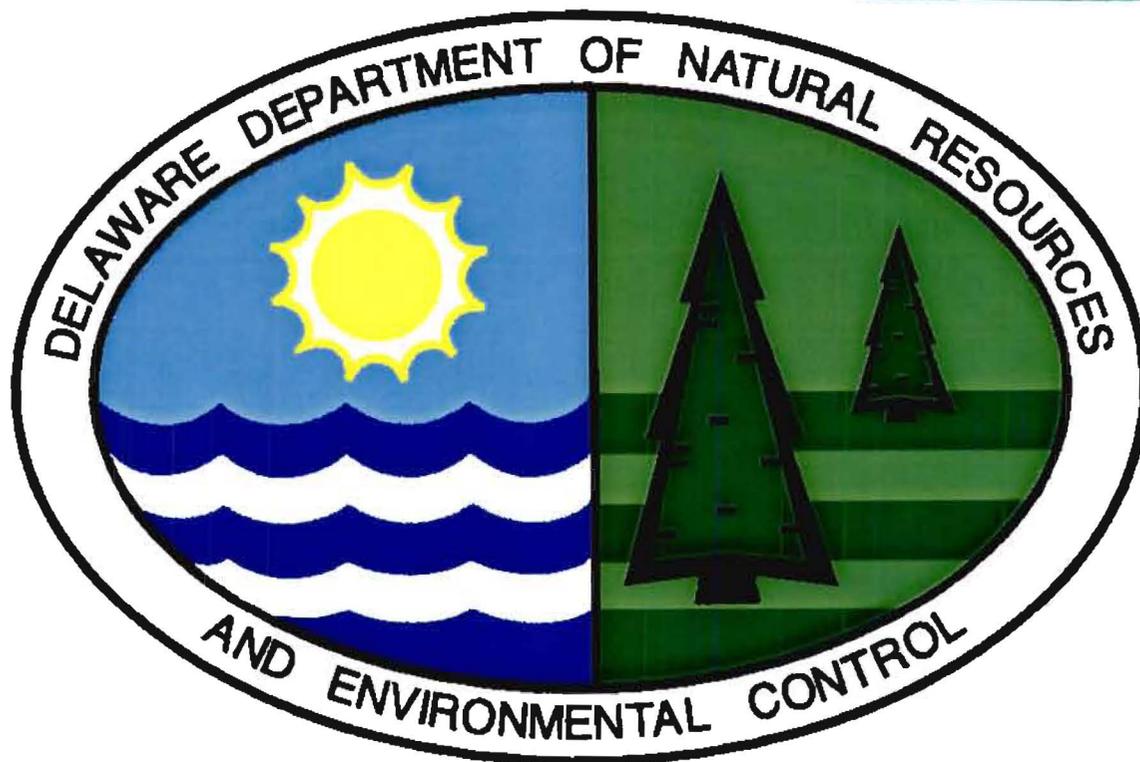


# FINAL PLAN OF REMEDIAL ACTION

524 A & B South Walnut Street

Wilmington, Delaware

DNREC Project No. - DE-1235



July 2002

Department of Natural Resources and Environmental Control  
Division of Air and Waste Management  
Site Investigation and Restoration Branch  
391 Lukens Drive  
New Castle, DE 19720 - 3774

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## **1.0 INTRODUCTION**

The 524 A & B South Walnut Street (site) is located at 524 South Walnut Street between Garasches Lane and C Street within the city limits of Wilmington, New Castle County, Delaware (Figure 1).

In order to determine the potential for environmental liability and obtain a Certificate of Completion of Remedy (COCR), and in accordance with applicable laws and regulations, 520 Venture Corporation (owner) entered into the Delaware Department of Natural Resources and Environmental Control (DNREC) Voluntary Cleanup Program (VCP) under the provisions of the Delaware Hazardous Substance Cleanup Act (HSCA), 7 Del. C. Chapter 91. Through a VCP Agreement, the owner agreed to conduct a remedial investigation (RI) to characterize the risks posed to public health, welfare and the environment. The owner contracted Tetra Tech, Inc. (Tt) to perform the RI of the site. The purpose of the RI was to: 1) understand the nature and extent of any soil contamination on the site, 2) evaluate risks to public health, welfare and the environment associated with any identified contamination, and 3), identify and recommend a remedial action, if required by DNREC.

This document is DNREC's final plan of remedial action (final plan) for the site. It is based on the results of the previous investigations performed at the site, the proposed plan, and any comments received. This final plan is issued under the provisions of the HSCA and the Delaware Regulations Governing Hazardous Substance Cleanup (Regulations). It presents the Department's assessment of the potential health and environmental risks posed by the site.

In June 2002, DNREC issued a proposed plan of remedial action (proposed plan) for the site based on the previous investigations. As described in Section 12 of the Regulations, DNREC provided notice to the public and an opportunity for the public to comment on the proposed plan. At the comment period's conclusion, DNREC did not receive any comments and prepared to issue this final plan. The final plan designates the selected remedy for the site. The proposed plan, all prior investigations of the site, the comments received from the public, DNREC's responses to those comments, and the final plan will constitute the remedial decision record.

Section 2.0 presents a summary of the site description, site history and previous investigations of the site. Section 3.0 provides a description of the remedial investigation results. Section 4.0 presents a discussion of the remedial objectives. Section 5.0 presents the final plan of remedial action. Section 6.0 discusses public participation requirements and Section 7.0 presents the Director's Declaration.

## **2.0 SITE DESCRIPTION AND HISTORY**

The site is located at 524 South Walnut Street between Garasches Lane and C Street, in Wilmington, New Castle County, Delaware. The site consists of approximately 7.2 acres within one tax parcel, New Castle County tax parcel number 26-050.00-031. The site has one commercial condominium building, paved parking surfaces and a small landscaped area. The site is approximately 90 percent covered by either the building and/or paved parking areas.

The site was previously used as a junkyard from the 1930s through the early 1960s. Prior to 1988, the eastern portion of the site was owned by railroad companies, including Consolidated Rail and the Wilmington and Northern Railroad. The building on the site was constructed sometime around 1988 and currently houses commercial tenants. The site is bounded generally by Walnut Street to the west, a vacant wooded area and unpaved driveway to the north, a drainage ditch and marshland to the east and vacant land to the south (Figure 2).

### *Site and Project History*

Historically, the site was used as a junkyard prior to its current land use. Surrounding properties have historically been used for lumberyards, coal companies, carriage works, leather works, an incinerator, a municipal dump, shipbuilding, automotive shops, salvage yards, warehousing, oil storage and distribution, and other commercial and industrial uses. Previous investigations in the vicinity have noted significant filling to have taken place on surrounding properties. Geotechnical investigations at the site in 1973, 1974 and 1987 have confirmed that the site has been extensively filled with a variety of material including rocks, broken concrete, trash, cinders, slag, incinerated rubbish, rags, wood, glass, plastic and coal. The 1987 report suggests that, the site may have received fill as recently as 1986. The depth of the material ranged from 0 to approximately 15 feet below grade.

Tt conducted Phase I Environmental Site Assessments in December 1997 and December 2000. Tt conducted an RI at the site in the September 2001 to assess the extent and character of potential contamination of soils and historical fill material observed at the site during earlier geotechnical studies.

## **3.0 INVESTIGATION RESULTS**

DNREC worked with Tt to develop an RI work plan to address the following:

- Determine the presence or absence of contaminants at the surface and subsurface soils and groundwater, and if present, determine if the contaminants pose any unacceptable risks to human health or the environment.

The RI work plan called for Tt to perform the following tasks:

- Sample and analyze the surface and subsurface soil and groundwater at the site;
- Conduct a deed search and gather relevant background information;
- Prepare a pathway analysis for potential contaminant pathways of concern.

The following is a brief summary of the results of the investigations for the site:

### **3.1 General Information**

The site consists of approximately 7.2 acres and is currently occupied by one commercial condominium building, paved surfaces and a small landscaped area. The site is approximately 90 percent covered by either building and/or paved parking areas and all non-hard surfaced areas

are reportedly covered with two feet of clean fill soil. All surrounding buildings and structures are currently connected to public water and sewer systems.

### 3.2 Site Soils

The soils at the site are mapped as made land or urban land, indicating areas that have been filled with soil material, miscellaneous fill or both. Direct-push soil sampling indicated that the subsurface materials consist of a layer of crushed rock or silty sand under asphalt or gravel underlain by fill to depths of 8 feet to 16 feet below ground surface. Fill materials consisted of rocks, broken concrete, trash, cinders, slag, incinerated rubbish, rags, wood, glass, plastic and coal.

As part of the RI conducted by Tt, ten (10) direct-push borings (Geoprobe<sup>®</sup>) were placed at representative locations around the property and a total of twenty-two (22) soil samples were collected. Soil samples were collected from 0 to 2 feet below ground surface, and between 2 and 6 feet below ground. All soil samples were then submitted for laboratory analysis of USEPA Target Compound List/Target Analyte List (TCL/TAL) parameters.

Laboratory analytical results indicated several metals and compounds exceeded the DNREC Uniform Risk-Based Standard (URS) restricted use value for soil in a non-critical water resource area in at least one sample, including the polycyclic aromatic hydrocarbons (PAHs) benzo(a)pyrene, dibenz(a,h)anthracene, benzo(b)fluoranthene, polychlorinated biphenyls (PCB) 1248, arsenic and lead. No volatile organic compounds (VOCs) were detected above the applicable URS values. Additional metals and compounds, including the PCBs - PCB-1254 and PCB-1260 and the pesticide DDT exceeded the unrestricted use value in at least one sample, but were below the restricted use URS value.

Benzo(a)pyrene (0.19 mg/kg to 6.4 mg/kg) exceeded the restricted use URS values in eight samples, dibenz(a,h)anthracene (0.038 mg/kg to 1.2 mg/kg) exceeded in two samples and benzo(b)fluoranthene (0.24 mg/kg to 8.1 mg/kg) exceeded the applicable URS values in one sample. PCB-1248 was detected greater than the restricted use URS values in one sample (14.0 mg/kg vs. 3.0 mg/kg). The data tables are shown in Appendix 1.

Arsenic exceeded the restricted use URS value of 4.0 mg/kg in eighteen samples, however, only four samples exceeded the natural background levels (11.0 mg/kg) normally found in northern New Castle County. Arsenic concentrations in shallow samples ranged from 3.3 mg/kg to 10.4 mg/kg, with a median concentration of 4.8 mg/kg. Deep soil samples had arsenic concentrations ranging from 2.6 mg/kg to 14.6 mg/kg and had a median concentration of 9.2 mg/kg. Lead concentrations ranged from 12.5 mg/kg to 1,140 mg/kg. One sample contained lead at a concentration greater than the restricted use URS value (1,140 mg/kg vs. 1,000 mg/kg). The data tables are included in Appendix 1.

### 3.3 Groundwater

Ten groundwater samples were collected during the RI. One groundwater sample was collected from each sampling location using a peristaltic pump in temporary PVC screen and casing placed in the borehole. The results of shallow groundwater sampling at the site indicated that groundwater beneath the site contains concentrations of metals, most notably arsenic, semi-volatile organic compounds (SVOCs) and some pesticides which exceed the URS value for groundwater.

SVOCs exceeding the groundwater URS values were detected at sample location DP-4. They consisted of acenaphthene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, carbazole, dibenzofuran, fluorene, indeno(1,2,3-cd)pyrene and naphthalene.

The pesticides aldrin and dieldrin were detected in sample location DP-2 at a concentration exceeding the URS value for groundwater and DDT exceeded the URS value for groundwater at DP-6.

Concentrations of metals greater than the URS value for groundwater were detected across the site. In general, concentrations of total metals were greater than dissolved metals. Eight sample locations contained barium, iron and manganese at concentrations greater than the respective groundwater URS values. Six groundwater samples exceeded the URS value for groundwater for arsenic, and one sample exceeded the URS value for aluminum.

The area is served by a public water supply system. There are no known users of local groundwater or water supply wells near the site. There is a north-south trending ditch on the eastern side of the site that likely receives groundwater discharge from the site. The ditch drains to the Christina River approximately one-quarter mile north of the site. Several wetland areas are located to the northeast, east and southeast of the site.

### **3.4 Summary**

The results of the investigations indicated that the site contains elevated concentrations of arsenic, lead, PAHs and PCBs in the soil samples that exceeded the DNREC URS values for restricted use. Several samples contained arsenic at a concentration greater than the URS value for restricted use, and four exceeded the range of concentrations that would be expected for natural background in Delaware. A number of the soil samples also contained contaminant concentrations greater than the URS value for unrestricted use, but below the restricted use URS values.

The results of shallow groundwater sampling at the site indicated that groundwater beneath the site contains concentrations of metals, most notably arsenic, SVOCs and some pesticides which exceeded the URS value for groundwater. SVOC and pesticide exceedances were limited to a single sampling location and do not appear to be representative of groundwater beneath the entire site.

There are no known users of local groundwater or water supply wells near the site and groundwater is not considered a human health pathway of concern for this site. To evaluate the potential impact on ecological receptors, groundwater concentrations were compared to surface water URS values for protection of the environment. When a conservative dilution factor of ten,

(often used by the National Oceanic and Atmospheric Administration as a screening comparison), was applied to groundwater concentrations, the majority of potential surface water exceedances were eliminated. Therefore, the potential impact to aquatic life in the Christina River is expected to be minimal.

The site is approximately 90 percent covered by a commercial building and asphalt parking lot, and landscaped areas are covered with approximately two feet of landscaped fill material, eliminating direct contact with contaminated soil, and minimizing the erosion of contaminated soil from the site.

#### **4.0 REMEDIAL ACTION OBJECTIVES**

According to Section 8.4 (1) of the Regulations, site-specific remedial action objectives must be established for all plans of remedial action. The Regulations provide that DNREC set objectives for land use, resource use, and cleanup levels that are protective of human health and the environment.

Qualitative objectives describe, in general terms, what the ultimate result of the remedial action, if necessary, should be. The following qualitative objectives are determined to be appropriate for the site:

- Control potential human exposure (dermal, inhalation and ingestion) to impacted soils;
- Control potential human exposure (ingestion and inhalation) to impacted groundwater;
- Control potential erosion of impacted soils to the Christina River; and
- Control the flow of groundwater contaminated by metals, PAHs and pesticides into the Christina River above the Delaware Surface Water Quality Standards.

These objectives are consistent with the current use of the site as non-residential use in an urban setting, and worker health and safety concerns.

Quantitative objectives define specific levels of remedial action to achieve protection of human health and the environment. Based on the qualitative objectives, the quantitative objectives will be to ensure that future site users such as site workers, construction workers, visitors, and trespassers do not come in contact with soils or groundwater that contain elevated levels of metals, PAHs, pesticides and PCBs above the established restricted use URS values, and to prevent discharge of groundwater containing elevated levels of metals, PAHs and pesticides above URS values for surface water.

Based on the qualitative objectives, the quantitative objectives are:

1. Prevent human exposure to soils and groundwater contaminated by metals, PAHs, pesticides and PCBs that would result in a carcinogenic risk exceeding  $1 \times 10^{-5}$ , a hazard index of 1.0 or lead concentrations exceeding 1,000 mg/kg.

2. Prevent erosion of surface soils contaminated above DNREC URS values for protection of the Christina River.
3. Prevent discharge of groundwater contaminated by metals, PAHs and pesticides into the Christina River above the Delaware Surface Water Quality Standards.

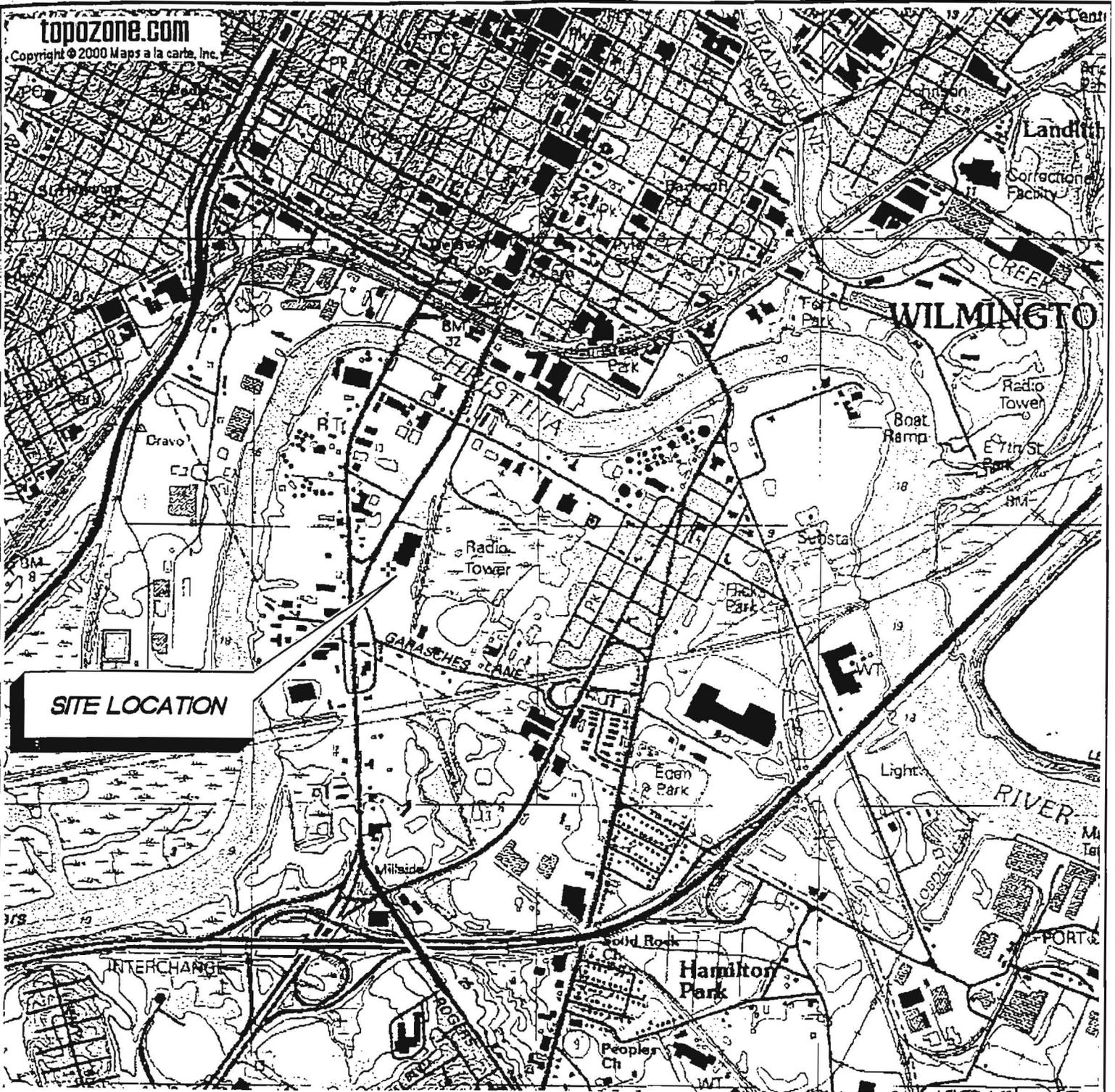
Concentrations of metals greater than the groundwater URS values were detected across the site. In general, concentrations of total metals were greater than dissolved metals. Eight sample locations contained barium, iron and manganese at concentrations greater than the respective URS values for groundwater. Six groundwater samples exceeded the groundwater URS values for arsenic and one sample exceeded the groundwater URS value for aluminum. SVOC and pesticide exceedances were limited to a single sampling location and do not appear to be representative of groundwater beneath the entire site. When a dilution factor of ten was applied to groundwater concentrations as a general rule of thumb, the majority of potential surface water exceedances were eliminated. Therefore, the potential impact to aquatic life in the Christina River is expected to be minimal.

The compounds that pose a potential human health hazard that were detected in groundwater are arsenic, pesticides and PAHs. There are no known users of local groundwater as a primary drinking water source in the area and no use of groundwater at the site. Based on this information, metal and organic compound concentrations in the groundwater, regardless of their source, do not pose a current risk to human health. In addition, the site is located within the boundaries of the Groundwater Management Zone (GMZ) for the City of Wilmington, established in August 2001, that will ensure that the Division of Air and Waste Management (DAWM) and the Division of Water Resources (DWR) will mutually review any water well permits at the site.

## **5.0 FINAL PLAN OF REMEDIAL ACTION**

As stated in Section 3.0 of this Final Plan, the soils at the site contain elevated levels of some metals, PAHs, pesticides and PCBs. The site is currently developed as a commercial building and parking lot and is expected to remain under the same land use. The final plan for the 524 A & B South Walnut Street site calls for maintenance of the existing cover system (building and parking lot) and institutional controls, consisting of the following:

- Placement of a deed restriction on the site limiting the property, which is currently a commercial condominium: a) to restricted land use (non-residential uses); b) prohibiting any excavation, trenching, construction, grading, drilling, digging or other earth disturbance activities, or renovation or demolition of the existing structures on the property, or any paved surfaces in excess of 12 inches below grade on the site without prior written approval of DNREC; and prohibiting the installation of any water well on, or use of groundwater at the site without the prior written approval of DNREC. Operation and maintenance (O&M) will consist of maintaining the pavement cap and landscaped areas in good condition.



**SITE LOCATION**



SCALE 1:25,000



APPROX. SCALE IN MILES



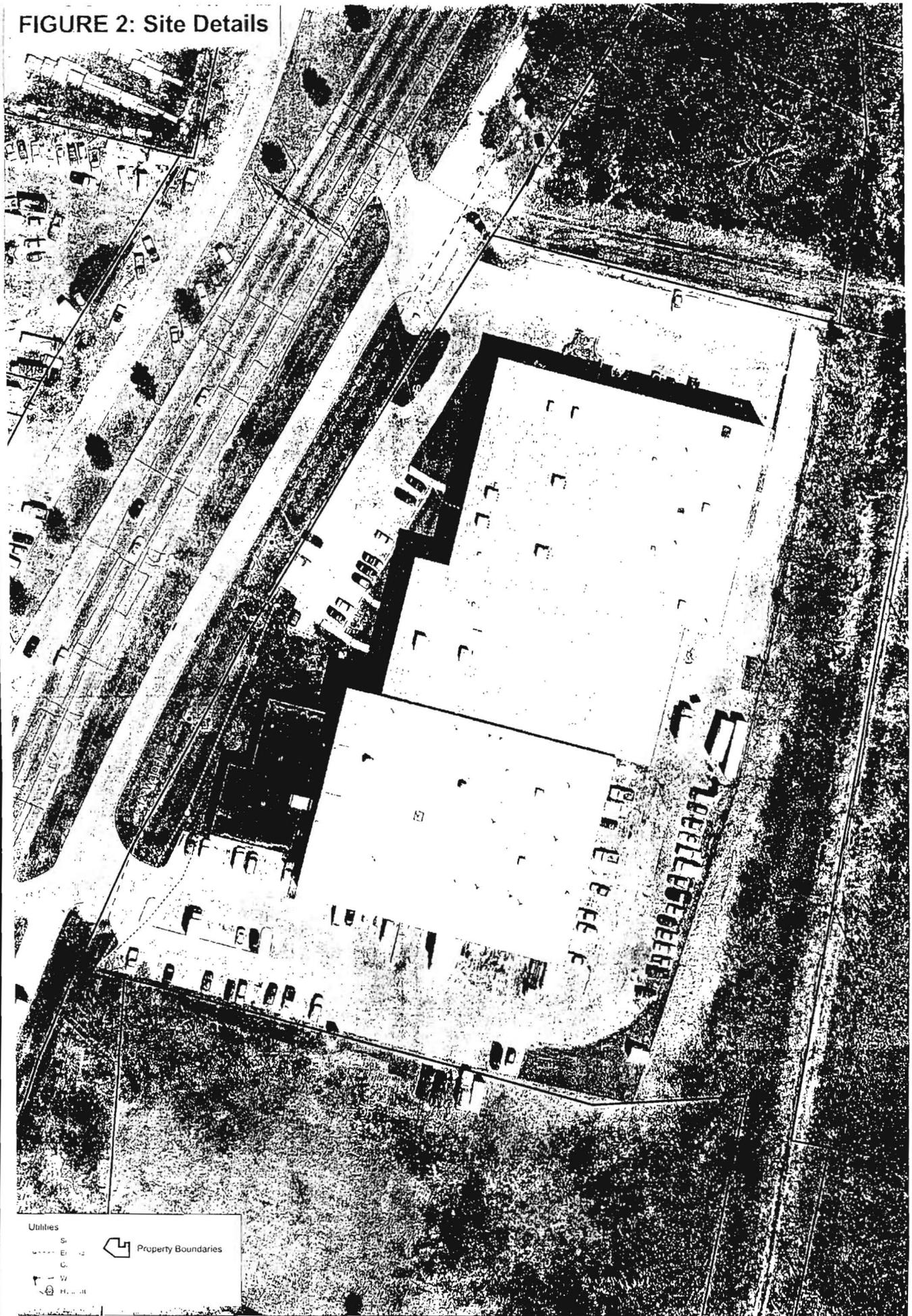
APPROX. SCALE IN FEET



**TETRA TECH, INC.**

**Figure 1**  
**Site Location Map**  
**524 A & B South Walnut Street**  
**Wilmington, Delaware**

**FIGURE 2: Site Details**



Utilities

- S<sub>1</sub>
- E<sub>1</sub>
- C<sub>1</sub>
- W<sub>1</sub>
- H<sub>1</sub>

Property Boundaries



**TETRA TECH, INC.**

56 West Main Street, Suite 400  
 Christiana, Delaware 19702-1501  
 302.758.7551 • 800.462.0910

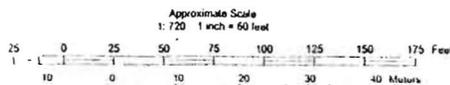


Image from City of Wilmington, 1997  
 Property boundaries: New Castle County  
 Utilities: GPS'd from Miss. Utility markings  
 This map is for informational purposes only



## **Appendix 1: Laboratory Data Tables**

**Table 1 (Page 1 of 5)**  
**Summary of Target Compound List Detections**  
**Soil (ug/kg)**

Tetra Tech, Inc.  
 524 A-B S. Walnut St.  
 RI Report  
 December 2001

**September 2001**

		Location:	DP1, SO-1	DP11, SO-1	DP1, SO-2	DP2, SO-1	DP2, SO-2
		Date:	9/13/2001	9/13/2001	9/13/2001	9/13/2001	9/13/2001
		Time:	1230	1235	1240	1105	1108
		Depth:	0.5-2 ft bg	0.5-2 ft bg	4-6 ft bg	1-2 ft bg	4-6 ft bg
		Non-Critical Water Resource Area					
		URS		Dup of DP1-SO-1			
Analysis Name	restricted use	Final Results	Final Results	Final Results	Final Results	Final Results	Final Results
<b>TCL Pesticides in Solids</b>							
Alpha Chlordane	16,000	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
DDD	24,000	12 J	14 J	N.D.	N.D.	N.D.	N.D.
DDE	17,000	4.9 J	8.4 J	N.D.	N.D.	N.D.	N.D.
DDT	17,000	37	320	N.D.	N.D.	N.D.	N.D.
Dieldrin	400	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Gamma BHC - Lindane	4,000	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Gamma Chlordane	16,000	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
PCB-1248	3,000	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
PCB-1254	3,000	N.D.	N.D.	N.D.	240	330	
PCB-1260	3,000	N.D.	N.D.	N.D.	200	550	
<b>TCL SW846 Semivolatiles Soil</b>							
2-Methylnaphthalene	4,100,000	N.D.	49 J	N.D.	53 J	120 J	
4-Chloroaniline	820,000	N.D.	N.D.	N.D.	N.D.	N.D.	
4-Methylphenol	5,000,000	N.D.	N.D.	N.D.	N.D.	N.D.	
Acenaphthylene	unknown	85 J	210 J	45 J	100 J	370	
Naphthalene	4,100,000	38 J	64 J	N.D.	88 J	150 J	
<b>TCL SW846 Semivolatiles/Soil</b>							
Acenaphthene	5,000,000	50 J	61 J	N.D.	210 J	250 J	
Anthracene	5,000,000	110 J	230 J	78 J	390	910	
Benzo(a)anthracene	8,000	470.	1,000.	360 J	1200	2200	
Benzo(a)pyrene	800	470.	1,000.	340 J	1200	2200	
Benzo(b)fluoranthene	8,000	590.	1,300.	480	1400	2800	
Benzo(g,h,i)perylene	unknown	240 J	410.	190 J	740	930	
Benzo(k)fluoranthene	78,000	250 J	570	190 J	580	1100	
Butylbenzylphthalate	5,000,000	N.D.	N.D.	N.D.	N.D.	N.D.	
Carbazole	290,000	N.D.	130 J	N.D.	100 J	290 J	
Chrysene	780,000	550.	1,300	440	1300	2400	
Dibenz(a,h)anthracene	800	100 J	160 J	73 J	250 J	390	
Dibenzofuran	820,000	N.D.	120 J	N.D.	110 J	200 J	
Fluoranthene	5,000,000	900	2,400	700	2200	3500	
Fluorene	5,000,000	55 J	110 J	N.D.	140 J	330 J	
Indeno(1,2,3-cd)pyrene	8,000	300 J	580	240 J	880	1200	
Phenanthrene	5,000,000	540	2,100	300 J	1200	2600	
Pyrene	5,000,000	860	2,100	650	2100	3400	
bis(2-Ethylhexyl)phthalate	410,000	N.D.	74 J	200 J	240 J	790	
<b>TCL by 8260 (soil)</b>							
Benzene	200,000	N.D.	N.D.	N.D.	N.D.	N.D.	
Ethylbenzene	5,000,000	N.D.	N.D.	N.D.	N.D.	N.D.	
Toluene	5,000,000	N.D.	N.D.	N.D.	N.D.	N.D.	
Xylene (Total)	5,000,000	N.D.	N.D.	N.D.	N.D.	N.D.	

URS = Uniform Risk Based Standard (DNREC, 1999)  
 N.D. = Not Detected  
 Highlighted = Value above URS-restricted use.

lab dataSoil TCL Detects

**Table 1 (Page 2 of 5)**  
**Summary of Target Compound List Detections**  
**Soil (ug/kg)**  
**September 2001**

Tetra Tech, Inc.  
 524 A-B S. Walnut St.  
 RI Report  
 December 2001

Analysis Name	Location:		DP3, SO-1	DP3, SO-2
	Date:		9/13/2001	9/13/2001
Time:		950	1000	
Depth:		1-2.5 ft bg	4.5-5.5 ft bg	
Non-Critical Water Resource Area URS				
	restricted use	Final Results	Final Results	
<b>TCL Pesticides in Solids</b>				
Alpha Chlordane	16,000	N.D.	N.D.	
DDD	24,000	N.D.	N.D.	
DDE	17,000	N.D.	N.D.	
DDT	17,000	N.D.	N.D.	
Dieldrin	400	N.D.	N.D.	
Gamma BHC - Lindane	4,000	N.D.	N.D.	
Gamma Chlordane	16,000	N.D.	N.D.	
PCB-1248	3,000	N.D.	N.D.	
PCB-1254	3,000	72 J	N.D.	
PCB-1260	3,000	N.D.	770 J	
<b>TCL SW846 Semivolatiles Soil</b>				
2-Methylnaphthalene	4,100,000	N.D.	95 J	
4-Chloroaniline	820,000	N.D.	N.D.	
4-Methylphenol	5,000,000	N.D.	N.D.	
Acenaphthylene	unknown	N.D.	240 J	
Naphthalene	4,100,000	N.D.	180 J	
<b>TCL SW846 Semivolatiles/Soil</b>				
Acenaphthene	5,000,000	86 J	160 J	
Anthracene	5,000,000	150 J	350 J	
Benzo(a)anthracene	8,000	340 J	1200	
Benzo(a)pyrene	800	310 J	1200	
Benzo(b)fluoranthene	8,000	410	1400	
Benzo(g,h,i)perylene	unknown	110 J	820	
Benzo(k)fluoranthene	78,000	180 J	580	
Butylbenzylphthalate	5,000,000	N.D.	N.D.	
Carbazole	290,000	N.D.	130 J	
Chrysene	780,000	360 J	1300	
Dibenz(a,h)anthracene	800	45 J	280 J	
Dibenzofuran	820,000	41 J	140 J	
Fluoranthene	5,000,000	780	N.D.	
Fluorene	5,000,000	67 J	270 J	
Indeno(1,2,3-cd)pyrene	8,000	140 J	910	
Phenanthrene	5,000,000	550	1600	
Pyrene	5,000,000	640	2200	
bis(2-Ethylhexyl)phthalate	410,000	N.D.	160 J	
<b>TCL by 8260 (soil):</b>				
Benzene	200,000	N.D.	N.D.	
Ethylbenzene	5,000,000	N.D.	N.D.	
Toluene	5,000,000	N.D.	N.D.	
Xylene (Total)	5,000,000	N.D.	N.D.	

URS = Uniform Risk Based Standard (DNREC, 1999)  
 N.D. = Not Detected  
 Highlighted = Value above URS-restricted use.

lab dataSoil TCL Detects

**Table 1 (Page 3 of 5)**  
**Summary of Target Compound List Detections**  
**Soil (ug/kg)**  
**September 2001**

Tetra Tech, Inc.  
524 A-B S. Walnut St.  
RI Report  
December 2001

Analysis Name	Location: Date: Time: Depth:	DP4, SO-1	DP4, SO-2	DP5, SO-1	DP5, SO-2	DP6, SO-1
		Final Results	Final Results	Final Results	Final Results	Final Results
	Location: DP4, SO-1 Date: 9/13/2001 Time: 825 Depth: 0-2 ft bg	DP4, SO-1 9/13/2001 831 4-6 ft bg	DP4, SO-2 9/13/2001 831 4-6 ft bg	DP5, SO-1 9/7/2001 855 1-2.3 ft bg	DP5, SO-2 9/7/2001 910 4-6 ft bg	DP6, SO-1 9/6/2001 1536 1-2.3 ft bg
	Non-Critical Water Resource Area URS			MS/MSD		
	restricted use			Final Results		
<b>TCL Pesticides in Solids</b>						
Alpha Chlordane	16,000	N.D.	N.D.	N.D.	N.D.	N.D.
DDD	24,000	N.D.	N.D.	N.D.	N.D.	N.D.
DDE	17,000	N.D.	N.D.	N.D.	N.D.	N.D.
DDT	17,000	N.D.	N.D.	330	140 J	N.D.
Dieldrin	400	N.D.	N.D.	N.D.	N.D.	N.D.
Gamma BHC - Lindane	4,000	N.D.	N.D.	N.D.	49 J	N.D.
Gamma Chlordane	16,000	N.D.	N.D.	N.D.	N.D.	N.D.
PCB-1248	3,000	N.D.	N.D.	N.D.	<b>14000</b>	N.D.
PCB-1254	3,000	N.D.	1500 J	N.D.	N.D.	N.D.
PCB-1260	3,000	N.D.	670 J	N.D.	N.D.	N.D.
<b>TCL SW846 Semivolatiles Soil</b>						
2-Methylnaphthalene	4,100,000	77 J	240 J	N.D.	300 J	97 J
4-Chloroaniline	820,000	N.D.	N.D.	N.D.	210 J	N.D.
4-Methylphenol	5,000,000	N.D.	N.D.	N.D.	N.D.	N.D.
Acenaphthylene	unknown	42 J	220 J	N.D.	1300 J	40 J
Naphthalene	4,100,000	120 J	530	N.D.	690 J	81 J
<b>TCL SW846 Semivolatiles/Soil</b>						
Acenaphthene	5,000,000	240 J	720	N.D.	590 J	40 J
Anthracene	5,000,000	330 J	1200	55 J	2500	81 J
Benzo(a)anthracene	8,000	670	1900	170 J	5400	190 J
Benzo(a)pyrene	800	610	<b>1800</b>	190 J	<b>5300</b>	210 J
Benzo(b)fluoranthene	8,000	790	2500	240 J	5900	310 J
Benzo(g,h,i)perylene	unknown	240 J	510	120 J	2000	150 J
Benzo(k)fluoranthene	78,000	340 J	1000	100 J	2700	110 J
Butylbenzylphthalate	5,000,000	N.D.	N.D.	N.D.	78000	140 J
Carbazole	290,000	200 J	400	N.D.	540 J	N.D.
Chrysene	780,000	750	2000	210 J	5400	290 J
Dibenz(a,h)anthracene	800	110 J	230 J	38 J	<b>860 J</b>	60 J
Dibenzofuran	820,000	120 J	480	N.D.	570 J	57 J
Fluoranthene	5,000,000	1500	3800	330 J	8800	470
Fluorene	5,000,000	200 J	800	N.D.	1100 J	43 J
Indeno(1,2,3-cd)pyrene	8,000	290 J	680	130 J	2500	180 J
Phenanthrene	5,000,000	1300	4400	230 J	7600	470
Pyrene	5,000,000	1200	3300	320 J	9400	450
bis(2-Ethylhexyl)phthalate	410,000	81 J	2800	N.D.	N.D.	N.D.
<b>TCL by 8260 (soil)</b>						
Benzene	200,000	N.D.	N.D.	N.D.	110 J	N.D.
Ethylbenzene	5,000,000	N.D.	N.D.	N.D.	110 J	N.D.
Toluene	5,000,000	N.D.	N.D.	N.D.	75 J	N.D.
Xylene (Total)	5,000,000	73 J	83 J	N.D.	180 J	N.D.

URS = Uniform Risk Based Standard (DNREC, 1999)  
N.D. = Not Detected  
Highlighted = Value above URS-restricted use.

lab dataSoil TCL Detects

**Table 1 (Page 4 of 5)**  
**Summary of Target Compound List Detections**  
**Soil (ug/kg)**  
**September 2001**

Tetra Tech, Inc.  
 524 A-B S. Walnut St.  
 RI Report  
 December 2001

Analysis Name	Location: Date: Time: Depth:	DP6, SO-2	DP7, SO-1	DP7, SO-2	DP8, SO-1	DP8, SO-2	
		9/6/2001 1545 4-6 ft bg	9/6/2001 1434 1-2.5 ft bg	9/6/2001 1445 4-6 ft bg	9/6/2001 1340 1-2.5 ft bg	9/6/2001 1350 4-6 ft bg	
Non-Critical Water Resource Area URS		restricted use	Final Results	Final Results	Final Results	Final Results	Final Result
<b>TCL Pesticides in Solids</b>							
Alpha Chlordane		16,000	N.D.	N.D.	N.D.	N.D.	N.D.
DDD		24,000	N.D.	N.D.	N.D.	N.D.	N.D.
DDE		17,000	N.D.	N.D.	N.D.	N.D.	3.8
DDT		17,000	N.D.	N.D.	N.D.	240	N.D.
Dieldrin		400	N.D.	N.D.	N.D.	N.D.	N.D.
Gamma BHC - Lindane		4,000	N.D.	N.D.	N.D.	N.D.	N.D.
Gamma Chlordane		16,000	N.D.	N.D.	N.D.	N.D.	N.D.
PCB-1248		3,000	N.D.	N.D.	N.D.	N.D.	N.D.
PCB-1254		3,000	N.D.	N.D.	N.D.	N.D.	11
PCB-1260		3,000	N.D.	N.D.	N.D.	N.D.	14
<b>TCL SW846 Semivolatiles Soil</b>							
2-Methylnaphthalene		4,100,000	320 J	N.D.	N.D.	N.D.	N.D.
4-Chloroaniline		820,000	N.D.	N.D.	N.D.	N.D.	N.D.
4-Methylphenol		5,000,000	N.D.	N.D.	N.D.	N.D.	N.D.
Acenaphthylene		unknown	130 J	N.D.	N.D.	100 J	N.D.
Naphthalene		4,100,000	260 J	N.D.	N.D.	57 J	N.D.
<b>TCL SW846 Semivolatiles/Soil</b>							
Acenaphthene		5,000,000	150 J	47 J	87 J	46 J	N.D.
Anthracene		5,000,000	340 J	140 J	N.D.	96 J	N.D.
Benzo(a)anthracene		8,000	800	550	310 J	370 J	N.D.
Benzo(a)pyrene		800	720	500	230 J	440	N.D.
Benzo(b)fluoranthene		8,000	1100	630	400 J	510	N.D.
Benzo(g,h,i)perylene		unknown	280 J	300 J	96 J	360 J	N.D.
Benzo(k)fluoranthene		78,000	420	270 J	160 J	190 J	N.D.
Butylbenzylphthalate		5,000,000	190 J	N.D.	420	N.D.	N.D.
Carbazole		290,000	150 J	N.D.	N.D.	N.D.	N.D.
Chrysene		780,000	1000	610	440	370 J	N.D.
Dibenz(a,h)anthracene		800	110 J	97 J	43 J	110 J	N.D.
Dibenzofuran		820,000	170 J	N.D.	N.D.	N.D.	N.D.
Fluoranthene		5,000,000	1400	1000	100 J	600	N.D.
Fluorene		5,000,000	99 J	N.D.	N.D.	N.D.	N.D.
Indeno(1,2,3-cd)pyrene		8,000	350 J	360 J	120 J	380 J	N.D.
Phenanthrene		5,000,000	1100	410	82 J	310 J	N.D.
Pyrene		5,000,000	1500	990	130 J	700	N.D.
bis(2-Ethylhexyl)phthalate		410,000	260 J	N.D.	310 J	130 J	130 J
<b>TCL by 8260 (soil)</b>							
Benzene		200,000	N.D.	N.D.	N.D.	N.D.	N.D.
Ethylbenzene		5,000,000	N.D.	N.D.	N.D.	N.D.	N.D.
Toluene		5,000,000	81 J	N.D.	N.D.	N.D.	N.D.
Xylene (Total)		5,000,000	61 J	N.D.	N.D.	N.D.	N.D.

URS = Uniform Risk Based Standard (DNREC, 1999)  
 N.D. = Not Detected  
 Highlighted = Value above URS-restricted use.

lab dataSoil TCL Detects

**Table 1 (Page 5 of 5)**  
**Summary of Target Compound List Detections**  
**Soil (ug/kg)**  
**September 2001**

Tetra Tech, Inc.  
524 A-B S. Walnut St.  
RI Report  
December 2001

Analysis Name	Non-Critical Water Resource Area URS	restricted use	Location:	DP9, SO-1	DP9, SO-2	DP10, SO-1	DP10, SO-2	DP10, SO-3
			Date:	9/6/2001	9/6/2001	9/6/2001	9/6/2001	9/6/2001
			Time:	1200	1212	1038	1106	1119
			Depth:	0-2 ft bg	3.5-5 ft bg	0-2 ft bg	5-6 ft bg	12-13.5 ft bg
			Final Results					
<b>TCL Pesticides in Solids</b>								
Alpha Chlordane		16,000	11.4 J	N.D.	N.D.	N.D.	N.D.	N.D.
DDD		24,000	N.D.	1200	440	N.D.	N.D.	N.D.
DDE		17,000	N.D.	260	260	N.D.	N.D.	N.D.
DDT		17,000	46 J	500	6200	N.D.	N.D.	N.D.
Dieldrin		400	N.D.	20 J	N.D.	N.D.	N.D.	N.D.
Gamma BHC - Lindane		4,000	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Gamma Chlordane		16,000	N.D.	9.8 J	N.D.	N.D.	N.D.	N.D.
PCB-1248		3,000	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
PCB-1254		3,000	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
PCB-1260		3,000	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
<b>TCL SW846 Semivolatiles Soil</b>								
2-Methylnaphthalene		4,100,000	N.D.	460	N.D.	70 J	67 J	
4-Chloroaniline		820,000	N.D.	N.D.	N.D.	N.D.	N.D.	
4-Methylphenol		5,000,000	N.D.	130 J	N.D.	N.D.	N.D.	
Acenaphthylene		unknown	45 J	1100	N.D.	130 J	220 J	
Naphthalene		4,100,000	46 J	840	N.D.	87 J	100 J	
<b>TCL SW846 Semivolatiles/Soil</b>								
Acenaphthene		5,000,000	150 J	650	N.D.	64 J	N.D.	
Anthracene		5,000,000	250 J	2200	55 J	280 J	300 J	
Benzo(a)anthracene		8,000	700	7900	330 J	740	1100	
Benzo(a)pyrene		800	680	6400	350 J	620	1100	
Benzo(b)fluoranthene		8,000	850	8100	460	770	1400	
Benzo(g,h,i)perylene		unknown	330 J	3500	280 J	390	490	
Benzo(k)fluoranthene		78,000	350 J	2900	210 J	300 J	550	
Butylbenzylphthalate		5,000,000	N.D.	N.D.	N.D.	N.D.	N.D.	
Carbazole		290,000	140 J	2000	N.D.	79 J	170 J	
Chrysene		780,000	780	8600	380	770	1300	
Dibenz(a,h)anthracene		800	140 J	1200	82 J	160 J	190 J	
Dibenzofuran		820,000	67 J	1100	N.D.	81 J	63 J	
Fluoranthene		5,000,000	1400	17000	620	1300	2100	
Fluorene		5,000,000	100 J	910	N.D.	97 J	N.D.	
Indeno(1,2,3-cd)pyrene		8,000	420	4300	300 J	440	590	
Phenanthrene		5,000,000	1000	17000	220 J	1100	1600	
Pyrene		5,000,000	1300	16000	580	1300	2200	
bis(2-Ethylhexyl)phthalate		410,000	230 J	330 J	120 J	520	N.D.	
<b>TCL by 8260 (soil)</b>								
Benzene		200,000	N.D.	N.D.	N.D.	N.D.	N.D.	
Ethylbenzene		5,000,000	N.D.	N.D.	N.D.	N.D.	N.D.	
Toluene		5,000,000	N.D.	N.D.	N.D.	N.D.	N.D.	
Xylene (Total)		5,000,000	N.D.	N.D.	N.D.	N.D.	N.D.	

URS = Uniform Risk Based Standard (DNREC, 1999)  
N.D. = Not Detected  
Highlighted = Value above URS-restricted use.

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**Table 2 (Page 1 of 4)**  
**Concentrations of Metals in Soils (mg/kg)**  
**September 2001**

Tetra Tech, Inc.  
524 A-B S. Walnut St.  
RI Report  
December 2001

Analysis Name	Location:		DP1-SO-1	DP11-SO-1	DP1-SO-2	DP2-SO-1	DP2-SO-2
	Date:		9/13/2001	9/13/2001	9/13/2001	9/13/2001	9/13/2001
	Time:		1230	1235	1240	1105	1108
Depth:		0.5-2 ft bg	0.5-2 ft bg	4-6 ft bg	1-2 ft bg	4-6 ft bg	
Non-Critical Water Resource Area URS		Restricted Use	Final Results				
Mercury	610	0.13	0.15	0.21	0.24	0.37	
Aluminum	200,000	17300	18700	12000	14200	10700	
Antimony	82	1.2 J	N.D.	N.D.	1.2 J	1.6 J	
Barium	14,000	95.5	115	45.3	77.4	141	
Beryllium	410	0.53	0.69	0.74	0.49 J	0.46 J	
Cadmium	100	N.D.	0.37 J	0.11 J	N.D.	N.D.	
Calcium	not applicable	6560	4350	3580	28100	15700	
Chromium	310,000	31	32.7	45.3	31.2	35	
Cobalt	12,000	8.8	11.7	6	5.3 J	10.2	
Copper	8,200	40.4	40.6	42.3	29.6	93.1	
Iron	61,000	24200	24800	52300	23300	40700	
Magnesium	not applicable	3460	2510	1070	4880	3500	
Manganese	4,100	233	279	226	247	290	
Nickel	4,100	14.5	17.3	6.6	11.1	20.8	
Potassium	N.A.	1050	1050	350	1250	1370	
Silver	1,000	N.D.	N.D.	N.D.	N.D.	N.D.	
Sodium	not applicable	71.6 J	175	161	231	200	
Vanadium	1,400	48.5	48.1	87.5	48.8	36.6	
Zinc	61,000	130	136	61.4	72.3	157	
Total Cyanide (solid)	unknown	N.D.	N.D.	N.D.	0.55	0.4 J	
Thallium TR	220	N.D.	2.5	6.3	N.D.	N.D.	
Arsenic TR	4	8.1	10.4	2.6	4.2	14.6	
Selenium TR	1,000	N.D.	1.4	3.1	N.D.	1.9	
Lead TR	1,000	116	154	62.5	75.6	312	

URS = Uniform Risk-Based Standard (DNREC, 1999)

ft bg = feet below grade

N.D. = Not Detected

Highlight = Value exceeds URS -restricted use

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**Table 2 (Page 2 of 4)**  
**Concentrations of Metals in Soils (mg/kg)**  
**September 2001**

Tetra Tech, Inc.  
 524 A-B S. Walnut St.  
 RI Report  
 December 2001

Analysis Name	Location:		DP3-SO-1	DP3-SO-2	DP4--SO-1	DP4-SO-2	DP5-SO-1	DP5-SO-2
	Date:		9/13/2001	9/13/2001	9/13/2001	9/13/2001	9/7/2001	9/7/2001
	Time:		950	1000	825	831	855	910
Depth:		1-2.5 ft bg	4.5-5.5 ft bg	0-2 ft bg	4-6 ft bg	1-2.3 ft bg	4-6 ft bg	
Non-Critical Water Resource Area URS							MS/MSD	
Restricted Use		Final Results						
Mercury	610	0.052 J	0.42	0.2	1.2	0.078 J	0.43	
Aluminum	200,000	12600	16900	12400	15600	22100	13200	
Antimony	82	1.5 J	1.6 J	1.1 J	1.6 J	1.3 J	1.6 J	
Barium	14,000	64.5	186	77.5	96.9	95.1	162	
Beryllium	410	0.35 J	0.76	0.45 J	0.81	0.81	0.47 J	
Cadmium	100	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Calcium	not applicable	48200	11200	47800	10800	8400	37400	
Chromium	310,000	40.1	56.3	35.2	73.5	59	32.9	
Cobalt	12,000	9.4	8.4	4.7 J	7.6	14.4	5.9	
Copper	8,200	177	46.9	23.2	97.8	59.5	31.2	
Iron	61,000	16600	32600	17300	44500	33600	19600	
Magnesium	not applicable	11800	4740	5620	6050	6410	9830	
Manganese	4,100	293	261	205	303	404	282	
Nickel	4,100	23.1	21.6	9.9	18.8	20.7	14.9	
Potassium	N.A.	1190	2610	1320	3280	1810	2000	
Silver	1,000	N.D.	N.D.	N.D.	N.D.	N.D.	0.22 J	
Sodium	not applicable	183	319	174	163	96.2 J	222	
Vanadium	1,400	31.7	48.2	35.3	55.3	64.9	40.2	
Zinc	61,000	43.4	200	70.2	117	55.9	296	
Total Cyanide (solid)	unknown	N.D.	N.D.	N.D.	0.65	N.D.	0.21 J	
Thallium TR	220	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Arsenic TR	4	3.3	10.5	4.9	14	3.3	8.7	
Selenium TR	1,000	N.D.	1.4	0.91 J	1 J	1.2	N.D.	
Lead TR	1,000	19.8	473	196	211	34.6	118	

URS = Uniform Risk-Based Standard (DNREC, 1999)  
 ft bg = feet below grade  
 N.D. = Not Detected  
**Highlight** = Value exceeds URS -restricted use

**Table 2 (Page 3 of 4)**  
**Concentrations of Metals in Soils (mg/kg)**  
**September 2001**

Tetra Tech, Inc.  
 524 A-B S. Walnut St.  
 RI Report  
 December 2001

Analysis Name	Location:		DP6-SO-1	DP6-SO-2	DP7-SO-1	DP7-SO-2	DP8-SO-1	DP8-SO-2
	Date:		9/6/2001	9/6/2001	9/6/2001	9/6/2001	9/6/2001	9/6/2001
	Time:		1536	1545	1434	1445	1340	1350
Depth:		1-2.3 ft bg	4-6 ft bg	1-2.5 ft bg	4-6 ft bg	1-2.5 ft bg	4-6 ft bg	
Non-Critical Water Resource Area URS			Final Results					
Restricted Use								
Mercury		610	0.049 J	0.21	0.047 J	0.037 J	0.34	N.D.
Aluminum		200,000	16700	14100	21000	11700	14800	10300
Antimony		82	1.3 J	4.1 J	1.3 J	0.97 J	0.91 J	1.5 J
Barium		14,000	84.2	172	94.4	126	201	49.5
Beryllium		410	0.56 J	0.54 J	0.67	0.26 J	0.58 J	0.48 J
Cadmium		100	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Calcium	not applicable		1780	16900	15300	3900	53200	70200
Chromium		310,000	29.2	32.2	49.8	19.4	26.5	22.3
Cobalt		12,000	7.9	6.9	12	4.2 J	6.1 J	5.2 J
Copper		8,200	21	60.6	24.8	9.1	25.4	41.1
Iron		61,000	22100	26700	25400	14500	19000	13600
Magnesium	not applicable		2390	8030	4930	1630	5810	5070
Manganese		4,100	208	283	471	120	240	198
Nickel		4,100	14.6	16.9	24.2	6.1	16	12.8
Potassium		N.A.	1320	1450	1210	654	1810	980
Silver		1,000	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Sodium	not applicable		182	337	224	78.5 J	238	176
Vanadium		1,400	42.8	43	52.3	31.8	30.8	18.1
Zinc		61,000	57.1	217	40.7	27.7	244	103
Total Cyanide (solid)		unknown	N.D.	0.3 J	N.D.	N.D.	0.47 J	N.D.
Thallium TR		220	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Arsenic TR		4	<b>5.9</b>	<b>11.4</b>	<b>4.5</b>	<b>6.6</b>	<b>4.8</b>	<b>4.7</b>
Selenium TR		1,000	N.D.	N.D.	0.61 J	N.D.	N.D.	N.D.
Lead TR		1,000	38.6	334	25.1	36.9	420	12.5

URS = Uniform Risk-Based Standard (DNREC, 1999)

ft bg = feet below grade

N.D. = Not Detected

Highlight = Value exceeds URS -restricted use

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**Table 2 (Page 4 of 4)**  
**Concentrations of Metals in Soils (mg/kg)**  
**September 2001**

Tetra Tech, Inc.  
524 A-B S. Walnut St.  
RI Report  
December 2001

Analysis Name	Location:		DP9-SO-1	DP9-SO-2	DP10-SO-1	DP10-SO2	DP10-SO-3
	Date:		9/6/2001	9/6/2001	9/6/2001	9/6/2001	9/6/2001
	Time:		1200	1212	1038	1106	1119
Depth:		0-2 ft bg	3.5-5 ft bg	0-2 ft bg	5-6 ft bg	12-13.5 ft bg	
Non-Critical Water Resource Area URS			Final Results				
Restricted Use	Final Results	Final Results	Final Results	Final Results	Final Results	Final Results	Final Results
Mercury	610	0.079 J	0.24	0.053 J	0.078 J	0.41	
Aluminum	200,000	18600	12600	23900	11100	8880	
Antimony	82	2 J	1.1 J	1.4 J	1.5 J	1.3 J	
Barium	14,000	85.6	101	99.6	110	645	
Beryllium	410	0.64	0.49 J	0.6	0.48 J	0.64 J	
Cadmium	100	N.D.	N.D.	N.D.	N.D.	N.D.	
Calcium	not applicable	7380	4370	3340	2550	13800	
Chromium	310,000	49.7	22.3	74.7	17.7	44.4	
Cobalt	12,000	7.5	5.6	10.9	4.8 J	7.2 J	
Copper	8,200	27.3	19.2	26.2	42.3	3690	
Iron	61,000	26300	17000	27200	17500	32800	
Magnesium	not applicable	4030	1760	3740	983	1300	
Manganese	4,100	285	226	305	141	579	
Nickel	4,100	17.8	10.3	30.9	24.8	30.4	
Potassium	N.A.	1280	951	936	561	1160	
Silver	1,000	N.D.	N.D.	N.D.	N.D.	0.33 J	
Sodium	not applicable	97.4 J	69.6 J	180	57.2 J	505	
Vanadium	1,400	61	34.7	61.3	25	35.5	
Zinc	61,000	80.7	140	64.5	243	803	
Total Cyanide (solid)	unknown	N.D.	N.D.	N.D.	N.D.	0.48 J	
Thallium TR	220	N.D.	N.D.	N.D.	N.D.	N.D.	
Arsenic TR	4	5.3	5	3.7	9.2	12.6	
Selenium TR	1,000	0.88 J	N.D.	N.D.	0.51 J	2.5	
Lead TR	1,000	71.2	154	30.2	90.3	1140	

URS = Uniform Risk-Based Standard (DNREC, 1999)

ft bg = feet below grade

N.D. = Not Detected

**Highlight** = Value exceeds URS -restricted use

lab dataSoil - TAL

**Table 3 (Page 1 of 2)**  
**Summary of Target Compound List Detections**  
**Ground Water (ug/l)**  
**September 2001**

Tetra Tech, Inc.  
524 A - B S. Walnut St.  
RI Report  
December 2001

Location:	DP1	DP11	DP2	DP3	DP4	DP5	DP6
Date:	9/13/2001	9/13/2001	9/13/2001	9/13/2001	9/13/2001	9/7/2001	9/6/2001
Time:	1335	1400	1140	1012	900	1010	1610
Compound	URS	(Dup of DP1)			MS/MSD		
<b>Volatile Organic Compounds</b>							
Acetone	61	13 J	11 J	N.D.	42	N.D.	16 J
Xylene (Total)	10,000/1,200	N.D.	N.D.	N.D.	3 J	N.D.	N.D.
<b>Semi-Volatile Organic Compounds</b>							
Acenaphthene	37	N.D.	N.D.	N.D.	1 J	42	1 J
anthracene	180	N.D.	N.D.	N.D.	N.D.	12	N.D.
benzo (a) anthracene	0.09	N.D.	N.D.	N.D.	N.D.	5 J	N.D.
benzo (b) fluoranthene	0.09	N.D.	N.D.	N.D.	N.D.	5 J	N.D.
benzo (k) fluoranthene	0.09	N.D.	N.D.	N.D.	N.D.	2 J	N.D.
benzo (a) pyrene	0.2/0.01	N.D.	N.D.	N.D.	N.D.	4 J	N.D.
benzo (g,h,i) perylene	unknown	N.D.	N.D.	N.D.	N.D.	3 J	N.D.
bis (2-ethylhexyl) phthalate	6/5	N.D.	N.D.	N.D.	4 J	N.D.	N.D.
carbazole	3	N.D.	N.D.	N.D.	N.D.	12	N.D.
chrysene	9	N.D.	N.D.	N.D.	N.D.	7 J	N.D.
dibenzofuran	2	N.D.	N.D.	N.D.	N.D.	6 J	N.D.
Fluoranthene	150	N.D.	2 J	1 J	2 J	18	N.D.
Flourene	24	N.D.	N.D.	N.D.	N.D.	32	N.D.
indeno (1,2,3-cd) pyrene	0.09	N.D.	N.D.	N.D.	N.D.	3 J	N.D.
2-Methylnaphthalene	unknown	N.D.	N.D.	N.D.	N.D.	1 J	N.D.
Naphthalene	20/0.7	N.D.	N.D.	N.D.	N.D.	5 J	N.D.
Phenanthrene	120	2 J	2 J	N.D.	2 J	44	N.D.
Pyrene	18	N.D.	2 J	1 J	2 J	13	N.D.
<b>Pesticides/PCB's</b>							
Aldrin	0.004	N.D.	N.D.	0.096 J	N.D.	N.D.	N.D.
Alpha Chlordane	2/0.2	N.D.	N.D.	N.D.	0.044 J	N.D.	N.D.
Gama Chlordane	2/0.2	N.D.	0.088 J	N.D.	0.098 J	N.D.	N.D.
DDE	0.2	N.D.	N.D.	N.D.	N.D.	N.D.	0.12
DDD	0.3	N.D.	N.D.	N.D.	N.D.	N.D.	0.18
DDT	0.2	N.D.	N.D.	N.D.	N.D.	N.D.	0.38
Diieldrin	0.004	N.D.	N.D.	0.6	N.D.	N.D.	N.D.

URS = Uniform Risk Based Standard (DNREC, 1999)

N.D. = Not Detected

**HIGHLIGHT** = Value above URS

**Table 3 (Page 2 of 2)**  
**Summary of Target Compound List Detections**  
**Ground Water (ug/l)**  
**September 2001**

Tetra Tech, Inc.  
 524 A - B S. Walnut St.  
 RI Report  
 December 2001

	Location:	DP7	DP8	DP9	DP10
	Date:	9/6/2001	9/6/2001	9/6/2001	9/6/2001
	Time:	1500	1400	1226	1127
Compound	URS				
<b>Volatile Organic Compounds</b>					
Acetone	61	N.D.	N.D.	N.D.	N.D.
Xylene (Total)	10,000/1,200	N.D.	N.D.	N.D.	N.D.
<b>Semi-Volatile Organic Compounds</b>					
Acenaphthene	37	N.D.	N.D.	N.D.	N.D.
anthracene	180	N.D.	N.D.	N.D.	N.D.
benzo (a) anthracene	0.09	N.D.	N.D.	N.D.	N.D.
benzo (b) fluoranthene	0.09	N.D.	N.D.	N.D.	N.D.
benzo (k) fluoranthene	0.09	N.D.	N.D.	N.D.	N.D.
benzo (a) pyrene	0.2/0.01	N.D.	N.D.	N.D.	N.D.
benzo (g,h,l) perylene	unknown	N.D.	N.D.	N.D.	N.D.
bis (2-ethylhexyl) phthalate	6/5	N.D.	N.D.	N.D.	N.D.
carbazole	3	N.D.	N.D.	N.D.	N.D.
chrysene	9	N.D.	N.D.	N.D.	N.D.
dibenzofuran	2	N.D.	N.D.	N.D.	N.D.
Fluoranthene	150	N.D.	N.D.	N.D.	N.D.
Flourene	24	N.D.	N.D.	N.D.	N.D.
indeno (1,2,3-cd) pyrene	0.09	N.D.	N.D.	N.D.	N.D.
2-Methylnapthalene	unknown	N.D.	N.D.	N.D.	N.D.
Naphthalene	20/0.7	N.D.	N.D.	N.D.	N.D.
Phenanthrene	120	N.D.	N.D.	N.D.	N.D.
Pyrene	18	N.D.	N.D.	N.D.	N.D.
<b>Pesticides/PCB's</b>					
Aldrin	0.004	N.D.	N.D.	N.D.	N.D.
Alpha Chlordane	2/0.2	N.D.	N.D.	N.D.	N.D.
Gamma Chlordane	2/0.2	N.D.	N.D.	N.D.	N.D.
DDE	0.2	N.D.	N.D.	N.D.	N.D.
DDD	0.3	N.D.	N.D.	N.D.	N.D.
DDT	0.2	N.D.	N.D.	N.D.	N.D.
Dieldrin	0.004	N.D.	N.D.	N.D.	N.D.

URS = Uniform Risk Based Standard (DNREC, 1999)

N.D. = Not Detected

**HIGHLIGHT** = Value above URS

**Table 4 (Page 1 of 3)**  
**Concentrations of Metals in Ground Water (mg/l)**  
**September 2001**

Tetra Tech, Inc.  
 524 A - B S. Walnut St.  
 RI Report  
 December 2001

Location:		DP1	DP1	DP11	DP11	DP2	DP2	DP3	DP3
Date:		9/13/2001	9/13/2001	9/13/2001	9/13/2001	9/13/2001	9/13/2001	9/13/2001	9/13/2001
Time:		1335	1335	1400	1400	1140	1140	1012	1012
QA/QC:				Dup of DP1	Dup of DP1				
Analyte	URS		Dissolved		Dissolved		Dissolved		Dissolved
Mercury	0.002/0.0004	0.00021	N.D.	0.0002 J	N.D.	0.0015	N.D.	0.00038	0.000064 J
Aluminum	0.2	17.1	N.D.	14.4	N.D.	12.4	N.D.	22.3	<b>0.742</b>
Antimony	0.006	0.0108 J	N.D.	0.0061 J	N.D.	0.0511 J	N.D.	0.0066 J	N.D.
Barium	2/0.26	0.895	<b>0.499</b>	0.877	<b>0.491</b>	4.09	<b>2.59</b>	0.429	0.148
Beryllium	0.004	0.0013 J	N.D.	0.0013 J	N.D.	0.00079 J	N.D.	0.0011 J	N.D.
Cadmium	0.005	0.0084 J	N.D.	0.0082 J	N.D.	0.0313	N.D.	0.00084 J	N.D.
Calcium	NA	94.3	86.9	94.6	86	108	83.1	97.9	61.2
Chromium	0.1 (III)	0.0443	N.D.	0.0394	N.D.	0.11	N.D.	0.0926	N.D.
Cobalt	0.22	0.0141 J	N.D.	0.0128 J	N.D.	0.024 J	N.D.	0.0164 J	N.D.
Copper	1.3	0.172	N.D.	0.162	N.D.	1.23	N.D.	0.123	N.D.
Iron	0.3	44	<b>6.63</b>	40	<b>6.51</b>	143	<b>12.1</b>	45.1	0.286
Manganese	NA	15.8	13.8	15.7	13.7	68.5	64	13.2	18.1
Manganese	0.05	1.11	<b>0.848</b>	1.1	<b>0.843</b>	0.981	<b>0.0876</b>	0.47	0.0263
Nickel	0.1	0.0336 J	N.D.	0.0302 J	N.D.	0.127	0.003 J	0.0482 J	0.0108 J
Potassium	NA	21.8	19.4	22.1	19.1	26.4	24.2	25	23.6
Silver	0.1	N.D.	N.D.	N.D.	N.D.	0.0026 J	N.D.	0.0015 J	N.D.
Sodium	NA	135	129	133	125	41	37.6	73.8	74.4
Vanadium	0.026	0.078	N.D.	0.0707	N.D.	0.0952	N.D.	0.0941	0.0189 J
Zinc	2	0.959	0.0157 J	0.908	N.D.	7.43	0.0202 J	0.505	N.D.
Thallium TR	0.002	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Arsenic TR	0.05/0.005	0.133	<b>0.0834</b>	0.118	<b>0.0882</b>	0.0245	N.D.	0.0259	<b>0.0057 J</b>
Selenium TR	0.05	0.0051 J	N.D.	N.D.	N.D.	0.0052 J	N.D.	N.D.	N.D.
Lead TR	0.015	0.842	N.D.	0.802	N.D.	4.74	N.D.	1.07	N.D.
Total Cyanide	unknown	N.D.	N.A.	N.D.	N.A.	0.0095	N.A.	0.338	N.A.

URS = Uniform Risk Based Standard (DNREC, 1999)

N.D. = Not Detected

N.A. = Not Analyzed

**HIGHLIGHT** = Value above URS

**Table 4 (Page 2 of 3)**  
**Concentrations of Metals in Ground Water (mg/l)**  
**September 2001**

Tetra Tech, Inc.  
 524 A - B S. Walnut St.  
 RI Report  
 December 2001

Location:		DP4	DP4	DP5	DP6	DP6	DP7	DP7
Date:		9/13/2001	9/13/2001	9/7/2001	9/6/2001	9/6/2001	9/6/2001	9/6/2001
Time:		900	900	1010	1610	1610	1500	1500
QA/QC:		MS/MSD						
Analyte	URS		Dissolved			Dissolved		Dissolved
Mercury	0.002/0.0004	0.00022	N.D.	Not Analyzed	0.00022	N.D.	0.00023	N.D.
Aluminum	0.2	1.66	N.D.		8.26	N.D.	6.98	N.D.
Antimony	0.006	N.D.	N.D.		0.0128 J	N.D.	0.0101 J	N.D.
Barium	2/0.26	0.86	<b>0.784</b>		1.08	<b>0.732</b>	1.37	<b>0.642</b>
Beryllium	0.004	N.D.	N.D.		N.D.	N.D.	0.0007 J	N.D.
Cadmium	0.005	0.0011 J	N.D.		0.001 J	N.D.	0.0017 J	N.D.
Calcium	NA	144	140		117	106	90.8	80
Chromium	0.1 (III)	0.04	N.D.		0.0296 J	N.D.	0.0198 J	N.D.
Cobalt	0.22	0.0022 J	N.D.		0.007 J	N.D.	0.0078 J	N.D.
Copper	1.3	0.0098 J	N.D.		0.128	N.D.	0.13	N.D.
Iron	0.3	13.2	<b>9.08</b>		73.8	<b>42.1</b>	30.9	<b>21.1</b>
Mangesium	NA	61.5	61.1		36.8	32.9	17.9	16.4
Manganese	0.05	0.464	<b>0.408</b>		0.76	<b>0.453</b>	0.439	<b>0.35</b>
Nickel	0.1	0.0541	N.D.		0.0157 J	0.0018 J	0.0166 J	N.D.
Potassium	NA	44.9	43.4		25.9	24.2	23.7	21.4
Silver	0.1	N.D.	N.D.		N.D.	N.D.	0.0013 J	N.D.
Sodium	NA	88	90.2		61.2	59.1	80.2	75.1
Vanadium	0.026	0.0066 J	N.D.		0.0452	N.D.	0.0326	N.D.
Zinc	2	0.292	N.D.		0.523	0.0046 J	0.731	0.0079 J
Thallium TR	0.002	N.D.	N.D.		N.D.	N.D.	N.D.	N.D.
Arsenic TR	0.05/0.005	N.D.	0.0041 J		0.032	<b>0.0125</b>	0.0322	<b>0.0173</b>
Selenium TR	0.05	0.0046 J	0.0054 J		N.D.	N.D.	N.D.	N.D.
Lead TR	0.015	0.056	N.D.		0.619	N.D.	1.01	N.D.
Total Cyanide	unknown	0.039	N.A.	0.0062	N.A.	0.0069'	N.A.	

URS = Uniform Risk Based Standard  
 N.D. = Not Detected  
 N.A. = Not Analyzed  
**HIGHLIGHT** = Value above URS

**Table 4 (Page 3 of 3)**  
**Concentrations of Metals in Ground Water (mg/l)**  
**September 2001**

Tetra Tech, Inc.  
 524 A - B S. Walnut St.  
 RI Report  
 December 2001

Location:		DP8	DP8	DP9	DP9	DP10	DP10
Date:		9/6/2001	9/6/2001	9/6/2001	9/6/2001	9/6/2001	9/6/2001
Time:		1400	1400	1226	1226	1127	1127
QA/QC:							
Analyte	URS	Dissolved		Dissolved		Dissolved	
Mercury	0.002/0.0004	0.00025	N.D.	N.D.	N.D.	0.000033 J	0.000044 J
Aluminum	0.2	14.9	N.D.	3.65	N.D.	1.5	N.D.
Antimony	0.006	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Barium	2/0.26	1.33	<b>0.827</b>	0.58	<b>0.497</b>	1.09	<b>0.989</b>
Beryllium	0.004	0.00098 J	N.D.	N.D.	N.D.	N.D.	N.D.
Cadmium	0.005	0.005 J	N.D.	0.0014 J	N.D.	N.D.	N.D.
Calcium	NA	79.5	63.4	125	121	74.6	72.4
Chromium	0.1 (III)	0.198	N.D.	0.0063 J	N.D.	0.0049 J	N.D.
Cobalt	0.22	0.0136 J	N.D.	0.0034 J	N.D.	0.0018 J	N.D.
Copper	1.3	0.0938	N.D.	0.03	N.D.	0.0372	N.D.
Iron	0.3	47.5	<b>13.6</b>	18.5	<b>11.8</b>	35.1	<b>31.7</b>
Mangesium	NA	11.8	9.98	25.3	24.3	11.4	11.1
Manganese	0.05	1.3	<b>0.625</b>	1.41	<b>1.33</b>	0.39	<b>0.352</b>
Nickel	0.1	0.0435 J	N.D.	0.0035 J	N.D.	0.0052 J	N.D.
Potassium	NA	17.6	15.3	12	11.1	21.6	20.5
Silver	0.1	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Sodium	NA	70.8	67.8	35	33.2	74.6	70.4
Vanadium	0.026	0.0437	N.D.	0.0088 J	N.D.	0.0086 J	N.D.
Zinc	2	0.923	0.0049 J	0.413	0.042	0.222	0.0147 J
Thallium TR	0.002	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Arsenic TR	0.05/0.005	0.025	<b>0.0067 J</b>	0.0046 J	N.D.	N.D.	<b>0.0069 J</b>
Selenium TR	0.05	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Lead TR	0.015	0.794	N.D.	0.119	N.D.	0.214	N.D.
Total Cyanide	unknown	0.0074	N.A.	0.0063	N.A.	0.0074	N.A.

URS = Uniform Risk Based Standard  
 N.D. = Not Detected  
 N.A. = Not Analyzed  
**HIGHLIGHT** = Value above URS

- Placement of a GMZ and associated deed restriction at the site to prevent future use of the groundwater beneath the site without prior approval of DNREC.
- Development of an O&M Plan for the site to insure future maintenance of the pavement cap, building and the cover in the landscaped areas.

## 6.0 PUBLIC PARTICIPATION

The Department actively solicited public comments or suggestions on the proposed plan and welcomed opportunities to answer questions. The public comment period for the proposed plan began on Monday, June 10, 2002, and concluded at the close of business Monday, July 1, 2002. No written comments or requests for a public hearing were received by DNREC.

## 7.0 DECLARATION

This final plan of remedial action for the 524 A & B South Walnut Street site is protective of human health, welfare and the environment and is consistent with the requirements of the Delaware Hazardous Substance Cleanup Act.

  
\_\_\_\_\_  
John Blevins

Director, Division of Air and Waste Management

8/2/02  
\_\_\_\_\_  
Date

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