FINAL PLAN OF REMEDIAL ACTION

WEST STREET CONNECTOR EXTENSION

Road Box and Associated Construction

Wilmington Riverfront Transportation Improvements

Wilmington, Delaware

DNREC Project No. DE-1157

November 2002

Department of Natural Resources and Environmental Control
Division of Air and Waste Management
Site Investigation and Restoration Branch
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1.0 INTRODUCTION

In response to requests from the State of Delaware, the City of Wilmington, and the business community, the Delaware Department of Transportation (DelDOT) plans to construct a second ingress/egress road in the Christina Riverfront area to supplement South Madison Street. The new road, called the West Street Connector Extension (site), will be constructed west of South Madison Street to improve traffic flow into and out of the Stadium, Shipyard Shops and Riverfront Arts Center area. In addition to the roadways, DelDOT will also create alternate transportation routes, including bicycling and walking paths along this corridor. These improvements will continue to facilitate the redevelopment of the Christina Riverfront area, which was historically a heavy industry area.

Because of its industrial past, the soil in the Christina Riverfront area has been impacted by a variety of industrial contaminants, including total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), lead and arsenic. In June 1999, DelDOT entered into a Voluntary Cleanup Program (VCP) Agreement with the Department of Natural Resources and Environmental Control, Site Investigation and Restoration Branch (DNREC) to perform a Remedial Investigation (RI) and a Feasibility Study (FS) at the site, pursuant to the Hazardous Substance Cleanup Act (HSCA), 7 Del. C. Chapter 91. DelDOT contracted WIK Associates, Inc. (WIK Associates) to perform the RI/FS of the site.

The purpose of the RI/FS was to:

1. Perform a RI to characterize the surface and subsurface soil within the project area using the same approach as on the previous West Street Connector Project (DE-1085).

2. Develop interim action and remedial action plans, if needed, to insure that the project is constructed in a manner that is protective of public health and the environment, and that is consistent with the 1998 Memorandum of Understanding (MOU) between DelDOT and DNREC.

3. Obtain a Certification of Completion of Remedy from DNREC for the roadway improvement project.

To accomplish these purposes, DelDOT performed soil borings, sampling and analysis along the planned road right-of-way to characterize the existing levels of contaminants from past industrial practices. The collection and analysis of these soil samples were performed in accordance with the Delaware Regulations Governing Hazardous Substance Cleanup (Regulations), Delaware Standard Operating Procedures for Chemical Analytical Programs (SOPCAP), DNREC guidance documents and other applicable DNREC policies and procedures. The analytical information collected by DelDOT was supplemented with data from previous soil investigations on other properties in and around the planned roadway.

This document is DNREC's final plan of remedial action (final plan) for the site. It is based on the results of the RI/FS and other previous investigations performed at the site. This final plan is issued under the provisions of the HSCA and the Regulations. It presents the Department's assessment of the potential health and environmental risks posed by the site.

This final plan addresses shallow and subsurface soil within the road box and concurrent construction activities. This final plan also addresses subsurface petroleum free product found at the site. It is the intent of this final plan to treat groundwater and any petroleum free product found at the site as a separate operable unit to eliminate concerns that the planned roadway may need to be removed after it is constructed to accommodate future remediation of petroleum free product and/or groundwater at the Site.

This final plan also discusses the two interim actions, which included the replacement of a section of the Shipley Run combined sewer overflow (CSO) systems, and the replacement and soil stabilization of a section of the Clements Run CSO system. Further plans for remediation of contaminated groundwater and petroleum free product at this site will be discussed in the proposed plan for the Wilmington Coal Gas North site pending conclusion of the remedial investigation currently being performed at that site by Conectiv.

The final plan is based on the following documents prepared by WIK Associates on behalf of DelDOT:

- Remedial Investigation Report (August 1999)
- Focused Feasibility Study (September 1999)
- Supplemental Remedial Investigation Report (March 2000)
- Soil Risk Calculations Summary (May 2001)
- Pole Barn Relocation Soil Sampling (May 2001)
- Additional Soil Risk Calculations (June 2001)
- Summary of Shipley Run and Clements Run CSO Reconstruction (February 2002)

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. The comment period has concluded, DNREC did not receive any comments and is now issuing this final plan. This final plan selects a remedy for the site. The RI/FS and other investigations of the site, the proposed plan, and the final plan will constitute the Remedial Decision Record for the site.

Section 2.0 presents a summary of the project description and site history. Section 3.0 provides a description of previous investigations of the site. Section 4.0 presents a discussion of the remedial action objectives. Section 5.0 presents the final plan of remedial action. Section 6.0 discusses public participation requirements. Section 7.0 is the Declaration portion of the final plan.

2.0 PROJECT DESCRIPTION AND SITE HISTORY

2.1 Project Description

The site improvements are located west of the Christina River in South Wilmington, Delaware (Figure 1). The improvements include construction of a new two-lane roadway extending 400 meters (1/4 mile) from the intersection of West Street (the Connector) and South Madison Street to Beech Street, and a concrete sidewalk along the north side of Beech Street from South Madison Street, extending west, to tie into the existing sidewalk/road located immediately west of the Amtrak viaduct. A portion of the roadway will lie directly beneath the Interstate 95 (I-95) viaduct.

The overall extension project area consists of approximately 5 acres of land, comprising portions of tax parcels currently owned by the State of Delaware, Norfolk Southern Railroad, the City of Wilmington and Connectiv, formerly Delmarva Power and Light Company.

The roadway project has been designed and engineered to minimize the need for significant amounts of soil excavation. The preliminary design plans show that most of the roadway construction project involves building the road on top of existing grade or raising the grade with fill and constructing the road on top of the fill. There are two existing buildings that will be demolished to make way for the road. Both buildings, a pole barn and a vehicle maintenance building, are owned and used by Connectiv.

Minor soil excavation will occur during road construction including trenches to install and/or relocate utilities and storm water lines associated with the road extension project. There are two areas of this project where soil excavations have already been completed as interim actions. These areas are the City of Wilmington's Shipley Run and Clements Run CSOs. Structural support for the CSO pipes was necessary prior to building the road above them. From June 2001 to January 2002, DelDOT's contractor worked to reconstruct a section of the Shipley Run and Clements Run CSOs. Using this approach, soil was excavated around each of the CSO sewer lines to a depth of approximately 13 feet below ground surface. Minimal excavation was required at the CSOs. Construction dewatering was performed during these activities and all discharges were to the sanitary sewer in accordance with the City of Wilmington's discharge permit. The completion of this work was summarized in a letter from WIK Associates dated February 1, 2002.

Figure 1 shows the project area, including the road extension right-of-way, the Shipley and Clements Run CSO reconstruction areas, and the location of the replacement pole barn.

2.2 Site History

Based on a review of historical directories, maps, existing environmental reports and interviews, several possible sources of historic contamination were identified on the subject property and in the immediate vicinity of the Site. The planned road improvements are located on properties that were historically the Wilmington Coal Gas Company's fueling areas and railroads.

The area in and around the planned transportation improvements was the site of ship building and other heavy industrial activities since the 1800s. Much of the area was reclaimed from marshland by filling with slag and other industrial waste products. Previous environmental investigations identified the former usage of surrounding properties as tanneries, heavy industry (shipyards, railcar builders, and machine companies), a manufactured gas plant, and a municipal garbage disposal yard/incinerator. The potential contaminants of concern associated with these industries include metals (from tanneries and heavy industry), petroleum hydrocarbons including PAHs (from coal gas operations and tanneries), and PCBs (from railroads and electrical equipment).

3.0 INVESTIGATION RESULTS

WIK Associates performed a RI on behalf of DelDOT in May 1999, in order to characterize the extension project area. Twelve soil borings were drilled and 21 soil samples were collected for laboratory screening analysis for TPH, BTEX, PAHs, RCRA Metals and PCBs by Mitkem Corporation in Warwick, RI. Based on laboratory field screening, 20% of the samples (five samples) were selected for HSCA analysis at STL Envirotech in Edison, NJ for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide. Analytical data from previous soil samples on adjacent properties were also evaluated to supplement the RI samples. All HSCA analytical data was evaluated and validated in accordance with the HSCA SOPCAP.

During the May 1999 RI, the compounds in soils that exceeded the DNREC Uniform Risk-Based Standard (URS) values (DNREC-SIRB, February 1998) for restricted use in a non-critical water resource area were benzo(a)pyrene in four of the five samples, excluding only EX10-S003. The highest concentration was found in sample EX08-S002 at a concentration of approximately 60 milligrams per kilogram (mg/kg). The remaining three samples contained benzo(a)pyrene concentrations of 1 mg/kg, 2 mg/kg, and 6.9 mg/kg. The corresponding URS for benzo(a)pyrene is 0.8 mg/kg. Benzo(a)anthracene was present at a concentration of 94 mg/kg in EX08-S002. The URS value is 8 mg/kg. Samples EX08-S002 and EX05-S001 contained concentrations of benzo(b)fluoranthene that exceeded the URS of 8 mg/kg. The concentrations in the samples were: 48 mg/kg and 25 mg/kg respectively. Indeno(1,2,3-cd)pyrene was found to exceed the corresponding URS in one sample. The concentration was 15 mg/kg, as compared to the URS of 8 mg/kg. Dibenz(a,h)anthracene was also found in EX05-S001 at a concentration of 2.5 mg/kg, (URS of 0.8 mg/kg). These results are summarized in the attached tables. DelDOT's environmental consultant used the soil results to assign soil re-use and disposal categories so that the transportation design engineers could calculate how much of the excavated soil could be reused, how much needed to be disposed off-site, and how much imported fill was necessary for the road construction project.

As shown in Table 2 from the RI report, free product/oily soil was noted in borings EX05 and EX08 from the RI, in test pit TP-11 from the DNREC Brownfield Preliminary Assessment II for the Wilmington Public Works Yard (June 1997), and in boring GP501 of the West Street Connector project (September 1998).

In May 2001, DelDOT's environmental consultant compared the soil contaminant concentrations on the road extension right-of-way to current restricted use (i.e., commercial or industrial use) URS values and evaluated the cumulative risk associated with the soil at the site using the "DNREC-SIRB Site-Specific Calculator" (May 2000 Version) for both the saturated and unsaturated zones. The calculated cumulative cancer risk associated with the soil samples collected above and below the groundwater table was 2.70E-05 and the Hazard Index was 0.13, which exceeds the DNREC risk guideline of 1×10^{-5} (DNREC-SIRB, 1996).

At the request of DNREC, DelDOT's environmental consultant performed additional risk calculations for the unsaturated soil screening data collected during the West Street Extension RI. This analysis showed that using the maximum detections, the calculated cancer risk would be 2.28E-05 and Hazard Index would be 0.19 and using the 95% upper confidence level (UCL), the calculated cancer risk would be 1.12E-05 and a Hazard Index of 0.06. Arsenic and PAHs were the individual compounds that contributed to the elevated risk. These calculations are detailed in the June 5, 2001 letter, Additional Soil Risk Calculation. Additional calculations

were performed for data both above and below the groundwater table (unsaturated and saturated soil).

The HSCA risk assessment comparison demonstrated that, with the exception of EX08-S002 (a sample collected below the groundwater table in an area of free product), the cumulative risk associated with the soil samples collected above and below the groundwater table on the West Street Extension road right-of-way is 2.70E-05 and the Hazard Index is 0.13, which exceeds the DNREC's risk guideline of $1x10^{-5}$ (DNREC-SIRB, 1996). Based on the risk assessment, the soil does pose an unacceptable risk to the human health and the environment for restricted use. As described above, remedial alternatives for the saturated zone will be evaluated in the proposed plan for the Wilmington Coal Gas North Site.

4.0 REMEDIAL ACTION OBJECTIVES

Remedial action objectives have been established in accordance with HSCA Regulation 8.4(1), based on the following factors:

- The Site is currently zoned as commercial and industrial land; most of it is vacant; a portion of the extension right-of-way crosses Conectiv's maintenance yard, including two existing buildings.
- The future site use is expected to be paved roadway, commercial and open space.
- The site is within 1,000 - 1,500 feet of the Christina River.
- Surrounding land uses are mixed, including manufacturing, commercial and residential.
- Soil at the site has been impacted by various chemical constituents. Based on the RI and supporting risk calculations, free-phase petroleum hydrocarbons, PAHs, and arsenic are the primary contaminants of concern.
- The primary exposure pathways are inhalation; direct contact with, and incidental ingestion of, impacted soil, erosional transport to the Christina River, and dewatered groundwater.
- The major risk associated with the site is potential human contact with impacted soil.

Qualitative Remedial Objectives

Based on the above factors, the following qualitative remedial action objectives were developed:

- Prevent potential human contact (dermal and ingestion) with contaminated soil and any groundwater.
- Prevent potential contaminated soil erosion to the Christina River.
- Remove, and properly dispose off-site, any excavated soil that may be generated during road construction or CSO replacement that contains free-phase petroleum (including soil containing oil or an oily sheen).

Quantitative Remedial Objectives

Based on the above qualitative remedial action objectives, the following quantitative remedial action objectives were developed:

- Prevent human contact with soil contaminants exceeding $1X10^{-5}$ risk and hazard index of 1.0.

- Ensure that future site users, such as future employees, construction workers and visitors are not exposed to petroleum free product and groundwater contamination above the DNREC-SIRB's risk guideline of 1E-05.

The remedial actions are based upon the Remedial Action Objectives and the 1998 MOU between DNREC and DelDOT.

5.0 FINAL PLAN OF REMEDIAL ACTION

Based on DNREC's evaluation of the site information and the above remedial action objectives, the recommended remedial action for the soils and groundwater will include the following:

- Removal and selective re-use of excavated materials and capping low-permeability surface as detailed in the construction plans for the road bed development and associated road and sidewalks. Excavated material must be managed pursuant to the "SIRB Presumptive Soil Reuse Guidelines" as outlined in Table 1.

- The placement of an institutional control (i.e., DNREC-approved deed restriction) which will restrict the Site to commercial and industrial use and prohibit any land disturbing activities under the road box without the prior written approval of DNREC.

- The site is currently in a Groundwater Management Zone (GMZ) that encompasses the City of Wilmington. Therefore, well installation and the future use, of groundwater beneath the site is already restricted, which shall be included in the deed restriction.

The petroleum-free product in soils, non-aqueous layers of petroleum in the subsurface, coal tar wastes, and contaminated groundwater found at the West Street Connector Extension site, will be addressed by means other than excavation by the respective property owners. The details of how these releases will be addressed will be described in a separate, but related proposed plan for the Wilmington Coal Gas North (WCGN) property. A remedial investigation is currently being conducted at the WCGN site, which will lead to the preparation and advertisement of a Proposed Plan for the WCGN site.

This decision is based on the following criteria, which include:

- Protection of public health, welfare, and the environment;
- Compliance with all applicable local, state and federal laws;
- Technical practicability; and
- Long and short-term effectiveness.

6.0 PUBLIC PARTICIPATION

The Department actively solicited public comments or suggestions on the proposed plan of remedial action. The public comment period ended on October 7, 2002. No comments were received during the public comment period.

7.0 DECLARATION

This final plan of remedial action for the West Street Connector 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

11/21/02
Date

Director, Division of Air and Waste Management

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Table 1: SIRB Presumptive Soil Re-Use Guidelines

SIRB PRESUMPTIVE SOIL RE-USE GUIDELINES
(Other alternatives may be considered per HSCA regulations and guidance)

Soil Category	A	B	Z
Contaminant of Concern	*Unlimited contractor re-use with areas assuming the URS value used is appropriate for the land use of the area where the soil will be applied.*	*Limited re-use under either a soil or impervious cap depending on site-specific conditions and future land use.*	*Off-site Treatment and Disposal*
Carcinogenic Chemical that has a URS based on an RBC	Below URS concentration for each chemical detected, or Below default and site specific background values for each chemical as described in SIRB's Remediation Standards Guidance Document (December 1999), and/or Cumulative risk below 1×10^{-5}	Above a 1×10^{-5} cumulative risk level but below a 1×10^{-4} cumulative risk level	Above a 1×10^{-4} cumulative risk level.
Non -carcinogenic Chemical that has URS listed as a RBM	Below URS values for each chemical Below default and site specific background for inorganic compounds	Hazard Index greater than 1 for each chemical	Above a Hazard Index of 10 for any specific chemical
Petroleum Hydrocarbons	Below URS values	Above URS values	Presence of free product, oily soil or coal tar
Chemicals listed with MAX as their URS value	Below URS values	Above URS values	Above a 1×10^{-4} cumulative risk level if a carcinogen Above a Hazard Index of 10 in a non-carcinogen
PCBs	Below 1 ppm	Between 1-3 ppm	Above a 3 ppm
Lead	Below 1,000 ppm for restricted use OR 400 ppm for unrestricted use	Between 1,000-2,000 ppm Stabilization may be also required.	Greater than 2,000 ppm

URS Refers to the Uniform Risk Based Standard found in Remediation Standards Guidance Under the Delaware Hazardous Substance Cleanup Act (December 1999).
RBC Refers to EPA's Risk Based Concentration Table found at http://www.epa.gov/reg3hwmd/risk/riskmenu.htm.
MAX Maximum ceiling value is 1,000 mg/kg for unrestricted use and 5,000 mg/kg for restricted use as described in the remediation standards document.
PCBs Polychlorinated biphenyls
PPM Parts per million
RBM Modified RBC value equal to a Hazard Index of 1.0

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Table 2: West Street Extension, Screening Data-Unsaturated Soil (Maximum Concentration)

TABLE 2
West Street Extension, Screening Data-Unsaturated Soil
(Maximum Concentration)

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DNREC SITE-SPECIFIC STANDARD CALCULATOR FOR MULTIPLE ANALYTES May, 2000 Version

Site Concentrations Table

Contaminant Name	CAS Number	Ground Water Concentration ug/L	Soil Concentration (Restricted Use) mg/kg	Soil Concentration (Unrestricted Use) mg/kg	Calculated Cancer Risk: Ground Water Ingestion Cancer Risk	Calculated Cancer Risk: Soil-Related Cancer Risk (Restricted Use)	Calculated Cancer Risk: Soil-Related Cancer Risk (Unrestricted Use)	Calculated Noncancer Risk: Ground Water Ingestion Noncancer Risk	Calculated Noncancer Risk: Soil-Related Noncancer Risk (Restricted Use)	Calculated Noncancer Risk: Soil-Related Noncancer Risk (Unrestricted Use)
					Totals By Category			Totals By Category		
					0.00E+00	2.28E-05	0.00E+00	0.00	0.19	0.00
					Maximum in Each Category			Maximum in Each Category		
					0.00E+00	9.95E-06	0.00E+00	0.00	0.11	0.00
METALS										
ARSENIC	7440382		35.000			9.17E-06				
BARIUM	7440393		700.000						0.00	
**CHROMIUM VI	18540299		660.000						0.11	
SELENIUM	7782492		10.000						0.00	
SILVER	7440224		3.000						0.00	
VOLATILE COMPOUNDS										
BENZENE	71432		4.900			2.48E-08				
ETHYLBENZENE	100414		4.900						0.00	
TOLUENE	108883		15.000						0.00	
XYLENES	1330207		29.800						0.00	
POLYNUCLEAR AROMATIC HYDROCARBONS										
**ACENAPHTHENE	83329		14.000						0.00	
**ANTHRACENE	120127		8.700						0.00	
**FLUORENE	86737		12.000						0.00	
**NAPHTHALENE	91203		3000.000						0.07	
**PYRENE	129000		26.000						0.00	
2-METHYLNAPHTHALENE	91576		8.600						0.00	
BENZ[A]ANTHRACENE	56553		7.900			1.01E-06				
BENZO[A]PYRENE	50328		7.800			9.95E-06				
BENZO[B]FLUORANTHENE	205992		7.400			9.44E-07				
BENZO[K]FLUORANTHENE	207089		7.900			1.01E-07				
CHRYSENE	218019		9.000			1.15E-08				
DIBENZ[A,H]ANTHRACENE	53703		0.860			1.10E-06				
FLUORANTHENE	206440		14.000						0.00	
INDENO[1,2,3-C,D]PYRENE	193395		3.100			3.95E-07				
POLYCHLORINATED BIPHENYLS										
AROCLOR-1260	11096825		0.140			4.89E-08				

Site Specific Data Entered 5/31/01

Table 3: West Street Extension, Screening Data-Unsaturated Soil (95% UCL)

TABLE 3
West Street Extension, Screening Data-Unsaturated Soil
(95%UCL)

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DNREC SITE-SPECIFIC STANDARD CALCULATOR FOR MULTIPLE ANALYTES May, 2000 Version

Site Concentrations Table

Contaminant Name	CAS Number	Ground Water Concentration ug/L	Soil Concentration (Restricted Use) mg/kg	Soil Concentration (Unrestricted Use) mg/kg	Calculated Cancer Risk: Ground Water Ingestion Cancer Risk	Calculated Cancer Risk: Soil-Related Cancer Risk (Restricted Use)	Calculated Cancer Risk: Soil-Related Cancer Risk (Unrestricted Use)	Calculated Noncancer Risk: Ground Water Ingestion Noncancer Risk	Calculated Noncancer Risk: Soil-Related Noncancer Risk (Restricted Use)	Calculated Noncancer Risk: Soil-Related Noncancer Risk (Unrestricted Use)
					Totals By Category			Totals By Category		
					0.00E+00	1.12E-05	0.00E+00	0.00	0.06	0.00
					Maximum In Each Category			Maximum in Each Category		
					0.00E+00	5.18E-06	0.00E+00	0.00	0.03	0.00
METALS										
ARSENIC	7440382		19.780			5.18E-06				
BARIUM	7440393		301.040						0.00	
**CHROMIUM VI	18540299		204.680						0.03	
SELENIUM	7782492		6.770						0.00	
SILVER	7440224		3.000						0.00	
VOLATILE COMPOUNDS										
BENZENE	71432		1.640			8.31E-09				
ETHYLBENZENE	100414		1.640						0.00	
TOLUENE	108883		4.700						0.00	
XYLENES	1330207		9.440						0.00	
POLYNUCLEAR AROMATIC HYDROCARBONS										
**ACENAPHTHENE	83329		5.510						0.00	
**ANTHRACENE	120127		2.930						0.00	
**FLUORENE	86737		4.130						0.00	
**NAPHTHALENE	91203		748.300						0.02	
**PYRENE	129000		9.440						0.00	
2-METHYLNAPHTHALENE	91576		3.500						0.00	
BENZ[A]ANTHRACENE	56553		3.330			4.25E-07				
BENZO[A]PYRENE	50328		3.150			4.02E-06				
BENZO[B]FLUORANTHENE	205992		3.830			4.89E-07				
BENZO[K]FLUORANTHENE	207089		2.550			3.25E-08				
CHRYSENE	218019		3.630			4.63E-09				
DIBENZ[A,H]ANTHRACENE	53703		0.650			8.29E-07				
FLUORANTHENE	206440		5.880						0.00	
INDENO[1,2,3-C,D]PYRENE	193395		1.500			1.91E-07				
POLYCHLORINATED BIPHENYLS										
AROCLOR-1260	11096825		0.120			4.19E-08				

Table 4: West Street Extension, All HSCA Data except EX08-S002 (Maximum)

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TABLE 4
West Street Extension, All HSCA Data except EX08-S002 (Maximum)

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DNREC SITE-SPECIFIC STANDARD CALCULATOR FOR MULTIPLE ANALYTES May, 2000 Version

Site Concentrations Table

Contaminant Name	CAS Number	Ground Water Concentration ug/L	Soil Concentration (Restricted Use) mg/kg	Soil Concentration (Unrestricted Use) mg/kg	Calculated Cancer Risk: Ground Water Ingestion Cancer Risk	Calculated Cancer Risk: Soil-Related Cancer Risk (Restricted Use)	Calculated Cancer Risk: Soil-Related Cancer Risk (Unrestricted Use)	Calculated Noncancer Risk: Ground Water Ingestion Noncancer Risk	Calculated Noncancer Risk: Soil-Related Noncancer Risk (Restricted Use)	Calculated Noncancer Risk: Soil-Related Noncancer Risk (Unrestricted Use)
					Totals By Category 0.00E+00	2.70E-05	0.00E+00	Totals By Category 0.00	0.13	0.00
					Maximum in Each Category 0.00E+00	1.01E-05	0.00E+00	Maximum in Each Category 0.00	0.06	0.00
METALS										
ALUMINUM	7429905		14700.000						0.01	
ANTIMONY	7440360		1.900						0.00	
ARSENIC	7440382		38.600			1.01E-05				
BARIUM	7440393		160.000						0.00	
BERYLLIUM	7440417		0.750						0.00	
**CHROMIUM VI	18540299		105.000						0.02	
COBALT	7440484		13.900						0.00	
COPPER	7440508		83.600						0.00	
IRON	7439896		39700.000						0.06	
MANGANESE	7439965		281.000						0.00	
NICKEL	7440020		16.800						0.00	
SELENIUM	7782492		2.700						0.00	
THALLIUM	7440280		1.300						0.01	
VANADIUM	7440622		45.500						0.00	
ZINC	7440666		447.000						0.00	
CYANIDES										
CYANIDE (FREE)	57125		207.000						0.01	
VOLATILE COMPOUNDS										
**CHLOROBENZENE	108907		0.910						0.00	
BENZENE	71432		1.000			5.07E-09				
ETHYLBENZENE	100414		24.000						0.00	
STYRENE	100425		0.870						0.00	
TOLUENE	108883		1.300						0.00	
XYLENES	1330207		38.000						0.00	
POLYNUCLEAR AROMATIC HYDROCARBONS										
**ACENAPHTHENE	83329		3.500						0.00	
**ANTHRACENE	120127		3.000						0.00	
**FLUORENE	86737		2.200						0.00	
**NAPHTHALENE	91203		67.000						0.00	
**PYRENE	129000		8.300						0.00	

Site Specific Data Entered 5/21/01

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TABLE 4
West Street Extension, All HSCA Data except EX08-S002 (Maximum)

Contaminant Name	CAS Number	Ground Water Concentration ug/L	Soil Concentration (Restricted Use) mg/kg	Soil Concentration (Unrestricted Use) mg/kg	Ground Water Ingestion Cancer Risk	Soil-Related Cancer Risk (Restricted Use)	Soil-Related Cancer Risk (Unrestricted Use)	Ground Water Ingestion Noncancer Risk	Soil-Related Noncancer Risk (Restricted Use)	Soil-Related Noncancer Risk (Unrestricted Use)
2-METHYLNAPHTHALENE	91576		10.000						0.00	
BENZ[A]ANTHRACENE	56553		5.000			6.38E-07				
BENZO[A]PYRENE	50328		6.900			8.80E-06				
BENZO[B]FLUORANTHENE	205992		25.000			3.19E-06				
BENZO[K]FLUORANTHENE	207089		10.000			1.28E-07				
CHRYSENE	218019		5.900			7.53E-09				
DIBENZ[A,H]ANTHRACENE	53703		2.500			3.19E-06				
FLUORANTHENE	206440		10.000						0.00	
INDENO[1,2,3-C,D]PYRENE	193395		6.800			8.67E-07				
PESTICIDES										
**HEPTACHLOR	76448		0.010			7.47E-09				
DDD	72548		0.092			3.86E-09				
DDE	72559		0.092			5.47E-09				
DDT	50293		0.092			5.47E-09				
DIELDRIN	60571		0.029			8.11E-08				
METHOXYCHLOR	72435		0.036						0.00	
SEMIVOLITADE COMPOUNDS										
**1,2,4,5-TETRACHLOROBENZENE	95943									
2,4-DIMETHYLPHENOL	105679		580.000						0.01	
2-METHYLPHENOL	95487		4.500						0.00	
4-METHYLPHENOL	106445		4.500						0.00	
CARBAZOLE	86748		0.960			3.35E-09				
DIBENZOFURAN	132649		1.200						0.00	
PHENOL	108952		5.200						0.00	

Site Specific Data Entered 5/21/01

Table 5: Soil Analytical Data STL Envirotech - SVOCs West Street Connector Extension Remedial Investigation

TABLE 9

Soil Analytical Data STL Envirotech - SVOCs
West Street Connector Extension
Remedial Investigation
(mg/kg)

Sample ID	DNREC URS Restricted Use Industrial Soil Cleanup Levels (mg/kg)	EX05-S001	EX06-S001	EX07-S002	EX08-S002	EX10-S003
Sample Depth (ft)		[illegible]	6.0-9.0	8.0-10.0	13.7-16.0	14.0-16.0
Date Taken		5/25/99	5/25/99	5/25/99	5/25/99	5/25/99
SEMIVOLATILE COMPOUNDS (GC/MS)						
Phenol	5,000	5.2 U	0.052 J	0.035 J	130 UJ	0.39 U
2-Methylphenol	5,000	0.29 J	0.91 U	0.47 U	130 UJ	0.39 U
4-Methylphenol	5,000	0.82 J	0.066 J	0.032 J	130 UJ	0.39 U
2,4-Dimethylphenol	41,000	580 J	0.91 U	0.47 U	130 U	0.039 U
Naphthalene	5,000	4.2 J	2.1	1.2	1,800 J	0.39 U
2-Methylnaphthalene	nca	2.7 J	0.59 J	1.2	1,300 J	0.39 U
Acenaphthylene	nca	20	0.58 J	0.35 J	63 J	0.39 U
Acenaphthene	5,000	2.8 J	3.5	0.84	650 J	0.39 U
Dibenzofuran	820	0.59 J	0.18 J	0.13 J	34 J	0.39 U
Fluorene	5,000	2.1 J	1.2	0.92 J	290 J	0.39 U
Phenanthrene	5,000	4.5 J	2.1	2.9	730 J	0.0088 J
Anthracene	5,000	3 J	1	0.79	220 J	0.39 U
Carbazole*	290	0.57 J	0.91 U	0.059 J	13 J	0.39 U
Fluoranthene	5,000	7.1	3	2.4	200 J	0.39 U
Pyrene	5,000	8.3	3.3	2.6	290 J	0.39 U
Benzo(a)anthracene*	8	4.9	1.8	1	94 J	0.039 U
Chrysene*	780	5.9	2	1.2	110 J	0.39 U
Benzo(b)fluoranthene*	8	25	2.2	1.1	48 J	0.039 U
Benzo(k)fluoranthene*	78	10	0.85	0.38	17 J	0.039 U
Benzo(a)pyrene*	0.8	6.9	2	1	60 J	0.039 U
Indeno(1,2,3-cd)pyrene*	8	6.8	1.1	0.45	15 J	0.039 U
Dibenz(a,h)anthracene*	0.8	2.5	0.32	0.14	13 UJ	0.039 U
Benzo(g,h,i)perylene	nca	5.8	0.99	0.41 J	15 J	0.39 U
Total CaPAHs	nca	62.57	10.27	5.33	370	0
All other SVOCs were below laboratory detection limits						

Qualifiers

UJ- Reported result is an estimated value.

U - The compound was not detected at the indicated concentration.

J - Result is an estimated value.

* - Carcinogenic Polycyclic Aromatic Hydrocarbons (as noted in Attachment 3 of DNREC's Remediation Guidance Standards 2/98)

Bold - The compound exceeds the Restricted Use URS

Table 6: Soil Analytical Data from STL Envirotech - Metals and Cyanide West Street Connector Extension Remedial Investigation

TABLE 10

Soil Analytical Data from Envirotech - Metals and Cyanide
West Street Connector Extension
Remedial Investigation
(mg/kg)

Sample ID	[illegible]	[illegible]	EX06S001	EX07S002	EX08S002	EX10S003
Sample Depth (ft)	[illegible]	[illegible]	6.0-9.0	8.0-10.0	13.7-16.0	14.0-16.0
Sample Date		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
METALS						
Aluminum	20,000	1,140	11,900	14,700	14,300	3,640
Antimony	82	1.9 J	1.6 UJ	1.6 UJ	1.8 UJ	1.4 UJ
Arsenic	61	12.7	23.3	38.6	5.5	0.75 U
Barium	5,000	160	116	109	70.7	13.9 B
Beryllium	1	0.10	0.59	0.75	0.75	0.19
Cadmium	100	0.099 U	0.38	0.21	0.12 U	0.094 U
Calcium	nca	414 J	17,600 J	3,030 J	1,980 J	285 J
Chromium	5,000	16.7	72.6	105	35.7	7.0
Cobalt	5,000	2.8	9.4	13.9	7.6	2.1
Copper	5,000	50.5 J	83.6 J	55.6 J	10.4 J	2.2 J
Iron	23,000	15,100	**39,700**	**24,000**	17,100	4,650
Lead	1,000	930	238	144	13.4	3.2
Magnesium	nca	77.6 J	1,530 J	2,570 J	4,170 J	331 J
Manganese	4,700	37.6	281	178	216	21.8
Mercury	20	0.43 J	0.48 J	0.64 J	0.06 J	0.020 U
Nickel	4,100	7.9	16.8	15.7	18.1	3.4
Potassium	nca	207 J	878 J	642 J	1,460 J	222 J
Selenium	1,000	2.7	1.1 U	1.2	1.3 U	0.98 U
Silver	1,000	0.35 U	0.38 U	0.40 U	0.44 U	0.33 U
Sodium	nca	107 J	660 J	214 J	123 UJ	92.6 UJ
Thallium	220	1.2 U	1.3 U	1.3 U	1.5 U	1.1 U
Vanadium	1,400	16.0	38.0	45.5	34.4	11.9
Zinc	5,000	45.9	447	219	64.2	8.3
WET CHEMISTRY	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total Cyanide	4100	207	0.5 U	0.5 U	2.7	0.5 U

Qualifiers
- B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.
- U - The compound was not detected at the indicated concentration.
- J - Result is an estimated value.
- Bold - The compound exceeds the Restricted Use URS