting Regional Administrator, EPA
Recipient: See document distribution list
Date: July 19, 1989
Type: Legal Document
Category: 4.30 Enforcement - Stipulation and Order

Document Number: 6-6.10-01

Title: Community Relations Plan
King of Prussia Landfill Site

Author: Technical Assistance Team, Roy F. Weston, Inc.
Recipient: Eugene Dominach, On-Scene Coordinator, Removal Action Branch, EPA
Date: April 5, 1989
Type: Report
Category: 6.10 Public Participation - Community Relations Plan

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Document Number: 6-6.20-01

Title: Fact Sheet
King of Prussia Landfill Site

Author: US Environmental Protection Agency
Recipient:
Date: June 1988
Type: Fact Sheet
Category: 6.20 Public Participation - Fact Sheets

1.2 Background

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

DATE: 27 MAR 1987

SUBJECT: Evaluation of King of Prussia Site for a Removal Action

FROM: John V. Czapor, Chief
Site Complaince Branch

TO: Fred N. Rubel, Chief
Response and Prevention Branch

The Site Compliance Branch (SCB) hereby requests that the King of Prussia site be evaluated for a removal action. The Potentially Responsible Parties (PRPs) have conducted a field investigation and sampling effort at the site as part of a Remedial Investigation/ Feasibility Study. Full field oversite was provided by the SCB's contractor, NUS Corporation.

As a result of the field investigation, it became apparent that there exists an area on the site where buried plastic carboys have ruptured and have become partially exposed. The site is not secured and we are aware that periodic trespassing occurs.

We request that your evaluation be conducted as expeditiously as possible. If a removal action is justified, we would offer the PRPs the opportunity to conduct the removal action.

If you have any questions, please contact John La Padula of my staff at FTS 264-6195 or Marilyn Haye at FTS 264-0151.

Thank you.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

DATE: NOV 2 0 1987

SUBJECT: Evaluations of NL Industries Site and King of Prussia Site for Removal Actions.

FROM: John V. Czapor, Chief
Site Compliance Branch

TO: Fred N. Rubel, Chief
Response and Prevention Branch

This memorandum requests that the Response and Prevention Branch evaluate the above-mentioned sites for Removal Actions. Both sites are on the National Priorities List.

Concerning the King of Prussia Site, which is located in Winslow Township, New Jersey, the potentially responsible parties as well as the local environmental commission have requested that EPA determine if a removal action is warranted at the site. My staff has acquired recent information which may be useful in making this assessment.

Regarding the NL Industries Site in Pedricktown, New Jersey, local officials of Oldmans Township recently requested that EPA evaluate this site for a Removal Action (copy of letter attached). A specific concern is whether the site poses any risks to trespassers.

For additional information regarding these sites, your staff should contact Marilyn Haye, Project Manager for the King of Prussia Site, at FTS 264-5387, Kerwin Donato, Project Manager for the NL Industries Site, at FTS 264-5397, or John La Padula, Chief of the Southern New Jersey Compliance Section at FTS 264-5388.

Thank you for your assistance.

cc: Kerwin Donato, SNJCS
Marilyn Haye, SNJCS
John La Padula, SNJCS

RECEIVED
23 NOV 1987
E
and
Edison, N. J

Assessment of the King of Prussia Site for a Removal Action

George Pavlou, Associate Director
for Enforcement Programs

Richard Salkie, Associate Director
for Removal Programs

Please review the current status of the King of Prussia site for consideration for a Removal Action of the carboys at the site. The Response and Prevention Branch performed a preliminary assessment of the site, which commenced in May of 1988, to determine whether the carboys, as well as other existing contamination, warranted an immediate removal action. It was determined that a Removal Action would be appropriate and that action would also involve enclosing the site with a fence. However, prior to notification from EPA, the responsible parties directed their contractor to erect the fence at the site. I believe that this action may have eliminated much of the threat to public health (via direct contact) but did not eliminate the environmental threat.

The carboy area was covered with approximately one foot of sand by the PRPs on two different occasions. The liquid material from the carboys eventually leaked through to the surface, due to precipitation and the wind shifting the sand. This was the PRPs' solution to stabilizing the area, which was not effective. Also, there is no liner beneath the carboys to prevent their leaking into the groundwater. Therefore, this area is a continuing source of contamination to the groundwater. In June 1986, the liquids in the carboys were sampled, and very high concentrations of metals were found, including: 17,000 ppm Zinc, 7700 ppm Nickel, 2400 ppm Copper, 1400 ppm Chromium and 61 ppm Lead.

The PRPs at this site have adamantly refused to remove the carboys, as no one in the group has claimed responsibility for sending this material to the site. Instead they have proposed a "shared" cleanup of the area by offering to provide EPA with the engineering support for the removal, while the Agency performs the actual removal and disposal of the contamination. EPA rejected their proposal because we believe that the Agency could perform both the engineering and removal work more efficiently, while utilizing our authority to cost recover our expenditures.

In light of the above, I request that the carboy area be reevaluated for a Removal Action as it is a continuing source of contamination to the groundwater and the current methods of stabilization have proven to be ineffective. If a removal cannot be performed, this area will be addressed for remediation in the Record of Decision.

cc: Eugene Dominach, RAB
Robin Moses, ORC

1.3 Preliminary Assessment

WESTON • SPER Suite 201, 1090 King Georges Post Road,
Edison, NJ 08837 • (201) 225-6116

TECHNICAL ASSISTANCE TEAM FOR EMERGENCY RESPONSE REMOVAL AND PREVENTION
EPA CONTRACT 68-01-7367

TAT-02-F-04641 MEMORANDUM

TO: Eugene Dominach and John Witkowski
Response and Prevention Branch, U.S. EPA

FROM: Don Graham, TAT PM
Isabelle Allgood, TAT QC

SUBJECT: Preliminary Assessment Report/Sampling Plan
King of Prussia Landfill
Winslow Township, Camden County, New Jersey

DATE: May 18, 1988

In accordance with TDD #8805-02, TAT performed the preliminary assessment of the King of Prussia landfill located on Piney Hollow Road in Winslow Township, Camden County, New Jersey. The assessment was performed on May 11, 1988, and included TAT members Carrie Mehalic, Isabelle Allgood and Don Graham. This report details TAT's preliminary findings and recommends a sampling plan which will determine whether the contamination that remains warrants an immediate removal action by EPA's Response and Prevention Branch in Region II.

BACKGROUND

The King of Prussia landfill is an abandoned chemical waste disposal site located along Piney Hollow Road in Winslow Township, New Jersey (Figure 1). The site is a relatively flat area of approximately 10 acres in size and is located within an undeveloped forest area. Prior site investigations and analyses have shown that there are varying degrees of contamination in both the soil and groundwater.

SITE ASSESSMENT

At 0930 hours on May 11, 1988, TAT personnel arrived on-site and met with EPA representatives Eugene Dominach and John Witkowski. The weather was partly cloudy, humid and temperatures were around 65-70 degrees fahrenheit.

At 1030 hours, TAT performed an initial site entry using Level B personal protection. Air monitoring using the Organic Vapor Analyzer (OVA), Combustible Gas Indicator (CGI) and Oxygen Detector and the Thyac II Radiation Detector (RAD) revealed no readings above background or indicated any oxygen deficiencies.

At 1115 hours, TAT performed a second site entry to make detailed observations throughout the site and to photodocument specific areas of interest. While conducting this assessment hydrogen cyanide (HCN) and hydrogen sulfide (H_2S) monotox units were used but no readings above background were detected. Draeger tubes specific for phenols and vinyl chloride, both suspected contaminants, were used in the area of stressed vegetation and at Lagoon #3.

The following determinations have been made:

1. Areas of stressed vegetation are located on the south perimeter of the site. These areas lie directly between the lagoon area and the nearest waterway (The Great Egg Harbor River). Sampling of the monitoring wells, conducted during 1981 in the area of the stressed vegetation, revealed gross contamination of the groundwater.

2. There are several areas throughout the site where the soil is discolored. The colors vary from white to purple and are present at the surface to an undetermined depth.

3. Of the original six (6) lagoons located on the site, four (4) have been filled with soil to ground level. The two remaining lagoons contain no liquid or sludge, but discoloration of sediment is evident and the liners are grossly deteriorated.

4. Various containers were found on-site including a single full drum of unknown material located in Lagoon #2, two deteriorated tank trailers located approximately 200 feet from Piney Hollow Road, and three partially exposed rusted drums. The exposed drums are located approximately 150 feet from an access road which enters from the west perimeter of the site.

5. There is unrestricted access to the site from all boundaries. This is evidenced by illegal trash dumping and tire tracks seen throughout the site and in the open lagoons.

Upon TAT and EPA's departure of the site at 1215 hours, TAT visited the Winslow Township Municipal Building as requested by EPA. While at the municipal building TAT first questioned the police about alleged reports of chemical exposure to adolescents whom often ride off road vehicles at the King of Prussia site. The police were not able to confirm or deny any such allegations.

TAT then visited the tax assessor's office to obtain ownership information on the King of Prussia site as well as any of the surrounding properties. TAT spoke to the township's supervisor for the Department of Public Works, Ed McGlinchey, the township's current liason for any proceedings regarding the King of Prussia site. Mr. McGlinchey informed TAT that the responsible parties' contractor, Environmental Resources Management of Exton, Pennsylvania, will be mobilizing at the site within the next few weeks to begin the Remedial Investigation and Feasibility Study (RI/FS).

Prior to TAT's departure, Mr. McGlinchey provided TAT with a copy of the letter sent by the RI/FS contractor detailing the intended scope of work. TAT subsequently submitted the letter to the EPA OSCs (Dominach and Witkowski) for appropriate coordination between the involved EPA branches.

SAMPLING PLAN

A. Objective and Scope

The objective of this sampling program is to obtain analytical data which will be utilized to determine whether the threat of contamination warrants an immediate removal action. This will be accomplished by collecting and testing various samples on-site.

Samples will be collected from several different locations on the King of Prussia landfill property. Samples will serve as verification of the results of the samples collected on-site by other branches of EPA prior to the Response and Prevention Branch's involvement.

B. Data Usage

Data obtained from the sampling program will be used in conjunction with previous analytical results to establish the threat posed by the constituents present at the site.

C. Sampling

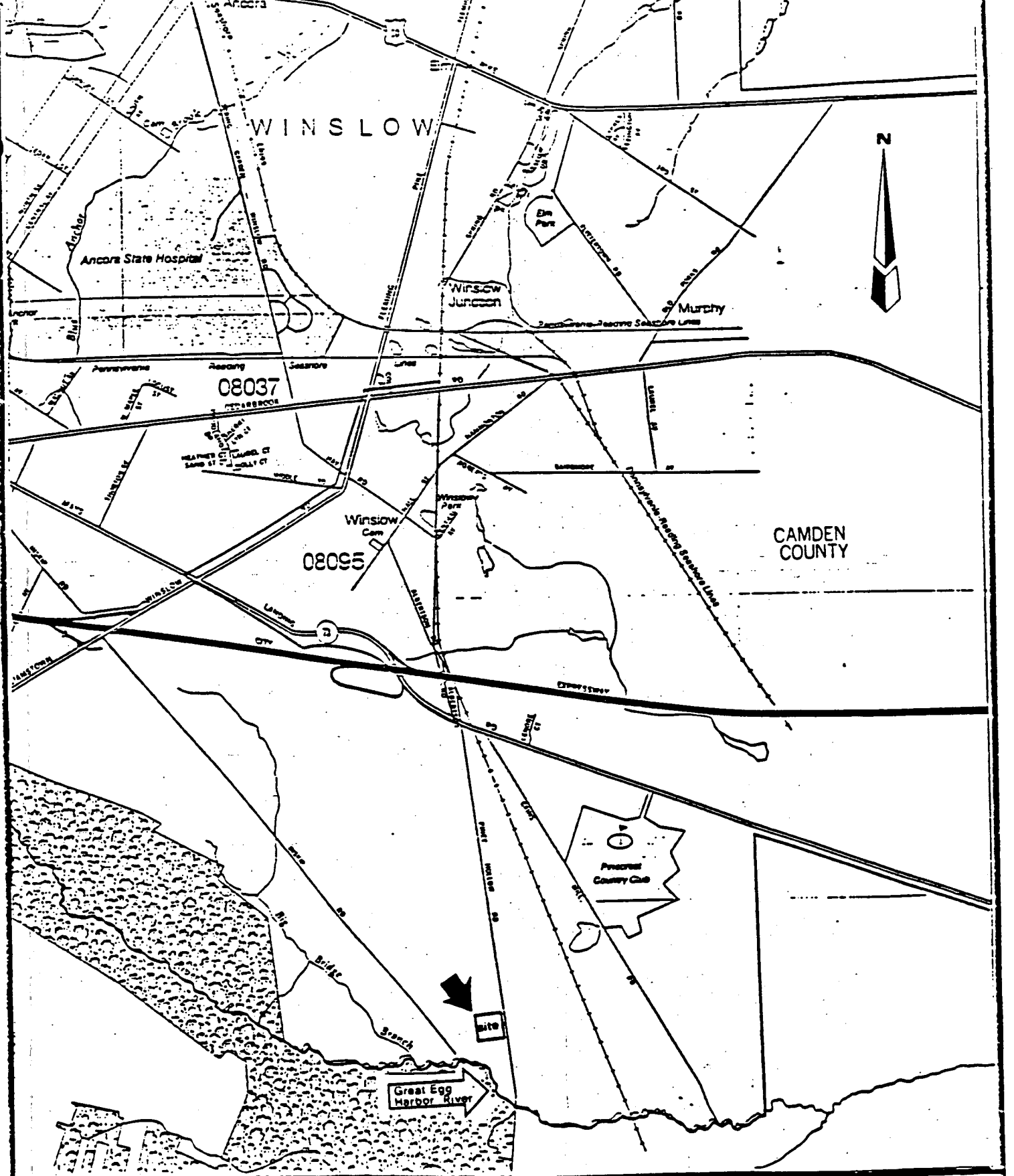
Samples will be collected from the following points:

1) Stressed vegetation Area #1 and Area #2 (purple soil) - composite
2) Drum pile near fire road exiting rear of site
3) Sediment at bottom of Lagoon #2 and #3 - composite

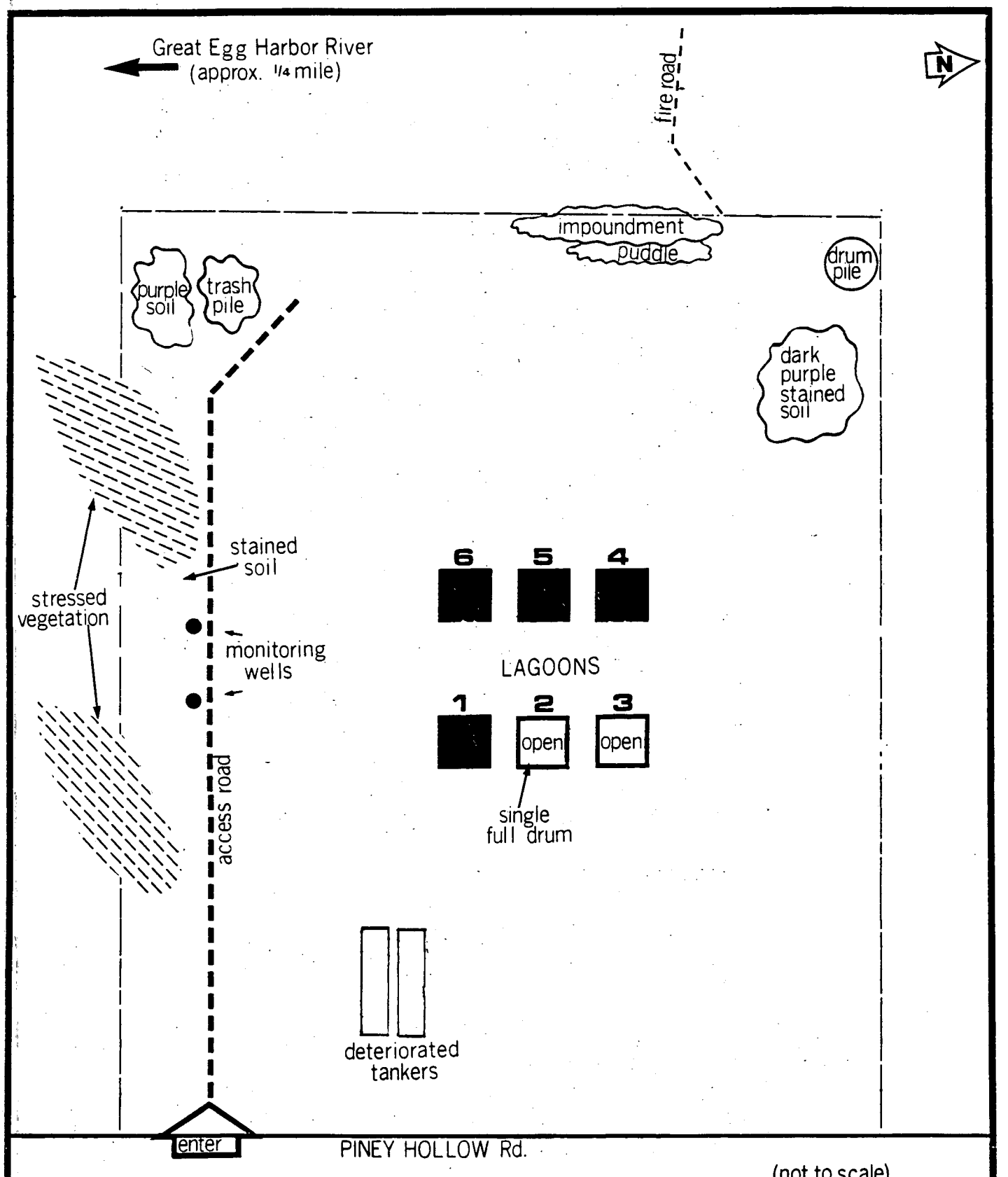
4) Dark purple soil along site's northern boundary
5) Proposed support zone - composite
6) Background sample - other side of Piney Hollow Road (See Figure #2 for approximate sampling locations).

All samples will be collected by personnel in Level C personal protection and in accordance with the existing site safety plan.

The soil samples will be collected from the surface to a depth of three (3) inches. The purpose of designating a 3" depth is to determine the potential exposure to the targeted population of individuals such as hunters and recreation vehicle users. If it is found that sufficient contamination does exist in the first 3" of soil, appropriate action will be taken by the Response and Prevention Branch in the form of a fence, clay cap or both. If, however, the soil is not contaminated to a degree that a threat of exposure exists, the Response and Prevention Branch will take no further action at this site.



WESTON	SPILL PREVENTION & EMERGENCY RESPONSE DIVISION	EPA PM DOMINACH	FIGURE 1
In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.		TAT PM GRAHAM	LOCATION MAP



WESTON MANAGERS DESIGNERS/CONSULTANTS — SPILL PREVENTION & EMERGENCY RESPONSE DIVISION	EPA PM **DOMINACH**	**K.O.P. LANDFILL SITE MAP**
In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.	TAT PM **GRAHAM**	**FIGURE 2**

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

File

DATE: January 29, 1980

SUBJECT: King of Prussia Hazardous Waste Site

FROM: Kevin Burger
Environmental Scientist

TO: Richard D. Spear, Chief
Surveillance & Monitoring Branch

On October 9, 1979 an investigation was conducted at the King of Prussia Hazardous Waste Site, Winslow Township, New Jersey. Participating in this investigation were Ken Gigliello and Kevin Burger of this office.

The King of Prussia site, located on Piney Hollow Road in the southern corner of Winslow Township was operated as a liquid chemical waste facility sometime prior to 1975 by Evor-Phillips Leasing Company. Sometime after it was abandoned in 1975 it is believed that illicit dumping of chemical materials continued. The entire site covers an area of approximately 7 acres. There are six lagoons on site. Four lagoons (Nos. 1, 4, 5, and 6) (see Figure I) still contain various unknown chemicals and sludges. Lagoons 4, 5, and 6 measure approximately 100' L x 80' W x 15' D. Lagoons 1, 2, and 3 measure approximately 70' L x 50' W x 15' D. There are also three defined areas where chemical powders of some sort are buried (2" to 18" thick) and one area where we have confirmed the presence of an unknown quantity of buried drums (see Figure I). A large area of dead trees in the south-southeastern boundary of the property indicates the presence of ground-water contamination, the extent of which remains unknown.

The site is situated directly above the Cohansey Aquifer in a predominently sandy, highly permeable soil area. Ground water movement is in a southeasterly direction towards the Great Egg Harbor River which is approximately 350 to 400 yards away.

During the October 9 investigation, samples were collected at various locations as listed below and analyzed for extractable and purgeable organics as well as metals. The results are contained in Table I and identified in Figure I.

A) Drinking Water Well — Sample No. 56731
Fish and Game Office
Williamstown, N.J.
Water

B) Monitoring Well KP 1 — Sample No. 56732
Water

C) Monitoring Well KP 4 — Sample No. 56733
Water

D) Lagoon #4 — Sample No. 56734
Sludge Composite (5 locations)

E) Purple-Buried Material — Sample No. 56735
Soil Sample

F) Runoff from Property — Sample No. 56736
(Drainage Ditch)
Water

There were some additional compounds found in Sample Nos. 56733 and 56734 which were not quantitated as follows:

Sample No. 56733	Sample No. 56734
Petroleum Oil	Petroleum Oil
Phosphoric Acid Tributyl Ester	9,10-Anthracenedione
Benzaldehyde	Benzene 1,1-Sulfonyl Bis-2-Methyl
Cyclohexanone	Chloromethyl Phenanthrene
	Methyl Phenanthrene
	Benzene 1,1-Sulfonyl Bis-
	Tetrachlorobenzene
	Benzene 1,1-Ethenylidenbis
	Diphenylmethanone
	C_6-Substituted Naptalene
	Bromoxylene

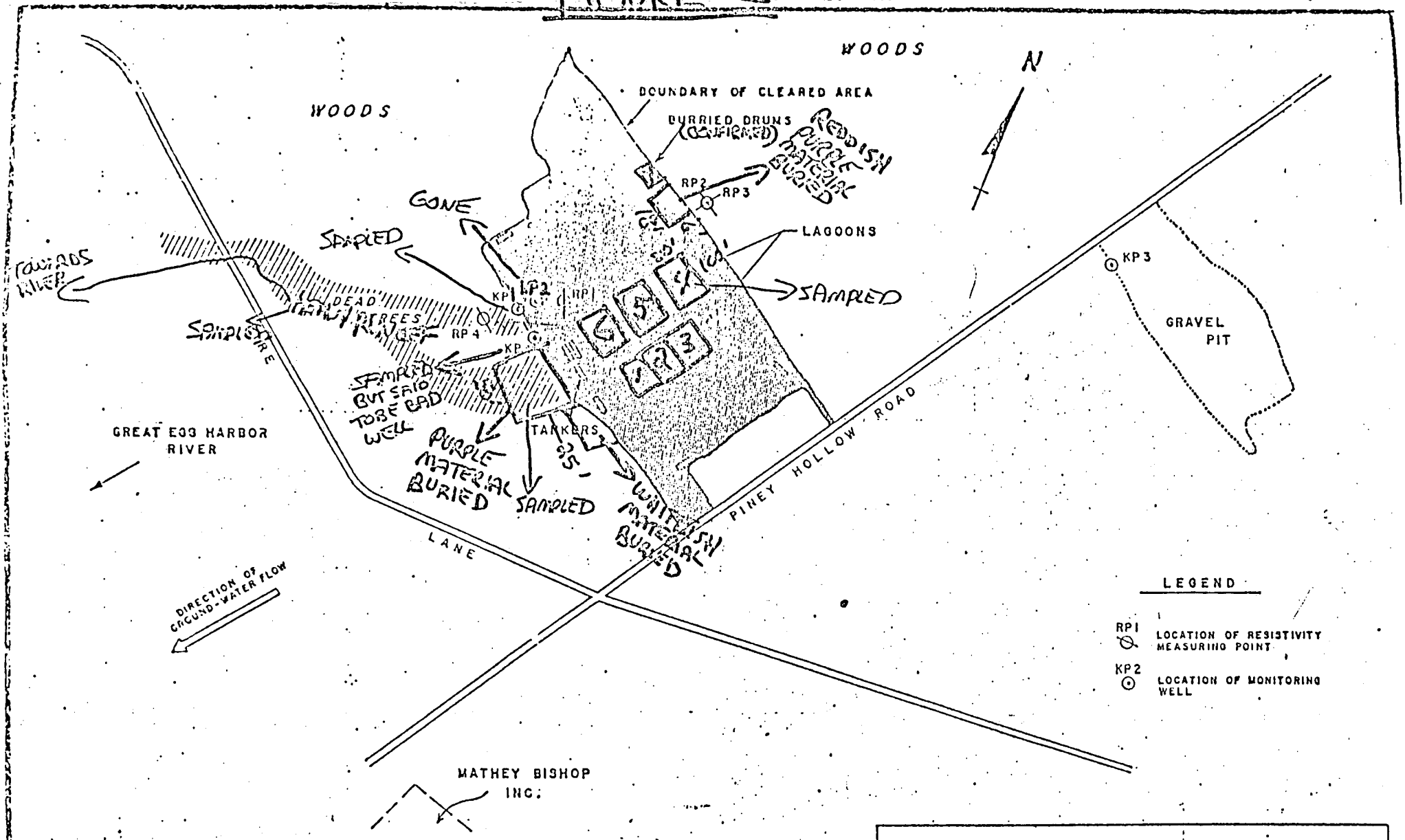
Attachments (2)

KING OF PRUSSIA HAZARDOUS WASTE SITE
SAMPLING RESULTS OCTOBER 9, 1979

PARAMETER	SAMPLE NUMBERS					
	ug/l 56731	ug/l 56732	ug/l 56733	ug/kg 56734	ug/kg 56735	ug/l 56736
1,2 DICHLOROETHANE			4.0	5.2		
CHLOROFORM		0.34	0.03	4.5	0.35	0.02
ETHYLBENZENE			0.09	23.0		
METHYLENE CHLORIDE			1.1	3.1	1.7	
METHYL CHLORIDE			10.0			
TOLUENE			1.3	29.0		
TRICHLOROETHYLENE		0.04	0.14	18.0		0.06
VINYL CHLORIDE		7.3	30.0			
BENZENE				0.38		
CARBON TETRACHLORIDE				0.29		
1,1,2,2, TETRACHLOROETHANE				2.6	.05	
PHENOL						0.23
MIREX				3500.0		
SILVER				0.7		
ARSENIC		7.2	1000.0	90.0	2.3	10.0
BERYLLIUM			2300.0	120.0	0.1	5.0
SELENIUM			450.0		0.17	
CADMIUM			600.0	7.9		4.0
CHROMIUM 50	10.0	10.0	5600.0	2500.0	10.0	340.0
COPPER 1000	20.0	75.0	3800.0	13,000	21.0	950.0
NICKEL	110.0	30.0	3300.0	2400.0	2.1	190.0
LEAD			600.0	84.0	1.0	
ANTIMONY well casing			3500.0			
ZINC in pipe laminate 5000 near footing	2400.0	160.0	13×10^6	3500.0	6.7	13,000
THALLIUM			400.0			
MERCURY			0.41	0.30	0.07	1.44
1,2,4 TRICHLOROBENZENE				100.0		
HEXACHLOROETHANE				740,000	49,000	
FLUORANTHENE				20.0		
NAPHTHALENE				200.0		
BIS(2-ETHYLHEXYL) PHTHALATE	0.45	3.5	4.0	1,300	570.0	9.1
DI-N-BUTYL PHTHALATE	0.26	0.49	1.5	210.0	240.0	0.81
DIETHYLPHTHALATE			4.9	82.0		
DIMETHYLPHTHALATE			0.35			
ACENAPHTHENE				110.0		

S-1127

FIGURE 1



KING OF PRUSSIA LANDFILL LOCATION MAP

WINSLOW TOWNSHIP
CAMDEN COUNTY, NEW JERSEY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: January 8, 1980

SUBJECT: Organics and Metals Results, King of Prussia Disposal Site, Winslow Township, N.J.

FROM: Francis T. Brezenski, Chief
Technical Support Branch

TO: Fred Rubel, Chief
Emergency Response and Hazardous Materials
Inspection Branch

Four liquid and two sediment samples collected in the area of the King of Prussia Disposal Site, Winslow Township, N.J. were analyzed for organics according to EFG Priority Pollutant Protocols (EPA Method Nos. 624 and 625) using GC/MS/DS. Purgeable Organics results for the four liquid samples were reported in a previous memorandum. The samples were identified as follows:

EPA Lab. Sample No.	Sample Source
56731	Well water collected from the Fish and Game, Shellfisheries Southern District Office, Hollow Road, Williamstown, N.J.
56732	Well water collected from well KP1
56733	Well water collected from well KP4
56734	Composite sediment at 5 locations (depth 2" to 12")
56735	Sediment (purple color) collected southwest of well locations
56736	Liquid sample collected from a drainage ditch which flows west towards Great Egg Harbor River

Purgeable Organics - Sediments

The two sediment samples were analyzed for purgeable organics by GC/MS/DS - results are presented in Table I.

In general, the sediments contained small amounts of several priority pollutant purgeable organics. Sample 56734 did, however, contain 23ug/kg of ethylbenzene and 29 ug/kg of toluene. (These same samples when analyzed for Base/Neutral Extractables showed high concentrations of hexachloroethane and phthalate esters.) (Sample 56734 in addition contained approximately 3500 ug/kg of Mirex.)

Other purgeable organics (not on the priority pollutant list) were detected:

Compounds	EPA Sample No. 56734	EPA Sample No. 56735
acetone (oxetane)	+	
butylacetate	+	
2-methyl propanol		+
butanal		+
3,3 dimethyl oxetane		+

+ = Found but not quantitated

Base/Neutral Extractables

The six samples were extracted for Base/Neutral priority pollutants according to EFG protocol and analyzed by GC/MS/DS. Compounds on the base/neutral priority pollutant list were identified and quantitated using an ADP routine. All other peaks were manually identified. (The base/neutral extract for Sample 56733 was lost during preparation. The Pesticide/PCB extract was used in its place.)

Results for the Base/Neutral analyses are presented in Table II. Samples indicated by an asterisk are sediments, consequently results are expressed in ug/kg whereas all other results are expressed in ug/l. Blank spaces indicate that values were below minimum detection limits of the test (< 0.1 ug/l for water and <10 ug/kg for sediments).

With the exception of the two sediment samples base/neutral compounds were absent or in small amounts. In the sediments, levels of 740,000 ug/kg in Sample 56734 and 49,000 ug/kg for hexachloroethane were recorded. Elevated levels of butyl benzyl phthalate (1,300 and 570 ug/kg) and Di-n-butyl phthalate (210 and 240 ug/kg) were observed in the sediments.

Acid Extractables

The four liquid samples were carried through the EFG protocol for acid extractables. The extracts were analyzed by GC/MS/DS (electron impact). Extract 56733 was lost during preparation, consequently results for the acid extract compounds for this sample are not available.

Results are as follows:

Acid Extractable Priority Pollutants (ug/l)

Compound	56731	56732	56736	Detection Limit
2-chlorophenol	-	-	-	0.5
2-nitrophenol	-	-	-	0.5
phenol	-	-	0.23	0.08
2,4-dimethylphenol	-	-	-	0.5
2,4-dichlorophenol	-	-	-	0.5
2,4,6-trichlorophenol	-	-	-	0.5
4-chloro-3-methylphenol	-	-	-	0.5
2,4-dinitrophenol	-	-	-	20
4,6-dinitro-2-methylphenol	-	-	-	10
pentachlorophenol	-	-	-	1.0
4-nitrophenol	-	-	-	1.0

Recoveries based on surrogate standards were lower than those normally received for this analysis. Recovery data for the surrogates are presented below.

Surrogate Compd.	EPA Sample No.	Surrogate added (ug)	Surrogate found (ug)	Percent recovery (%)
pentafluorophenol	56731	104.4	28.6	27.5
	56732	104.4	18.5	17.3
	56736	104.4	67.2	64.4
trifluoro-m-cresol	56731	105.5	33.1	31.8
	56732	105.5	39.8	37.2
	56736	105.5	77.8	64.4

Other Compounds

Additional compounds found in the samples are as follows:

Compound	56731	56732	56733	56734	56735	56736
petroleum oil			+	+		
phosphoric acid-tributyl ester			+			
benzaldehyde			+			
cyclohexanone			+			
9,10-anthracenedione				+		
benzene 1,1'-sulfanyl bis-2-methyl				+		
chloromethyl phenanthrene				+		
mirex				3500 ug/kg		
methyl phenanthrene				+		
benzene 1,1'-sulfanyl bis				+		
tetrachlorobenzene				+		
benzene 1,1'-ethenylidenbis				+		

Compound	56731	56732	56733	56734	56735	56736
diphenylmethanone				+		
C_6-substituted naphtalene				+		
bromoxylene				+		

+ = Identified but not quantitated.
Blank spaces indicate that the compound was not detected.

Metals

The six samples were analyzed for trace elements by inductively coupled plasma - atomic emission spectrometry (ICAP) using the Jarrell Ash Model 1160, Plasma ATCOMP Direct Reading Spectrometer System plus the following: N + 1 channel; advanced automatic background correction system; autosampler and VT 52 DEC Scope.

Results are as follows:

Concentration in ug/l

EPA Lab. Sample No.	Ag	As	Be	Se	Cd	Cr	Cu	Ni	Pb	Sb	Zn	Tl	Hg*
56731	<7	<1	<1	<4	<3	10	20	110	<30	<20	2400	<4	<0.2
56732	<7	7.2	<1	<4	<3	10	95	30	<30	<20	160	<4	<0.2
56733	<7	1000	2200	400	600	5600	3900	3900	600	3500	13,000,000	400	0.41
56736	<7	10	5	<4	4	340	950	190	<30	<20	12,000	<4	1.44

Concentration in ug/kg

56734	0.7	90	120	<20	7.9	2500	13,000	2400	84	<0.4	3600	<40	0.30
56735	<0.1	2.3	0.1	0.17	<0.06	10	21	2.1	1	<0.4	6.7	< 2	0.07

* = Hg assay performed according to flameless AA procedure (Cold Vapor Technique)

A high concentration of metals was noted for specific samples. For example, two well samples had high levels of copper (2400 ug/l and 13,000,000 ug/l for samples 56731 and 56733 respectively). The well water sample (56733) was highly contaminated with Be, Cd, Cr, Cu, Ni, Pb and Sb. The sediment sample 56734 contained extremely high conentrations of AS, Cr, Cu, Ni, Pb and Zn - (90, 2500, 13,000, 2400, 84 and 3600 mg/kg respectively).

cc: B. Metzger
R. Spear
K. Burger
G, Shanahan

King of Prussia - Sediments **TABLE I**

PURGEABLE ORGANICS — CONCENTRATION: µg/Kg

Compound Name	No.	Stored no.	Laboratory Number SC 734	SC 735
Benzene	4	34030	.38	
Carbon Tetrachloride	6	32102	.29	
Chlorobenzene	7	34301		
1,2-Dichloroethane	10	32103	5.2	
1,1,1-Trichloroethane	11	34506		
1,1-Dichloroethane	13	34496		
1,1,2-Trichloroethane	14	34511		
1,1,2,2-Tetrachloroethane	15	34516	2.6	.05
Chloroethane	16	34311		
Bis (chloromethyl) ether	17	34268		
2-Chloroethyl vinyl ether (mixed)	19	34576		
Chloroform	23	32106	4.5	.35
1,1-dichloroethylene	29	34501		
1,2-trans-Dichloroethylene	30	34546		
1,2-dichloropropane	32	34541		
1,3-Dichloropropylene (1,3-Dichloropropene)	33	34561		
Ethylbenzene	38	34371	23	
Methylene Chloride (Dichloromethane)	44	34423	2.1	1.7
Methyl Chloride (Chloromethane)	45	34418		
Methyl bromide (Chloromethane)	46	34413		
Bromoform (Tribromomethane)	47	32104		
Bromodichloromethane	48	32101		
Trichlorofluoromethane	49	34488		
Dichlorodifluoromethane	50	34668		
Dibromochloromethane	51	32105		
Tetrachloroethylene	85	34475		
Toluene	86	34010	29	
Trichloroethylene	87	39180	18	
Vinyl chloride	88	39175		
Acrolein	2	34210		
Acrylonitrile	3	34215		
Recoveries			**Percent Recovered**	
Surrogate Std #1			96	83
" " #2			88	77
" " #3			114	88

TABLE II

King of Prussia

BASE/NEUTRAL EXTRACTABLES

CONCENTRATION ug/l
*concentration ug/kg (sediment sample)

			Detection Limit (liquid) 0.1 ug/l						
			56731	56732	56733	56734*	56735*	56736	
Acenaphthene	1	34205							
1,2,4-Trichlorobenzene	8	34551				120.			
Hexachlorobenzene	9	39700							
Hexachloroethane	12	34396				740,000	49,000		
Bis(2-chloroethyl)ether	18	34273							
2-Chloronaphthalene	20	34581							
1,2-Dichlorobenzene	25	34536							
1,3-Dichlorobenzene	26	34566							
1,4-Dichlorobenzene	27	34571							
3,3-Dichlorobenzidine	28	34631							
2,4-Dinitrotoluene	35	34611							
2,6-Dinitrotoluene	36	34626							
1,2-Diphenylhydrazine	37	34346							
Fluoranthene	39	34376				20.			
4-chlorophenyl phenyl ether	40	34641							
4-Bromophenyl phenyl ether	41	34636							
Bis(2-chloroisopropyl)ether	42	34283							

5-B27

Bis(2-chloroethoxy)methane	43	34278							
Hexachlorobutadiene	52	39702							
Hexachlorocyclopentadiene	53	34386							
Isophorone	54	34408							
Naphthalene	55	34696				200			
Nitrobenzene	56	34447							
N-nitrosodimethylamine	61	34438							
N-nitrosodiphenylamine	62	34433							
N-nitrosodi-n-propylamine	63	34428							
Bis(2-ethylhexyl) phthalate	66	39100	0.45	3.5	4.0	1,300	570	9.1	
Butyl benzyl phthalate	67	34292							
Di-n-butyl phthalate	68	39110	0.26	0.49	1.5	210.	240.	0.81	
Di-n-octyl phthalate	69	34596							
Diethylphthalate	70	34336			4.9	88.			
Dimethylphthalate	71	34341			0.35				
Benzo(a)anthracene (1,2-benzanthracene)	72	34526							
Benzo(a) pyrene	73	34247							
Benzo(b) fluoranthene	74	34230							
Benzo(k) fluoranthene	75	34242							
Chrysene	76	34320							
Acenaphthylene	77	34200							
Anthracene	78	34220							
Benzo(ghi) perylene (1,12-benzoperylene)	79	34521							
Fluorene	80	34381							
Phenanthrene	81	34461				110			
Dibenzo(a,h) anthracene (1,2,5,6-dibenzanthracene)	82	34556							
Indeno (k,2,3-cd) pyrene	83	34403							
2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)	129	34675							
Benzidine	5	39120							
Pyrene	84	34469							

56733 = RUN ON Pest / PCB Extract

2.2 Action Memorandum

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

DATE: MAY 11 1989

SUBJECT: Preliminary Assessment and CERCLA/SARA Removal Funding Request for the King of Prussia Landfill Site, Winslow Township, Camden County, New Jersey - ACTION MEMORANDUM

FROM: Eugene G. Dominach, On-Scene Coordinator
Removal Action Branch

TO: William J. Muszynski, P.E.
Acting Regional Administrator

Stephen D. Luftig, Director
Emergency and Remedial Response Division

I. EXECUTIVE SUMMARY

The King of Prussia site is an abandoned hazardous waste disposal facility in the midst of a State Wildlife Management Area. Aside from several gravel pits, a chemical company, and the municipal landfill, the site setting is quite rural. Despite its isolated location and prior to the Potentially Responsible Parties' (PRPs) fencing the site, hunters, trash dumpers and operators of off-road vehicles frequented the site. Assessments performed by the United States Environmental Protection Agency (EPA), the New Jersey Department of Environmental Protection (NJDEP) and PRPs have confirmed the presence of hazardous contaminants in the soil and groundwater. Present at the site are: an undetermined number of buried drums, partially buried plastic carboys and an adjacent stressed area, two deteriorated tank trailers containing an unknown substance, and six lagoons (two which have been back filled). In addition to the above, in several areas throughout the site, the soil is stained a deep purple.

On May 6, 1988, at the request of the Site Compliance Branch (SCB), the Response and Prevention Branch (RPB) initiated proceedings to provide interim emergency measures as part of a long-term CERCLA/SARA cleanup of the site. As a result of this effort, the PRPs installed a perimeter fence.

All indications are that the site is grossly contaminated by heavy metals and unknowns which pose an immediate threat to a sensitive ecosystem and a potential threat to human health. The removal action proposed is to sample the carboy disposal area, remove the buried and partially buried carboys and remove approximately 315 cubic yards of grossly contaminated soil in the highly stressed area. The PRPs have adamantly refused to remove the carboys, as no one in the group has claimed responsibility for sending this material to the site. On February 9, 1989, the New Jersey Compliance Branch (NJCB) requested the Removal Action Branch (JRAB) to assess the carboy disposal area for a removal action.

The initial action is designed to mitigate the threat of the carboy's contents to discharge or discharge further into the groundwater. No liner is present under the carboys to prevent further releases to the environment.

The cost for sampling and removal of the carboys and contaminated soil is estimated at $593,000 of which $439,000 is for mitigation contracting.

II. BACKGROUND

A. Site Setting/Description

The King of Prussia Landfill is an abandoned hazardous waste management facility located along Piney Hollow Road, Winslow Township, Camden County, New Jersey. The property is bounded on three sides by a State Wildlife Management Area and the fourth side borders on Piney Hollow Road. Along the southern perimeter of the site is an intermittent wetland which feeds directly into the Great Egg Harbor River less than a quarter of a mile away (Figure 1). The site is in a rural/remote area. The nearest residence is within a quarter mile of the site. Several gravel operations, a chemical manufacturer, an asphalt plant and the municipal landfill are all within a quarter mile of the site.

The King of Prussia property consists of a cleared ten-acre area which is devoid of vegetation except for grasses, scrub brush, and an occasional pine tree. Within these ten acres are the following points of special concern: six lagoons, two deteriorated tank trailers, several areas of soil discolored by an undetermined purple substance, partially buried carboys and drums, one exposed drum of unknown content and a large area of stressed vegetation on the southern perimeter (Figure 2).

Prior to fencing the ten-acre site by the PRPs, the site lacked any form of security. A deer blind and numerous tire tracks throughout the site clearly indicated that the site was subject to trespassing by hunters and operators of off-road vehicles. There is clear evidence that illegal dumping has occurred.

B. Brief History

Based upon information previously gathered by the EPA and the NJDEP, a brief history of the activities at the site follows.

At an unspecified date prior to 1975, the Evor-Phillips Leasing Company and Interchemical Corporation began operating the King of Prussia site as a liquid chemical waste treatment/disposal facility. During this time the facility was used primarily by five companies that now make up the current group of PRPs. An undetermined amount of illicit dumping of chemical materials is

believed to have continued long after the facility was abandoned in 1975.

C. Quantity and Types of Substances Present

The King of Prussia site has numerous containers of varying types and sizes, which have deteriorated, releasing their contents onto the ground. Included in this list of deteriorated containers are the following:

1) **six lagoons: two backfilled, four open**

Three lagoons are 70 feet long, 50 feet wide and 15 feet deep (working capacity 350,000 gallons each). The larger lagoons are 100 feet long, 80 feet wide and 15 feet deep (working capacity of 800,000 gallons each). At a working capacity of 90% the plant storage capability was 3.5 million gallons.

Grossly deteriorated liners are visible in three of the open lagoons. No liquid retention capabilities are possible.

2) **partially buried drums and carboys**

There are two areas where the burial of drums and carboys is clearly evident. The number of drums is estimated at twenty and the number of carboys at ten. Excavation is necessary to obtain an accurate count.

3) **two badly deteriorated tank trailers**

The trailers are positioned side by side and are the predominant visible aspects of the site. A total of approximately 10 cubic yards of an inert solid remains inside the tankers.

In addition to the containers listed, there exist several areas where soil contamination/discoloration is clearly visible and of undetermined depth.

Analytical results for samples taken of the groundwater, lagoon sediment, surface runoff, the carboys and the purple discolored soil all verify varying degrees of contamination.

The following is a partial list of the hazardous substances identified by studies conducted prior to 1988.

Contaminant	Concentration	Media	Statutory Source Under CERCLA
Bis (2-ethylhexyl)phthalate	1,200 ug/kg	L.S.	2,4
1,2,4 Trichlorobenzene	120 ug/kg	L.S.	2
Hexachlorobenzene	1,300 ug/kg	L.S.	2,4
Hexachloroethane	740,000 ug/kg	L.S.	2,4
Arsenic	330,000 ug/kg	L.S.	2,3
Trichloroethene	360 ug/l	M.W.	1,2,4
Chromium	5,600 ug/l	M.W.	2
Copper	3,900 ug/l	M.W.	2
Cadmium	600 ug/l	M.W.	2
Arsenic	1,000 ug/l	M.W.	2,3
Beryllium	2,200 ug/l	M.W.	2,3,4
Mercury	1.44 ug/l	M.W.	2,3,4
Lead	600 ug/l	M.W.	2
Chromium	1,400,000 ug/l	CBY.	2
Copper	2,400,000 ug/l	CBY.	2
Cadmium	21,000 ug/l	CBY.	2
Lead	61,000 ug/l	CBY.	2
Vinyl chloride	29 ug/l	CBY.	2,3,4
Phenol	1,700 ug/l	CBY.	1,2,4

1. 311(b)(4) of the Clean Water Act
2. 307(a) of the Clean Water Act
3. 112 of the Clean Air Act
4. RCRA section 3001

Media Symbols: M.W.= monitoring well
CBY.= carboy
L.S.= lagoon sediment

Current data (1988) from the PRP surficial sampling of the carboy area during the recent RI/FS have identified the presence of the following: Copper (1550 mg/kg), Chromium (185 mg/Kg), Lead (15 mg/Kg) and Zinc (517 mg/kg).

D. National Priorities List

This site is on the National Priorities List.

III. THREAT

A. Threat of Public Exposure:

The King of Prussia facility is a high-risk site. The property prior to fencing by the PRPs lacked any form of security. Its remote location made it an obvious choice for hunters as evidenced by the presence of a deer blind and off-road vehicle users as evidenced by numerous motorcycle tracks.

Since the King of Prussia facility ceased operations in 1975, there have been alleged instances of youths contracting rashes of unknown origin after riding their dirt bikes at the site. As of May 11, 1988, the Winslow Township Police were unable to deny or confirm such allegations.

The high levels of toxic compounds known to exist in the upper portion of the soil present an unacceptable health risk to the targeted population. Many of the compounds found thus far are known to be carcinogenic, teratogenic and mutagenic. The potential for exposure to the known and unknown compounds on site warrants the continued restriction of unauthorized persons from the site.

Aside from the threat of direct contact with the hazardous and toxic compounds on site, the threat of inhalation is also a major concern. The sandy and wind-swept nature of the site make the likelihood of inhaling airborne particles highly possible.

B. Threat to the Environment

All analyses conducted thus far indicate that contamination of the site is pervasive. Almost the entire southern perimeter of the site consists of stressed and dead vegetation. Surface water contamination was identified during a study conducted by EPA during October of 1979. Analytical results of runoff water from a ditch revealed a significant amount of contaminants including the following: Mercury (1.44 ppb), Arsenic (10 ppb), Chromium (340 ppb), Beryllium (5 ppb), Cadmium (4 ppb), Copper (950 ppb), Nickel (190 ppb), Phenol (0.23 ppb), Bis 2-Ethylhexyl Phthalate (9.1 ppb) and Di-N-Butyl Phthalate (0.81 ppb).

The sandy soil conditions of southern New Jersey have a high percolation rate, which decreases the potential for off-site surface migration but does not totally eliminate the possibility for migration to the wetlands and the Great Egg Harbor River which is one quarter of a mile from the southern boundary of the site.

The high percolation rate greatly increases the potential to contaminate the subsurface soils and the underlying Cohansey aquifer. The analytical results of the groundwater samples taken during October of 1979 verify that such contamination has occurred.

The 1979 analytical results of the major contaminants from monitoring well #1, located between the lagoons and the carboy disposal and stressed vegetation areas, are as follows: Chloroform (0.34 ppb), Vinyl Chloride (7.3 ppb), Arsenic (7.2 ppb), Chromium (10 ppb), Copper (95 ppb), Bis 2-Ethylhexyl Phthalate (3.5 ppb) and Di-N-Butyl Phthalate(0.49 ppb).

The most recent round of surficial sampling, performed during June of 1988 revealed that organic and inorganic contaminants are present in the first three inches of soil throughout much of the site. Contamination of the upper layers of soil was found to be consistent with results previously found in samples taken of surficial runoff and groundwater. Contamination of this particular substrate is cause for concern because the contaminants can migrate into the ground and surface water through the actions of wind, rain and human activities.

Aerial photography of 1975 indicates that two horizontal chemical storage tanks and two tank trailers were located on or adjacent to the carboy disposal area. Ground stains are evident in the vicinity of the lagoons. Spillage or runoff from any or all of the above due to site topography would flow in the direction of the carboy disposal area. Since the lagoons are upstream of the carboy area, a leak in a lagoon liner could also contribute to contamination of the carboy area. Site runoff flows into a small unnamed tributary which then flows two thousand feet due west into the Great Egg Harbor River.

C. Evidence of Extent of Release

The analytical data and on-site observations performed thus far are indicative of the off-site release of contaminants. The available information indicates that a release of contaminants has been occurring for a number of years and unless mitigation means are implemented will continue for many years.

Contaminated soils and groundwater (documented by laboratory analysis) and a large area of stressed vegetation located off-site are strong indicators that contaminants are migrating off-site via the air, surface water and groundwater.

D. Previous Actions to Abate Threat

On April 17, 1985, the EPA and the PRPs (Cabot Corp., Carpenter Technology Corp., Johnson Matthey Inc., Ruetgers-Nease Chemical Co. and LNP Corp.) entered into an agreement through a Consent Order whereby the PRPs would undertake a Remedial Investigation and Feasibility Study (RI/FS).

The NJCB has indicated that the PRPs have twice covered the carboy area with soil. This action has proven ineffective. The stained soil is repeatedly exposed when the added soil is eroded by wind and rain.

The PRPs in 1988 installed a perimeter fence during the RI/FS activity, decreasing the possibility for intimate contact.

E. Current Actions to Abate Threat

EPA, NJDEP and the Winslow Township Police currently observe the hazardous waste site on a regular basis.

IV. ENFORCEMENT

During 1976-1977, after the facility's closure in 1975, the NJDEP conducted several on-site inspections but no enforcement action was taken. The NJDEP maintained the lead on all enforcement matters until an unspecified date during 1979, at which time the site was referred to EPA for the purpose of addressing site security and mitigation efforts.

On October 9, 1979, EPA conducted a site investigation which included the sampling of monitoring wells, lagoon sediment, liquid runoff and soil.

To date, no reliable information is available that details the installation of the monitoring wells. Indications are that the wells were installed sometime prior to the issuance of a site report by Geraghty and Miller during 1975-1976. Analytical results showed that the shallow groundwater was severely contaminated.

As a result of the EPA's efforts, a Consent Order was signed on April 17, 1985, in which the PRPs agreed to conduct a RI/FS at the site. In July 1986, the PRPs submitted a Draft Remedial Investigation report. Upon review of the report, the NJDEP and the EPA determined that the details did not fully address the extent of contamination at the site and, therefore, requested the PRPs to conduct a Phase II RI. On May 16, 1988, the PRPs' consultant, Environmental Resources Management of Exton, Pa., mobilized at the site to begin supplemental field activities that were completed in November 1988.

The site was referred to the Response and Prevention Branch and a preliminary assessment was performed on February 11, 1989. Before an Action Memorandum that requested funding to install a fence, post hazard warning signs and cover the stained soil in the carboy area could be approved, the PRPs installed the perimeter fence in July 1988.

A review of existing files indicates that Interchemical Corporation with the Evor-Phillips Leasing Corporation operated the facility. In addition, Valley Forge Engineering of Pennsylvania or its principles may have been involved in the operation. Since the PRPs have refused to remediate the carboy area the current action includes removal of the carboys and the adjacent highly contaminated soil to eliminate further contamination.

V. PROPOSED PROJECTS AND COSTS

If the PRPs are willing to undertake the aforementioned corrective action in a timely manner, all or part of the funds requested herein may not be necessary.

A. Objective of the Project's Action

The main objective of the removal action is to excavate and dispose of all carboys and to excavate and dispose of a volume of contaminated soil within a circle approximately sixty feet in diameter and three feet deep (315 cubic yards). The material will be disposed at an approved facility.

Estimated Site Budget
Extramural Costs

1. Labor

   (includes but not limited to the following: Response Manager, Chemist, Clerk, (2) Lab. Techs., (2) Laborers, (1) Equipment Operator, (1) Ind.Hyg./Safety Eng.)
   **includes per diem.....$ 72,650

2. Equipment

   (includes but not limited to the following: porta-johns, office and decon trailers, vehicles, heavy equipment, portable radios, safety showers, generators).....$ 17,540

3. Materials

   (includes but not limited to the following: Geotech Fabric, visqueen, personal protective clothing, safety supplies, warning tape, tape, road stone).....$ 9,000

4. Gravel/sand/backfill

   (Includes truck and driver)..... $ 10,000

5. Security ..... $ 6,300

6. Analytical..... $ 50,000

7. Disposal

   (includes truck, driver,

and liner)	$200,000
Contracting Cost	$365,490
20 % Contingency	$ 73,100
Total Mitigation Contracting Cost	$438,590
Total Mitigation Contracting Cost Rounded	$439,000

Extramural Costs (TAT)

1.	Field Support	$ 25,600
2.	Office Support	$ 6,125
	Total TAT Costs	$ 31,725
	Total TAT Costs Rounded	$ 32,000
	Subtotal Extramural Costs	$471,000
	15 % Contingency of Above Costs (Rounded)	$ 71,000
	Total Extramural Costs	$542,000

Intramural Direct Costs

1.	Direct Regional Costs	$ 15,000
2.	Indirect Costs	$ 34,000
3.	Headquarters Costs (10% of Direct Costs)	$ 1,500
4.	Total Intramural Costs	$ 50,500
	Total Extramural Costs Rounded	$ 51,000

Total Removal Project Ceiling Estimate.....$593,000

VI. PROJECTS SCHEDULE

The project can be initiated within three weeks upon approval of this Action Memorandum. The time required for completion of this action is not expected to exceed the 12-month statutory limit for removal actions.

The proposed mitigative tasks are outlined below.

Upon Project Approval

1) Prepare a work plan for carboy and soil removal based on preassessment sampling results.

2) Prepare a detailed design and location for a truck and equipment decon pad.

3) Get PRP acceptance to 1 & 2 above.

Mobilization

4) Mobilize equipment and manpower.

5) Initiate guard service.

6) Construct decon facilities.

7) Stake out soil and carboy removal area.

8) Soil and carboy disposal at a accepted facility.

VII. RECOMMENDATION

I recommend your approval of the proposed removal action as detailed and justified above. The proposed removal action contributes to the efficient performance of any long-term remedial action at this site. Under 40 CFR 300.65 of the National Oil and Hazardous Substances Pollution Contingency Plan, a removal action is appropriate at this site due to the existence of:

1) Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations, animals, or food chain [300.65(b)(2)(i)];

2) Actual or potential contamination of drinking water supplies or sensitive ecosystems [300.65(b)(2)(ii)];

3) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate [300.65(b)(2)(iv)];

4) Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released [300.65(b)(2)(v)];

5) The availability of other appropriate Federal or State response mechanisms to respond to the release [300.65(b)(2)(vii)];

6) Other situations or factors which may pose threats to public health or welfare or the environment [300.65(b)(2)(viii)];

The estimated project ceiling of the King of Prussia site Removal Funding Request is $593,000 of which $439,000 is for mitigation contracting.

Your authority to approve this request is established by Administrator Lee Thomas' interim delegation 14-1-A of September 21, 1987.

Sufficient funding is available in our current Advice of Allowance to finance this project.

Approved: James R. Maxwell Date: 5/11/89

Disapproved: _____ Date: _____

cc: (after approval is obtained)
S. Luftig, 2ERR
R. Salkie, 2ERR-ADREPP
G. Zachos, 2ERR-RAB
G. Pavlou, 2ERR-ADEP
J. Frisco, 2ERR-ADRP
M. Randol, 2OEP
R. Gherardi, 2OPM-FIN
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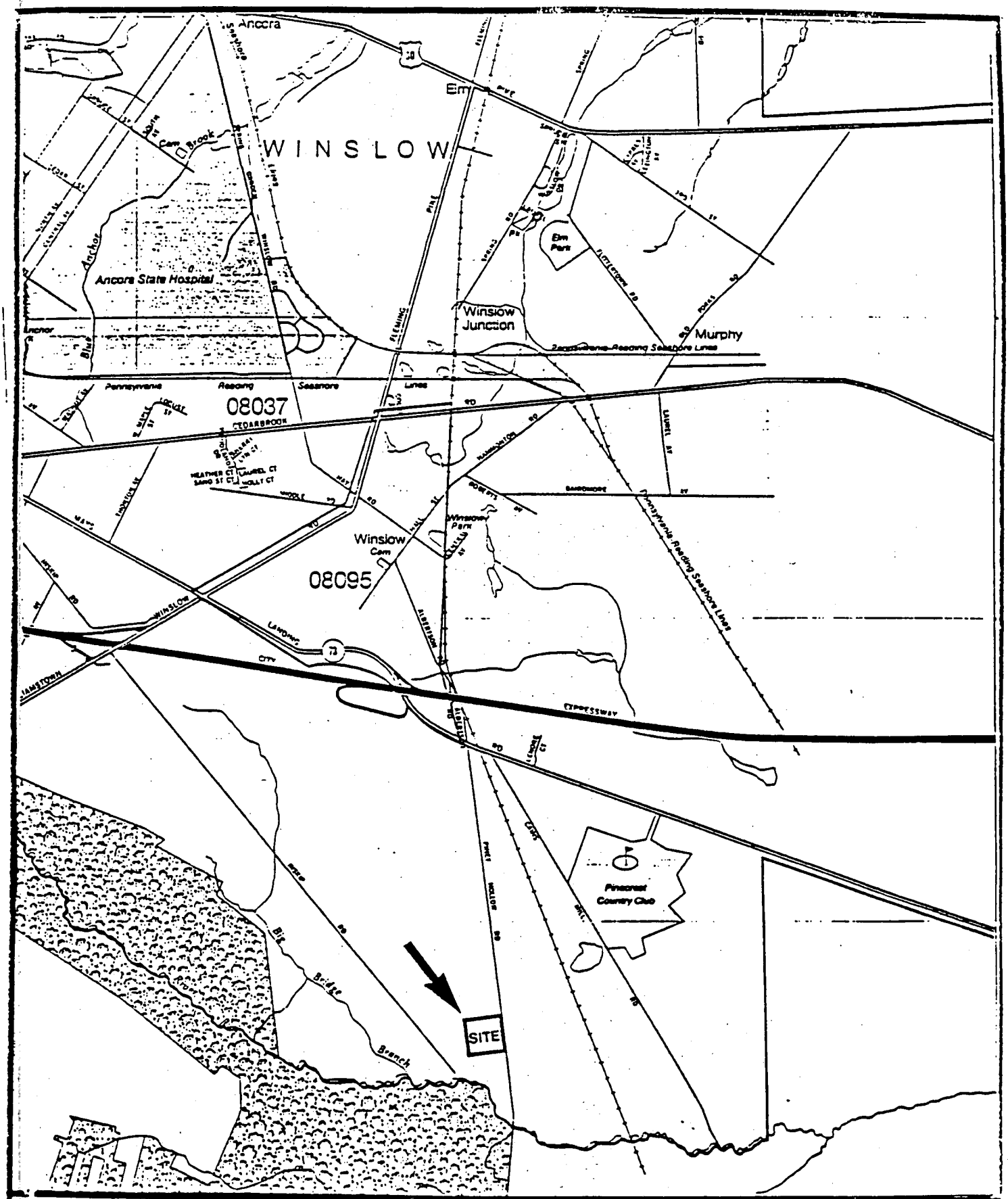
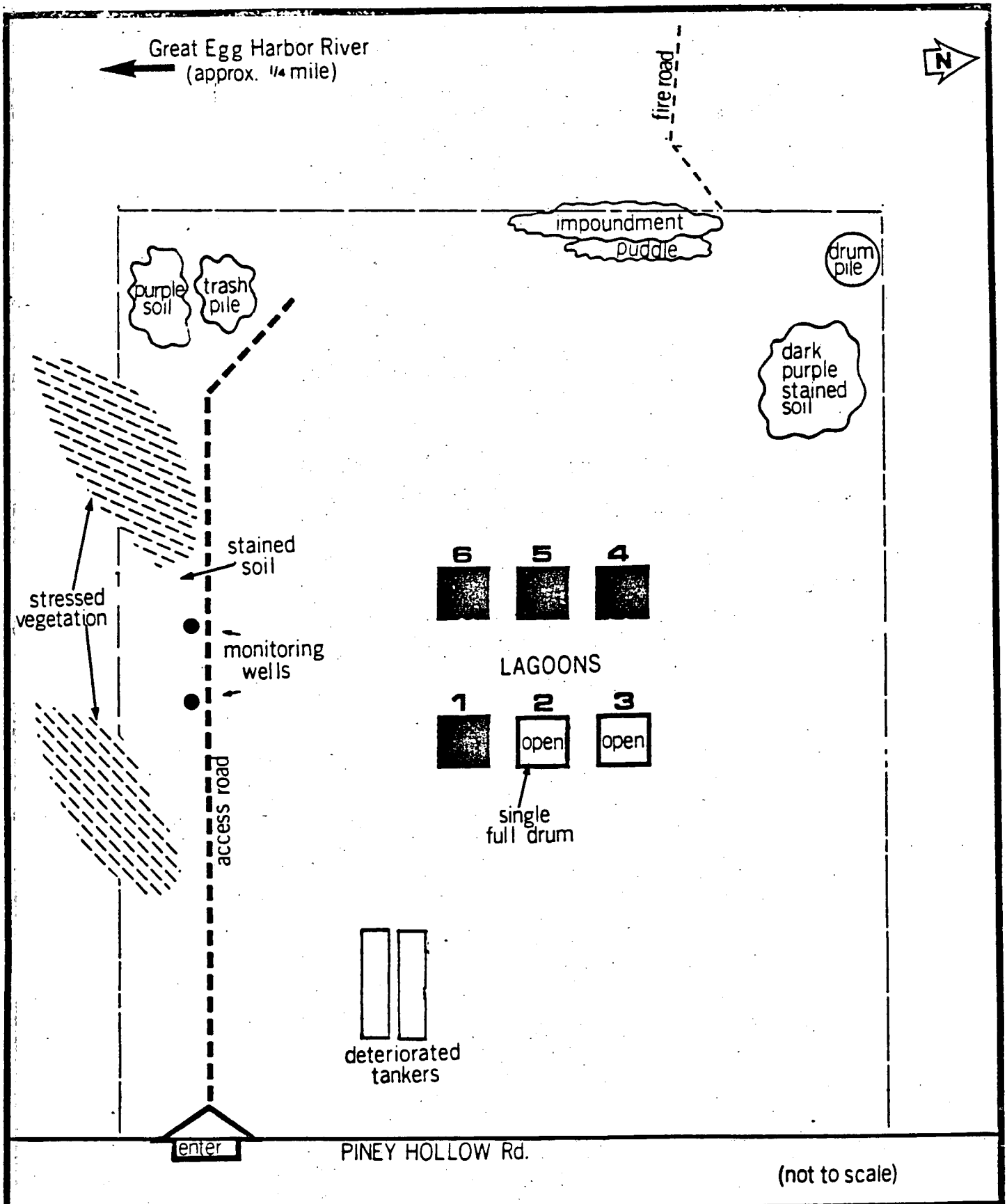
C. Moyik, 2ERR-PS
J. Rosianski, 2OEP
L. Guarneiri, OS-210



WESTON — SPILL PREVENTION & EMERGENCY RESPONSE DIVISION	EPA PM **DOMINACH**	**LOCATION MAP**
In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.	TAT PM **GRAHAM**	**FIGURE 1**



WESTON — SPILL PREVENTION & EMERGENCY RESPONSE DIVISION	EPA PM DOMINACH	K.O.P. LANDFILL SITE MAP
In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.	TAT PM GRAHAM	FIGURE 2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

December 7, 1979

Submission of Inspection Reports

Fred N. Rubel, Chief
Emergency Response & Hazardous Materials Inspection Branch

Mike DeBonis
Uncontrolled Hazardous Waste Site Coordinator

Attached are inspection reports for:

a. Bog Creek Farm

b. Lone Pine Landfill

c. Syorset Municipal Landfill

d. D & J Trucking

e. Sharkey Landfill

f. Hopewell Precision

g. King of Prussia (EPA Industries)

cc File

Dossiers are also attached for Lone Pine and Syosset. A dossier was previously prepared for King of Prussia and may be in your file under Attachments "EPL Industries."

Attachments

2-SA-ERHMIB:ENRubel:cl"Bldg.209:X6657

	CONCURRENCES							
SYMBOL	ERHMIB							
SURNAME	RUBEL							
DATE								

EPA Form 1320-1 (12-70) OFFICIAL FILE

2.6 Pollution Reports

U. S. ENVIRONMENTAL PROTECTION AGENCY

POLLUTION REPORT

DATE: June 10, 1988

Region II
Response and Prevention Branch
Edison, New Jersey 08837

(201) 548-8730 - Commercial and FTS
24 Hour Emergency

To: C. Daggett, EPA
S. Luftig, EPA
R. Salkie. EPA
G. Zachos, EPA
J. Marshall, EPA
J. Czapor, EPA
J. Frisco, EPA
J. Trela, NJDEP
ERD, EPA Washington, D.C.
(E-Mail)
TAT

POLREP NO.: One (1)
INCIDENT/SITE NO.: King of Prussia Landfill/ # 15
POLLUTANT: Heavy metals, organic compounds,unknowns
CLASSIFICATION: National Priority List
SOURCE: Inactive waste management facility
LOCATION: Piney Hollow Road, Winslow Township, New Jersey
AMOUNT: Unknown
WATER BODY: Great Egg Harbor River

1. SITUATION:

A. The King of Prussia Site is an abandoned liquid chemical treatment/disposal facility located on Piney Hollow Road, Winslow Township, New Jersey. The facility occupies approximately 10 acres within a State Wildlife Management area of relatively flat terrain. Approximately 1/4 mile to the south of the facility is the Great Egg Harbor River that runs parallel to the site.

An EPA, October, 1979, sampling and site inspection revealed organic and metal contamination of groundwater and soil. Currently a large area of stressed vegetation exists on the south side of the site. In addition there are six lagoons (only two remain open), two deteriorated tankers containing an unknown solid of an undetermined volume, several areas of discolored soil and partially buried drums and carboys.

The property is currently owned by Winslow Township.

B. The King of Prussia disposal facility was once operated by the Evor-Phillips Leasing Company. It was abandoned by Evor-Phillips in 1975. Five companies (Cabot Corporation, Carpenter Technology Corporation, Johnson Matthey, Inc., Ruetgers-Nease Chemical Company, Inc., and LNP Corp.) have been named as Potentially Responsible Parties (PRPs) of the

facility. Allegedly, Ernest Roth was a p
King of Prussia Landfill.

C. There is evidence that the grounds are be
recreational vehicles, hunters and person
household trash.

D. The United States Environmental Protectio
has entered into an Agreement and Consent
PRPs on April 17,1985.

E. Sampling, performed by EPA during October
a variety of contaminants in the soil, gr
surface runoff. The following is a parti
contaminants and the substrate in which t

1) **Monitoring Well KP4-** arsenic, beryllium
cadmium, copper, chromium, nickel, mer
2) **Surface Runoff-** phenol, mercury, chromi
3) **Lagoon Sediment-** mirex, diphenylmethanc
chromium, several benzene compounds

F. A July 11, 1986 analytical report, com
Inc., revealed that the carboys contained
contaminants, including the following: ph
and heavy metals (cadmium, chromium, copp
thallium, zinc).

2. ACTION TAKEN

A. EPA and the Technical Assistance Team (T
initial site assessment on May 11, 1988.
results were negative.

B. On May 10, 1988, a letter addressed to th
Committee of Winslow Township confirmed
of Environmental Resources Management,(ER
16, 1988, ERM mobilized onsite on behalf
Prussia PRP site committee, to commence
Investigation/Feasibility Studies (RI/FS)

C. On May 31, 1988 TAT conducted surficial s
the site. Air monitoring was conducted a
were negative. The PRP's contractor, ER
conducting RI/FS activities.

3. FUTURE PLANS AND RECOMMENDATIONS:

A. Continue to follow the PRP's RI/FS activi

B. Prepare a Removal Action Memorandum.

C. Install security fence and post hazard wa
alleviate the potential for direct contac
population.

D. Cap the contaminated soil to prevent airborne releases of hazardous material into the environment and limit the potential for direct contact.

E. Dispose of any surficial materials, such as drums, tankers carboys and extremely contaminated soils.

FUTURE POLREPS

FINAL POLREP___ FORTHCOMING___ SUBMITTED BY _____
(TAT)

Eugene Dominach,OSC
Response and Prevention
Branch

Date Released_____

Graham

U. S. ENVIRONMENTAL PROTECTION AGENCY

POLLUTION REPORT

DATE: August 26, 1988

Region II
Response and Prevention Branch
Edison, New Jersey 08837

(201) 548-8730 - Commercial and FTS
24 Hour Emergency

To: W. Muszynski, EPA
S. Luftig, EPA
R. Salkie. EPA
G. Zachos, EPA
J. Marshall, EPA
J. Czapor, EPA
J. Frisco, EPA
J. Trela, NJDEP
ERD, EPA Washington, D.C.
(E-Mail)
TAT

POLREP NO.: Two (2)
INCIDENT/SITE NO.: King of Prussia Landfill/ # 15
POLLUTANT: Heavy metals, organic compounds, unknowns
CLASSIFICATION: National Priority List
SOURCE: Inactive waste management facility
LOCATION: Piney Hollow Road, Winslow Township, New Jersey
AMOUNT: Unknown
WATER BODY: Great Egg Harbor River

1. SITUATION:

A. The King of Prussia Site is an abandoned liquid chemical treatment/disposal facility located on Piney Hollow Road, Winslow Township, New Jersey. The facility occupies approximately 10 acres within a State Wildlife Management area of relatively flat terrain. Approximately 1/4 mile to the south of the facility is the Great Egg Harbor River which runs parallel to the site.

A site inspection and sampling, conducted by EPA during October 1979, revealed organic and heavy metal contamination of groundwater and soil. Currently a large area of stressed vegetation exists on the south side of the site. In addition there are six lagoons (only two remain open), two deteriorated tankers containing an unknown inert solid of undetermined volume, several areas of discolored soil and partially buried drums and carboys.

The property is currently owned by Winslow Township.

B. The King of Prussia disposal facility was once operated by the Evor-Phillips Leasing Company. It was abandoned by Evor-Phillips in 1975. Five companies (Cabot Corporation, Carpenter Technology Corporation, Johnson Matthey, Inc., Ruetgers-Nease Chemical Company, Inc., and LNP Corp.) have been named as Potentially Responsible Parties (PRPs) of the

facility. Allegedly, Ernest Roth was a principal in the King of Prussia Landfill.

C. There is evidence that the grounds are being used by recreational vehicles, hunters and persons discarding household trash.

D. The United States Environmental Protection Agency (U.S. EPA) entered into an Agreement and Consent Order with the PRPs on April 17,1985.

E. Sampling, performed by EPA during October of 1979, revealed a variety of contaminants in the soil, groundwater and surface runoff. The following is a partial list of the contaminants and the substrate in which they were found:

1) Monitoring Well KP4- arsenic, beryllium, selenium, lead, cadmium, copper, chromium, nickel, mercury
2) Surface Runoff- phenol, mercury, chromium, copper
3) Lagoon Sediment- mirex, diphenylmethanone, arsenic, chromium, several benzene compounds

F. A July 11, 1986 analytical report, completed by SMC Martin, Inc., revealed that the carboys contained a variety of contaminants, including the following: phenol, vinyl chloride and heavy metals (cadmium, chromium, copper, lead, nickel, thallium, zinc).

2. ACTION TAKEN

A. On June 22, 1988, TAT conducted the sampling of the contents from the two deteriorated tankers located on-site. The subsequent analytical results of the material revealed an inert soil-like solid which contained contamination comprable to surrounding soils.

B. EPA and (TAT) continue to periodically monitor the RI/FS activities being conducted by the PRP's contractor, ERM, Inc..

C. An Action Memorandum that addresses the primary mitigation concerns, detailed in Section 3 of this polrep, was finalized.

3. FUTURE PLANS AND RECOMMENDATIONS:

A. Continue to follow the PRP's RI/FS activities.

B. Upon receipt of the approved Removal Action Memorandum, the following mitigative tasks will be performed:

1. Install security fence and post hazardous waste warning signs to help alleviate the potential for direct contact by the targeted population.

2. Cap the contaminated soil to prevent airborne releases of hazardous material into the environment and limit the potential for direct contact.

3. Dispose of any surficial materials, such as drums, tankers, carboys and extremely contaminated soils.

FUTURE POLREPS

FINAL POLREP___ FORTHCOMING___ SUBMITTED BY Eugene Dominach
(TAT)

Eugene Dominach, OSC
Response and Prevention
Branch

Date Released 9-12-88

Atul

U.S. ENVIRONMENTAL PROTECTION AGENCY

POLLUTION REPORT

DATE: April 5, 1989

Region II
Response and Prevention Branch
Edison, New Jersey 08837

TO: W. Muszynski, EPA
S. Luftig, EPA
R. Salkie, EPA
G. Zachos, EPA
J. Marshall, EPA
J. Czapor, EPA
J. Frisco, EPA
J. Trela, NJDEP
ERD Washington
(E-Mail)
TAT

(201) 548-8730 - Commercial and FTS
24 Hour Emergency

POLREP NO.: Three (3)
INCIDENT NAME: King of Prussia Landfill/ #15
POLLUTANT: Heavy metals, organic compounds,
CLASSIFICATION: National Priority List
SOURCE: Inactive waste management Facility
LOCATION: Piney Hollow Road, Winslow Township, New Jersey
AMOUNT: Unknown
WATER BODY: Great Egg Harbor River

1. SITUATION:

A. The King of Prussia Site is an a abandoned liquid chemical treatment/disposal facility that occupies approximately 10 acres within a State Wildlife Management area over-lying the Cohansey Aquifer. Approximately 1/4 mile to the south is the Great Egg Harbor River a tributory of the Delaware River.

Sampling, conducted by EPA in October 1979, revealed organic and heavy metal contamination of groundwater and soil. Stressed vegetation, six lagoons, two deteriorated tankers containing an unknown inert solid, several areas of discolored soil and partially buried drums and carboys are present on-site.

The property is currently owned by Winslow Township.

B. The King of Prussia disposal facility was once operated by the Evor-Phillips Leasing Company. It was abandoned by Evor-Phillips in 1975. Five companies (Cabot Corporation, Carpenter Technology Corporation, Johnson Matthey, Inc., Ruetgers-Nease Chemical Company, Inc., and LNP Corp.) have been named as Potentially Responsible Parties (PRPs) of the facility. Allegedly, Ernest Roth was a principal in the King of Prussia Landfill.

C. The PRPs signed a Order on Consent with the United States Environmental Protection Agency (EPA) on April 17, 1985. On May 16, 1988 the PRPs consultant Environmental Resources Management mobilized to begin a Phase II RI.

D. Action Memorandum for funding to install a security fence, post hazardous waste signs and soil cap the carboy area was submitted on September 22, 1988.

E. The PRPs without prior notice to EPA completed installation of a perimeter fence prior to August 30, 1989.

F. On February 9, 1989 the Remedial Action Branch referred the site for a removal action when the PRPs refused to remove the carboys.

2. ACTION TAKEN:

A. The Removal Action Branch reassessed the carboy area and submitted an Action Memorandum on March 14, 1989 for funding to remove the carboys and a maximum of 315 cubic yards of contaminated soil.

B. TAT core sampled (4 feet deep) the carboy area on March 27 and 28, 1989. Analytical results expected by April 20, 1989 should define the extent of vertical and horizontal contamination.

C. Samples taken in the carboy area are also being analyzed by FIT Personnel, using X-Ray Fluorescence unit.

3. FUTURE PLANS AND RECOMMENDATIONS:

A. Continue to follow the PRPs RI activities.

B. Employ FIT personnel, using x-ray fluorescence instrumentation (KEVEX Unit), to identify extent of heavy metal contaminated soil down to 10 ppm accuracy. Will allow for the minimum and most economic volume of soil removal.

C. Upon receipt of funding excavate carboys and contaminated soil.

D. Continue to negotiate with all PRPs to assume timely and responsible action.

FINAL POLREP_____ FURTHER POLREPS FORTHCOMING__X___ SUBMITTED BY: Eugene Dominach

Eugene Dominach, OSC
Response and
Prevention Branch

DATE OF RELEASE: 4-11-89

U.S. ENVIRONMENTAL PROTECTION AGENCY

POLLUTION REPORT

DATE: September 12,1989

Region II
Removal Action Branch
Edison, New Jersey

TO: W. Muszynski, EPA
S. Luftig, EPA
R. Salkie, EPA
J. Marshall, EPA
M. Randol, EPA
J. Frisco, EPA
D. Karlen, EPA
G. Pavlou, EPA
G. Zachos, EPA
J. Trela, NJDEP
L. Miller, NJDEP
L. Grayson, NJDEP
ERD Washington (E-Mail)
TAT

(201) 548-8730 - Commercial and FTS
24 Hour Emergency

POLREP NO.: Four (4)
INCIDENT NAME: King of Prussia Landfill/ #15
POLLUTANT: Heavy metals, organic compounds
CLASSIFICATION: National Priority List
SOURCE: Inactive waste management facility
LOCATION: Piney Hollow Road, Winslow Township, NJ
AMOUNT: Unknown
WATER BODY: Great Egg Harbor River

1. SITUATION

A. The King of Prussia Site (KOP) is an abandoned liquid chemical waste treatment/disposal facility that occupies approximately 10 acres within a State Wildlife Management area overlying the Cohansey Aquifer. Great Egg Harbor River, a tributary of the Delaware River, lies 1/4 mile to the south. The property is currently owned by Winslow Township.

B. Sampling activities conducted by the Environmental Protection Agency (EPA) in October 1979 and April 1980 revealed the presence of toluene, xylene, lead, chromium, copper, zinc and beryllium at the site. These substances are defined hazardous under CERCLA.

C. The KOP facility was once operated by the Evor-Phillips Leasing Company and was abandoned in 1975. Remaining on site are six lagoons, two deteriorated tankers, buried drums, buried carboys, discolored soil and stressed vegetation. On April 17, 1985, EPA entered into an Administrative Order on Consent (AOC) with Cabot-Beryl Co., Carpenter Technology Corporation, Johnson-Matthey, Inc., LNP Corporation, and Reutgers-Nease Chemical Company as potentially responsible parties (PRPs)to perform a Remedial Investigation/Feasibility Study (RI/FS) at the site. This study was begun on May 16, 1988 .

D. The EPA Removal Action Branch (RAB) assessed the site in May 1988. Soil sampling confirmed the presence of hazardous metals. Funding was requested in September 1988 to install perimeter fencing, soil cap the carboy area and install hazardous waste warning signs. Although the PRPs maintained no responsibility for the carboy area, on August 30, 1988, without prior notice to EPA, they financed installation of the required fencing.

E. The RAB sampled the carboy area in March 1989 and obtained funding to remove the carboys, the carboy liquids and the adjacent contaminated soil. The removal start was delayed pending issuance of an AOC to the PRPs and their response to the proposed removal. The PRPs have declined to do the actual removal and are currently considering a monetary settlement.

F. ERCS contractor was issued a delivery order on May 22, 1989 to provide a" Health and Safety Plan" and a "Work Plan". Soil from the carboy and adjacent areas were sampled and submitted for waste disposal acceptance.

G. The RAB was given notice to proceed with the removal effort on August 17,1989.

2. ACTION TAKEN

A. ERCS contractor, TAT and EPA mobilized on September 12,1989. Command post, decontamination trailer located and construction of equipment decontamination pad begins.

B. Notice of removal activity and Administrative Record entered in local newspaper.

3. FUTURE PLANS AND RECOMMENDATIONS

A. Stake out area slated for soil removal.

B. Establish command post with required facilities.

C. Complete decontamination pad.

D. Contract X-Ray Fluorescence Contractor.

E. Provide Haz-Cat analysis to assist in identification of contaminated areas.

4. FINANCIAL STATUS 9/12/89

A.	Total Project Ceiling Authorized	$593,000
B.	Mitigation Contract Funds Authorized 1. Obligated by DCN #KE3009	$250,000
C.	Expenditures for Mitigation Contracts	$ 6,890
D.	Obligated balance remaining	$243,110
E.	Other Extramural Costs TAT Salary/Travel	$ 2,700
G.	Intramural Removal Costs EPA Salary/Travel	$ 9,000
H.	Total Expenditures	$ 18,590
I.	Percentage of Total Project Ceiling	3.1%

FINAL POLREP____ FURTHER POLREPS FORTHCOMING__X__ SUBMITTED BY Eugene G. Dominach

Eugene G. Dominach

Removal Action Branch

RELEASE DATE September 13, 1989

U.S. ENVIRONMENTAL PROTECTION AGENCY

POLLUTION REPORT

DATE: September 13,1989

Region II
Removal Action Branch
Edison, New Jersey

TO: W. Muszynski, EPA
S. Luftig, EPA
R. Salkie, EPA
J. Marshall, EPA
M. Randol, EPA
J. Frisco, EPA
D. Karlen, EPA
G. Pavlou, EPA
G. Zachos, EPA
J. Trela, NJDEP
L. Miller, NJDEP
L. Grayson, NJDEP
ERD Washington (E-Mail)
TAT

(201) 548-8730 - Commercial and FTS
24 Hour Emergency

POLREP NO.:	Five (5)
INCIDENT NAME:	King of Prussia Landfill/ #i5
POLLUTANT:	Heavy metals,acids and organic compounds
CLASSIFICATION:	National Priority List
SOURCE:	Inactive waste management facility
LOCATION:	Piney Hollow Road, Winslow Township, NJ
AMOUNT:	Unknown
WATER BODY:	Great Egg Harbor River

1. SITUATION

A. The King of Prussia Site (KOP) is an abandoned liquid chemical waste treatment/disposal facility that occupies approximately 10 acres within a State Wildlife Management area overlying the Cohansey Aquifer. Great Egg Harbor River, a tributary of the Delaware River, lies 1/4 mile to the south. The property is currently owned by Winslow Township.

B. Sampling activities conducted by the Environmental Protection Agency (EPA) in October 1979 and April 1980 revealed the presence of toluene, xylene, lead, chromium, copper, zinc and beryllium at the site. These substances are defined hazardous under CERCLA.

C. The KOP facility was once operated by the Evor-Phillips Leasing Company and was abandoned in 1975. Remaining on site are six lagoons, two deteriorated tankers, buried drums, buried carboys, discolored soil and stressed vegetation. On April 17, 1985, EPA entered into an Administrative Order on Consent (AOC) with Cabot-Beryl Co., Carpenter Technology Corporation, Johnson-Matthey, Inc., LNP Corporation, and Reutgers-Nease Chemical Company as potentially responsible parties (PRPs)to perform a Remedial Investigation/Feasibility Study (RI/FS) at the site. This study was begun on May 16, 1988 .

D. The EPA Removal Action Branch (RAB) assessed the site in May 1988. Soil sampling confirmed the presence of hazardous metals. Funding was requested in September 1988 to install perimeter fencing, soil cap the carboy area and install hazardous waste warning signs. Although the PRPs maintained no responsibility for the carboy area, on August 30, 1988, without prior notice to EPA, they financed installation of the required fencing.

E. The RAB sampled the carboy area in March 1989 and obtained funding to remove the carboys, the carboy liquids and the adjacent contaminated soil. The removal start was delayed pending issuance of an AOC to the PRPs and their response to the proposed removal. The PRPs have declined to do the actual removal and are currently considering a monetary settlement.

F. ERCS contractor was issued a delivery order on May 22, 1989 to provide a" Health and Safety Plan" and a "Work Plan". Soil from the carboy and adjacent areas were sampled and submitted for waste disposal acceptance.

G. The RAB was given notice to proceed with the removal effort on August 17,1989.

2. <u>ACTION TAKEN</u>

A. First order of business was a safety meeting. All personnel were requested to read and sign the site safety plan.

B. TAT using Hazcat analytical kit determines that contents of three carboys at the surface of the carboy disposal area contain hydrochloric acid.

C. ERCS continues to provide necessary items to complete motilization.

D. ERCS begins forming decontamination pad.

3. FUTURE PLANS AND RECOMMENDATIONS

A. Prepare for level B entry and hand excavation to remove buried carboys.

B. Stake out area slated for soil removal.

B. Correct electrical problem in command post.

C. Complete decontamination pad.

D. Contract X-Ray Fluoreescence Contractor.

4. FINANCIAL STATUS 9/13/89

A.	Total Project Ceiling Authorized	$593,000
B.	Mitigation Contract Funds Authorized 1. Obligated by DCN #KE3009	$250,000
C.	Expenditures for Mitigation Contracts	$ 10,470
D.	Obligated balance remaining	$239,530
E.	Other Extramural Costs TAT Salary/Travel	$ 4,700
G.	Intramural Removal Costs EPA Salary/Travel	$ 10,350
H.	Total Expenditures	$ 25,520
I.	Percentage of Total Project Ceiling	4.3%

7 FURTHER
FINAL POLREP ____ POLREPS FORTHCOMING X SUBMITTED BY: Eugene G. Dominach

Eugene G. Dominach
Removal Action Branch

RELEASE DATE Sept 14, 1989

U.S. ENVIRONMENTAL PROTECTION AGENCY

POLLUTION REPORT

DATE: September 14,1989

Region II
Removal Action Branch
Edison, New Jersey

TO: W. Muszynski, EPA
S. Luftig, EPA
R. Salkie, EPA
J. Marshall, EPA
M. Randol, EPA
J. Frisco, EPA
D. Karlen, EPA
G. Pavlou, EPA
G. Zachos, EPA
J. Trela, NJDEP
L. Miller, NJDEP
L. Grayson, NJDEP
ERD Washington
(E-Mail)
TAT

(201) 548-8730 - Commercial and FTS
24 Hour Emergency

POLREP NO.: Six (6)
INCIDENT NAME: King of Prussia Landfill/ #15
POLLUTANT: Heavy metals, acids and organic compounds
CLASSIFICATION: National Priority List
SOURCE: Inactive waste management facility
LOCATION: Piney Hollow Road, Winslow Township, NJ
AMOUNT: Unknown
WATER BODY: Great Egg Harbor River

1. SITUATION

A. The King of Prussia Site (KOP) is an abandoned liquid chemical waste treatment/disposal facility that occupies approximately 10 acres within a State Wildlife Management area overlying the Cohansey Aquifer. Great Egg Harbor River, a tributary of the Delaware River, lies 1/4 mile to the south. The property is currently owned by Winslow Township.

B. Same as previous Polreps.

2. ACTION TAKEN

A. Addendum to safety plan provided to incorporate excavation and handling of concentrated hydrochloric acid. Safety meeting to stress safety during excavation and emptying of carboys.

B. Hand excavation results in excavation of twenty (20) plastic carboys and collection and bulking of approximately 50 gallons of concentrated acid.

C. Decontamination pad form completed and concrete poured today.

C. TAT continues Hazcatting carboy liquids to permit composite bulking.

3. FUTURE PLANS AND RECOMMENDATIONS

A. Continue hand excavation to locate buried carboys.

B. Continue Hazcatting and bulking.

C. Stake out area slated for soil removal.

D. Contract awarded to Schafer & Associates of Bozeman, MT for XRay Fluorescence services. Contractor to be on-site Monday September 18.

4. FINANCIAL STATUS 9/14/89

A.	Total Project Ceiling Authorized	$593,000
B.	Mitigation Contract Funds Authorized 1. Obligated by DCN #RE3009	$250,000
C.	Expenditures for Mitigation Contracts	$ 14,460
D.	Obligated balance remaining	$235,540
E.	Other Extramural Costs TAT Salary/Travel	$ 6,700
G.	Intramural Removal Costs EPA Salary/Travel	$ 11,350
H.	Total Expenditures	$ 32,510
I.	Percentage of Total Project Ceiling	5.5%

FINAL POLREP ___ FURTHER POLREPS FORTHCOMING X SUBMITTED BY Eugene G. Dominach

Eugene G. Dominach

Removal Action Branch

RELEASE DATE September 15, 1989

U.S. ENVIRONMENTAL PROTECTION AGENCY

POLLUTION REPORT

DATE: September 15,1989

Region II
Removal Action Branch
Edison, New Jersey

TO: W. Muszynski, EPA
S. Luftig, EPA
R. Salkie, EPA
J. Marshall, EPA
M. Randol, EPA
J. Frisco, EPA
D. Karlen, EPA
G. Pavlou, EPA
G. Zachos, EPA
J. Trela, NJDEP
L. Miller, NJDEP
L. Grayson, NJDEP
ERD Washington
(E-Mail)
TAT

(201) 548-8730 - Commercial and FTS
24 Hour Emergency

POLREP NO.:	Seven (7)
INCIDENT NAME:	King of Prussia Landfill/ #15
POLLUTANT:	Heavy metals, acids and organic compounds
CLASSIFICATION:	National Priority List
SOURCE:	Inactive waste management facility
LOCATION:	Piney Hollow Road, Winslow Township, NJ
AMOUNT:	Unknown
WATER BODY:	Great Egg Harbor River

1. SITUATION

A. The King of Prussia Site (KOP) is an abandoned liquid chemical waste treatment/disposal facility that occupies approximately 10 acres within a State Wildlife Management area overlying the Cohansey Aquifer. Great Egg Harbor River, a tributary of the Delaware River, lies 1/4 mile to the south. The property is currently owned by Winslow Township.

B. Same as previous Polreps.

2. ACTION TAKEN

A. Morning safety meeting continues to stress safety during excavation and emptying of carboys.

B. Hand excavation results in excavation of forty (40) plastic carboys and collection and bulking of approximately 110 gallons of concentrated acid.

C. TAT continues Hazcatting carboy liquids to permit composite bulking.

3. FUTURE PLANS AND RECOMMENDATIONS

A. Continue hand excavation to locate buried carboys.

B. Continue Hazcatting and bulking.

C. Stake out area slated for soil removal.

D. Checking on disposal options for plastic carboys.

E. Stripping of wood form from decontamination pad.

4. FINANCIAL STATUS 9/15/89

A.	Total Project Ceiling Authorized	$593,000
B.	Mitigation Contract Funds Authorized 1. Obligated by DCN #KE3009	$250,000
C.	Expenditures for Mitigation Contracts	$ 17,805
D.	Obligated balance remaining	$232,195
E.	Other Extramural Costs TAT Salary/Travel	$ 8,200
G.	Intramural Removal Costs EPA Salary/Travel	$ 12,550
H.	Total Expenditures	$ 32,510
I.	Percentage of Total Project Ceiling	6.5%

FINAL POLREP ___ FURTHER POLREPS FORTHCOMING ___ SUBMITTED BY Eugene G. Dominach

Eugene G. Dominach

Removal Action Branch

RELEASE DATE September 15, 1989

U.S. ENVIRONMENTAL PROTECTION AGENCY

POLLUTION REPORT

DATE: September 19,1989

Region II
Removal Action Branch
Edison, New Jersey

TO: W. Muszynski, EPA
S. Luftig, EPA
R. Salkie, EPA
J. Marshall, EPA
M. Randol, EPA
J. Friscc, EPA
D. Karlen, EPA
S. Pavlou, EPA
G. Zachos, EPA
J. Trela, NJDEP
L. Miller, NJDEP
L. Greyson, NJDEP
ERD Washington
(E-Mail)
TAT

(201) 548-8730 -- Commercial and FTS
24 Hour Emergency

POLREP NO.: Eight (8)
INCIDENT NAME: King of Prussia Landfill/ #15
POLLUTANT: Heavy metals, acids and organic compounds
CLASSIFICATION: National Priority List
SOURCE: Inactive waste management facility
LOCATION: Piney Hollow Road, Winslow Township, NJ
AMOUNT: Unknown
WATER BODY: Great Egg Harbor River

1. SITUATION

A. The King of Prussia Site (KOP) is an abandoned liquid chemical waste treatment/disposal facility that occupies approximately 10 acres within a State Wildlife Management area overlying the Cohansey Aquifer. Great Egg Harbor River, a tributary of the Delaware River, lies 1/4 mile to the south. The property is currently owned by Winslow Township.

B. Sampling activities conducted by the Environmental Protection Agency (EPA) in October 1979 and April 1980 revealed the presence of toluene, xylene, lead, arsenic, copper, zinc and beryllium at the site. These substances are defined hazardous under CERCLA.

C. The KOP facility was once operated by the Evor-Phillips Leasing Company and was abandoned in 1975. Remaining on site are six lagoons, two deteriorated tankers, buried drums, buried carboys, discolored soil and stressed vegetation. On April 17, 1985, EPA entered into an Administrative Order on Consent (AOC) with Cabot-Beryl Co., Carpenter Technology Corporation, Johnson-Matthey, Inc., LNP Corporation, and Reutgers-Nease Chemical Company as potentially responsible parties (PRPs)to perform a Remedial Investigation/Feasibility Study (RI/FS) at the site. This study was begun on May 16, 1988 .

D. The EPA Removal Action Branch (RAB) assessed the site in May 1988. Soil sampling confirmed the presence of hazardous metals. Funding was requested in September 1988 to install perimeter fencing, soil cap the carboy area and install hazardous waste warning signs. Although the PRPs maintained no responsibility for the carboy area, on August 30, 1988, without prior notice to EPA, they financed installation of the required fencing.

E. The RAB sampled the carboy area in March 1989 and obtained funding to remove the carboys, the carboy liquids and the adjacent contaminated soil. The removal start was delayed pending issuance of an AOC to the PRPs and their response to the proposed removal. The PRPs have declined to do the actual removal and are currently considering a monetary settlement.

F. ERCS contractor was issued a delivery order on May 22, 1989 to provide a" Health and Safety Plan" and a "Work Plan". Soil from the carboy and adjacent areas were sampled and submitted for waste disposal acceptance.

G. The RAB was given notice to proceed with the removal effort on August 17,1989.

2. ACTION TAKEN

A. Morning safety meeting with instructions for dealing with excavation in acid soil and emptying acid from buried carboys.

B. Hand excavation uncovers 89 plastic carboys. Hydrochloric acid collected totals 150 gallons. Twenty six carboys contained the collected acid and the remainder were either water or empty. A total of 3500 gallons of acid was potentially released.

C. XRF person from Schafer & Associates arrives on site. Begins sampling soil to establish calibration curve.

C. ETEC strips form from decontamination pad.

D. Bell telephone provides cable to command post. Need 12 telephone service by Wednesday. Mobile phones are unreliable.

E. Removal action aborted on Tuesday, September 19. Very heavy rain caused flooding and difficulty in backhoe machine excavation in the carboy area.

3. FUTURE PLANS AND RECOMMENDATIONS

A. Begin machine excavation in carboy area and stockpiling of acid soil for on site neutralization.

B. Deliver quarry stone blend to prepare decon pad approaches and cover of roadway to excavation area.

C. Relocate carboys to decontamination pad for tripple rinsing and disposal as non-hazardous.

D. Use X-Ray Fluorescence to delineate excavation area for heavy metal bearing soil.

4. FINANCIAL STATUS 9/19/89

A. Total Project Ceiling Authorized	$997,000
B. Mitigation Contract Funds Authorized & Obligated by DCN #HED009	$250,000
C. Expenditures for Mitigation Contracts	$ 23,845
D. Obligated balance remaining	$226,155
E. Other Extramural Costs TAT Salary/Travel	$ 12,600
F. Intramural Removal Costs ETA Salary/Travel	$ 15,050
G. Total Expenditures	$ 51,495
H. Percentage of Total Project Ceiling	8.5%

FINAL REPORT ___ FURTHER REPORTS FORTHCOMING X SUBMITTED BY: Eugene D. Dominach
Eugene D. Dominach
Removal Action Branch

RELEASE DATE September 19, 1989

U.S. ENVIRONMENTAL PROTECTION AGENCY

POLLUTION REPORT

DATE: September 20,1989

Region II
Removal Action Branch
Edison, New Jersey

TO: W. Muszynski, EPA
S. Luftig, EPA
R. Salkie, EPA
J. Marshall, EPA
M. Randol, EPA
J. Frisco, EPA
D. Karlen, EPA
G. Pavlou, EPA
G. Zachos, EPA
J. Trela, NJDEP
L. Miller, NJDEP
L. Grayson, NJDEP
ERD Washington
(E-Mail)
TAT

(201) 548-8730 - Commercial and FTS
24 Hour Emergency

POLREP NO.: Nine (9)
INCIDENT NAME: King of Prussia Landfill/ #15
POLLUTANT: Heavy metals, acids and organic compounds
CLASSIFICATION: National Priority List
SOURCE: Inactive waste management facility
LOCATION: Piney Hollow Road, Winslow Township, NJ
AMOUNT: Unknown
WATER BODY: Great Egg Harbor River

1. SITUATION

A. The King of Prussia Site (KOP) is an abandoned liquid chemical waste treatment/disposal facility that occupies approximately 10 acres within a State Wildlife Management area overlying the Cohansey Aquifer. Great Egg Harbor River, a tributary of the Delaware River, lies 1/4 mile to the south. The property is currently owned by Winslow Township.

B. Same as previous Polreps.

2. ACTION TAKEN

A. Safety meeting discussing neutralization and triple rinsing of excavated carboys and procedure to be followed during machine excavation of acid soil in the carboy area.

B. Handheld shovel excavation was replaced by machine excavation today and an additional 31 carboys were recovered, bringing the total to 120. No additional acid was recovered. In POLREP EIGHT (8) it was reported that 8500 gallons of acid was potentially released, the correct amount is 1650 gallons.

C. Site operation continued with machine excavation of acid and heavy metal contaminated soils from the carboy area. Prior to removal the acid soil was neutralized on-site with sodium carbonate to elevate the pH from 2 to an average of 6. The sodium carbonate added to the soil also solidified the free liquids present. The treated soil was staged on plastic and covered with visqueen.

D. XRF analysis of the post excavation samples disclosed that heavy metal contamination still existed in three sections of the carboy area.

3. FUTURE PLANS AND RECOMMENDATIONS

A. Continue machine excavation in the carboy area and begin excavaton in the heavy metal area.

B. Finish triple rinsing carboys.

D. Checking on disposal options for plastic carboys.

E. Complete sampling plan for soil disposal.

F. Arrange for off-site disposal of acid contaminated soil from the carboy area , recovered acid and metal bearing soil.

4. FINANCIAL STATUS 9/20/89

A.	Total Project Ceiling Authorized	$593,000
B.	Mitigation Contract Funds Authorized 1. Obligated by DCN #KE3009	$250,000
C.	Expenditures for Mitigation Contracts	$ 28,715
D.	Obligated balance remaining	$221,285
E.	Other Extramural Costs 1. TAT Salary/Travel	$ 15,960
	2. Subcontract-Schaefer Associates Ray Fluorescence Analytical $12,200 x 1.85 ADM Multiplier	$ 22,570
G.	Intramural Removal Costs EPA Salary/Travel	$ 16,650
H.	Total Expenditures	$ 83,895
I.	Percentage of Total Project Ceiling	14.1%

FINAL POLREP____ FURTHER POLREPS FORTHCOMING X SUBMITTED BY Eugene G. Dominach

Eugene G. Dominach

Removal Action Branch

RELEASE DATE 9-28-89

U.S. ENVIRONMENTAL PROTECTION AGENCY

POLLUTION REPORT

DATE: September 21,1989

Region II
Removal Action Branch
Edison, New Jersey

TO: W. Muszynski, EPA
S. Luftig, EPA
R. Salkie, EPA
J. Marshall, EPA
M. Randol, EPA
J. Frisco, EPA
D. Karlen, EPA
G. Pavlou, EPA
G. Zachos, EPA
J. Trela, NJDEP
L. Miller, NJDEP
L. Grayson, NJDEP
ERD Washington
(E-Mail)
TAT

(201) 548-8730 - Commercial and FTS
24 Hour Emergency

POLREP NO.:	Ten (10)
INCIDENT NAME:	King of Prussia Landfill/ #15
POLLUTANT:	Heavy metals, acids and organic compounds
CLASSIFICATION:	National Priority List
SOURCE:	Inactive waste management facility
LOCATION:	Piney Hollow Road, Winslow Township, NJ
AMOUNT:	Unknown
WATER BODY:	Great Egg Harbor River

1. SITUATION

A. The King of Prussia Site (KOP) is an abandoned liquid chemical waste treatment/disposal facility that occupies approximately 10 acres within a State Wildlife Management area overlying the Cohansey Aquifer. Great Egg Harbor River, a tributary of the Delaware River, lies 1/4 mile to the south. The property is currently owned by Winslow Township.

B. Same as previous Polreps.

2. ACTION TAKEN

A. Safety meeting held and discussion centered on machine excavation and handling of heavy metal bearing soil.

B. Rinsing and bagging of carboys completed today.

C. Machine excavation was continued in the carboy area and an additional 20 cubic yards of heavy metal contaminated soil were removed as identified by the XRF scan. The approximate total volume of soil removed from the carboy area is 80 cubic yards. Excavation was considered complete when: (1) pH of the soil was at least five as recorded by litmus paper and verified by a pH meter; (2) post excavation samples taken 6 inches below the base of the excavation were nominally below the NJ State action levels as determined by XRF on site analysis. Duplicates of the post excavation samples will also be analyzed by a CLP Laboratory.

D. Machine excavation was started in the site drainage pathway located to the west and adjacent to the carboy area. Completion of excavation was determined by post excavation sampling of soil 6 inches below the new grade and on-site XRF analysis results for heavy metals were nominally below NJ State action levels. Six(6) post excavation soil samples were collected from the base of the excavation, submitted to a CLP laboratory for heavy metal analyses to confirm that acceptable clean-up levels were achieved. Duplicates of the soil samples were analyzed by XRF analyses. Approximately 170 cubic yards was excavated from this area, stockpiled and covered with visqueen.

E. During the soil removal activities in the heavy metal contaminated area a six (6) inch layer of green colored soil was encountered. This layer located about 1.5 feet below grade awas determined to be approximately 15 feet wide by 35 feet in length. XRF Analyses indicated a copper content exceeding 50,000 ppm. SC Branch was notified of this material and has acknowledged its presence.

F. Prepare for demobilization.

3. FUTURE PLANS AND RECOMMENDATIONS

A. Collect soil samples of excavated soil in accordance with a sampling plan entitled " Stock Piled Soils for Disposal". Submit for laboratory analysis, waste profiling and final disposal.

B. Sample and submit contaminated acid for analysis for waste profiling and final disposal.

C. Potential for recycle of the plastic carboys being investigated.

4. FINANCIAL STATUS 9/21/89

A.	Total Project Ceiling Authorized	$593,000
B.	Mitigation Contract Funds Authorized 1. Obligated by DCN #KE3009	$250,000
C.	Expenditures for Mitigation Contracts	$ 33,090
D.	Obligated balance remaining	$216,910
E.	Other Extramural Costs 1. TAT Salary/Travel	$ 19,030
	2. Subcontract-Schaefer Associates XRay Fluorescence Analytical $12,200 x 1.85 ADM Multiplier	$ 22,570
F.	Intramural Removal Costs EPA Salary/Travel	$ 17,925
G.	Total Expenditures	$ 92,615
H.	Percentage of Total Project Ceiling	15.6%

FINAL POLREP____ FURTHER POLREPS FORTHCOMING X SUBMITTED BY Eugene G. Dominach

Eugene G. Dominach

Removal Action Branch

RELEASE DATE 9-29-89

U.S. ENVIRONMENTAL PROTECTION AGENCY

POLLUTION REPORT

DATE: September 22,1989

Region II
Removal Action Branch
Edison, New Jersey

TO: W. Muszynski, EPA
S. Luftig, EPA
R. Salkie, EPA
J. Marshall, EPA
M. Randol, EPA
J. Frisco, EPA
D. Karlen, EPA
G. Pavlou, EPA
G. Zachos, EPA
J. Trela, NJDEP
L. Miller, NJDEP
L. Grayson, NJDEP
ERD Washington
(E-Mail)
TAT

(201) 548-8730 - Commercial and FTS
24 Hour Emergency

POLREP NO.:	Eleven (11)
INCIDENT NAME:	King of Prussia Landfill/ #15
POLLUTANT:	Heavy metals, acids and organic compounds
CLASSIFICATION:	National Priority List
SOURCE:	Inactive waste management facility
LOCATION:	Piney Hollow Road, Winslow Township, NJ
AMOUNT:	Unknown
WATER BODY:	Great Egg Harbor River

1. SITUATION

A. The King of Prussia Site (KOP) is an abandoned liquid chemical waste treatment/disposal facility that occupies approximately 10 acres within a State Wildlife Management area overlying the Cohansey Aquifer. Great Egg Harbor River, a tributary of the Delaware River, lies 1/4 mile to the south. The property is currently owned by Winslow Township.

B. Same as previous Polreps.

2. ACTION TAKEN

A. Safety meeting. Prepare for demoblization.

B. Three waste classification samples taken by Haztech personnel. WC-1 soil from carboy area, WC-2 soil from heavy metal area and WC-3 recovered acid.

C. Preliminary arrangement made with a disposal firm for recycle of plastic carboys.

D. Identification markings on the carboys include the letters "CCA" "DELAWARE" and 1970 within a circle including the numbers 1 to 12 (Probably the months of the year).

E. Personnel and equipment demobilized at 3:30 pm. Remaining on-site is the command post, portajohn and two 5K pools.

F. Telephone line connected to command post.

3. FUTURE PLANS AND RECOMMENDATIONS

A. Upon receipt of composite sample analyses, complete and submit waste profile sheets for waste acceptance and final disposal.

B. Dispose of plastic carboys.

C. Potentially on-site treatment of decon water or arrange for off-site disposal.

4. FINANCIAL STATUS 9/22/89

A.	Total Project Ceiling Authorized	$593,000
B.	Mitigation Contract Funds Authorized 1. Obligated by DCN #KE3009	$250,000
C.	Expenditures for Mitigation Contracts	$ 35,525
D.	Obligated balance remaining	$214,475
E.	Other Extramural Costs 1. TAT Salary/Travel	$ 22,100
	2. Subcontract-Schaefer Associates XRay Fluorescence Analytical $12,200 x 1.85 ADM Multiplier	$ 22,570
F.	Intramural Removal Costs EPA Salary/Travel	$ 18,825
G.	Total Expenditures	$ 99,020
H.	Percentage of Total Project Ceiling	16.7%

FINAL POLREP____FORTHCOMING_X__SUBMITTED BY Eugene G. Dominach
FURTHER POLREPS

Eugene G. Dominach
Removal Action Branch

RELEASE DATE 9-22-89

2.7 Sampling Plan

WESTON • SPER Suite 201, 1090 King Georges Post Road,
Edison, NJ 08837 • (201) 225-6116

TECHNICAL ASSISTANCE TEAM FOR EMERGENCY RESPONSE REMOVAL AND PREVENTION
EPA CONTRACT 68-01-7367

TO: G. Dominach

FROM: Atul Rajani / A. Diaz

SUBJECT: Documentation of Transmittal

SITE: King of Prussia Landfill

TDD#: 02-8902-25

DATE: 3/23/89

The purpose of this memo is to document the transmittal of the following:

_____ Letter Report DCN#_____

_____ OSC Report Draft/Final DCN#_____

_____ Photographs

_____ Analytical Data

_____ POLREP

_____ Safety Plan DCN#_____

_____ Community Relations Plan DCN#_____

_____ Sampling Plan DCN#_____

✓ Sampling Report DCN# Revised.

_____ Action Memorandum DCN#_____

_____ SPCC Report

_____ Site Maps

_____ Other _____

cc: TAT PM
TDD File

3/29/89 FASP/Removal Program Meeting

RAY BATH	NUS	225-6160
REN NAMAN	"	"
DAVE GRUPP	"	"
ATUL RAJAN	TAT	225-6110
EUGENE DOMINICK	KAB	321-6666
[illegible]	TAT	225-6116
Carol D'Alessandro	SMB	321-6714
John Witkowski	EPA	321-6739

KING OF PRUSSIA SAMPLING PLAN

1. Project Name: King of Prussia Sampling Plan
   Winslow Township, Camden County, NJ

2. Project Requested By: Eugene Dominach, On-Scene Coordinator
   Response and Prevention Branch

3. Date Requested: March 8, 1989

4. Date of Project Initiation: March 1, 1989

5. Project Officer: Atul Rajani, TAT II

6. Quality Assurance Officer: Anibal Diaz TAT II

7. Project Description:

   a. Objective and Scope:

The purpose of this project is the collection of soil samples for analysis of target compound list (TCL) metals in soils. The soil samples collected for (TCL) metals will be screened using a field X-Ray Flourescence (XRF) unit manufactured by KEVEX and analyzed using a CLP lab. By utilizing the XRF unit in conjunction with a limited number of CLP fixed lab analyses, a determination can be made as to whether or not the contaminant levels warrant an immediate removal action by the RAB. The advantages of using the XRF unit are real time analysis, multielement analytical capacity, minimal sample quantity preparation and no cost to the project ceiling.

   B. Data Usage:

Data obtained from this sampling program will be used in conjunction with previous analytical results to accomplish the following:

   i. Identify the extent of soil contamination in and around the carboy area in order to establish the possible removal of carboys and contaminated soil.

   ii. Determine the direction of contaminant migration and evaluate the possibility of a correlation between the lagoons, carboys and stressed vegetation.

   iii. Compare the results with the data obtained by the Responsible Party.

   iv. Confirm reliability of results obtained by the KEVEX unit.

C. Sampling:

Samples will be collected from a 30,000 square foot grid encompassing the carboy area, portions of lagoons #1 and #6, and the areas of stressed vegetation (See Figure 1). The main grid will then be divided into 12 equal grids of 50' x 50' each. Three columnar samples will be collected from each grid to a depth of 3 feet. One composite sample, consisting of two jars, will be made from the three column samples taken from each of the grids. One jar will be analyzed by fixed lab analyses, while the second jar will be retained for comparative analyses on the KEVEX unit. Similarly, three more biased soil samples will be collected surrounding the lagoons. In addition, five more samples will be taken for Quality Assurance/Quality Control which will include: a field blank, a duplicate, a matrix spike and two rinsate blanks.

D. Parameter Tables:

Parameter	Number of Samples	Sample Matrix	Analytical Method Reference	Sample Preservation	Holding Time
Heavy Metals	18	Soil	Prep 3050* Analysis* 7,000's	None	6 mos.
Heavy Metlas	2	Water	Prep 3010* Analysis 200's**	HNO3 to pH<2	6 mos.
Heavy Metals	As needed	Soil	KEVEX Inst.***	None	6 mos.

* SW - 846
** MCAWW
*** See Appendix A

8.0 Project Fiscal Information

Sampling equipment and manpower will be provided by the Technical Assistance Team (TAT). Analysis of samples for heavy metals will be arranged by TAT and performed by CLP. Heavy metals analysis using the KEVEX will be provided by the Field Investigative Team (FIT).

9.0 Project Organizations and Responsibility:

Eugene Dominach	On-Scene Coordinator
Atul Rajani	Project Manager
Anibal Diaz	Laboratory QA/QC Analysis
Don Graham	Overall QA/QC Officer

10.0 Sampling Procedure

The utilization of any of the sampling devices described below will yield samples considered representative for the purpose of this project. The soil samples will be collected on site from 15 locations using two hand augers to a 3 foot depth. The diameter of the hand auger is 3 1/4". Figure 2 shows the components and material of construction of the auger. From each grid, three columnar soil samples will be composited to obtain one representative sample. The sample will then be split into two jars, one for CLP lab and the other for analysis on the KEVEX unit. The hand auger will be rinsed with soap and water after every sampling. To ensure no cross contamination, the final rinsate for each hand auger will be collected and sent to the CLP lab to verify the integrity of the samples. All soil samples will be collected in 8 oz glass containers that have been specially cleaned following CLP protocol. Once it is confirmed that the KEVEX is providing reliable data, those locations showing results above the instrument detection limit (IDL) (refer to Table 1), will be resampled to establish the degree and extent of contamination. An aliquot of each columnar sample location will be taken at one, two, and three feet to represent that part of the sampling grid. During this phase of sampling, a few samples from the site may be analyzed for organic parameters.

TABLE 1 - IDL FOR METALS

Element	IDL, ppb
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5000
Chromium	10
Cobalt	50
Copper	25
Iron	100
Lead	5
Magnesium	5000
Manganese	15
Mercury	0.2
Nickel	40
Potassium	5000
Selenium	5
Silver	10
Sodium	5000
Thallium	10
Vanadium	50
Zinc	20

11.0 Sample Custody Procedures:

EPA Chain-of-Custody will be maintained throughout the sampling program as per TAT Standard Operating Procedures (SOP) on sample handling, sample container contract specifications and EPA Laboratories SOP. The Chain-of-Custody form to be used lists the following information:

i. Sample number

ii. Number of sample containers

iii. Description of samples including specific location of sample collection.

iv. Identity of person collecting the sample.

v. Date and time of sample collection.

vi. Date and time of custody transfer to laboratory (if sample was collected by a person other than laboratory personnel).

vii. Identity of person accepting custody (if the sample was collected by a person other than the laboratory personnel).

viii. Identity of laboratory performing the analysis.

12.0 Documentation, Data Reduction and Reporting:

Documentation: Field data will be entered into a bound notebook. Field notebooks, Chain-of-Custody forms, and laboratory analysis reports will be filed and stored per the TAT Document Control System.

13.0 Quality Assurance and Data Reporting:

Contracted Laboratory Quality Assurance:

QA/QC to be furnished by the contracted laboratory in performance of the analysis will consist, at a minimum of the following measures to ensure accurate data.

1. One field blank will be shipped unopened to the laboratory. This blank is to be analyzed in order to ensure that no contamination has occurred.

2. Every 20th sample will be collected in duplicate and analyzed to determine analytical precision and accuracy.

3. A matrix spike sample will be analyzed to evaluate analytical accuracy.

4. A rinsate blank will be analyzed to verify sampling integrity.

14.0 Data Validation:

All steps of data generation and handling will be evaluated by the On-Scene Coordinator, the Project Officer, and the Quality Assurance Officer for compliance with EPA Region II SOP for validating hazardous waste site data.

15.0 System Audit:

The QA/QC Officer or a designated representative will observe the sampling operations and review subsequent analytical data to assure that the QA/QC project plan has been adhered to.

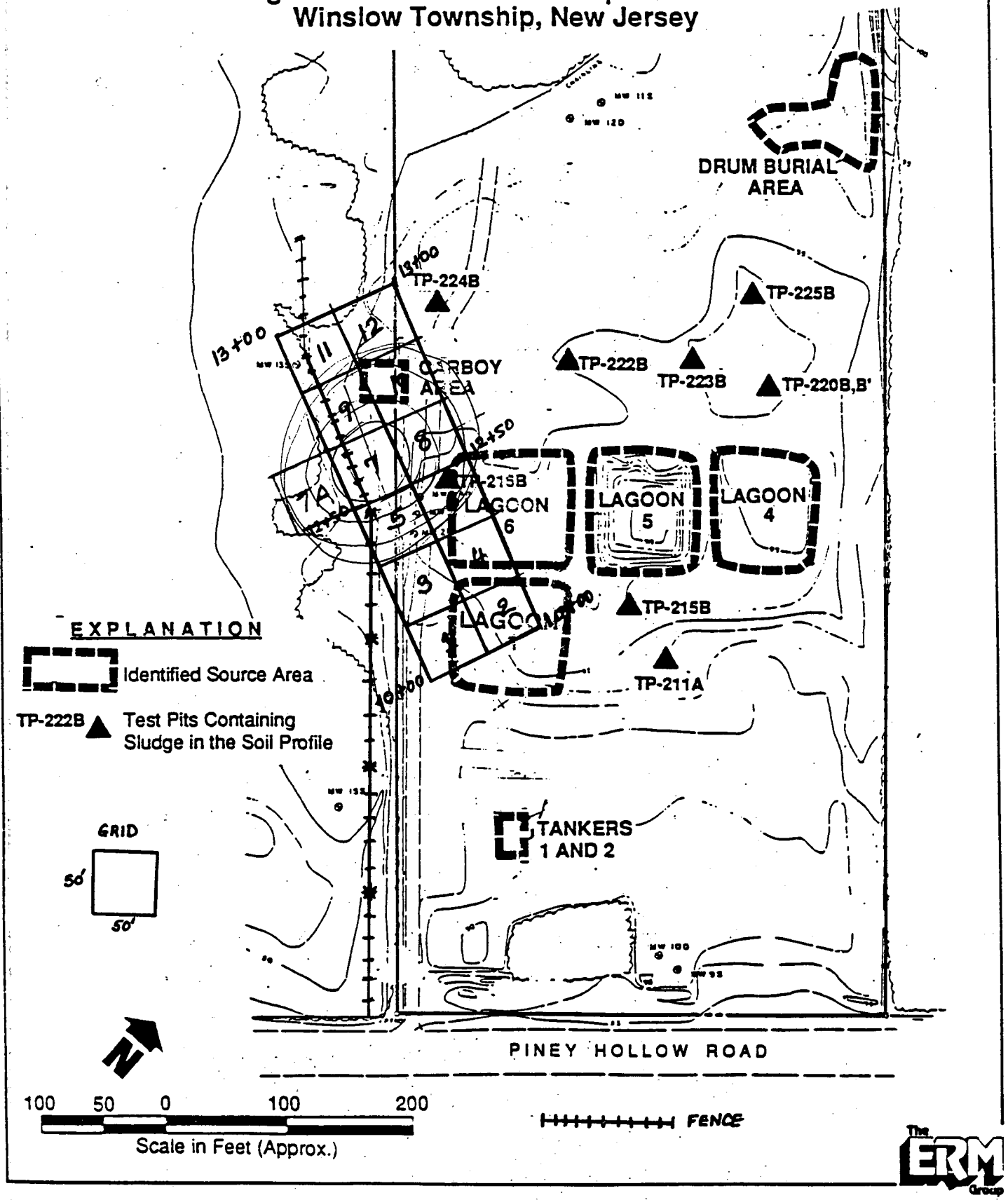
16.0 Corrective Action:

All provisions in the field and laboratory will be taken to ensure that any problems that may develop will be dealt with as quickly as possible to ensure the continuity of the sampling program. Any deviations from this sampling plan will be noted in the final report.

17.0 Reports:

Draft reports will be issued 14 days after receipt of laboratory results. Final reports will be issued 7 days after the return of the draft report by the EPA's Project Manager.

Figure 1
Identified Source Areas
King of Prussia Technical Corporation Site
Winslow Township, New Jersey



E.J.K 12/16/88

7040.015

The ERM Group

APPENDIX A

INFORMATION ON KEVEX INSTRUMENT

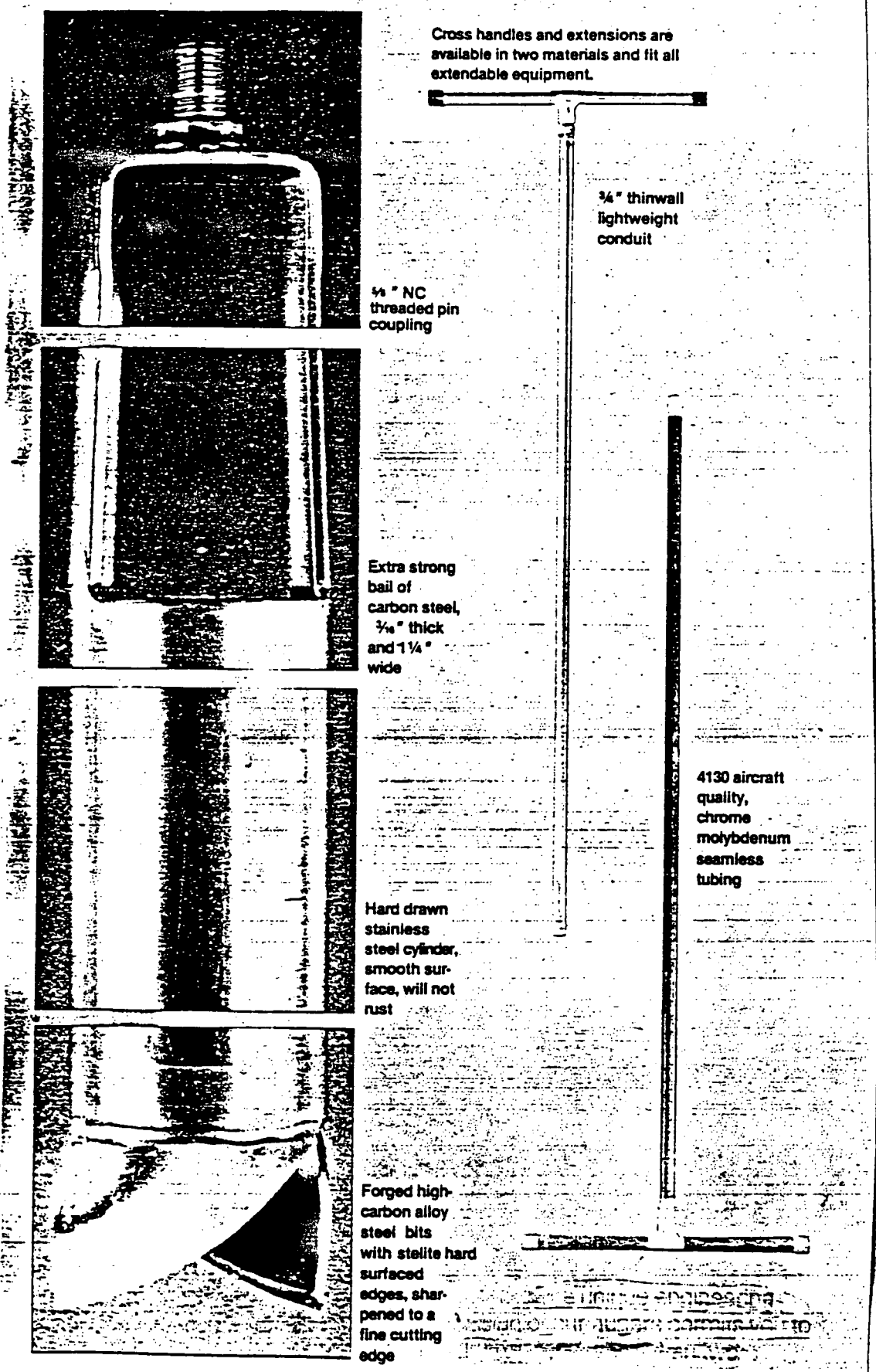


FIGURE 2. HAND AUGER

Applications of X-Ray Fluorescence Spectroscopy for Site Screening

Annette R. Sackman
Randy Perlis
Mark Chapin
Ecology and Environment, Inc.
Denver, Colorado

ABSTRACT

Recent field investigations have demonstrated the successful use of x-ray fluorescence spectroscopy (XRF) screening analysis for metal contamination at various hazardous waste sites.

Using minimal sample preparation and field sampling methods, the results were comparable to laboratory results using conventional methods such as atomic absorption (AA) and inductively coupled plasma (ICP). Multi-elemental analysis was performed on soil samples with particular interest in lead, arsenic, chromium, copper, and zinc levels. Detection limits achieved for some elements were 10 ppm. The XRF results were used in mapping and contouring the extent of contamination of a hazardous waste site containing inorganic contamination.

The lower detection limits and quick turn-around times proved the feasibility of using the XRF in screening hazardous waste sites and environmental monitoring.

INTRODUCTION

The Ecology and Environment, Inc. (E&E, Inc.) Field Investigation Team was tasked by the U.S. EPA to initiate a field analytical screening program to assist in site investigations and listing or expanded site investigations. Field screening should enhance the preremedial program by assisting the U.S.EPA in completing the site inspection inventory in a timely manner, by decreasing the number of "non-detected" samples, by supporting the revised Hazardous Ranking System, and by accelerating remedial investigation and feasibility studies. The increased sampling capability increases the chances of detecting an observed release without compromising data quality since rapid turn-around allows CLP confirmation. Part of this program was to develop a screening analysis for metal-contaminated solids such as soils and sediments including mine tailings and mining waste materials in U.S. EPA Region VIII. E&E, Inc. determined the best instrument for these types of analysis would be an x-ray fluorescence spectrophotometer. Previous successful operations with the XRF indicated the XRF's usefulness in screening analysis of metal contaminated solids on potential hazardous waste sites.[1,2,3,4] However, lower detection limits were difficult to achieve.

The rapid turn-around times available on a wide variety of elements and minimal sample preparation made the XRF almost ideal for screening analysis. As previously stated, one major drawback associated with the XRF was the relatively high detection limits. However, with the Tracor 6000 XRF, E&E, Inc. is able to achieve detection limits of approximately 10 ppm consistently and confidently without liquid nitrogen cooling of the XRF detector as needed for other conventional low level XRF analysis. This advantage greatly increases the mobility of the instrument. These detection limits are more than adequate for most metal-contaminated sites.

The purpose of this paper is to summarize E&E, Inc.'s experience with low level XRF analysis and AA/ICP analysis from the CLP on collocated samples. An example of how the XRF screening analysis is used to characterize a hazardous waste site with grid sampling and contour mapping is presented.

INSTRUMENT CALIBRATION

Elemental identification and quantification are obtained using the "Fundamental Parameters" personal computer software in conjunction with the Tracor Spectrace 6000 energy dispersive x-ray fluorescence analyzer.

When metal atoms present in a soil sample (metals are actually present as metal complexes) are irradiated with a beam of x-rays, electrons in the atom's lower lying energy levels are excited to higher energy levels. The vacancies left in the inner electron orbitals make the atom unstable. Relaxation to the stable ground state occurs, resulting in the emission of x-rays characteristic of the excited elements. Thus, by examining the energies of the x-rays emitted by the irradiated soil sample, identification of metals present in the sample is possible. Comparing the intensities of the x-rays emitted from a given unknown sample to those emitted from reference standards with known analyte concentrations allows quantification of the metals present in the sample.

During sample analysis, a spectrum is acquired. Different instrumental parameters and excitation conditions are used to analyze for different metals. Generally, metals are segregated for analysis into groups which emit x-rays within a specified energy range. Currently 14 different elements are being analyzed using three separate excitation conditions. A sample spectrum for the mid atomic number elements potassium, calcium, and chromium is presented in Figure 1. Figure 2 is a sample spectrum for the high atomic number elements: manganese, iron, copper, zinc, arsenic, and lead. And a sample spectrum for the elements silver, cadmium, tin and antimony is presented in Figure 3.

As previously stated, a peak's position along the spectral energy axis (horizontal axis) is indicative of the element from which it arose, and therefore is the primary basis of elemental identification. Each metal will exhibit several peaks in the spectrum, since a separate peak will be observed for each allowed electron orbital energy transition. For example, peak A in Figure 2 is lead's L-alpha line. It arises when electrons initially excited to a lead atom's M shell return to the lead atom's L shell giving off x-rays which have an energy of 10.5 KeV. Peak B is lead's L-beta line. When electrons in the lead atom energetically relax from the N shell to the L shell, x-rays at 12.6 KeV are emitted.

Prior to running a series of samples, the instrument is calibrated

Finally, the program calculates values termed alpha coefficients which quantitatively describe matrix absorption, or enhancement effects on the analyte intensity. The alphas are calculated using the hypothetical standards established by the "Fundamental Parameters" program. The program first generates a list of standards with concentrations values grouped around the average concentrations of the actual standards. For each of the hypothetical standards, the program calculates the relative intensities that would be measured for each element in the standard. Alpha coefficients are then calculated from these hypothetical standards. The standards data are stored on a disk and the instrument does not have to be standardized prior to each run, only reference calibrated with the pure copper standard.

When running an unknown, the program first recalculates pure element count rates by sorting the standards to which one is closest to the unknown based on the intensities of the unknowns and standards.

Analysis of unknowns proceeds by an iterative computation. An estimate of the composition of the unknown is made by comparison of the measured intensities to the pure element count rate values. The estimated concentrations are then used along with the alpha coefficients to make a new estimate of the composition. The process is repeated again with the program using the last calculated composition values along with the alpha coefficients and pure elemental count rates to calculate a new composition. If the difference between the last calculated concentration and the concentration determined from the new iteration is less than 1% relative, the program assumes convergence and the analysis procedure ends.

SAMPLE PREPARATION

Soil and sediment samples are collected with the usual protocol, although not as large a sample is required as with the acid digestion in AA/ICP analysis. The most homogeneous sample possible is recommended.

No great differences have appeared between grab or composite sampling provided the samples are well mixed. Grab samples have shown a slight statistical advantage in comparing with AA/ICP results which probably reflect sample homogeneity.

Analysis of particulates collected on dust filters is now being tested. No sample preparation is involved with air filters, however accuracy of the results depends greatly on sampling procedures and accurate measurement of sample amount.

Sample preparation for XRF screening analysis was designed to be kept simple. Accuracy of XRF results is described in detail by Wheeler.[5] The sample preparation is minimal to ensure rapid turnaround and to provide adequate analytical quality. The minimum sample preparation includes air or mild oven drying of the solid sample and mixing in a mortar and pestle to homogenize the sample as much as possible. No sieving is necessary unless the sample contains particles larger than 10 mesh. After mixing , the sample is placed as a loose powder in a sample cup and sealed with mylar. The sample is irradiated through the mylar by the instrument and analyzed. Using this procedure, a sample can be prepared and analyzed in approximately 30 min.

The sensitivity of the XRF is proportional to the fineness of the sample and smoothness of the analytical surface. Procedures not employed by E&E, Inc., but which improve analytical sensitivity, include grinding the sample and pressing a pellet or fluxing the sample. Both methods have been deemed inappropriate for site screening analysis. These procedures, however, are still obviously quicker and less hazardous than the acid digestion AA/ICP methods.

QUALITY ASSURANCE AND QUALITY CONTROL

QA/QC for XRF screening analysis includes duplicate samples, standards checks, and splits with other laboratories. Sample duplicates are run at a 10 to 20% frequency with the sample split before sample preparation. This procedure indicates the precision of an analysis and sampling procedure as well as the homogeneity of the sample matrix. An indication of the precision of the Tracor 6000 XRF alone was made by analyzing a standard as an unknown 10 times and calculating the standard deviation Table 1.

Table 1
Standard Deviation of Ten NBS Standard Sample Runs

ELEMENT	RUN 1 (PPM)	RUN 2 (PPM)	RUN 3 (PPM)	RUN 4 (PPM)	RUN 5 (PPM)	RUN 6 (PPM)
K	10520	10090	9220	10155	9840	9080
CA	52220	51630	50500	51790	50550	50870
CR	370	370	360	360	370	360
MN	700	680	660	800	830	760
FE	25780	26040	25810	25800	25540	25350
CU	550	630	580	550	570	540
ZN	4370	4340	4400	4340	4350	4260
AS	0	0	0	0	0	0
PB	6070	6050	6020	6050	6060	5920
AG	10	10	0	10	0	10
CD	80	80	70	80	70	70
SN	170	170	170	170	170	160
SB	40	40	30	40	40	40

ELEMENT	RUN 7 (PPM)	RUN 8 (PPM)	RUN 9 (PPM)	RUN 10 (PPM)	AVERAGE (PPM)	STANDARD DEVIATION
K	9830	9880	9350	9190	9715	457.3
CA	51320	50770	50180	51250	51108	612.6
CR	360	340	370	360	362	8.7
MN	610	740	740	810	733	67.1
FE	25500	25360	25590	25860	25663	217.2
CU	550	550	550	550	562	25.2
ZN	4270	4290	4310	4310	4324	42.0
AS	0	0	0	0	0	0.0
PB	5940	6010	5960	5940	6002	54.8
AG	10	0	0	0	5	5.0
CD	80	70	70	80	75	5.0
SN	170	170	170	170	169	3.0
SB	40	40	30	40	38	4.0

Standards used to calibrate the Tracor 6000 XRF were obtained from the National Bureau of Standards (NBS) and the Canadian Department of Energy, Mines and Resources (CDEMR). These standards are run at a 10 to 20% frequency during a site analysis to determine continuing calibration of the instrument. The NBS- and CDEMR-certified standard results were compared to results obtained from analyzing these standards as unknowns on the XRF Table 2.

Table 2
Comparison of XRF Results to NBS and Canadian Standards

SAMPLE	ELEMENT	CONCENTRATION (PPM) UNKNOWN	TRUE	RELATIVE PERCENT DIFFERENCE (%RPD)
NBS SRM 1648	K	9833	10500	6.56
SOIL STANDARD	CA	51817	NA	NA
	CR	387	403	4.05
	MN	700	860	20.51
	FE	26213	30100	13.80
	CU	570	609	6.62
	ZN	4420	4760	7.41
	AS	ND	115	NA
	PB	6073	6550	7.56
	AG	ND	6	NA
	CD	83	75	10.10
	SN	170	NA	NA
	SB	40	NA	NA
SO-3 CANADIAN	K	9010	11600	25.13
SOIL STANDARD	CA	140010	146300	4.39
	CR	40	26	42.42
	MN	280	520	60.00
	FE	12790	15100	16.57
	CU	20	17	16.22
	ZN	50	52	3.92
	AS	ND	NA	NA
	PB	30	14	72.73
	AG	ND	NA	NA
	CD	ND	NA	NA
	SN	10	NA	NA
	SB	ND	NA	NA
CCU-1A CANADIAN	K	ND	NA	NA
SOIL STANDARD	CA	2350	2500	6.19
	CR	60	NA	NA
	MN	430	NA	NA
	FE	272770	304700	11.06
	CU	226670	267800	16.64
	ZN	25220	28600	12.56
	AS	ND	53	NA
	PB	3120	3640	15.38
	AG	120	145	18.87
	CD	240	96	85.71
	SN	110	NA	NA
	SB	10	NA	NA

ND = NOT DETECTED
NA = NOT ANALYZED
%RPD = |X-Y|/((X+Y)/2)*100 , where
X = TRUE ; and Y = UNKNOWN

The Tracor 6000 results compared favorably to the certified standard results, especially for lead. To date, in samples containing high lead concentrations, arsenic percentages lower than approximately 12% of the lead concentrations could not be detected Table 3. In addition,

potassium and manganese values were observed to be increasingly [illegible] with increasing calcium and iron concentrations, respectively.

Table 3
Arsenic Detection Limits for Increasing lead Concentrations

SAMPLE	ELEMENT	CONCENTRATION (PPM) UNKNOWN	TRUE	RELATIVE PERCENT DIFFERENCE (RPD)
PD-1 CANADIAN SOIL STANDARD	K	1780	NA	NA
	CA	4060	NA	NA
	CR	190	NA	NA
	MN	2050	NA	NA
	FE	205710	NA	NA
	CU	106570	NA	NA
	ZN	523810	NA	NA
	AS	7030	7700	9.10
	PB	24840	27500	10.16
	AG	130	NA	NA
	CD	2840	NA	NA
	SN	500	NA	NA
	SB	123	NA	NA
CPB-1 CANADIAN SOIL STANDARD	K	ND	NA	NA
	CA	8000	NA	NA
	CR	110	NA	NA
	MN	400	390	2.53
	FE	98370	84300	15.40
	CU	2720	2540	6.84
	ZN	45660	44200	3.25
	AS	ND	560	NA
	PB	669910	647400	3.42
	AG	680	626	8.27
	CD	800	143	139.34
	SN	190	190	0.00
	SB	3800	3600	5.41
SO-1 CANADIAN SOIL STANDARD	K	26660	26800	0.52
	CA	17640	18000	2.02
	CR	170	160	6.06
	MN	910	890	2.22
	FE	52180	60000	13.94
	CU	80	61	26.95
	ZN	130	146	11.59
	AS	ND	NA	NA
	PB	20	21	4.88
	AG	ND	NA	NA
	CD	ND	NA	NA
	SN	20	NA	NA
	SB	ND	NA	NA

ND = NOT DETECTED
NA = NOT ANALYZED
%RPD = |X-Y|/((X+Y)/2)*100 , where
X = TRUE ; and Y = UNKNOWN

COMPARISON OF XRF RESULTS TO CONTRACT LABORATORY PROGRAM DATA

As in any comparison, the more similar the sample and the procedure are for multiple analysis, the closer the comparison will become. In dealing with soils and solid environmental samples the homogeneity of the matrix is questionable and therefore a true duplicate or split is difficult to achieve. Also, the differences in the methodologies of the XRF and CLP AA/ICP analyses lend to the differences observed in the comparison results.

A comparison between XRF and CLP results for a specific site is reported in Table 4.

Flags for the CLP data were not available at the time this manuscript was prepared. In most cases, XRF values were consistently high in comparison to CLP results for this site. Similar comparisons at other sites have yielded different results due to variations in soil matrices and CLP laboratories. In most XRF/CLP comparisons of data, chromium tends to be consistently higher in the XRF results by approximately a factor of two. No apparent reason is known for this phenomenon, but some theories suggest loss of chromium in the acid digestion process through a change in the oxidation number or enhancement properties in the soil matrix when XRF analysis is performed. Nevertheless, XRF results compared favorably with CLP results in many cases and certainly justify the XRF as a site screening tool.

APPLICATIONS OF RESULTS

Interpretation of XRF results have been used most successfully in more fully characterizing the extent and magnitude of contaminants on a site, characterizing contaminants migrating off-site, confirming and supporting heath assessment studies, and aiding in remedial action by confirming extent of cleanup. XRF results also have been used for field screening purposes which have aided in preliminary evaluations and on-site decision making. The quick turn-around times and low

Table 4
Comparison of XRF Results to CLP Results

SAMPLE	ELEMENT	CONCENTRATION (PPM) UNKNOWN	TRUE	RELATIVE PERCENT DIFFERENCE (RPD)
EC-1A CANADIAN SOIL STANDARD	K	ND	NA	NA
	CA	390	NA	NA
	CR	50	NA	NA
	MN	80	100	22.22
	FE	113380	109000	3.94
	CU	6780	6290	7.50
	ZN	337000	346500	2.78
	AS	ND	NA	NA
	PB	22000	22400	1.80
	AG	1610	1720	6.61
	CD	3940	NA	NA
	SN	6020	6100	1.32
	SB	80	NA	NA
UR-1 CANADIAN SOIL STANDARD	K	ND	200	NA
	CA	16260	16700	2.67
	CR	3100	3100	0.00
	MN	900	1200	28.57
	FE	119140	134000	11.74
	CU	3770	4300	13.14
	ZN	100	100	0.00
	AS	ND	NA	NA
	PB	20	NA	NA
	AG	ND	NA	NA
	CD	10	NA	NA
	SN	20	NA	NA
	SB	ND	NA	NA

ND = NOT DETECTED
NA = NOT ANALYZED
%RPD = |X-Y|/((X+Y)/2)*100 , where
X = TRUE ; and Y = UNKNOWN

detection limits achieved by the XRF unit make this instrument ideal for these and many more applications.

Sampling points and grid layouts have also been used extensively to interpret XRF results. Grid layouts are based on the size of the site, detail of investigation, turn-around time required, and economics such as extent of sampling and man-hours available. Results of a grid examination of a site using XRF analysis are presented in Figures 4 and 5. The figures presented show contamination zones and relative amounts of lead and zinc present on a hazardous waste site.

The intensity of the employed sampling characterized the waste present on-site and in the immediate areas and was used to evaluate on-site pathways. Forty-one soil samples were collected for XRF analysis, while 18 of these samples were submitted for CLP analysis. These figures clearly show the areas of high concentrations of contaminants.

CONCLUSIONS

XRF screening analysis of low level metal contamination is proving to be valuable in the investigations of hazardous waste sites. XRF screening analyses have very effectively: established contamination boundaries using contouring maps; visualized contaminated zones and the extent of contamination on-site; and characterized migration pathways. It has also aided in preliminary evaluations and on-site decision-making.

The cost savings compared to usual inorganic analytical services is estimated to be $80/sample per sample after instrument payoff. The turn-around times with XRF analysis are conducive to field screening. The small amount of sample necessary and minimal sample preparations diminish health and safety problems and reduce the amount of sample to dispose. The non-destructive analytical technique allows multiple analysis and archiving of samples.

With advancing technology, x-ray fluorescence spectrometers are becoming more mobile and portable while achieving lower detection limits. Thus field screening analyses are possible. Finally, the results obtained from XRF screening analyses show good correlations with other types of inorganic analyses and basic trends and comparisons can be confidently made.

REFERENCES

1. Raab, G. A., "Evaluation of a Prototype Field Portable X-Ray Fluorescence System for Hazardous Waste Screen", *EPA Research & Development*, Aug.

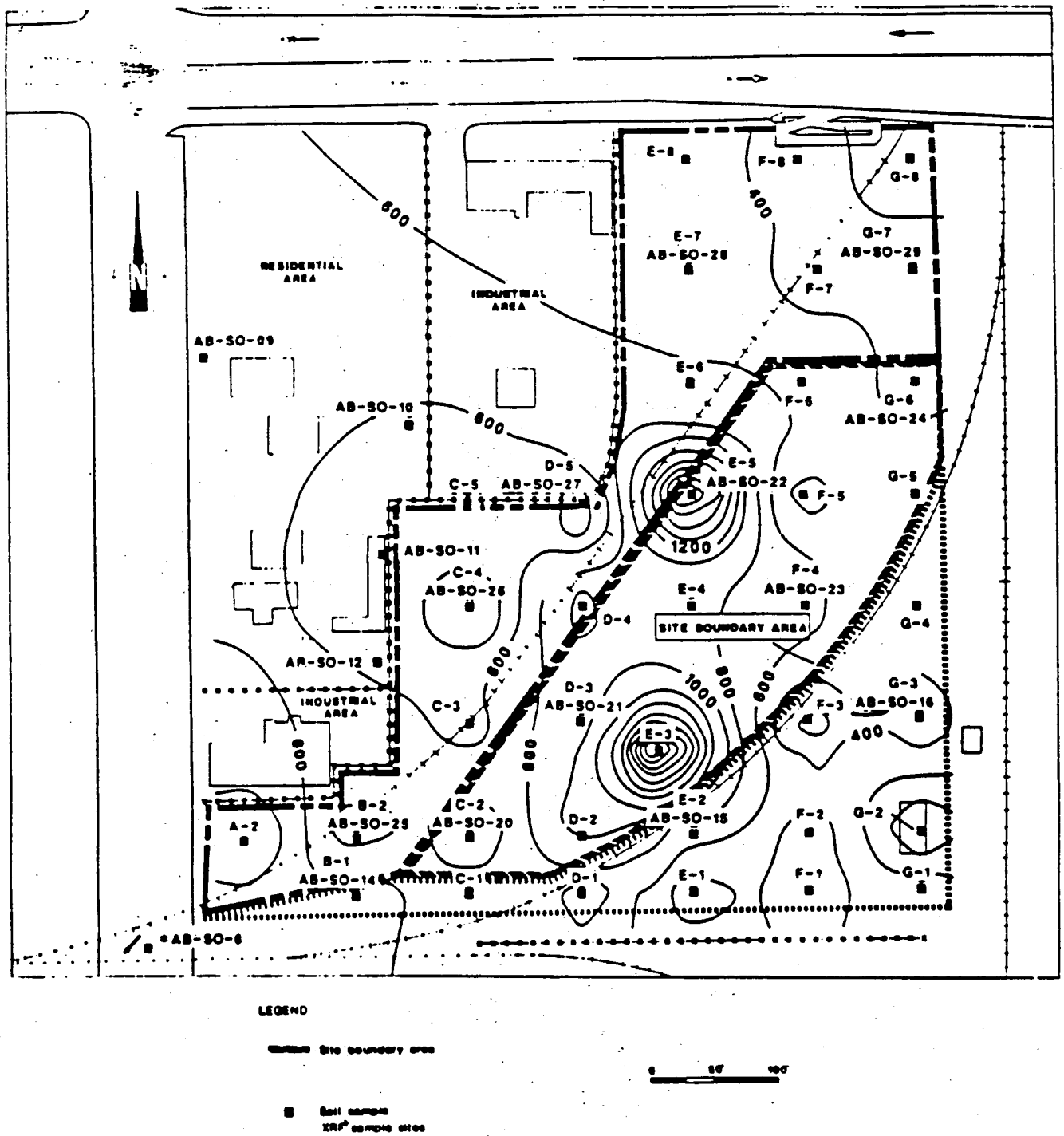


Figure 4
Lead IDS Contour Map

1987.

2. Furst, G. and Spittler, T., "Screening for Metals at Hazardous Waste Sites: A Rapid Cost-Effective Technique Using X-Ray Fluorescence", *Proc. Management of Uncontrolled Hazardous Waste Sites 6th National Conference*, HMCRI, Silver Spring, MD, pp. 93-96, Nov. 1985.
3. Mernitz, S. and Staible, T., "Use of a Portable X-Ray Analyzer and Geostatistical Methods to Detect and Evaluate Hazardous Metals in Mine/Mill Tailings", *Proc. Management of Uncontrolled Hazardous Waste Sites 6th National Conference*, HMCRI, Silver Spring, MD, pp. 107-111, Nov. 1985.
4. Piorek, S. and Rhodes, J. R., "Hazardous Waste Screening Using a Portable X-Ray Analyser", *R&E Report* #528, March 1987.
5. Wheeler, B., "Accuracy in X-Ray Spectrochemical Analysis as Related to Sample Preparation", *Spectroscopy*, 3,(3), pp. 24-33, 1987.

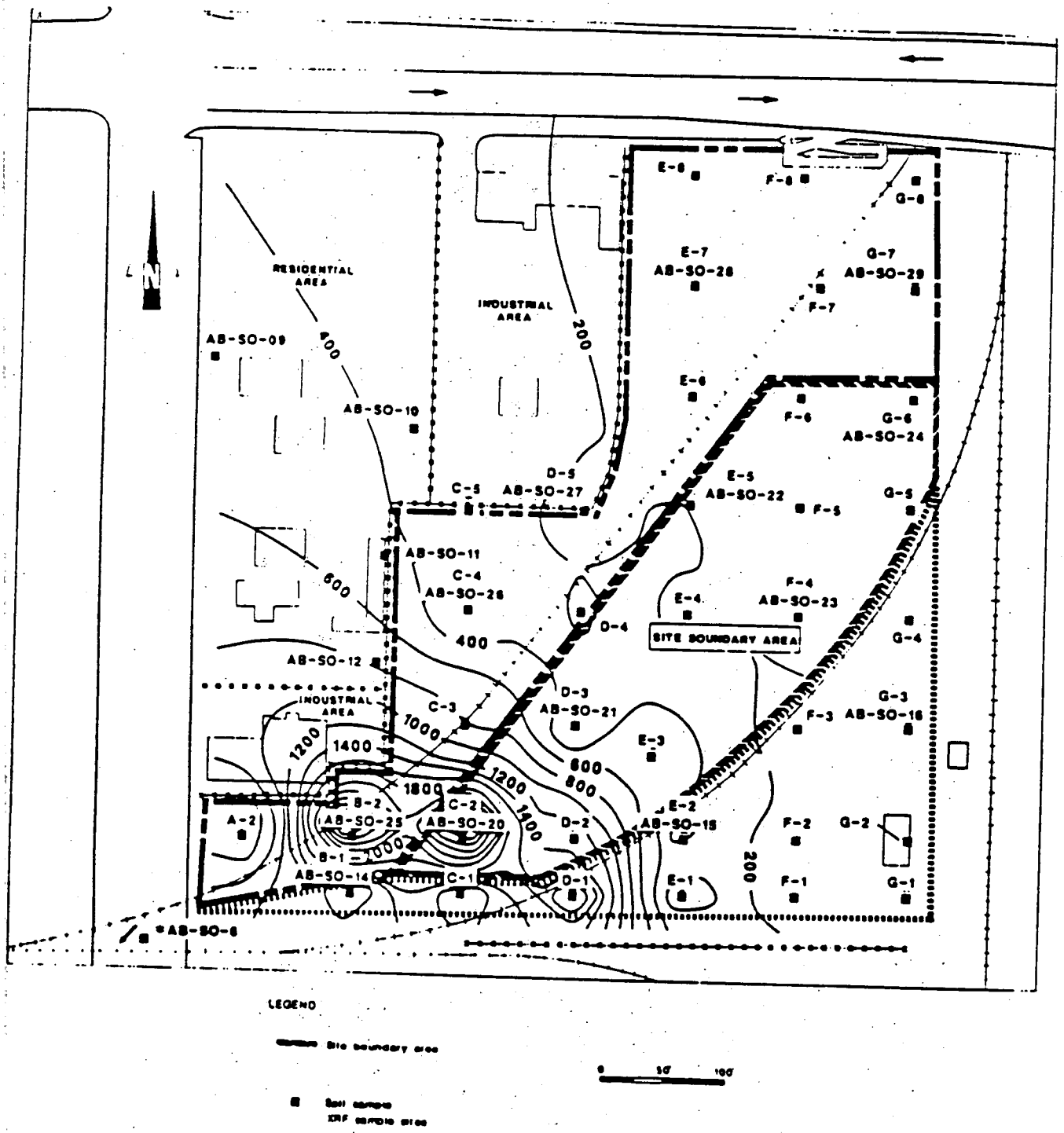


Figure 5
Zinc IDS Contour Map

METHOD FM-2: X-RAY FLUORESCENCE (XRF) IN LABORATORY FOR HEAVY METALS

SUMMARY: Rapid screening of most metals (46) in soil and water in field laboratory to minimum of 20 mg/kg in soil. Conventional methods have better sensitivity and precision. Simultaneous detection (of the 18 elements analyzed for) is one of the greatest advantages of the system.

METHOD DESCRIPTION: Uses a flux of high energy x-rays to bombard sample causing elements in sample to emit characteristic wavelengths. The instrument separates the elements' wavelengths into a spectrum. Concentration of elements present is directly proportional to energies being produced. Technique used to screen soil and water samples. Soil sample preparation includes drying sample and grinding to a fine powder. Aqueous sample preparation includes concentrating the metallic

cations by filtering through strong acid ion exchange paper. Sample pH must be below 2 to ensure that metal ions are in cationic form. When anionic forms such as arsenate, etc. are present, base ion exchange is required. Region VIII method uses portable XRF analyzer which offers less sensitivity and detects fewer metals than this method.

APPLICATION: Rapid screening in laboratory for chromium, barium, cobalt, silver, arsenic, antimony, selenium, thallium, mercury, tin, cadium, lead, copper, nickel, zinc, manganese, iron, and vanadium.

LIMITATIONS: Does not have sensitivity or precision of atomic absorption or other conventional methods. Lithium, beryllium, aluminum, and boron not detected using this method.

INSTRUMENTATION USED: Kevex 7000 X-Ray Fluorescence Spectrometer.

PERFORMANCE SPECIFICATION

DETECTION LIMIT: Is element specific. For critical elements such as lead, it is 20 mg/kg in soil and 600 ug/l in water. For 18 elements tested, the range was from 20 to 50 mg/kg in soil and 100 to 600 ug/l in water.

SELECTIVITY: Elements may be identified by looking at various emission x-rays (i.e., K-alpha, K-beta, etc.). Spectra are stored on computer disc for later printout and direct identification of each element.

ACCURACY: Four samples analyzed for lead by CLP had values of 80, 180, 130 and 910 mg/kg. The range of values for the same samples analyzed by XRF were 100-300, 100-200, 95-120 and 800-900 mg/kg, respectively.

PRECISION/REPEATABILITY: Duplicate samples show good repeatability.

COMMENTS: XRF is non-destructive; samples can be stored for future reference after analysis.

USE

LOCATION USED: Sudbery, MA; 1985 (Non-CERCLA).

EPA SITE NUMBER (CERCLIS): Non-CERCLA

MATRIX: Soil and Water.

PREPARATION, MAINTENANCE AND CLEANUP: Soil samples (dried, 60 mesh-screened) are placed directly into sample cup; aqueous samples are ion exchanged by passing through a resin-coated filter paper. XRF spectrometer must be set up and programmed. Maintenance of the spectrometer includes checking probe for cleanliness and dryness and checking source decay. Standards are prepared using 1,000 mg/kg AA standard solutions for Ag, Ba, Mn, Ni, Sn, Zn, Se and Pb. Standards can be prepared separately or as multi-element mixtures and can be used up to 5 months.

ANALYSIS TIME: 10-30 minutes for sample preparation. Analysis time is less than 10 minutes.

CAPITAL COSTS: $80,000.00

CALIBRATION: Standards required at concentrations of 1000, 500, 250, and 125 mg/kg for soil and 2, 1, 0.5 and 0.25 ug/l plus a blank for water samples. Run all standards at beginning of each day and run a set every fourth hour of analysis or after all samples have been analyzed, whichever is more frequent. Additional standards must be prepared and used to cover the entire working range of required analyses.

COMMENTS: Spectrum displayed on video screen and stored in computer disk. Used routinely in Region I. Sample quantity needed for analysis is 1g of soil or 40 ml for water.

PROTOCOL AVAILABLE: Yes.

SOURCE

TECHNICAL CONTACT: Dr. Thomas Spittler

AFFILIATION: U.S. EPA Region I Laboratory

TELEPHONE: (617) 861-6700

PREPARED: April 7, 1987

BIBLIOGRAPHY

Furst, G.A., Spittler, T. and Tillinghust, V., "Screening For Metals at Hazardous Waste Sites: A Rapid Cost-Effective Technique Using X-Ray Fluorescence," Management of Uncontrolled Hazardous Waste Sites, Washington, D.C. November 4-6, 1985.

SAMPLING QA/QC PLAN

King of Prussia Removal

Prepared by
Roy F. Weston, Inc.

EPA Project No.: 2-8909-01
Contractor Work Order No.: 2504
EPA Contract No.: 2962-21-02-2504

APPROVALS

Roy F. Weston, Inc.

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Anibal Diaz — Date: 10/6/89
Project Manager

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Eugene Dominach — Date:
On-Scene Coordinator

1.0 BACKGROUND

The suspected contamination is a result of:
an abandoned liquid waste treatment facility.

The following information is known about the site:
The site is located in the city of Winslow Township in the County of Camden, in the State of New Jersey. See attached map, Figure 1.1. The nearest residents are located within a quarter mile of the site, in an easterly direction. The site was a liquid waste treatment facility on 10 acres of property which had been operating for a number of years and is now abandoned since 1975.

The types of material(s) handled by this facility were/are:

___ radioactives
_X_ acids
_X_ unknown
_X_ organic solvents
_X_ bases
_X_ petroleum
_X_ inorganics
___ (specify other)

The volume(s) of contaminated materials to be addressed are: 350 cubic yards of soil and 150 gallons of Hydrochloric Acid.

The contaminants of concern are:

Chemical	Range
Metals	100ppm to 20,000 ppm
HCL	1% to 25%

The basis of this information/data may be found in:
the site associated polreps and the action memo.

2.0 OBJECTIVES

The objective of this sampling event is to determine:

___ the presence of contamination
_X_ the extent of contamination
_X_ the magnitude of contamination
___ the impact of contamination
___ the effectiveness of new sampling methods or instrumentation
__ (specify other)

For the purpose of:

___ site characterization
_X_ monitoring data
___ engineering design
___ risk assessment
_X_ enforcement action
_X_ disposal
___ field personnel health & safety
___ bioassessment
___ compatibility
_X_ (specify other)
residual contamination assessment

The data will be evaluated against:

___ an existing data base (specify)
_X_ federal/state action levels (NJDEP/RCRA)
___ permit levels (specify)
___ (specify other)

3.0 QUALITY ASSURANCE OBJECTIVES

As identified in Sections 1.0 and 2.0, the objective of this sampling event applies to the following parameters:

Parameters	Matrix	INTENDED USE OF DATA	QA
VOA	liq/soil	disposal	2
BNA	liquid	disposal	2
PEST	liquid	disposal	2
PCB	liquid	disposal	2
METALS	liquid	disposal	2
CN	liquid	disposal	2
HCL	liquid	disposal	1
CORROSIVITY	liq/soil	disposal	1
IGNITABILITY	liq/soil	disposal	1
REACTIVITY	liq/soil	disposal	1
EP TOXICITY	soil	disposal	1

Verification of preliminary screening results will be achieved by:

- Definitive quantitation - On at least 10% of the samples collected, analyte quantitation will be verified by alternate method or repeat of preliminary procedure; and a determination of precision, accuracy, and confidence limits will be made on at least 1% of the samples collected using the verification method.

Methods to be employed during this event include:

_X_ spot tests
_X_ indicator tubes
_X_ paper strip tests
_X_ chemical reactions producing colors, gases, or precipitates
_X_ electronic meters (e.g. pH, conduct)
_X_ electronic detectors
- ___ photoionization
- ___ electron capture
- ___ flame ionization
- ___ flame photometric
- ___ electron capture
- ___ infrared
- ___ gas chromatography
- ___ mass spectroscopy (single ion monitoring)
- ___ GC/MS
- _X_ atomic adsorption
- _X_ ICP
- _X_ X-ray fluorescence

X other
Ion Chromatography

Methods for confirmed identification on organics include:

__ GC/photoionization
__ GC/electron capture
__ GC/flame ionization
__ GC/flame photometric
__ infrared
__ gas chromatography
__ mass spectroscopy
__ GC/MS
__ [other]

Methods for definitive quantitation and determination of confidence limits will include matrix spike duplicates.

Results will be representative, comparable, and complete. This QA Objective, defined by this criteria as QA-2, is further defined by requirements in Section 6.0.

4.0 APPROACH AND SAMPLING METHODOLOGIES

4.1 Media/Matrix

This event involves the assessment of the following media/matrix:

__X__ soil/sediment
___ groundwater
___ surface water
___ air
__X__ waste material
___ soil gas
___ specify other

4.2 Sampling Equipment

The following equipment will be utilized to obtain samples from the respective media/matrix:

Matrix/Media	Sampling Equipment	Fabrication	Dedicated
liquid waste	scoop	plastic	no
soil	auger/trowel	stainless steel	no

4.2.1 Sampling Equipment Decontamination

The following decontamination procedure will be employed prior and subsequent to sampling each soil location in the following sequence:

__1__ physical removal
___ non-phosphate detergent wash [specify:
__2__ potable water rinse
___ distilled/deionized water rinse
__3__ 10% nitric acid rinse
___ solvent rinse [specify:
___ solvent rinse [specify:
__5__ air dry
__4__ distilled water rinse
___ organic free water rinse

4.3 Sampling Design

The sampling design is depicted on the attached Sample Location Map (Figure 4-1) and is based on the following rationale:

A composite of all the Hydrochloric Acid waste will be obtained by mixing equal volumes from each drum in 16 ounce bottles. These samples will be collected using a plastic scoop.

The soil samples will be obtained from three distinct sources; an acid tainted-neutralized soil pile, a metals contaminated soil pile and the excavation area. An auger will be used to collect a composite from the piles. Aliquots from a grid on the piles will be mixed in a stainless steel bowl using trowels and submitted for analysis. The trowels will be used for obtaining samples from the excavation area and for any other subsurface samples.

All of the samples will be mixed thoroughly and then split to allow for all the necessary analyses. One of the liquid waste samples will be Hazcatted, a second sent to a lab for disposal analysis and another stored as a retain sample. Similarly, every soil sample from the excavation area will be screened using an XRF and six to ten of them will be submitted to CLP for metals analysis (confirmation of XRF, determination of levels of contamination and evaluation of residual contamination). The soil from the waste piles will be split for XRF, CLP, disposal analysis and a fourth aliquot retained for future evaluation.

The sampling equipment will be decontaminated following the procedure specified above and the final distilled water rinse collected and sent to the lab involved in metals analysis for determination of sample integrity.

4.4 Standard Operating Procedures

4.4.1 Sample Documentation

All sample documents must be completed legibly, in ink. Any corrections or revisions must be made by lining through the incorrect entry and by initialing the error.

1. Field Log Book

The Field Log Book is essentially a descriptive notebook detailing site activities and observations so that an accurate account of field procedures can be reconstructed in the writer's absence. All entries should be dated and signed by the individuals making the entries, and should include (at a minimum) the following:

1. Site name and project number.
2. Name(s) of personnel on-site.
3. Dates and times of all entries (military time preferred).
4. Descriptions of all site activities, including site entry and exit times.
5. Noteworthy events and discussions.
6. Weather conditions.
7. Site observations.
8. Identification and description of samples and locations.
9. Subcontractor information and names of on-site personnel.
10. Date and time of sample collections, along with chain-of-custody information.
11. Record of photographs.
12. Site sketches.

2. Sample Labels

Sample labels must clearly identify the particular sample, and should include the following:

1. Site number.
2. Time sample was taken.
3. Sample preservation.
4. Initial of sampler(s).

Optional, but pertinent, information:

1. Analysis requested.
2. Sample location.

Sample labels must be securely affixed to the sample container. Tie-on labels can be used if properly secured.

3. Chain of Custody Record

A Chain of Custody record must be maintained from the time the sample is taken to its final deposition. Every transfer of custody must be noted and signed for, and a copy of this record kept by each individual who has signed. When samples (or groups of samples) are not under direct control of the individual responsible for them, they must be stored in a locked container sealed with a Chain of Custody seal.

The Chain of Custody record should include (at minimum) the following:

1. Sample identification number.
2. Sample information.
3. Sample location.
4. Sample date.
5. Name(s) and signature(s) of sampler(s).
6. Signature(s) off any individual(s) with control over samples.

4. Chain of Custody Seals

Chain of Custody Seals demonstrate that a sample container has not been tampered with, or opened.

The individual in possession of the sample(s) must sign and date the seal, affixing it in such a manner that the container cannot be opened without breaking the seal. The name of this individual, along with a description of the sample packaging, must be noted in the Field Logbook.

5. Corrective Action

Corrective actions are those taken in response to nonconformance reports, audit findings, or surveillance findings. The quality assurance representative is responsible for reviewing audit reports and nonconformance reports to determine the significant or repetitious conditions adverse to quality, or failure to implement or adhere to required quality assurance practices. When such problems are identified, the responsible manager must investigate the causes of the problems and define and implement the necessary actions to correct the problems. Documentation that supports major corrective actions must be maintained in the project files.

4.4.2 Sampling

Drum Sampling

Prior to sampling, drums must be inventoried, staged, and opened. Inventory entails recording visual qualities of each drum and any characteristics pertinent to the contents' classification. Staging involves the organization, and sometimes consolidation of drums which have similar wastes or characteristics. Opening of closed drums can be performed manually or remotely. Remote drum opening is recommended for worker safety.

The method used for sampling the drums involves the use of a plastic scoop. This method is quick, simple and inexpensive. The scoop is inserted into the drum to obtain a grab sample from the subsurface of the liquid. The waste is allowed to equilibrate in the scoop, which is then emptied into three sample containers. The process is repeated for the other two drums.

Soil Sampling

The collection of samples from near-surface soil will be accomplished with trowels. Surface debris will be removed to the required depth with this equipment in order to collect a representative sample. This method can be used in most soil types but is limited to sampling near surface areas. The use of a flat, pointed mason trowel to cut a block of the desired soil can be helpful when undisturbed profiles are required.

Sampling at depth will be accomplished with an auger. This system consists of an auger, a series of extensions, and a "T" handle. The auger is used to bore a hole to desired sampling depth. The core is then withdrawn and the sample collected.

Subsurface soil sample collection will follow excavation activities. Samples are collected from the pit using a trowel scoop.

The stainless steel sampling devices should be cleaned, before sampling and between samples, following the decontamination procedure described elsewhere in Section 4.0.

Waste Pile Sampling

Stainless steel shovels, spoons, or scoops will be used to clear away surface material before samples are collected. For samples at depth, a decontaminated auger will be required.

All samples collected, except those for volatile organic analysis, will be placed into a plastic or stainless steel pail and mixed thoroughly before transfer to appropriate sample container.

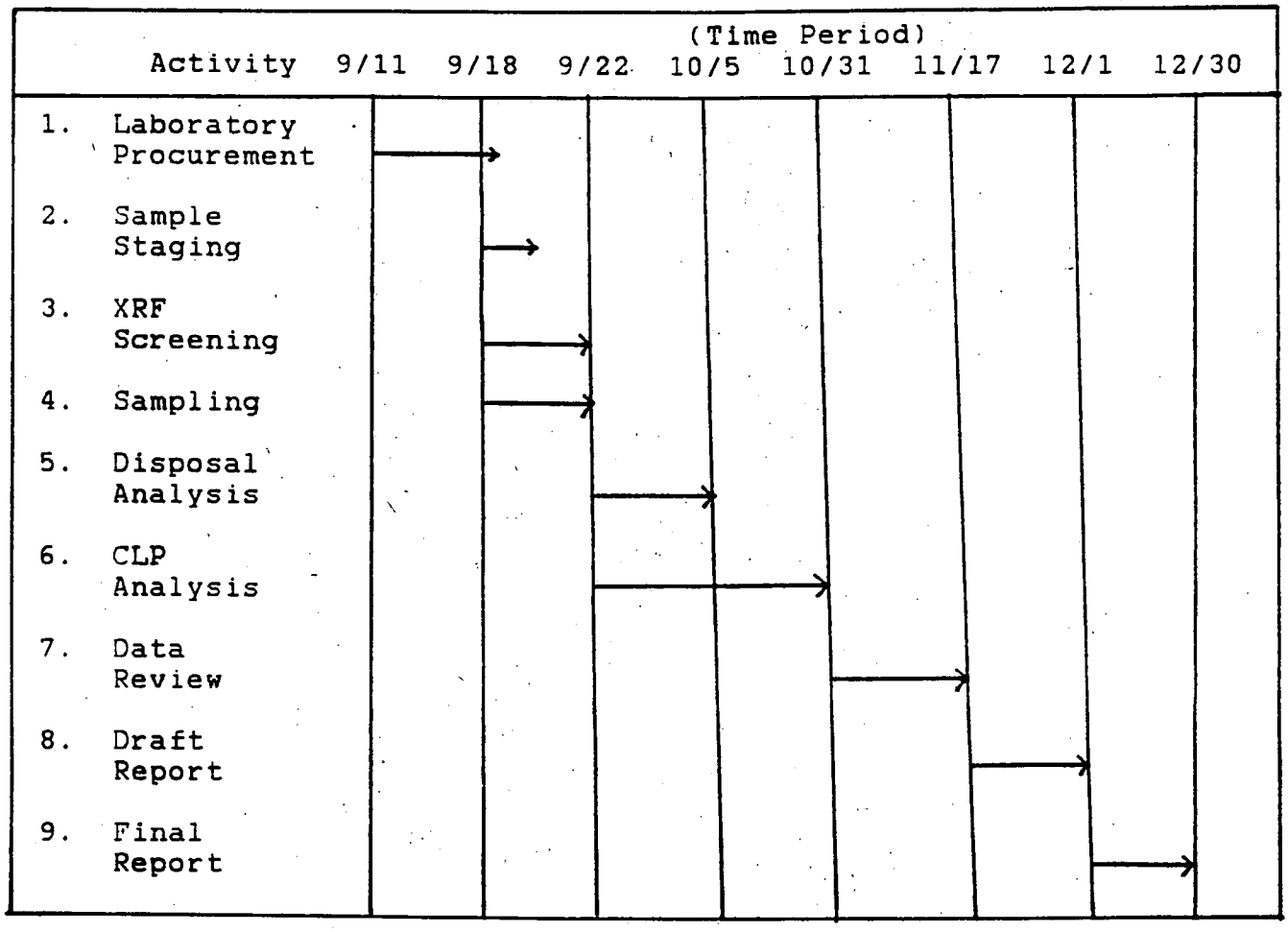
4.4.3 Sample Handling and Shipment

Each of the sample bottles will be sealed and labeled according to the following protocol. Caps will be secured with custody seals. Bottle labels will contain all required information including sample number, time and date of collection, analysis requested, and preservative used. Sealed bottles will be placed in large metal or plastic coolers, and padded with an absorbent material such as vermiculite.

All sample documents will be affixed to the underside of each cooler lid. The lid will be sealed and affixed on at least two sides with EPA custody seals so that any sign of tampering is easily visible.

4.5 Schedule of Activities

Table 1: Proposed Schedule of Work



5.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The EPA On-Scene Coordinator, Eugene G. Dominach, will provide overall direction to Roy F. Weston, Inc. staff concerning project sampling needs, objectives, and schedule.

The Roy F. Weston, Inc. Task Leader, Julian Hill, is the primary point of contact with the EPA On-Scene Coordinator. The Task Leader is responsible for the implementation of the Sampling QA/QC Plan, project team organization, and supervision of all project tasks, including reporting and deliverables.

The Roy F. Weston, Inc. Site QC Coordinator, Anibal Diaz, is responsible for ensuring field adherence to the Sampling QA/QC Plan and recording any deviations. The Site QC Coordinator is also the primary project team contact with the lab. The following field sampling personnel will work on this project.

Personnel	Responsibility
Anibal Diaz	Supervise and coordinate the analytical services and disposal, prepare OSC report, hazcat samples, provide QC for XRF and assist with preparation of POLREPS.
Julian Hill	Assist OSC with removal action; Keep entry/exit log, monitor ERCS contractor, check 1900-55's, collect necessary samples, provide SIMS reports and maintain file.
Haztech	Obtain disposal samples and analysis for disposal.

The Roy F. Weston, Inc. Task Leader, Julian Hill, Health and Safety Officer, Bill Kowalski, and Project Manager, Anibal Diaz, are responsible for auditing and guiding the project, reviewing the final deliverables and proposing corrective action, if necessary, for nonconformity to the Sampling QA/QC Plan or Health and Safety Plan.

The following laboratories will be providing the following analyses:

Lab Name/Location	Lab Type	Parameters
Rocky Mountain Laboratory Arvada, Colorado	CLP	metals
AnalytiKem Cherry Hill, New Jersey	commercial	disposal
Shaefer & Associates Bozeman, Montana	commercial	XRF/metals

Haztech will handle all matters pertaining to the disposal sampling and analysis (Appendix A).

6.0 QUALITY ASSURANCE REQUIREMENTS

The following requirements apply to the respective QA Objectives and parameters identified in section 3.0:

The following QA/QC protocols will be addressed:

- -sample documentation
- -chain of custody documentation (optional for field analysis)
- -sample holding time documentation
- -collection and evaluation of blanks and sample replicates (Refer to Tables 2 and 3)
- -instrument calibration documentation
- -PE samples, if appropriate
- -detection limit will be determined, unless inappropriate
- -definitive identification: confirmed identification of analytes by a second GC column or mass spectra for 10% of the samples collected (organics only) and provide gas chromatograms and/or mass spectra.
- -definitive quantitation: verify preliminary quantitative results by reanalyzing 10% of the samples collected and make a determination of precision, accuracy, and confidence limits by preparing and analyzing matrix spike duplicates on 1% of the samples collected. If the preliminary method is a field screening procedure, an alternate, EPA approved method will be used to verify the quantitative results.

Numbers of samples to be collected for this project are entered onto Table 2 (Field Sampling Summary) and Table 3 (QA/QC Analysis and Objectives Summary) to facilitate ready identification of analytical parameters desired, type, volume and number of containers needed, preservation requirements, number of samples required and associated number, and type of QA/QC control samples required based on this QA level.

All project deliverables will receive an internal peer QC review prior to release, as per guidelines established in the (EPA Regional or Branch or Contractor) Quality Assurance Program Plan.

Table 2: Field Sampling Summary

Parameter	Container	Preservative	Holding Time	Site Samples*	Rinsate Blank
PCB	8 oz glass	none	7days	3	0
Metals	8 oz glass	none+	6 months#	13	3
pH	8 oz glass	none	none	3	0
Reactivity	incl w/pH	none	14 day	3	0
TPHC	incl w/pH	none	7 days	3	0
EP Tox metals	incl w/pH	none	7 days	3	0
Acid Conc.	incl w/pH	none	n/a	1	0

* All sample shipment of 3 samples includes 2 soil and 1 liquid
# Mercury has a holding time of 28 days
+ metals include 3 rinsate blanks preserved with HNO3 to pH<2

Table 3: QA/QC Analysis and Objectives

Parameter	Matrix	Preparation Method	Analytical Method	Spikes	Detection Level	QA
PCB	S/L	3500	8080	0	<0.5ppm	1
Metals	S/L	3040	7000	2	CLP*	2
pH	S/L	N/A	9045	0	0.2	1
Reactivity	S/L	N/A	SW-846	0	N/A	1
TPHC	S/L	N/A	418.1M	0	<1ppm	1
EP Tox metals	S/L	N/A	1310	0	EP Tox*	1
Acid Conc.	L	N/A	305.1+	0	1%	1

* See Appendix B for specific levels

7.0 DELIVERABLES

The Roy F. Weston, Inc. Task Leader, Julian Hill, will maintain contact with the EPA On-Scene Coordinator, Eugene G. Dominach, to keep him informed about the technical and financial progress of this project. This communication will commence with the issuance of the work assignment and project scoping meeting. Activities under this project will be reported in status or trip reports and other deliverables (e.g., analytical reports, final reports) described herein. Activities will also be summarized in appropriate format for inclusion in monthly and annual reports.

The following deliverables will be provided under this project:

Site Log-book
Polreps
Hazcat data
XRF data
CLP Metals Analysis
OSC Report

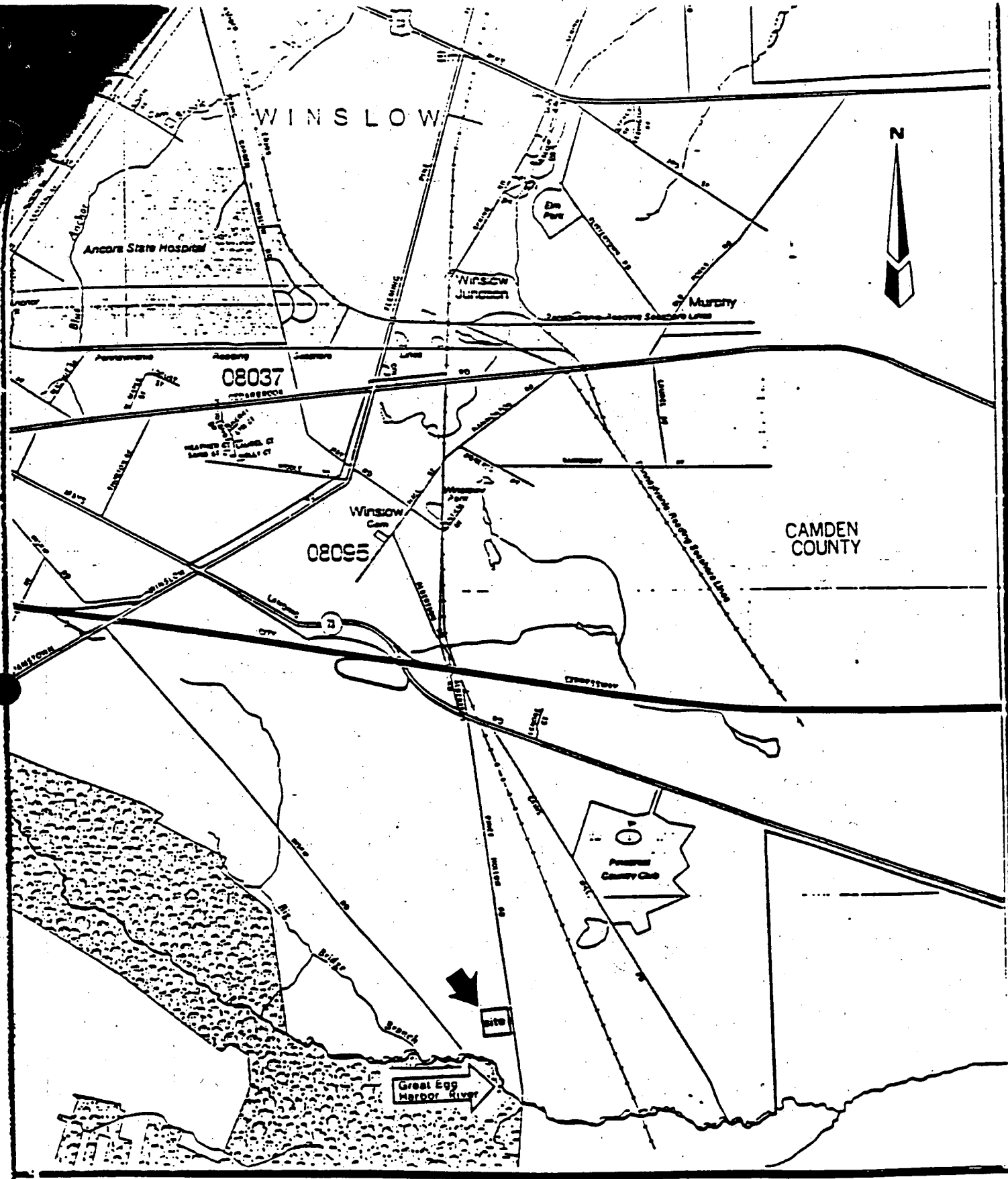
8.0 DATA VALIDATION

Data generated under this QA/QC Sampling Plan will be evaluated accordingly with appropriate criteria contained in the Removal Program Data Validation Procedures which accompany OSWER Directive #9360.4-1.

Specific data review activities for QA-2 should be performed by the following approach:

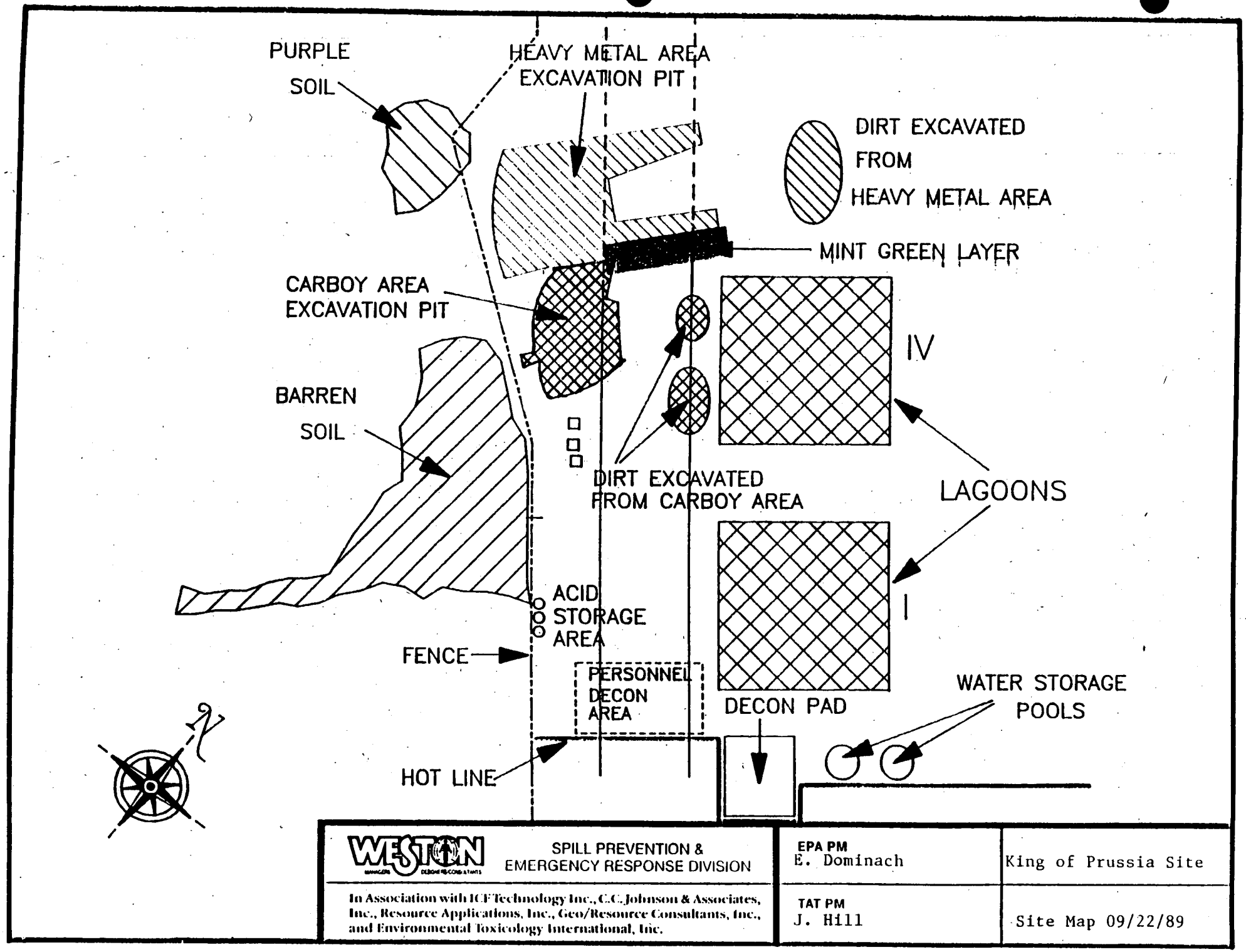
1. Of the samples collected in the field, 10% will be confirmed for identification, precision, accuracy, and error determination.
2. The results of 10% of the samples in the analytical data packages should be evaluated for holding times, blank contamination, spike (surrogate/matrix) recovery, and detection capability.
3. The holding times, blank contamination, and detection capability will be reviewed for the remaining samples.

King of Prussia Removal
Figure 1-1 Site Location Map



WESTON — SPILL PREVENTION & EMERGENCY RESPONSE DIVISION		EPA PM — DOMINACH	FIGURE 1
In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.		TAT PM — GRAHAM	LOCATION MAP

King of Prussia Removal
Figure 4-1 Sample Location Map



WESTON
SPILL PREVENTION & EMERGENCY RESPONSE DIVISION

In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.

EPA PM E. Dominach	King of Prussia Site
TAT PM J. Hill	Site Map 09/22/89

APPENDIX A: Disposal Sampling and Analysis
(Proposed by Haztech)

UNITED STATED ENVIRONMENTAL PROTECTION AGENCY
DELIVERY ORDER NO.: 0016-02-003
WINSLOW TOWNSHIP, NEW JERSEY

WESTINGHOUSE HAZTECH
PROJECT NO.: 2340-89-4047

SAMPLING PLAN FOR CHARACTERIZATION OF STOCK PILED SOILS FOR DISPOSAL

PREPARATION

- Sampling equipment will be cleaned by the sampling technician prior to mobilization to the site.
- The cleaned sampling equipment (ss hand auger) will be wrapped in aluminum foil and remain sealed until arrival at the project site.

SAMPLING EQUIPMENT DECONTAMINATION PROCEDURES

All sampling equipment (i.e., augers, scoops and trowels) will be constructed of inert materials and decontaminated prior to use in the field. The sampling equipment will be decontaminated between samples and all augers will be steam cleaned prior to use at a new sampling location. All sampling devices will be cleaned and prepared for field using the following procedures:

1. non-phosphate detergent and tap water wash;
2. tap water rinse;
3. distilled/deionized water rinse;
4. total air dry or nitrogen blow out and
5. distilled/deionized water rinse.

SOIL SAMPLING PROCEDURES

All sampling will be accomplished in accordance with the NJDEP Field Sampling Procedures Manual, February, 1988.

1. The laboratory "shuttle" will be opened and sample bottles will be inspected to make sure that all of the required bottles are presented and properly labeled.
2. Collection of soil samples in shallow borings will be performed using a clean, standard SS Hand Auger. When retrieved, the sampler will be opened, and the soil will be placed into the 8 oz. jars using a scoop or trowel. To the extent possible, soil which has come in contract with the walls or the sampler will be discarded.
3. Sampling Method (waste profiles) - Using a ss hand auger one sample collected per 100 yards of material. Divide the pile into a grid and collect samples at the nodes, obtaining a core of 1-2 feet in length at each node.
4. For each sampling event, samples will be handled with a new pair of disposable plastic surgical gloves.

5. Each sample bottle will be labeled with the following information:

   a. owner/client;
   b. sample number or designation;
   c. date;
   d. time;
   e. type of laboratory analysis (i.e. PCE, etc.); and
   f. name of person collecting sample.

6. Each core sample taken will be removed and the core sample material will be removed from the hand auger, using a plastic disposable scoop, into a stainless steel 2 1/2 gallon pale. When all of the core samples have been composited from the soil pile and put into the stainless steel pile and mixed, 4-8 oz. samples will be obtained from the composite.

7. The Chain-Of-Custody forms from the analytical laboratory will be completed and signed.

8. The shuttle will be sealed and stored.

9. A field blank will be collected in accordance with procedures described above.

10. The shuttles will be transported to the laboratory within 24 hours after the samples are collected The laboratory will be notified by the response manager in a timely manner of the impending arrival of the samples. The laboratory will be prepared to receive the samples and perform preliminary extractions or analyses within the EPA-recommended holding times.

DISPOSAL ANALYSIS

The following analytical analysis parameters will be conducted by the laboratory chosen to perform the analyses:

PH
Reactitivity
PHT's
PCB's

EP TOX Metals

APPENDIX B: Detection Levels Specified

Table 1. Elements Determined by Inductively Coupled Plasma Emission or Atomic Absorption Spectroscopy

Element	Contract Required Detection Level (1,2) (ug/L)
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5000
Chromium	10
Cobalt	50
Copper	25
Iron	100
Lead	5
Magnesium	5000
Manganese	15
Mercury	0.2
Nickel	40
Potassium	5000
Selenium	5
Silver	10
Sodium	5000
Thallium	10
Vanadium	50
Zinc	20

Table II-2
Toxicity Characteristic Leachate Procedure List

	HAZ WASTE NO	CONTAMINANT	TCLP (MG/L)
VOLATILES	D018	Acrylonitrile	5.0
	D019	Benzene	0.07
	D021	Carbon Disulfide	14.4
	D022	Carbon Tetrachloride	0.07
	D024	Chlorobenzene	1.4
	D025	Chloroform	0.07
	D031	1, 2-Dichloroethane	0.40
	D032	1, 1-Dichloroethylene	0.1
	D038	Isobutanol	25.0
	D039	Methylene Chloride	8.6
	D040	Methyl Ethyl Ketone	7.2
	D045	1, 1, 1, 2-Tetrachloroethane	10.0
	D046	1, 1, 2, 3-Tetrachloroethane	1.3
	D047	Tetrachloroethylene	0.1
	D049	Toluene	14.4
	D050	1, 1, 1-Trichloroethane	25.0
	D051	1, 1, 2-Trichloroethane	1.2
	D052	Trichloroethylene	0.07
	D055	Vinyl Chloride	0.05

	HAZ WASTE NO	CONTAMINANT	TCLP (MG/L)
BASE-NEUTRALS	D020	BIS (2-Chloroethyl) Ether	0.05
	D029	1, 2-Dichlorobenzene	4.3
	D030	1, 4-Dichlorobenzene	10.8
	D033	2, 4-Dinitrotoluene	0.13
	D035	Hexachlorobenzene	0.13
	D036	Hexachlorobutadiene	0.72
	D037	Hexachloroethane	4.3
	D041	Nitrobenzene	0.13
	D044	Pyridine	5.0
ACID EXTRACT	D026	O-Cresol	10.0
	D027	M-Cresol	10.0
	D028	P-Cresol	10.0
	D042	Pentachlorophenol	3.6
	D043	Phenol	14.4
	D048	2, 3, 4, 6-Tetrachlorophenol	1.5
	D053	2, 4, 5-Trichlorophenol	5.8
	D054	2, 4, 6-Trichlorophenol	0.20

	HAZ WASTE NO	CONTAMINANT	TCLP (MG/L)	EP TOX (MG/L)
METALS	D004	Arsenic	5.0	5.0
	D005	Barium	100.0	100.0
	D006	Cadmium	1.0	1.0
	D007	Chromium	5.0	5.0
	D008	Lead	5.0	5.0
	D009	Mercury	0.2	0.2
	D010	Selenium	1.0	1.0
	D011	Silver	5.0	5.0
PESTICIDES	D012	Endrin	0.003	0.02
	D013	Lindane	0.06	0.4
	D014	Methoxychlor	1.4	10.0
	D015	Toxaphene	0.07	0.5
	D016	2, 4-D	1.4	10.0
	D017	2, 4, 5-TP	0.14	1.0
	D023	Chlordane	0.03	
	D034	Heptachlor (And Hydroxide)	0.001	

2.8 Work Plan

DRAFT WORK PLAN

SAMPLING AND EXCAVATION
REGIONAL E.R.C.S. PROJECT
WINSLOW TOWNSHIP, NEW JERSEY
D.O. NO.: 0016-02-003

WESTINGHOUSE HAZTECH, INC.
PROJECT NO.: 2340-89-4047

REVISION I

INDEX

SECTION I

Sampling and Analysis

Sampling

Three soil samples will be taken in the designated area, using a hand auger to a depth of 1.5 feet each. These three samples will be composited into four 8 oz. samples to be sent to Analyti Chem in Cherry Hill, New Jersey for analysis.

Analysis - (Contaminated Soil)

The sample will be analyzed using land fill disposal acceptance, analysis will include RCRA Metals.

Analysis - (Backfill)

Based on competitive supplier selection a backfill material supplier will be selected. A sample of the backfill material will be collected and sent to Analyti Chem for E.P. TOX analysis.

Analysis - (Wash Water)

Water samples will be collected from each batch of waste wash-water collected from the decontamination pad and analyzed prior to discharging or off-site disposal.

SECTION II

Decontamination Pad Construction

Pad Construction (Subcontractor)

- 20' x 35' with sump under drain collection and pumping system. (Drawing 1A - 1B).

Collection System (Equipment)

- 1 - 6.5 KW Generator
- 1 - 6,000 gallon clean water holding pool
- 2 - 110 Volt 2 inch submersible pump
- 1 - 3,000 P.S.I. pressure washer
- 1 - 6,000 gallon gray water holding pool
- 100' - 2" discharge hose

Process

One 2-inch submersible pump in the clean water supply pool will pump water to the 3,000 psi power washer. The power washer will be used to decontaminate equipment and dump trailer trucks. A second 2-inch submersible pump will pump the waste wash water from the decon pad collection system to the second 6,000 gallon holding pool. A 6.5 KW Generator will be used to supply 110 volt power to both of the 2-inch submersible pumps.

SECTION III

Mobilization / Site Prep.

Mobilization

Prior to mobilization of the excavation crew to the site, the office trailer will be set up and the decontamination pad construction would have been completed. Also, by the time we are ready to mobilize to the site, transportation and disposal approvals will be in place.

Office Trailer Equipment:

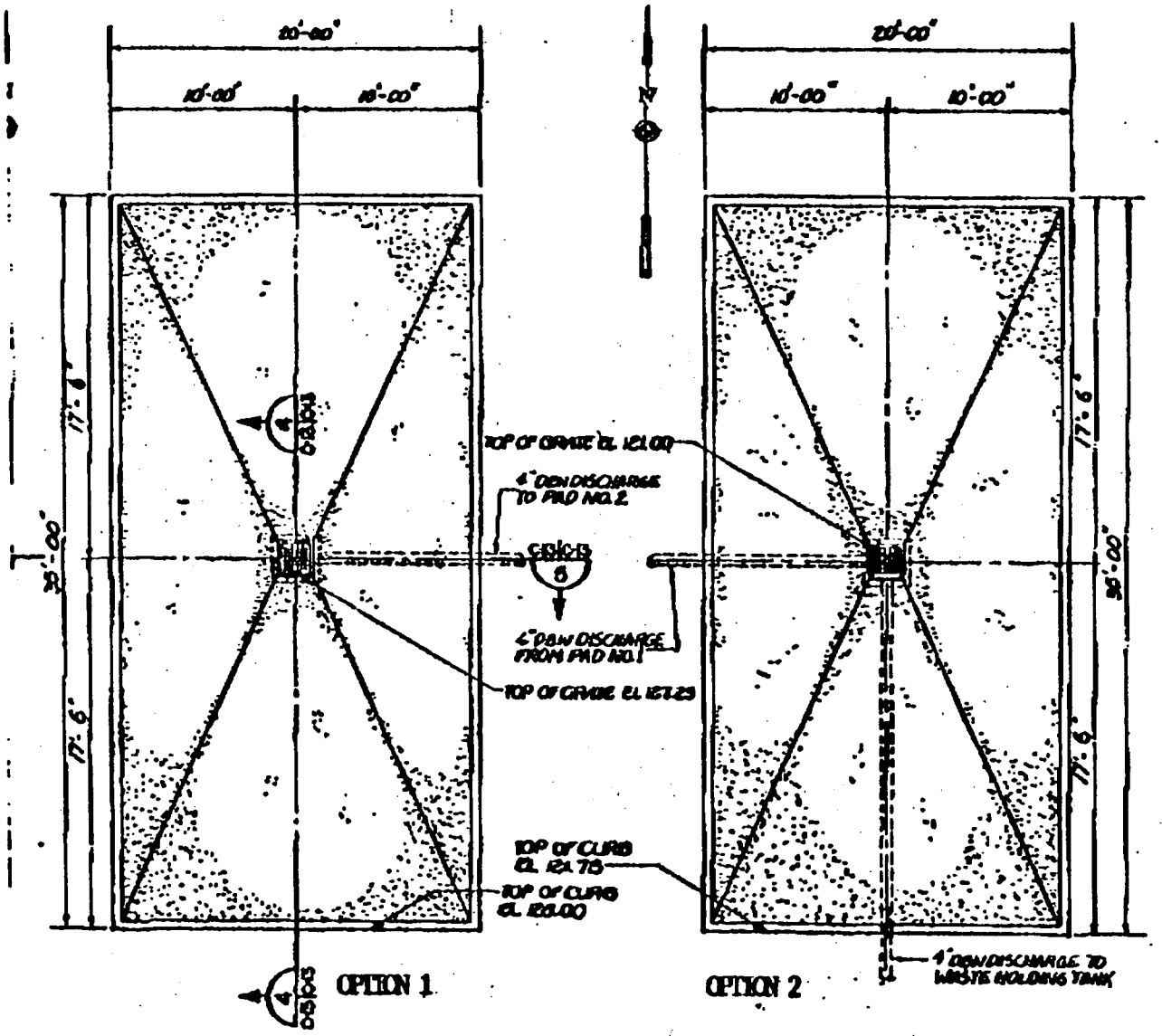
1 - Fax Machine
1 - Copier
1 - Water Cooler
1 - Lap Top Computer (R.C.M.S.)
1 - Cellular Phone
Misc. Office Supplies and Furniture

Site Prep

As part of site preparation existing electrical service will be connected to the office trailer, a cellular mobile phone will be provided for on site for communications, At the O.S.C's request.

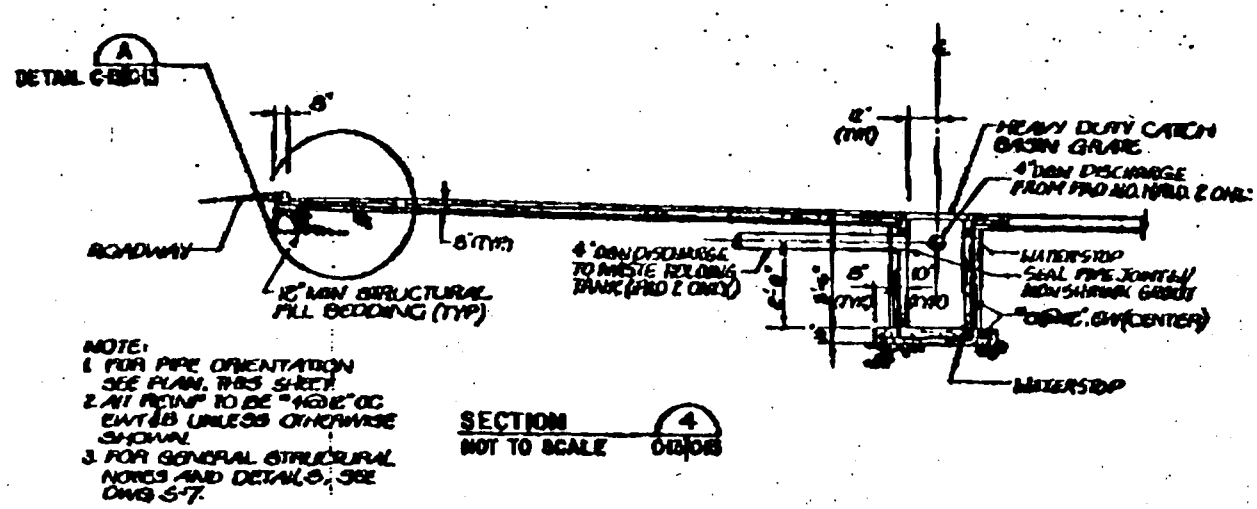
The decontamination pad collection and process equipment system will be set up and temporary generator power will be connected as well.

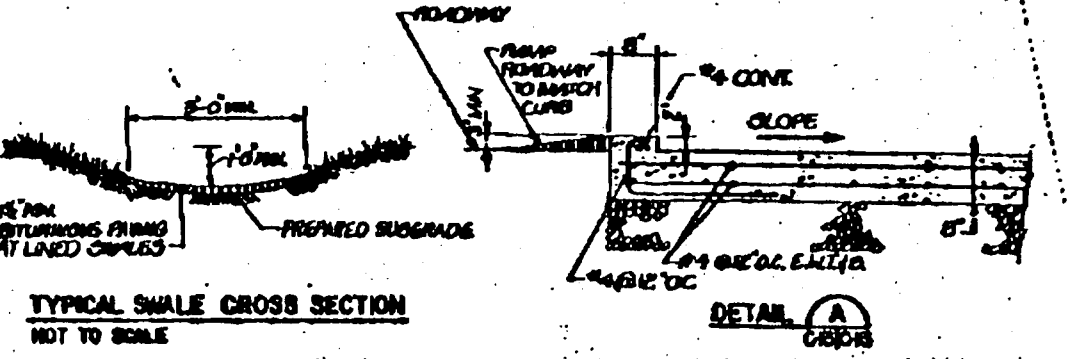
DRAWING 1A



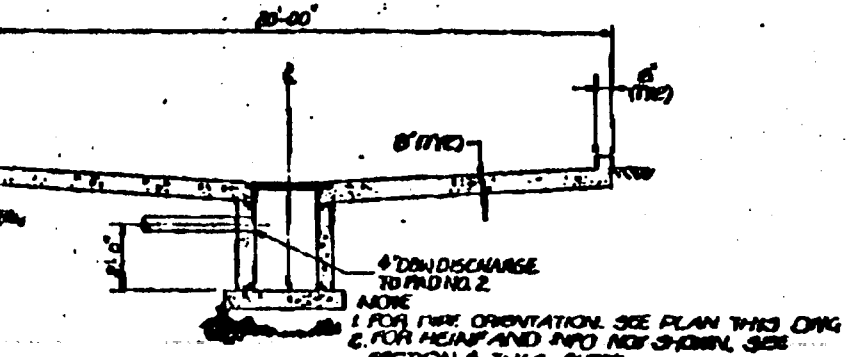
EQUIPMENT DECONTAMINATION PAD PLAN
NOT TO SCALE

NOT TO SCALE





TYPICAL SWALE CROSS SECTION
NOT TO SCALE



SECTION 5
NOT TO SCALE
DWG S-8

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

SECTION III

Excavation and Backfill

Excavation and Backfill

The excavation area is estimated to be approximately 350 c.y. Based on preliminary site assessment by E.P.A. and T.A.T. Using a CAT 215-Excavator the area will be excavated to a depth of 1.5 feet as indicated by the preliminary information.

The contaminated soil will be loaded into the bucket of a track loader and transported and loaded onto 20 yard dump trailers for off-site disposal. Prior to starting of any excavation, a erosion control fencing system will be installed around the excavation area. Based on the information available at this time, post excavation conformation sampling will not be required. During the excavation removal operation, should surface or rain water enter the excavation, that by passes the erosion control fencing system, it will have to be removed and transported to the waste water holding pool using a vacuum truck.

Backfill

When the excavation has been completed, post excavation sampling and analysis if required has also been completed, backfilling of the excavation will be accomplished in the following manner:

- Placement of the backfill material will be accomplished using the CAT 215 excavator. Backfill will be dumped adjacent to the excavation and spread using the CAT 215.

- When the backfill material has been spread out, it will be compacted in 18" lifts using walk behind plate compactors.

  The reason for the compaction of the backfill material is to minimize erosion from surface run off from rain fall.

SECTION IV

Transportation and Disposal

Based on laboratory results, disposal of contaminated soil from the site will be arranged for in accordance with all Local, State and Federal regulations.

Transportation of contaminated soil will be arranged for on a competitive subcontractor basis as outlined by contract requirements.

All transportation and disposal arranged for by Westinghouse/Haztech are subject to approval by the project O.S.C.

SECTION V

Equipment Decontamination / Demobilization

All equipment and dump trailers will be decontaminated before leaving the site or be demobilized.

Gross contamination will be removed prior to equipment being power washed on the decontamination pad and demobilized.

When all equipment has be decontaminated and the decon pad and sump has been cleaned, all water collection and process equipment except for the contaminated wash water pool will be demobilized.

SECTION VI

Cost and Scheduling

1.	**Sampling and Analysis**	
a.	Sampling - Personnel, Equipment, Supplies	$ 573.00
b.	Analysis - Contaminated Soil Area	2,500.00
c.	Analysis - Backfill Material	5,000.00
d.	Analysis - Wash Water	2,000.00ea
2.	**Mobilization and Site Prep.**	
a.	Mobilization - Personnel, Equipment, Subcontractors	2,200.00
b.	Site Prep - Electrician, Set-up	1,500.00
c.	Decontamination Pad Construction	14,000.00
d.	Process Equipment	4,500.00
3.	**Excavation and Backfill**	
a.	Personnel and Equipment	18,000.00
b.	Backfill 350 c.y. x 20.00/c.y.	7,000.00
4.	**Transportation and Disposal**	
a.	Transportation / per ton x 350 tons	
b.	Disposal / per ton x 350 tons $ 380.00/ton	133,000.00
5.	**Equipment Decontamination & Demobilization**	
a.	Decontamination 1,200/day x 5 days	6,000.00
b.	Demobilization	2,200.00
	Estimated Total	**$198,473.00**

Personnel

1 - Response Manager
1 - Admin. Tech.
2 - Equipment Operators
1 - Technician (Decon Pad)
1 - Clean-up Technician (Excavation Spotter)

Equipment

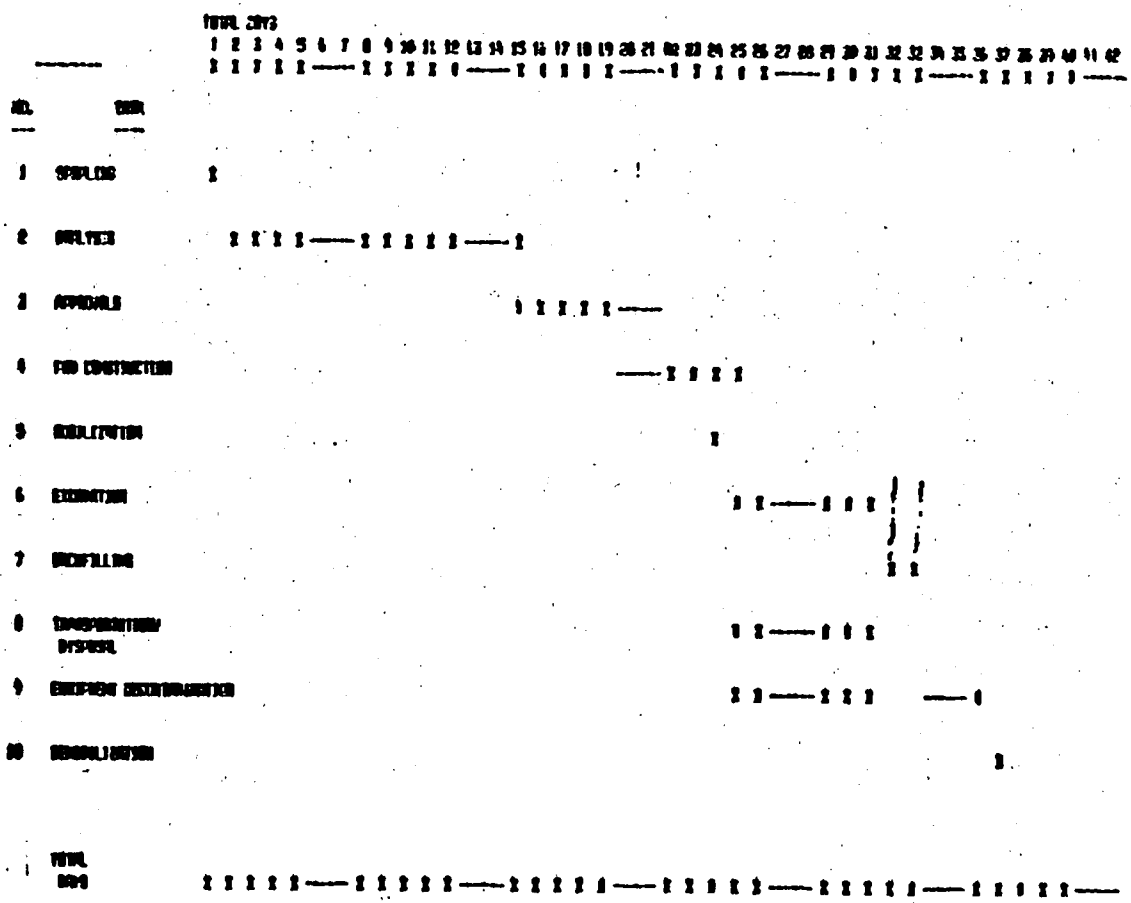
1 - Fuel Truck
1 - Van
1 - 215 Track Excavator
1 - Track Loader
1 - 6.5 KW Generator
2 - 6,000 Gallon Holding Pools
2 - 2 Inch Submersible Pumps
1 - 3,000 psi Washer

Level C Protection (As Needed)
Level B Protection (As Needed)

Subcontractors

Electrician
Masonary Contractor
Transportation
Disposal
Analytical Services

PROJECT:
LOCATION :
PREP. BY:
WORK ITEM SCHEDULE OF ACTIVITIES



NOTE >>> BASED ON 8 - 10 HOUR WORK DAYS

2.9 Maps

MAP INDEX
FOR
THE KING OF PRUSSIA SITE
WINSLOW TOWNSHIP, CAMDEN COUNTY, NEW JERSEY

Figure 1.	Site map as of 9/22/89. Shows current site activity.
Figure 2.	Map of exploratory excavations in the carboy area on 9/14/89. Excavations were performed by hand in level B protection.
Figure 3.	Map of sample locations collected 9/19/89. Each location was sampled at 4 different depths; 0" - 6", 6" - 12", 12" - 18", 18" - 24". These samples were analyzed on-site using an X-Ray Fluorescence Spectrometer (XRF).
Figure 4.	Map of post excavation sample locations collected from the carboy area on 9/20/89 at a depth of 6". These samples were analyzed on-site with the XRF. The results of some of the samples have been written on the map. The shaded area is where additional excavation was needed to be performed.
Figure 5.	Map of post excavation sample locations collected from the carboy area after additional excavation was completed. The samples were collected on 9/21/89 at a depth of 6" and split to be analyzed on-site with the XRF and sent to CLP for confirmation.
Figure 6.	Map of post excavation sample locations collected from the heavy metal area at a depth of 6" on 9/21/89. The samples were analyzed on-site using the XRF and the results were included on the map. The shaded area shows where additional excavation was needed to be performed.
Figure 7.	Map of post excavation sample locations from the heavy metal area after additional excavations were completed. The samples were collected from a depth of 6" and split to be analyzed on-site with the XRF and sent to a CLP lab for confirmation.

Figure 8. Map of soil sample locations collected on 9/12/89. Two soil samples were collected from the heavy metal area and one liquid sample was collected from a leaking carboy. These samples were measured for pH using a Hoch pH meter. The pH of the liquid was less than 0.

Figure 9. Site map showing locations of samples collected 4/27/89. Some of the CLP results have been written on the map. The shaded area shows the area of proposed excavation.

Figure 10. Site map showing locations of samples collected 4/27/89. The samples were analyzed on-site using a Kevex XRF. Lines have been drawn showing lines of equal toxicity for Copper at a depth of 0' - 1.5'.

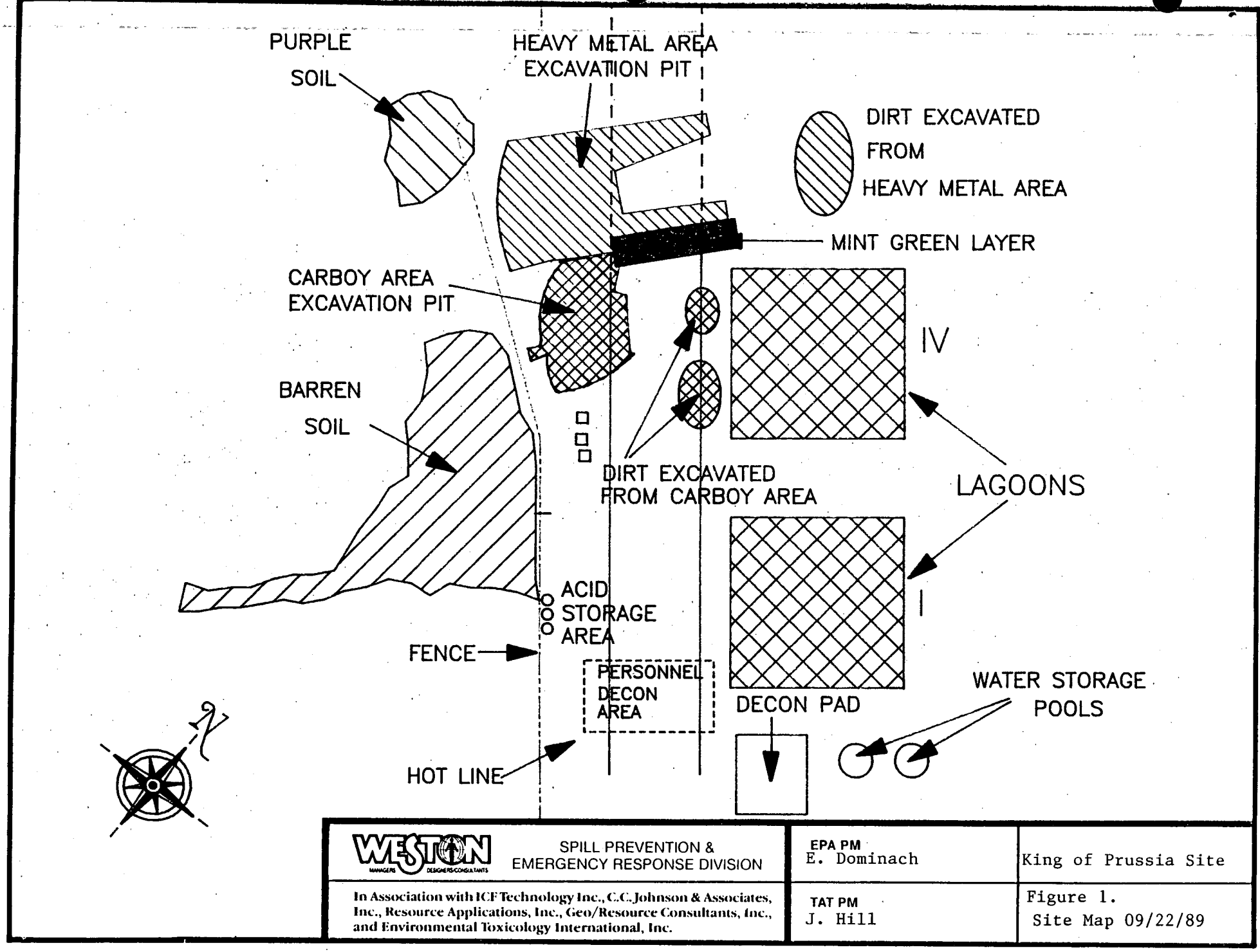
Figure 11. Site map showing locations of samples collected 4/27/89. The samples were analyzed on-site using a Kevex XRF. Lines have been drawn showing lines of equal toxicity for Copper at a depth of 1.5' - 3.0'.

Figure 12. Site map showing locations of samples collected 4/27/89. The samples were analyzed on-site using a Kevex XRF. Lines have been drawn showing lines of equal toxicity for Nickel at a depth of 0' - 1.5'.

Figure 13. Site map showing locations of samples collected 4/27/89. The samples were analyzed on-site using a Kevex XRF. Lines have been drawn showing lines of equal toxicity for Nickel at a depth of 1.5' - 3.0'.

Figure 14. Site map showing locations of samples collected 4/27/89. The samples were analyzed on-site using a Kevex XRF. Lines have been drawn showing lines of equal toxicity for Zinc at a depth of 0' - 1.5'.

Figure 15. Site map showing locations of samples collected 4/27/89. The samples were analyzed on-site using a Kevex XRF. Lines have been drawn showing lines of equal toxicity for Zinc at a depth of 1.5'- 3.0'.



WESTON MANAGERS DESIGNERS/CONSULTANTS — SPILL PREVENTION & EMERGENCY RESPONSE DIVISION		EPA PM E. Dominach	King of Prussia Site
In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.		TAT PM J. Hill	Figure 1. Site Map 09/22/89

WESTON
MANAGERS DESIGNERS/CONSULTANTS

FIGURE 2.

SHEET ____ of ____

CLIENT/SUBJECT KING OF PRUSSIA SITE W.O. NO. ____

TASK DESCRIPTION MAP OF EXPLORATORY EXCAVATIONS on 9/14 TASK NO. ____

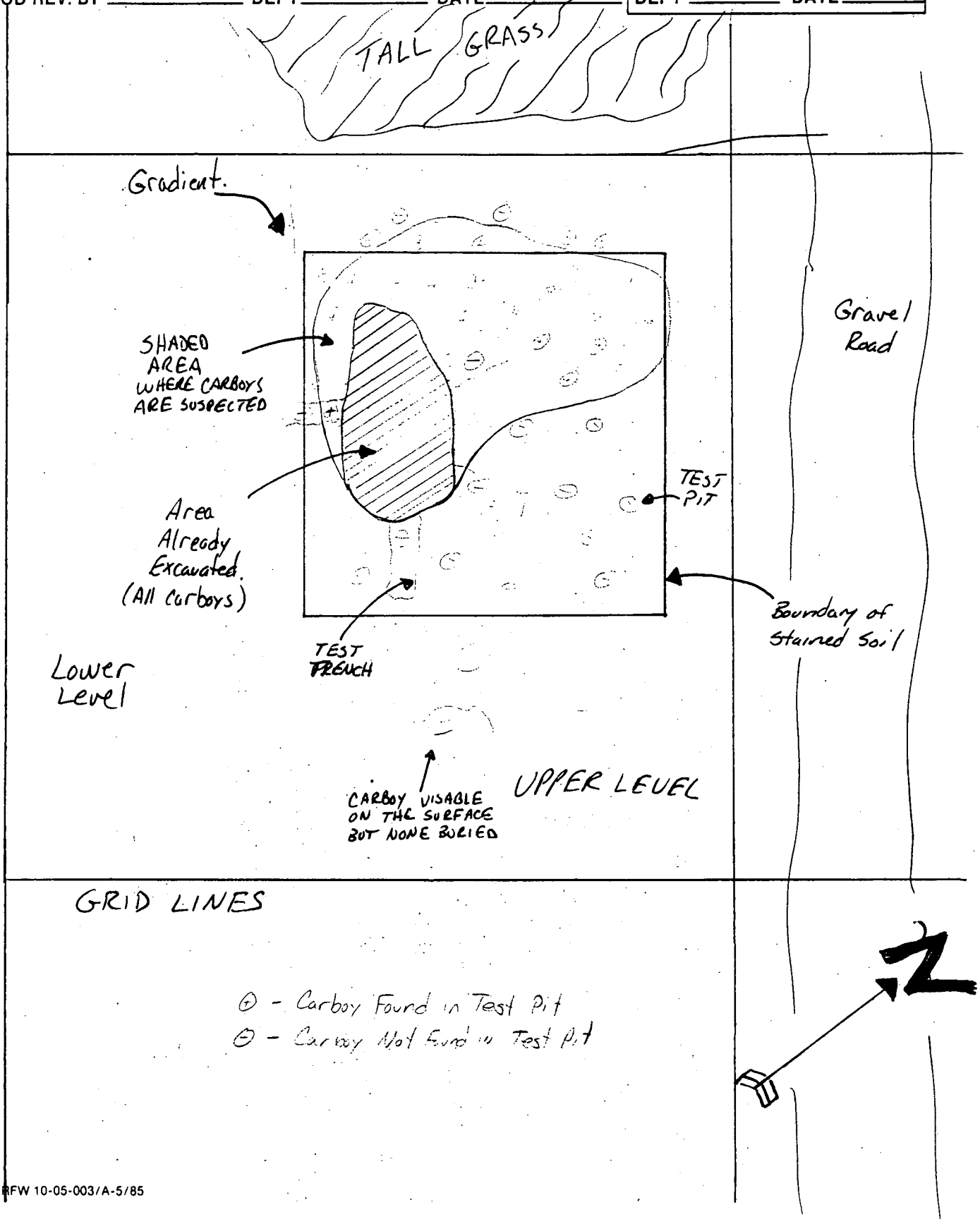
PREPARED BY ____ DEPT ____ DATE ____

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____



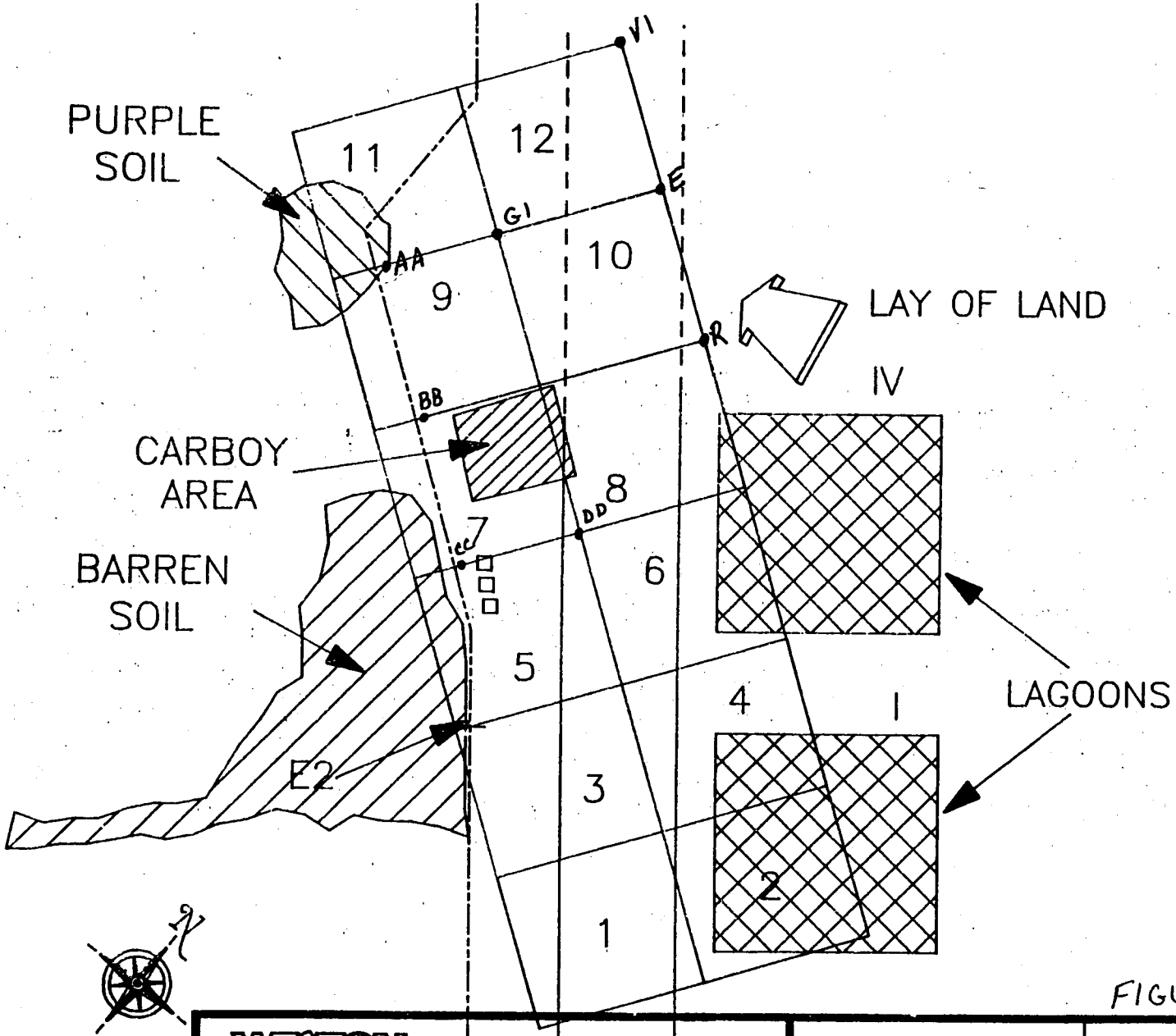


FIGURE 3.

WESTON MANAGERS DESIGNERS CONSULTANTS SPILL PREVENTION & EMERGENCY RESPONSE DIVISION In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.	EPA PM E. DOMINACH	KING OF PRUSSIA
	TAT PM J. Hill	SAMPLE LOCATION MAP 9/19/89

Figure 4.

SHEET ____ of ____

CLIENT/SUBJECT KING OF PRUSSIA SITE W.O. NO. ____

TASK DESCRIPTION POST EXCAVATION SAMPLE MAP 9/20/89 OF CARBOY AREA TASK NO. ____

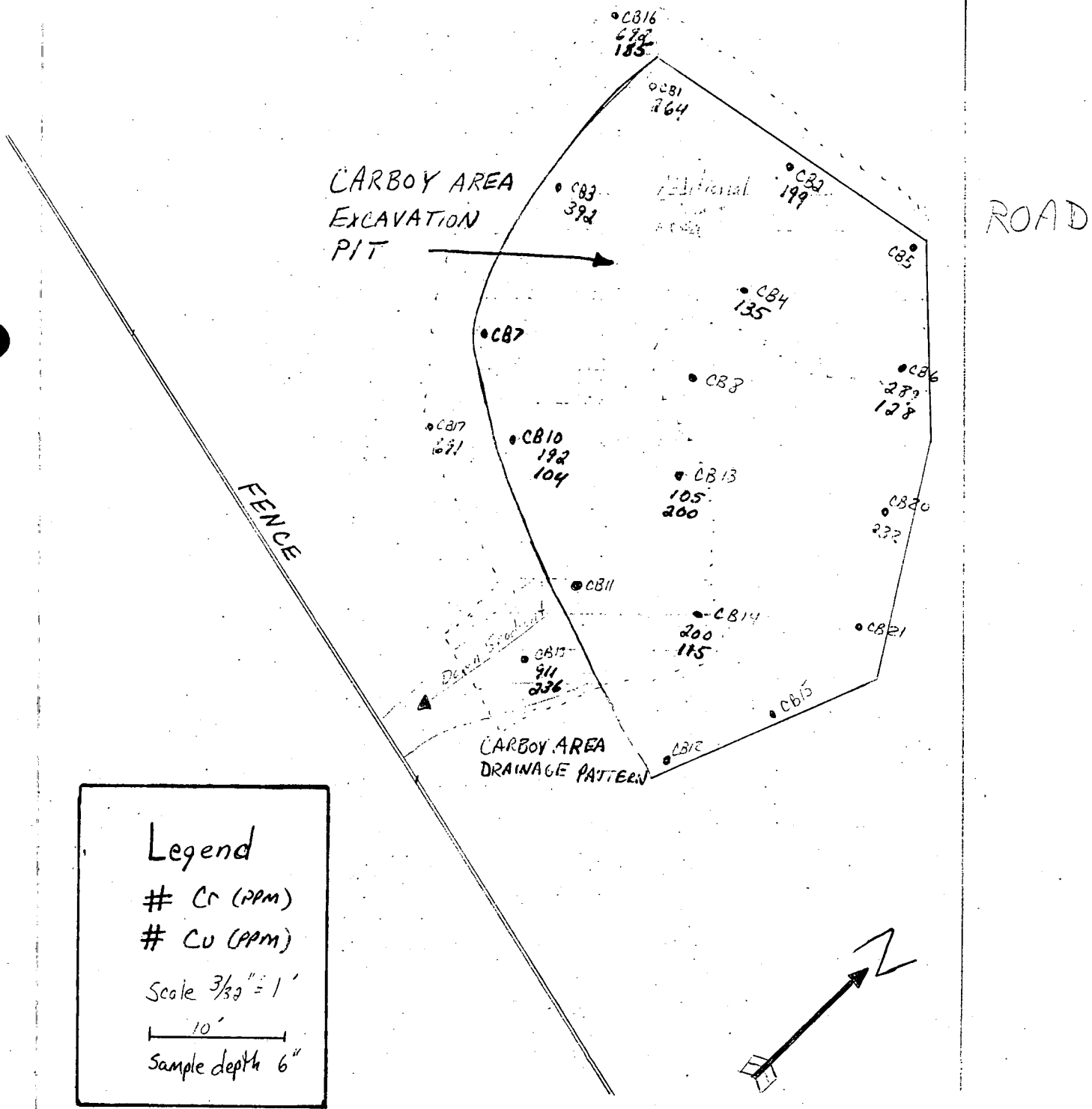
PREPARED BY ____ DEPT ____ DATE ____

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____



RFW 10-05-003/A-5/85

FIGURE 5.

SHEET ____ of ____

CLIENT/SUBJECT KING OF PRUSSIA SITE Sept. 21, 1989 W.O. NO. ____

TASK DESCRIPTION POST EXCAVATION SAMPLE MAP OF CARBOY AREA AFTER ADDITIONAL SOIL WAS REMOVED TASK NO. ____

PREPARED BY ____ DEPT ____ DATE ____

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____

LEGEND

Cr : PPM

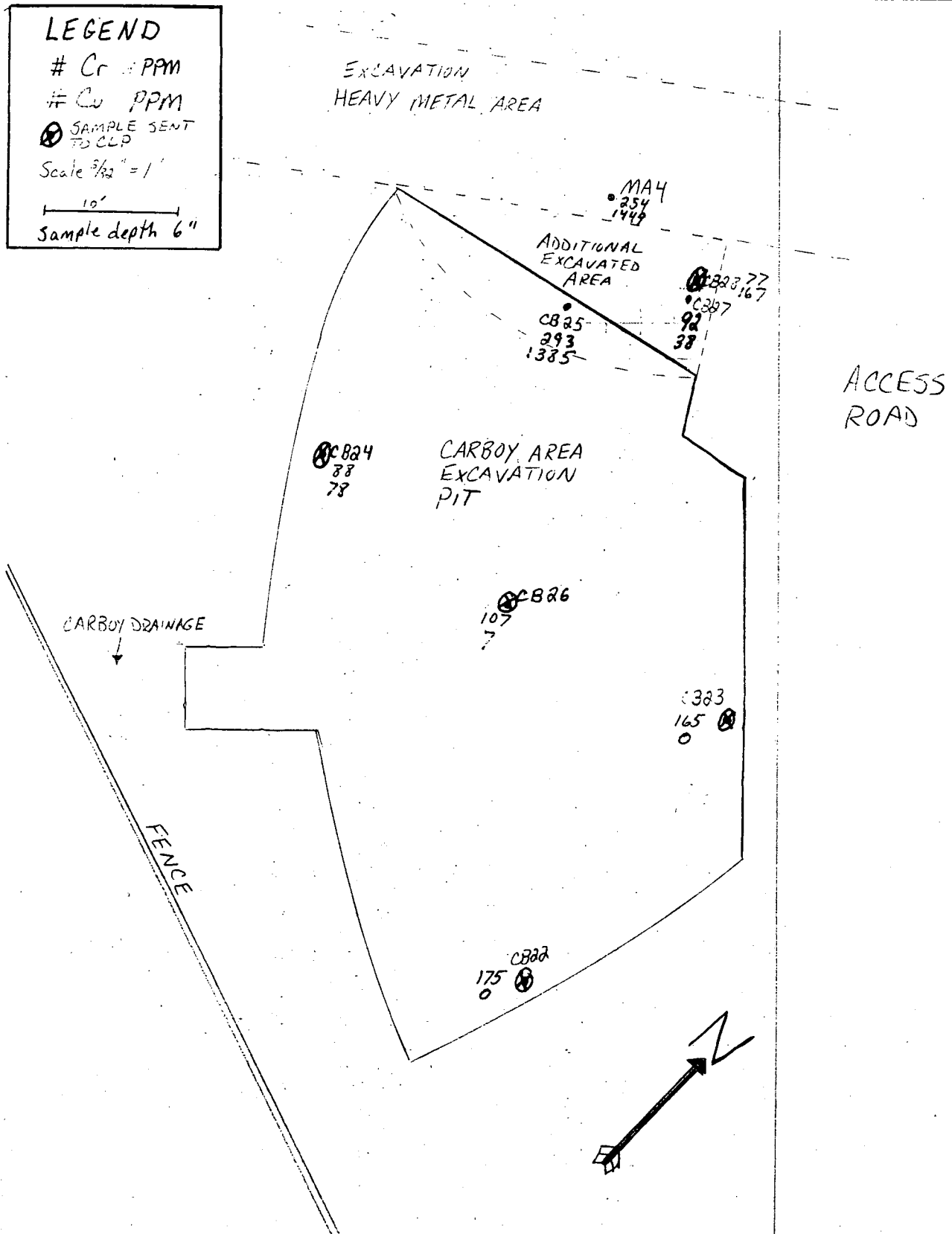
Cu PPM

⊗ SAMPLE SENT TO CLP

Scale 3/32" = 1'

10'

Sample depth 6"



KING OF PRUSSIA SITE

Figure 6.

WESTON MANAGERS DESIGNERS/CONSULTANTS

CLIENT/SUBJECT KING OF PRUSSIA SITE 9/21/89 W.O. NO.

TASK DESCRIPTION Post excavation sample map of heavy metal Area TASK NO.

SHEET ___ of ___

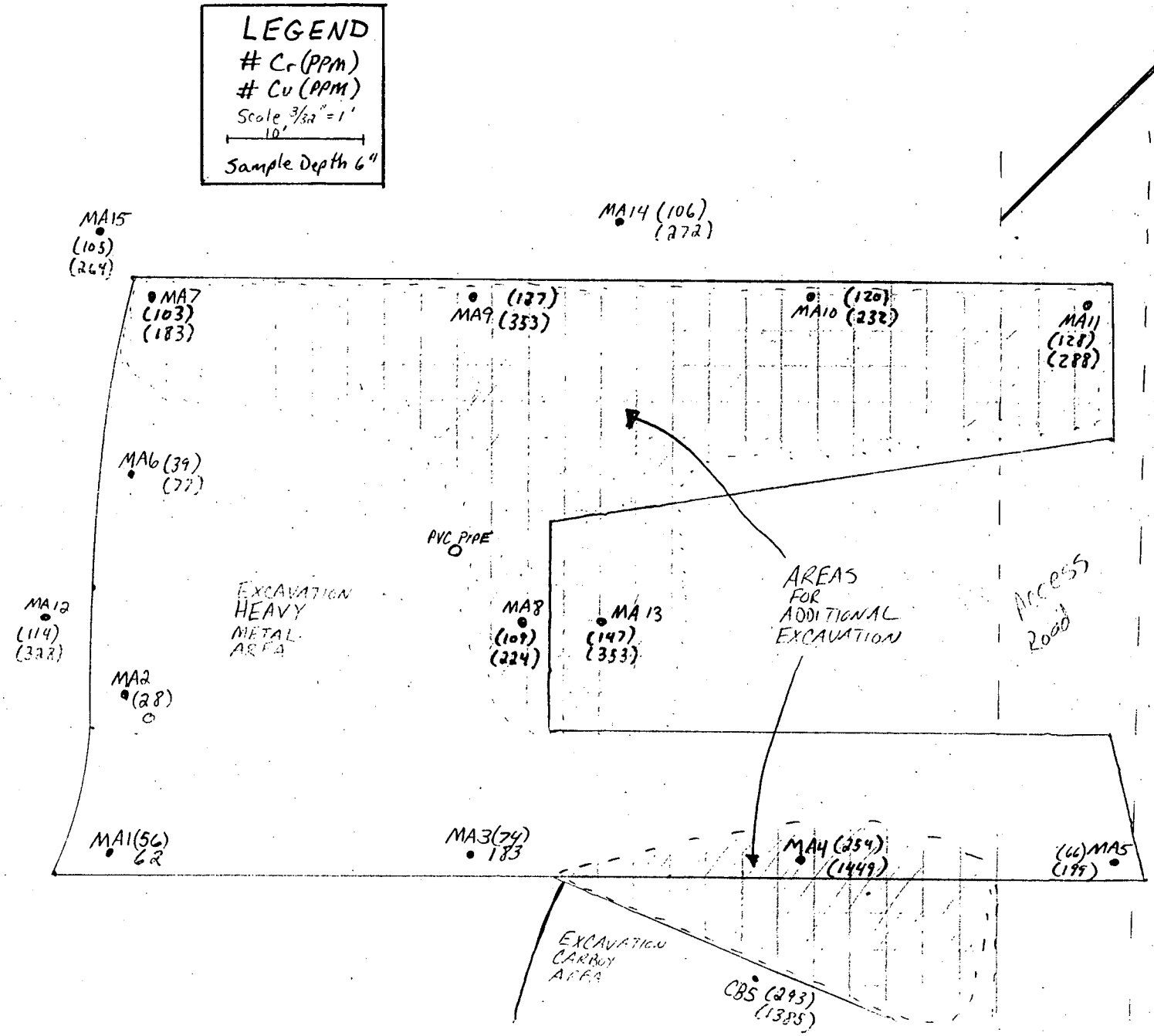
PREPARED BY ___ DEPT ___ DATE ___

MATH CHECK BY ___ DEPT ___ DATE ___

METHOD REV. BY ___ DEPT ___ DATE ___

APPROVED BY

DEPT ___ DATE ___



POST EXCAVATION SAMPLE MAP OF THE HEAVY METAL AREA 9/21/89

RFW 10-05-003/A-5/85

FIGURE 7.

WESTON MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT KING OF PRUSSIA SITE 9/21/89 W.O. NO. ____

TASK DESCRIPTION Post excavation Sample Map from heavy metal area after additional soil was removed TASK NO. ____

PREPARED BY ____ DEPT ____ DATE ____

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

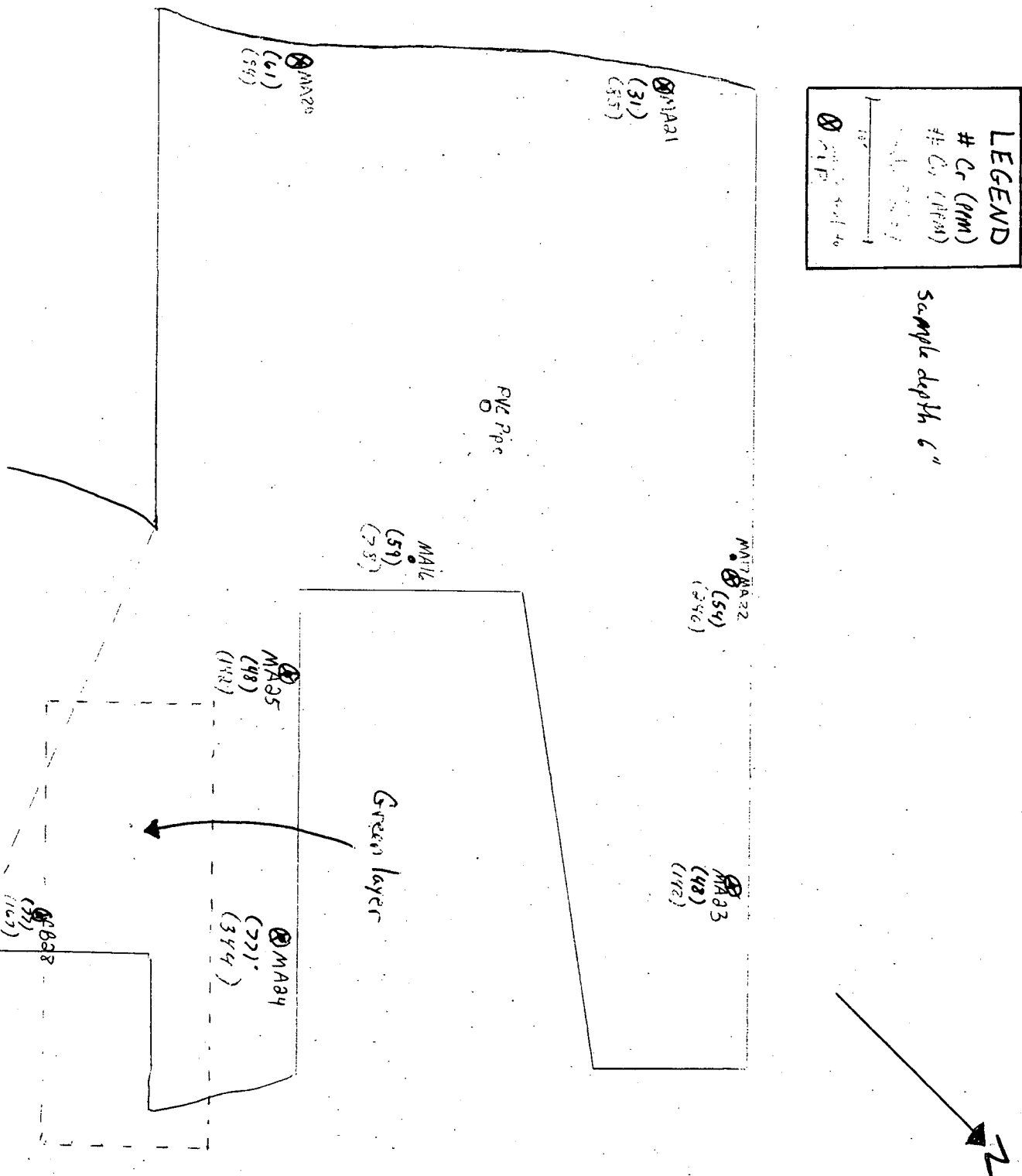
APPROVED BY

DEPT ____ DATE ____

KING OF PRUSSIA SITE

POST EXCAVATION SAMPLE MAP OF THE HEAVY METAL AREA AFTER ADITIONAL EXCAVATION

9/21/89



RFW 10-05-003/A-5/85

SOIL SAMPLES FOR KP

SEPT 12, 1989 1:30 PM

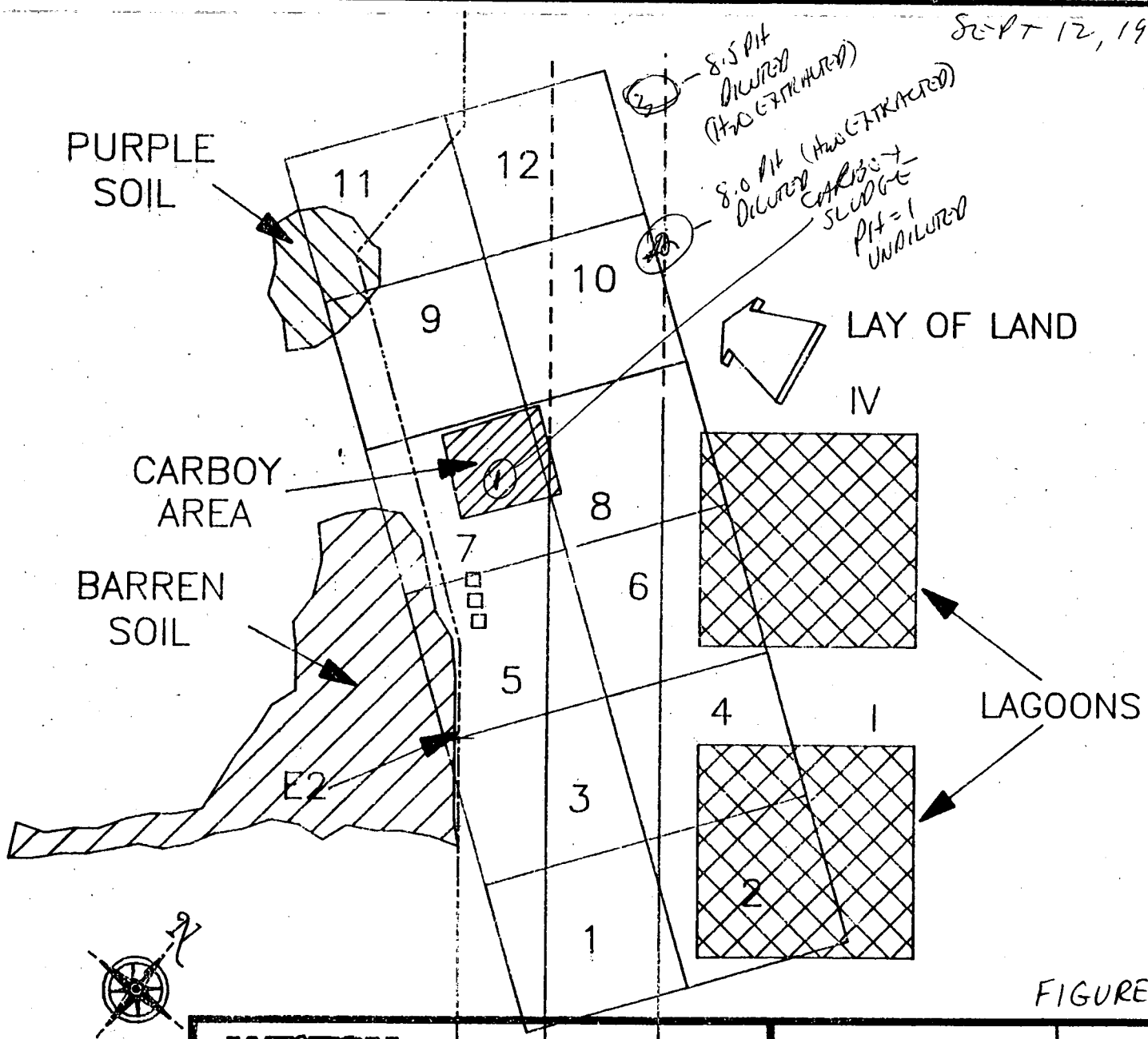
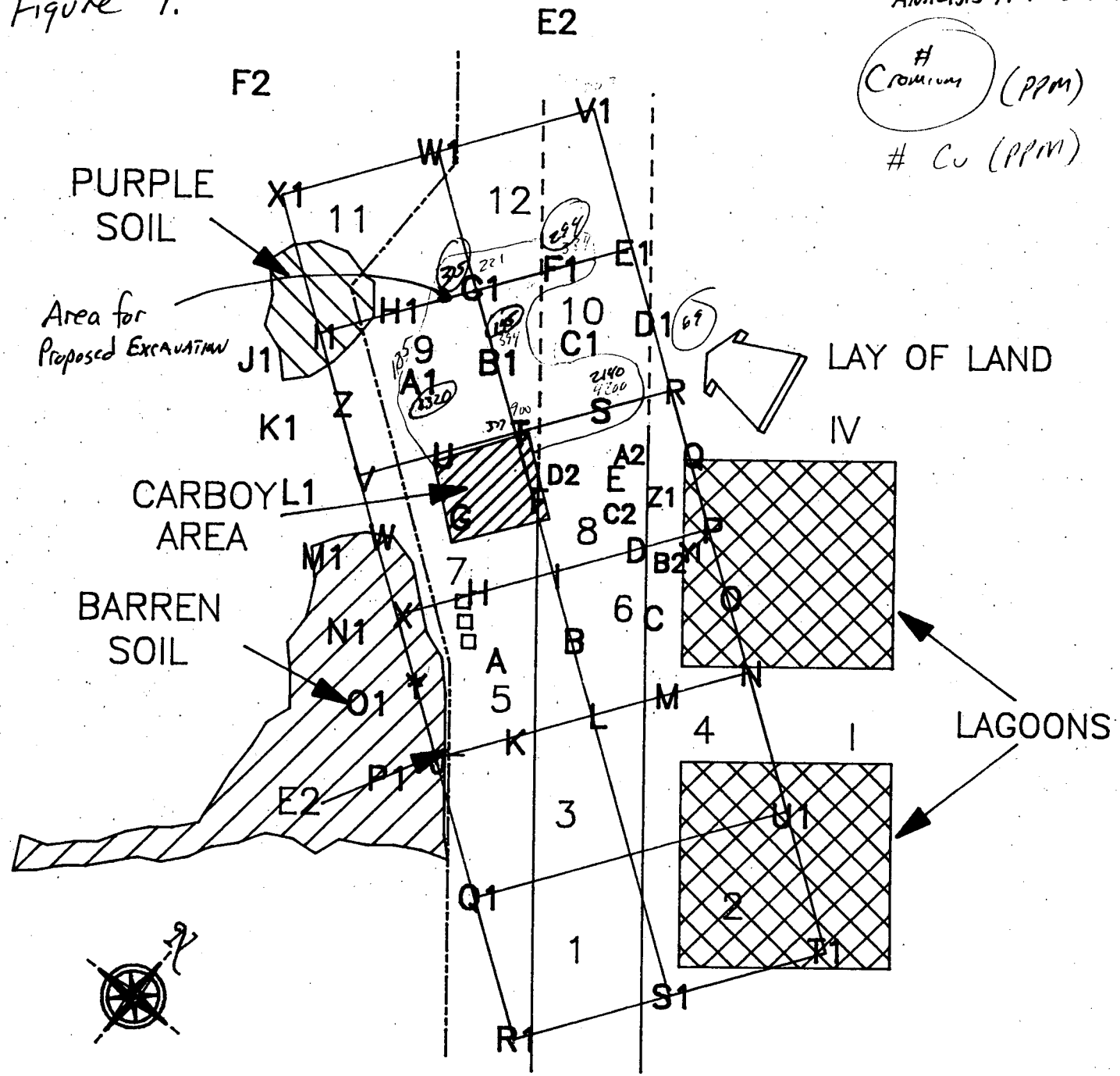


FIGURE 8.

WESTON MANAGERS DESIGNERS/CONSULTANTS — SPILL PREVENTION & EMERGENCY RESPONSE DIVISION	EPA PM: DOMINACH	KING OF PRUSSIA
In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.	TAT PM: HILL	9/12/89

KING OF PRUSSIA SITE Planned Excavations.

Figure 9.



COPPER (Cu)
0 – 1.5 ft

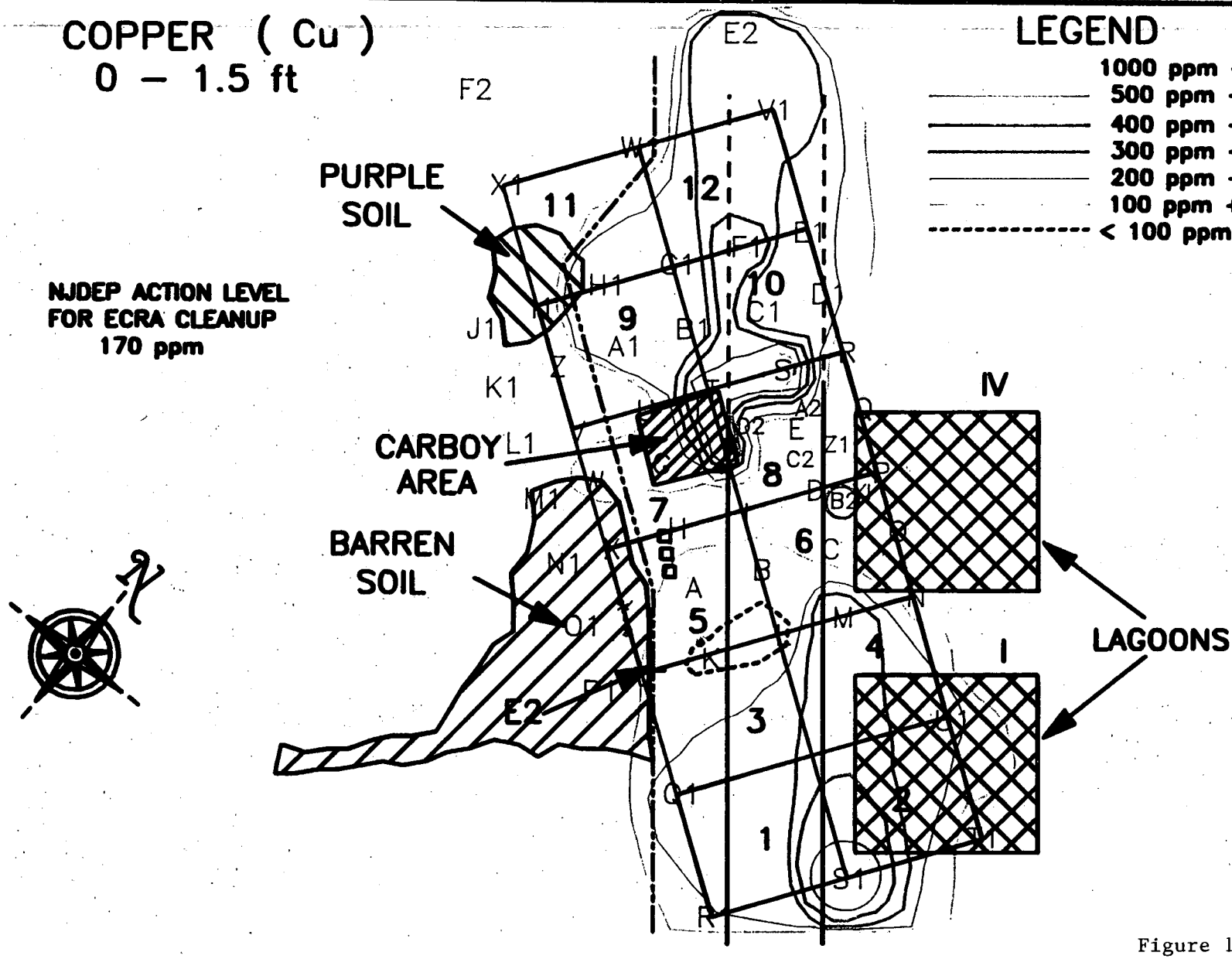


Figure 10.

WESTON MANAGERS DESIGNERS/CONSULTANTS — SPILL PREVENTION & EMERGENCY RESPONSE DIVISION	EPA PM DOMINACH	KING OF PRUSSIA SITE SAMPLING LOCATIONS
In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.	TAT PM RAJANI	TDD # 02-8902-25

COPPER (Cu)
1.5 – 3 ft

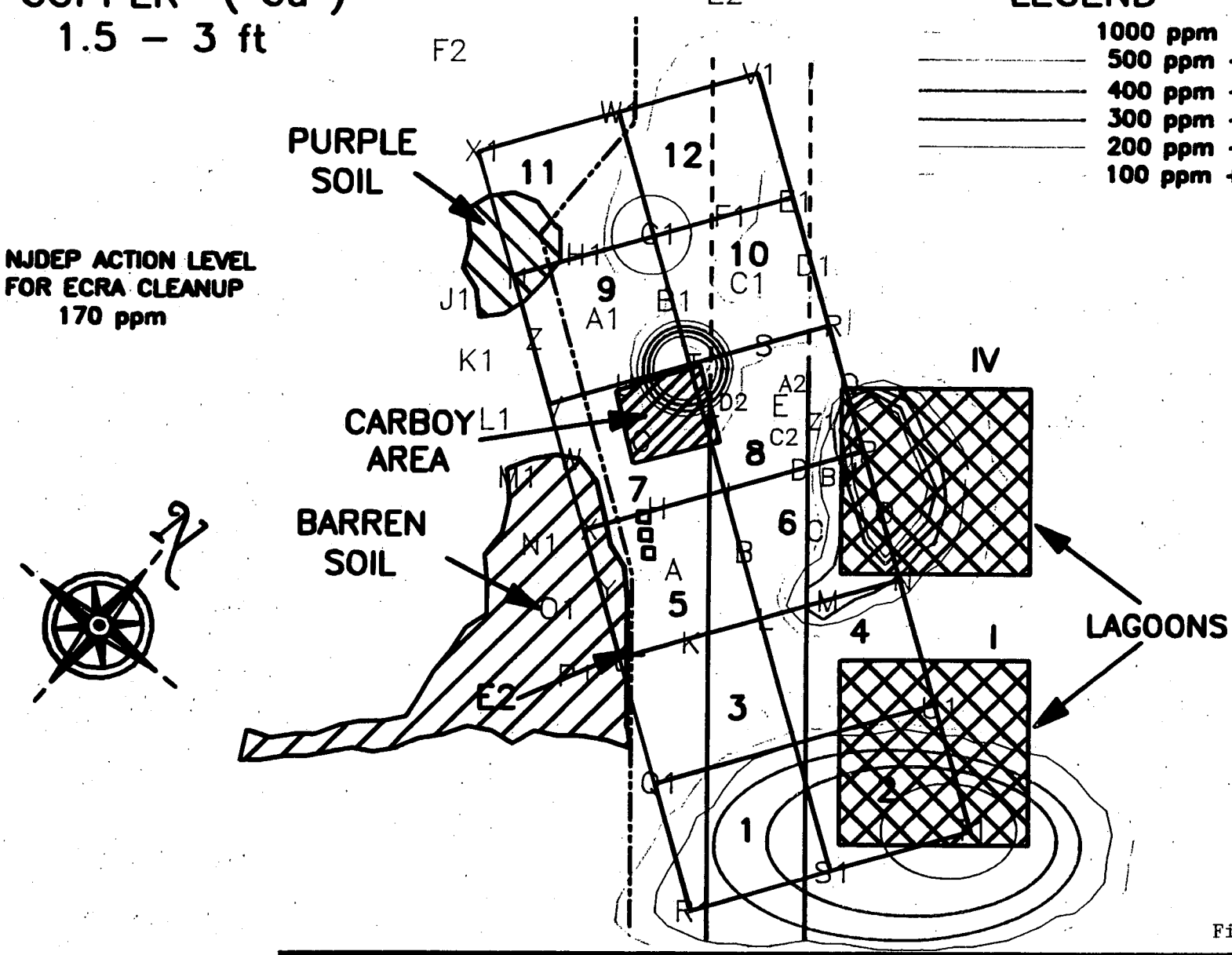


Figure 11.

WESTON MANAGERS DESIGNERS/CONSULTANTS — SPILL PREVENTION & EMERGENCY RESPONSE DIVISION	EPA PM DOMINACH	KING OF PRUSSIA SITE SAMPLING LOCATIONS
In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.	TAT PM RAJANI	TDD # 02-8902-25

NICKEL (Ni)
0 – 1.5 ft

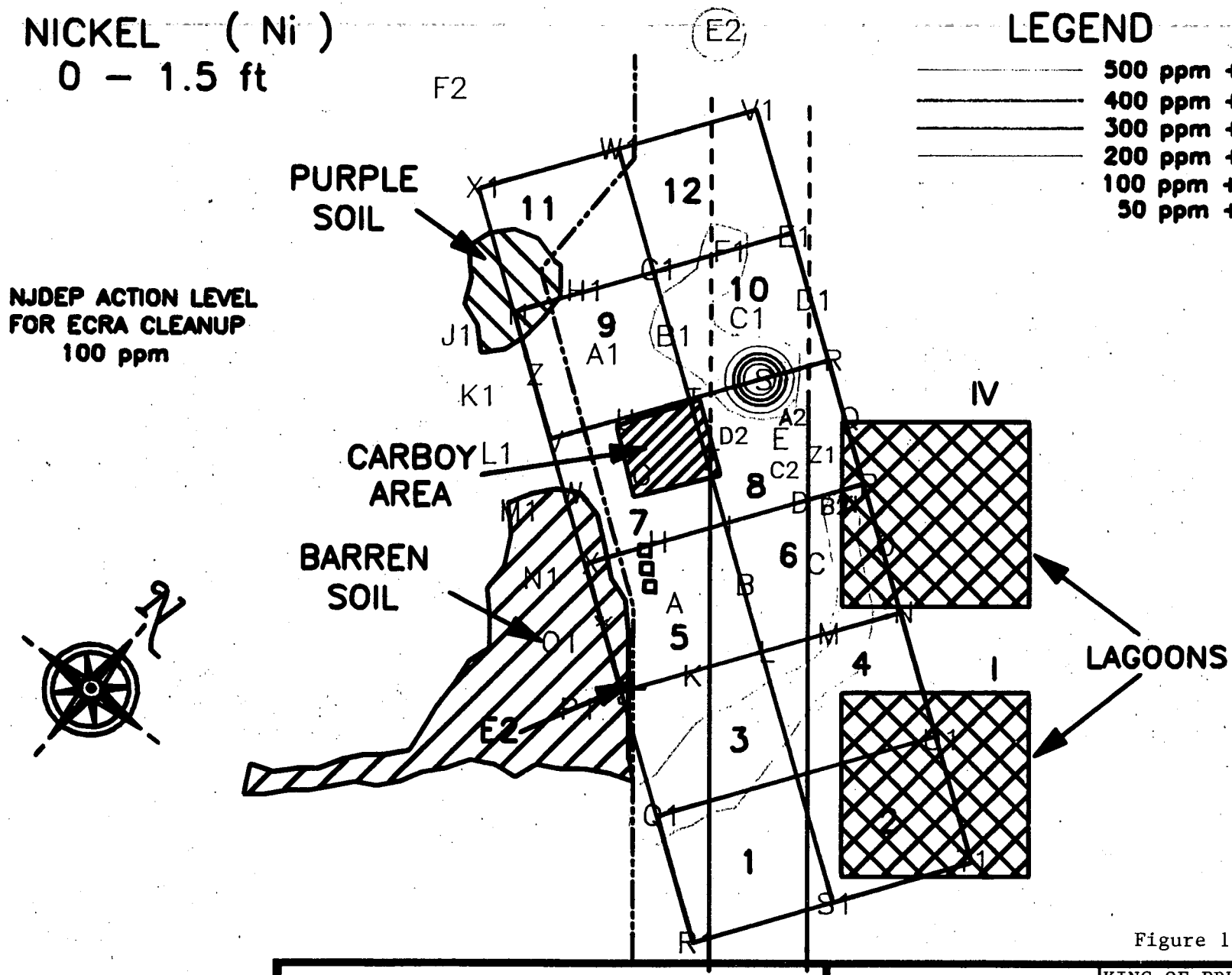


Figure 12.

WESTON MANAGERS DESIGNERS/CONSULTANTS — SPILL PREVENTION & EMERGENCY RESPONSE DIVISION	EPA PM DOMINACH	KING OF PRUSSIA SITE SAMPLING LOCATION
In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.	TAT PM RAJANI	TDD # 02-8902-25

NICKEL (Ni)
1.5 – 3 ft

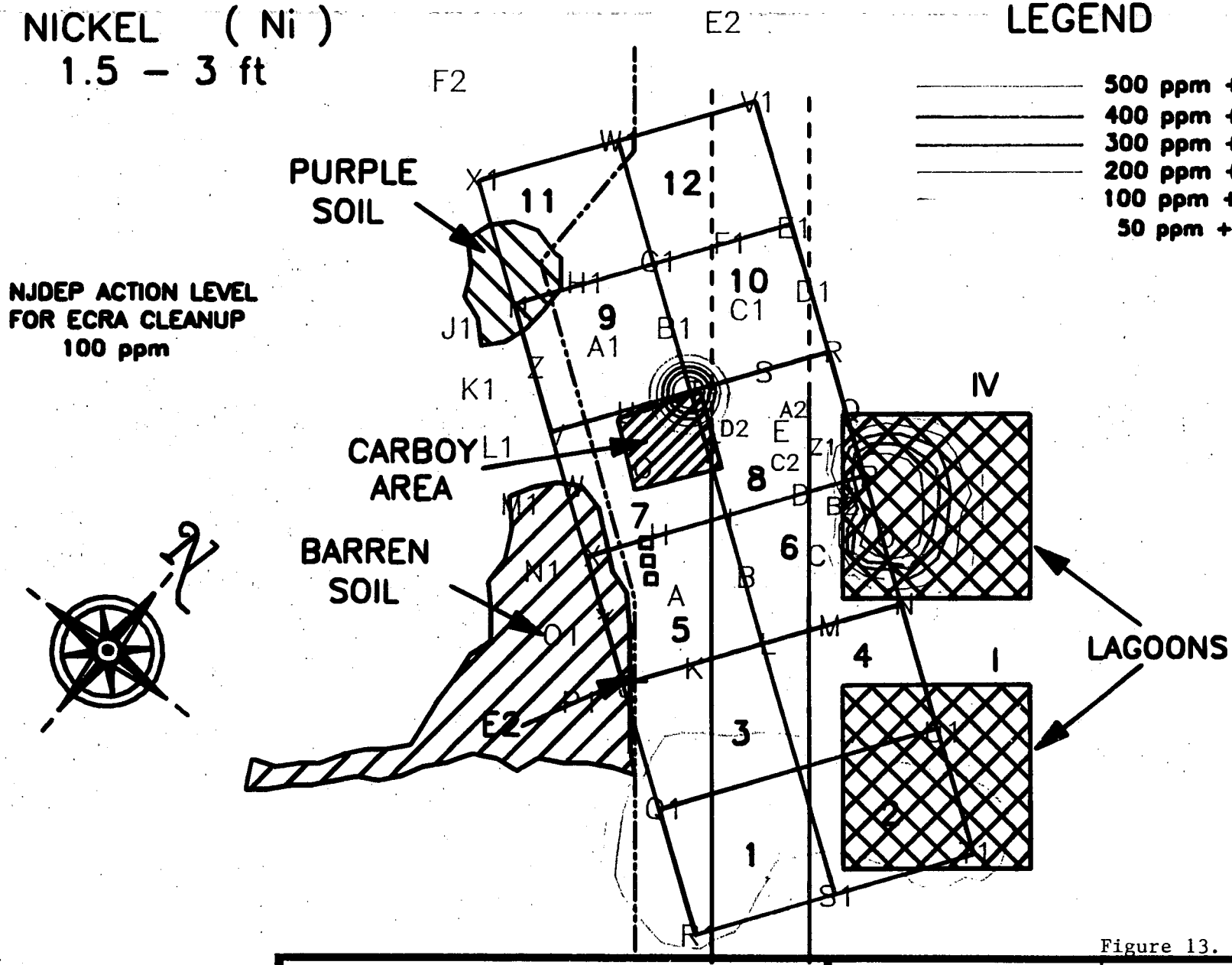


Figure 13.

WESTON MANAGERS DESIGNERS/CONSULTANTS — SPILL PREVENTION & EMERGENCY RESPONSE DIVISION	EPA PM DOMINACH	KING OF PRUSSIA SITE SAMPLING LOCATIONS
In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.	TAT PM RAJANI	TDD # 02-8902-25

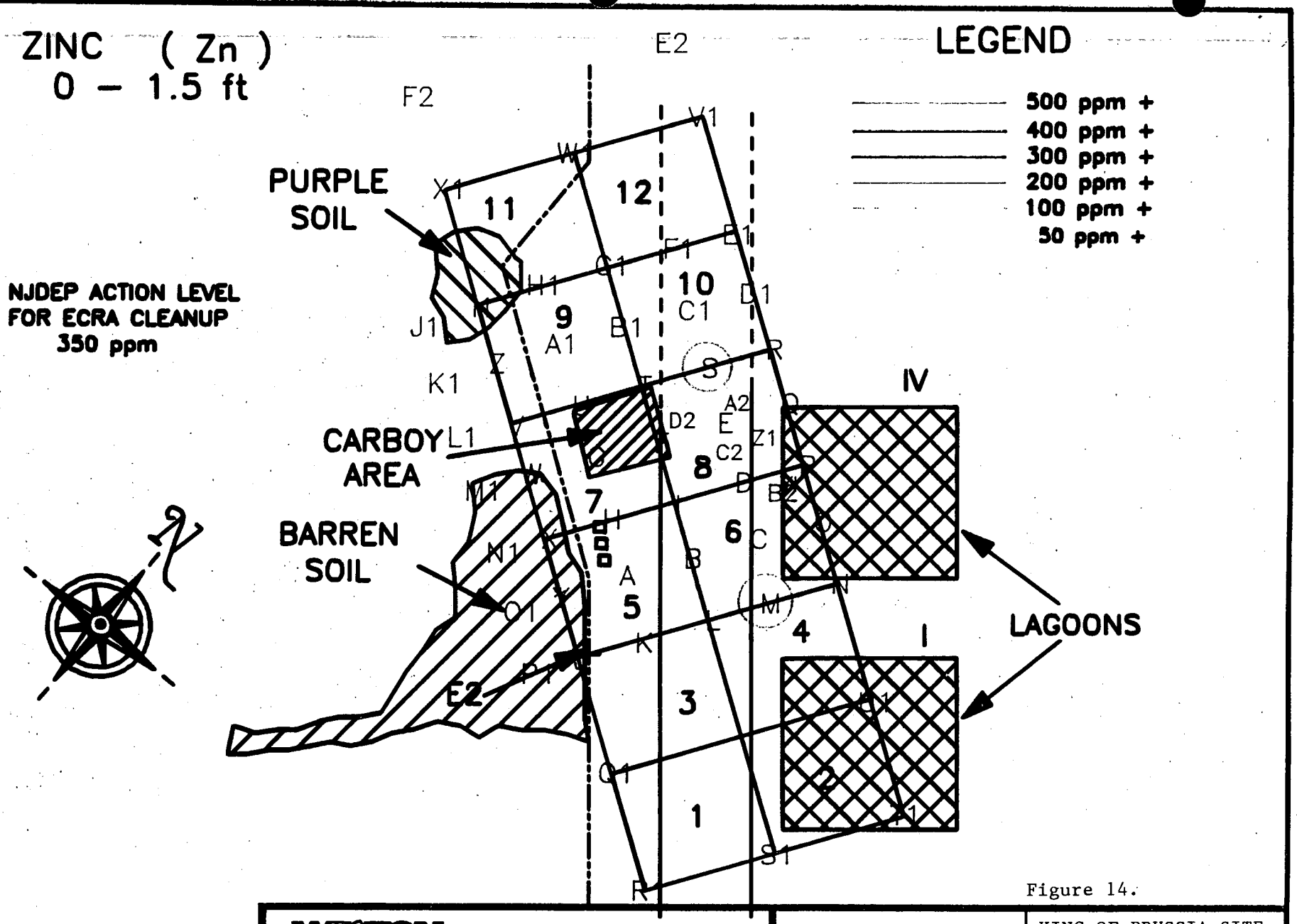


Figure 14.

WESTON MANAGERS DESIGNERS/CONSULTANTS SPILL PREVENTION & EMERGENCY RESPONSE DIVISION	EPA PM DOMINACH	KING OF PRUSSIA SITE SAMPLE LOCATIONS
In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.	TAT PM RAJANI	TDD # 02-8902-25

ZINC (ZN)
1.5 – 3 ft

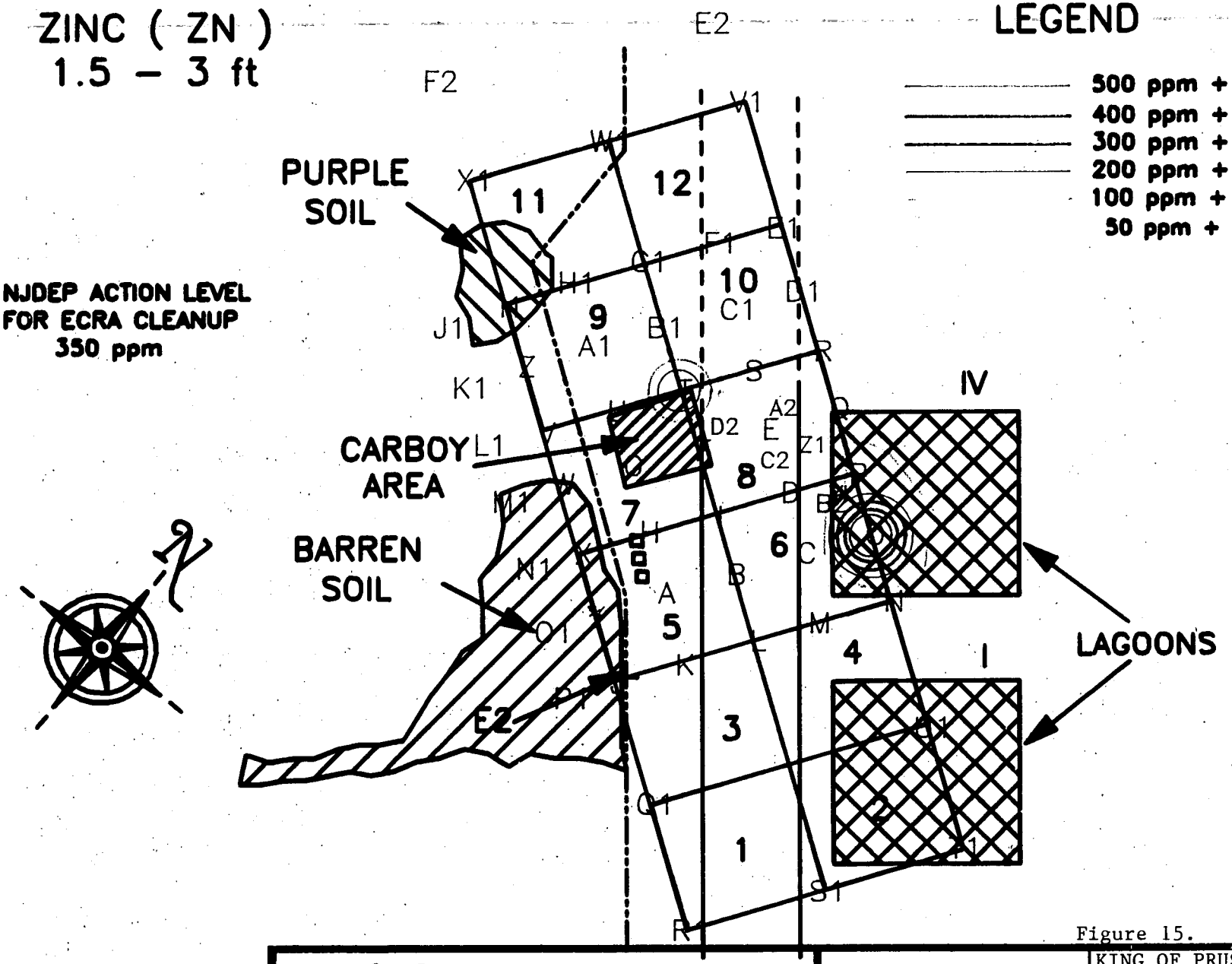


Figure 15.

WESTON MANAGERS DESIGNERS/CONSULTANTS — SPILL PREVENTION & EMERGENCY RESPONSE DIVISION	EPA PM DOMINACH	KING OF PRUSSIA SITE SAMPLING LOCATIONS
In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.	TAT PM RAJANI	TDD # 02-8902-25

KING OF PRUSSIA

FIT ANALYTICAL RESULTS VS CLP ANALYTICAL RESULTS

SAMPLE #	TAT #	DEPTH	COPPER			ZINC			NICKEL		
			FIT	CLP	% CHANGE	FIT	CLP	% CHANGE	FIT	CLP	% CHANGE
KOP-01	A	0-1.5	174.1	178.0	2.2	19.3	41.5	114.6	91.7	78.2	-14.7
KOP-02	B	0-1.5	127.0	89.8	-29.3	61.3	19.4	-68.4	54.6	30.3	-44.5
KOP-05	E	0-1.5	16.5	90.8	450.3	<10.0	7.9		10.7	6.9	-35.5
KOP-06	F	0-1.5	536.4	452.0	-15.7	20.6	22.3	8.3	13.6	14.0	2.9
KOP-10	J	0-1.5	101.3	79.7	-21.3	22.0	17.6	-20.0	50.9	31.9	-37.0
KOP-15	O	0-1.5	<10.0	13.2		<10.0	6.2		15.8	5.6	-64.6
KOP-19	S	0-1.5	4300.0	4200.0	-2.3	152.0	146.0	-3.9	641.7	708.0	10.3
KOP-20	T	0-1.5	522.1	909.0	74.1	88.3	109.0	23.4	70.4	127.0	80.4
KOP-25	Y	0-1.5	36.1	72.1	99.7	26.9	25.6	-4.8	39.5	48.9	23.8
KOP-30	E	1.5-3.0	<10.0	19.9		<10.0	5.5		<10.0	5.8	
KOP-31	F	1.5-3.0	168.9	176.0	4.2	13.1	12.1	-7.6	<10.0	8.5	
KOP-35	J	1.5-3.0	12.8	27.0	110.9	<10.0	6.6		<10.0	8.1	
KOP-38	M	1.5-3.0	305.7	217.0	-29.0	49.9	30.0	-39.9	85.4	62.5	-26.8
KOP-40	O	1.5-3.0	3500.0	31200.0	791.4	774.0	12500.0	1515.0	509.4	9630.0	1790.5
KOP-41	P	1.5-3.0	2000.0	2030.0	1.5	117.1	161.0	37.6	492.3	669.0	36.0
KOP-45	T	1.5-3.0	3900.0	149.0	-96.2	269.3	25.7	-90.5	613.8	25.6	-95.8
KOP-50	Y	1.5-3.0	16.6	199.0	1098.8	12.0	83.3	594.2	33.9	77.3	127.4
KOP-53	A1	0-1.5	216.1	185.0	-14.4	29.1	25.0	-14.1	39.9	36.6	-8.5
KOP-54	A1	1.5-3.0	45.4	45.4	0.0	14.9	7.9	-99.4	<10.0	7.8	
KOP-55	B1	0-1.5	276.6	394.0	42.2	66.5	55.7	-16.2	138.8	132.0	-4.9
KOP-56	B1	1.5-3.0	93.3	111.0	19.0	19.4	9.0	-53.6	30.3	25.5	-15.8
KOP-60	D1	1.5-3.0	47.4	52.1	9.9	<10.0	15.4		<10.0	5.6	
KOP-63	F1	0-1.5	429.0	384.0	-10.5	55.7	61.9	11.1	102.5	104.0	1.5
KOP-65	G1	0-1.5	211.5	221.0	4.5	28.4	31.8	12.0	28.3	37.9	33.9
KOP-75	L1	0-1.5	52.9	30.5	-42.3	47.7	7.9	-83.3	22.1	5.7	-74.2
KOP-80	D31	1.5-3.0	11.8	19.2	62.7	<10.0	10.6		<10.0	5.7	
KOP-85	Q1	0-1.5	250.4	445.0	77.7	40.4	54.6	35.1	72.5	103.0	42.1
KOP-90	S1	1.5-3.0	385.3	410.0	6.4	11.4	11.5	0.9	<10.0	6.4	
KOP-95	V1	0-1.5	410.6	202.0	-50.8	32.2	35.7	10.9	43.0	39.6	-7.9
KOP-100	X1	1.5-3.0	80.8	73.0	-9.3	11.9	8.5	-27.4	19.5	9.5	-51.3
KOP-105	A2	0-1.5	78.5	107.0	36.3	19.1	42.2	120.9	23.1	26.2	13.4
KOP-110	C2	1.5-3.0	<10.0	14.1		<10.0	8.9		<10.0	9.4	
KOP-115	SC1	0-1.5	601.3	806.0	34.0	59.2	73.6	24.7	75.2	107.0	42.7
KOP-120	SC6	0-1.5	347.6	272.0	-21.7	15.4	7.5	-51.0	<10.0	9.7	
KOP-124	SC10	0-1.5	86.2	53.9	-37.3	<10.0	10.4		<10.0	8.1	
KOP-125	E2	0-1.5	356.6	566.0	58.7	84.9	132.0	55.5	129.6	193.0	48.9
KOP-129	S	3.0-4.5	97.5	129.0	35.4	19.1	41.2	115.7	<10.0	14.3	

04/26/89

KING OF PRUSSIA SITE

TAT SAMPLE #	FIT SAMPLE #	DEPTH	COPPER	ZINC	NICKEL
A	KOP-1	0-1.5	174.10	19.34	91.69
B	KOP-2	0-1.5	126.96	61.31	54.59
C	KOP-3	0-1.5	67.34	17.20	30.26
D	KOP-4	0-1.5	72.37	27.41	30.13
E	KOP-5	0-1.5	16.54	6.25	10.72
F	KOP-6	0-1.5	536.39	20.58	13.61
G	KOP-7	0-1.5	177.49	20.76	20.77
H	KOP-8	0-1.5	56.61	26.57	28.44
I	KOP-9	0-1.5	24.58	8.89	9.59
J	KOP-10	0-1.5	101.29	22.04	50.85
K	KOP-11	0-1.5	87.40	6.25	56.05
L	KOP-12	0-1.5	57.12	9.96	36.86
M	KOP-13	0-1.5	301.95	104.17	91.39
N	KOP-14	0-1.5	6.52	6.25	11.71
O	KOP-15	0-1.5	6.48	6.25	15.77
P	KOP-16	0-1.5	130.71	22.35	62.04
Q	KOP-17	0-1.5	53.75	9.92	7.11
R	KOP-18	0-1.5	271.48	12.6	19.37
S	KOP-19	0-1.5	~4000.0 .43 %	151.92	641.74
T	KOP-20	0-1.5	522.11	88.32	70.41
U	KOP-21	0-1.5	79.89	16.02	14.40
V	KOP-22	0-1.5	54.58	11.93	16.34
W	KOP-23	0-1.5	117.26	52.18	85.14
X	KOP-24	0-1.5	221.29	31.03	29.91
Y	KOP-25	0-1.5	36.11	26.85	39.51
Z	KOP-51	0-1.5	25.97	15.44	54.27
A1	KOP-53	0-1.5	216.10	29.09	39.92
B1	KOP-55	0-1.5	275.56	66.53	138.75
C1	KOP-57	0-1.5	258.76	34.52	57.10
D1	KOP-59	0-1.5	201.54	15.05	<10.00
E1	KOP-61	0-1.5	219.54	24.62	60.27
F1	KOP-63	0-1.5	429.00	55.69	102.53
G1	KOP-65	0-1.5	211.54	28.41	28.25
H1	KOP-67	0-1.5	223.69	32.89	38.38
I1	KOP-69	0-1.5	66.98	15.90	11.52
J2	KOP-71	0-1.5	19.26	16.32	<10.00
K1	KOP-73	0-1.5	12.52	10.14	<10.00
L1	KOP-75	0-1.5	52.93	47.74	22.07
M1	KOP-77	0-1.5	59.97	14.73	11.78
N1	KOP-79	0-1.5	14.46	13.15	<10.00
O1	KOP-81	0-1.5	48.68	22.12	46.92
P1	KOP-83	0-1.5	40.66	12.22	41.31
Q1	KOP-85	0-1.5	248.70	37.73	103.24
R1	KOP-87	0-1.5	193.60	26.84	57.70
S1	KOP-89	0-1.5	500.99	26.45	58.35
T1	KOP-91	0-1.5	52.53	15.39	61.18
U1	KOP-93	0-1.5	223.88	23.91	67.07
V1	KOP-95	0-1.5	332.03	35.18	61.25
W1	KOP-97	0-1.5	34.50	16.67	21.49

04/26/89

KING OF PRUSSIA SITE

TAT SAMPLE #	FIT SAMPLE #	DEPTH	COPPER	ZINC	NICKEL
X1	KOP-99	0-1.5	46.05	11.21	30.03
Y1	KOP-101	0-1.5	<10.00	<10.00	11.31
Z1	KOP-103	0-1.5	<10.00	<10.00	14.08
A2	KOP-105	0-1.5	78.49	19.06	23.09
B2	KOP-107	0-1.5	458.56	87.26	130.72
C2	KOP-109	0-1.5	85.71	<10.00	<10.00
D2	KOP-111	0-1.5	132.98	36.41	28.46
E2	KOP-125	0-1.5	375.91	95.01	132.11
F2	KOP-127	0-1.5	39.27	12.79	17.96

04/26/89 KING OF PRUSSIA SITE

TAT SAMPLE #	FIT SAMPLE #	DEPTH	COPPER	ZINC	NICKEL
A	KOP-26	1.5-3	11.90	<10.00	<10.00
B	KOP-27	1.5-3	53.19	17.20	19.78
C	KOP-28	1.5-3	17.42	15.97	<10.00
D	KOP-29	1.5-3	<10.00	<10.00	<10.00
E	KOP-30	1.5-3	<10.00	<10.00	<10.00
F	KOP-31	1.5-3	168.87	13.12	<10.00
G	KOP-32	1.5-3	97.43	15.33	14.98
H	KOP-33	1.5-3	11.91	36.91	10.63
I	KOP-34	1.5-3	17.86	<10.00	13.83
J	KOP-35	1.5-3	12.77	<10.00	<10.00
K	KOP-36	1.5-3	<10.00	<10.00	10.36
L	KOP-37	1.5-3	<10.00	<10.00	11.64
M	KOP-38	1.5-3	305.71	49.93	85.42
N	KOP-39	1.5-3	196.62	18.86	27.42
O	KOP-40	1.5-3	~3500.0 .35 %	774.04	509.35
P	KOP-41	1.5-3	~2000.0 .20 %	117.08	492.34
Q	KOP-42	1.5-3	64.74	12.32	22.77
R	KOP-43	1.5-3	101.97	14.19	14.97
S	KOP-44	1.5-3	104.30	21.75	18.75
T	KOP-45	1.5-3	~3900.0 .39 %	269.30	613.78
U	KOP-46	1.5-3	57.42	12.44	17.16
V	KOP-47	1.5-3	36.65	10.95	15.22
W	KOP-48	1.5-3	29.78	20.80	12.91
X	KOP-49	1.5-3	26.84	<10.00	13.13
Y	KOP-50	1.5-3	16.62	11.98	33.85
Z	KOP-52	1.5-3	16.17	12.76	13.51
A1	KOP-54	1.5-3	45.35	14.92	<10.00
B1	KOP-56	1.5-3	93.33	19.38	30.34
C1	KOP-58	1.5-3	60.77	20.19	26.59
D1	KOP-60	1.5-3	47.37	<10.00	<10.00
E1	KOP-62	1.5-3	67.63	12.14	30.07
F1	KOP-64	1.5-3	157.24	36.83	27.28
G1	KOP-66	1.5-3	248.56	19.13	21.88
H1	KOP-68	1.5-3	37.56	12.33	<10.00
I1	KOP-70	1.5-3	14.48	<10.00	<10.00
J1	KOP-72	1.5-3	<10.00	<10.00	<10.00
K1	KOP-74	1.5-3	18.07	<10.00	63.84
L1	KOP-76	1.5-3	37.05	13.67	11.11
M1	KOP-78	1.5-3	76.61	<10.00	<10.00
N1	KOP-80	1.5-3	11.80	<10.00	<10.00
O1	KOP-82	1.5-3	31.07	<10.00	46.37
P1	KOP-84	1.5-3	35.05	14.45	42.83
Q1	KOP-86	1.5-3	55.17	10.52	64.03
R1	KOP-88	1.5-3	252.60	22.42	152.61
S1	KOP-90	1.5-3	441.51	13.80	41.73
T1	KOP-92	1.5-3	795.01	72.55	148.29
U1	KOP-94	1.5-3	130.99	16.69	29.53
V1	KOP-96	1.5-3	34.69	<10.00	24.72

04/26/89

KING OF PRUSSIA SITE

TAT SAMPLE #	FIT SAMPLE #	DEPTH	COPPER	ZINC	NICKEL
W1	KOP-98	1.5-3	34.69	<10.00	24.72
X1	KOP-100	1.5-3	93.32	17.02	46.41
Y1	KOP-102	1.5-3	253.32	20.72	147.07
Z1	KOP-104	1.5-3	12.36	15.71	<10.00
A2	KOP-106	1.5-3	<10.00	<10.00	<10.00
B2	KOP-108	1.5-3	31.37	<10.00	<10.00
C2	KOP-110	1.5-3	<10.00	<10.00	<10.00
D2	KOP-112	1.5-3	105.98	15.44	29.78
E2	KOP-126	1.5-3	66.56	27.05	32.62
F2	KOP-128	1.5-3	18.46	<10.00	<10.00
S	KOP-129	3-4.5	97.62	19.57	<10.00
T	KOP-130	3-4.5	88.17	19.69	<10.00
CARBOY-A	KOP-113	0-3.8	241.16	33.18	53.65
CARBOY-B	KOP-114	3.8-4.2	96.41	24.57	14.36

04/26/89

KING OF PRUSSIA SITE

TAT SAMPLE #	FIT SAMPLE #	DEPTH	COPPER	ZINC	NICKEL
SC1	KOP-115	0-1.0	601.25	59.18	75.16
SC2	KOP-116	0-1.0	~1600.0 .16 %	20.99	33.99
SC3	KOP-117	0-1.0	797.76	26.27	12.45
SC4	KOP-118	0-1.0	24.84	<10.00	<10.00
SC5	KOP-119	0-1.0	587.81	15.72	<10.00
SC6	KOP-120	0-1.0	347.62	15.39	<10.00
SC7	KOP-121	0-1.0	27.69	12.50	<10.00
SC8	KOP-122	0-1.0	60.85	<10.00	<10.00
SC9	KOP-123	0-1.0	70.42	11.38	<10.00
SC10	KOP-124	0-1.0	86.88	<10.00	<10.00

Conover Doreen USHwyNo1SBrns 821-6441
Conover E 97 GeorgeCart 969-0338
Conover E 30 IdlewildAvSayr 257-2203
Conover E 1 KulasLaSayr 727-9545
Conover E M 52 SedgwickJamesbg 521-0359
Conover Earl Dunham'sCornerRdSBrns 821-9297
Conover Eugene P
1963 BeekmanRdMonJct 297-0690
Conover F W 53 SedgwickJamesbg 521-1136
Conover G K 44 FernRdEBrns 254-9348
CONOVER GARRET B AGENCY THE
28 MainEnglishtown **446-7676**
Conover Geo Mrs 5 FraleyDrSomrst 545-5615
Conover Geo G
OldBridge-EnglishtownRdOBdg 251-3528
Conover Geo L 358 HillcrestAvSomrst 247-4755
Conover George W 5 FraleyDrSomrst 545-6287
Conover H R Mrs 8 RedcliffeAvHlndPk 247-0926
Conover J 100 TicetownRdOBdg 679-2043
Conover John F 245 BurlingtonAvSpotwd 251-0058
Conover K F 50 RegencyManorDr 828-7994
Conover Kenneth 163 ChurchillAvSomrst 828-9539
Conover L 22 MacArthurDrEdsn 738-8132
Conover L 33 MortonAvSpotwd 251-8755
Conover Lawrence 95 CollegeAv 937-8090
Conover M A 120 QuentinAv 246-2146
Conover Marvin 128 LincolnSayr 721-5118
Conover Mr & Mrs R
715-B CranburyCrossRdNoBrns 247-0147
Conover Nurseries Inc 44 FernRdEBrns 254-9348
Conover R 58 WillettAvSRiv 254-7577
Conover Raymond 10 TuscororaCirOBdg 679-1448
Conover Raymond Jr 13 DeniseAvMiltwn 821-7161
Conover Richard D & Melissa L
73 LettsCtOBdgTwp 583-6430
Conover Robt 59 WillowRdMetn 548-0224
Conover Robt T 59 WFochAvMiltwn 545-7790
Conover Steven 180 ElizabethAvIsln 283-1325
Conover T CookCampus 247-9689
Conover T D 9 HavenTerSayr 721-7357
Conover T D 13 SummitAvFord 738-7569
Conover Thos 11 AlphaLaOBdgTwp 679-8147
Conover Viola 171 AustinAvOBdg 251-4172
Conover W & H 216 GatzmerJamesbg 521-0839
Conover Walter R 83 GrossAvEdsn 738-3933
Conquest Robt 154 FreemanWdbg 636-0708
Conquip Machinery Exchange
9 ValiantRdEBrns 238-4070
Conrad B J 21 CrescentRdEdsn 287-4113
Conrad Chas 7 CatherineCart 541-7210
Conrad E 238 ManalapanRdSpotwd 251-1319
Conrad E 100 MontgomeryHlndPk 247-3878
Conrad Jack 31-D SpruceLaOBdg 679-0430
Conrad Keith & Barbara 85 HollyRdIsln 549-1836
Conrad Kurtis 97 CollegeDrEdsn 248-8318
Conrad M 11 FaganPlCol 388-3528
Conrad Michele 11 FaganPlCol 388-6089
Conrad Robt 348 LancasterCtPisctwy 463-7129
Conrad Robt Sr 1610 RivendellWyEdsn 572-7485
Conrad S L 1410-K OakTreeDrNoBrns 545-0825
Conrad V George 745-9245
Conrad W W 232 ManalapanRdSpotwd 251-7531
Conrad Wm 338 WoodAvIsln 548-4278
Conrado Geo 340 WoodruffAvAvnl 636-3159
Conrail BordentownAv&JerneeMillRdOBdg 257-9677
Conrail Real Estate 510 ThornallAvEdsn 906-3000
Conran's Retail Store
251 StateHwyNo18EBrns 257-8000
Conroy A M 212 SouthOBdg 360-2470
Conroy B 506 CordeliaNoBrns 821-6871
Conroy C 3 CharlesSAmb 721-1712
Conroy Chas M 148 StocktonSAmb 721-7231
Conroy Daniel J Jr
336-N NewportWyRosmr 609 655-0767
Conroy David J 11 RacetrackRdEBrns 257-9466
Conroy E 69 MorrisMorgn 727-4915
Conroy Edward 3 KosterBlvdEdsn 494-5549
Conroy F 108 AugustaSAmb 727-6482
Conroy F J 15 ElmCtMetn 549-5066

CONROY FUNERAL HOME
21 E2ndBoundBrook 356-0991

Conroy Gene 613 AlmonAvWdbg 636-3144
Conroy Henry 516 DavidSAmb 721-9485
Conroy J E 92 SLakesideDrLkNlsn 463-1340
Conroy J F Jr 24 PurdueRdOBdgTwp 727-5025
Conroy Jas A 212 SouthStOBdg 360-1409
Conroy James F 212 SouthStOBdg 679-7559
Conroy James F Jr 18 SunsetSRiv 238-7056
Conroy Jennie C 1033 ApacheNoBrns 297-0183
Conroy John & Barbara ErnstonRdSayr 727-1038
Conroy John E Jr 255 Handy 545-5964
Conroy John P 31 DeyPlEdsn 985-2163
Conroy K 199 EJamesPlIsln 283-1499
Conroy K 248 VineyardAvMorgn 727-6286

Conroy L 346 6thSAmb 721-2099
Conroy M 33 HemlockDrSayr 721-0291
Conroy M F III 26 AveEJamesbg 521-4532
Conroy M L
369-A NewBedfordLaRosmr 609 655-3298
Conroy Mark 33 HemlockDrPrin 721-4754
Conroy Martin
356 MatchaponixRdJamesbg 521-3375
Conroy Martin J USHwyNo9Wdbg 636-8000
Conroy P 23-A WestminsterBlvdOBdgTwp 721-1673
Conroy Peter 30 AlphaAvOBdgTwp 679-8510
Conroy Robt 575 EastonAvSomrst 745-7605
Conroy S 7 BorelleSqSayr 727-3491
Conroy T 35 DaynaCtPerth 826-3231
Conroy T 95 HearthstoneAvFord 225-9351
Conroy T J 506-B CordeliaNoBrns 821-6854
Conry Donald 25 KingsbridgeDrEdsn 381-6823
Conry J J 991 OldBridgeTpkEBrns 254-8404
Consales R 43 OxfordRdCol 388-7584
Consalvo A 28 Juliet 247-2195
Consalvo J C 28 Juliet 846-4562
Consalvo J V 28 Juliet 846-9148
Consalvo L 138 Fulton 247-3806
Consalvo N 73 Juliet 247-2421
Consalvo T 452 RemsenAv 545-5630
Conselyea E 51 WallingSayr 238-0751
Conselyea E 51 WallingSayr 238-3760
Conseur C BuschCampusPisctwy 932-1100
Considine C NeilsonCampus 745-8211
Consiglio D C 107 AshCart 541-7156
Consiglio Jos 32 WillowCart 541-7635
Consiglio Paul 27 TallOaksDrNoBrns 821-7408
Consiglio R D 1079 FloridaGroveRdPerth 442-1221
Consolata Mission Hall
StateHwyNo27Somrst 297-9191
Consolata Missionaries-Mission Center
StateHwyNo27Somrst 297-9191
CONSOLATA SOCIETY FOR FOREIGN MISSIONS—
Provincial Office StateHwyNo27Somrst **297-9191**
Consolata Mission Center
StateHwyNo27Somrst 297-9191
Consolazio E 25 MinebrookRdEdsn 548-1813
Consoli Carmelo 1110 DeastonAvSomrst 545-5738
Consoli J P StateHwyNo518FklnTwp 297-5287
Consoli R 303 RalphSomrst 828-6794
CONSOLIDATED AIR FREIGHT INC
NewBrunswickArea **828-1215**
Consolidated Converting
500 MarketPerth 826-4664
Consolidated Credit Bureau
3826 ParkAvEdsn 548-5800
Consolidated Freightways
105 NewEraDrSouthPlainfield 754-1464
Consolidated Freightways Arrowhead
Services 712 USHwyNo1Edsn 572-9533
Consolidated Graphic Materials
69 VeronicaAvSomrst 246-8244
Consolidated Ingredients Systems Inc
69 VeronicaAvSomrst 828-8613
Consolidated Laundries Inc—
Uniform Supply Services
1212 SummitAvJerseyCity 659-8700
Health Care Services 12 CliftonNewark 824-0770
Linen Supply & Towel Division
NewarkAera 483-2400
Consolidated Material Converting Co Inc
500 MarketPerth 826-4664
Consolidated NDE Inc
6 WoodbridgeAvWdbg 636-4550
Consolidated Press Inc 116 MainWdbg 636-7020
Consolidated Press Inc 116 MainWdbg 636-7448
Consolidated Services International
140 JacksonAvEdsn 225-6446
Consolidated Somerset Syrups
1850 JerseyAvNoBrns 545-9300
Constable P 302 McKinleyAvEdsn 756-1315
Constandis D MD 415 AvenelAvnl 636-7787
Constant J 1050 George 247-6108
Constant Richard A 50 CarlisleCtSomrst 846-9257
Constant Stephen
52 WindingWoodDrSayr 257-8926
Constantian T
70 JohnFKennedyBlvdSomrst 247-1955
Constantine J 398 MainMetn 632-8673
Constantine Jos 19 BunkerHillDrOBdg 251-7927
Constantine L 12 WindsorDrEBrns 254-7565
Constantine R 318 HooverAvEdsn 225-9533
Constantineau Henry P
36 EmbroiderySayr 238-6537
Constantinides Alkis
44 MacAfeeRdSomrst 846-8292
Constantino C 14 OakwoodPlCart 969-0872
Constantinov C 273-C S10thAvHlndPk 572-7703
Constanza J C 63 WebbEdsn 756-7582
Constanza Jos A Jr 65 WebbEdsn 757-1671
Construction By Povlich
3 PeppermintHillsRdNoBrns 297-1133
Construction Economists Of America

Construction Financial Management
Association 40 BrunswickAvEdsn 287-2777
Constructive Concepts EdisonArea 572-9046
Consuegra R 68 ClaremontRdFklnPk 297-3494
Consultant Resources Inc
1010 RiverRdPisctwy 463-1211
Consultants For Telecommunications Inc
485 USHwyNo1Wdbg 750-0040
Consultants In Behavioral Control Inc
678 UnionRdSpringValleyNY 914 354-7296
Consumer Affairs See N J State Of
Consumer Bureau Princeton—
To File A Complaint-24 Hour Service 609 924-8223
For Other Business 609 924-0737
Consumer Credit Corp
NewBrunswickArea 846-3900
Consumer Food Services Inc
152 TicesLaEBrns 390-9111
Consumer Healthcare Communications Inc
1460 USHwyNo9Wdbg 636-7080
Consumer Loan Center
389 StateHwyNo18EBrns 238-5786
Consumer Surveys Inc
EastBrunswickArea 238-7555
Consumers Distributing
205 CampusPlazaEdsn 225-4200
Consumers Distributing
233 StateHwyNo18EBrns 828-5483
Consumers Distributing Co Inc
180 RaritanCenterPkwyEdsn 417-9090
Consumers Distributing Co Ltd
USHwyNo9Wdbg 826-5071
Consumers Distributing P O S Line
96 NorthfieldAvEdsn 225-9059
CONSUMERS PLUMBING & HEATING
6 CulnenDrBranchburg **725-6600**
Consumers World EastBrunswickArea 254-2626
Contact Lens Outlet MetuchenArea 287-6005
Contact Lens Outlet & Fashion Glasswork
1032 StGeorgesAvAvnl 750-3900
Contact Lens Outlet & Fashion Glassworks
MetuchenArea 494-2380
Contact Lens Outlet & Fashion Glassworks
550 OldPostRdEdsn 287-6600
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489 5thAvNYCNY 212 687-3880
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ProgressRdSBrns **821-9600**
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Contala A P 900 RahwayAvAvnl 636-5595
Contala J 27 LarchPrtRdng 541-7709
Contala Victor M 47 DivisionPrtRdng 969-0512
Contant Ralph
70 JohnFKennedyBlvdSomrst 249-8948
Contardo R 40 BeekmanAvCol 381-8687
CONTE See Also CONTI
Conte A CookCampus 745-1490
Conte A 60 MarlinAvEEdsn 549-6396
Conte A 68 PostBlvdCart 541-9048
Conte Anthony 4 FischerDrFklnPk 821-8385
Conte Anthony 68 PostBlvdCart 969-2139
Conte B 55-R ReadingRdEdsn 906-8110
Conte C F 41 VictorianDrOBdg 360-1252
Conte Carl F 13 PetuniaDrNoBrns 422-0992
Conte D A 20 VerosLaSomrst 422-0916
Conte Edward 33 BennettCtEBrns 390-7991
Conte Frank 64 WillowCart 541-8983
Conte G 302 S3rdAvHlndPk 249-5022
Conte Harold 21 DianeAvOBdg 723-1812
Conte J Jr 5 OakwoodAvCart 541-1109
Conte J Sr 94 DanielCart 541-8756
Conte Michael Mr & Mrs
1014 CricketLaWdbg 855-2219
Conte Robt 55 ThorneLaOBdgTwp 566-8326
Conte Wm P 19 ParkerRdEdsn 548-5445
Conte Y 253 Hale 247-0192
Conteh C 62 RegencyManorDr 828-7915
Conteh D 33 CommercialAv 828-1668
Conteh Ibrahim 250 MatildaAvSomrst 828-9149
Conteh S 166 RemsenAv 246-7220
Conteh Sheaka 120 GeorgeSpotwd 251-9246
CONTEL TEXOCOM
100 NewfieldRdEdsn **225-4114**
Contempo Casuals
232 WoodbridgeCtrDrWdbg 855-0610
Contemporaries 762 GreenIsln 750-4990
Contemporary Cabinet Concepts
735 StateHwyNo18SEBrns 238-3233
CONTEMPORARY-MCGRAW-HILL
PrincetonRdHightstown 609 426-5000

CONTEMPORARY MOTOR CARS INC
14 FairviewAvLittleSilver 842-5353

Contemporary Psychology Institute

Contempra Design Furniture
162 StateHwyNo34OldBridge 290-8
Contessa Nick & Carol Q-1 QuincyCtrDytn 329-6
Contessa Nick Mr & Mrs
161 RuesLaEBrns 390-
Contessa Rocco 161 RuesLaEBrns 390-4
Contessa Thomas 161 RuesLaEBrns 613-1
Contestable T 33 Mine 937-6
Contey M 847 DavidsonRdPisctwy 932-0
Contey P 48 ManorCt 828-2
Contey P 18 MerkerDrEdsn 225-7
CONTI See Also CONTE
Conti Anna 11 ButtonwoodDrOBdgTwp 679-8
Conti Chris 54 Baldwin 545-1
Conti Darrin 56-P ReadingRdEdsn 906-8
Conti Frank 337 WoodAvEdsn 494-1
Conti G B SwiderDrSayr 721-1
Conti J 257 Powers 246-7
Conti Jill 68 WindingWoodsDrSayr 257-6
Conti John 11 ButtonwoodDrOBdgTwp 679-8
Conti Joseph 24 OverhillDrNoBrns 821-1
Conti Jos L 48 BoskoDrEBrns 254-1
Conti M 23 MinebrookRdEdsn 494-5
Conti R 64 EastsideAvEdsn 985-7
Conti R & V 1104 NOaksBlvdNoBrns 247-1
Conti S 63 PercivalCtOBdg 679-3
Conti Stephen 44 LocustCart 541-5
Contic P 54 Hassart 247-0
Conticchio J C 70 GrantAvCol 574-3
Conticchio L 305 MerrywoodDrEdsn 572-2
Conticchio Thomas 15 VanLiewAvMiltwn 828-2
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Continental Baking Co Engineering & Research Div TicesLaEBrns 254-8
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24 KilmerRdEdsn 985-4
Continental Casualty Co
88 WFrontKeyport 739-4
Continental Construction Associates
335 HighMetn 494-0
Continental Construction Corp
EastBrunswickArea 246-4
Continental Controls & Equipment Co Inc
300 BuckelewAvJamesbg 521-4
Continental Data Forms Inc
69 VeronicaAvSomrst 246-8
Continental Finishing Corp
3143 BordentownAvOBdgTwp 727-3
Continental Group Inc The—
Continental Can Company USA Company
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Continental Forest Industries—
Fibre Drum Division Sales & Mfg
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Continental Plastic Containers Sales & Mfg
300 RyderLaMiltwn 254-5
Nights Saturdays Sundays & Holidays 254-5
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Contact Systems, Inc. (Electronic Assembly Production Machinery), Miry Brook Rd., Danbury, CT 06810 (Ex.) (5M+) (TWX: 710-456-7611) ..... 203—743-3837

Containair Systems Corp. (Containers), 145-80 228th St., Springfield Gardens, NY 11413 (Brs. at North Hollywood, Calif.; Chicago, Ill.; Detroit, Mich.; Australia, England, Israel, Japan, Puerto Rico, South Africa) (Ex., Ca. 'Conair') (NR) (TELEX: 422-071) ..... 718—276-6500

Container Corp. of America (A Mobil Corp.) (Shipping Containers, Folding Cartons, Plastic Industrial Containers), One First National Plaza, Chicago, IL 60603 (Brs. at Santa Clara, CA & Philadelphia, PA) (Plts. at Atlanta, GA; Carol Stream, IL; St. Louis, MO; Cincinnati, OH; Oaks, PA; Fort Worth, TX)) (Ex.) (50M+) (TELEX: 247059) ..... 312—580-5500

Container Corp. of America, Fibre Can Div., 3235 S. Big Bend Blvd., Maplewood, MO 63143 (1M+) ..... 314—646-7503

Container Corp. of America, Fibre Drum Div. (A Mobil Corp.) (Fibre Drums), 125-T Harrison Ave., P.O. Box 433, Matawan, NJ 07747 (Ex.) (50M+) ..... 201—566-5500

Container Corp. Of America Plastics Div. (Polyethylene Containers, Open Head Polyethylene Tanks), P.O. Box 1648, Wilmington, DE 19899 (Ex.) (1M+) ..... 302—573-2550

Container Design, Inc. (Polystyrene Packaging Materials & Containers), 637-T Billinis Rd., Salt Lake City, UT 84119 (NR) ..... 801—262-6608

Container Equipment Corp. (CECO) (Cartoning Machinery), One-T Ceco Way, Cedar Grove, NJ 07009 (Ex.) (1M+) ..... 201—857-1500

Container Graphics Corp. (S—Tech Steel Rule Die Co., Inc.) (Cutting Dies, Printers' Supplies), 305-T Ryder Rd., P.O. 3474 Sta. C, Toledo, OH 43607 (Plts.at Anaheim & Hayward, CA; Arlington, IL; Vernon, IN; Marysville, MI; Hazlet, NJ; Charlotte, NC; Dallas, Springboro & Toledo, OH; Dallas, TX; Weston, Ontario, CAN) (Ex.) (5M+) (TWX: 810-442-1729) ..... 419—537-8600

Container Industries Inc. (Plastic Pails), 11151-T Sutter Ave., Pacoima, CA 91331 (NR) ..... 213—875-1978

CONTAINER MACHINERY CORP. CAN MACHINERY-FOOD MACHINERY, P.O. Box 503-T, Kinderhook, NY 12106 (1M+) (TELEX: 145307 IMI USA KNHK) ..... **518—758-6660**
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Container Machinery, Inc., 7450-T Tower St., Fort Worth, TX 76118 (NR) ..... 817—589-2172

Container Printing Ink Corp. (A Commercial Ink Corporation) (Fine Inks For The Graphic Arts, Silk Screen Inks & Coatings), 820-T Magazine St., New Orleans, LA 70130 (NR) ..... 504—524-8173

Container Products Inc. (Mfrs. Of Carbon & Stainless Steel Containers From 3 1/2 To 55 Gallon, Plastic Pails From 2 1/2 To 7 Gallon. Standards And Specials. We Furnish All D.O.T. And U.N. Specification Containers), 20245-T Twelve Mile Rd., Southfield, MI 48076 (Ex.) (25M+) ..... 313—827-7720

CONTAINER RING CO., INC., 857 Woodruff Lane, Elizabeth, NJ 07201 (1M+) ..... **201—354-1900**
(A Eastern Steel Barrel Corp.)
(S—Eastern/Plastics Div.; Plyfiber Container Corp.)
(V.P. Sls.) R.W. Okra

Container Service Corp. (Packaging Materials), 309-T Dixie, North Little Rock, AR 72114 (1M+) ..... 501—945-3296

Container Service, Inc. (Cryogenic Containers, Low Temperature Equipment Systems), 1090 Industrial Ave., E., Lowell, MA 01853 (1M+) (TELEX: 94-7485) ..... 617—454-5495

Container Services International Inc. (Container International), Brookley Industrial Complex, P.O. Box 2191, Mobile, AL 36652 (NR) (TELEX: 505-517) ..... 205—432-2672

Container Specialties, Inc. (Manufacturing, Cleaning & Reconditioning Leather Gloves & Aprons), 3261 Flushing Rd., Flint, MI 48504 (1/2M+) ..... 313—239-9222

CONTAINER STAPLING CORP., 27th St. & I. C. R. R., Herrin, IL 62948 (1M+) ..... **618—942-2125**
(Manufacturers of Stapling Machines and King-Size Staples to Close Corrugated Containers — Machines to Drive Corrugated Fasteners, Nails, Staples Revisions And Boxmakers' Stitching Wire, Stampling Wire, Manufacturers' Coppered And Galvanized Wire)
(Ex.) (Chmn.) W. Schafroth; (P.) Dr. B. Kelly; (T.) C. Brewster; (S.M.) C.A. Baker; (Plt. Mgr.) A.E. Cairatti; (P.A.) B.M. Schafroth

Container Supply Co., Inc. (Metal Cans & Plastic Containers), 12571 Western Ave., Garden Grove, CA 92641 (1M+) ..... 714—530-1901

Container Systems Corp. (Export Packing), 145-80 228th St., Springfield Gardens, NY 11413 (NR) (TELEX: 12-5061) ..... 718—276-6500

Container Systems, Inc. (Heavy Duty Industrial & Shipping Containers), P.O. Box 519, Franklinton, NC 27525 (1/2M+) ..... 919—496-6133

Container Testing Laboratory, Inc. (Package Engineering & Package Testing), 607-T Fayette Ave., Mamaroneck, NY 10543 (1/2M+) ..... 914—381-2600

Container Tooling Corp. (Tooling For Aluminum & Steel Can 100, Rte. 66, P.O. Box 246-T, Neptune, NJ 07753 (E (1M+) .....

Container & Label, Inc. (Corrugated Boxes), Apdo. 29201, 65 I Piedras, PR 00929 (NR) .....

Containercraft Inc. (Corrugated Containers), 144-T Plymouth S OH 44904 (1/4M–) .....

Containerization Systems Div., Liberty Carton Co. (Cargo Cont Within 24 Hours. Air Freight/Bulk/Palletized Conta Surface & Ocean Delivery), 872 Louisiana Ave., S., M MN 55426 (Ex.) (NR) .....

CONTAINMENT SYSTEMS CORP., P.O. Box 1390-T, Cocc (1M+) (TELEX: 56-6535 CSC COCA) .....
(Oil Spill Containment Booms & Oil Recovery Equip
(Ex.) (P.) J.P. Kallestad; (V.P., Eng.) H.R. Ankeny; (Koivu

Contamination Control Corp. (Paper Trim Collection Equipmen Control Equipment, Dust Collectors, Baghouses, Inci Box 177, Maple Plain, MN 55359 (Ex.) (1M+) .....

Contamination Control, Inc. (A Mallinkrodt Inc.) (S—Forma Sc (Laboratory Equipment), P.O. Box 867, Lansdale, PA (1M+) (TELEX: 846460) .....

Conte Luna Foods, Inc. (Macaroni), 910-T E. Main St., P.O.Box Norristown, PA 19404 (1/4M–) .....

Contech Products, Consolidated Technologies Corp. (A Enmar (Demolition Hammers, Compaction Equipment, Mobi Breaking Systems), 5070-T Oakland St., Denver, CO (1M+) (TELEX: 45-0195) .....

Contech Research Inc. (Research & Testing), 67-T Mechanic St., 02703 (NR) .....

Contek, Inc. (Pressure Sensitive Decals, Injection Molded Namep Plaques), 1800 Park Blvd., Streamwood, IL 60103 (NR) .....

Contel CADO (A Continental Telecom Inc.) (Computers), 2055 St., Torrance, CA 90504 (Ex.) (50M+) .....

Contel/Continental Telephone System (A Continental Telecom Telephone & Data Communication Systems. Needs An Configuration To Requirements, Sales, Service & Main Total Telecommunications Products & Services), Mark Services, 245 Perimeter Pkwy., Atlanta, GA 30346 (Of Throughout The Country) (50M+) .....

Contel Corp. (Project Scheduling Software), 416-T W. 5th Ave., N 60540 (NR) .....

Contel Data Services Corp. (A Continental Telecom Inc.) (Custo & Data Processing Software, Firmware & Hardware P The Telephone Industry As Well As For Government Commercial/Industrial Telecommunications Customers C/M, 245 Perimeter Pkwy., Atlanta, GA 30346 (NR) .....

Contel Information Systems (A Continental Telecom, Inc.) (Appl Software), 4330-T East-West Hwy. 200, Bethesda, MD (50M+) (TWX: 710-824-0414) .....

Contel Page, Inc. (A Continental Telecom, Inc.) (Civil & Military Communications & Security Systems), 801-T Follin Lan VA 22180 (Ex., Ca. 'Pageneers') (50M+) (TELEX: 89-2455) .....

Contempo Campers, Inc. (S—Contempo Vans; Contempo Enterpri Frantom; Contempo Hobby Products) (Vans, Lapidary I 9175-T San Fernando Rd., Sun Valley, CA 91353 (Br. at Ohio) (Ex.) (5M+) .....

Contempo Card Co. (Display Cards For Jewelry), 69-T Tingley St., RI 02903 (Ex.) (1M+) .....

Contempo Engineering Co. (Computer Room Air Conditioning; Co Panels), 553-T Constitution Ave., Camarillo, CA 93010 ((TELEX: 66-2756) .....

Contempo Frames Co., Inc. (Wrought Iron & Chrome Dinette Sets Ave., Brooklyn, NY 11213 (1/4M–) .....

Contempo Hobby Products (Model Aircraft Engines), 9175-T San F Rd., Sun Valley, CA 91353 (NR) .....

Contempo Lighting (Lighting Fixtures), 601-T Saluda Ave., P.O. Bo Batesburg, SC 29006 (NR) .....

Contempo Trophy Mfg. Co. (Plaques, Screen Printing), P.O. Box 41 Huntington, WV 25729 (1/4M–) .....

Contempora Fabrics Inc. (Knit Fabrics), P.O. Box 312, Lumberton, (NR) .....

Contemporary American Furniture Inc., 1821 W. Berteau St., Chica 60613 (NR) .....

Contemporary Computerwear (Computer Covers), 1320-T 36th Ave Francisco, CA 94122 (NR) .....

Contemporary Control Systems Inc. (Microcomputer & Systems), 27 Curtiss St., Downers Grove, IL 60515 (1/4M–) .....

Contemporary Corp. (Plastic Furniture Panels), Dept. Tr., P.O. Box Prairie, TX 75051 (1/4M–) .....

Contemporary Craftsman (Hand Crafted Custom Made Wood Furni 231-C Stokes N.W., Huntsville, AL 35805 (NR) .....

Contemporary Design (Paper Products), 819-T Lincoln Way, Ames, (NR) .....

Contemporary Interiors, Inc. (Vinyl & Fabric Slipcovers, Draperies, Hardware), 6113-T Benhurst Rd., Baltimore, MD 21209 ((1/4M–) .....

CONTEMPORARY KILN, INC., 26 "N" Commercial Blvd., Novat 94947 (1/4M–) **4**
(Electric & Gas, Standard & Custom Glass & Ceramic Batc Kilns From 1 To 200 Cubic Feet, 2500 Degrees F. Also Repa & Element Replacement)
(Ex.) (P.) J.L. Glossinger

Contemporary Leader Window Co., 236-T S.E. 59th, Section E, Okla City, OK 73149 (NR) .....

Contemporary Modular Cabinetry, P.O. Box 238, Woodland, CA 956 (NR) .....

Contemporary Plaque Company, Inc., Dept. T, 1532 Old Garner Rd. NC 27529 (Br. At Tampa, FL) (Ex.) (1/4M+) .....

Let's protect our earth

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS SITE MITIGATION
401 E. State St., CN 413, Trenton, N.J. 08625-0413
(609) 984-2902
Fax # (609) 633-2360

Anthony J. Farro
Director

HAZARDOUS SITE SCIENCE ELEMENT
NJDEP SOIL ACTION LEVELS

Total Petroleum Hydrocarbons (TPHC)	100 ppm
Surrogate Levels:	
Acid Extractables (AE)	Case-by-Case
Base Neutrals (BN)	10 ppm
Volatile Organics (VOC)	1 ppm
Pesticides	
DDT	1-10 ppm
Chlordane	1 ppm
Other	Case-by-Case
Polychlorinated Biphenyls (PCB)	1-5 ppm
Priority Pollutant Metals (PPM):	
Antimony	10 ppm
Arsenic	20 ppm
Barium	400 ppm
Beryllium	1 ppm
Cadmium	3 ppm
Chromium	100 ppm
Copper	170 ppm
Lead	250-1,000 ppm
Nickel	100 ppm
Mercury	1 ppm
Molybdenum	1 ppm
Selenium	4 ppm
Silver	5 ppm
Thallium	5 ppm
Vanadium	100 ppm
Zinc	350 ppm
Polycyclic Aromatic Hydrocarbons (PAH)	10 ppm

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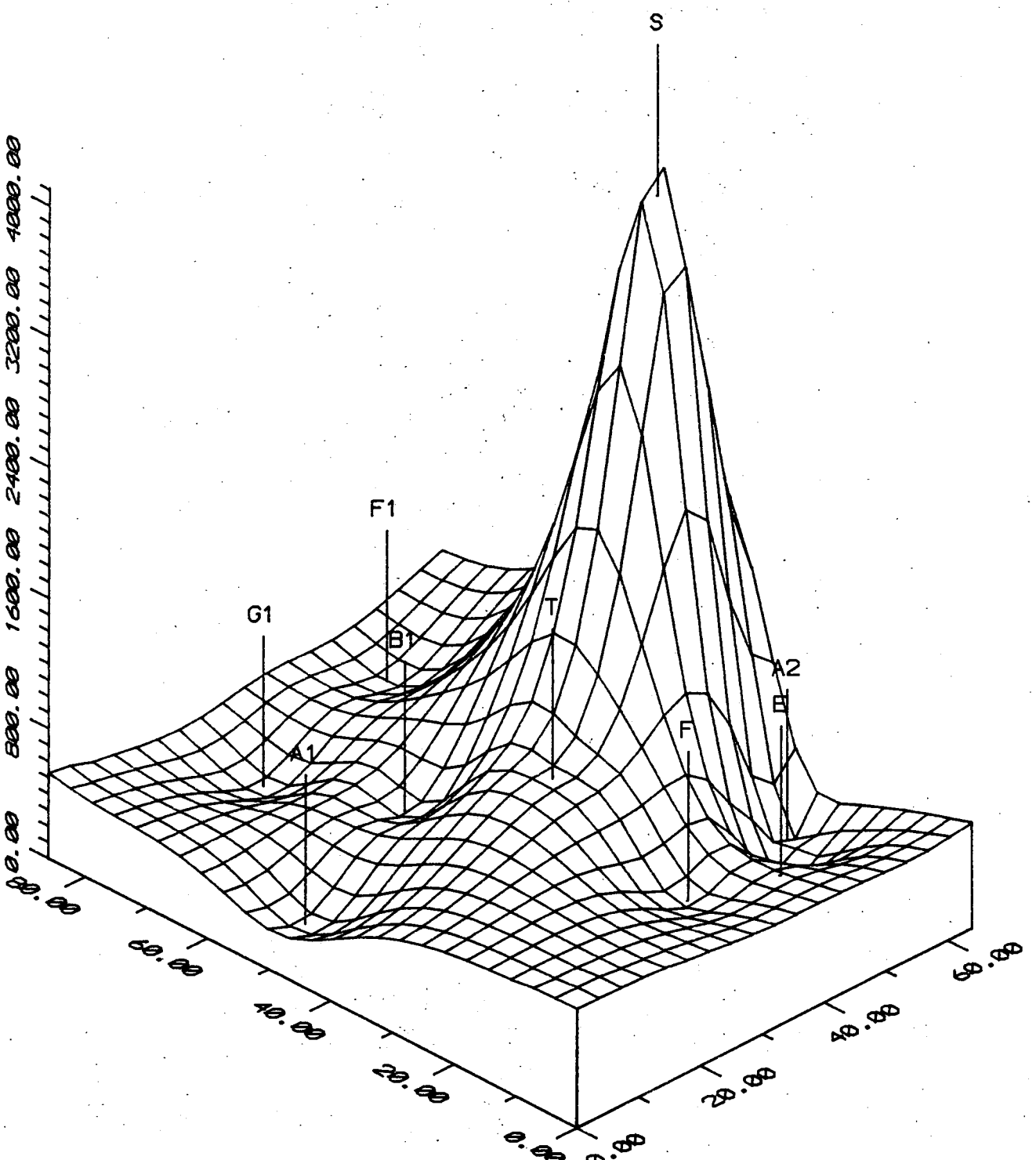
ppm = Parts per million (mg/kg)

The action levels are reference numbers used to identify presence of contamination. All contamination identified at a site above the action level should have horizontal and vertical extent delineated. Specific cleanup objectives are developed on a case-by-case basis (and may be the action levels in some instances).



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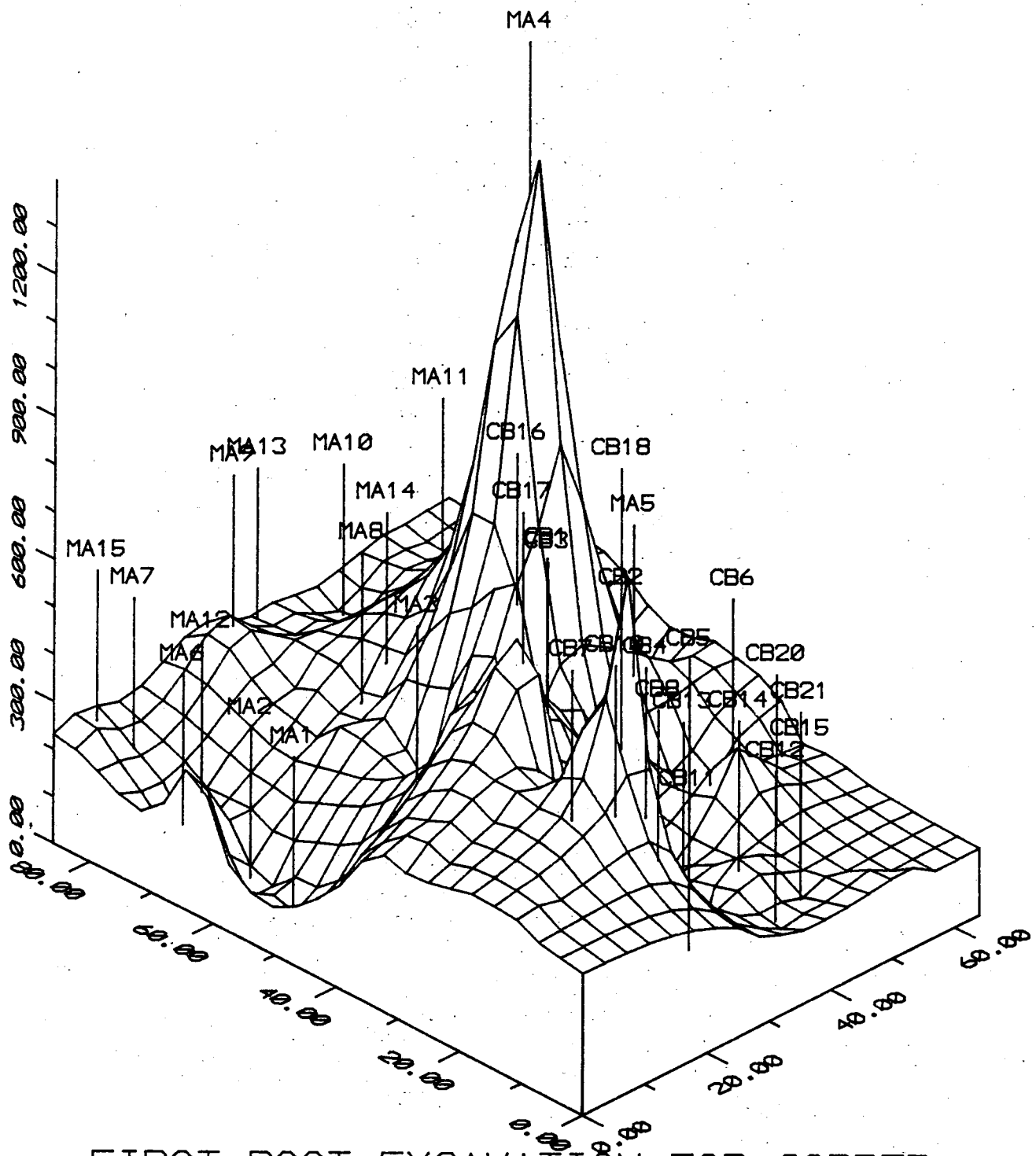

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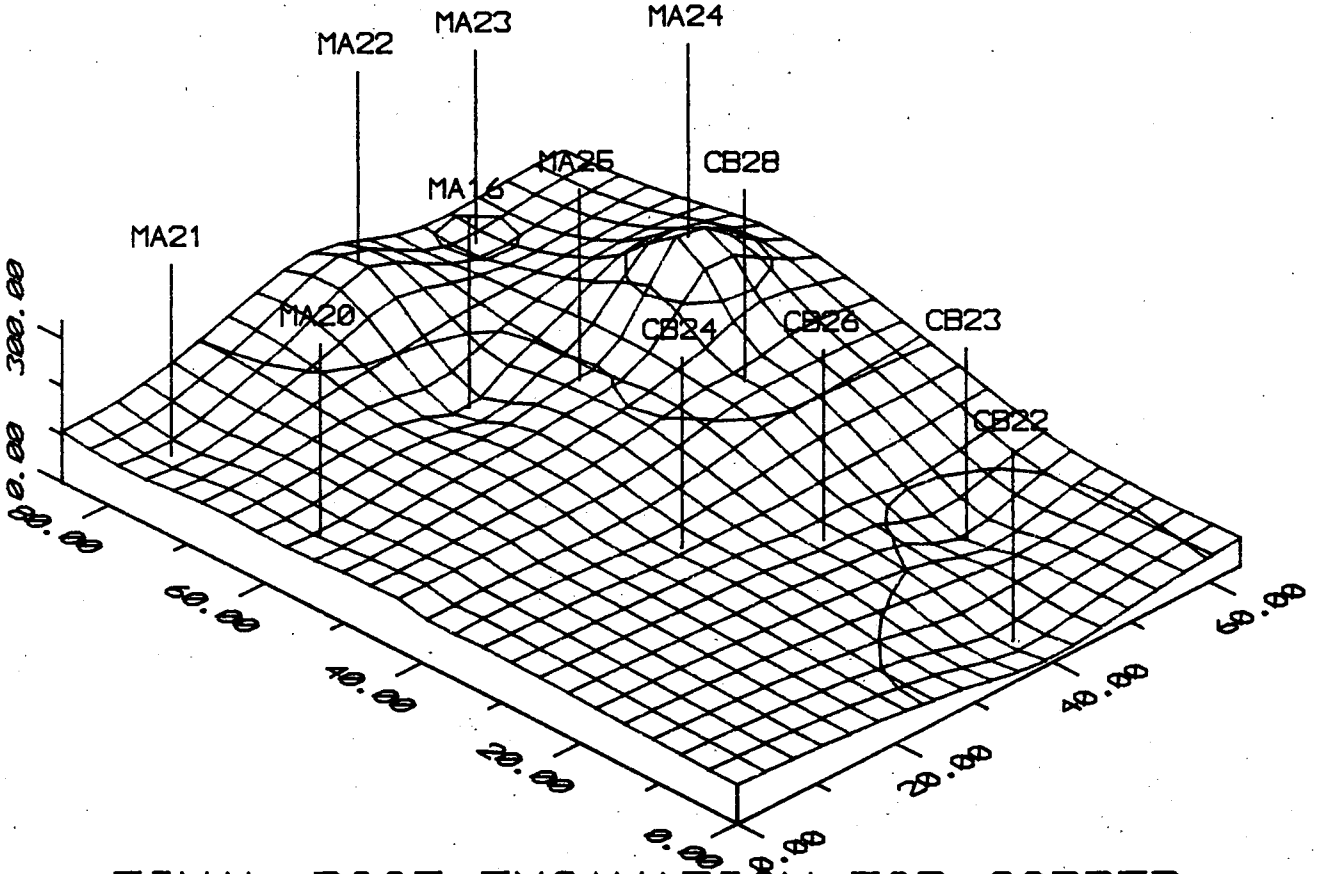

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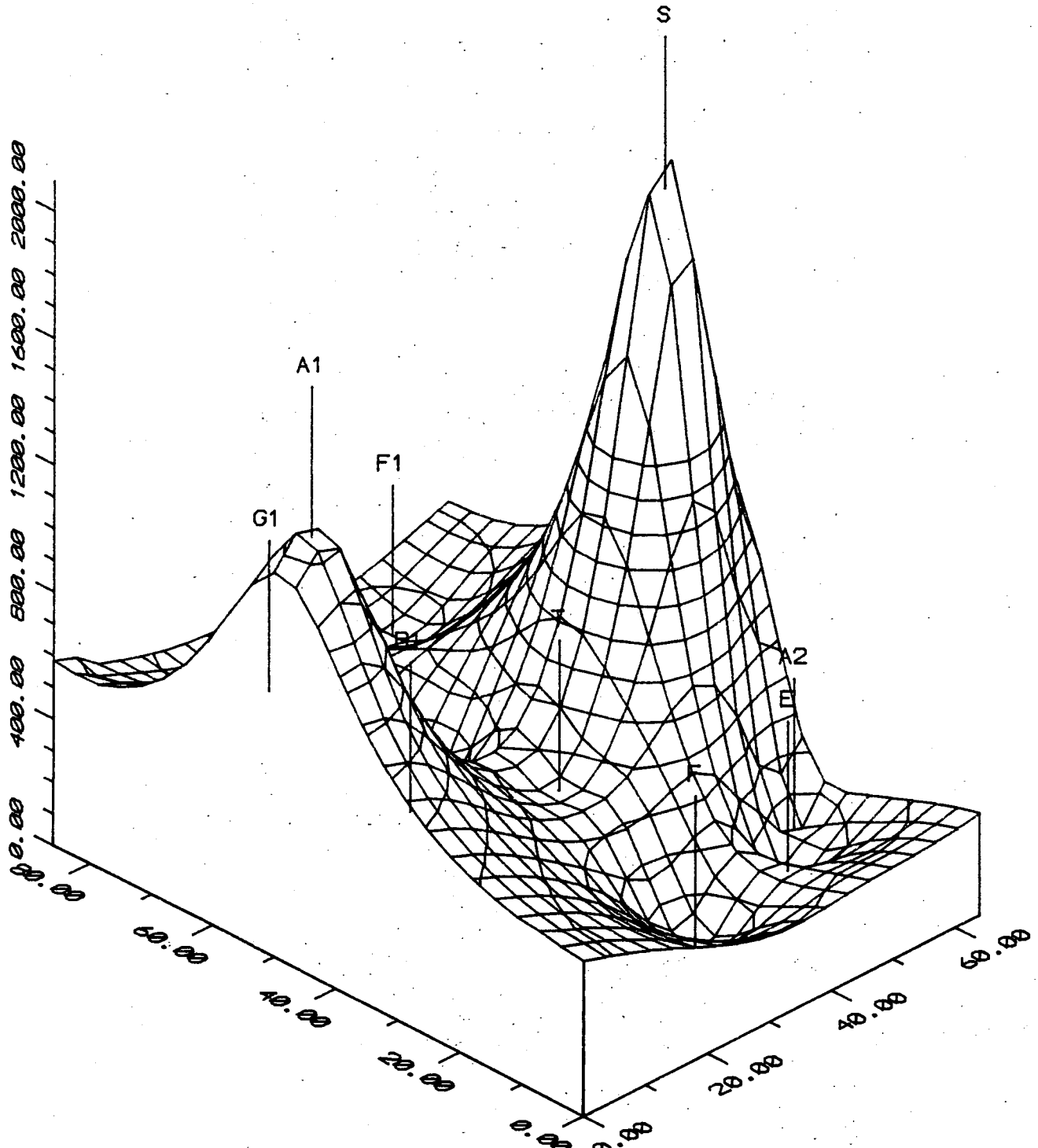
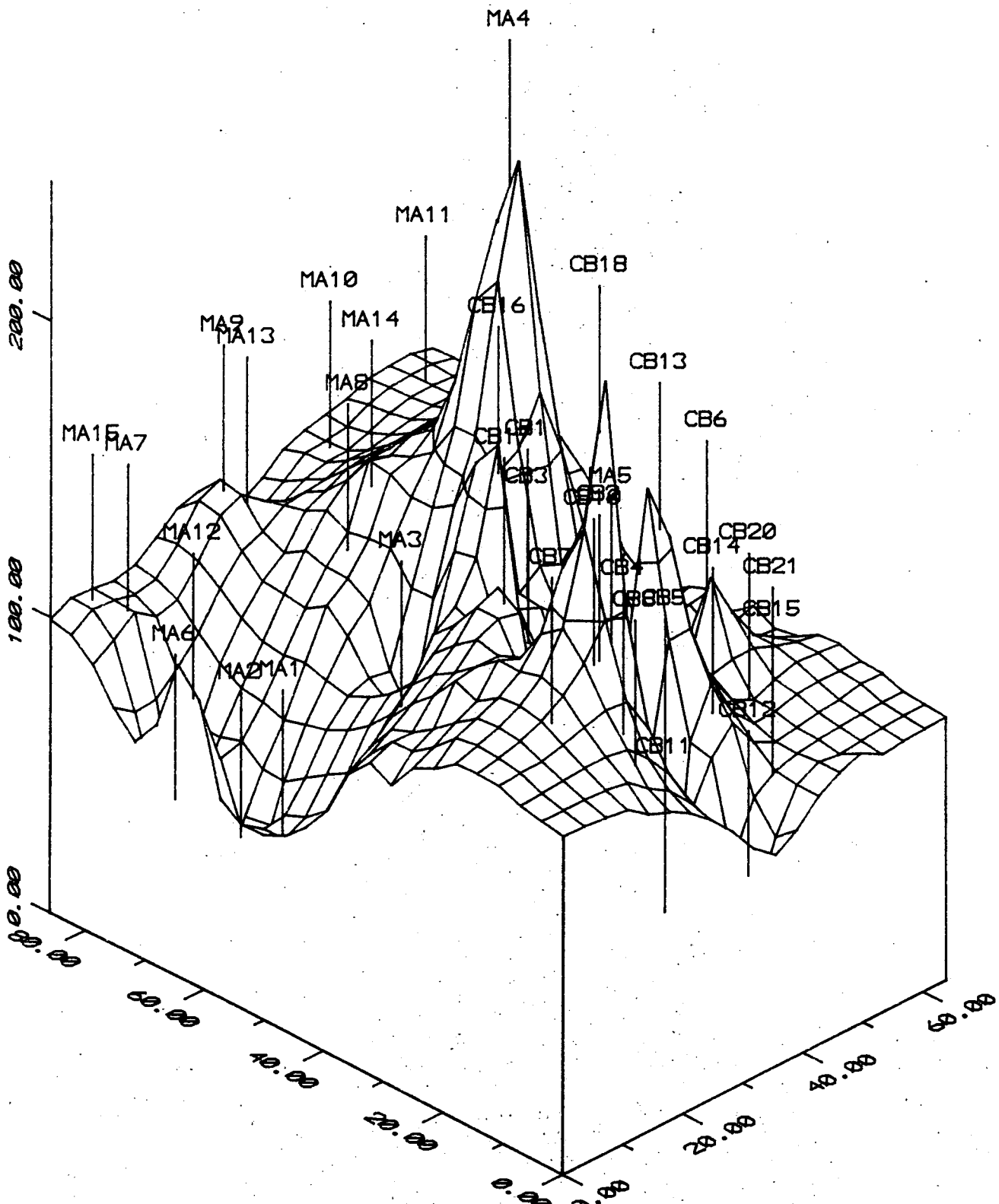
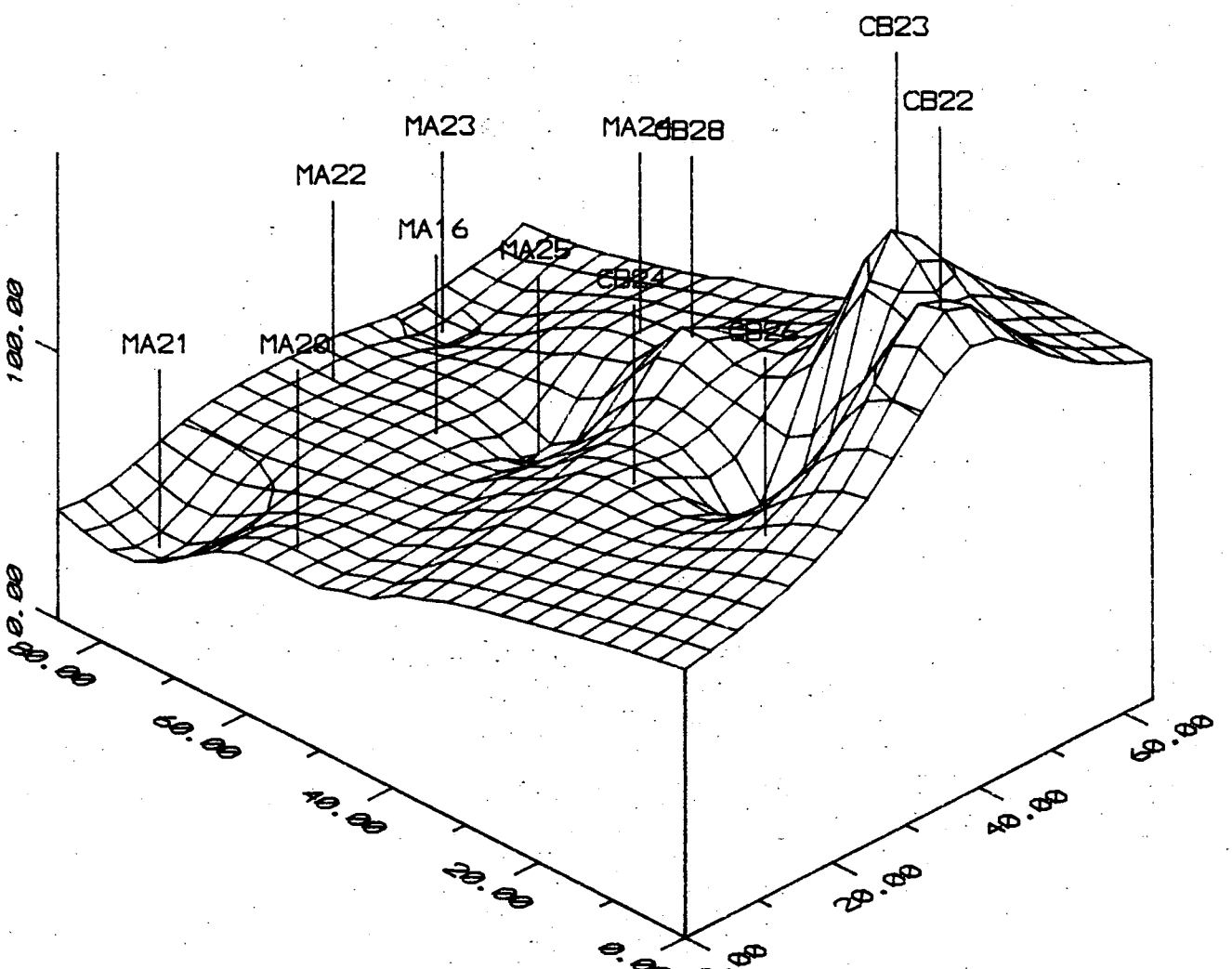


PRE-EXCAVATION FOR CHROMIUM



FIRST POST EXCAVATION FOR CHROMIUM



FINAL POST EXCAVATION FOR CHROMIUM

3.1 Correspondence

Environmental Resources Management, inc.

855 Springdale Drive • Exton, Pennsylvania 19341 • (215) 524-3500 • Telex 4900009249

10 May 1988

Mayor and Township Committee
Township of Winslow
Municipal Building
Rt. 73
Braddock, NJ 08037

File: 704-02-05

RE: Former King of Prussia Technical Corporation Site
Winslow Twp., New Jersey

Gentlemen:

The purpose of this letter is to confirm our conversation with Mr. Ed McGlinchey regarding activities to be conducted at the former King of Prussia Technical Corporation (KOP) Site on Piney Hollow Road.

Environmental Resources Management, Inc. (ERM) of Exton, Pennsylvania will be continuing the Remedial Investigation at the former KOP Site on behalf of the KOP Site Committee, in accordance with the requirements of the United States Environmental Protection Agency (EPA). ERM is an environmental consulting firm experienced in Remedial Investigations. The enclosed brochure will introduce you to ERM.

Field work for the investigation is planned to begin the week of 16 May 1988 and continue through most of the summer. The work involves the installation of ground water monitoring wells and the sampling and analysis of source materials, surface water, sediments, soil and ground water. The data will then be reviewed in order to determine the effects on the environment and possible methods for minimizing the risks, if any, of such effects.

We have currently begun mobilization activities which will provide us with the necessary support facilities at the site (office space, sanitary facilities, electric, etc.). Our contact with various Township employees in arranging for these facilities as well as other aspects of the project has been very favorable and cooperative. We expect to accomplish our RI activities in keeping with the site access arrangements made previously by the EPA with the Township.

If you have any questions regarding the work, please do not hesitate to contact us.

Very truly yours,

Joe Hochreiter/jm

Joe Hochreiter, CGWP

Jim LaRegina

Jim LaRegina
Project Geologist

JH/JLR/gl
Enclosure

redi-letter ○ carbonless 117510 TRIP

TO Ron Nunnenkamp
Twp. Clerk/Administrator

FROM Ed McGlinchey
Supt. D.P.W.

SUBJECT King of Prussia Site (Piney Hollow Rd.) DATE 5/11/88

MESSAGE

Ron

Please be advised that it was my understanding that E.R.M. Inc. would also like to erect a chain link fence around the site to protect the equipment which will be on site.

SIGNED Eddie

REPLY

4.1 Correspondence

JUL 19 1989

EXPRESS MAIL
RETURN RECEIPT REQUESTED

LNP Corporation
c/o Nielsen Lewis Esq.
Goldshore and Wolf
2683 Main St.
P.O. Box 6820
Lawrenceville, NJ 08648

Reutgers-Nease Chemical Co.
c/o William J. Kennedy Esq.
Dechert, Price and Rhoads
3400 Centre Square West
1500 Market St.
Philadelphia, PA 19102

Cabot BerylCo
c/o Frank Thomas Esq.
Morgan, Lewis and Bockius
2000 One Logan Square
Philadelphia, PA 19103

Carpenter Technology Corp.
c/o Robin Price Esq.
Edwards and Angell
430 Park Ave.
New York, NY 10022

Johnson-Matthey
c/o Michael Scott Esq.
Lowenstein, Sandler, Kohl, Fisher
and Boylan
65 Livingston Ave.
Roseland, NJ 07068-1791

Ford Electronics and
Refrigeration Corp.
c/o Norman Bernstein Esq.
Associate Counsel
Ford Motor Company
Park Lane Towers West
Suite 401
Dearborn, MI 48126

Re: King of Prussia Technical Corporation Site
Winslow Township, New Jersey

Dear Sirs:

The U.S. Environmental Protection Agency (EPA) is charged with responding to the release or threatened release of hazardous substances, pollutants and contaminants into the environment and with enforcement responsibilities under the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), 42 U.S.C. §9601, et seq. Releases of hazardous substances into the environment have occurred and/or are threatened at the above-referenced site (hereinafter, the Site). In response to these releases and the threat of further such releases, EPA has spent public funds and anticipates spending additional public funds. These actions have been and will be taken by EPA pursuant to CERCLA.

Under CERCLA and other laws, responsible parties may be held liable for monies expended by the federal government in taking response actions at and around sites where hazardous substances have been released, including investigative, planning, removal, remedial and enforcement actions. Responsible parties may also be ordered to take response actions themselves. Responsible parties who fail to comply with EPA's order may be liable for treble damages based upon costs incurred by EPA in performing the work. Responsible parties under CERCLA include, among others, the current and past owners or operators of the facility from which there has been a release or threatened release of hazardous substances, and persons who arranged for the disposal or treatment of hazardous substances that came to be disposed of at the facility.

By this letter, we notify each of you that EPA has reason to believe that you or your company arranged for the disposal or treatment of hazardous substances at the Site. You are accordingly potentially responsible parties (PRPs) under CERCLA. This notice is not being provided pursuant to the special notice procedures outlined in Section 122(e) of CERCLA, 42 U.S.C. §9622(e). Use of those procedures here and the moratorium that those procedures entail would be inappropriate in light of the endangerment posed by conditions at the Site and the need for prompt commencement of the planned response action.

EPA signed an Action Memorandum on May 11, 1989 which authorized the performance of a Removal Action at the Site, including sampling, excavation and disposal of buried carboys and related contaminated soils. Because of the public health and environmental threats posed by the Site, it is necessary that this work be initiated as soon as possible. This response action is intended as an interim measure to reduce the immediate threat posed by conditions at the Site.

Pursuant to Section 106(a) of CERCLA, 42 U.S.C. §9606(a), EPA has issued an administrative order to you requiring you to carry out certain tasks. The administrative order is enclosed. As is stated in the order, the effective date is August 14, 1989. If you wish to confer with EPA to convert the enclosed unilateral order into an administrative consent order -- that is, agree to the issuance of the order, you must contact Thomas Dunkelman at (212) 264-5386 or Joseph McVeigh, Esq., at (212) 264-3795. Please note that Mr. McVeigh will be acting for Robin Moses, Esq., until August 1, 1989. Ms. Moses may be reached after that date at (212) 264-3299.

Please note that to convert the order, you must notify EPA on or before July 28, 1989, and execute an order on consent prior to August 14, 1989. EPA will not allow any discussions concerning a possible consent order to delay significantly the work to be performed pursuant to the order.

We trust that you will give this matter your immediate attention.

Sincerely yours,

Stephen D. Luftig, Director
Emergency and Remedial Response Division

Enclosure

cc: J. Schnitzer, NJDEP
J. Trela, NJDEP
G. Burke, NJDEP

bcc: E. Dominach, ERRD ✓

4.3 Stipulation And Order

FINAL

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

IN THE MATTER OF: KING OF PRUSSIA TECHNICAL CORP. SITE WINSLOW TOWNSHIP, N.J. CABOT CORPORATION CARPENTER TECHNOLOGY CORPORATION JOHNSON MATTHEY INC. RUETGERS-NEASE CHEMICAL COMPANY, INC. LNP CORP. Respondents Proceeding Under Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. §9606(a))	AGREEMENT AND CONSENT ORDER Index No. II-CERCLA-40105

JURISDICTION

The following Agreement and Order on Consent (ORDER) is entered into with the Cabot Corporation, Carpenter Technology Corporation, Johnson Matthey, Inc., Ruetgers-Nease Chemical Company, Inc., and LNP Corp.(Respondents) pursuant to the authority vested in the President of the United States by Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. §9606(a), which authority was delegated to the Administrator of the United States Environmental Protection Agency (EPA) by Executive Order 12316, August 20, 1981, 46 Fed. Reg. 42237, and redelegated to the Regional Administrator, Region II.

Pursuant to Section 106(a) of CERCLA, 42 U.S.C. §9606(a), the State of New Jersey has previously been notified of this ORDER.

PREAMBLE

The Regional Administrator, Cabot Corporation, Carpenter Technology Corporation, Johnson Matthey, Inc., Ruetgers-Nease Chemical Company, Inc., and LNP Corporation Corp., hereby

consent and agree to the ORDER set forth below, without trial or adjudication of any issues of fact or law, and without any admissions of fact, fault or liability by Respondents.

1. The King of Prussia Technical Corp[illegible]ite is located on Piney Hollow Road in Winslow Township, Camd[illegible]unty, New Jersey.

2. The King of Prussia site is currently owned by Winslow Township. The site is a "facility" within the meaning of Section 101(9) of CERCLA, 42 U.S.C. §9601(9). None of the Respondents have ever owned or operated the King of Prussia site.

3. Respondents are persons as defined in Section 101 (21) of CERCLA, 42 U.S.C. §9601(21). EPA also considers the Respondents responsible parties under Section 107 (a) (3) of CERCLA, 42 U.S.C. §9607(a) (3).

4. On October 9, 1979 and April 23, 1980, representatives of EPA conducted sampling activities at and adjacent to the King of Prussia site. Analysis revealed the presence, in some samples, of the following substances, among others: toluene, xylene, lead, chromium, copper, zinc and beryllium. These substances,as found in these samples, are defined as hazardous under Section 101(14) of CERCLA, 42 U.S.C. §9601(14).

5. Analyses revealed that hazardous substances have been released into the groundwater and the surface waters of the Great Egg Harbor River.

6. The King of Prussia site is on the National Priorities List, promlugated pursuant to Section 105(8)(B) of CERCLA.

DETERMINATION

Based on information available to EPA, including but not limited to the facts recited above, the Regional Administrator hereby determines that the release and threatened release of hazardous substances from the facility may present an imminent and substantial endangerment to the public health and welfare and the environment. The Regional Administrator also has determined that, in order to protect public health and welfare and the environment, it is necessary that a remedial investigation and feasibility study take place to evaluate the nature and extent of releases of hazardous substances from the facility.

ORDER

Based on the foregoing, it is hereby ORDERED and AGREED that respondents shall undertake a Remedial Investigation and Feasibility Study (RI/FS) at the facility in accordance with the following schedule of compliance. This ORDER is entered without trial or adjudication of fact, fault or liability of the Respondents. Respondents do not admit or agree to the statements contained in the Preamble or Determination, and are not bound thereby, except only that Respondents do agree not to contest the authority or jurisdiction of EPA to issue this ORDER in any proceedings to enforce this ORDER.

I. Remedial Investigation

A. Respondents have submitted to EPA, and EPA has approved a detailed work plan and implementation schedule necessary to complete a remedial investigation of the site. The detailed work plan and implementation schedule, which is attached hereto as Appendix A, Section A, conforms to and is consistent with the National Oil and Hazardous Substances Contingency Plan (NCP), in particular, 40 C.F.R. 300.68(a)-(j). The remedial investigation is designed to fully define the nature and extent of contamination, if any, that constitutes the release and threatened release.

B. Within 180 days after the effective date of the Order, Respondents, through their consultant, shall complete the activities specified in Appendix A, Section A, and shall submit to EPA a report detailing the results of the remedial investigation.

C. Within 30 days of receipt of EPA comments on the remedial investigation report, Respondents shall modify the report as necessary to address such comments and submit the modified report to EPA. Respondents shall initiate such additional investigations as may be found necessary by EPA pursuant to the National Contingency Plan and applicable EPA guidance (or draft guidance), in accordance with a schedule to be proposed by Respondent and approved by EPA.

D. Within thirty days of receipt of EPA comments on the modified remedial investigation report, Respondents shall modify the report as necessary to address such comments and submit the report to EPA for approval.

E. Before EPA finalizes its comments under paragraphs I. C. and D. above, EPA will provide to the Respondents an opportunity to confer concerning such comments.

II. Feasibility Study

A. Respondents have also submitted to EPA, and EPA has approved, a detailed work plan and implementation schedule necessary to complete an engineering study of feasible alternatives with respect to conditions at the site, including the recommended remedial alternative (feasibility study). The detailed work plan, which is attached hereto as Appendix A, Section B, conforms to and is consistent with the requirements of the NCP, in particular, 40 C.F.R. §300.68(a)-(j).

B. Within 180 days of receipt by EPA of the final remedial investigations report, Respondents, through their consultant, shall complete the activities specified in Appendix A, Section B, and shall submit to EPA for review and approval a feasibility study report including the recommended remedial alternative. Within 30 days of receipt of EPA's comments on the feasibility report, Respondents shall modify that report as may be necessary to address such comments and submit the modified report to EPA.

III. Reporting, Quality Assurance and Sampling

A. All actions performed by Respondents' consultant pursuant to this ORDER shall be in compliance with all applicable laws and regulations, including but not limited to Section 300.68 of the National Contingency Plan, exclusive of the cost balancing provisions of 300.68(k), and in accordance with the Quality Control/Quality Assurance and Chain of Custody methodologies as set forth in Appendix A attached hereto.

B. Upon request by EPA, Respondents shall provide EPA with duplicate and/or split samples of any samples collected in furtherance of work performed in accordance with this ORDER.

C. All data and technical information not otherwise privileged or confidential, including raw sampling and monitoring data required pursuant to this ORDER, shall be made available to EPA within ten days of receipt by Respondents. No sampling and monitoring data or hydrological or geological data shall be considered confidential.

D. All documents delivered to EPA in the course of implementing this ORDER shall be available to the public unless identified as confidential by Respondents in conformance with 40 C.F.R., Part 2 and, in the case of New Jersey, applicable New Jersey law. Records so identified shall be treated as confidential in accordance with the applicable confidentiality regulations. No sampling and monitoring data or hydrological or geological information shall be considered confidential.

E. All correspondence, reports, work plans and other writings required under the terms of this ORDER to be submitted to EPA shall be sent by certified mail, return receipt requested, to the following address:

Chief, Site Investigation and Compliance Branch
Emergency and Remedial Response Division
U.S. Environmental Protection Agency
Room 402
26 Federal Plaza
New York, New York 10278
Attention: King of Prussia Project Officer

A copy of each such submittal shall be sent to the New Jersey Department of Environmental Protection (NJDEP) at the following addresses:

New Jersey Department of Environmental Protection
Office of Regulatory Services
CN 402
Labor & Industry Building
Trenton, New Jersey 08625
Attention: George Slosser, Esq.

and

New Jersey Department of Environmental Protection
Hazardous Site Mitigation Administration
CN 028
8 East Hanover Street
Trenton, New Jersey 08628
Attention: Chris Altomari

F. Copies of all notices and correspondence from EPA directed to the Facility Coordinator pursuant to paragraph IV. A., below, shall be sent separately to: ; such designated recipient may be changed upon notice to EPA by the Respondents.

G. Prior to performing any of the studies or actions required in Sections I through III above, Respondents shall provide to EPA, for its review, the names, titles and qualifications of all professionals engaged in the conduct of the specified activities.

IV. Facility Coordinator and On-Scene Coordinator

A. Respondents shall appoint a Facility Coordinator who shall be responsible for oversight of the implementation of this ORDER and the activities required herein. All written reports, written comments, and other correspondence dealing with technical and engineering matters directed to Respondents will be made to the Facility Coordinator.

B. EPA shall appoint an On-Scene Coordinator (OSC). The OSC will be EPA's designated representative at the site, and will have the right to move freely about the site at all times when work is being carried out pursuant to this ORDER.

C. Respondents and EPA have the right to appoint a new Facility Coordinator or On-Scene Coordinator at any time. Such change shall be accomplished by notifying the other party in writing at least five working days prior to the change. Both the Facility Coordinator and the On-Scene Coordinator shall be appointed within 15 days of the effective date of this ORDER.

V. General Provisions

A. EPA and Respondents recognize and agree that full and complete implementation of the work plan attached as Appendix A, including the schedule of work, is contingent upon the access to the King of Prussia Technical Corp. Site. Since Respondents are not the owners of the site, and do not have possession or control over it, EPA will exercise its authority to the extent necessary to secure sufficient access to the site for Respondents and Respondents' consultant.

B. Any delay of performance which is caused by circumstances beyond the control of Respondents and its consultant (force majeure) shall not be a breach or violation of this ORDER. Respondents and its consultant shall use best efforts to avoid or minimize any delay or prevention of performance of its obligations under this ORDER. The time for performance of any

activity delayed by circumstances beyond the control of Respondents will be extended by a period of time equal to that which can reasonably be attributed to such circumstances. Increased costs or expenses associated with the implementation of the activities called for in this ORDER shall not of itself be considered a circumstance beyond the control of Respondents. Respondents shall orally notify EPA's On-Scene Coordinator of such circumstance or of Respondents' belief that such circumstances may occur, as soon as possible. In addition, written notification to those persons identified in paragraph III (E), above, shall be given as soon as possible but not later than 10 days after the date of oral notification. Such written notification shall be accompanied by all available documentation. Respondents shall explain why they believe the circumstances were beyond their control, the actions that are being taken to minimize the delay, and their estimate as to the length of time that the circumstances that constitute the force majeure will delay the affected activity.

C. EPA and the Respondents agree that each shall preserve, to the best of their abilities, during the pendency of this Consent Order and for a minimum of six (6) years after its effective date, all records and documents relating to the work under this Order, in their possession or in the possession of their divisions, employees, agents, or attorneys which relate in any way to the Site, despite any document retention policy to the contrary. Upon request by EPA, the Respondent shall make available to EPA such records or copies of any such records not privileged.

D. Any decisions of EPA under this ORDER, including approvals, disapprovals, and requests for modifications of reports, work plans, specifications, schedules, and other work outputs, will be made in consultation with DEP, and will be communicated in writing to Respondents by the Chief, Site Investigation and Compliance Branch, U.S. Environmental Protection Agency, 26 Federal Plaza, New York, New York 10278.

E. No informal advice, guidance, suggestions or comments by EPA or NJDEP shall be construed as relieving Respondents of their obligation to obtain such formal approvals as may be required herein.

F. Neither the United States Government nor any agency thereof shall be liable for any injuries or damages to persons or property resulting from acts or omissions of Respondents, its officers, directors, employees, agents, servants, receivers, trustees, successors, assignees, or of any persons, including but not limited to firms, corporations, subsidiaries, contractors or consultants carrying out activities on behalf of Respondents pursuant to this ORDER.

G. Neither the Respondents nor anyone acting for or on their behalf shall be liable for any injuries or damages to persons or property resulting from any acts or omissions of the United States Government, any agency thereof or of its employees, agents, servants, or representatives, including but not limited to persons, firms, corporations, subsidiaries, contractors or consultants carrying out activities on behalf of the Government pursuant to this ORDER.

H. Respondents have, and at their sole discretion may exercise, the right to retain or discharge any consultant for the purpose of performing any work pursuant to this ORDER.

I. This ORDER shall apply to and be binding upon Respondents and their agents, servants, receivers, trustees, successors, and assignees.

J. Nothing contained in this ORDER shall affect any right, claim, interest, or cause of action of any party hereto with respect to third parties.

K. No part of this ORDER shall constitute or be interpreted or construed as an admission by any of the Respondents of any liability under any federal, state, or local law or that the Respondents are in violation of any laws, rules or regulations. No part of this Order shall be admissible as evidence in any court or administrative proceeding, except as evidence for purposes of enforcement of this ORDER and for purposes of the recovery of costs incurred by the Government and for any other proceedings initiated by the Government in connection with the King of Prussia site which are related to the factual basis for issuance of this Order or as agreed to by the Respondents.

L. Respondents agree not to make any claims pursuant to Section 112 of CERCLA, 42 U.S.C. §9612, against the Hazardous Substance Trust Fund established by the Act for expenses relating to this Order.

VI. Enforcement Actions and Effective Date

A. In the event that Respondents fail to adhere to any requirement of this ORDER; or, notwithstanding compliance with the terms of this ORDER, upon the occurrence or discovery of a situation as to which EPA would be empowered to take any further response action, including but limited to an immediate removal, planned removal and/or initial remedial action; or in the event of a release or threatened release not addressed by this ORDER; or upon the determination that action beyond the terms of this ORDER is necessary to abate an imminent and substantial endangerment to the public health or welfare or

the environment that may be posed by this facility; or upon the completion of the activities required by this ORDER; or under any other circumstances authorized by law, EPA may institute federally-funded response activities and subsequently pursue cost recovery actions available, and/or EPA may issue orders to Respondents pursuant to available statutory authority. In addition, EPA reserves its rights to recover under Section 107 of CERCLA all costs it has incurred in the oversight of the implementation of this Order. Nothing contained herein shall be deemed an admission by Respondents or a waiver of their legal rights (excepting the right to contest EPA's jurisdiction to issue this ORDER).

Dated and effective, this APRIL 17 day of 1985 with the agreement and consent of the parties.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Christopher J. Daggett

CHRISTOPHER J. DAGGETT
Regional Administrator
U.S. Environmental Protection Agency
Region II
26 Federal Plaza
New York, N.Y 10278

LNP Corp.

Theodore G. Lieb

Name: Theodore G. Lieb
Title: Vice President & Director
Finance & Administration

3/27/85
Date

CABOT CORPORATION

L. S. O'Rourke

Name: L. S. O'ROURKE

Title: VICE PRESIDENT

WSR

May 20 1985

Date

JOHNSON MATTHEY INC.

M B Stringfellow

Name: M. B. Stringfellow
Title: President

March 29, 1985
Date

CARPENTER TECHNOLOGY CORPORATION

Name: D. K. Rothermel
Title: Vice President

Date March 13, 1985

RUETGERS-NEASE CHEMICAL COMPANY, INC.

G. H. Wecker
Name:
Title: President

March 11 1983
Date

IN THE MATTER OF KING OF PRUSSIA TECHNICAL CORP. SITE WINSLOW TOWNSHIP, NEW JERSEY CABOT CORPORATION CARPENTER TECHNOLOGY CORPORATION JOHNSON-MATTHEY INC. REUTGERS-NEASE CHEMICAL COMPANY, INC. LNP CORPORATION FORD ELECTRONICS AND REFRIGERATION CORPORATION Respondents Proceeding under Section 106(a) of the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §9606(a)	ADMINISTRATIVE ORDER Index No. II CERCLA-

I. JURISDICTION

1. This Administrative Order ("Order") is issued to the above-captioned Respondents (hereinafter collectively referred to as "Respondents") pursuant to the authority vested in the President of the United States under Section 106(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA), 42 U.S.C. §9606(a), which authority was delegated to the Administrator of the United States Environmental Protection Agency (EPA) and duly redelegated to the Regional Administrators of EPA. Notice of this Order was provided to the New Jersey Department of Environmental Protection (NJDEP).

II. FINDINGS

2. The King of Prussia Technical Corporation Site ("the Site") is located in Winslow Township, Camden County, New Jersey (Figure 1). The Site is described as Block 8801, Lot 1A on the Tax Map for Winslow Township.

3. The Site is currently owned by Winslow Township. The Site is a "facility" within the meaning of Section 101(9) of CERCLA, 42 U.S.C. §9601(9).

4. Respondents are "persons" as defined in Section 101(21) of CERCLA, 42 U.S.C. §9601(21).

5. The Site is on the National Priorities List, promulgated pursuant to Section 105(8)(B) of CERCLA.

6. The 10.1-acre Site is bounded on three sides by the Winslow Wildlife Management Area and on the fourth side by Piney Hollow Road (Figure 1). The Site consists of a cleared area which is nearly devoid of vegetation except for grasses, shrubs and several pine trees.

7. An intermittent wetland is present along the southwestern perimeter of the Site. Surface water flow from this wetland may feed directly into the Great Egg Harbor River, which is approximately 1000 feet southwest of the Site.

8. Two wells have been identified within a half mile radius of the Site. Neither well is used as a potable water supply.

9. The Site is an abandoned liquid chemical waste treatment/ disposal facility which is believed to have been operated sometime during the period 1970-1975.

10. The King of Prussia Technical Company, Inc. purchased the Site from Winslow Township on July 24, 1970. The Board of Directors for this company consisted of the following: Sidney Fried, Chairman of the Board and Director; Ernest Roth, President and Director; Anthony Introcaso, Executive Vice-President and Director; Sidney Dennis, Vice-President and Director; and Harrison Kalbach, Treasurer and Director.

11. On April 4, 1973, the Site was purchased by Evor Phillips Leasing. At that time, Evor Phillips was the President of this company. On June 7, 1974 an amendment to the certification of incorporation was executed. The amendment changed the name of the company to EPL Industries, and was signed by its President, Neil Shanman.

13. On April 27, 1976 Winslow Township obtained a judgment against EPL Industries for nonpayment of taxes and assumed title to the land and facility.

14. The Respondents are generators of chemical waste which was treated and/or disposed of at the Site. As a result, the Respondents are responsible parties under Section 107(a)(3) CERCLA, 42 U.S.C. §9607(a)(3).

15. Cabot BerylCo and Kawecki BerylCo (KBI) are subsidiaries of the Cabot Corporation. During the years 1970 to 1976, Cabot BerylCo plants located in Reading, Hazelton and Revere, PA produced wastes which were disposed of by King of Prussia Technical Company, Inc., Evor Phillips Leasing and EPL Industries. These wastes totalled approximately 732,793 gallons and included spent nitric acid, spent sulfuric acid, spent alkaline containing copper, beryllium, cobalt, chromium, nickel and other refining wastes. This information was supplied by Cabot-BerylCo in response to an inquiry sent by the Hazardous Site Field Investigation Team (FIT) investigators, and in response to an EPA Information Request letter dated March 19, 1982. In a deposition dated December 23, 1981 (U.S. District Court, District of New Jersey, Civil Action No. 80-4104), Evor Phillips indicated that wastes from KBI were taken to the Site for treatment.

16. On March 18, 1971 the Carpenter Technology Corporation (CarTech) entered into a contract with the King of Prussia Technical Company, Inc. for the removal of waste acids. A February 26, 1971 Memorandum from D.E. Mann (a chemical engineer with CarTech) references contact with Ernest Roth of King of Prussia Technical Company, Inc. Roth indicated that he had three 1/4 million gallon, lined storage lagoons, two of which could be available for CarTech waste acids. Further, a letter dated June 14, 1971 from Roscoe J. L. Houser, Safety Director for CarTech, discusses an incident involving a truck leaking waste acid. On June 13, 1971 New Jersey State Police intercepted a truck owned by King of Prussia Technical Company, Inc. which was leaking waste acid. The destination of the truck, which had been loaded at a CarTech facility, was given as Winslow Township, New Jersey. In a deposition dated December 23, 1981 (U.S. District Court, District of New Jersey, Civil Action No. 80-4104), Evor Phillips indicated that wastes from "Carpenter Steel" were taken to the Site for treatment. In a deposition dated September 3, 1981 (U.S. District Court, District of New Jersey, Case No. 80-4104), Ernest Roth indicated that CarTech was a primary source contacted regarding wastes to be handled at the Site. In a December 6, 1982 response to an EPA Information Request letter, CarTech indicated that it had utilized the services of King of Prussia Technical Company, Inc., and that certain waste acids may have been disposed of in Winslow Township, New Jersey. King of Prussia Technical Company, Inc. transported approximately 3,500,000 gallons of waste acid for CarTech; while Evor Phillips Leasing transported approximately 535,000 gallons of waste acid. These waste acids, which were generated from pickling specialty steel, consisted of hydrochloric acid, sulfuric acid and nitric acid and contained cobalt, chromium, copper, iron and nickel among other contaminants.

17. On September 1, 1972 Philco-Ford entered into a contract with King of Prussia Technical Company, Inc. to remove sludge from a storage sludge lagoon and settling pond located at the Lansdale Plant 40B. Approximately 600,000 gallons of waste and water were removed pursuant to the contract. On October 4, 1971 Philco-Ford entered into a contract with King of Prussia Technical Company, Inc. for the removal of spent "hi speed etch" from Plant 10 in Philadelphia, PA. Approximately 149,575 gallons of waste were removed including spent acid and "high speed etch". This information was supplied by Ford Electronics and Refrigeration Corporation's responses (dated June 16, 1983, January 20, 1984 and November 6, 1984) to an EPA Information Request Letter.

18. Records provided by Johnson-Matthey Inc. (formerly Matthey-Bishop), including a December 11, 1981 letter, indicate that between 1971 and 1974 Johnson-Matthey Inc. disposed of waste effluent at the Site, including approximately one million gallons of refinery acidic containing iron, zinc, nickel, chromium and lead among other contaminants. In a deposition dated September 3, 1981 (U.S. District Court, District of New Jersey, Case No. 80-4104), Ernest Roth indicated that Matthey-Bishop was a primary source contacted regarding wastes to be handled at the Site.

19. In a June 14, 1983 response to an EPA Information Request letter, LNP Corporation indicated that it had possibly used King of Prussia Technical Company, Inc. to transport hazardous substances including dilute solutions of hydrochloric acid.

20. Records provided to EPA in response to the FIT investigation and an EPA Information Request letter sent March 15, 1982 indicate that Reutgers-Nease Chemical Company began transportation of wastes from its plant in State College, PA to the Site on October 2, 1972. Reutgers-Nease used the Site for disposal until November 19, 1973. Reutgers-Nease shipped approximately 271,000 gallons of aqueous wastes containing toluene, xylene, and methanol/acetone, among other contaminants, to the Site for disposal. On June 8, 1982 Reutgers-Nease Chemical Company notified EPA pursuant to Section 103(C) of CERCLA, 42 U.S.C. Section 9603(C), that it had disposed of approximately 580,000 gallons of hazardous wastes at the Site. These wastes consisted of alkaline process wastes containing inorganics and small amounts of organics.

21. On April 17, 1985, EPA entered into an Administrative Order on Consent (Index No. II CERCLA-40105) with Cabot-BerylCo, Carpenter Technology Corporation, Johnson-Matthey, Inc., LNP Corporation and Reutgers-Nease Chemical Company for the performance of a Remedial Investigation/Feasibility Study (RI/FS) at the Site.

22. In April 1975, EPA installed and sampled four wells at the Site.

23. In March 1989, the EPA Technical Assistance Team conducted a soil sampling program in the carboy area, utilizing an X-Ray Fluorescence unit in conjunction with limited CLP analyses. Preliminary results of this sampling indicated significantly elevated levels of chromium, copper and zinc in the vicinity of the carboy area.

24. In May 1989, Environmental Resources Management, Inc. submitted a Remedial Investigation (RI) Report to EPA. Among other things, the RI Report indicated the following:

- Presence of up to six lagoons with approximate dimensions of 100 feet by 80 feet (Figure 1). The lagoons are presently filled with sand to varying degrees. Lagoon sludges, buried sludges and sediments in an off-site drainage swale all contain elevated concentrations of priority pollutant metals including chromium, copper, nickel and zinc.

- Presence of an area of buried carboys on the southwestern side of the Site (Figure 1). Several of the carboys have been observed to contain a dark-colored liquid, and soils in the vicinity of the carboys are visually stained. Sampling of the carboy liquids indicated the presence of priority pollutant metals including chromium up to 1,200 parts per million (ppm), copper up to 2,400 ppm, nickel up to 7,700 ppm and zinc up to 17,000 ppm. Soil sampling in the vicinity of the carboys also indicated elevated levels of priority pollutant metals.

- Presence of an area of buried drums on the northeastern side of the Site (Figure 1). Soils in the buried drum area contain elevated concentrations of priority pollutant volatile organic compounds, pesticides and hydrocarbons.

- Presence of two badly deteriorated tankers (Figure 1). Samples of residue in the tankers indicated the presence of priority pollutant metals.

- Shallow aquifer system (upper subzone of the Kirkwood-Cohansey Aquifer System) in the vicinity of the Site discharges to the Great Egg Harbor River. The shallow aquifer is contaminated with several priority pollutant metals including copper up to 12,500 parts per billion (ppb), chromium up to 1,040 ppb and nickel up to 4,670 ppb.

- Concentrations of chromium, lead and nickel in excess of background concentrations were detected in the Great Egg Harbor River, in the vicinity of the presumed area of groundwater discharge from the Site.

25. Chromium, copper, nickel and zinc are hazardous substances within the meaning of Section 101(14) of CERCLA, 42 U.S.C. §9601(14). These substances may cause a variety of adverse health effects in exposed population groups including central nervous system depression and adverse effects on the kidneys.

26. The observed releases of hazardous substances onto the soil, into the groundwater and into the Great Egg Harbor River are ongoing at the Site, and there is a continuing threat of further releases of hazardous substances at and from the Site, as the term "release" is defined at Section 101(22) of CERCLA, 42 U.S.C. §9601(22).

27. In response to the release and threat of release of hazardous substances at the Site, EPA issued an Action Memorandum on May 11, 1989 which authorized the performance of a Removal Action at the Site, pursuant to Section 104 of CERCLA and Section §300.65 of the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), 40 CFR §300.65. The Removal Action is to include the sampling, excavation and disposal of the carboys and related contaminated soils. This Removal Action is intended as an interim measure to reduce the immediate threat posed by conditions at the Site. EPA intends to evaluate or require responsible parties to evaluate further response measures at the Site in the future.

28. The hazards posed by the Site include, but are not limited to, direct contact by individuals with hazardous substances at high concentrations at the Site, the threat of further release of hazardous substances to the soil, the threat of further release of hazardous substances into the underlying aquifers and the threat of further release of hazardous substances into the Great Egg Harbor River.

DETERMINATION

29. Based upon the Findings set forth above, EPA has determined that the release and threat of release of hazardous substances to the environment from the Site present an imminent and substantial endangerment to the public health, welfare and the environment within the meaning of Section 106(a) of CERCLA, 42 U.S.C. §9606(a).

ORDER

30. Based upon the foregoing Findings and Determination, it is hereby Ordered that Respondents perform corrective actions at the Site including sampling, excavation and disposal of buried carboys, carboy liquids and related visually contaminated soils in the immediate vicinity of the carboys. The type and number of samples taken should be sufficient to characterize the carboys, carboy liquids and contaminated soils for disposal. During the excavation process, appropriate erosion and dust control systems shall be employed. Any surface or rain water accumulating in the excavation area shall be removed, sampled and disposed of appropriately. When excavation is complete, as certified by EPA, the excavated area shall be backfilled and compacted. Transportation and offsite disposal/treatment of the carboys, carboy liquids and contaminated soil shall be in accordance with all local, state and federal regulations.
All activities specified below shall be initiated and completed as soon as possible even though maximum time periods for their completion are specified herein.

Description of Work

31. Within fourteen (14) calendar days of the effective date of this Order, Respondents shall retain a contractor for performance of the work described in paragraph 30. Respondents shall notify EPA of the contractor's name.

32. Within thirty (30) calendar days of the effective date of this Order, Respondents shall ensure that EPA is in receipt of an Operations Plan for the work described in paragraph 30. The Operations Plan should include but should not necessarily be limited to the following:

a. detailed time schedule for performance of the work described in paragraph 30;

b. a description of the manner in which the work will be performed, including handling of carboy liquids;

c. list identifying all contractors, subcontractors, laboratories, haulers and proposed disposal facilities to be utilized and their respective responsibilities;

d. location and analyses to be performed on any samples taken;

e. discussion of hauling and manifesting procedures;

f. discussion of disposal/treatment methods for carboys, carboy liquids, contaminated soils, water accumulating in the excavation area and decontamination water;

g. Contingency Plan for conducting Site activities;

h. Quality Assurance/Quality Control (QA/QC) Plan; and

i. Site Safety Plan.

33. EPA will review the Operations Plan. If EPA determines that the Operations Plan submitted by Respondents needs to be revised, EPA will revise the Operations Plan or will require Respondents to revise it. If EPA directs Respondents to make modifications to the Operations Plan, Respondents shall make the required modifications and submit the revised Operations Plan to EPA within five (5) business days of Respondents' receipt of EPA's comments on the Operations Plan. EPA shall remain the final arbiter in any dispute regarding the sufficiency or acceptability of the Operations Plan, and EPA may modify it unilaterally. At such time as EPA determines that the Operations Plan is acceptable, EPA will transmit to Respondents a written statement to that effect. Upon its approval by EPA, the Operations Plan shall be deemed to be incorporated in and an enforceable part of this Order.

34. Within forty calendar (40) days of EPA's approval of the Operations Plan, Respondents shall complete all work described in the Operations Plan.

35. Within sixty calendar (60) days of EPA's approval of the Operations Plan, Respondents shall submit a Removal Action Report which includes at a minimum the following:

a. synopsis of all work performed under this Order, and a certification that all work described in the Operations Plan has been performed;

b. explanation of any EPA-approved modifications that occurred during the performance of the work;

c. results of any sampling and analyses performed; and

c. list of all haulers and disposal facilities utilized.

Designated Coordinator, On-Scene Coordinator, Other Personnel, and Modifications to EPA-Approved Work Plan

36. Within three (3) business days of the effective date of this Order, Respondents shall select a coordinator, to be known as the Designated Coordinator, and submit the name, address and telephone number of the Designated Coordinator to EPA. The Designated Coordinator shall be responsible for coordinating the implementation of this Order. All EPA correspondence to the Respondents will be sent to the Designated Coordinator. The current EPA On-Scene Coordinator for the Site is: Eugene Dominach, Removal Action Branch, Emergency and Remedial Response Division, U.S. Environmental Protection Agency, Woodbridge Avenue, Edison, N.J. 08837, (201) 321-6666. EPA will notify the Designated Coordinator if EPA's On-Scene Coordinator should change.

37. All activities required of Respondents under the terms of this Order shall be performed only by well-qualified persons possessing all necessary permits, licenses and other authorizations required by federal, state and local governments.

38. In the event of an inability or anticipated inability on the part of Respondents to perform any of the actions required under this Order in a timely fashion, the Designated Coordinator shall immediately notify EPA of the reason for and the expected duration of the inability to perform and the actions taken or to be taken by Respondents to avoid or mitigate the impact of such inability to perform, including the proposed schedule for such actions. Such notification by the Designated Coordinator shall not relieve Respondents of any of their obligations under this Order.

39. As appropriate during the course of implementation of the actions required of Respondents pursuant to this Order, Respondents or their consultants or contractors, acting through the Designated Coordinator, may confer with EPA concerning the required actions. Based upon new circumstances or new information not in the possession of EPA on the date of this Order, the Designated Coordinator may request in writing, EPA approval of modification(s) to the EPA-approved Operations Plan. Only modifications approved by EPA in writing shall be deemed effective. Upon approval by EPA, such modifications shall be deemed incorporated in this Order and shall be implemented immediately by Respondents.

40. In the event of a significant change in conditions at the Site or adjacent areas, the Designated Coordinator shall immediately notify the EPA On-Scene Coordinator at the following emergency telephone numbers: (201) 321-6666 (during business hours), or (201) 548-8730 (after business hours). In the event that EPA determines that the activities performed pursuant to this Order or significant changes in conditions at the Site pose a threat to human life or health or the environment, EPA may direct Respondents to stop further implementation of any actions pursuant to this Order or to take other and further actions reasonably necessary to abate the threat. This provision is not to be construed so as to limit any powers EPA may have under Section 300.65 of the NCP, 40 CFR §300.65, or any other applicable provision of the NCP, or under any other applicable law or regulation.

Reporting Requirements

41. Respondents shall provide bi-weekly written progress reports to EPA which fully describe all actions and activities undertaken pursuant to this Order.

42. All submittals, correspondence and notifications to EPA pursuant to this Order shall be made in writing to the EPA On-Scene Coordinator, whose address appears above in paragraph 36, and to:

Chief, New Jersey Compliance Branch
Emergency and Remedial Response Division
U.S. Environmental Protection Agency
Room 747
26 Federal Plaza
New York, NY 10278
Attn: King of Prussia Site Project Manager

Access and Availability of Data

43. Respondents shall be responsible for obtaining in a timely fashion such access to the Site and any other premises where work under this Order is to be performed as is necessary for Respondents to carry out the requirements of this Order. This Order does not convey any rights of access to Respondents.

44. Respondents shall in no way hinder full and unimpeded access to the Site and any structures thereon by EPA and NJDEP, as well as their respective representatives, agents, employees, contractors and consultants. Respondents shall permit such persons to be present on the Site at any and all times and to observe any and all activities conducted pursuant to this Order.

45. EPA and NJDEP shall have full access to all records, including, but not limited to, contractual documents maintained or created by Respondents or their agents, contractors or consultants in connection with implementation of the work under this Order. In addition, all data, information and records created or maintained by Respondents or their agents, contractors or consultants in connection with implementation of the work under this Order shall, upon request, be made available to EPA without delay.

46. All employees of all persons, including contractors, who engage in activities under this Order shall be available to and shall cooperate with EPA.

47. Respondents shall preserve, during the pendency of this Order and for a minimum of eight (8) years after its termination, all records and documents in their possession or in the possession of their employees, agents or contractors, which in any way relate to the Site, despite any document retention policy to the contrary. After this eight-year period, Respondents shall notify EPA at least thirty (30) calendar days prior to the destruction of any such documents.

48. Upon request by EPA, Respondents shall provide split samples of any material sampled in connection with implementation of this Order.

General Provisions

49. Each Respondent is jointly and severally liable for the implementation of the work required by this Order.

50. This Order shall apply to and be binding upon Respondents, as well as their officers, directors, agents, contractors, consultants, successors, assigns, receivers and trustees.

51. All actions and activities carried out by Respondents pursuant to this Order shall be performed in accordance with all applicable federal, state and local laws, regulations and requirements.

52. All waste disposal conducted by Respondents pursuant to this Order shall comply with all requirements of CERCLA, including but not limited to Section 121(d)(3), 42 U.S.C. §9621(d)(3), the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. §6901, et seq., the Toxic Substances Control Act ("TSCA"), 15 U.S.C. §2601, et seq., and all regulations promulgated pursuant thereto, and all other applicable federal and state laws and regulations. In addition, all waste disposal conducted by Respondents pursuant to this Order shall be carried out in compliance with all applicable EPA policies and guidance documents, including but not limited to Revised Procedures for Planning and Implementing Off-Site Response Actions, U.S. EPA Office of Solid Waste and Emergency Response (November 13, 1987).

53. Respondents shall notify EPA of the waste treatment, storage or disposal facilities that Respondents propose to use for waste disposal conducted pursuant to this Order at least five (5) business days prior to off-site shipment of such wastes.

54. All sampling and analyses performed pursuant to this Order shall conform to EPA Quality Assurance/Quality Control (QA/QC) and Chain of Custody procedures as directed by the EPA and in conformance with the EPA publication entitled "Test Methods for Evaluating Solid Waste" (SW-846, November 1986 or as updated).

55. At the time of completion of all activities required by this Order, demobilization shall include sampling and proper disposal or decontamination of protective clothing, remaining laboratory samples and any equipment or structures constructed to facilitate the cleanup.

56. EPA shall make the final determination as to the sufficiency and acceptability of all work conducted under this Order including but not limited to each required submittal.

57. All documents submitted by Respondents to EPA in the course of implementing this Order shall be available to the public unless identified as confidential by Respondents pursuant to 40 CFR Part 2, Subpart B and determined by EPA to merit treatment as confidential business information in accordance with applicable law. In addition, EPA may release all such documents to NJDEP and may make those documents available to the public unless Respondents conform with applicable laws and regulations regarding confidentiality. Respondents shall not assert a claim of confidentiality regarding any monitoring or hydrogeologic data, any information specified under Section 104(e)(7)(F) of CERCLA, or any other chemical, scientific or engineering data relating to the work performed hereunder.

58. Neither EPA nor the United States, by issuance of this Order, assumes any liability for any injuries or damages to persons or property resulting from acts or omissions by Respondents or Respondents' employees, agents, contractors or consultants in carrying out any action or activity pursuant to this Order, nor shall EPA or the United States be held as or be held out to be a party to any contract entered into by Respondents or Respondents' officers, employees, agents, contractors or consultants in carrying out any action or activity pursuant to this Order.

59. Nothing contained in this Order shall affect any right, claim, interest, defense or cause of action of any party.

60. Nothing in this Order shall be construed to constitute preauthorization under Section 111(a)(2) of CERCLA, 42 U.S.C. §9611(a)(2), and 40 CFR §300.25(d).

61. Nothing herein shall constitute or be construed as a satisfaction or release from liability for Respondents or Respondents' officers, directors, employees, agents, contractors, consultants, receivers, trustees, successors or assigns or for any other individual or entity. Nothing herein shall constitute a finding that Respondents are the sole responsible parties with respect to the release and threatened release of hazardous substances at and from the Site.

Enforcement

63. Failure of Respondents to carry out expeditiously and completely any terms of this Order may result in EPA taking the required actions unilaterally, pursuant to Section 104(a) of CERCLA, 42 U.S.C. §9604(a).

64. Failure of Respondents to comply with any provision of this Order may result in the initiation of an enforcement action against Respondents pursuant to, inter alia, Sections 106(b)(1) and/or 107(c)(3) of CERCLA, 42 U.S.C. §§9606(b)(1), 9607(c)(3).

65. Notwithstanding any other provision of this Order, EPA reserves its right to bring an action against Respondents (or any other responsible parties) pursuant to Section 107(a) of CERCLA, 42 U.S.C. §9607(a), for recovery of any costs incurred by the United States Government with respect to the Site.

66. Nothing herein shall preclude EPA from taking any additional enforcement actions and/or other actions as it may deem necessary or appropriate for any purpose, including, but not limited to, the investigation, prevention or abatement of a threat to the public health, welfare or the environment arising from conditions at the Site.

Opportunity to Confer, Effective Date

67. Not later than July 28, 1989, Respondents may contact EPA to advise that they are willing to consent to this Order. EPA will then meet with Respondents to discuss the conversion of this Order. Such conference is not, and shall not be deemed to be, an adversarial hearing or part of a proceeding to challenge this Order, and no official stenographic record of such proceeding shall be kept. Any request to convert the Order shall be made to Joseph McVeigh, Esq., Office of Regional Counsel, United States Environmental Protection Agency, Region II, 26 Federal Plaza, Room 309, New York, New York 10278, (212) 264-3795.

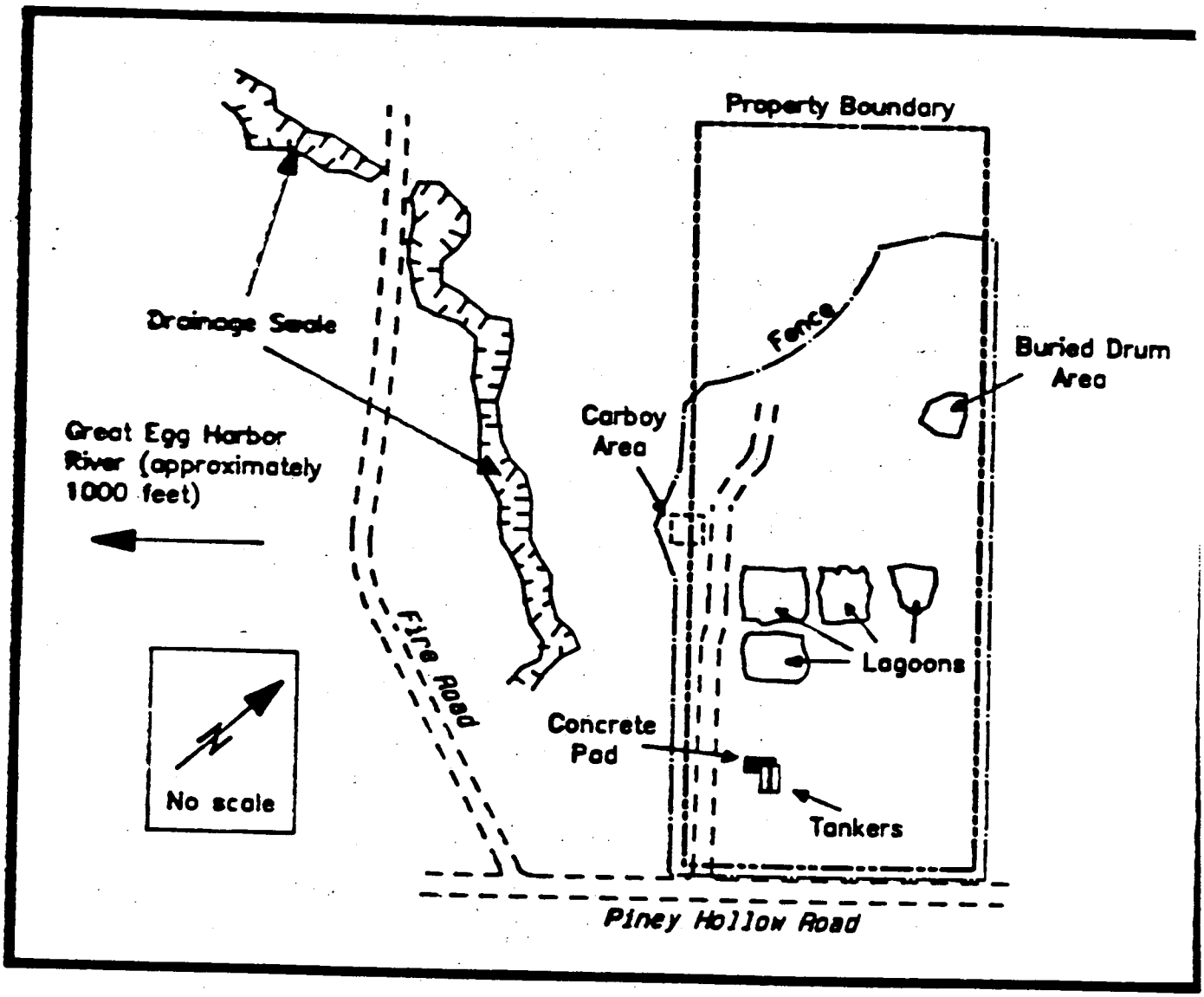
68. This Order shall become effective on August 14, 1989, as to each Respondent which has not executed an order on consent prior to such date.

U.S. ENVIRONMENTAL PROTECTION AGENCY

WILLIAM J. MUSZYNSKI, P.E.
Acting Regional Administrator
U.S. Environmental Protection Agency
Region II

July 19, 1989
Date of Issuance

FIGURE 1


Property Boundary
Drainage Swale
Fence
Buried Drum Area
Carboy Area
Great Egg Harbor River (approximately 1000 feet)
Fire Road
Lagoons
Concrete Pad
Tankers
No scale
Piney Hollow Road

5.0 Health Assessment

KING OF PRUSSIA TECHNICAL CORPORATION
CAMDEN COUNTY
WINSLOW TOWNSHIP, NEW JERSEY
October 3, 1988
(Revised October 11, 1989)

Prepared by:
Division of Science and Research
New Jersey Department of Environmental Protection (NJDEP)

Prepared For:
Agency For Toxic Substances and Disease Registry (ATSDR)

BACKGROUND

The King of Prussia Technical Corporation (KOP) site in Winslow Township, Camden County, New Jersey, is ranked 40th on the National Priorities List (NPL) of Superfund hazardous waste sites in New Jersey. The KOP site, comprising approximately 10.1 acres of generally barren sandy soil, is located northwest of Piney Hollow Road, midway between the Black Horse Pike and Folsom Road, within the 6,000 acre Winslow Wildlife Management Area. This area is located in extreme southern Winslow Township in Camden County immediately adjacent to Gloucester and Atlantic Counties, in a remote part of the New Jersey Pine Barrens. The Phase I draft report of the Remedial Investigation (RI) on the site was completed in July 1986.

The KOP site was purchased from Winslow Township in 1970 and was used by KOP from 1970 through 1973 when operations ceased. After the Township resumed ownership in 1976 for default in taxes, illicit dumping is suspected to have continued at this site, as a result of its proximity to the road and the lack of a fence (Personal communication, Environmental Resource Management). The site has recently been fenced. Winslow Township began construction of a police pistol range on the site in 1980; however, construction stopped when the Environmental Protection Agency (EPA) notified the township of the dangers involved with disturbing the site. In 1981, an Emergency Action Plan was prepared by the EPA. Four test wells were installed in 1975-1976 and subsequently sampled with additional samples taken in 1979 and 1980.

During its operational period, the KOP site was used as a waste treatment and disposal facility for hazardous industrial liquids. Located at the site are four large and two smaller

lagoons, two rusting and torn tankers, and possible drum burial sites with an indeterminate number of buried and deteriorating carboys and drums.

During heavy rains and/or periods of high groundwater table, water from the site drains off the site toward the southwest boundary in a swale to form a small periodic pond approximately 400 feet from the site, and then to the Great Egg Harbor River immediately to the west. (Remedial Investigation Report)

COMMUNITY CONCERNS

According to available documentation and USEPA, to date there have not been many health concerns expressed by the public concerning the King of Prussia site because of it's remote, rural location. Issues associated with the site may be summarized as follows:

* The severe contamination of ground water near the site.
* The contamination of the Great Egg Harbor River located approximately 375 yards away.
* The potential impact on the nearby New Jersey fish and wildlife area.
* Accessibility of the site to hunters and recreational vehicles. (The accessibility of the site was reduced when the site was recently fenced.)

Other concerns expressed by the community were the perceived lack of a direct and accurate channel of communication with the agencies responsible for remediation of the site, the long time frame associated with remediation efforts, and the impact of the site on township real estate values.

ENVIRONMENTAL CONTAMINATION AND PHYSICAL HAZARDS

A. On-Site Contamination

<u>Soil</u>

Analysis of soil samples, collected during Phase I of the Remedial Investigation (RI), detected priority pollutant compounds in shallow soils, including heavy metals, volatile organic compounds (VOCs), and other organic contaminants. Soil

on the site consists of fine-grained, tan, silty sand, together with coarse gravel at some locations at the site. A variable, mostly thin layer of purple tinged/stained sand lies on or near the surface of the ground over large portions of the site. In some areas, ants bring this purple sand up to the soil surface, as they dig their ant holes. Tests have indicated that the purple substance is methylene blue.

There are quality assurance/quality control concerns, along with field operations concerns, with some of the soil sampling performed during Phase I of the RI. Additional sampling will occur during Phase II to correct this matter. The levels of compounds identified in soil samples and tanker samples are listed in Table 1. Phase II of RI will include additional soil sampling. Visible signs of ponding and stressed vegetation have been noted in the area of the swale. Analysis of sediments from the drainage swale revealed the presence of heavy metals that are being carried off-site by the swale (Table 2).

Lagoon

Lagoon 5 was the only lagoon with quantifiable base neutrals and pesticides. Lagoon 4 had sludge that had a TOX level of 120 ppm. Several unidentified organics were in the various lagoons. (Remedial Investigation Report) They are summarized as follows:

Lagoon 1: One unidentified alkane
Lagoon 4: Four unidentified alkanes
Lagoon 6: Two unidentified alkanes
Several unidentified phthalates

The concentration of other chemicals in the lagoons are presented in Table 3.

Magnetic Survey

Data from a magnetic survey, conducted by EPA's consultant, indicated that buried metallic debris may be present four twelve feet below the surface, in a number of areas. If buried metallic objects are present, they may be potential sources for contamination.

Surface Water

There is usually no standing surface water on the site, due to the high permeability of the sandy soil. During wet periods, however, a small pond forms immediately adjacent to the site along the swale that conducts runoff to the Great Egg

Harbor River, approximately 1,050 feet from the site boundary. Heavy metal concentrations detected in this surface water are listed in Table 4. Sampling, by EPA's consultant demonstrated that heavy metals are being transported by this swale and/or the groundwater beneath the swale toward the river. At the time the sampling occurred (March 1986), surface water quality in the Great Egg Harbor River had been altered only with respect to copper. Copper was not in the river above the KOP site. Below the site, copper is present in water at a concentration of 0.11 ppm which is less than the protection limit for human health (1.0 ppm), but slightly higher than the protection limit for freshwater aquatic biota (0.043 ppm). Further downstream dilution and adsorption in the sediment had reduced the concentration of copper by 50 percent, to approximately aquatic biota protection limits.

Groundwater

The nearest groundwater user is a residence about one mile northeast and upgradient of the site. An industrial property 2,000 feet south of the site contains a production well, for industrial use only, that was uncontaminated when last tested. The local groundwater flow direction and surface water drainage from the site are toward the southwest, in the direction of the Great Egg Harbor River. The regional groundwater flow direction however is to the southeast. There are no potable wells within 3 miles downgradient of the site. Neither of the nearby wells was tested during Phase I of the RI. Other homes in the Town of Folsom, about 2 miles southeast of the site, are on private wells and have not been affected by any off-site contamination from the KOP site.

EPA's consultant evaluated groundwater quality by comparing contaminant levels in the on-site and downgradient wells with the levels in the upgradient background well. Priority pollutants were not detected in the background well, except zinc which was present at 0.09 ppm. (The water quality criteria level for zinc is 5 ppm, and for protection of freshwater aquatic life the maximum allowable level is 0.57 ppm.) The concentrations of contaminants detected in the downgradient monitoring wells are presented in Table 5.

Air

No air sampling has been conducted at the KOP site to date. Further, insufficient data are available to identify possible receptors at risk. The relatively high concentrations of inorganic constituents in surface and subsurface soil

samples collected during the RI suggest inhalation may be an exposure pathway.

B. Off-Site Contamination

A large groundwater plume and sediments being carried by surface water are the major pathways of off-site migration. The plume has moved off-site in a generally southwesterly direction toward the river. The surface water and sediments, in runoff from the site, contain inorganic priority pollutant metals and organics. A small seasonal pond sometimes forms off-site prior to emptying into the Great Egg Harbor River to the west. Estimates of the depth of the conductive plume range from 35 to 80 feet beneath the ground surface. Visibly stressed vegetation indicates run-off to be an environmental pathway of concern.

QUALITY ASSURANCE/QUALITY CONTROL

The reports and other material reviewed for this document indicated that all laboratory chemical analyses were conducted by S-R Analytical, Inc., Cherry Hill, New Jersey; that chain-of-custody procedures were followed for the samples obtained during the field investigation; and that methods utilized for the chemical analyses of priority pollutants were in accordance with EPA accepted methodologies. However, several areas of concern and deficiencies were noted, such as: chemicals (vinyl chloride) being referred to in some reports but not others; many chemicals primarily organic, were detected in the analysis blanks (any chemical that was detected in the analysis blanks were deleted from further consideration in this report); samples were taken that were neither analyzed nor reported; and some data sheets were reduced to a small size that precludes reading. However, the data contained in these reports is of sufficient quality and accuracy for use in Phase I of RI/FS, and in a qualitative preliminary health assessment. Discrepancies and concerns noted need to be addressed in later phases of the RI/FS.

SITE VISIT AND PHYSICAL HAZARDS

The KOP site (10.1 acres) was visited on September 8, 1988, by Department of Environmental Protection staff. The site is surrounded by a new (installation completed late in July 1988) 8 foot tall cyclone fence, with three gates secured with padlocks. At the front gate is a "NO TRESPASSING" sign

Several areas on-site may present physical hazards. These include the unstable ground area surrounding the carboy partial burial area and other areas where buried drums are known/suspected. In these areas there is evidence of ground subsidence possibly due to containers collapsing beneath the ground surface.

POTENTIAL ENVIRONMENTAL AND HUMAN EXPOSURE PATHWAYS

A. Environmental Pathways

On-Site

In Phase I of the RI/FS soils, groundwater, and surface water were identified as the primary media in which the contamination has been detected. Results of soil sampling during Phase I of the RI/FS identifed the potential for surface and groundwater contamination. Sampling of this will be part of the continued investigation in Phase II activities. Preliminary investigation of surface water samples and sediments from the drainage swale indicated the presence of a number of heavy metals above acceptable limits (see Tables 2 and 3).

Off-Site

The contaminants listed in Tables 2 and 3 are migrating off-site, leaching into the soils, water table, and Cohansey Aquifer below and adjacent to this site (Remedial Investigation Report). Analysis of drainage water and sediments from the swale indicates that heavy metals are present in levels exceeding New Jersey Drinking Water Guidance criteria and New Jersey Soil Cleanup Objectives. The heavy metal-polluted water is emptying into the small transient pond and later into the river. The soil in this region is sandy and has an above average percolation rate. Therefore, this polluted surface water is a conduit for moving contaminated water to the Great Egg Harbor River, to groundwater, and ultimately to the Cohansey Aquifer which underlies the site and supplies much of southern New Jersey. Copper is the only identifiable contaminant from this site presently degrading the water quality of the River.

B. Human Exposure Pathways

Exposure pathways of concern at this site include: inhalation, dermal absorption, ingestion, and ingestion of contaminated aquatic biota. The utilization of contaminated

groundwater appears to be the most significant human exposure pathway. This site is within the 6,000 acre Winslow Wildlife Management Area which is used for recreation and hunting. Probable uses by residents and visitors to the wildlife area and the Great Egg Harbor River include hiking, camping, birding, picnicking, fishing, hunting, and possibly wading. Private wells service the drinking water needs of residents that live in the area of the site. City drinking water is not available.

Human exposure to contaminated surface soils may occur via ingestion or dermal contact. Since access to the site is now restricted by a fence, exposure of on-site receptors is limited to those personnel involved with the remediation of this site. However, since a significant component of the contamination has been eroded off-site by run-off, and contaminant migration via runoff, people who are outside the restricted access area may be exposed to contamination. A significant degree of disturbance in the surface or subsurface soils in the contaminated areas off-site has the potential to increase the human and environmental exposures.

Surface contamination in the wooded area is limited to the drainage swale. The risk to human or wildlife exposed to contamination is minimal because of the relatively low concentrations in the area and the short duration of any such exposure. The concentrations of contaminants in the river will be low, due to the effects of dilution.

DEMOGRAPHICS

The area of the site does not have a large permanent population base. The area is primarily rural, and KOP is surrounded by the 6,000 acre Winslow Wildlife Management Area. The estimated population in a three mile radius area is estimated to be at least 150 people.

Additional demographic information is needed, including the identification of potable wells near the site, and within a 2-3 mile radius of the site, and a characterization of the population close to the site (i.e., identification of sensitive populations).

EVALUATION AND DISCUSSION

Phase I studies were designed primarily to determine the nature of the contaminants, not the extent of the contamination

at the site. Future studies will concentrate on the more quantitative aspects required before effective remediation procedures can be recommended.

It should be noted that some of the samples taken in the Phase I portion of work were not properly collected. Phase II sampling was designed to correct for this deficit. Hence, Phase II results may reveal contamination that was not indicated in the Phase I portion of this work.

On-site contamination consists principally of heavy metals with highest concentrations being found for chromium, copper, nickel, and zinc. Probable sources of contamination are a drum burial area, a carboy area, soils northwest of several lagoons, four confirmed lagoons, surface soils near rusted tankers, and soils located in the eastern corner of the site.

Soil and tanker samples exceeded New Jersey Soil Cleanup Objectives for beryllium, cadmium, chromium, copper, mercury, nickel, silver, volatile organics, and oil and grease. Lagoon soil samples exceeded New Jersey Soil Cleanup Objectives for arsenic, beryllium, cadmium, copper, lead, nickel, and zinc. Groundwater monitoring wells exceeded New Jersey Drinking Water Guidance criteria for chromium, copper, mercury, iron, 1,1-dichloroethene, trans-1,2-dichloroethene, 1,1,1-trichloroethane, trichloroethene, tetrachloroethene, and bis (2-ethylhexyl) phthalate. Drainage swale surface water exceeded New Jersey Drinking Water Guidance criteria for chromium, iron, and lead. Drainage swale sediments exceeded New Jersey Soil Cleanup Objectives for beryllium, chromium, copper, and selenium. No standards are available for some of the contaminants at this site. These are indicated by blanks on the respective tables.

Additional contamination may occur in buried drums that are suspected to exist on the site at depths between 4 and 12 feet. Preliminary information indicates soils in the area of the carboys contain at least nickel, zinc, chromium, lead, and cadmium.

Surface runoff transports contaminants via erosion and sedimentation. Groundwater flows southwest from the site to the Great Egg Harbor River. Although the contaminant plume requires better characterization, the plume may have reached the river and might be approximately 1,000 feet wide.

No known domestic groundwater users are known to have been affected by the groundwater contaminants. When the peak concentrations in the groundwater plume reach the river, water quality will be degraded. However, the effects on human health

and aquatic biota may be minimal as a result of downstream dilution.

CONCLUSIONS AND RECOMMENDATIONS

Discrepancies and areas of concern expressed in this report regarding QA/QC issues, including illegible data and report sheets, and samples taken but not reported, need to be addressed and/or clarified.

Lagoons 2 and 3, previously identified on aerial photographs, are not shown on the current mapping of this site, nor discussed in the available reports. The location and characterization of the materials associated with these lagoon locations should be further investigated, and these findings should be incorporated into future phases of this project. In addition, materials buried in drum and carboy areas need to be better characterized, and air sampling for mercury and VOC levels needs to be conducted.

Warning signs need to be posted at off-site locations where soil is heavily contaminated with heavy metals to minimize inadvertent exposure of casual users in these areas.

Within approximately one mile upgradient and across Piney Hollow Road there is a single family residence assumed to be on a private well. In this same general area several real estate signs are posted, indicating that further development of this area is imminent. Results of the analyses of all private wells in the surrounding area and test wells located in areas where private development is likely to occur in the near future, need to be included in Phase II of the RI/FS. A land use policy that is consistent with these findings and is protective of human health concerns should be developed or modified for the surrounding area.

Should contaminant levels in the river increase to levels that may be hazardous to human health, signs should be erected warning against ingestion of all aquatic species.

A sizable percentage of the contaminated materials may have escaped into the air, groundwater, and subsurface soils. Future cleanup phases should be expedited to minimize continued migration of contaminated material into the environment.

This health assessment focuses on public health issues. Environmental issues and natural resources damage issues, which may play a key role in the remediation of the site, are not

focused upon in the assessment. The emphasis of the health assessment on public health is not intended to diminish the importance to remediation based upon environmental damage.

There are potential exposure pathways that have not yet been adequately characterized or addressed. In particular, the locations of potable wells need to be identified and wells that could be impacted by the site need to be sampled. More information is needed before a decision can be made on whether a feasibility health study is warranted. When this information becomes available, the health assessment will be revised if necessary, and a decision on whether to conduct a feasibility health study will be made.

REFERENCES

ATSDR Site Summary, King of Prussia, CERCLIS No. 7-19-88.

Field Investigations of Uncontrolled Hazardous Waste Sites, Task Report to the Environmental Protection Agency Contract No. 68-01- 6056, Mitre Model Scoring of King of Prussia, New Jersey, TDD No. HQ-8109-01. Ecology and Environment, Inc., October 1981.

King of Prussia, Comments to Draft Remedial Investigation Report.

King of Prussia Hazardous Waste Site visit by NJDEP personnel on September 8, 1988.

New Jersey Safe Drinking Water Act, N.J.A.C. 7:10- 1.1 through 7.3, November 1985.

New Jersey Department of Environmental Protection (NJDEP), Summary of Approaches to Soil Cleanup Levels, 1987.

New Jersey Drinking Water Quality Institute: Maximum Contaminant Level Recommendations for Hazardous Contaminants in Drinking Water, NJDEP, 1987.

New Jersey Department of Environmental Protection: Division of Water Resources Division Order No. 64, Groundwater Cleanup Criteria, September 1986.

REM III Program, Remedial Planning Activities At Selected Uncontrolled Hazardous Substance Disposal Sites Within EPA Regions I-IV., King of Prussia, Region II, New Jersey., Supplemental Work Plan for Remedial Investigation Field Activities, King of Prussia Site, Camden County, New Jersey, Prepared by: NUS Corporation, Pittsburgh, PA., Approved by: EBASCO Services Incorporated, Lynhurst, NJ., EPA Work Assignment Number 108-2615 under EPA Contract Number 68-01-7250, July, 1987.

Draft Remedial Investigation Report for the King of Prussia Technical Corporation Site in Winslow Township, Camden County, New Jersey, Volume One: Narrative Report, Volume Two: Appendices, Prepared for: U.S. Environmental Protection Agency, Region II, New York, Prepared by: SMC Martin Inc., Valley Forge, PA., Reference 8925- 040-80040, July 1986.

Case Manager, 1988. Personal communication. NJDEP (New Jersey Department of Environmental Protection), Division of Hazardous Site Mitigation, Technical Coordinator for King of Prussia Technical Corporation, Inc. site.

Table 1. Soil and Tanker Samples

Contaminant	Concentration (PPM)	New Jersey Soil Cleanup Objectives (1) (PPM)
Beryllium	1.0 - 16	1
Chromium	5.0 - 570	100
Copper	5.9 - 1,100	170
Mercury	0.24 - 100	1
Nickel	6.6 - 470	100
Silver	18	5
Thallium	10 - 24	
Organic Carbon	190 - 3,500	
Organic Halogens	150 - 1,600	
Oil and Grease	50 - 3,000	100
Total Volatile Organic Compounds	4	1
Lagoon 5 Sludge	(PPB)	
alpha BHC (Lindane)	3,000	

(1) New Jersey Department of Environmental Protection (NJDEP), Summary of Approaches to Soil Cleanup Levels, 1987. Numbers indicate NJDEP Cleanup Objective in parts per million. PPM = parts per million = milligrams per kilogram. PPB = parts per billion.

Table 2. Metals Detected in Drainage Swale Sediment

Contaminant	Maximum Concentration (PPM)	New Jersey Soil Cleanup Objectives (1) (PPM)
Beryllium	8.3	1
Chromium	430	100
Copper	760	170
Selenium	5.4	4

-- PPM = parts per million.

(1) New Jersey Department of Environmental Protection (NJDEP), Summary of Approaches to Soil Cleanup Levels, 1987. Numbers indicate NJDEP Cleanup Objective in parts per million (PPM = milligrams per kilogram).

Table 3. Metals and Selected Parameters from Lagoon Soil Samples

Contaminant	Maximum Concentration (PPM)	New Jersey Soil Cleanup Objectives (1) (PPM)
Arsenic	300	20
Beryllium	100	1
Cadmium	18	3
Chromium	5,000	100
Copper	3,700	170
Lead	290	250
Nickel	1,400	470
Thallium	45	
Zinc	1,600	350
Organic Carbon	2.900	
Organic Halogens	120	
Oil and Grease	1,200	100

(1) New Jersey Department of Environmental Protection (NJDEP), Summary of Approaches to Soil Cleanup Levels, 1987. Numbers indicate NJDEP Cleanup Objective in parts per million.

Table 4. Metals Detected in Drainage Swale (Surface Water)

Contaminant	Maximum Concentration (PPM)	New Jersey Drinking Water Guidance (1) (PPM)
Chromium	0.20	0.05
Iron	1.1	0.3

--- PPM = parts per million.

(1) New Jersey Safe Drinking Water Act, N.J.A.C. 7:10 - 1.1 through 7.3.

Table 5. Contaminants in the Groundwater Monitoring Wells

Contaminant	Maximum Concentration (PPM)	New Jersey Drinking Water Guidance (1) (PPM)
Metals:		
Beryllium	0.12	
Chromium	0.55	0.05
Copper	14.00	1.0
Mercury	0.003	0.002
Iron	36.00	0.3
Volatile Organics:	(PPB)	(PPB)
1,1-Dichloroethene	26	1 (2)
Trans-1,2-Dichloroethene	25	10 (2)
1,1,1-Trichloroethane	280	26 (2)
Trichloroethene	360	1 (2)
1,1,2,2-Tetrachloroethane	930	
Tetrachloroethene	1500	1 (2)
Base Neutrals:		
Bis (2-Ethylhexyl)Phthalate	25	

--- PPM = parts per million = milligrams per liter.

(1) New Jersey Safe Drinking Water Act, N.J.A.C. 7:10 - 1.1 through 7.3.

(2) New Jersey Drinking Water Quality Institute: Maximum Contaminant Level Recommendations for Hazardous Contaminants in Drinking Water. 1987. As part of New Jersey Safe Drinking Water Act N.J.A.C. 7:10 - 1.1 through 7.3.

6.1 Community Relations Plan

TAT-02-F-04760

COMMUNITY RELATIONS PLAN
KING OF PRUSSIA LANDFILL SITE
WINSLOW TOWNSHIP, CAMDEN COUNTY, NEW JERSEY

Issued: April 5, 1989

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COMMUNITY RELATIONS PLAN
KING OF PRUSSIA LANDFILL SITE
WINSLOW TOWNSHIP, NEW JERSEY

I. SITE BACKGROUND

A. Site Description

The King of Prussia Landfill is an abandoned hazardous waste management facility located along Piney Hollow Road, Winslow Township, Camden County, New Jersey. The property is bounded on three sides by a State Wildlife Management Area and the fourth side borders on Piney Hollow Road. Along the southern perimeter of the site is an intermittent wetland which feeds directly into the Great Egg Harbor River less than a quarter of a mile away (Figure 1). The site is in a rural/remote area. The nearest residence is within a quarter mile of the site. Several gravel operations, a chemical manufacturer, an asphalt plant and the municipal landfill are all within a quarter mile of the site.

The King of Prussia property consists of a cleared ten acre area which is devoid of vegetation except for grasses, scrub brush, and an occasional pine tree. Within these ten acres are the following points of special concern: six lagoons, two deteriorated tank trailers, several areas of soil discolored by an undetermined purple substance, partially buried carboys and drums, one exposed drum of unknown content and a large area of stressed vegetation on the southern perimeter (Figure 2).

Prior to fencing the ten acre site by the PRPs, the site lacked any form of security. A deer blind and numerous tire tracks throughout the site clearly indicated that the site was subject to trespassing by hunters and operators of off-road vehicles. There is clear evidence that illegal dumping has occurred.

B. Brief History

Based upon information previously gathered by the EPA and the NJDEP, a brief history of the activities at the site follows:

At an unspecified date prior to 1975, the Evor-Phillips Leasing Company and Interchemical Corporation began operating the King of Prussia site as a liquid chemical waste treatment/disposal facility. During this time the facility was used primarily by five companies that now make up the current group of PRPs. An undetermined amount of illicit dumping of chemical materials is believed to have continued long after the facility was abandoned in 1975.

C. Quantity and Types of Substances Present

The King of Prussia Site has numerous containers of varying types and sizes, which have deteriorated, releasing their contents onto the ground. Included in this list of deteriorated containers are the following:

1) Six lagoons: four backfilled, two open

Three lagoons are 70 feet long, 50 feet wide and 15 feet deep (working capacity 350,000 gallons each). The larger lagoons are 100 feet long, 80 feet wide and 15 feet deep (working capacity of 800,000 gallons). At a working capacity of 90% the plant storage capability was 3.5 million gallons.

Grossly deteriorated liners are visible in the open lagoons. No liquid retention capabilities are possible.

2) Partially buried drums and carboys

There are two areas where the burial of drums and carboys is clearly evident. The number of drums is estimated at twenty and the number of carboys at ten. Excavation is necessary to obtain a count.

3) Two badly deteriorated tank trailers

The trailers are positioned side by side and are the predominant visible aspects of the site. A total of approximately 10 cubic yards of an inert solid remains inside the tankers.

4) One full drum of unknown contents

This drum is fully exposed and is lying in lagoon #2.

In addition to the containers listed, there exists several areas where soil contamination/discoloration is clearly visible and of undetermined depth.

Analytical results for samples taken of the groundwater, lagoon sediment, surface runoff, the carboys and the purple discolored soil all verify varying degrees of contamination.

The following is a partial list of the hazardous substances identified by studies conducted prior to 1988.

Contaminant	Concentration	Sample Media	Statutory Source Under CERCLA
1,2,4 Trichlorobenzene	120 ug/kg	L.S.	2
Hexachloroethane	740,000 ug/kg	L.S.	2,4
Chromium	5,600 ug/l	M.W.	2
Copper	3,900 ug/l	M.W.	2
Cadmium	600 ug/l	M.W.	2
Arsenic	1,000 ug/l	M.W.	2,3
Beryllium	2,200 ug/l	M.W.	2,3,4
Mercury	1.44 ug/l	M.W.	2,3,4
Lead	600 ug/l	M.W.	2
Vinyl chloride	29 ug/l	CBY.	2,3,4
Phenol	1,700 ug/l	CBY.	1,2,4

The following is a list of the hazardous substances identified by sampling conducted in 1988.

Bis (2-ethylhexyl) phthlate	1,200 ug/kg	L.S.	2,4
Hexachlorobenzene	1,300 ug/kg	L.S.	2,4
Arsenic	330,000 ug/kg	L.S.	2,3
Beryllium	120 ug/l	M.W.	2,3,4
Mercury	3 ug/l	M.W.	2,3,4
Chromium	1,400,000 ug/l	CBY.	2
Copper	2,400,000 ug/l	CBY.	2
Cadmium	21,000 ug/l	CBY.	2
Lead	61,000 ug/l	CBY.	2
Vinyl chloride	29 ug/l	CBY.	2,3,4
Phenol	1,700 ug/l	CBY.	1,2,4
Trichloroethene	360 ug/l	M.W.	1,2,4

1. 311(b)(4) of the Clean Water Act
2. 307(a) of the Clean Water Act
3. 112 of the Clean Air Act
4. RCRA Section 3001

Media Symbols: M.W. = monitoring well
CBY. = carboy
L.S. = lagoon sediment

Current data (1988) from the PRP surficial sampling of the carboy area during the recent RI/FS has identified the presence of the following: Copper (1550 mg/Kg), chromium (185 mg/Kg), Lead (15 mg/Kg), and Zinc (517 mg/kg).

D. National Priorities List

This site is on the National Priorities List.

II. THREAT

A. Threat of Public Exposure

The King of Prussia facility is a high risk site. The property, prior to fencing by the PRPs, lacked any form of security. Its remote location made it an obvious choice for hunters and off-road vehicle users as evidenced by the presence of a deerblind and numerous motocycle tracks.

Since the King of Prussia facility ceased operations in 1975, there have been alleged instances of youths contracting rashes of unknown origin after riding their dirt bikes at the site. As of May 11, 1988, the Winslow Township Police were unable to deny or confirm such allegations.

The high levels of toxic compounds known to exist in the upper portion of the soil present an unacceptable health risk to the targeted population. Many of the compounds found thus far are known to be carcinogenic, teratogenic and mutagenic. The potential for exposure to the known and unknown compounds on site warrants the continued restiriction of unauthorized persons from the site.

Aside from the threat of direct contact with the hazardous and toxic compounds on site, the threat of inhalation is also a major concern. The sandy and wind swept nature of the site makes the likelihood of inhaling airborne particles highly possible.

B. Threat to the Environment

All analyses conducted thus far indicate that contamination of the site is pervasive. Almost the entire southern perimeter of the site consists of stressed and dead vegetation. Surface water contamination was identified during a study conducted by EPA during October of 1979. Analytical results of runoff water from a ditch revealed a significant amount of contaminants including the following: Mercury (1.44 ppb), Arsenic (10 ppb), Chromium (340 ppb), Beryllium (5 ppb), Cadmium (4 ppb), Copper (950 ppb), Nickel (190 ppb), Phenol (0.23 ppb), Bis 2-Ethylhexyl Phthalate (9.1 ppb) and Di-N-Butyl Phthalate (0.81 ppb).

The sandy soil conditions of southern New Jersey have a high percolation rate, which decreases the potential for off-site surface migration but does not totally eliminate the possiblity for migration to the wetlands and the Great Egg Harbor River which is one quarter of a mile from the southern boundary of the site.

The high percolation rate greatly increases the potential to contaminate the subsurface soils and the underlying Cohansey aquifer. The analytical results of the groundwater samples taken during October of 1979, verify that such contamination has occurred.

The analytical results of the major contaminants from monitoring well #1, located between the lagoons and the carboy disposal and stressed vegetation areas, are as follows:

Chloroform (0.34 ppb), Vinyl Chloride (7.3 ppb), Arsenic (7.2 ppb), Chromium (10 ppb), Copper (95 ppb), Bis 2-Ethylhexyl Phthalate (3.5 ppb) and Di-N-Butyl Phthalate (0.49 ppb).

The most recent round of surficial sampling, performed during June of 1988, revealed that organic and inorganic contaminants are present in the first three inches of soil throughout much of the site. Soil depths below three inches were not investigated. Contamination of the upper layers of soil was found to be consistent with results previously found in samples taken of surficial runoff and groundwater. Contamination of this particular substrate is cause for concern because the contaminants can migrate into the ground and surface water through the actions of wind, rain and human activities.

Aerial photography of 1975 indicates that two horizontal chemical storage tanks and two tank trailers were located on or adjacent to the carboy disposal area. Grounds stains are evident in the vicinity of the lagoons. Spillage or runoff from any or all of the above due to site topography would flow in the direction of the carboy disposal area. Since the lagoons are upstream of the carboy area, a leak in a lagoon liner could also contribute to contamination of the carboy area. Site runoff flows into a small unnamed tributary which then flows two thousand feet due west into the Great Egg Harbor River.

C. Evidence of Extent of Release

The analytical data and on-site observations performed thus far are indicative of the off-site release of contaminants. The available information indicates that a release of contaminants has been occurring for a number of years and unless mitigation means are implemented will continue for many years.

Contaminated soils and groundwater (documented by laboratory analysis) and a large area of stressed vegetation located off-site are strong indicators that contaminants are

migrating off-site via the air, surface water and groundwater.

D. Previous Actions to Abate Threat

On April 17, 1985, the EPA and the PRPs (Cabot Corp., Carpenter Technology Corp., Johnson Mathey Inc., Ruetgers-Nease Chemical Co., LNP Corp.) entered into an agreement through a Consent Order whereby the PRPs would undertake a Remedial Investigation and Feasibility Study (RI/FS).

The NJRAB has indicated that the PRPs have twice covered the carboy area with soil. This action has proven ineffective. The stained soil is repeatedly exposed when the added soil is eroded by wind and rain.

The PRPs in 1988 installed a perimeter fence during the RI/FS activity, decreasing the possibility for intimate contact.

E. Current Actions to Abate Threat

EPA, NJDEP, and the Winslow Township Police currently observe the hazardous waste site on a regular basis.

III. ENFORCEMENT

During 1976-1977, after the facility's closure in 1975, the NJDEP conducted several on-site inspections but no enforcement action was taken. The NJDEP maintained the lead on all enforcement matters until an unspecified date during 1979, at which time the site was referred to EPA for the purpose of addressing site security and mitigation efforts.

On October 9, 1979, EPA conducted a site investigation which included the sampling of monitoring wells, lagoon sediment, liquid runoff and soil.

To date, no reliable information is available that details the installation of the monitoring wells. Indications are that the wells were installed sometime prior to the issuance of a site report by Geharty and Miller during 1975-1976. Analytical results showed that the shallow groundwater was severly contaminated.

As a result of the EPA's efforts, a Consent Order was signed on April 17, 1985, in which the PRPs agreed to conduct a RI/FS at the site. In July, 1986, the PRPs submitted a Draft Remedial Investigation report. Upon review of the report, the NJDEP and the EPA determined that the details did not fully address the extent of contamination at the site and, therefore, requested the PRPs to conduct a Phase

II RI. On May 16, 1988, the PRPs' consultant, Environmental Resources Management of Exton, Pa., mobilized at the site to begin supplemental field activities that were completed in September, 1988.

The site was referred to the Response and Prevention Branch and a preliminary assessment was performed on May 11, 1988. Before an Action Memorandum that requested funding to install a fence, post hazard warning signs and cover the stained soil in the carbor area could be approved, the PRPs installed the perimeter fence.

A review of existing files indicates that Interchemical Corporation with the Evor-Phillips Leasing Corporation operated the facility. In addition, Valley Forge Engineering of Pennsylvania or its principles may have been involved in the operation. Since the PRPs have refused to remediate the carboy area the current action includes removal of the carboys and the adjacent highly contaminated soil to eliminate further contamination.

IV. PROPOSED PROJECT

A. Objective of the Project's Initial Action

The main objective of the project's initial action is to eliminate the threat of direct contact with the hazardous materials which exist on the surface and to a depth of three inches, disposing of surface hazardous materilas and encapsulating selected areas of contamination where removal is unfeasible.

B. Objective of the Project's Secondary Action

The secondary objective of the removal action is to sample, stage, and dispose of surface and partially buried containers and other non-indigenous materials. Additionally, selected areas of soil will be excavated where sufficient contamination exists.

C. Objective of the Project's Final Action

The final objective will address subsurface soils, groundwater contamination, and other removal actions not included in this report.

V. COMMUNITY INFORMATION

A. Community Profile

Winslow Township is located in the southeastern section of Camden County which borders Gloucester and Atlantic

Counties. The township has an area of 57.78 square miles, and a population of 20,034 according to 1980 census data. Winslow Township has developed into approximately ten smaller communities which range from rural to suburban. Eighty percent of the Township is situated within the Pinelands National Reserve. This area is conservation land, in which development is regualted by the State. The suburban sections of the township are developing rapidly as many Philadelphia and Atlantic City commuters are moving to the area.

Winslow Township is governed by a mayor and eight township committee members. Township elections are held every three years.

B. Community Involvement

Within the last two years there has been an increased level of activities regarding environmental issues in Winslow Township. The first Township Environmental Commission was recently established and members were appointed in January 1987. A local environmental organization called Residents for Environmental Protection and Preservation (R.E.P.P.) was established in late 1987. R.E.P.P. has been active in trying to deny a local company a permit to rebuild a chemical storage warehouse which burned down recently.

Neither R.E.P.P. nor the Township Environmental Commission have been involved with the King of Prussia Landfill. The only focused community involvement has been from the Township Committee, which has been the primary local point of contact for EPA at the site.

VI. COMMUNITY CONCERNS

This community concerns section is based on interviews conducted with local officials, community leaders, and residents of Winslow Township during June of 1988. While concerns about general environmental issues in Winslow Township have risen over the last year, the level of concern about the King of Prussia landfill site has remained at a low level. Residents are more concerned about other environmental issues in their area, rather than the King of Prussia Landfill site which is located in a remote part of the Township. One public official commented that if more people lived near the site that it would receive more attention from residents.

1. Length of Time of Site Mitigation

Several public officials and community leaders expressed concerns about the length of time involved in mitigating contamination at the King of Prussia Landfill site. One community leader

requested that EPA address the length of time involved in site mitigation.

2. Exposure to Contaminants and Potential Health Effects

Several local officials, community leaders, and residents expressed concerns about the possibility of adverse health effects to people who have entered the site. Most of the people interviewed expressed concerns about the potential health effects to area children who allegedly use the site to ride their off-road vehicles. One local official said that hunters use the site to hunt deer. This official was also concerned that residents who had cut down trees from the site for firewood might be exposed to contaminants from burning the wood in their fireplaces.

3. Extent of Contamination

Several local officials and community leaders expressed concerns about the extent of contamination. Local officials and community leaders said that they believe that excavation and water uses by area resource extraction facilities could extend the migration of contaminants from the site and potentially lead to drinking water contamination. Community leaders are also concerned about the potential of the contamination from the site entering the Great Egg Harbor river. They believe that contamination could jeopardize the river's status as part of a Congressional Scenic and Wild River Study that began in 1986.

4. Extent of Cleanup

Community leaders said that they are concerned about the extent and degree of cleanup. Another community leader said that Winslow Township residents want to learn about the cleanup process involved at the site.

5. Information on Site Activities

Several public officials and community leaders said that the best way to inform Winslow Township residents about site activities is through the local media. One community leader said that EPA should directly distribute reports and information about site activities to the local officials and local organizations. This community leader said that R.E.P.P. would like to publish information supplied by EPA in its newsletter. The same community leader said that a location should be established in the Township at which this information would be made available to the public. This community leader said that some R.E.P.P. members are familiar with environmental issues and would be able to understand technical information about the site.

VII. OBJECTIVES OF THE COMMUNITY RELATIONS PLAN AT THE KING OF PRUSSIA LANDFILL SITE

The objectives of EPA's community relations plan for the King of Prussia landfill site are specifically designed to meet the needs and concerns of public officials, community leaders, and residents expressed during community interviews. The primary objective of EPA's community relations plan will be to provide information about the progress of the cleanup and the safety measures taken at the site to reduce health risks.

PROVIDE STATUS UPDATES OF EPA CLEANUP ACTIVITIES.

EPA will provide local officials, community leaders, and residents with frequent, accurate, and easily understandable status updates of cleanup activities. Status updates of EPA's cleanup activities will communicate to local officials, community leaders, and residents a clear picture of progress being made at the residents a clear picture of progress being made at the site. Providing community members with periodic updates of site. Providing community members with periodic updates of sampling results, and explaining the significance of any newly discovered contaminant levels, will help to communicate to them that EPA is actively seeking to precisely define the nature and extent of contamination.

PREPARE AND DISTRIBUTE UPDATES ON SITE ACTIVITIES

Purpose: To inform residents about site safety activites.

Technique: Cleanup efforts and safety measures taken by EPA at King of Prussia site will be prepared and distributed by EPA and provided to local officials and community leaders. A special effort should be made to distribute updates to state elected officials and to R.E.P.P. since organization wants to publish information about the site in the newsletter.

PROVIDE ADEQUATE WARNING OF DANGERS ASSOCIATED WITH ENTERING THE SITE

Purpose: To warn the community and keep trespassers off the site.

Technique: The PRPs in 1988 installed a perimeter fence and large visible warning signs on the fence are placed. The signs clearly indicate the dangers associated with entering the site. EPA, NJDEP and the Winslow Township Police currently observe the hazarodus waste site on a regular basis.

PREPARE AND DISTRIBUTE PRESS RELEASES ON SITE ACTIVITIES

Purpose: To inform residents about the Superfund cleanup process, site activities, and safety measures implemented during the cleanup.

Technique: Press release will be prepared and distributed to local media that describe the Superfund cleanup process, and EPA's site activities and safety measures.

PROVIDE UPDATES ON SAMPLING RESULTS

Purpose: To inform community leaders about sampling results of groundwater and surface water that could potentially effect the status of the Great Egg Harbor River as part of the Congressional Scenic and Wild River Study.

Technique: EPA should provide technical reports and information directly to local officials and community leaders. In addition, EPA should maintain phone contact to be able to quickly inform local officials and community leaders about sampling results throughout and cleanup process.

ESTABLISH AND MAINTAIN AN INFORMATION REPOSITORY

Purpose: To ensure all technical documents,the final community relations plan, and other site related inforamtion is available to interested parties.

Technique: A suggested location for an information repository is the Winslow Township Municipal Building.

SPONSOR A PUBLIC MEETING

Purpose: To provide information about site activities and respond to questions. A public meeting is not a formal hearing at which testimony is received. It is a meeting at which EPA and the community can exchange information.

Technique: EPA should sponsor a public meeting in Winslow Township in coordination with local officials and community leaders. A press release should be prepared to inform the community about the meeting purpose, location, time, and date.

APPENDIX A

SUGGESTED LOCATIONS FOR AN INFORMATION REPOSITORY AND PUBLIC MEETINGS

A. Information Repository

Camden County Library (609) 567-9770
Winslow Township Branch
Route 73
Braddock, New Jersey 08037

Hours of Operation

Monday and Wednesday 10:00 a.m - 8:00 p.m.
Tuesday, Thursday, and Friday 10:00 a.m. - 5:00 p.m.
Saturday 10:00 a.m. - 2:00 p.m.

Contact: Art Wolk, Reference Librarian

B. Public Meeting Location

Winslow Township Municipal Building (609) 567-0700
Route 73
Braddock, New Jersey 08037

Hours of Operation

Monday - Friday 8:30 a.m. - 4:30 p.m.

Contact: Ron Nunnemkamp, Township Clerk

Capacity: 200

C. State Elected Officials

State Senator Daniel J. Dalton (609) 227-1407
Box 100, RD 2
Grentree Road
Turnersville, NJ 08012

State Assemblyman Anthony Marsella (609) 589-2333
Box 427 RD 3
Ganttown Road
Ganttown Professional Plaza
Sewel, NJ 08080

State Assemblyman Dennis Riley (609) 228-8080
Academy Hall 27 South
Black Horse Pike
Blackwood, NJ 08012

D. State Officials

*Catherine Timpy (609) 894-9342
Environmental Specialist
New Jersey Pinelands Commission
P.O. Box 7
New Lisbon, NJ 08064

E. Winslow Township Officials

*Norman Tomasello, Mayor
F. William Auwarter, Committee Member
Russell Bates, Committee Member
John Gargano, Committee Member
Sue Ann Metzner, Committee Member
Jeannine LaRue, Committee Member
*Lawrence Mauriello, Committee Member
James Powell, Committee Member
N. Lee Tomasello, Committee Member

*Ron Nunnenkamp, Township Clerk
*Dr. George Leon, Environmental Commission Chairperson
*Ed McGlinchey, Superintendent, Department of Public Works
*June Fletcher, Environmental Commission Member

Winslow Township Municipal Building (609) 567-0700
Route 73
Braddock, NJ 08037

F. Winslow Township Community Organizations

*Macy Wright, President (through June 1988) (609) 767-4273
Residents for Environmental
Protection and Preservation (R.E.P.P.)
*Indicates persons interviewed in preparation of this plan.

G. Newspapers

Courier Post (609) 663-6000
301 Cuthbert Road
Cherry Hill, NJ 08002

Philadelphia Inquirer (609) 779-3840
53 Haddonfield Road
Cherry Hill, NJ 08002
Attention: Andy Wallace

E. Television Stations

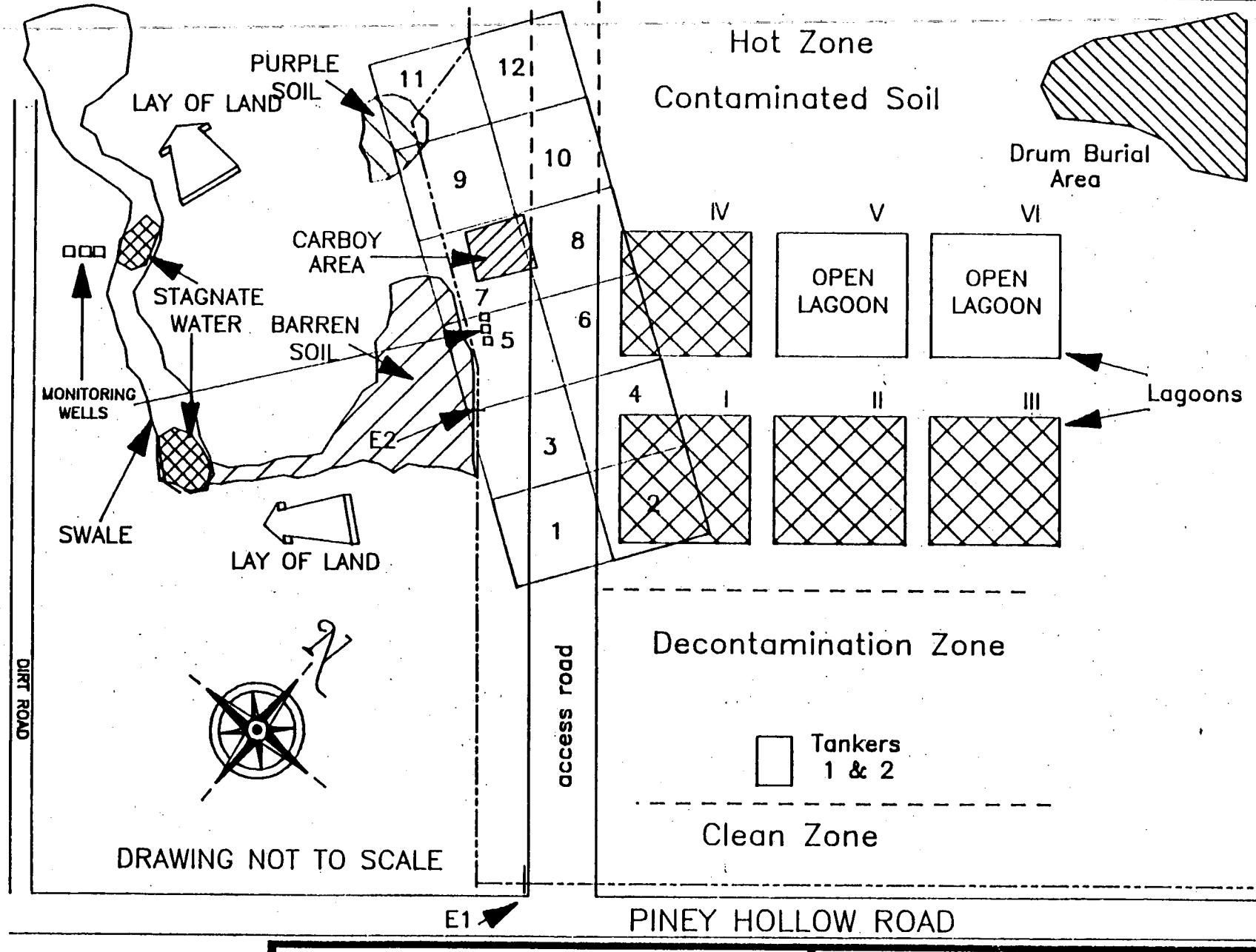
WCAU-TV (609) 866-0553
Plaza Office Center
Route 73
Mount Laurel, NJ 08054

WPVI-TV (609) 966-6666
4100 City Line Avenue
Philadelphia, PA 19131

F. Radio Stations

WDBK-FM (609) 227-7200
Camden County College
Little Gloucester Road
P.O. Box 200
Blackwood, NJ 08012

WSSJ-AM (609) 365-5600
Mutual Broadcasting System
6N Market Street
Camden, NJ 08101



WESTON SPILL PREVENTION & EMERGENCY RESPONSE DIVISION		EPA PM E. Dominach	King of Prussia Site
In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.		TAT PM D. Graham	Figure 2.

6.2 Press Release And Fact Sheets

United States
Environmental Protection Agency
Region 2: New Jersey, New York
Puerto Rico, Virgin Islands
26 Federal Plaza, NY, NY 10278

FACTS

SUPERFUND UPDATE

June 1988

KING OF PRUSSIA TECHNICAL CORPORATION DISPOSAL SITE
Winslow Township, New Jersey

This update reviews the activities of the U. S. Environmental Protection Agency (EPA) at the King of Prussia Technical Corporation Disposal Superfund Site (KOP) since August 1987. Information on site background and current and future activities is provided.

SITE BACKGROUND

The King of Prussia Technical Corporation Disposal Site is located on Piney Hollow Road in Winslow Township, Camden County, New Jersey. The site is approximately 10 acres and is located 800 to 1000 feet northeast of the Great Egg Harbor River. There are no private residences in the immediate surroundings of the site.

Between 1970 and 1973 the site was used as an industrial waste treatment station. The facility processed liquid industrial wastes, principally through a series of lagoons. In 1973, KOP sold the facility to the Evor Phillips Leasing Company, and in 1976, Winslow Township foreclosed on the property for failure of the company to pay taxes. Winslow Township currently owns the property.

Based on chemical analyses of groundwater and soil samples obtained and conducted by EPA at various times between 1975 and 1980, EPA determined that a Remedial Investigation/Feasibility Study (RI/FS) was necessary. Consequently, KOP was placed on the National Priorities List of hazardous waste sites.

In April 1985, EPA entered into an Agreement and Consent Order with five Potentially Responsible Parties (PRPs) to conduct the RI/FS. The purpose of the RI/FS is to determine the nature and extent of contamination at the site and to identify and evaluate clean up alternatives.

FIELD ACTIVITIES

The RI for this site will be done in two phases. Phase I focused on defining and characterizing the nature of contamination on and near the KOP site. Field work for Phase I began in November 1985 and was completed in June 1986.

Field work consisted of surface and subsurface soils investigations, including the collection and analysis of samples from 76 locations. Seven wells were drilled and the groundwater from these wells was sampled. In addition, surface water and sediment sampling occurred at 6 locations in

the Great Egg Harbor River. Analysis of the results of the sampling revealed heavy metals contamination throughout the site as well as the presence of small amounts of volatile chemicals in the groundwater on the site.

Phase II of the RI will focus on determining the amount and extent of contamination on and near the site. Field work for Phase II began in May 1988 and is scheduled to be completed in late summer of this year. Current field activities include soil sampling, additional surface water and sediment sampling from the Great Egg Harbor River, and the placement of additional wells throughout the site, including one on the side of the Great Egg Harbor River opposite the site. In addition, all of the previously installed wells and the new ones (a total of 28 wells) will be sampled during this phase. EPA estimates that the RI will be completed in December 1988.

FUTURE ACTIVITIES

Once the RI has been completed and reviewed by EPA, the data gathered from the RI will be used to develop the FS. The FS will address remedial response objectives and identify and evaluate viable clean up alternatives. EPA estimates that the FS will be completed in the summer of 1989.

In addition, an EPA contractor will be preparing an Endangerment/Risk Assessment Report. This report will identify the contaminants of concern to determine and evaluate pathways by which the public and the environment may be exposed, and will estimate the short and long-term effects of such exposures. The Endangerment/Risk Assessment Report is scheduled for completion in December 1988.

FURTHER INFORMATION

Copies of technical and community relations documents regarding the King of Prussia Technical Corporation Disposal Superfund Site will be available for review in the near future at the following locations:

Winslow Township Municpal Hall
Route 73
Braddock, New Jersey 08073
(609) 567-0700

Camden County Library
Echelon Urban Center
Laurel Road
Voorhees, New Jersey 08043
(609) 772-1636

Residents and other interested parties with questions or comments concerning the King of Prussia Technical Corporation Disposal Superfund Site may contact Marilyn Haye, EPA Enforcement Project Officer or Isabel Funcia, EPA Superfund Community Relations Specialist, at

EPA Region II
26 Federal Plaza
New York, NY 10278
(212) 264-2515