PHASE II ENVIRONMENTAL ASSESSMENT
GEORGE AND LYNCH PROPERTY
426 WATER STREET
DOVER, DELAWARE

SEPTEMBER 2006

Prepared for:

State of Delaware
Department of Transportation
Dover, Delaware

Prepared by:

Tetra Tech, Inc.
56 West Main Street, Suite 400
Christiana, DE 19702

T13735.60

REPRESENTATIONS

This report was compiled based partially on information supplied to Tetra Tech from outside sources and other information that is in the public domain. The conclusions and recommendations herein are based solely on the information Tetra Tech obtained in compiling the report. Documentation for the statements made in the report is on file at Tetra Tech's Christiana, Delaware office. Tetra Tech makes no warranty as to the accuracy of statements made by others that may be contained in the report, nor are any other warranties or guarantees, expressed or implied, included or intended by the report except that it has been prepared in accordance with the current generally accepted practices and standards consistent with the level of care and skill exercised under similar circumstances by other professional consultants or firms performing the same or similar services. Because the facts forming the basis for the report are subject to professional interpretation, differing conclusions could be reached. Tetra Tech does not assume responsibility for the discovery and elimination of hazards that could possibly cause accidents, injuries or damage. Compliance with submitted recommendations or suggestions does not assure elimination of hazards or the fulfillment of clients' obligations under local, state or federal laws or any modifications or changes to such laws.

None of the work performed hereunder shall constitute or be represented as a legal opinion of any kind or nature, but shall be a representation of findings of fact from records examined.

Report prepared by:

Vadim Petrov
Environmental Scientist II

Report reviewed by:

Christopher Geiger, P.G.
Project Manager

INTRODUCTION

This report describes the procedures used and analytical results of a Phase II Environmental Investigation performed by Tetra Tech, Inc. at a George and Lynch property located at 426 Water Street in Dover, Delaware (Figure 1). The subject property consists of three different tax parcels, totaling approximately 3.35 acres in size and zoned commercial and residential. There used to be several buildings present on the property that were used for offices, equipment maintenance, and chemicals storage. Land use in the immediate vicinity of the site is a combination of residential and commercial. The goal of the Phase II Environmental Investigation was to determine if soils and groundwater at the site have been contaminated as a result of the historical commercial use of the property.

SAMPLING PROCEDURE

Tetra Tech subcontracted Vironex Environmental Services to provide a Geoprobe® direct-push drill rig for collecting subsurface soil and groundwater samples at the subject property. A total of 12 soil borings were drilled at the site on June 13, 2006. The boring locations were selected based on field observations and biased toward the areas of higher potential of being contaminated. Specifically, the borings were mostly concentrated along the perimeter of the former machine shop building and near the former aboveground storage tank (AST) locations. Other sample locations were also chosen in order to obtain data over the entire site. Sample locations are shown on Figure 2.

The borings were drilled to a depth of 8 to 16 feet based on visual field observations and boring location. The deeper borings were generally located near the former machine shop building. The water table was encountered at a depth of 12 to 15 feet below grade. A Tetra Tech scientist supervised the work. A photoionization detector (PID) calibrated to a 100 parts per million isobutylene standard was used to screen the split-spoon soil samples that were collected at each boring. Soil samples were collected at each boring using a decontaminated stainless steel Macro Core Sampler. The Macro Core Sampler uses a cutting shoe, drive head, and Teflon inner sample sleeve to collect 4-foot samples. The sampler was driven into the subsurface using the percussion of the Geoprobe® direct-push rig. The initial core sample was collected in the sleeve and sampler; it

was then extracted from the borehole, and the sleeve removed. Groundwater samples were collected with a peristaltic pump.

Seven subsurface soil samples and three groundwater samples were collected on site during the investigation and sent for laboratory analyses. The soil samples were collected from the intervals of elevated organic vapor concentrations detected with the PID. All the samples were submitted to Lancaster Laboratories (Lancaster, Pennsylvania) and analyzed for Priority Pollutant Volatiles, Priority Pollutant Semi-Volatiles, and Priority Pollutant Metals.

OBSERVATIONS

The typical soil column encountered in the borings at the site consisted of approximately 3 to 10 feet of orange-brown, grey to reddish brown silt underlain by 5 to 12 feet of fine to coarse sand. Soil samples collected at the property did not reveal major contamination or staining. A trace of petroleum odor was noted at location SB-4 at approximately 4 feet below grade. A PID measurement was recorded at 22 parts per million, the highest concentration noted during the investigation. The soils at the depths greater than 10 feet below grade appeared to be undisturbed and native. Soil boring logs are included in Appendix A.

ANALYTICAL RESULTS

Copies of the laboratory chain-of-custody and the analytical reports are included in Appendix B. The analytical results were compared to Uniform Risk-Based Standards (URS) established by the Delaware Department of Natural Resources and Environmental Control (DNREC) under the Hazardous Substance Cleanup Act (HSCA). Specifically, Tetra Tech compared the soil analytical data to the URS for protection of human health in a Non-Critical Water Resource Area, Unrestricted-Use screening concentrations and Restricted-Use screening concentrations.

The Unrestricted-Use setting is defined by DNREC in the Remediation Standards Guidance under the Delaware Hazardous Substance Cleanup Act as "any setting where current or future use will not be restricted in any way to ensure protection of human health and would typically include land-uses

where there is potential for more extensive soil ingestion, such as playgrounds, recreational areas, parks, etc."

The Restricted-Use setting is defined as "any setting where current or future land use will be restricted in some way (either through deed restriction, risk management, or engineering control measures) to ensure the protection of human health."

Groundwater samples were compared to URS concentrations established predominately for drinking water wells based on USEPA maximum contaminant levels, and other health advisory limits derived to reflect a carcinogenic human health risk of 1 in 1,000,000 and a non-carcinogenic health hazard index of 0.1.

Soil Analytical Results

Inorganic Compounds

The inorganic analytical data are summarized in Table 1. A number of inorganic analytes were detected at trace to low concentrations; however, only arsenic was detected at sample location SB-8 at a concentration that barely exceeded its URS concentration for an unrestricted-use setting. No other inorganic analytes were detected above their respective URS standards for an unrestricted-use or restricted-use settings.

Organic Compounds

The organic analytical data are summarized in Table 1. Seventeen organic compounds, mostly polynuclear aromatic hydrocarbons (PAHs), were detected at trace to low concentrations in the subsurface soil samples collected at the site. None of the compounds exceeded their respective URS standard for unrestricted-use or restricted-use setting in a Non-Critical Water Resource area.

Groundwater Analytical Results

Inorganic Compounds

The inorganic analytical data are summarized in Table 2. Six inorganic analytes (beryllium, chromium, copper, lead, nickel, and zinc) were detected at the site at trace to low concentrations. Five of the above-mentioned inorganic analytes (excluding copper) exceeded their respective URS standards for drinking water at boring location SB-8. In addition, the URS for chromium was exceeded at boring location SB-2.

Organic Compounds

The organic analytical data are summarized in Table 2. Eleven PAHs were detected at boring location SB-8 and eight of the PAHs had concentrations that exceeded their respective URS drinking water standards. Additionally, toluene was detected at a trace concentration at boring location SB-2. No other compounds were detected at concentrations above their respective laboratory quantitation limits.

CONCLUSIONS

Based on analytical results and observations made during the sampling activities, trace to low concentrations of PAHs were detected in subsurface soil and groundwater samples collected at the site. None of the PAHs detected in the subsurface soil samples were detected at concentrations that exceeded their respective URS concentrations for an unrestricted-use or unrestricted-use setting. Eight PAHs were detected at concentrations that exceeded their respective URS drinking water standards in the groundwater sample collected at soil boring location SB-8. The source of PAHs in the subsurface at the site is likely the result of minor releases of motor oils and fuels from construction equipment stored and maintained at the site by the previous property owner. Given the low concentrations and depth where the PAHs were detected, there is no immediate risk to human health or the environment.

Inorganic analytes detected in the subsurface soil and groundwater samples collected at the site appear to be at naturally occurring concentrations and do not appear to be a result of the past commercial use of the site.

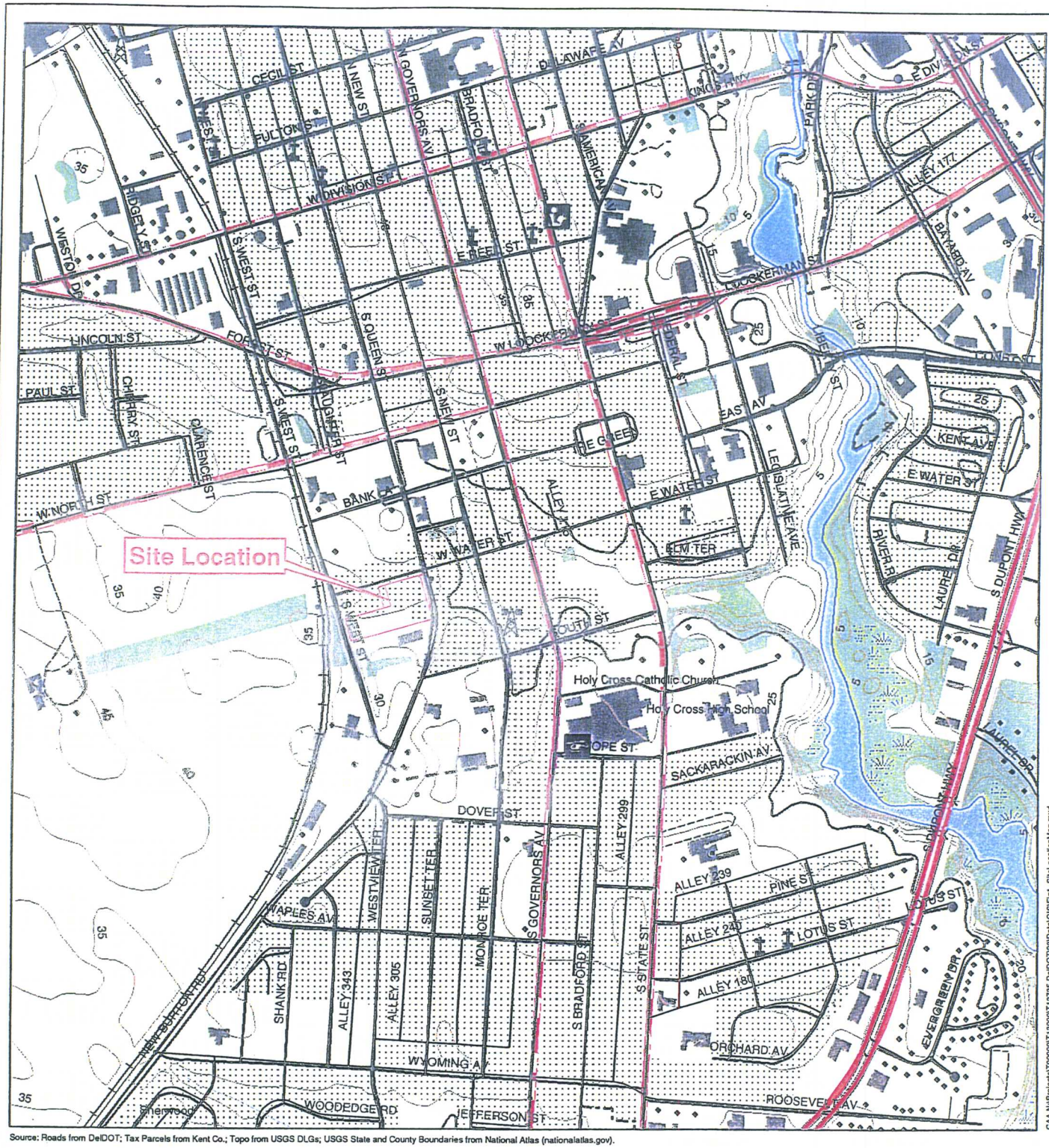
RECOMMENDATIONS

Based on the findings of the Phase II Environmental Investigation and the intended future use of the site as a bus terminal, Tetra Tech recommends no remedial action at the site as long as the following conditions are met:

- Any soil excavated at depths greater than 5 feet below grade during future site redevelopment activities should be reused on the site to the full extent possible. Because this soil does not meet the criteria of "clean fill" because of the low concentrations of PAHs detected, any soil that would need to be shipped off-site during future redevelopment activities would need to be sent to a licensed treatment or disposal facility to eliminate any long-term environmental liabilities associated with mobilizing the soil from the site.

- No groundwater supply wells should be installed at the site for potable water supply or other uses during future land redevelopment due to the low concentrations of PAHs detected in the groundwater samples collected at the site.

Tables and Figures



Source: Roads from DelDOT; Tax Parcels from Kent Co.; Topo from USGS DLGs; USGS State and County Boundaries from National Atlas (nationalatlas.gov).

CAA N:\Projects\T00000\T13000\T13735 DelDOT\23\Data\GIS\Fig1_SiteLocationMap.mxd

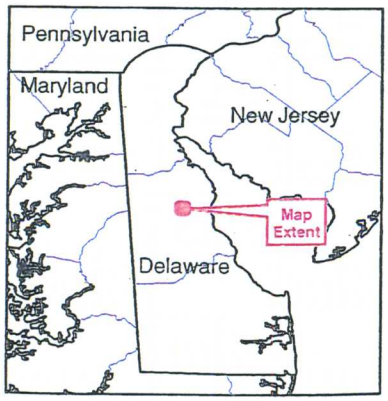
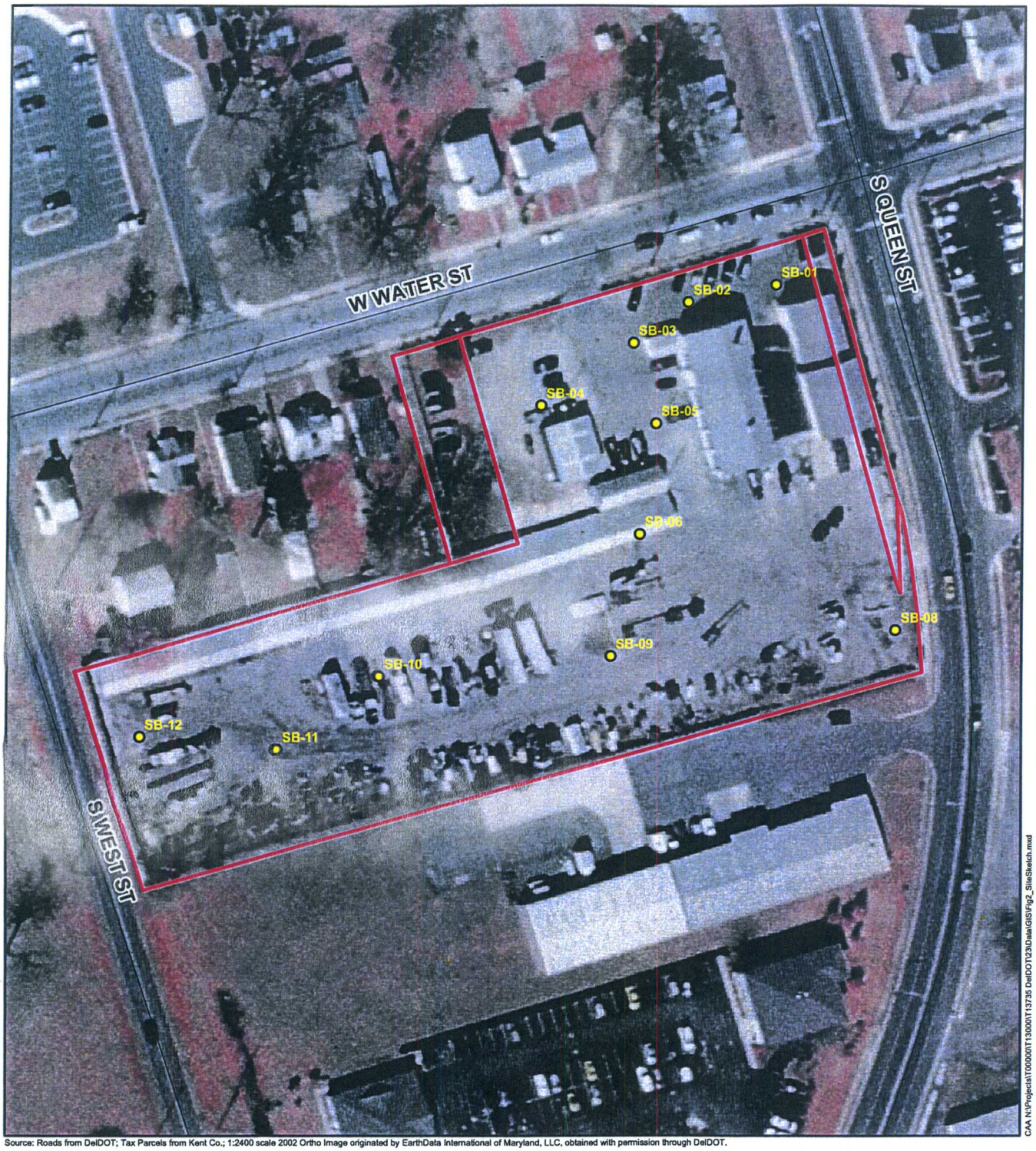


Figure 1
Site Location Map
George and Lynch
Dover, Kent Co., DE

1 inch equals 1,000 feet

0 500 1,000 2,000 Feet

TetraTech, Inc.
56 West Main Street, Suite 400
Christiana, DE 19702-1501
Phone: (302) 738-7551
Toll Free: (800) 462-0910
www.tetratech.com www.tetratech-de.com



Source: Roads from DelDOT; Tax Parcels from Kent Co.; 1:2400 scale 2002 Ortho Image originated by EarthData International of Maryland, LLC, obtained with permission through DelDOT.

CAA N:\Projects\T00000\T130001\T13735 DelDOT\23\Data\GIS\Fig2_SiteSketch.mxd

FIGURE 2

Sampling Locations
George and Lynch
Dover, Kent Co., DE

1 inch equals 100.0 feet

0 50 100 200 Feet

Legend
- Site Outline
- Point

N
W E
S

TetraTech, Inc.
56 West Main Street, Suite 400
Christiana, DE 19702-1501
Phone: (302) 738-7551
Toll Free: (800) 462-0910
www.tetratech.com www.tetratech-de.com

Table 1
Subsurface Soil Inorganic and Organic Analytical Results
George and Lynch Property, Dover, Delaware
Samples collected on June 13, 2006

Analyte/Compound Name	URS Un-Restricted Use Setting Concentration	URS -Restricted Use Setting Concentration	Units	SB-2	SB-4	SB-5	SB-8	SB-9	SB-10	SB-12
Inorganics										
Mercury	10	610	mg/kg	ND	0.0214 J	ND	0.103 J	0.0411 J	0.0145 J	0.0212 J
Arsenic	4	11	mg/kg	ND	1.71 J	1.04 J	4.19	3.36	2.17	2.49
Beryllium	16	410	mg/kg	0.731	0.421 J	0.333 J	0.697	1.48	0.883	1.96
Cadmium	4	100	mg/kg	ND	0.269 J	ND	0.116 J	ND	ND	ND
Chromium	270	610	mg/kg	6.8	9.71	8.99	12.9	10.7	9.32	12.2
Copper	310	8,200	mg/kg	4.04	18.6	4.96	17.5	6.83	4.28	6.55
Lead	400	1,000	mg/kg	5.04	49.6	6.57	34.2	14.8	9.25	10.1
Nickel	160	4,100	mg/kg	10.3	7.38	5.81	9.97	8.34	6.77	11.6
Zinc	2,300	61,000	mg/kg	14.7	62	19.6	53.5	27.9	21.7	30.6
Moisture	NA	NA	%	9.7	8.1	5.6	17.2	12.8	9.4	17.9
Organics										
Pyrene	230,000	5,000,000	ug/kg	ND	74 J	ND	70 J	67 J	ND	ND
Naphthalene	160,000	4,100,000	ug/kg	ND	37 J	ND	ND	ND	ND	ND
Acenaphthylene	470,000	5,000,000	ug/kg	ND	52 J	ND	ND	ND	ND	ND
Phenanthrene	1,000,000	5,000,000	ug/kg	ND	51 J	ND	ND	ND	ND	ND
Fluoranthene	310,000	5,000,000	ug/kg	ND	61 J	ND	65 J	62 J	ND	420 J
Benzo(a)anthracene	900	8,000	ug/kg	ND	57 J	ND	51 J	47 J	ND	ND
Chrysene	87,000	780,000	ug/kg	ND	60 J	ND	62 J	63 J	ND	ND
bis(2-Ethylhexyl)phthalate	46,000	410,000	ug/kg	ND	ND	ND	ND	ND	320 J	ND
Benzo(b)fluoranthene	900	8,000	ug/kg	ND	72 J	ND	75 J	74 J	ND	ND
Benzo(k)fluoranthene	9,000	78,000	ug/kg	ND	ND	ND	ND	41 J	ND	ND
Benzo(a)pyrene	90	800	ug/kg	ND	67 J	ND	59 J	57 J	ND	ND
Indeno(1,2,3-cd)pyrene	900	8,000	ug/kg	ND	48 J	ND	49 J	44 J	ND	ND
Benzo(g,h,i)perylene	NS	NS	ug/kg	ND	67 J	ND	58 J	54 J	ND	ND
Methylene Chloride	13,000	760,000	ug/kg	10	11	6	ND	ND	ND	17
Benzene	800	200,000	ug/kg	ND	1 J	ND	ND	ND	ND	ND
Toluene	650,000	5,000,000	ug/kg	ND	1 J	ND	ND	ND	ND	ND
Xylene (total)	420,000	5,000,000	ug/kg	ND	3 J	ND	ND	ND	ND	ND

Detected concentration exceeds URS Un-Restricted Use Setting Concentration

NS - No URS established

Table 2
Groundwater Inorganic and Organic Analytical Results
George and Lynch Property, Dover, Delaware
Samples collected on June 13, 2006

Analyte Name	URS Value	Units	SB-2	SB-6	SB-8
Inorganics					
Beryllium	0.004	mg/L	ND	ND	0.0449
Chromium	0.011	mg/L	0.0116 J	0.0056 J	0.192
Copper	1.3	mg/L	0.0072 J	0.0025 J	0.0487 J
Lead	0.015	mg/L	ND	ND	0.126
Nickel	0.1	mg/L	0.0168	0.0077 J	0.152
Zinc	2	mg/L	0.0502	0.021	2.01
Organics					
Phenanthrene	120	ug/L	ND	ND	14 J
Fluoranthene	150	ug/L	ND	ND	42 J
Pyrene	18	ug/L	ND	ND	32 J
Benzo(a)anthracene	0.09	ug/L	ND	ND	18 J
Chrysene	9	ug/L	ND	ND	23 J
bis(2-Ethylhexyl)phthalate	5	ug/L	ND	ND	36 J
Benzo(b)fluoranthene	0.09	ug/L	ND	ND	28 J
Benzo(k)fluoranthene	0.9	ug/L	ND	ND	14 J
Benzo(a)pyrene	0.01	ug/L	ND	ND	23 J
Indeno(1,2,3-cd)pyrene	0.09	ug/L	ND	ND	16 J
Benzo(g,h,i)perylene	NS	ug/L	ND	ND	18 J
Toluene	750	ug/L	5	ND	ND

Detected concentration exceeds URS drinking water concentration
ND - Not detected above laboratory quantitation limit
J - Estimated concentration