



October 29, 2015

Ms. Donna Nickerson, Secretary
Delaware Public Service Commission
861 Silver Lake Boulevard
Cannon Building, Suite 100
Dover, Delaware 19904

RE: Chesapeake Utilities Corporation, Environmental Rider Rate to be effective
December 1, 2015

Dear Ms. Nickerson:

Enclosed for filing is Chesapeake Utilities Corporation's ("Chesapeake") application for a proposed change in its Environmental Rider rate level to be effective for service rendered on and after December 1, 2015.

Pursuant to the provisions of Chesapeake's Environmental Rider tariff clause, Chesapeake proposes to change its Environmental Rider rate level from \$0.0000 per Ccf to a surcharge of \$0.0001 per Ccf. As a result of this proposed change, an average residential heating customer using 700 Ccf per year will experience an annual increase of approximately 0.01%, or \$0.07. During the winter heating season, an average residential heating customer using 120 Ccf per month will experience a monthly increase of approximately 0.01%, or \$0.01. Also, enclosed is the Delaware Public Service Commission's "Filing Cover Sheet" with the \$100 application fee.

Should you have any questions with regard to this filing, please contact me at 302.734.6797, extension 6201.

Sincerely,

A handwritten signature in black ink, appearing to read "Sarah E. Hardy", is written over a white background.

Sarah E. Hardy
Regulatory Analyst III

Enclosure

cc: William A. Denman, Esquire
Jason Smith, Public Utilities Analyst
David Bonar, Public Advocate

Chesapeake Utilities Corporation

350 South Queen Street • Dover, Delaware 19904 • 302.734.6797 • 302.735.3061 / fax

www.chpkgas.com

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF DELAWARE

IN THE MATTER OF THE APPLICATION OF)
CHESAPEAKE UTILITIES CORPORATION)
FOR APPROVAL OF A CHANGE IN ITS) P.S.C. DOCKET NO. 15-
ENVIRONMENTAL RIDER RATE TO BE)
EFFECTIVE DECEMBER 1, 2015)

CERTIFICATE OF SERVICE

I, Sarah E. Hardy, do hereby certify that on October 29, 2015, a copy of Chesapeake Utilities Corporation – Delaware Division’s application for a proposed change in its Environmental Rider Rate to be effective for service rendered on and after December 1, 2015 was issued to the following persons in the manner indicated:

VIA ELECTRONIC DELIVERY

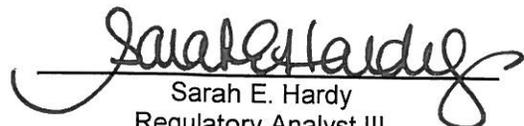
JASON R. SMITH
DELAWARE PUBLIC SERVICE COMMISSION
861 SILVER LAKE BLVD
SUITE 100
DOVER, DELAWARE 19904

VIA ELECTRONIC DELIVERY

WILLIAM A. DENMAN, ESQUIRE
PARKOWSKI, GUERKE AND SWAYZE P.A.
116 WEST WATER STREET
P. O. BOX 598
DOVER, DELAWARE 19903

VIA ELECTRONIC DELIVERY

DAVID BONAR, PUBLIC ADVOCATE
DIVISION OF THE PUBLIC ADVOCATE
JOHN G. TOWNSEND BUILDING
401 FEDERAL ST, STE 3 (SOS)
DOVER, DE 19904


Sarah E. Hardy
Regulatory Analyst III

"DRAFT"

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF DELAWARE**

**IN THE MATTER OF THE APPLICATION OF)
CHESAPEAKE UTILITIES CORPORATION)
FOR APPROVAL OF A CHANGE IN ITS) PSC DOCKET NO. 15-
ENVIRONMENTAL RIDER RATE TO BE)
EFFECTIVE DECEMBER 1, 2015)
(FILED OCTOBER 29, 2015))**

PUBLIC NOTICE

**TO: ALL NATURAL GAS CUSTOMERS OF CHESAPEAKE UTILITIES
CORPORATION AND ANY OTHER INTERESTED PERSONS**

Pursuant to the environmental remediation recovery mechanism approved by the Commission in PSC Order No. 4104 on December 19, 1995 in PSC Docket No. 95-73, Chesapeake Utilities Corporation ("Chesapeake") has filed with the Delaware Public Service Commission ("Commission") an application proposing to increase the Environmental Rider ("ER") from \$0.0001 per Ccf to a surcharge of \$0.0001 per Ccf to be effective with service rendered on and after December 1, 2015. As a result of this proposed change, an average residential heating customer using 700 Ccf per year will experience an annual increase of approximately 0.01%, or \$0.07.

The Commission has permitted the proposed Environmental Rider Rate to become effective with usage on and after December 1, 2015, subject to refund and pending the Commission's final decision after evidentiary hearings and any other proceedings that may be necessary.

The Commission will conduct evidentiary hearings, to be scheduled at a later date, concerning this Application. The Commission's final decision will be based on the evidence presented at such hearings.

If you wish to formally participate as a party in this matter, with the right to present evidence and be represented by counsel, you must file with the Commission a written petition asking for leave to intervene in accordance with the requirements of the Commission's Rules of Practice and

Procedure (26 Del. Admin. C. §1001-2.9) **on or before** _____, **2015**. All such petitions should be sent to the Commission's address listed above with attention to "PSC Docket No. 15-____." Petitions filed after the deadline of _____, 2015, will not be considered except for good cause shown.

You are invited to review Chesapeake's application and supporting documents to determine how your interests may be affected by going to DelaFile (<http://delafile.delaware.gov>), the Commission's file management system, and by searching for Docket No. 15-0950.

If you would like to review documents at the Commission's offices, please contact Donna Nickerson at (302) 736-7500 or by sending an email addressed to donna.nickerson@state.de.us.

You may also review copies of Chesapeake's application and supporting documents at the office of the Division of the Public Advocate located at either 820 North French Street, 4th Floor, Wilmington, Delaware 19801 or 29 South State Street, Dover, Delaware 19901. Please call either (302) 577-5077 or (302) 241-2555 to arrange for a time to review the documents at either of those locations.

If you wish to request copies of documents in this matter, please submit a Freedom of Information Act Request Form. The link to this form can be found on the Commission's website, <http://depssc.delaware.gov> or by visiting this web address: <https://delafile.delaware.gov/Complaints/FOIA.aspx>. The Commission will respond to your request in accordance with the Delaware Freedom of Information Act, 29 Del. C. ch. 100.

If you have a disability and wish to participate or to review the materials in this matter, please contact the Commission to discuss any auxiliary aids or services you might need to help you. You may contact the Commission in person, by writing, by telephone (including text telephone), by Internet e-mail, or other means. If you have questions about this matter, you may call the Commission at 1-800-282-8574 (toll-free in Delaware) or (302) 736-7500 (voice and text telephone). You may also send questions regarding this matter by Internet e-mail addressed to jason.r.smith@state.de.us.

APPLICATION

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF DELAWARE**

**IN THE MATTER OF THE APPLICATION OF)
CHESAPEAKE UTILITIES CORPORATION)
FOR APPROVAL OF A CHANGE IN ITS) P.S.C. DOCKET NO. 15-
ENVIRONMENTAL RIDER RATE TO BE)
EFFECTIVE DECEMBER 1, 2015)**

Chesapeake Utilities Corporation (hereinafter sometimes called "Applicant") pursuant to 26 Del. C. 201 and 304, makes the following application for approval by the Commission of a change in its Environmental Rider ("ER") to be effective for service rendered on and after December 1, 2015.

1. Applicant is Chesapeake Utilities Corporation, 909 Silver Lake Boulevard, Dover, Delaware 19904. All communications should be addressed to the Applicant at the following address, Attention: Sarah E. Hardy, Regulatory Analyst III, 350 South Queen Street, P.O. Box 1769, Dover, Delaware 19903 or at the following e-mail address: shardy@chpk.com. The respective phone number and fax number are 302.734.6797, extension 6201 and 302.735.3061.

2. Counsel for the Applicant is William A. Denman, Esquire, Parkowski, Guerke & Swayze P.A., 116 West Water Street, P.O. Box 598, Dover, Delaware 19903. Correspondence and other communications concerning this application should be directed to counsel at the foregoing address, or at the following e-mail address: wdenman@pgslegal.com. The respective phone number and fax number are 302.678.3262 and 302.678.9415.

3. Pursuant to the provisions of Applicant's Environmental Rider tariff clause, Applicant requests permission to change Applicant's current Environmental Rider rate level from \$0.0000 per Ccf to a positive surcharge of \$0.0001 per Ccf for all firm delivery service

customers, said change to be effective for service rendered on and after December 1, 2015 and thereafter until changed by further order of the Delaware Public Service Commission.

4. The full calculation of the proposed Environmental Rider rate level to be effective for service rendered on and after December 1, 2015 is set forth in the Direct Testimony of Sarah E. Hardy on behalf of Applicant. The reasons and basis for the proposed change in Applicant's present Environmental Rider rate level are more fully explained by direct testimony filed herewith.

WHEREFORE, the Applicant prays as follows:

- A. That the Commission file this Application and schedule it for hearing; and
- B. That the Commission approve the proposed change in Applicant's Environmental Rider rate to a positive surcharge of \$0.0001 per Ccf for all firm delivery service customers, and authorize the Company to place the proposed rate into effect on a temporary basis and subject to refund for usage on and after December 1, 2015.

SIGNATURES APPEAR ON THE FOLLOWING PAGE

CHESAPEAKE UTILITIES CORPORATION

BY: 
C. James Moore
Vice President

Parkowski, Guerke & Swayze P.A.

BY: 
William A. Denman
116 West Water Street
Dover, DE 19903
Attorney for Applicant

DATED: October 29, 2015

TARIFF SHEETS

RATE SCHEDULE "ER"

ENVIRONMENTAL RIDER

PURPOSE

The purpose of this rider is to recover reasonable environmental costs associated with cleaning up former manufactured gas plants (MGP). Applicable environmental costs are those incurred as a result of, but not limited to, investigation, testing, monitoring, remediation (including remediation of the groundwater), land acquisition, and legal costs relating to former MGP sites, disposal sites, or sites to which material may have migrated as a result of the earlier operation and/or decommissioning of MGPs. Environmental costs expended will be offset by any payments related to these costs received by the Company from insurance proceeds or from another party. Environmental costs shall not include expenses incurred in connection with litigation by third parties claiming personal injury or by third parties claiming damage to their property as a result of the operation or decommissioning of MGPs or as a result of the migration of materials from MGP sites.

APPLICABILITY

The environmental rider will be applicable to all firm Delivery Service customers.

OPERATION OF THE RIDER

The Company will file with the Commission a copy of the environmental rider computation at least 30 days prior to the proposed effective date, which will be each December 1.

The calculation filed will be supported by all bills and receipts relating to the amount of any environmental costs incurred in the preceding Environmental Cost Year for which the Company seeks to begin recovery. In the same filing, the Company shall include similar material and information to support any expenses and/or recoveries resulting from Third Party claims. The Company shall also submit in its annual filing a projection of environmental costs for the following Environmental Cost Year based on the best information available at the time of filing.

RATE

The rate for the rider effective December 1, 2015 is \$0.0001 per Ccf.

Issue Date: October 29, 2015

Effective Date: For Service Rendered on and after December 1, 2015

Authorization:

RATE SCHEDULE "ER"

ENVIRONMENTAL RIDER

PURPOSE

The purpose of this rider is to recover reasonable environmental costs associated with cleaning up former manufactured gas plants (MGP). Applicable environmental costs are those incurred as a result of, but not limited to, investigation, testing, monitoring, remediation (including remediation of the groundwater), land acquisition, and legal costs relating to former MGP sites, disposal sites, or sites to which material may have migrated as a result of the earlier operation and/or decommissioning of MGPs. Environmental costs expended will be offset by any payments related to these costs received by the Company from insurance proceeds or from another party. Environmental costs shall not include expenses incurred in connection with litigation by third parties claiming personal injury or by third parties claiming damage to their property as a result of the operation or decommissioning of MGPs or as a result of the migration of materials from MGP sites.

APPLICABILITY

The environmental rider will be applicable to all firm Delivery Service customers.

OPERATION OF THE RIDER

The Company will file with the Commission a copy of the environmental rider computation at least 30 days prior to the proposed effective date, which will be each December 1.

The calculation filed will be supported by all bills and receipts relating to the amount of any environmental costs incurred in the preceding Environmental Cost Year for which the Company seeks to begin recovery. In the same filing, the Company shall include similar material and information to support any expenses and/or recoveries resulting from Third Party claims. The Company shall also submit in its annual filing a projection of environmental costs for the following Environmental Cost Year based on the best information available at the time of filing.

RATE

The rate for the rider effective December 1, ~~2015~~~~2008~~ is ~~\$0.0001~~~~\$0.0000~~ per Ccf.

Issue Date: ~~October 29, 2015~~~~December 23, 2008~~

Effective Date: For Service Rendered on and after ~~December 1, 2015~~~~December 1, 2008~~

Authorization: ~~Order No. 7360 dated February 5, 2008 PSC Docket No. 07-299~~

**TESTIMONY OF
SARAH E. HARDY**

BEFORE THE DELAWARE PUBLIC SERVICE COMMISSION

**IN THE MATTER OF THE APPLICATION OF)
CHESAPEAKE UTILITIES CORPORATION)
FOR APPROVAL OF A CHANGE IN ITS) P.S.C. DOCKET NO. 15 -
ENVIRONMENTAL RIDER RATE TO BE)
EFFECTIVE DECEMBER 1, 2015)**

DIRECT TESTIMONY OF SARAH E. HARDY

On Behalf of Chesapeake Utilities Corporation

Delaware Division

Submitted for filing: October 29, 2015

1 Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS
2 ADDRESS.

3 A. My name is Sarah E. Hardy and I am a Regulatory Analyst III with
4 Chesapeake Utilities Corporation (“Chesapeake” or the “Company”). My
5 business address is 350 S. Queen Street, Dover, Delaware 19904.
6

7 Q. DESCRIBE BRIEFLY YOUR EDUCATION AND RELEVANT
8 PROFESSIONAL BACKGROUND.

9 A. I received a Bachelor of Science degree in Business Administration with
10 concentrations in Management and Operations Management and a Minor
11 in International Business from the University of Delaware in Newark,
12 Delaware, in 2005. I received a Masters of Business Administration from
13 the University of Delaware in Newark, Delaware, in 2009. I was hired by
14 Chesapeake as a Regulatory Analyst II in June 2010, and promoted to a
15 Regulatory Analyst III in October of 2014. As a Regulatory Analyst III, I
16 have primarily been involved in the areas of gas cost recovery, rate of return
17 analysis, and budgeting for the Delaware natural gas distribution company.
18 Prior to joining Chesapeake, I was employed by Conectiv Energy Supply,
19 Inc. from July, 2005 until May, 2010, most recently as a Senior Accountant.
20 As a Senior Accountant, I was responsible for Conectiv Energy’s derivatives
21 accounting (including preparation of derivatives disclosures for SEC
22 reporting), Federal Energy Regulatory Commission (FERC) filings, and
23 other general accounting duties.

1 Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY IN THIS
2 PROCEEDING?

3 A. The purpose of my direct testimony in this proceeding is to present and
4 discuss the calculation of Chesapeake's proposed Environmental Rider
5 ("ER") rate to be effective for service rendered on and after December 1,
6 2015 in accordance with the Company's natural gas tariff.

7

8 Q. HAVE YOU INCLUDED ANY ATTACHMENTS WITH YOUR DIRECT
9 TESTIMONY?

10 A. Yes. My direct testimony includes Attachments SEH-1, SEH-2, SEH-3, and
11 SEH-4. These attachments are provided as support to the determination of
12 the Company's proposed Environmental Rider rate level and are described
13 further in my testimony. Also included are Exhibits 1, 2, and 3, which will
14 be referenced later in my testimony.

15

16 Q. PLEASE EXPLAIN THE PURPOSE OF THE ENVIRONMENTAL RIDER.

17 A. As provided in Chesapeake's tariff, at Sheet No. 45, the purpose of the
18 Environmental Rider is "to allow Chesapeake to recover environmental
19 expenses associated with cleaning up former manufactured gas plants
20 ("MGP)." In prior environmental rider filings, Chesapeake recovered costs
21 associated with the Dover Gas Light Site and the Smyrna Gas Plant Site.
22 The site included in this filing is the former Seaford Town Gas location,
23 comprised of approximately 0.79 acres on Budd Street in Seaford,

1 Delaware (“Seaford Town Gas Site”).

2 As stated in the tariff, applicable environmental costs are “those incurred as
3 a result of, but not limited to, investigation, testing, monitoring, remediation
4 (including remediation of the groundwater), land acquisition, and legal costs
5 relating to former MGP sites, disposal sites, or sites to which material may
6 have migrated as a result of the earlier operation and/or decommissioning
7 of MGP’s.” The Environmental Rider mechanism was approved by the
8 Commission in Order No. 4104 in PSC Docket No. 95-73 issued on
9 December 19, 1995.

10

11 Q. WHY IS CHESAPEAKE NOW INCURRING ENVIRONMENTAL COSTS
12 RELATING TO THE SEAFORD TOWN GAS SITE?

13 A. By letter dated December 5, 2013, the Delaware Department of Natural
14 Resources & Environmental Control (“DNREC”) notified Chesapeake that it
15 would be conducting a facility evaluation of the Seaford Town Gas Site
16 (“Site”). (See Exhibit 1.) After its facility evaluation, by letter dated February
17 24, 2015, DNREC notified Chesapeake of its liability as an owner of the
18 Site, pursuant to Section 9105 of the Delaware Hazardous Substance
19 Cleanup Act. (See Exhibit 2.) In the notice, DNREC encouraged
20 Chesapeake to enter into a Voluntary Cleanup Program (VCP), which would
21 allow for an expedited cleanup process with reduced transaction costs.

22 On April 2, 2015, Chesapeake submitted a VCP application to DNREC and,
23 on September 23, 2015, Chesapeake and DNREC entered into a VCP.

1 (See Exhibit 3.) Under the “Operational History” section, the VCP states
2 that, according to DNREC, the Site was a “coal gas plant” until
3 approximately 1950, when Chesapeake purchased the Site and reportedly
4 changed it to a propane air plant. (See Exhibit 3, Appendix A, at page 4.)
5 Although the specific operational history of the site is uncertain, it is clear
6 that the contaminants at the site are associated with manufactured gas (*i.e.*;
7 “coal gas”) production.

8 The VCP calls for additional sampling and investigation of the Site to
9 determine whether a cleanup of the Site is necessary. (See Exhibit 3, at
10 paragraph 3.) Chesapeake has incurred expenses relating to the
11 investigation of the Site and the preparation of the VCP, which it has
12 included for recovery in this application.

13

14 Q. WHO IS SUBJECT TO THE ENVIRONMENTAL RIDER RATE?

15 A. The Environmental Rider rate is applicable to all firm “Delivery Service”
16 customers on the Company’s distribution system.

17

18 Q. PLEASE EXPLAIN THE DETERMINATION OF THE ENVIRONMENTAL
19 RIDER RATE.

20 A. There are several time periods and factors used in the calculation of this
21 rate as explained in the Delaware Division’s natural gas tariff, specifically
22 tariff Sheet Nos. 45, 45.1, and 45.2. There is an Environmental Cost Year,
23 a Recovery Year, an Amortization Factor, and a Reconciliation Factor. The

1 Environmental Rider rate is equal to the sum of the amortization and
2 reconciliation factors plus the Delaware P.S.C. Assessment divided by the
3 projected firm delivery service consumption for the new recovery period of
4 December 1 through November 30. The factors and time periods used in
5 this calculation are described below.

6 Environmental Cost Year

7 The Environmental Cost Year (“ECY”) is each October 1 through
8 September 30 and represents the time period over which environmental
9 costs are incurred and any payments from other parties are netted against
10 the costs for this period.

11 Environmental Recovery Year

12 The Environmental Recovery Year is each December 1 through November
13 30 and represents the time period over which the annually calculated
14 Environmental Rider rate will be billed to firm delivery service customers.

15 Amortization Factor

16 Recovery of net environmental costs incurred during an Environmental Cost
17 Year will be accomplished through a five-year amortization, offset by an
18 imputed deferred tax benefit associated with the amortization of those
19 environmental costs. A net recovery amount is calculated for each of the
20 five years of amortization scheduled for each Environmental Cost Year.
21 The Amortization Factor for any year will be comprised of the total net
22 annual amounts scheduled for that year.

23 Reconciliation Factor

1 The Reconciliation Factor is equal to the over/under collection of the
2 Environmental Rider. Over/under collection is the accumulated net over or
3 under recovery of the environmental costs during the twelve-month period
4 ending with the month of August immediately preceding the beginning of
5 the next Recovery Year.

6

7 Q. WHAT INTERNAL REVIEW PROCEDURES DOES THE COMPANY
8 EMPLOY WITH RESPECT TO PROCESSING ENVIRONMENTAL
9 INVOICES?

10 A. All environmental cost invoices submitted to the Company are first reviewed
11 internally by the individual primarily responsible for managing the
12 Company's environmental activities. The invoices are then submitted to
13 senior management for final review and approval. This review process
14 takes place prior to the payment of the environmental invoices to the
15 appropriate vendor.

16

17 Q. WHAT ENVIRONMENTAL RIDER RATE LEVEL IS THE COMPANY
18 PROPOSING IN THIS PROCEEDING TO BE EFFECTIVE DECEMBER 1,
19 2015?

20 A. The Delaware Division is proposing to change its current Environmental
21 Rider rate level from the current rate of \$0.0000 per Ccf to a positive
22 surcharge of \$0.0001 per Ccf.

1 Q. AS YOU HAVE ALREADY MENTIONED, THERE ARE NUMEROUS
2 FACTORS AND TIME PERIODS USED IN THE CALCULATION OF THIS
3 RATE. PLEASE DESCRIBE HOW YOU CALCULATED THE PROPOSED
4 ENVIRONMENTAL RIDER RATE LEVEL PROPOSED IN THIS
5 PROCEEDING.

6 A. As shown on Attachment SEH-1, Chesapeake's Delaware Division incurred
7 \$28,888.96 of actual environmental expenses during the Environmental
8 Cost Year ended September 30, 2015, consisting of consulting, legal and
9 other expenses for the Seaford Town Gas Site to be recovered in this
10 Recovery Year. The Company considers the information contained in
11 Attachment SEH-1 confidential and proprietary.

12 Attachment SEH-2 demonstrates the amortization of the total costs for the
13 ECY ended September 30, 2015 over five years subtracting out the deferred
14 tax credit for each year, resulting in the recovery amount for each period.
15 The actual recovery amount for the ECY ended September 30, 2015
16 included in the Environmental Rider rate level to be effective for service
17 rendered on and after December 1, 2015 is \$4,532.84.

18 Attachment SEH-3 is a summary of all Environmental Cost Year scheduled
19 recoveries. This attachment shows a "net recovery" amount of \$4,532.84
20 for the recovery year beginning December 1, 2015, which includes recovery
21 for the first amortization year of the ECY ended September 30, 2015. The
22 "net recovery" amount of \$4,532.84 is then grossed up by 0.3% in order to
23 recover the Delaware P.S.C. Assessment. As shown on this attachment,

1 the "total net recovery" amount is \$4,546.48 ($\$4,532.84 / (1 - .003)$).

2 Attachment SEH-4 demonstrates the calculation of the Environmental Rider
3 rate level by dividing the "total net recovery" amount from Attachment SEH-
4 3 of \$4,546.48 by the projected firm sales for the Recovery Year of
5 7,821,646 Mcf, resulting in a rate of \$0.001 per Mcf or \$0.0001 per Ccf.

6

7 Q. PLEASE EXPLAIN WHY THERE IS NO RECONCILIATION FACTOR
8 INCLUDED IN THIS YEAR'S ENVIRONMENTAL RIDER CALCULATION.

9 A. Because there were no revenues associated with an Environmental Rider
10 collected by the Company during the previous Recovery Year (December
11 1, 2014 – November 30, 2015), there is no true-up of over or under-
12 collection necessary for the current Recovery Year's calculation. However,
13 there will be a Reconciliation Factor included in the Company's next
14 Environmental Rider application.

15

16 Q. PLEASE DESCRIBE HOW THE FIRM SALES FORECAST USED IN THE
17 CALCULATION OF THE ENVIRONMENTAL RIDER RATE LEVEL WAS
18 DEVELOPED.

19 A. Forecasted sales for the twelve-month period of December 1, 2015 through
20 November 30, 2016 were developed based upon the actual sales volumes
21 billed to each customer class during each month for the prior year with
22 adjustments to reflect weather, customer growth, and customers switching
23 rate classes. The forecasted sales volumes are based on normal weather

1 that is developed based on a ten-year average for July 2006 through June
2 2015.

3

4 Q. WHAT EFFECT WILL THIS PROPOSED INCREASE IN THE
5 ENVIRONMENTAL RIDER HAVE UPON THE AVERAGE RESIDENTIAL
6 HEATING CUSTOMERS?

7 A. The average residential heating customer using 700 Ccf per year will
8 experience an annual increase of approximately 0.01% or \$0.07. During
9 the winter heating season, an average residential heating customer using
10 120 Ccf per month will experience an increase of approximately 0.01% or
11 \$0.01 per month.

12

13 Q. IS THE INFORMATION SET FORTH IN ATTACHMENTS SEH-1, SEH-2,
14 SEH-3, AND SEH-4 TRUE AND CORRECT TO THE BEST OF YOUR
15 KNOWLEDGE AND BELIEF?

16 A. Yes, it is.

17

18 Q. BASED ON THE INFORMATION AVAILABLE, WHAT IS THE
19 COMPANY'S PROJECTION OF ENVIRONMENTAL COSTS FOR THE
20 NEXT ENVIRONMENTAL COST YEAR, OCTOBER 1, 2015 THROUGH
21 SEPTEMBER 30, 2016?

22 A. The level of costs that will be incurred over the next Environmental Cost
23 Year will depend largely on the remedial activities that may be required

1 following the pending field investigation. In addition, the cost will be
2 impacted by whether the required remedial activities, if any, occur during
3 the next Environmental Cost Year or the year after. However, based on
4 estimates provided by our consultants, the Company projects that its
5 environmental costs for the next Environmental Cost Year will be
6 approximately \$300,000.

7

8 Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

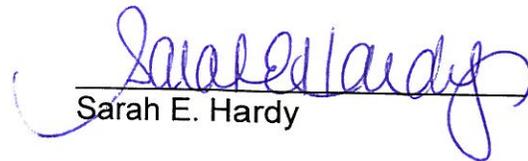
9 A. Yes, it does.

DATED: OCTOBER 29, 2015

STATE OF DELAWARE)
)
COUNTY OF KENT)

AFFIDAVIT OF SARAH E. HARDY

SARAH E. HARDY, being first duly sworn according to law, on oath deposes and says that she is the witness whose testimony appears as "Chesapeake Utilities Corporation, Delaware Division, Direct Testimony of Sarah E. Hardy"; that, if asked the questions which appear in the text of the direct testimony, she would give the answers that are therein set forth; and that she adopts this testimony as her sworn direct testimony in these proceedings.


Sarah E. Hardy

Then personally appeared this 29th day of October 2015 the above-named Sarah E. Hardy and acknowledged the foregoing Testimony to be her free act and deed. Before me,




Notary Public
My Commission Expires: 7.17.18

Chesapeake Utilities Corporation
Delaware Division
Environmental Expenses
Environmental Cost Year (October 1, 2014 - September 30, 2015)
REDACTED

Chesapeake Utilities Corporation
Delaware Division
Recovery Schedule
Environmental Cost Year Ending September 30, 2015

Expenses	\$28,888.96
Cost of Capital	8.91%
Tax Rate	40.655%
Adj Cost of Capital	13.25%

<u>Year</u>	<u>Amortization</u>	<u>Unamortized Balance</u>	<u>Income Taxes</u>	<u>Deferred Tax Account</u>	<u>Deferred Tax Benefit</u>	<u>Actual Recovery</u>	<u>To be Recovered During Recovery Year Beginning</u>
1	\$5,777.79	\$23,111.17	\$2,348.96	\$9,395.85	\$1,244.95	\$4,532.84	1-Dec-2015
2	\$5,777.79	\$17,333.38	\$2,348.96	\$7,046.88	\$933.71	\$4,844.08	1-Dec-2016
3	\$5,777.79	\$11,555.59	\$2,348.96	\$4,697.92	\$622.47	\$5,155.32	1-Dec-2017
4	\$5,777.80	\$5,777.79	\$2,348.96	\$2,348.96	\$311.24	\$5,466.56	1-Dec-2018
5	\$5,777.79	\$0.00	\$2,348.96	\$0.00	\$0.00	\$5,777.79	1-Dec-2019
Total	\$28,888.96		\$11,744.80		\$3,112.37	\$25,776.59	

**Chesapeake Utilities Corporation
Delaware Division
Summary of Environmental Cost Year Scheduled Recoveries**

Recovery Year Beginning	ECY Ending 30-Sep-15	ECY Ending 30-Sep-16	ECY Ending 30-Sep-17	ECY Ending 30-Sep-18	ECY Ending 30-Sep-19	Total Recovery	Year 1 (Over)/Under Collection	Year 2 (Over)/Under Collection	Net Recovery	
1-Dec-2015	1	\$4,532.84				\$4,532.84	\$0.00	\$0.00	\$4,532.84	
1-Dec-2016	2	\$4,844.08	1	\$0.00						
1-Dec-2017	3	\$5,155.32	2	\$0.00	1	\$0.00				
1-Dec-2018	4	\$5,466.56	3	\$0.00	2	\$0.00	1	\$0.00		
1-Dec-2019	5	\$5,777.79	4	\$0.00	3	\$0.00	2	\$0.00		
1-Dec-2020			5	\$0.00	4	\$0.00	3	\$0.00		
1-Dec-2021				\$0.00	5	\$0.00	4	\$0.00		
1-Dec-2022						\$0.00	5	\$0.00		
1-Dec-2023						\$0.00				
		<u>\$25,776.59</u>	<u>\$0.00</u>	<u>\$0.00</u>	<u>\$0.00</u>	<u>\$0.00</u>	<u>\$4,532.84</u>	<u>\$0.00</u>	<u>\$0.00</u>	<u>\$4,532.84</u>
							P.S.C. Assessment	0.3%	=	\$13.64
							Total Net Recovery		=	<u><u>\$4,546.48</u></u>

Chesapeake Utilities Corporation
Delaware Division
Environmental Rider Rate Calculation
Recovery Year December 1, 2015 - November 30, 2016

	Projected 31-Dec-2015	Projected 31-Jan-2016	Projected 29-Feb-2016	Projected 31-Mar-2016	Projected 30-Apr-2016	Projected 31-May-2016	Projected 30-Jun-2016	Projected 31-Jul-2016	Projected 31-Aug-2016	Projected 30-Sep-2016	Projected 31-Oct-2016	Projected 30-Nov-2016	Total
Projected Mcf Sales													
Firm Sales													
Residential Service - 1	7,407	10,118	12,403	9,201	5,376	2,698	1,521	1,616	1,366	1,342	1,366	3,347	57,761
Residential Service - 2	330,834	477,738	533,583	411,020	258,726	119,558	52,354	41,745	36,800	36,168	63,277	180,529	2,542,332
General Service	34,371	51,997	60,647	49,363	28,209	11,466	4,974	4,055	3,485	3,768	5,567	13,670	271,571
Medium Volume Service	36,865	51,783	61,207	45,930	26,784	13,529	6,763	5,702	5,678	5,010	8,492	19,734	287,477
Large Volume Service	36,385	37,079	39,625	32,640	18,212	9,557	5,896	4,827	4,769	17,787	22,281	18,056	247,111
High Load Factor Service	24,914	25,692	26,579	25,182	21,455	19,531	19,278	19,468	19,074	19,031	26,551	26,341	273,096
Gas Lighting	7	7	7	7	7	7	7	7	7	7	7	7	84
Sub-Total Firm Sales	470,783	654,414	734,052	573,343	358,768	176,345	90,792	77,421	71,178	83,113	127,540	261,683	3,679,433
Firm Transportation													
Transportation - Commercial	183,239	188,599	216,190	176,703	105,739	50,171	43,313	40,762	38,725	44,578	67,002	109,673	1,264,694
Transportation - Industrial	339,363	270,597	267,775	272,280	240,979	205,926	207,010	187,942	183,831	219,675	255,164	226,978	2,877,520
Sub-Total Firm Transportation	522,602	459,196	483,965	448,984	346,718	256,097	250,323	228,703	222,556	264,253	322,166	336,650	4,142,213
Total Firm Mcfs	993,385	1,113,610	1,218,017	1,022,327	705,486	432,442	341,115	306,124	293,734	347,366	449,706	598,334	7,821,646

Total Net Recovery (Attachment SEH-3)	\$4,546.48	/	7,821,646	=	\$0.001 / Mcf \$0.0001 / Ccf
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	Projected Dec-15	Projected Jan-16	Projected Feb-16	Projected Mar-16	Projected Apr-16	Projected May-16	Projected Jun-16	Projected Jul-16	Projected Aug-16	Projected Sep-16	Projected Oct-16	Projected Nov-16	Total
Recovery @ \$0.001 per Mcf	993,385	1,113,610	1,218,017	1,022,327	705,486	432,442	341,115	306,124	293,734	347,366	449,706	598,334	7,821,646
	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.007
	\$577.42	\$647.31	\$708.00	\$594.25	\$410.08	\$251.37	\$198.28	\$177.94	\$170.74	\$201.91	\$261.40	\$347.79	\$4,546.49
Recovery Net of PSC Assess	\$575.69	\$645.37	\$705.88	\$592.47	\$408.85	\$250.62	\$197.69	\$177.41	\$170.23	\$201.30	\$260.62	\$346.75	\$4,532.88
PSC Assessment	\$1.73	\$1.94	\$2.12	\$1.78	\$1.23	\$0.75	\$0.59	\$0.53	\$0.51	\$0.61	\$0.78	\$1.04	\$13.61
	\$577.42	\$647.31	\$708.00	\$594.25	\$410.08	\$251.37	\$198.28	\$177.94	\$170.74	\$201.91	\$261.40	\$347.79	\$4,546.49



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
& ENVIRONMENTAL CONTROL
DIVISION OF WASTE AND HAZARDOUS SUBSTANCES
391 LUKENS DRIVE
NEW CASTLE, DELAWARE 19720-2774

SITE INVESTIGATION &
RESTORATION SECTION

TELEPHONE: (302) 395 - 2600
FAX NO.: (302) 395 - 2601

December 5, 2013

Mr. Josh Denham
Chesapeake Utilities Corporation
909 Silver Lake Boulevard
Dover, DE 199904

**RE: Request for Permission to Perform Soil & Groundwater Sampling
Seaford Town Gas Site (DE-0061)
Sussex County Tax Parcel # 5-31-13.00-0006.00**

Dear Mr. Denham:

The purpose of this letter is to inform you that the State of Delaware, Department of Natural Resources and Environmental Control Site Investigation and Restoration Section (DNREC-SIRS) will be conducting a facility evaluation (FE) of the Seaford Town Gas Site (DE-0061).

The Seaford Town Gas Site was subject to a Preliminary Assessment by DNREC in March 1984 and was granted a No Further Action Tentative Desposition by the Environmental Protection Agency (EPA) in 1985.

The purpose of this facility evaluation is to determine if a release of hazardous substances has occurred at the site. The FE costs will be funded by the Hazardous Substance Act Cleanup Fund (HSCA Fund).

In order to conduct this investigation, DNREC-SIRS is requesting your permission to access to the property, which is listed as Sussex County Tax Parcel #5-31-13.00-0006.00 for the purpose of collecting soil, and groundwater samples.

The collection of soil and/or groundwater samples will involve intrusive activities which require holes of up to four (4) inches in diameter to be bored into the subsurface up to a depth of approximately 20 feet. DNREC-SIRS will also need to install groundwater monitor well(s) and/or possibly remove contaminated soils and perform any other remedial actions as deemed necessary to protect public health and the environment. DNREC-SIRS assures you that the property will be restored to its original condition prior to the investigatory activities.

DNREC-SIRS has prepared and included with this letter for your convenience a "Access Agreement" for soil and/or groundwater sampling of your property in order to assist in our

Delaware's good nature depends on you!

Mr. Josh Denham
December 5, 2013
Page 2 of 2

investigatory efforts. **Upon your review and concurrence with the terms of the enclosed agreement, DNREC-SIRS requests that you sign, date and return it to DNREC-SIRS in the enclosed envelope as soon as possible.** Be advised that due to the necessity of the upcoming investigation and in accordance with 7 Del. C. § 9106. Investigation and Access, DNREC-SIRS “may enter, at reasonable times, upon any real property, public or private, to conduct sampling, inspection, examination, and investigation evaluating the release or imminent threat of release to determine the need for a remedy or to execute the remedy upon given verbal notice, and after presenting official identification to the owner or operator.”

DNREC-SIRS would like to thank you in advance for your permission to access your property to complete this important environmental investigation.

Please contact me at (302) 395-2600 at your earliest convenience if you have any questions regarding the information contained in this letter or the attached access agreement.

Sincerely,



Robert C. Asreen, Jr.
Project Officer

RCA:tlw
RCA13121.doc
DE 0061 II H 1

Enclosure: Exhibit A Seaford Town Gas Facility Evaluation Work Plan FINAL

pc: Timothy Ratsep, Environmental Program Manager
Paul Will, Program Manager I

SITE ACCESS AGREEMENT

The State of Delaware, Department of Natural Resources and Environmental Control, Site Investigation and Restoration Section (“DNREC-SIRS”) is performing a Facility Evaluation (“FE”) for the Seaford Town Gas Site (the “Site” or “Property”). The Site encompasses approximately 0.79 acres and is made up of Sussex County Tax Parcel #5-31-13.00-0006.00.

The Chesapeake Utilities Corporation (“Owner”) currently owns the Site, which is located at 0 SSE. Budd Street in Seaford.

DNREC-SIRS desires permission from the Chesapeake Utilities Corporation to allow access to the Property for the purpose of implementing a Facility Evaluation (“FE”) at the Site, as described in the Seaford Gas Site Facility Evaluation Work Plan FINAL, Inc., dated November, 2013 (“Work Plan”), attached as Exhibit A. The Owner has been provided with a copy of the Work Plan and has had an opportunity to review it and discuss it with any person he may deem appropriate.

DNREC-SIRS will arrange with Miss Utility to mark all underground lines and structures within their jurisdiction or control to be present on the Property.

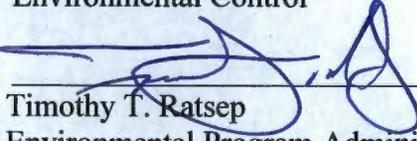
Based on the above request, it is hereby agreed as follows:

1. The Owner/Resident grants DNREC-SIRS and its contractor, Tetra Tech, Inc. and their agents and employees (collectively the “Parties”), permission to enter the Property for the purpose of implementing the Facility Evaluation Work Plan. This permission begins on January 2, 2014 and will remain in effect for such period of time until the Final Plan of Remedial Action for the Property is implemented.
2. The Owners shall identify by markout all underground lines or structures on the Property, which are not part of the Miss Utility identification surveys.
3. If the lines or structures the Owners are to mark, exclusive of the lines or structures Miss Utility is to mark, are incorrectly marked and a breach in the line or damage to underground structures occurs as a consequence of the implementation of the Work Plan, the Parties will not be responsible for any resulting damage.
4. DNREC-SIRS will provide Owner/Resident at least 48 hours advance notice before the parties arrive on the Property to conduct activities pursuant to the FE Work Plan.

5. Following completion of the Facility Evaluation, as set out in the FE Work Plan, DNREC-SIRS agrees to return the Property to substantially the same condition as it was immediately prior to the commencement of work.

12/5/2013
Date _____

Department of Natural Resources and
Environmental Control



Timothy T. Ratsep
Environmental Program Administrator

Owner

Date

By: _____

Title: _____

SITE ACCESS AGREEMENT

The State of Delaware, Department of Natural Resources and Environmental Control, Site Investigation and Restoration Section ("DNREC-SIRS") is performing a Facility Evaluation ("FE") for the Seaford Town Gas Site (the "Site" or "Property"). The Site encompasses approximately 0.79 acres and is made up of Sussex County Tax Parcel #5-31-13.00-0006.00.

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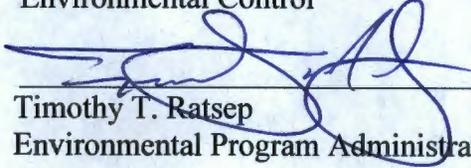
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2. The Owners shall identify by markout all underground lines or structures on the Property, which are not part of the Miss Utility identification surveys.
3. If the lines or structures the Owners are to mark, exclusive of the lines or structures Miss Utility is to mark, are incorrectly marked and a breach in the line or damage to underground structures occurs as a consequence of the implementation of the Work Plan, the Parties will not be responsible for any resulting damage.
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5. Following completion of the Facility Evaluation, as set out in the FE Work Plan, DNREC-SIRS agrees to return the Property to substantially the same condition as it was immediately prior to the commencement of work.

12/5/2013
Date

Department of Natural Resources and
Environmental Control



Timothy T. Ratsep
Environmental Program Administrator

Owner

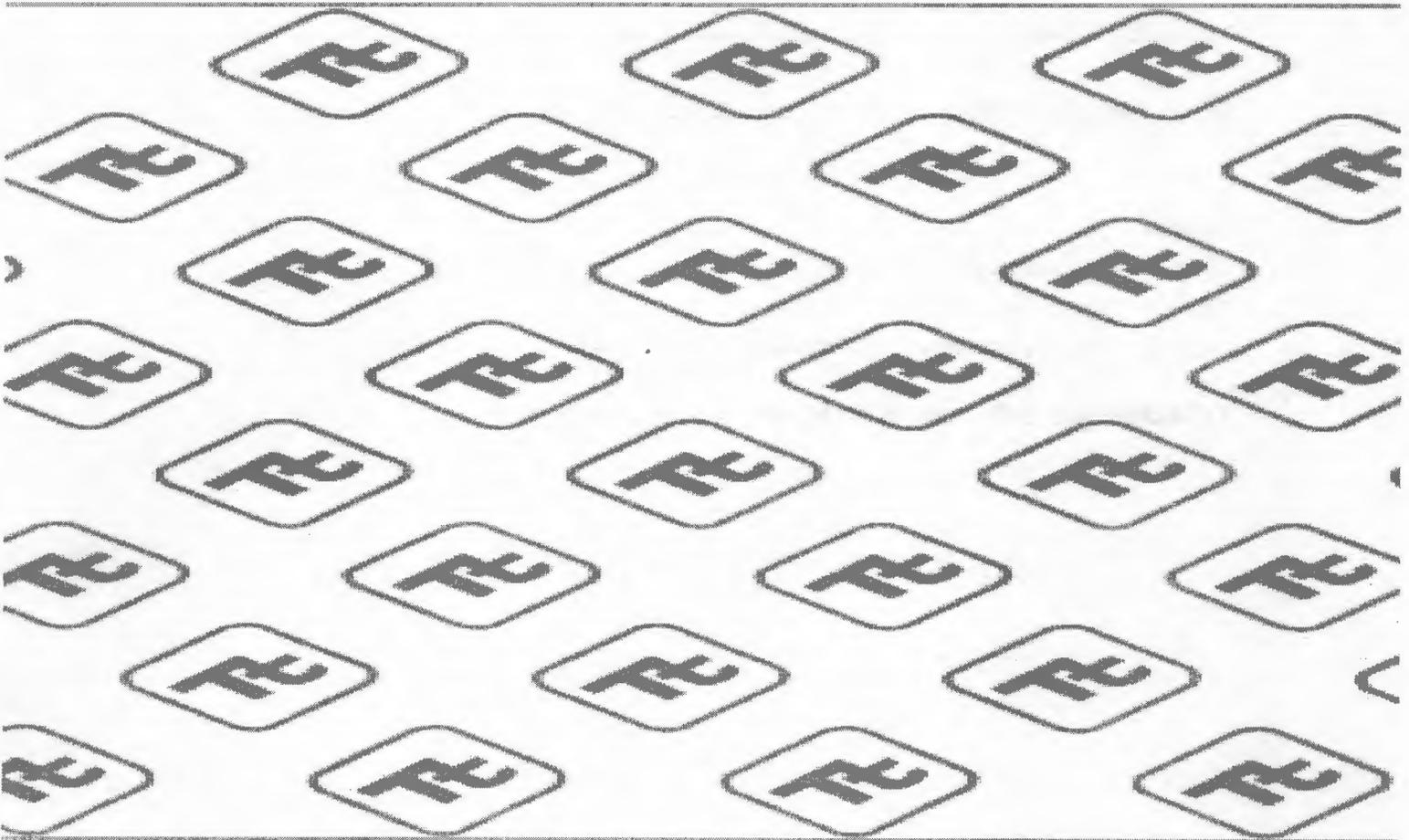
Date

By: _____

Title: _____



Seaford Gas Site Facility Evaluation Work Plan (FINAL)



Prepared for:

Site Investigation & Restoration Section
Division of Waste & Hazardous Substances
Dept. of Natural Resources & Environmental
Control
391 Lukens Drive, New Castle, DE 19720

Project No. 103S257406

November 2013

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 2.2 Monitor Well Installation 3

 2.3 Groundwater Sampling 5

3.0 REPORTING 6

4.0 PROJECT MANAGEMENT 7

Figures:

Figure 1 - Site Location Map

Figure 2 - Closeup Aerial Image

Figure 3 - Closeup Aerial Image with Proposed Boring Locations

ATTACHMENT: SAMPLING & ANALYSIS PLAN (SAP)

1.0 INTRODUCTION

Tetra Tech, Inc. (Tetra Tech) is pleased to provide this work plan to the Delaware Department of Natural Resources and Environmental Control (DNREC) Site Investigation and Restoration Section (SIRS) for the investigation of the Seaford Gas Company Site located in Seaford, Delaware 19973, located on Shipley Street at coordinates 38.63589°, -75.61965° (**Figure 1**). The Seaford Gas site is a former coal manufactured gas plant (MGP) site. The Environmental Protection Agency (EPA) inspected the site in May of 1985 and made a determination that no further action was necessary. This determination was based upon information provided by employees of Chesapeake Utilities—that no waste was disposed of on site and that the generated waste/byproduct was sold to roofers. No other known environmental investigation related activities have been documented for the site.

The purpose of this work plan is to more fully investigate/evaluate environmental conditions at the site and determine whether further investigation is required, or whether a conditional No Further Action determination can be made by DNREC.

The Scope of Work (SOW) will comprise of the following tasks:

- Conduct a review of existing project file records, project planning and coordination.
- Implement the proposed field related activities.
- Prepare a Facility Evaluation Report.
- Provide project management including preparation of a timeline of deliverable and related administrative tasks (progress reports, invoicing).

1.1 Project Planning and Coordination

Tetra Tech will conduct project planning activities to support this SOW; these activities will include the following:

- Prepare a Site Health and Safety Plan (HASP) for the field activities. The HASP shall include procedures and contact information for safely conducting the fieldwork.
- Prepare a Sampling and Analysis Plan (SAP). The SAP will establish the appropriate Data Quality Objectives (DQO) and the benchmarks to ensure that they are attained.
- Develop a schedule to implement the work plan and other associated tasks.

2.0 IMPLEMENT PROPOSED FIELD RELATED ACTIVITIES

As part of the investigation, Tetra Tech will provide oversight for soil boring installation and construction of monitor wells. Based upon our understanding of the local geology, Tetra Tech anticipates a heavy-duty Geoprobe should have sufficient power to install the borings and monitor wells. The field investigation activities are detailed in the following sections. DNREC-SIRS Standard Operating Procedures for soil and groundwater sampling will be followed during the investigation process.

2.1 Soil Borings

- Prior to drilling at the site, Tetra Tech will obtain utility clearance through the “Call Before You Dig” system.
- Given the approximately 0.90-acre footprint of the site, Tetra Tech proposes to install up to 12 soil borings as part of the investigation. Based on actual field conditions, this number of borings may vary (with DNREC concurrence). Soil borings will be advanced through the vadose (unsaturated) zone into the top of the saturated zone except at those locations where a well is to be installed in the boring in which case the boring will be advanced through the saturated zone so that the screened interval straddles the water table. The proposed locations are depicted on **Figures 2 and 3**, but will be finalized in consultation with DNREC.
- Subsurface soil samples will be collected in 4- or 5-foot disposable acetate sleeves using direct push (GeoProbe) equipment. Soils will be continuously screened using a photoionization detector (PID) and visually inspected for the presence of potential environmental contamination (based upon color, odor and any visible staining).
- One soil sample will be collected from the shallow subsurface surface (0-2 ft. bgs) and one from the water table interface at each location; these samples will be submitted for laboratory analyses.
- All soil samples will be initially submitted to the DNREC screening laboratory for the screening analysis for VOCs, SVOCs, Pesticides/PCBs and Total Metals. Based upon the findings of the screening analysis, DNREC and Tetra Tech will select the appropriate samples for fixed laboratory analysis for TAL/TCL analysis. A copy of the Sampling and Analysis Plan (SAP) is provided as an Attachment to this work plan.
- Any residual soil from the soil boring activities will be placed back into the borehole. If all of the soil cannot be placed back into the borehole, then it will either be containerized into 55-gallon drums for disposal or, with DNREC approval, will be spread on site.

2.2 Monitor Well Installation

Tetra Tech will provide oversight for the installation of the monitor wells in order to collect groundwater samples and to obtain site specific hydrogeological data (groundwater flow direction, gradient, etc.). The anticipated well construction related activities are summarized below.

- Tetra Tech will provide oversight for the installation of up to 4 monitor wells on site to evaluate groundwater flow patterns and to obtain an initial groundwater quality baseline. These wells will be located in consultation with DNREC.
- The depth to groundwater in soils in the area is unknown; however, the site elevation is approximately 20 feet above mean sea level. Based upon this assumption, the expected depth of each well will range from 15 to 20 ft. bgs.
- Monitor wells will be constructed of 1-inch diameter polyvinyl chloride (PVC), with pre-packed 10-slot (0.010) PVC screen installed to a depth to intersect the top of the water table. The maximum screen length will be 10 feet. Wells will be completed as a flush-mount style with protective casing.
- After the monitor wells are installed, they will be developed/purged using a peristaltic pump or by other approved methods. The purging process will be continued until the purge water is relatively clear. Field parameters such as pH, specific conductivity, and temperature will be measured and results recorded.
- Approximately 48-72 hours after the wells are purged, Tetra Tech will sample the wells by low flow methods for analyses of TCL/TAL VOC, SVOCs, Pesticides/PCBs and Total/Dissolved Metals by the lab (See Section 2.3).
- Minimal investigation derived waste (IDW) is expected to be generated because of the low flow sampling methodology. Any residual development and purge water from sampling activities will be containerized into 55-gallon drums for disposal. Alternatively, if site conditions allow for on-site disposal with DNREC approval, then this method will be considered.
- Tetra Tech will initially record the horizontal coordinates of each monitor well to an accuracy of approximately 3 meters using Global Positioning System (GPS). The relative elevation (based on arbitrary datum) of the monitor wells and the water table will be determined using standard instrument survey techniques. All new survey data will be incorporated into the existing base survey coordinate system.

Assumptions

The following assumptions apply to this subtask:

- Tetra Tech assumes 2 field personnel will be mobilized from the Newark, Delaware office to oversee the soil boring installation and well construction, and well development.
- The Tetra Tech Field Operations Leader (FOL) and equipment manager will coordinate the procurement of all equipment and supplies needed for the drilling and well installation.
- For cost estimating purposes, Tetra Tech assumes approximately 8 soil samples will be submitted for fixed laboratory analyses $\{(12 \text{ soil borings} \times 2 \text{ soil samples per boring}) \times 25\% + 2 \text{ quality control samples}\}$.
- Tetra Tech anticipates 3 to 4 calendar days to implement the soil boring and well installation activities. This time includes mobilization for driller and Tetra Tech, utilities clearance, advancing the borings, soil sampling, well installation, well development, IDW management, and demobilization activities. Tetra Tech assumes 2 Tetra Tech field personnel will oversee the work.
- Tetra Tech assumes 4 drums of drilling and well installation related IDW (residual soils [2], development water and decontamination fluids [2]) will be generated. All IDW is assumed to be non-hazardous for the purpose of estimating costs.
- One Tetra Tech project coordination meeting is assumed at the beginning of the field sampling program to discuss the scope of the investigation with field team members, initiate procurement of equipment and supplies for the field work, and obtain information for security and health and safety clearances. This meeting is assumed to be one hour in duration involving the project manager, project technical lead, project chemist, health and safety representative, field operations leader (FOL), field sampling staff, and equipment manager.

2.3 Groundwater Sampling

Tetra Tech will perform groundwater sampling for the newly installed monitor wells. In general, the well sampling work will include the following related tasks:

- Tetra Tech will conduct groundwater sampling approximately 48-72 hours after development of the new monitor wells in order to allow the wells to equilibrate with the local hydrogeologic conditions.
- Prior to sampling Tetra Tech will perform a synoptic round of groundwater level measurements from the monitor wells.
- The monitor wells will then be purged using either peristaltic or submersible pumps attached to Teflon-lined tubing (depending on the available water column head). Dedicated sample tubing will

be installed into each new well during the first event so that it may be re-used for future sampling events.

- Groundwater samples will be collected from each of the wells using low-flow sampling techniques.
- Groundwater samples will be collected and submitted to the analytical lab for analyses of TCL/TAL VOC, SVOCs, Pesticides/PCBs and Total/Dissolved Metals.
- Tetra Tech will containerize all IDW generated during groundwater sampling into 55-gallon drums and procure a subcontractor to characterize and dispose of IDW after sampling. Alternatively, if site conditions allow for on-site disposal with DNREC approval, then this method will be considered.
- A copy of the Sampling and Analysis Plan (SAP) is provided as an Attachment to this work plan.

Assumptions

The following assumptions are implicit in the Tetra Tech budget estimate for this subtask:

- Costs developed for this work plan reflect one round of groundwater sampling at the site.
- The Tetra Tech FOL and equipment manager will coordinate the procurement of all sampling equipment and supplies for each sampling event.
- For cost estimating purposes, Tetra Tech assumes 6 groundwater samples will be submitted for laboratory analyses (4 well samples plus 2 quality control samples).
- Tetra Tech anticipates 1 day to conduct groundwater sampling. This time includes mobilization, groundwater level measurements, groundwater water sampling activities, and demobilization. Tetra Tech assumes 2 field personnel will conduct the work.
- Tetra Tech assumes 1 drum of liquid IDW (purge water and decontamination fluids) will be generated as part of the groundwater sampling event. All IDW is assumed to be non-hazardous for the purpose of estimating costs.

3.0 REPORTING

Tetra Tech will prepare a Facility Evaluation Report as part of this scope. The report will consist of the following components:

- An introduction with a description stating the purpose, objective and scope of the investigations.
- A brief narrative summary of the environmental setting and current and historical environmental conditions, any previous environmental work conducted, and the current regulatory status.

- A summary of the work completed during the investigation, including the rationale for the density, frequency, locations, and depths of sampling; field procedures and any deviations from the proposed sampling plan; analytical methods; details of field screening and instrument calibration; and any relevant QA/QC issues that may affect data quality and data usability, based on the data quality assessment and data usability evaluation performed in accordance with procedures described in the QA/QC guidance document.
- A tabular summary of the current and historical soil and groundwater analytical data. This data will be compared against the newly promulgated DNREC-SIRS screening levels(January 2013).
- A findings section that will include any updates to the site geology and hydrogeology (based upon the field investigation findings) and, if appropriate, further refine the spatial distribution and temporal variations in concentrations of any identified COCs for each media of concern.
- A conclusions section that will include an interpretation of the findings, an assessment of the environmental implications if impacted soil or groundwater is encountered, and the rationale used to arrive at the conclusions.
- Any recommendations for any additional investigation if warranted.
- Appendices, including soil boring logs, geologic cross-sections, well construction logs, well permits, groundwater level measurement forms, groundwater contour maps, low-flow sample collection log sheets, laboratory chain-of-custody forms, and full laboratory reports.

Deliverables:

The deliverables associated with this scope will include a draft and final version of the report. All comments will be incorporated into the final report, but no separate written response to comments will be prepared.

Submittals will be provided as follows:

DRAFT documents:

- 1 bound copy, text printed double-sided with “DRAFT” clearly marked on the cover
- 1 electronic version (CD or e-mail attachment to Project Officer)

FINAL documents:

- 1 unbound copy, text printed double-sided, including a cover letter with brief responses to all comments offered by DNREC-SIRS on the draft document
- 1 electronic version on CD

4.0 PROJECT MANAGEMENT

This task includes the level of effort necessary for the Tetra Tech Project Manager to perform resource planning, direct project staff and subcontractors, perform routine communications with DNREC, and conduct other project management duties (monthly progress reports, phone calls, teleconferences, meetings, and invoicing) associated with the scope of work.

FIGURES

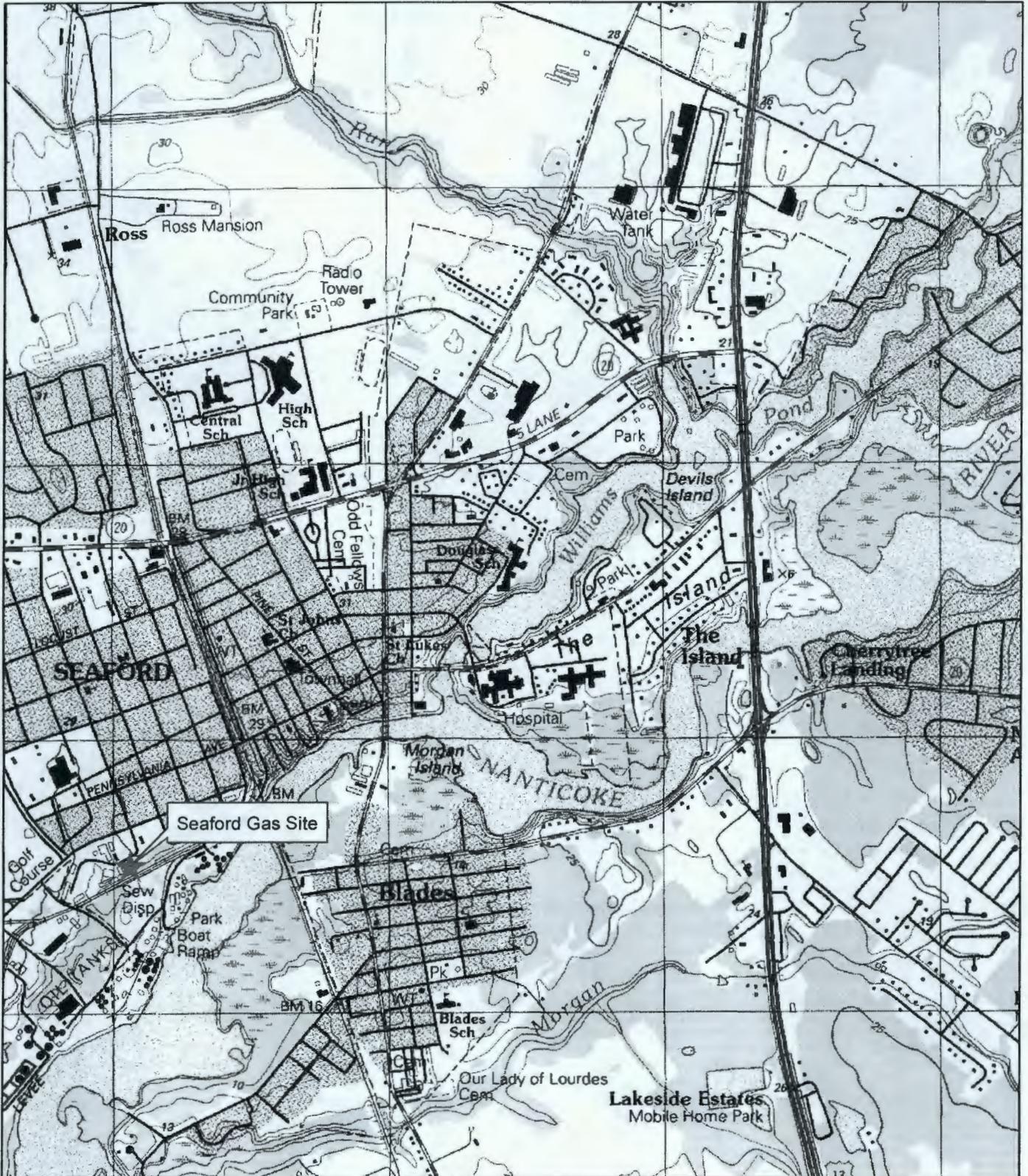


Figure 1
 Site Location Map
 Seaford Gas Site
 Seaford, Sussex Co., DE



Tetra Tech
 240 Continental Drive, Suite 200
 Newark, DE 19713
 Phone: (302) 738-7551
 Toll Free: (800) 462-0910
www.tetratech.com

This map is provided by Tetra Tech solely for display and reference purposes and is subject to change without notice. No claims, either made or intended, as to the absolute accuracy or precision of any data contained herein are made by Tetra Tech, nor will Tetra Tech be held responsible for any use of this document for purposes other than which it was intended.

S:\02-Projects\Utility & License\CONTRACT\1038237\468 Seaford Gas\Figure 1\Figure 2- Seaford Gas Location Map.mxd



Legend

-  Approximate Historical Structure Locations
-  Approximate Property Boundary

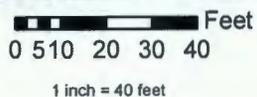


Figure 2
 Site Map
 Seaford Gas Site
 Seaford, Sussex Co., DE



Tetra Tech
 240 Continental Drive, Suite 200
 Newark, DE 19713
 Phone: (302) 738-7551
 Toll Free: (800) 462-0910
 www.tetrattech.com

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Legend

-  Approximate Historical Structure Locations
-  Approximate Property Boundary
-  Proposed Boring Locations

0 5 10 20 30 40 Feet
1 inch = 40 feet



Figure 3
Proposed Boring Locations
Seaford Gas Site
Seaford, Sussex Co., DE



Tetra Tech
240 Continental Drive, Suite 200
Newark, DE 19713
Phone: (302) 738-7551
Toll Free: (800) 462-0910
www.tetrattech.com

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ATTACHMENT
SAMPLING & ANALYSIS PLAN

Proposed Sampling and Analyses Plan for Seaford Gas Site (DE-0061)

1.0 Proposed Sampling and Analyses Plan Table

Sampling Matrix	Locations, depths and number of Samples	Sample Collection Methodology	DNREC-SIRB Lab Screening/Other Screening	HSCA Laboratory Analysis	Comments/Justification
Subsurface Soil	12 Locations up to 2 per location (total of 24 samples)	SIRB_SOP_Subsurface Soil_Sampling	TCL/TAL VOC, SVOCs, Pesticides/PCBs and Total/Dissolved Metals	To be determined based upon screening results	Samples to be collected by Geoprobe
Groundwater	4 Wells	SIRB_SOP_Groundwater_Sampling	TCL/TAL VOC, SVOCs, Pesticides/PCBs and Total/Dissolved Metals	To be determined based upon screening results	Samples to be collected by low-flow sampling methods using a peristaltic pump
Soil gas (vapor intrusion related)	N/A	SIRB_SOP_Soilgas_Sampling	N/A	N/A	No soil gas sampling scoped at this time.
Sediment	N/A	SIRB_SOP_Sediment_Sampling	N/A	N/A	No sediment sampling scoped at this time.
Surface Water	N/A	SIRB_SOP_Surface Water_Sampling	N/A		No surface water sampling scoped at this time.

Other Survey (geophysical, etc)	N/A	Industry Standard Procedure for the Survey proposed			
QA/QC Samples – Fixed Lab Analysis					
Media	No. Samples (Planned)	Quality Control (QC) Sample	Analytical Group		Frequency
Groundwater	1	Field Duplicate	VOCs		1 per 20 samples
	1	MS/MSD	VOCs		1 per 20 samples
Soil	1	Field Duplicate	VOCs		1 per 20 samples
	1	MS/MSD	VOCs		1 per 20 samples
Other	TBD	Trip Blank	VOCs		One per cooler containing VOCs.

2.0 Proposed Sampling Location Map(s)

(See Attached Figure 3)

3.0 Investigation Derived Waste Management

Overview

This waste management plan addresses the management for wastes generated during implementation of the field investigation activities at the Seaford Gas site. Since it is anticipated that waste generated from these activities will be non-hazardous, the procedures and practices in this plan address management and disposal of non-hazardous waste. While many of these procedures and practices are also applicable to hazardous waste, this plan will be modified to include hazardous waste requirements in the event that hazardous waste is generated.

It is anticipated that the following investigation derived waste (IDW) will be generated during these activities:

- Approximately two 55-gallon drums of residual soil from boring activities.
- Approximately one 55-gallon drums of debris containing personnel protective equipment (PPE) related materials such as disposable gloves, plastic sheeting, decontamination water, and disposable sampling supplies such as acetate soil sleeves.
- Approximately one 55-gallon drums of water generated during the low-flow sampling groundwater activities, as well as any residual decontamination fluids generated during the field work.

Management of Waste/Media during Soil Boring and Groundwater Sampling

During the soil boring activities, soil samples will be collected by direct push methods (e.g., "Geoprobe") using disposable acetate sleeves. Soil will be removed from each sleeve in order to classify the soil and collect samples for laboratory analysis. The remaining residual soil from each acetate sleeve will be staged on polyethylene sheeting next to the borehole until drilling has been completed at that location. At the completion of drilling, the residual soils will be placed back down the borehole (to the extent practicable). Any residual material that cannot be returned into the

hole will be placed into DOT-compliant 55-gallon steel drums and staged for future characterization and disposition. The spent acetate sleeves will be placed into heavy duty plastic contractor bags and disposed of as municipal trash. The use of direct push methods for collecting soil samples low-flow groundwater sampling methods is intended to minimize waste generation.

During the groundwater sampling, residual purge water from the low flow sampling will be initially discharged into 5-gallon plastic buckets with lids. Once sampling is complete at each well, the residual purge water will be transferred to a 55-gallon steel drum for future characterization and disposition. All drums will be labeled with a description of the waste, origin of the contents (boring or well location) and date of generation. All of the drums will be staged at a location to be designated by DNREC personnel until they can be sampled for waste characterization purposes and final disposition.

4.0 Health and Safety Plan

(See Attached)

TIPS FOR THE LEVEL 2 HEALTH AND SAFETY PLAN (HASP)

This page presents tips for word processing the Level 2 HASP form. This page is not part of the HASP. The *boilerplate* text of the form should never be changed and is issued in read-only format. After revising the form, save the revised document under a new name. **Save your work frequently.**

WARNING: Work slowly and carefully. Print this page out now so you have the following instructions while you work on the form. Delete this page when you are finished working on the HASP form.

- ✓ RED text contains instructions or sample text only. **Red text should be deleted and formatted in black throughout the document after information is added.**
- ✓ Double-click or right-click on any box and then select the "checked" option to enter an X. The boxes are set up to center the text both horizontally and vertically.
- ✓ Most of this document is set up in table format. A table row may be preset to a specific size, and not all text within the row will be displayed. When not all text is displayed, place the cursor in the row in question.

Additional Comments:

- ✓ HASPs should be submitted to your Regional Safety Officer (RSO) or by emailing to EMI.HaspApprovers.com for review and approval prior to the start of operations.
- ✓ Ensure that all subcontractors have been pre-qualified prior to submission for HASP approval. If you are unsure a subcontractor is currently pre-qualified, please visit the health and safety website at: <http://home.ttemi.com/High%20Hazard%20Subcontractor%20Docu/default.aspx>.
- ✓ Subcontractor and persons from other organizations that will be following this HASP must be identified by name where applicable and sign the Approval and Sign-off Form.
- ✓ This HASP may be completed electronically or by hand, as necessary to ensure that a complete HASP is available to support the project.
- ✓ All blanks should be filled in with appropriate information or marked as not applicable (NA)
- ✓ Mark all applicable items with an X in the box in sections that contain lists and boxes to check.
- ✓ **The HASP must be reviewed and approved before any work can begin on site.** After the initial project work, data and subsequent decisions related to health and safety may be recorded in the field log book.
- ✓ An amendment is required when changes that were not within contingency plans are made or a new task is added to Tetra Tech's scope of work. A signature by a HASP approver is also required for amendments.
- ✓ An approved copy of the HASP must be kept on jobsites at all times Tetra Tech personnel are present. **Failure to have an approved HASP on site at all times will lead to disciplinary actions.**
- ✓ The HASP located on the jobsite must contain signatures from each person entering the jobsite signifying review and acceptance of the plan.
- ✓ Personnel who prepare an HASP must be familiar with the requirements stated in the *START Health and Safety Plan Approval Procedures* document, dated September 19, 2001.

Rights and Responsibilities

- ✓ All personnel working on Tetra Tech projects are expected to and responsible for reporting safety hazards they face while performing their work. As such, reports of safety hazards are viewed as positive interactions and no employee of Tetra Tech EMI will retaliate against anyone who reports a safety hazard.
- ✓ Tetra Tech employees have the right to refuse to perform work involving significant safety hazards they feel have not been addressed.
- ✓ All personnel working on Tetra Tech projects have the right to stop work if they feel any worksite condition, practice, or operation causes or presents a hazard that can reasonably be expected to result in immediate death, serious physical harm, or severe damage to the environment.

Attachments to the HASP

- ✓ Daily Tailgate Safety Meeting form (to be completed at the beginning of each day and stored with the HASP onsite)
- ✓ OSHA VPP Info sheet for review on jobsites
- ✓ HASP Amendment Form (to be completed when new tasks are added to Tetra Tech's scope of work, an existing HASP changes substantially, or new hazards are encountered on the jobsite)
- ✓ Form AF-1 (Field Audit Checklist to be completed once per week onsite and submitted to your Regional Safety Officer)
- ✓ Activity Hazard Analysis (AHA) template



LEVEL 2 HEALTH AND SAFETY PLAN

Site Name: Seaford Gas Co. Site (DE-0061)	Site Contact: Dave Kane	Telephone: (302) 283-2251
Location: S. Shipley Street, Seaford, DE 19973	Client Contact: Bob Asreen (DNREC)	Telephone: (302) 395-2600
EPA ID No. DE-0061	Prepared By: Jacob Costello	Date Prepared: 10/18/2013
Project No. 103S257406	Dates of Activities: 10/31/2013-10/31/2014 (HASP is not valid for periods longer than 12 months)	Emergency Response <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Objectives: Perform the following field investigation at the Seaford Gas site: 1. Conduct groundwater sampling from monitor wells (to be installed). 2. Collect soil samples from undisturbed areas	Site Type: Check as many as applicable. <input type="checkbox"/> Active <input type="checkbox"/> Landfill <input type="checkbox"/> Inner-City <input checked="" type="checkbox"/> Inactive <input type="checkbox"/> Railroad <input checked="" type="checkbox"/> Rural <input checked="" type="checkbox"/> Secured <input type="checkbox"/> Residential <input type="checkbox"/> Remote <input type="checkbox"/> Unsecured <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Other (specify)	
Project Scope of Work and Site Background The Seaford Gas Site is listed on the contaminated sites at the Department of Natural Resources and Environmental Control – Site Investigation and Restoration Branch (DNREC-SIRB). The Seaford Gas Site is located within the town of Seaford, Delaware. The Site is located on the west side of S. Shipley Street and south of Harrington Street and consists of approximately 0.90 acre in industrial lands, bordered to the north by industrial park and to the south by a railroad line. The property is south of residential housing lots. Historically, the site was reportedly used as a coal gas plant. No wastes were known to be disposed of on site and in the mid-1980's, the site was listed as a no action recommended site by the EPA. No work has been conducted at the site since that time. Tetra Tech anticipates the field activities for the field investigation to include the following activities: 1. Site Mobilization/Demobilization 2. Install soil borings/monitoring wells. 3. Collect soil and groundwater samples. 4. Investigation Derived Waste (IDW) Management 5. Decontamination The following table shows a summary of field activities for the current project objectives.		



SUMMARY OF FIELD INVESTIGATION ACTIVITIES AT SEAFORD GAS

Proposed Activity	Purpose	Proposed Sampling Activities
Perform site setup activities	Support field investigation activities	<ul style="list-style-type: none"> Coordinate sample activity with property owner and contractors present on site. Research previous Field Activities to determine extent of sampling.
Groundwater Sampling	To evaluate the presence of contaminants in groundwater. The data will be used to develop the No Further Action Report, if possible.	<ul style="list-style-type: none"> Install and develop Monitor wells on site. Collect groundwater samples using pump Analyze samples for VOCs, SVOCs, and Metals
Soil Sampling	To evaluate the presence of contaminants in soil.	<ul style="list-style-type: none"> Collect soil samples by Geoprobe methods to a depth of 15 to 20 ft. below grade

Health and Safety Approver Comments or Additional Instructions: Ensure that the entire area has been adequately surveyed and marked for ALL utilities and that no intrusive work is conducted within the margin of error of the survey. ONLY subcontractors (i.e. drilling) that have been pre-approved by Tetra Tech and (if required) the client may be utilized. Further, subcontractors MUST complete their own HASP and provide JSA/AHAs for EACH of their assigned tasks,

Health and Safety Plan Approver Signature:

Date:

Note: A minimum of two persons with appropriate training and medical surveillance must be on site for any fieldwork subject to Level 2 HASP requirements.
 Note: A detailed site sketch or figure may be included on Page 10 of 12.



Initial Isolation and Protective Action Distances (for emergency response operations only): NA

Initial Isolation Distance: This zone should extend in all directions; 660 feet for unknown hazards and 0.5 mile for tanker truck or rail car incidents.
 NOTE: Keep a maximum distance away for unknown sites until the identity of the materials is determined.

Subsequent Isolation and Protection Action Zones Based on Air Monitoring Results:

NOTE: Distance at sites with unknown hazards should be increased, if necessary, based on air monitoring results.

Wind Speed and Direction (Approach from upwind)		Temperature (°F)	Relative Humidity (%)	Probability of Precipitation (%)	Weather Forecast (such as partly cloudy, snow, etc.)
Speed (mph):	From Direction:	varies	varies	varies	varies

On-Site Supplies: First Aid Kit Fire Extinguisher Air Horn Oral Thermometer Noise Dosimeter

Known or Anticipated Site Hazards or Concerns: (Hazards covered by existing Safe Work Practices are listed on the next page)

<input type="checkbox"/> Work on active roadway	<input checked="" type="checkbox"/> Overhead utilities	<input type="checkbox"/> Energized electrical systems
<input type="checkbox"/> Onsite laboratory	<input checked="" type="checkbox"/> Buried Utilities	<input checked="" type="checkbox"/> Portable hand tool use
<input type="checkbox"/> Explosion or fire hazard	<input type="checkbox"/> Surface or underground storage tanks	<input type="checkbox"/> Portable electrical tool use
<input type="checkbox"/> Oxygen deficiency	<input checked="" type="checkbox"/> General slips, trips, falls	<input type="checkbox"/> Machine guarding
<input checked="" type="checkbox"/> Unknown or poorly characterized chemical hazards	<input checked="" type="checkbox"/> Uneven, muddy, rugged terrain	<input checked="" type="checkbox"/> Portable fire extinguisher use
<input checked="" type="checkbox"/> Inorganic chemicals	<input type="checkbox"/> Lift (man lift, cherry picker) use	<input checked="" type="checkbox"/> Driving commercial vehicles
<input checked="" type="checkbox"/> Organic chemicals	<input type="checkbox"/> Industrial truck (forklift) use	<input checked="" type="checkbox"/> Driving personal vehicles
<input type="checkbox"/> Chemical warfare materiel	<input type="checkbox"/> Wood or metal ladder use	<input type="checkbox"/> Scientific diving operations
<input type="checkbox"/> Compressed Gas Cylinders	<input type="checkbox"/> Dangerous goods shipped by air	<input type="checkbox"/> Injury and Illness Prevention Program (California only)
<input type="checkbox"/> Asbestos	<input type="checkbox"/> Elevated work (over 6' high)	<input type="checkbox"/> Ergonomics (California only)
<input type="checkbox"/> Respirable particulates	<input type="checkbox"/> Heavy equipment use or operation	<input type="checkbox"/> Work in strip or shaft mines
<input type="checkbox"/> Respirable silica	<input type="checkbox"/> Construction work	<input type="checkbox"/> Client-specific safety requirements (attach to HASP)
<input type="checkbox"/> Blasting and explosives	<input type="checkbox"/> Excavation or trenching	<input type="checkbox"/> ATV use
<input type="checkbox"/> Non-ionizing radiation (lasers, radiofrequencies, UV)	<input type="checkbox"/> Benching, shoring, bracing	<input type="checkbox"/> Methamphetamine lab
<input type="checkbox"/> Ionizing radiation (alpha, beta, gamma, etc.)	<input type="checkbox"/> Scaffold use	<input type="checkbox"/> Working over or near water
<input checked="" type="checkbox"/> Heat stress	<input type="checkbox"/> High noise	<input type="checkbox"/> Mold
<input checked="" type="checkbox"/> Cold stress	<input type="checkbox"/> Grinding operations	<input checked="" type="checkbox"/> Other (insert) Insect Bites, Stings, etc.

Explosion or Fire Potential: High Medium Low Unknown



<p>Chemical Products Tetra Tech EM Inc. Will Use or Store On Site: (Attach a Material Safety Data Sheet [MSDS] for each item.)</p>			
<input checked="" type="checkbox"/> Alconox or Liquinox	<input type="checkbox"/> Calibration gas (Methane)	<input type="checkbox"/> Hydrogen gas	<input type="checkbox"/> Isopropyl alcohol
<input checked="" type="checkbox"/> Hydrochloric acid (HCl)	<input type="checkbox"/> Calibration gas (Isobutylene)	<input type="checkbox"/> Household bleach (NaOCl)	<input type="checkbox"/> HazCat Kit
<input type="checkbox"/> Nitric acid (HNO ₃)	<input type="checkbox"/> Calibration gas (Pentane)	<input type="checkbox"/> Sulfuric acid (H ₂ SO ₄)	<input checked="" type="checkbox"/> Eyewash (potable water)
<input type="checkbox"/> Sodium hydroxide (NaOH)	<input type="checkbox"/> Calibration gas (4-gas mixture)	<input type="checkbox"/> Hexane	<input type="checkbox"/> Other (specify) _____
<p>WARNING: Eyewash solution shall be readily available on ALL projects where corrosives (acids or bases) are used, including sample preservatives</p>			
<p>Applicable Safety Programs and Safe Work Practices (SWP). Attach to HASP:</p> <ul style="list-style-type: none"> <input type="checkbox"/> DCN 4-09 Haulage and Earth Moving <input type="checkbox"/> DCN 4-10 Lead Protection Program <input checked="" type="checkbox"/> SWP DCN 5-01 General Safe Work Practices <input checked="" type="checkbox"/> SWP DCN 5-02 General Safe Work Practices HAZWOPER <input checked="" type="checkbox"/> SWP DCN 5-03 Safe Work Practices for Office Employees <input checked="" type="checkbox"/> SWP DCN 5-04 Safe Drilling Practices <input checked="" type="checkbox"/> SWP DCN 5-05 Safe Direct Push (GeoProbe) Practices <input type="checkbox"/> SWP DCN 5-06 Working Over or Near Water <input type="checkbox"/> SWP DCN 5-07 Use of Heavy Equipment <input type="checkbox"/> SWP DCN 5-08 Special Site Hazards (Firearms, Remote Sites, Mines, aircraft, etc.) <input type="checkbox"/> SWP DCN 5-09 Safe Electrical Work Practices <input type="checkbox"/> SWP DCN 5-10 Fall Protection Practices <input type="checkbox"/> SWP DCN 5-11 Portable Ladder Safety <input checked="" type="checkbox"/> SWP DCN 5-12 Drum and Container Handling Practices <input type="checkbox"/> SWP DCN 5-13 Flammable Hazards and Ignition Sources <input type="checkbox"/> SWP DCN 5-14 Spill and Discharge Control Practices <input checked="" type="checkbox"/> SWP DCN 5-15 Heat Stress <input checked="" type="checkbox"/> SWP DCN 5-16 Cold Stress <input checked="" type="checkbox"/> SWP DCN 5-17 Biohazards <input type="checkbox"/> SWP DCN 5-18 Underground Storage Tank Removal Practices <input checked="" type="checkbox"/> SWP DCN 5-19 Safe Lifting Procedures <input type="checkbox"/> SWP DCN 5-22 Hydrographic Data Collection <input type="checkbox"/> SWP DCN 5-23 Permit-Required Confined Space Entry Practices <input type="checkbox"/> SWP DCN 5-24 Non-Permit-Required Confined Space Entry Practices <input checked="" type="checkbox"/> SWP DCN 5-26 Prevention of Sun Exposure <input type="checkbox"/> SWP DCN 5-27 Respirator Cleaning Practices <input type="checkbox"/> SWP DCN 5-28 Safe Use Practices for Use of Respirators <input type="checkbox"/> SWP DCN 5-29 Respirator Qualitative Fit Testing Procedures <input type="checkbox"/> SWP DCN 5-30 Laboratory Soil Testing Safe Work Practices <input checked="" type="checkbox"/> SWP DCN 5-35 Underground Utilities, including 5-35F, Ground Disturbance Permit <input checked="" type="checkbox"/> SWP DCN 5-36 Drill Rigs 		<p>Tasks Performed At Job Site that are NOT Covered by SWPs NOTE: Many AHA's can be found on the Health & Safety intranet site at: http://home.ttemi.com/C18/Activity%20Hazard%20Analysis%20Docum/default.aspx Attach Activity Hazard Analysis (AHA) for each non-covered task</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Direct-Push Apparatus Sampling <input checked="" type="checkbox"/> Monitoring Well Sampling (Pumping) <input checked="" type="checkbox"/> Soil Sampling <input checked="" type="checkbox"/> Observation Near Drill Rigs and Heavy Equipment <input type="checkbox"/> (non-covered task) 	
<p>Tetra Tech Employee Training and Medical Requirements:</p>			
<p>Basic Training and Medical</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Initial 40 Hour Training <input checked="" type="checkbox"/> 8-Hour Supervisor Training (one-time) <input checked="" type="checkbox"/> Current 8-Hour Refresher Training <input type="checkbox"/> Current Medical Clearance (including respirator use) <input checked="" type="checkbox"/> Current First Aid Training <input checked="" type="checkbox"/> Current CPR Training <input type="checkbox"/> Current Respirator Fit-Test 			
<p>Other Specific Training and Medical Surveillance Requirements</p> <ul style="list-style-type: none"> <input type="checkbox"/> Confined Space Training <input type="checkbox"/> Level A Training <input type="checkbox"/> Radiation Training <input type="checkbox"/> OSHA 10-hour Construction Safety Training <input type="checkbox"/> OSHA 30-hour Construction Safety Training <input type="checkbox"/> Asbestos Awareness Training <input type="checkbox"/> Asbestos B-Reader X-Ray <input type="checkbox"/> Blood Lead Level and ZPP Pre, during and Post-Project <input type="checkbox"/> Urinary Arsenic Level Pre and Post-Project <input type="checkbox"/> Other _____ <input type="checkbox"/> Other _____ 			



LEVEL 2 HEALTH AND SAFETY PLAN

Materials Present or Suspected at Site	Highest Observed Concentration (specify units and sample medium)	Exposure Limit (specify ppm or mg/m ³)	IDLH Level (specify ppm or mg/m ³)	Primary Hazards of the Material (explosive, flammable, corrosive, toxic, volatile, radioactive, biohazard, oxidizer, or other)	Symptoms and Effects of Acute Exposure	Photoionization Potential (eV)
SVOCs (PAHs and Associated)	No Data Available	Unknown	Unknown	Unknown	Unknown	N/A

Specify Information Sources: NIOSH Pocket Guide to Hazardous Chemicals, September 2005 and American Conference of Governmental Industrial Hygienists (ACGIH). "Threshold Limit Values and Biological Exposure Indices for 2012"

Note: In the Exposure Limit column, include Ceiling (C) and Short-Term Exposure Limits (STEL) if they are available. Also, use the following short forms and abbreviations to complete the table above.

A = Air
 CARC = Carcinogenic
 eV = Electron volt
 U = Unknown

IDLH = Immediately dangerous to life or health
 mg/m³ = Milligram per cubic meter
 NA = Not available
 NE = None established

PEL = Permissible exposure limit
 ppm = Part per million
 REL = Recommended exposure limit
 S = Soil

TLV = Threshold limit value
 MCL = Maximum Contaminant Level



LEVEL 2 HEALTH AND SAFETY PLAN

Note: If no contingency level of protection is selected, all employees covered under this plan must evacuate the immediate site area if air contaminant levels require upgrading PPE. Level A field work requires a Level 3 HASP. This information is available on the chemical hazards page of this HASP.

Field Activities Covered Under this HASP:

Task Description	Level of Protection ¹		Date of Activities
	Primary	Contingency	
1 Conduct groundwater sampling	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D	10/31/2013-10/31/2014
2 Conduct soil sampling	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D	
	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D	

Site Personnel and Responsibilities (include subcontractors):

Employee Name and Office Code / Location	Task(s)	Responsibilities
Jacob Costello / DE	1, 2	<ul style="list-style-type: none"> Project Manager: Manages the overall project, makes site safety coordinator (SSC) aware of pertinent project developments and plans, and maintains communications with client as necessary. Additionally, For projects lasting longer than one consecutive week on-site, the PM is responsible for conducting one field audit using Form AF-1. Field Team Leader: Directs field activities, makes site safety coordinator (SSC) aware of pertinent project developments and plans, and maintains communications with the Project Manager and the client as necessary Site Safety Coordinator (SSC): Ensures that appropriate personal protective equipment (PPE) is available, enforces proper use of PPE by on-site personnel and subcontractors; suspends investigative work if personnel are or may be exposed to an immediate health hazard; implements and enforces the HASP; identifies and controls site hazards when possible; communicates site hazards to all personnel; and reports any deviations observed from anticipated conditions described in the health and safety plan to the health and safety representative. Alternate Site Safety Coordinator (if any) Field Personnel: Completes tasks as directed by the project manager, field team leader, and SSC, and follows the HASP and all SWPs and guidelines established in the Tetra Tech, Inc., Health and Safety Manual. Tetra Tech-hired subcontractor personnel on site (a subcontract SSC MUST be identified by name): Completes tasks as outlined in the project scope of work in accordance with the contract. Participates in all Tetra Tech on-site safety meetings and follows all procedures and guidelines established in this HASP, as well as the company health and safety plan and program.
Dave Kane / DE	1, 2	
TBD / DE	1, 2	

Note:
1. See next page for details on levels of protection



NOTE: Contingency level of protection section should be completed only if the upgraded level of protection is immediately available at the job site. If no contingency level of protection is denoted, all employees covered under this HASP must evacuate the immediate site area if air contaminant levels would require an upgrade of PPE.

Protective Equipment: (Indicate type or material as necessary for each task.)				
Task	Primary Level of Protection (A,B,C,D)	PPE Component Description (Primary)	Contingency Level of Protection (A, B, C, D)	PPE Component Description (Contingency)
1	D	Respirator type: NA Cartridge type (if applicable): NA CPC material: NA Glove material(s): Nitrile Boot material: Steel-toe with boot covers Other: NA	D	Respirator type: NA Cartridge type (if applicable): NA CPC material: NA Glove material(s): Nitrile Boot material: Steel-toe with boot covers Other: NA
2		Respirator type: Cartridge type (if applicable): CPC material: Glove material(s): Boot material: Other:		Respirator type: Cartridge type (if applicable): CPC material: Glove material(s): Boot material: Other:
3		Respirator type: Cartridge type (if applicable): CPC material: Glove material(s): Boot material: Other:		Respirator type: Cartridge type (if applicable): CPC material: Glove material(s): Boot material: Other:

Respirator Notes:
Respirator cartridges may only be used for a maximum time of 8 hours or one work shift, whichever is less, and must be discarded at that time. For job sites with organic vapors, respirator cartridges may be used as described in this note as long as the concentration is less than 200 parts per million (ppm), the boiling point is greater than 70 °Celsius, and the relative humidity is less than 85 percent. If any of these levels are exceeded, a site-specific respirator cartridge change-out schedule must be developed and included in the HASP using Tetra Tech Form RP-2 (Respiratory Hazard Assessment Form)

Notes:
All levels of protection must include eye, head, and foot protection.
CPC = Chemical protective clothing
Thermoluminescent Dosimeter (TLD) Badges must be worn during all field activities on sites with radiation hazards. TLDs must be worn under CPC.



LEVEL 2 HEALTH AND SAFETY PLAN

Monitoring Equipment: All monitoring equipment on site must be calibrated before and after each use and results recorded in the site logbook				
Instrument (Check all required)	Task	Instrument Reading	Action Guideline	Comments
<input type="checkbox"/> Combustible gas indicator model:	<input type="checkbox"/> 1	0 to 10% LEL	Monitor; evacuate if confined space	
	<input type="checkbox"/> 2			
	<input type="checkbox"/> 3	10 to 25% LEL	Potential explosion hazard; notify SSC	
	<input type="checkbox"/> 4			
	<input type="checkbox"/> 5	>25% LEL	Explosion hazard; interrupt task; evacuate site, notify SSC	
<input type="checkbox"/> Oxygen meter model:	<input type="checkbox"/> 1	>23.5% Oxygen	Potential fire hazard; evacuate site	
	<input type="checkbox"/> 2			
	<input type="checkbox"/> 3	23.5 to 19.5% Oxygen	Oxygen level normal	
	<input type="checkbox"/> 4			
	<input type="checkbox"/> 5	<19.5% Oxygen	Oxygen deficiency; interrupt task; evacuate site; notify SSC	
<input type="checkbox"/> Photoionization detector model: <input type="checkbox"/> 11.7 eV <input type="checkbox"/> 10.6 eV <input type="checkbox"/> 10.2 eV <input type="checkbox"/> 9.8 eV <input type="checkbox"/> Other (specify): _____	<input type="checkbox"/> 1	Any response above background to 0.5 ppm above background	PPE > Level D is NOT Authorized	
	<input type="checkbox"/> 2			
	<input type="checkbox"/> 3			
	<input type="checkbox"/> 4			
	<input type="checkbox"/> 5			
<input type="checkbox"/> Other (specify): If available, use benzene-specific Drager tube (such as 6728561) with a lower detection limit of AT LEAST 0.5 ppm <input type="checkbox"/> Other (specify): If available, use vinyl chloride-specific Drager tube (such as 8101721) with a lower detection limit of AT LEAST 0.5 ppm	<input type="checkbox"/> 1	Any response above BG to 0.5 ppm above BG	Monitor worker breathing zone (BZ) areas.	
	<input type="checkbox"/> 2	> 0.5 to 1 ppm above background	> 1 ppm above BG, evacuate the area, retreat upwind to a safe area (where BG levels exist) and allow work area to ventilate to OUTDOORS using mechanical means (fans, pumps) if possible.	
	<input type="checkbox"/> 3			
	<input type="checkbox"/> 4			
	<input type="checkbox"/> 5	> 1 ppm above BG	If BZ readings remain > 1 ppm BG, retreat upwind and contact Health and Safety for further direction	

Notes: eV= electron volt LEL=Lower explosive limit mrem=Millirem PEL=Permissible exposure limit ppm=Part per million. Level B is required when chemical hazards are present, but are uncharacterized. Level C may be acceptable for certain tasks in some situations. If you are uncertain, consult your RSO.



LEVEL 2 HEALTH AND SAFETY PLAN

Project-Specific Industrial Hygiene Requirements	Emergency Contacts:	Telephone No.																		
<p>OSHA-Regulated Chemicals*: <i>Check any present on the job site in any medium (air, water, soil)</i></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> No chemicals below are located on the job site <input type="checkbox"/> Friable Asbestos <input type="checkbox"/> Silica, crystalline <input type="checkbox"/> alpha-Naphthylamine <input type="checkbox"/> Methyl chloromethyl ether <input type="checkbox"/> 3,3'-Dichlorobenzidine (and its salts) <input type="checkbox"/> bis-Chloromethyl ether <input type="checkbox"/> beta-Naphthylamine <input type="checkbox"/> Benzidine <input type="checkbox"/> 4-Aminodiphenyl <input type="checkbox"/> Ethyleneimine <input type="checkbox"/> beta-Propiolactone <input type="checkbox"/> 2-Acetylaminoflourene <input type="checkbox"/> 4-Dimethylaminoazobenzene <input type="checkbox"/> N-nitrosomethylamine <input type="checkbox"/> Vinyl chloride <input type="checkbox"/> Inorganic arsenic <input type="checkbox"/> Lead <input type="checkbox"/> Chromium (VI) <input type="checkbox"/> Cadmium <input type="checkbox"/> Benzene <input type="checkbox"/> Coke oven emissions <input type="checkbox"/> 1,2-Dibromo-3-chloropropane <input type="checkbox"/> Acrylonitrile <input type="checkbox"/> Ethylene oxide <input type="checkbox"/> Formaldehyde <input type="checkbox"/> Methylenedianiline <input type="checkbox"/> 1,3-Butadiene <input type="checkbox"/> Methylene chloride <p>* NOTE: Many states, including California and New Jersey, have chemical-specific worker protection requirements and standards for many chemicals and known or suspected carcinogens.</p>	<p>WorkCare and Incident Intervention 888.449.7787, or 800.455.6155</p> <p>Tetra Tech EMI 24-hour Anonymous Hazard Reporting Line 866.383.8070</p> <p>U.S. Coast Guard National Response Center 800.424.8802</p> <p>InfoTrac 800.535.5053</p> <p>Poison Control 800.222.1222</p> <p>Fire department 911</p> <p>Police department 911</p> <p>Personnel Call-Down List:</p> <table border="0"> <tr> <td colspan="2">Job Title or Position:</td> <td>Cell Phone:</td> </tr> <tr> <td>Regional Safety Officer</td> <td>Chris Draper</td> <td>615.969.1334</td> </tr> <tr> <td>Project Manager:</td> <td>Dave Kane</td> <td>302.283.2251</td> </tr> <tr> <td>Field Team Leader/</td> <td></td> <td></td> </tr> <tr> <td>Site Safety Coordinator (SSC):</td> <td>Jacob Costello</td> <td>302.420.7553</td> </tr> <tr> <td>Subcontractor SSC:</td> <td>N/A</td> <td></td> </tr> </table>	Job Title or Position:		Cell Phone:	Regional Safety Officer	Chris Draper	615.969.1334	Project Manager:	Dave Kane	302.283.2251	Field Team Leader/			Site Safety Coordinator (SSC):	Jacob Costello	302.420.7553	Subcontractor SSC:	N/A		
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Field Team Leader/																				
Site Safety Coordinator (SSC):	Jacob Costello	302.420.7553																		
Subcontractor SSC:	N/A																			
	<p>Medical and Site Emergencies:</p> <p>Signal a site or medical emergency with three blasts of a loud horn (car horn, fog horn, or similar device). Site personnel should evacuate to the area of safe refuge designated on the site map.</p> <p>Hospital Name: Nanticoke Memorial Hospital Address: 801 Middleford Road (Road 535), Seaford, DE</p> <p>General Phone: (302) 629-6611 Emergency Phone: (302) 629-6611 Ambulance Phone: 911</p> <p>Hospital called to verify emergency services are offered? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/></p> <p>Step-by-step Route to Hospital: (see Page 11 of 12 for route map)</p>																			

Note: This page must be posted on site.



Decontamination Procedures		Emergency Response Planning
<p>The site safety coordinator oversees implementation of project decontamination procedures and is responsible for ensuring they are effective.</p>		<p>During the pre-work briefing and daily tailgate safety meetings, all on-site employees will be trained in the provisions of emergency response planning, site communication systems, and site evacuation routes.</p>
<p>Personnel Decontamination</p> <p>Level D Decon - <input type="checkbox"/> Wet <input checked="" type="checkbox"/> Dry</p> <p>Level C Decon - <input type="checkbox"/> Wet <input type="checkbox"/> Dry</p> <p>Level B Decon – Briefly outline the level B decontamination methods to be used on a separate page attached to this HASP.</p> <p>Level A Decon – A Level 3 HASP is required. Notify your regional health and safety representative and health and safety director.</p>	<p>Decontamination Equipment</p> <p><input type="checkbox"/> Washtubs</p> <p><input type="checkbox"/> Buckets</p> <p><input type="checkbox"/> Scrub brushes</p> <p><input type="checkbox"/> Pressurized sprayer</p> <p><input checked="" type="checkbox"/> Detergent [Liquinox]</p> <p><input type="checkbox"/> Solvent [Type]</p> <p><input type="checkbox"/> Household bleach solution Concentration/Dilution: _____</p> <p><input type="checkbox"/> Deionized water</p> <p><input type="checkbox"/> Disposable sanitizer wipes</p> <p><input type="checkbox"/> Facemask sanitizer powder</p> <p><input type="checkbox"/> Wire brush</p> <p><input checked="" type="checkbox"/> Spray bottle</p> <p><input type="checkbox"/> Tubs / pools</p> <p><input type="checkbox"/> Banner/barrier tape</p> <p><input type="checkbox"/> Plastic sheeting</p> <p><input type="checkbox"/> Tarps and poles</p> <p><input checked="" type="checkbox"/> Trash bags</p> <p><input type="checkbox"/> Trash cans</p> <p><input type="checkbox"/> Duct tape</p> <p><input checked="" type="checkbox"/> Paper towels</p> <p><input type="checkbox"/> Folding chairs</p> <p><input checked="" type="checkbox"/> Other (Liquinox)</p>	<p>In the event of an emergency that necessitates evacuation of a work task area or the site, the following procedures will take place.</p> <ul style="list-style-type: none"> • The Tetra Tech SSC will contact all nearby personnel using the on-site communications to advise the personnel of the emergency. • The personnel will proceed along site roads to a safe distance upwind from the hazard source. • The personnel will remain in that area until the SSC or an authorized individual provides further instructions. <p>In the event of a severe spill or a leak, site personnel will follow the procedures listed below.</p> <ul style="list-style-type: none"> • Evacuate the affected area and relocate personnel to an upwind location. • Inform the Tetra Tech SSC, a Tetra Tech office, and a site representative immediately. • Locate the source of the spill or leak, and stop the flow if it is safe to do so. • Begin containment and recovery of spilled or leaked materials. • Notify appropriate local, state, and federal agencies. <p>In the event of severe weather, site personnel will follow the procedures listed below.</p> <ul style="list-style-type: none"> • Site work shall not be conducted during severe weather, including high winds and lightning. • In the event of severe weather, stop work, lower any equipment (drill rigs) and evacuate the affected area. • Severe weather may cause heat or cold stress. Refer to SWPs 5-15 and 5-16 for information on both. <p>All work-related incidents must be reported. According to TTEM's reporting procedures, for non-emergency incidents you should:</p> <ul style="list-style-type: none"> • Notify WorkCare and Incident Intervention at 888.449.7787, or 800.455.6155 • Notify your Project Manager or Safety Manager via phone immediately. • Complete a "Tetra Tech Incident Report" (Form IR) within 24 hours and send it to your RSO. If an injury or illness has occurred, the Form IR-A and the WorkCare HIPAA form must be completed at the same time the Form IR is completed.
<p>Equipment Decontamination</p> <p>All tools, equipment, and machinery from the Exclusion Zone (hot) or Contamination Reduction Zone (warm) are decontaminated in the CRZ before they are removed to the Support Zone (cold). Equipment decontamination procedures are designed to minimize the potential for hazardous skin or inhalation exposure, cross-contamination, and chemical incompatibilities.</p>		
<p>Respirator Decontamination</p> <p>N/A</p>		
<p>Waste Handling for Decontamination</p> <p>Procedures for decontamination waste disposal meet all applicable local, state, and federal regulations.</p>		

Site Map (May be drawn after crews arrive onsite or inserted using aerial photographs, site figures, etc.):





Hospital Route Map (attach or insert):

Directions from Seaford Gas Site to Beebe Medical Center:

1. Start out going north on S Shipley Street toward Pennsylvania Avenue.
2. Turn right onto Pennsylvania Avenue.
3. Stay straight on Pennsylvania Avenue (becomes High Street).
4. Stay straight on High Street (becomes Middleford Road).
5. Nanticoke Memorial Hospital is on the right.

Note: A dry-run should be conducted to establish a physical location associated with the map included in the HASP. Verbal verification from the hospital emergency room should also be obtained to ensure that the hospital will accept chemically contaminated patients.

Hospital Route Map



A. Seaford Gas Site (Address: S. Shipley Street, Seaford, DE)

B. Nanticoke Memorial Hospital (Address: 801 Middleford Road (Road 535), Seaford, DE)



VOLUNTARY PROTECTION PROGRAM



Management Leadership

Lead by example. Good managers recognize the benefits of a strong safety program and ensure that their personnel and subcontractors have the right tools, equipment, and attitude to work safely.

Some areas where effective management leadership for safety can be demonstrated include:

- Provide visible safety leadership - start meetings with a safety topic, integrate safety into planning, scheduling, and budgeting processes, take personal action to resolve safety issues.
- Become involved in incident reporting, investigation, corrective action - share lessons learned.
- Include subcontractors in your safety program and oversee their work.

Employee Involvement

Get involved! Take personal action and work directly with your supervisor daily to identify, control, or eliminate potential safety hazards.

Other ways to become involved in the safety program and improve work conditions include:

- Initiate hazard reports to identify hazards, suggest improvements, and recognize safe behaviors
- Participate in safety meetings and worksite safety inspections (daily, weekly, monthly, and quarterly)
- Participate in incident reports, investigations, corrective actions, and Lessons Learned

Worksite Analysis

The process of identifying and evaluating potential hazards is a critical element in achieving zero incidents and creating low risk and hazard-free work areas.

Worksite analysis methods used to identify and evaluate potential hazards include:

- Safety inspections (daily, weekly, monthly, and quarterly)
- Develop or review safe work procedures, AHA's, and the HASP
- Monitoring for air quality, heat stress, noise, ergonomics and other job hazards

Hazard Prevention and Control

Eliminating hazards from your job, preventing new hazards, and controlling known hazards are fundamental parts of the projects safety program.

Important points include:

- Control hazards by:
 - Installing and maintaining **Engineering Controls**
 - Following **Administrative/Work Practice Controls** (HASP, AHAs, and safe work practices)
 - Specifying and wearing **Personal Protective Equipment** where needed
- Perform integrated safety reviews for new or modified work tasks
- Consult with qualified medical and safety professionals as needed

Safety and Health Training

Effective safety training is an important element in incident prevention. Remember, if you are unfamiliar with the work or feel that you don't have the necessary training, speak up and notify your team leader or project manager.

Safety training methods that may be used at the project include:

- New employee orientation, including HASP and task-specific training
- Project meetings, daily briefings, and/or task briefings
- Lessons learned and monthly safety communications

DEFINITIONS AND NOTES

Emergency Contacts

WorkCare - For issues requiring an Occupational Health Physician; assistance is available 24 hours per day, 7 days per week.

InfoTrac - For issues related to incidents involving the transportation of hazardous chemicals; this hotline provides accident assistance 24 hours per day, 7 days per week

U.S. Coast Guard National Response Center - For issues related to spill containment, cleanup, and damage assessment; this hotline will direct spill information to the appropriate state or region

Poison Control Center - For known or suspected poisoning.

Limitations:

The Level-Two HASP is not appropriate in some cases:

- Projects involving unexploded ordnance (UXO), radiation sources as the primary hazard, or known chemical/biological weapons site must employ the Level 3 HASP
- Projects of duration longer than 90 days may need a Level 3 HASP (consult your RSO)

Decontamination:

Decontamination Solutions for Chemical and Biological Warfare Agents^a: PPE and equipment can be decontaminated using 0.5 percent bleach (1 gallon laundry bleach to 9 gallons water) for biological agents (15 minutes of contact time for anthrax spores; 3 minutes for others) followed by water rinse for chemical and biological agents. In the absence of bleach, dry powders such as soap detergents, earth, and flour can be used. The powders should be applied and then wiped off using wet tissue paper. Finally, water and water/soap solutions can be used to physically remove or dilute chemical and biological agents. Do not use bleach solution on bare skin; use soap and water instead. Protect decontamination workers from exposure to bleach.

Decontamination for Radiological and Other Chemicals: Primary decontamination should use Alconox and water unless otherwise specified in chemical specific information resources. The effectiveness of radiation decontamination should be checked using a radiation survey instrument. Decontamination procedures should be repeated until the radiation meter reads less than 100 counts per minute over a 100-square-centimeter area when the probe is held 1 centimeter from the surface and moving slower than 2.5 centimeters per second.

Decontamination Corridor: The decontamination setup can be adjusted to meet the needs of the situation. The decontamination procedures can be altered to meet the needs of the specific situation when compound- and site-specific information is available.

Decontamination Waste: All disposable equipment, clothing, and decontamination solutions will be double-bagged or containerized in an acceptable manner and disposed of with investigation-derived waste.

Decontamination Personnel: Decontamination personnel should dress in the same level of PPE or one level below the entry team PPE level.

All investigation-derived waste should be left on site with the permission of the property owner and the EPA on-scene coordinator. In some instances, another contractor will dispose of decontamination waste and investigation-derived waste. DO NOT place waste in regular trash. DO NOT dispose of waste until proper procedures are established.

Notes:

^a Source: Jane's Information Group. 2002. *Jane's Chem-Bio Handbook*. Page 39.



TETRA TECH, INC.
DAILY TAILGATE SAFETY MEETING FORM

Date: _____ Time: _____ Project No.: _____

Client: _____ Site Location: _____

Site Activities Planned for Today: _____

Weather Conditions: _____

Safety Topics Discussed	
Protective clothing and equipment:	
Chemical and physical hazards:	
Emergency procedures:	
Equipment hazards:	
Other:	
Attendees	
Printed Name	Signature

Meeting Conducted by:

 Name

 Signature



TETRA TECH EM INC.
HEALTH AND SAFETY PLAN AMENDMENT

Site Name: _____

Amendment Date: _____

Purpose or Reason for Amendment: _____

Required Additional Safe Work Practices or Activity Hazard Analyses: _____

Required Changes in PPE: _____

Action Level Changes: _____

AMENDMENT APPROVAL

RSO or Designee	_____	_____	_____
	Name	Signature	Date

Site Safety Coordinator	_____	_____	_____
	Name	Signature	Date

Date presented during daily site safety meeting: _____



TETRA TECH, INC.
FIELD AUDIT CHECKLIST

Project Name: _____ Project No.: _____

Field Location: _____ Completed by: _____

Project Manager: _____ Site Safety Coordinator: _____

General Items		In Compliance?		
		Yes	No	NA
Health and Safety Plan Requirements				
1	Approved health and safety plan (HASP) on site or available			
2	Names of on-site personnel recorded in field logbook or daily log			
3	HASP compliance agreement form signed by all on-site personnel			
4	Material Safety Data Sheets on site or available			
5	Designated site safety coordinator physically present on jobsite			
6	Daily tailgate safety meetings conducted and documented on Form HST-2			
7	Documentation available proving compliance with HASP requirements for medical examinations, fit testing, and training (including subcontractors)			
8	HASP onsite matches scope of work being conducted			
9	Emergency evacuation plan in place and hospital located			
10	Exclusion, decontamination, and support zones delineated and enforced			
11	HASP attachments present onsite (VPP sheet, audit checklist, AHA, etc.)			
12	Illness and injury prevention program reports completed (California only)			
Emergency Planning				
13	Emergency telephone numbers posted			
14	Emergency route to hospital posted			
15	Local emergency providers notified of site activities			
16	Adequate safety equipment inventory available			
17	First aid provider and supplies available			
18	Eyewash solution available when corrosive chemicals are present			
Air Monitoring				
19	Monitoring equipment specified in HASP available and in working order			
20	Monitoring equipment calibrated and calibration records available			
21	Personnel know how to operate monitoring equipment and equipment manuals available on site			
22	Environmental and personnel monitoring performed as specified in HASP			

Safety Items		In Compliance?		
Personal Protection		Yes	No	NA
23	Splash suit, if required			
24	Chemical protective clothing, if required			
25	Safety glasses or goggles (always required)			
26	Gloves, if required			
27	Overboots, if required			
28	Hard hat (always required)			
29	High visibility vest, if required			
30	Hearing protection, if required			
31	Full-face respirator, if required			
Instrumentation				
32	Combustible gas meter and calibration notes			
33	Oxygen meter and calibration notes			
34	Organic vapor analyzer and calibration notes			
Supplies				
35	Decontamination equipment and supplies			
35	Fire extinguishers			
37	Spill cleanup supplies			
Corrective Action Taken During Audit:				

Note: NA = Not applicable

Auditor's Signature

Site Safety Coordinator's Signature

Date

		ACTIVITY HAZARD ANALYSIS (AHA)	
		Tetra Tech EM Inc.	
Monitoring Well Sampling (Pumping)			
Task Description			
<p>This Activity Hazard Analysis (AHA) applies to collection of grab groundwater samples. It has been developed and approved by the Health and Safety Department. The AHA identifies potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.</p>			
Hazards		Actions	
Task Steps Site preparation	Potential Hazards SLIP/TRIP/FALL LIFTING – SPRAIN/STRAIN	Critical Safety Procedures and Controls <ul style="list-style-type: none"> • Visually inspect the area for slippery spots or debris and correct if found • Wear steel-toed, non-skid boots in accordance with Tetra Tech EMI policy • Use proper lifting techniques (lift with legs not back) 	
Open well and measure depth to water and/or bottom	EMPLOYEE EXPOSURE	<ul style="list-style-type: none"> • Use PID or FID to monitor well for vapors in well head and breathing zone. • Wear safety glasses and nitrile gloves to protect against splash 	
Connecting and disconnecting pump to tubing and power source	LACERATION ELECTRICAL SHOCK	<ul style="list-style-type: none"> • Use double-bladed cutting tool to open acetate sleeve – USE EXTREME CAUTION • Cut tubing away from self or other personnel • Use caution and follow manufacturer’s instructions when connecting to vehicle battery or portable generator and when adding fuel to generator tank. 	
Purging and sampling and sample handling	EMPLOYEE EXPOSURE LACERATION SLIP/TRIP/FALL LIFTING – SPRAIN/STRAIN	<ul style="list-style-type: none"> • Use PID or FID to monitor breathing zone • Wear safety glasses and nitrile gloves • Handle glass containers carefully; dispose of any broken glass shards • Use proper lifting techniques, including obtaining help with heavy coolers 	
Equipment to be Used <ul style="list-style-type: none"> • Specified PPE • Sampling equipment, pumps, bottle ware, etc. • Air monitoring equipment IAW site HASP • First aid kit & eye wash 	Inspection Requirements <ul style="list-style-type: none"> • PPE prior to use • Inspect and calibrate any monitoring equipment 	Training Requirements <ul style="list-style-type: none"> • As specified in site HASP 	

 Tetra Tech, Inc.	ACTIVITY HAZARD ANALYSIS (AHA)	
	Tetra Tech EM Inc.	
	Soil Sampling	
Task Description		
<p>This Activity Hazard Analysis (AHA) applies to collection of grab soil samples. It has been developed and approved by the Director of Health and Safety for Tetra Tech EMI. The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.</p>		
Hazards		Actions
Task Steps	Potential Hazards	Critical Safety Procedures and Controls
Set up equipment at sampling location	SLIP/TRIP/FALL BACK STRAIN/SPRAIN	<ul style="list-style-type: none"> • Visually inspect the area for slippery spots or debris and correct if found • Wear steel-toed, non-skid boots in accordance with Tetra Tech EMI policy • Use proper lifting techniques (lift with legs not back)
Dig to appropriate depth with appropriate tools	SLIP/TRIP/FALL BACK STRAIN/SPRAIN	<ul style="list-style-type: none"> • Wear steel-toed, non-skid boots in accordance with Tetra Tech EMI policy • Use proper digging techniques • Wear gloves
Extract Soil	EMPLOYEE EXPOSURE	<ul style="list-style-type: none"> • Wear safety glasses and nitrile gloves
Fill sample bottles with sample material, load coolers and IDW (if appropriate) into vehicle	LACERATION	<ul style="list-style-type: none"> • Handle all glass containers carefully • Have a first aid kit on-site available

		<p>for small cuts</p> <ul style="list-style-type: none"> • Dispose of all broken shards immediately
<p>Store sample containers in coolers and load onto vehicles</p>	<p>SLIP/TRIP/FALL</p> <p>BACK STRAIN/SPRAIN</p>	<ul style="list-style-type: none"> • Ensure all debris has been removed from the path of travel • Use proper lifting techniques, including obtaining help with heavy coolers
<p><u>Equipment to be Used</u></p> <ul style="list-style-type: none"> • Level D PPE (steel-toed boots, safety glasses, nitrile gloves) • Reflective safety vest if in areas of vehicle traffic • First Aid Kit • Disposable scoop • Hand Auger • Shovel 	<p><u>Inspection Requirements</u></p> <ul style="list-style-type: none"> • None 	<p><u>Training Requirements</u></p> <ul style="list-style-type: none"> • Safe Lifting Procedures • Personal Protective Equipment • Hazardous Waste Operations and Emergency Response (40-hour and current 8-hour update) • CPR/First Aid (one employee on-site must have current CPR/First Aid training)



STATE OF DELAWARE
 DEPARTMENT OF NATURAL RESOURCES
 & ENVIRONMENTAL CONTROL
 DIVISION OF WASTE AND HAZARDOUS SUBSTANCES
 391 LUKENS DRIVE
 NEW CASTLE, DELAWARE 19720-2774

SITE INVESTIGATION &
 RESTORATION SECTION

TELEPHONE: (302) 395 - 2600
 FAX No.: (302) 395 - 2601

February 24, 2015

Mr. David R. De Caro, Strategic Projects Director
 Chesapeake Utilities Corporation
 909 Silver Lake Boulevard
 Dover, DE 19904

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED
 7014 1200 0000 3589 1120

**RE: Voluntary Cleanup Program (VCP) Application
 Seaford Town Gas Site (DE-0061)**

Dear Mr. De Caro:

The purpose of this letter is to notify Chesapeake Utilities Corporation of its liability, pursuant to Section 9105 of the Delaware Hazardous Substance Cleanup Act, 7 Del. C., Chapter 91 (HSCA), with respect to the Seaford Town Gas Site (the "Site"), located at Budd Street in Seaford. The approximate 0.79 acre Site is identified on the tax maps of Sussex County as tax parcel number 5-31-13.00-0006.00. As an owner of the Site, Chesapeake Utilities Corporation is a potentially responsible party (PRP) as defined in Section 9103(23) of HSCA.

The Delaware Department of Natural Resources and Environmental Control (DNREC) has documented the release or threatened release of hazardous substances, pollutants, or contaminants at the above-referenced Site. DNREC believes that further action is required under HSCA. The basis of the Department's position includes, but is not limited to, the presence of hazardous substances, including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and heavy metals at the Site.

Section 9109 of HSCA grants the Secretary of DNREC power to require PRPs to undertake response actions. However, DNREC encourages PRPs to enter into voluntary agreements to provide appropriate responses to prevent threats to public health and welfare or the environment.

In July 1995, the Department amended HSCA and established a Voluntary Cleanup Program (VCP) to address sites which satisfy the "Site Eligibility Requirement" as outlined in the document entitled "An Introduction to Delaware's Voluntary Cleanup and Brownfield Programs" (March 1998). The VCP approach allows a remedy, as defined in the Regulations, to be performed under the authority of 7 Del. C., Chapter 91, under a streamlined agreement. The Seaford Town Gas Site is one such site that would qualify to perform a remedy under the VCP. The VCP allows for an expedited cleanup process with reduced transaction costs. More

Delaware's good nature depends on you!

Mr. David R. De Caro
February 24, 2015
Page 2 of 2

information about the VCP is available at

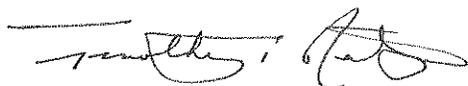
http://www.dnrec.delaware.gov/dwhs/SIRB/Pages/Voluntary_Cleanup_Program.aspx

Please review the enclosed VCP application carefully and contact the Department with any questions. If you wish to participate in the VCP, please respond with a willingness to proceed **within thirty (30) days of your receipt of this notice letter**. Meetings will take place at the DNREC office at 391 Lukens Drive in New Castle, Delaware.

If we do not hear back from you within this timeframe, DNREC intends to take any enforcement action under applicable law to require that a remedy be performed at the Site. This will include scheduling a hearing to issue a Secretary's Order to require to Chesapeake Utilities Corporation implement a remedy at the Site.

If you have any questions pertaining to this letter or the provisions of HSCA, please contact Robert Asreen of my staff or me at (302)395-2600.

Sincerely,



Timothy Ratsep
Environmental Program Administrator

EML/TTR:vdh
EML15026.doc
DE 0061 II H 3

Enclosures: VCP Application

pc: Paul Will Environmental Program Manager, DNREC-SIRS (w/o Enclosures)
Robert Asreen, Project Manager, DNREC-SIRS (w/o Enclosures)
Robert Phillips, Deputy Attorney General
Robert Newsome, Public Information Officer
Elizabeth LaSorte, Paralegal

**VOLUNTARY CLEANUP PROGRAM AGREEMENT FOR FACILITY
EVALUATION/REMEDIAL INVESTIGATION
FEASIBILITY STUDY/INTERIM ACTION/REMEDIAL DESIGN/REMEDIAL
ACTION**

IN THE MATTER OF
Seaford Town Gas Site (DE-0061)
AND
Chesapeake Utilities Corporation

AGREEMENT

This Voluntary Cleanup Program (“VCP”) Agreement is entered into by Chesapeake Utilities Corporation (hereinafter “Respondent”) and the Department of Natural Resources & Environmental Control (hereinafter “DNREC” or “Department”) pursuant to the Hazardous Substance Cleanup Act (“HSCA”), 7 Del.C. Chapter 91 and the Delaware Regulations Governing Hazardous Substance Cleanup (“Regulations”).

FINDINGS OF DNREC

1. The property that is the subject of this Agreement, the former Seaford Town Gas location, Budd Street, Seaford, Delaware, 19973, comprised of approximately 0.79 acres, being Sussex County Tax Parcel 5-31-13.00-0006.00 (hereinafter “the Site”), is owned by Chesapeake Utilities Corporation. The Site is bounded generally by property zoned as light industrial now or formerly owned by Parsons Brothers and railroad tracks. At the present time the Site encompasses the referenced 0.79 acre property owned by Respondent. The Site boundaries may change based upon the results of the investigation.
2. The Department believes that further investigation should be performed to determine whether a cleanup at the Site is necessary.
3. The intent of this Agreement is to allow Respondent to conduct the activity(s) outlined herein with oversight from the Department and in accordance with the guidance documents described below in Paragraph 5. Respondent has indicated to the Department in its (application or letter) dated April 3, 2015, that it wishes to conduct the following activity(s) at the Site with the Department’s oversight:

Additional sampling and investigation of the Seaford Town Gas Site, DE-0061.
4. By entering into this Agreement, Respondent does not admit to any fact, fault, or liability under any statute, regulation, or common law for conditions which existed before, during, or after Respondent’s execution of this Agreement.

Now therefore, based on the foregoing findings and pursuant to 7 Del. C., Chapter 91 and the Regulations, the Department and Respondent hereby agree that, in order to protect public health, welfare and the environment, the following actions shall be taken at the Site:

I. RESPONSE ACTION

5. All remedial activity(s) conducted pursuant to this Agreement shall be done in accordance with the Regulations and the following guidance documents:
 - a. Standard Operating Procedures for Chemical Analytical Programs.
 - b. All applicable Policies, Procedures and/or Guidance in accordance with HSCA and the Regulations.
6. Unless otherwise expressly stated, the definitions provided in the Regulations shall control the meaning of terms used in this Agreement.
7. The Department approves Duffield Associates as the Consultant and its designated laboratory as required under Paragraph 10 of this Agreement. Respondent shall conduct the activities consistent with the DNREC approved Conceptual Site Model (CSM) and Sampling and Analysis Plan (SAP) as attached hereto as Exhibit "A". If Respondent desires to conduct any additional phases of work at the Site beyond what is called for in the SAP, Respondent shall submit a new or revised or amended SAP for the implementation of such additional phases of the work, when appropriate, for the Department's review and approval. The Work to be undertaken by Respondent shall be in accordance with the Schedule attached hereto as Exhibit "B".
8. The Department reserves the right to request any amendments to the SAP during the course of the scheduled Work if conditions arise which were not expected at the time of the Department's approval of the SAP. It is understood and agreed by the parties that any such amendments shall be governed by the Regulations and guidance documents in effect as referenced above in Paragraph 5.
9. Within thirty (30) calendar days after the Department's receipt of any submission pursuant to the SAP, the Department will inform Respondent in writing of any deficiencies in the submission, as determined pursuant to HSCA, the Regulations, and the guidance documents, that will prevent the Department from conducting its review. The Department will notify Respondent in writing of the timeframe required for the Department to complete the review.
10. Within seven (7) days after the effective date of this Agreement, Respondent will submit to the Department: a) the name, address and telephone number of the individual who will be the contact for Respondent regarding technical matters concerning this Agreement; b) the names and addresses of the designated agents for Respondent for the purpose of service for all matters concerning this Agreement including the name of the person who will receive the statement of account from the Department under Paragraph 13 of this Agreement; c) the name of the HSCA certified consulting firm; and, d) the name of the HSCA approved laboratory that will perform

the analytical work for the Department's approval. If the Respondent wishes to later change the consultant, Project Manager, or the laboratory which was initially approved, the Department's approval will be required for such change. All approvals under this paragraph shall be in writing.

11. Respondent may terminate this Agreement if it determines that it is no longer feasible or desirable to continue with the work required herein, when Respondent:

- a) Submits full payment to the Department for any oversight costs incurred by the Department pursuant to this Agreement which Respondent has not paid;
- b) Notifies the Department in writing of its intentions to terminate this Agreement at least ten (10) days prior to the date of such termination;
- c) Submits all data generated pursuant to this Agreement; and
- d) Certifies to DNREC that no environmental hazards exist at the Site as a result of Respondent's actions pursuant to this Agreement which did not exist prior to such actions, and receives DNREC's written concurrence as to such certification. Such concurrence will not be unreasonably withheld. If DNREC does not give such concurrence, Respondent shall comply with all reasonable directives by DNREC in order to remove any such environmental hazards.

II. PROJECT COORDINATION

12. Unless otherwise directed by the Department, Respondent shall submit two (2) copies of all documents required by this Agreement to the person identified below, who shall be the Project Manager for this Site and the Department's contact person for the Respondent for all matters concerning this Agreement.

Robert C. Asreen, Jr., 391 Lukens Drive, New Castle, DE 19720-2774

III. FINANCIAL OBLIGATIONS

13. Respondent shall pay to the Department all costs incurred by the Department in preparing this Agreement, in overseeing work at the Site, and in providing public information and conducting community relations about the site as well as in complying with any public notice, public hearing or comment provisions required or authorized by HSCA. Respondent shall submit a check to the Department in the amount of \$5,000.00 as a partial payment towards the estimated cost of preparing this Agreement and of oversight by the Department for the review of the CSM and SAP and for the work conducted in accordance with the SAP. The check shall be drawn in favor of the "Department of Natural Resources & Environmental Control." The Department will maintain an account in the name of the Site where this money will be deposited. Costs incurred by the Department will be drawn against this account. Following the effective date of this Agreement, the Department will send Respondent a current statement of Respondent's account once every quarter. Whenever the Department determines that the funds in the account are not sufficient to cover the Department's

estimated future costs for the next thirty (30) days, the Department will send Respondent a current statement of Respondent's account along with the estimated future costs and a request for a deposit of an additional \$5,000.00, or an amount of additional funds sufficient to cover the Department's estimated future costs for the next quarter, whichever is greater. Within thirty (30) days of this request, Respondent shall submit a check to the Department, in the amount of the request and payable as set out before, for deposit into the Site account. The Department will draw upon these funds to cover the Department's actual costs as they are incurred during that next quarter. Failure to comply with any of these financial terms will result in the Department suspending further work on the Site until the required payment is received. After completion of all work required by this Agreement and any required public notice and comment as required by HSCA, the Department will return to Respondent any funds which remain in the Site account after all costs, as described above, have been paid to the Department, along with a final accounting of all costs incurred by DNREC and all transactions in the Site account. Before beginning any additional phases of the work beyond that called for herein, a check for the cost of the work and related matters for the next quarter estimated by the Department, less any balance unused from the Site account, shall be submitted by Respondent. Respondent's accountant's name is Matt Dewey, Director of Shared Accounting Services. His phone number is 302-734-6736.

14. Oversight costs, may include, but are not limited to, costs incurred by the Department after complete execution of the VCP Agreement in overseeing Respondent's implementation of the requirements of this Agreement, and activities performed by the Department at the Site as part of the investigation, study and cleanup, in providing public information and conducting community relations, and in complying with any public notice, public hearing or public comment provisions required or authorized by HSCA. Costs shall include all direct and indirect costs, including but not limited to, time and travel costs of the Department personnel, and associated indirect costs, contractor costs, collection and analysis of split samples, Site visits, inspection of field activities and review and approval or disapproval of reports.

VI. RESERVATION OF RIGHTS

15. The Department reserves the right to unilaterally terminate this Agreement in the event that: a) Respondent violates or fails to meet any terms or obligations of this Agreement, b) the Site becomes an imminent threat to public health, welfare, or the environment, c) the Department determines that satisfactory progress is not being made at the Site, d) Respondent declines to implement the Work Plan after being notified by the Department that it has been approved, or e) Respondent declines to amend the Work Plan to incorporate any amendments requested by the Department. The Department's termination of this Agreement shall be effective ten (10) days after notifying the Respondent in writing of its intention to terminate, except as provided in Subparagraph b) above in which event any notice of termination shall become effective immediately.

16. Except as provided in Paragraph 26 below, nothing herein, including any document the Department issues as may be called for herein, shall be interpreted to constitute a release or waiver of liability for any of the conditions which existed before, during, or after the Department's execution of this Agreement.

V. GENERAL CONDITIONS

17. Respondent shall, in addition to any other obligation required by law, notify the Department contact person immediately upon knowledge of any condition at the Site which poses an immediate threat to public health and/or the environment.
18. Respondent shall perform all work conducted pursuant to this Agreement in accordance with HSCA, the Regulations, the guidance documents, and applicable professional standards.
19. Respondent shall conform all actions required by this Agreement with all applicable federal, State and local laws and regulations.
20. Nothing in this Agreement shall relieve Respondent from its obligation to comply with all other applicable laws and regulations.
21. Respondent shall preserve all potential evidentiary documentation or materials found at the Site which may provide a nexus between the contaminated Site and any potentially responsible party, or lead to the discovery of other areas of potential contamination at the Site, including without limitation, documents, labels, drums, bottles, boxes or other containers, and/or other physical materials that could lead to the establishment of the identity of any person who generated, treated, transported, stored or disposed of hazardous substances at the Site, until written approval is received from the Department to do otherwise. The Department shall provide the Respondent with such written approval within a reasonable period of time after Respondent informs the Department of the existence of potential evidentiary documentation or materials.
22. Respondent shall submit to the Department all data and information concerning contamination at the Site, including technical records and contractual documents, and raw sampling and monitoring data, developed pursuant to this Agreement. If Respondent believes any such data or information is protected by a confidence and/or privilege, it shall retain the data and information and notify the Department in writing of the general nature of the document and the privilege claimed. Respondent may request that the Department keep information contained in a submission to the Department confidential pursuant to 29 Del. C. Chapter 100.
23. This Agreement shall be governed and interpreted under the laws of the State of Delaware.
24. This Agreement shall be binding, jointly and severally, on each signatory, its successors and assignees. No change in the ownership, corporate, or business status of any signatory, or of the Site, shall alter any signatory's responsibilities under this Agreement.
25. Respondent shall indemnify the State of Delaware, its agencies, departments, agents and employees and hold them harmless from any and all claims or causes of action arising from or on account of acts or omissions of Respondent, assignees, or any persons including, but not limited to, firms, corporations, subsidiaries, and contractors in carrying out activities under this Agreement. The State of Delaware, or any agency or authorized representative thereof, shall not

be held as a party to any contract entered into by Respondent in carrying out activities under this Agreement.

26. Upon successful completion of all activities required in the Scope of Work and SAP, the Department may issue Respondent a "Certification of Completion of Remedy" ("Certificate") if the Department determines that no additional activities are required to remedy contamination at the Site or protect public health, welfare or the environment. If the Department issues a Certificate, the Respondent shall have resolved its liability to the Department pursuant to 7 Del. C. Chapter 91 for conditions known by the Department to be existing on the Site at the time the Certificate is issued. Whether or not a Certificate is issued by the Department, upon successful completion of all activities required in the Scope of Work and SAP, and any amendments thereto, Respondent shall have resolved its liability to the Department pursuant to 7 Del. C. Chapter 91 for those activities addressed in the Scope of Work and SAP; provided, however, that the Department reserves the right to bring any appropriate enforcement action against Respondent for any portions of a remedy not addressed in the Scope of Work and SAP, and Respondent shall not have resolved its liability as to such other portions of a remedy at the Site. The Certificate will be considered invalid, and all rights and entitlements granted thereby shall be considered revoked, if any one of the following occurs:

- a) Respondent submits fraudulent information or engages in fraudulent practices during the voluntary performance of Work;
- b) Future Site development which is inconsistent with the uses permitted under the current zoning classification or future use of the property which is inconsistent with a property environmental covenant, if required by the Department;
- c) Respondent violates, or permits others to violate, the terms of any Long Term Stewardship (LTS) Plan or the Certification of Completion of Remedy;
- d) Respondent interferes with, or permits others to interfere with, any aspect of the remedy addressed in the Certification of Completion of Remedy; or
- e) New information arises which indicates that remediation was not completed as described in the Scope of Work or that the work performed is no longer protective of public health, welfare, or the environment.

27. This Agreement shall become effective upon execution hereof by all parties.

28. This Agreement may be amended in writing by mutual consent of the Department and the Respondent. Amendments shall become effective when signed by all parties.

29. Whenever the approval, consent or cooperation of either party is requested or required under the terms of this Agreement, then any such approval, consent or cooperation shall not be unreasonably withheld or delayed.

30. This Agreement may be executed in multiple counterparts each of which shall be deemed

IT IS SO AGREED:

Department of Natural Resources and Environmental Control

By: 

Timothy Ratsep, Environmental Program Administrator
Division of Waste and Hazardous Substances
Site Investigation and Restoration Section

Date: September 17, 2015

Respondent

Chesapeake Utilities Corporation

By: _____
Steven C. Thompson, Senior Vice President

Date: _____

IT IS SO AGREED:

Department of Natural Resources and Environmental Control

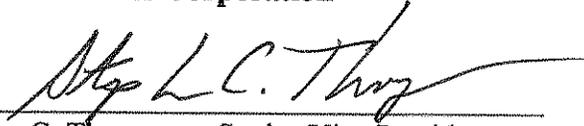
By: 

Timothy Ratsep, Environmental Program Administrator
Division of Waste and Hazardous Substances
Site Investigation and Restoration Section

Date: September 17, 2015

Respondent

Chesapeake Utilities Corporation

By: 

Steven C. Thompson, Senior Vice President
SCW *Stephen*

Date: 09-23-15

an original but which together shall constitute one and the same instrument. An electronic signature may also constitute an original signature in accordance with 6 Del. C. Ch. 12A.

****SIGNATURE PAGE FOLLOWS****

EXHIBIT "A"

CONCEPTUAL SITE MODEL (CSM) AND SAMPLING AND ANALYSIS PLAN (SAP)

Conceptual Site Model and Site Summary for Seaford Town Gas Site (DE-00061)

The purpose of the Conceptual Site Model and Site Summary (CSM-SS) document is to provide a single document where all the information about the site can easily be reviewed and used for decision making at any stage of the project. This format is all inclusive and not all sections are applicable to all sites. The CSM-SS is a dynamic document that is intended to be refined and updated as new information becomes available.

At the initial stage of the development of this document, only information that is readily available and necessary for the Scoping Meeting for the investigation needs to be completed. The sections that need to be completed for the Scoping Meeting are shown in *bold italics*. The CSM-SS should be submitted by the consultant at **least two weeks'** prior to the Scoping Meeting and should be used during the **Scoping Meeting** along with the **Sampling and Analysis Plan**.

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1.0 Site Description	11.0 Air (Vapor Intrusion)
2.0 Site Developer and Development Plan	12.0 Ecological Concerns
3.0 Site Regulatory/Operational/Investigation History	13.0 Asbestos and Lead Issues
4.0 Potential Contaminants and Source Areas	14.0 Community Outreach
5.0 Adjacent Properties and Release Sites	15.0 Other Federal, State and Local Agency Involvement
6.0 Geologic and Hydrogeologic Setting	16.0 Conceptual Site Model
7.0 Surface and Subsurface Soil	16.1 Conceptual Site Model Table
8.0 Groundwater	16.2 Conceptual Site Model Map
9.0 Surface Water	16.3 Conceptual Site Model Cross-Section
10.0 Sediment	Appendix - Maps, Photos, Tables, etc.

1.0 Site Description

SECTIONS	DESCRIPTION	COMMENTS	MAPS, PHOTOS & TABLES	REFERENCE USED
<i>1.1 Site Location (Address and Tax Parcel ID)</i>	Budd Street Seaford, Delaware 19973 Sussex County Tax Parcel 5-31-13.00-0006.00		<i>Figure 1 – Overview Map</i>	
<i>1.2 Site Description (Acreage, Layout, current buildings, undeveloped areas, parking facilities/paved areas, etc)</i>	Approximate Acreage: 0.79 acres Current Layout: Fenced area for storage of equipment and dry material (i.e. polyethylene pipe. cr-6 aggregate. topsoil (clean backfill) and selective fill) storage yard for natural gas distribution operations. A natural gas regulation station (Photograph 1 and 2).		<i>Photographs Figure 2 – Sample Location Map</i>	
<i>1.3 Current Zoning and future zoning</i>	The site is zoned Light Industrial.			
<i>1.4 Existence of infrastructure (i.e., sewer, water, roads etc.)</i>	Electric is provided by aboveground utility poles. Water is available by the City of Seaford. The Site is located at the end of South Shipley Road on Budd Street.			

2.0 Site Developer and Development Plan

SECTIONS	DESCRIPTION	COMMENTS	MAPS, PHOTOS & TABLES	REFERENCE USED
2.1 <i>Developer/Applicant Name and Address</i>	Sussex Gas Company Chesapeake Utilities Corporation P.O. Box 1769 Dover, Delaware 19903 Attn: Mr. David DeCaro	Same as above.		
2.2 <i>Current Owner Name and Address (if different from 2.1)</i>	Same as above.			
2.3 <i>Proposed future use and development plan</i>	Fenced area for storage of equipment and dry material (i.e. polyethylene pipe, cr-6 aggregate, topsoil (clean backfill) and selective fill) storage yard for natural gas distribution operations. A natural gas regulation station.			
2.4 <i>Project start date and completion date (Project Schedule)</i>	Not Applicable. No future development is proposed at this time.			
2.5 <i>Consultant Name and Address</i>	Duffield Associates, Inc. 5400 Limestone Road Wilmington, DE Attn: Christopher Whallon			

3.0 Site Regulatory/Operational/Investigation History

SECTIONS	DESCRIPTION	COMMENTS	MAPS, PHOTOS & TABLES	REFERENCE USED
<p><i>3.1 Operational History and known or potential use of chemicals or hazardous substances</i></p>	<p>According to Sanborn fire insurance maps (Sanborn Maps) from 1931, 1948, and 1959, the Site was identified as "Sussex Gas Co.", which stored natural gas. The Sanborn Maps reported "No Manufactured Gas Onsite" Piped from Salisbury."</p> <p>According to the State of Delaware, Department of Natural Resources and Environmental Control (DNREC), the Property was a "coal gas plant" until approximately 1950. The Site was bought by Chesapeake Utilities Corporation in approximately 1950 and reportedly changed over to propane/air. By 1958, the Site was switched to natural gas. In 1984, the Site was used as a transfer station for natural gas and storage of propane tanks. Chesapeake Utilities Corporation presently (February 2015) uses the Site as storage and staging areas for trucks and equipment.</p> <p>Reportedly, the "coal gas plant" burned coal at low temperature and oxygen to produce gas. The gas was then sent through scrubbers to remove impurities, such as coal tar and naphthalene. The impurities were sold to local businesses (e.g., roofing companies) instead of the impurities being disposed or stored off-site.</p>			<p>Sanborn fire insurance maps</p> <p>DNREC's March 1984 Preliminary Site Assessment</p> <p>TetraTech's February 2015 Facility Evaluation report</p>
<p><i>3.2 Regulatory History</i></p>	<p>In March 1984, DNREC performed a Preliminary Assessment of the Site, which was identified as a former "coal gas plant." DNREC did not find evidence of a former coal gas plant, during historical records review or site visit. No historical waste disposal records or evidence of by-products from coal gas plant operations were observed during DNREC's site visit. Due to insufficient knowledge of the former coal gas plant operations, DNREC recommended a low priority site inspection be</p>			<p>DNREC's March 1984 Preliminary Site Assessment</p> <p>TetraTech's February 2015 Facility Evaluation report</p>

<p>3.3 Investigation History</p>	<p>performed.</p> <p>In May 1985, the Environmental Protection Agency (EPA) inspected the site and issued a "Tentative Disposition" of the potential hazardous waste site, reporting that no further action was necessary at that time.</p> <p>At the request of DNREC-Site Investigation and Restoration Section (DNREC-SIRS), a Facility Evaluation was performed and a report was prepared by TetraTech in February 2015. Substances that may have been associated with historic site operations were reported in soil and groundwater that were above DNREC Screening Levels.</p> <p>DNREC (SIRS) issued a "Voluntary Cleanup Program Application" letter to Chesapeake Utilities Corporation (CUC) on February 24, 2015. DNREC-SIRS reported that further action at the Site was required due to indications of a release on the Site from the February 2015 Facility Evaluation report. The letter identified CUC as a potentially responsible party (PRP). The letter required CUC to respond within 30 days whether they wish to be entered into the Voluntary Cleanup Program (VCP).</p> <p>On April 2, 2015, Chesapeake Utilities Corporation (CUC) submitted a Voluntary Cleanup Program Application to DNREC-SIRS.</p> <p>DNREC's March 1984 Preliminary Site Assessment – To address whether a release has occurred due to reported historic use of the Site as a "coal gas plant".</p> <p>USEPA May 1985 Tentative Disposition Form – Determination of no further action with respect to EPA's historical records and preliminary investigation of the Site with respect to reported</p>			<p>USEPA May 1985 Tentative Disposition Form</p>

	historic use as a "coal gas plant."			
	TetraTech's February 2015 Facility Evaluation report – To further address Site conditions via subsurface investigation and sampling as a result of reported historic use of the Site as a "coal gas plant."			
	On April 2, 2015, Chesapeake Utilities Corporation (CUC) submitted a Voluntary Cleanup Program Application to DNREC-SIRS.			

4.0 Potential Contaminants and Source Areas

SECTIONS	DESCRIPTION	COMMENTS	MAPS, PHOTOS & TABLES	REFERENCE USED
<i>4.1 Known Release Areas on Site</i>	During TetraTech's Facility Evaluation on the Site, eleven soil samples, four groundwater samples, and quality assurance/quality control samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals. Nine SVOCs were detected in soil samples above DNREC's Screening Levels. Benzene, ethylbenzene, total xylenes, and mercury were detected in groundwater samples above DNREC's Screening Levels. Samples with reported substances above regulatory standards were primarily located within the fenced-in portion of the Site.			TetraTech's February 2015 Facility Evaluation report
<i>4.2 Potential Source areas /areas of contamination on Site</i>	The fenced-in area was reported to be the only area of potential contamination.		<i>Figure 2 - Sample Location Map</i>	TetraTech's February 2015 Facility Evaluation report

5.0 Adjacent Properties and Release Sites

SECTIONS	DESCRIPTION	COMMENTS	MAPS, PHOTOS & TABLES	REFERENCE USED
<i>5.1 List all adjacent site land uses (past & present)</i>	Current adjacent sites are: North, East, and West: Commercial/Light Industrial Use sites (Photographs 3 and 4) South: Railroad Tracks (Photographs 5 and 6) Past adjacent site uses appear to have been for light industrial and commercial use.		<i>Photographs</i>	
<i>5.2 Describe any known or potential contaminant sources on adjacent sites.</i>	No adjacent contaminant sources have been identified. However, reportedly a fire occurred within the past several years involving the warehouse located to the west of the property on an adjacent tax parcel. It has been suggested to CUC that, at the time of the fire, the warehouse may have contained "chemicals." Photographs 7 and 8, attached, depicted charred and melted materials resulting from the fire. Apparently some of this fire-related debris remains on the adjacent property along the boundary shared with the site.		<i>Photographs</i>	

6.0 Geologic and Hydrogeologic Setting

SECTIONS	DESCRIPTION	COMMENTS	MAPS, PHOTOS & TABLES	REFERENCE USED
<i>6.1 Regional Geology</i>	The Seaford Town Gas site lies within the Atlantic Coastal Plain Physiographic Province consisting of Holocene sediments of the Columbia Group.			TetraTech's February 2015 Facility Evaluation report

<p>6.2 Site Geology</p>	<p>Generally, soil conditions at the Property consisted of gravel or topsoil overlying reddish-brown to brown silt and light gray to light brown medium to coarse sand.</p>	<p>TetraTech's February 2015 Facility Evaluation report NRCS Web Soil Survey, USDA</p>
<p>6.3 Regional Hydrogeology</p>	<p>Site soils are mapped entirely as Henlopen-Rosedale-Urban land complex. This type of soil consists of sandy eolian deposits and loamy fluviomarine sediments, and is somewhat excessively drained to well drained with a water table typically 42 to greater than 80 inches below the surface. Groundwater was expected to flow southeast towards the Nanticoke River.</p>	<p>TetraTech's February 2015 Facility Evaluation report</p>
<p>6.4 Site Hydrogeology</p>	<p>During TetraTech's Facility Evaluation, soil borings and monitoring wells were performed and groundwater was encountered at depths ranging from 14 to 18 feet below the ground surface. Existing groundwater monitoring wells on the Site did not suggest a large gradient in groundwater elevations.</p>	<p>TetraTech's February 2015 Facility Evaluation report</p>

7.0 Surface and Subsurface Soil

SECTIONS	DESCRIPTION	COMMENTS	MAPS, PHOTOS & TABLES	REFERENCE USED
7.1 Surface Soil				
7.1.1 Potential Contamination areas and contaminants (include concentration ranges, if known) for surface soil	The analytical results from soil samples collected at the Site reported the presence of elevated concentrations of semivolatile organic compounds (SVOCs), primarily polycyclic aromatic hydrocarbons (PAHs), and mercury, with respect to DNREC Screening Levels. Soil samples were primarily elevated in concentration within the fenced-in portion of the Site.	<p>TetraTech's February 2015 Facility Evaluation report:</p> <ul style="list-style-type: none"> • PAHs – <ul style="list-style-type: none"> ○ 1,1'-Biphenyl – 24 milligrams per kilogram (mg/kg) ○ 2-methylnaphthalene – 72 mg/kg ○ Benzo(a)anthracene – 61 mg/kg ○ Benzo(a)pyrene – 49 mg/kg ○ Benzo(b)fluoranthene – 76 mg/kg ○ Benzo(k)fluoranthene – 34 mg/kg ○ Dibenz(a,h)anthracene – 9 mg/kg ○ Indeno(1,2,3-cd)pyrene – 53 mg/kg ○ Naphthalene – 100 mg/kg • Mercury – 5.3 mg/kg 		
7.1.2 Potential Receptors	Site workers, sampling teams, trespassers			

<p>7.2 Subsurface Soil</p>				
<p>7.2.1 Potential Contamination areas and contaminants (include concentration ranges, if known) for sub-surface soil</p>	<p>The analytical results from soil samples collected at the Site indicated the presence of elevated concentrations of VOCs and SVOCs, primarily PAHs, with respect to DNREC Screening Levels. Soil samples were primarily elevated in concentration within the fenced-in portion of the Site.</p>	<p>TetraTech's February 2015 Facility Evaluation report:</p> <ul style="list-style-type: none"> • Ethylbenzene – 28 mg/kg • Xylenes – 73 mg/kg • PAHs – <ul style="list-style-type: none"> ○ 1,1'-Biphenyl – 21 mg/kg ○ 2-methylnaphthalene – 20 mg/kg ○ Benzo(a)anthracene – 54 mg/kg ○ Benzo(a)pyrene – 50 mg/kg ○ Benzo(b)fluoranthene – 38 ug/L ○ Benzo(k)fluoranthene – 19 mg/kg ○ Dibenz(a,h)anthracene – 3.7 mg/kg ○ Indeno(1,2,3-cd)pyrene – 26 mg/kg ○ Naphthalene – 19 mg/kg 	<p><i>Figure 2 - Sample Location Map</i></p>	
<p>7.2.2 Potential Receptors</p>	<p>Site excavation workers, sampling teams, trespassers</p>			

8.0 Groundwater

SECTIONS	DESCRIPTION	COMMENTS	MAPS, PHOTOS & TABLES	REFERENCE USED
<p>8.1 Background contamination</p>	<p>Groundwater samples collected on the Site reported elevated concentrations of benzene, ethylbenzene, total xylenes, SVOCs, and metals, with respect to DNREC's July 2014 Screening Levels, primarily in monitoring wells located within the fenced-in portion of the Site (west).</p>	<p>TetraTech's February 2015 Facility Evaluation report:</p> <ul style="list-style-type: none"> • Benzene – 27 micrograms per liter (ug/L) • Ethylbenzene – 30 ug/L • Total Xylenes – 180 ug/L • PAHs: <ul style="list-style-type: none"> ○ 1,1'-Biphenyl – 22 ug/L ○ 2-Methylnaphthalene – 150 ug/L ○ Benzo(a)pyrene – 0.84 ug/L ○ Fluorene – 40 ug/L ○ Naphthalene – 880 ug/L ○ Phenanthrene – 47 ug/L • Total Metals: <ul style="list-style-type: none"> ○ Iron – 22,000 ug/L ○ Manganese – 591 ug/L ○ Mercury – 0.3 ug/L • Dissolved Metals: <ul style="list-style-type: none"> ○ Cobalt – 4.1 ug/L ○ Iron – 20,900 ug/L ○ Manganese – 512 ug/L ○ Mercury – 0.2 ug/L 		
<p>8.2 Distance to Nearest drinking water source</p>	<p>The Site is approximately 2,500 feet south (downgradient) of a Wellhead Protection Area.</p>			<p>Delaware Environmental Navigator</p>

<p>8.3 Predominant use of groundwater in the area and Site</p>	<p>Public water services the area surrounding the Property. Groundwater is predominantly not used in the area of the site.</p>		
<p>8.4 Depth & direction of groundwater flow of the uppermost aquifer</p>	<p>Based on the proximity of the Nanticoke River to the Site, groundwater is expected to flow to the southeast. Depth of groundwater was estimated to between 14 feet to 18 feet below ground surface.</p>		
<p>8.5 Deeper aquifer and impermeable layers (depth, thickness and flow direction</p>	<p>Principal geologic units in the vicinity of the site include Pleistocene sands (Nanticoke deposits) which are up to 10 feet thick in nearby logs) that are described as unconformably overlying Pliocene sands and clayey sands of the Beaverdam fm. Nearby logs describe the Beaverdam as approximately 50 to 80 feet thick. The Nanticoke deposits and Beaverdam fm are considered as part of the Columbia group, which is both unconfined and confined (semi-confined) in this part of Sussex County. Unconformably underlying the Beaverdam fm are Miocene sands and clayey sands of the Manokin fm, which extend to at least 80 feet below ground surface in the vicinity of the site. Both the Columbia (Beaverdam) and Manokin are used as sources of water in Sussex County. Underlying the Manokin Aquifer are less permeable units of the Lower Mankin and St.</p>		<p>Delaware Geological Survey's July 1995 "Geology of Seaford Area, Delaware," Geologic Map No. 9</p> <p>Delaware Geological Survey's June 6, 2014, "An overview of aquifer resources and groundwater withdrawals, Kent and Sussex Counties, Delaware" presentation to the Delaware Center for the Inland Bays</p>

<p>8.6 Distance to Water Resource Protection Area and to GMZ (if applicable)</p>	<p>Mary's fms, which are Miocene in age. Below the St. Mary's fm are the Miocene aquifers of the Choptank and Calvert formations.</p> <p>The Site is approximately 2,500 feet south (downgradient) of a Wellhead Protection Area. The Site falls within a Recharge Area.</p>			<p>Delaware Environmental Navigator</p>
<p>8.7 Potential Contaminants (include concentration ranges, if known)</p>	<p>Benzene, ethylbenzene, total xylene, PAHs, and metals.</p>			
<p>8.8 Potential Receptor(s)</p>	<p>Site excavation workers, sampling teams</p>			

9.0 Surface Water

SECTIONS	DESCRIPTION	COMMENTS	MAPS, PHOTOS & TABLES	REFERENCE USED
9.1 Nearest surface water body (include distance from site)	The Nanticoke River is approximately 850 feet southeast of the Site.		<i>Figure 1- Overview Map</i>	
9.2 Site Surface drainage direction	Based on topographic mapping, the site appears to drain towards the Nanticoke River to the southeast.		<i>Figure 1- Overview Map</i>	
9.3 Usage of surface water at the area and Site	Not applicable.			
9.4 Potential Contaminants (include concentration ranges, if known)	Not applicable.			
9.5 Receptors	Nanticoke River			
9.6 Offsite source of Contamination	Not applicable.			
9.7 Groundwater to surface water loading	Not estimated.			

10.0 Sediment

SECTIONS	DESCRIPTION	COMMENTS	MAPS, PHOTOS & TABLES	REFERENCE USED
10.1 Background contamination	No sediment was identified on the Site.			
10.2 Site related contaminants	Not applicable.			
10.3 Potential Receptor(s)	Not applicable.			

11.0 Air (Vapor Intrusion)

SECTIONS	DESCRIPTION	COMMENTS	MAPS, PHOTOS & TABLES	REFERENCE USED
<i>11.1 Contaminant with Vapor Intrusion Potential</i>	The potential for vapor intrusion issues may exist at the site. Benzene, ethylbenzene, and total xylenes are present in groundwater at elevated concentrations with respect to DNREC's Screening Levels.			
<i>11.2 Current & Potential buildings within 100 feet and type of building</i>	There is one building located on the Property, which reportedly, currently functions as a storage shed. This building is reported to be constructed at-grade and does not extend into the subsurface.			
11.3 Preferential Pathway	None identified.			

12.0 Ecological Concern

Are any of the following ecologically sensitive areas (ECSA) present on or adjacent to the site? If the answer is "YES" to any of these questions, then further ecological evaluation may be necessary.

Criteria	YES or NO	DESCRIPTION	COMMENTS	GRAPHICS DATA TABLE	REFERENCE USED
12.1 ECSA on or adjacent to site	NO				
12.1.1 Critical Habitat for endangered or threaten species	NO				
12.1.2 Parks, wildlife refuge	NO				
12.1.3 Coastal Barriers	NO				
12.1.4 Spawning, migration and feeding areas	NO				
12.1.5 Water way (stream, lake etc.)	NO				
12.1.6 Wetland	NO				Delaware Environmental Navigator
12.2 Site Within 2,000 feet of an ECSA	NO				
12.2.1 Connected to an ECSA via open-space, wooded area, ag land, perennial water body or other natural corridor?	NO				
12.2.2 Storm runoff from the site discharges via a pipe or drainage swale directly to the ECSA?	NO				
12.2.3 Evidence of soil erosion from the site such as gulleys, washout features	NO				
12.3 The site supports fauna with a shelter or food source	NO				
12.4 Evidence of stressed veg., barren soil, dead animals, fish kills or other ecological detriments?	NO				

13.0 Asbestos and Lead Issues

SECTIONS	DESCRIPTION	COMMENTS	MAPS, PHOTOS & TABLES	REFERENCE USED
13.1 Was lead paint survey conducted? Type of lead present in the buildings	No.			
13.2 Was asbestos survey conducted? Type of asbestos present and is it friable	No.			

14.0 Community Outreach

SECTIONS	DESCRIPTION	COMMENTS	MAPS, PHOTOS & TABLES	REFERENCE USED
14.1 Public Representatives (names and contact information)	<p>Representative Daniel B. Short Legislative District: 39 411 Legislative Avenue Dover, DE 19901 Phone: (302) 744-4172 Fax: (302) 739-2773</p> <p>Senator Bryant L. Richardson Legislative District: 21 411 Legislative Avenue Dover, DE 19901 Phone: (302) 744-4298</p>			
14.2 Community groups	None identified.			
14.3 Known areas of Public concern/issues	None.			
14.4 Public Outreach Plan	None.			

15.0 Other Federal/State/ Local Agency Involvement

(Identify the agencies, issues and contacts related to this site. Fill in only the items that apply)

Agencies	Issues/Involvements	Contact	Comments
15.1 DNREC Tank Management Branch	Not applicable.		
15.2 DNREC Solid and Hazardous Waste Branch	Not applicable.		
15.3 DNREC Sediment & Storm water Management Section	Not applicable.		
15.4 DNREC Wetland & Subaqueous Land Section	Not applicable.		
15.5 Delaware State Historic Preservation Office	Not applicable.		
15.6 Fire Marshall's Office	Not applicable.		
15.7 Del DOT	Not applicable.		
15.8 DNREC Groundwater Discharge	Not applicable.		
15.9 DNREC Parks & Recreation	Not applicable.		
15.10 City Planning Office	Not applicable.		
15.11 County Planning Office	Not applicable.		
15.12 DEDO	Not applicable.		
15.14 Coastal Zone	Not applicable.		
15.15 Federal Agencies (TSCA, EPA, ACOE, etc)	EPA – Region III	215-814-5000	

16.0 Site Conceptual Model

16.1 Conceptual Site Model Table

Known and Potential Sources	Impacted Media	Contaminants of Concern	Exposure Route	Receptors		Comments
				Current	Future	
Potential releases from historic use of the Site as a "coal gas plant."	Soil	Ethylbenzene, total xylenes, PAHs, mercury	Inhalation, ingestion, and dermal contact	Trespasser	Outdoor worker, site occupants, excavator, and trespasser	
	Groundwater	Benzene, ethylbenzene, total xylenes, PAHs, metals	Ingestion, dermal contact	None	None	

**** SEE APPENDIX C FOR SAMPLING ANALYSIS PLAN

Notes:

Sources: historic fill, spill areas, USTs, hotspots (arsenic, lead, NAPL), etc

Impacted Media: Soil, Groundwater, Sediment, Surface water, Soil vapor, etc.

Contaminant of Concern: dominant contaminants that will drive the risk, etc

Exposure routes: inhalation of vapors, dust, dermal, ingestion, fish consumption, etc.

Receptors: resident, excavator, future construction worker, recreational user, office worker, trespasser, gardener, fish and other ecological receptors, etc.

16.2 Conceptual Site Model Map

See Figure 2.

16.3 Conceptual Site Model Cross-section

A cross-sectional view was not performed due to lack of current subsurface data at the Property.

PHOTOGRAPHS

- Photograph 1 – Fenced Portion of Site Taken from Northeast
- Photograph 2 – Fenced Gas Transmission Lines
- Photograph 3 – Portion of the Former Parsons Brothers & Co. West of Site
- Photograph 4 – Portion of the Former Parsons Brothers & Co. North of Site
- Photograph 5 – Railroad Related Materials and Railroad Tracks South of Site
- Photograph 6 – Railroad Related Materials and Railroad Tracks South of Site (cont.)
- Photograph 7 – Charred Material from Fire at Southwest Site Boundary
- Photograph 8 – Melted Tar Material from Fire at Southwest Site Boundary

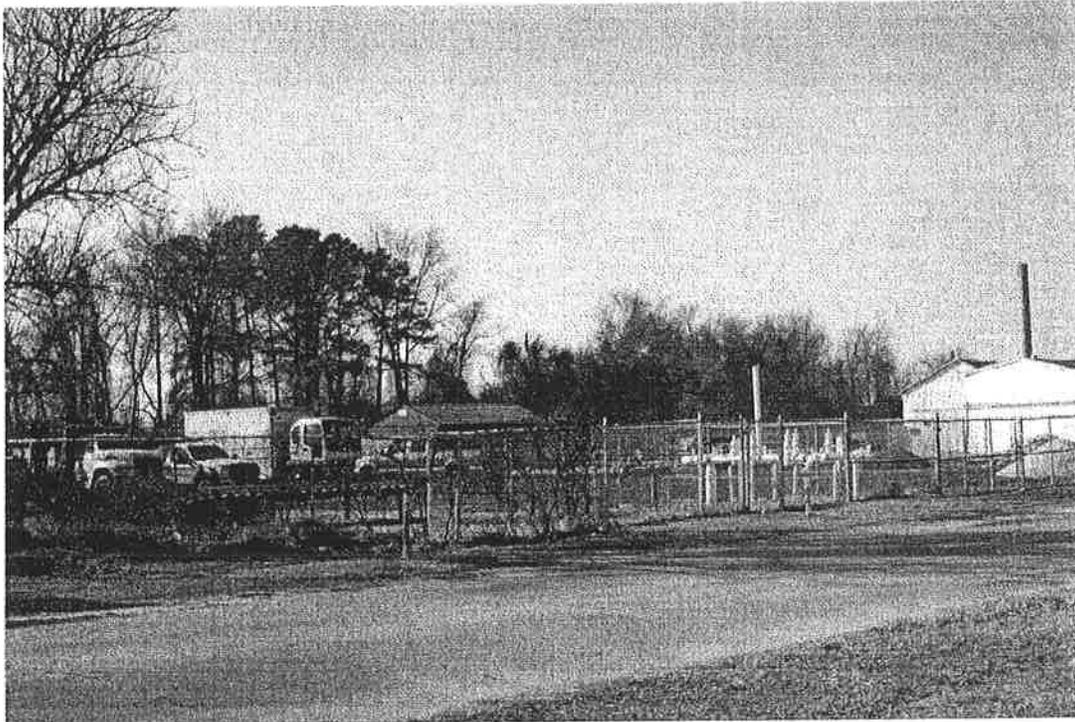
FIGURES

- Figure 1 –Overview Map
- Figure 2 – Sampling Location Map

APPENDICES

- Appendix A – DNREC’s March 1984 Preliminary Assessment report
- Appendix B – TetraTech’s February 2015 Facility Evaluation report
- Appendix C – Sampling and Analysis Plan

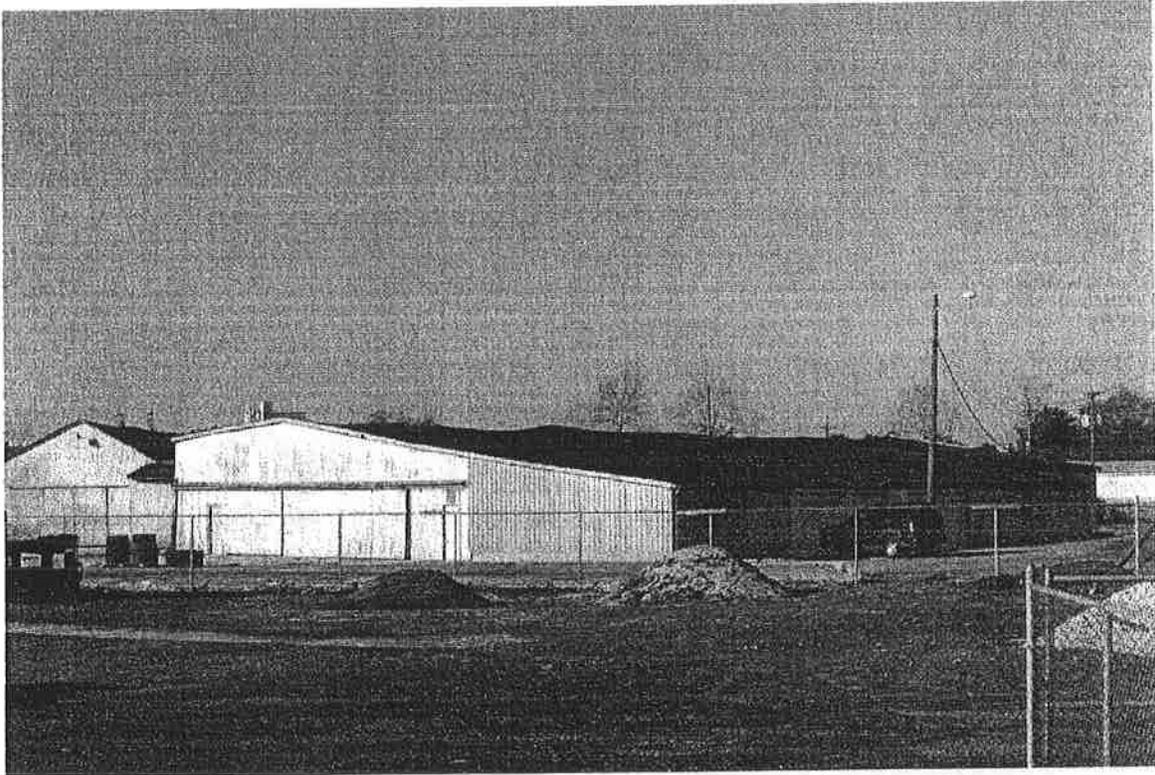
PHOTOGRAPHS



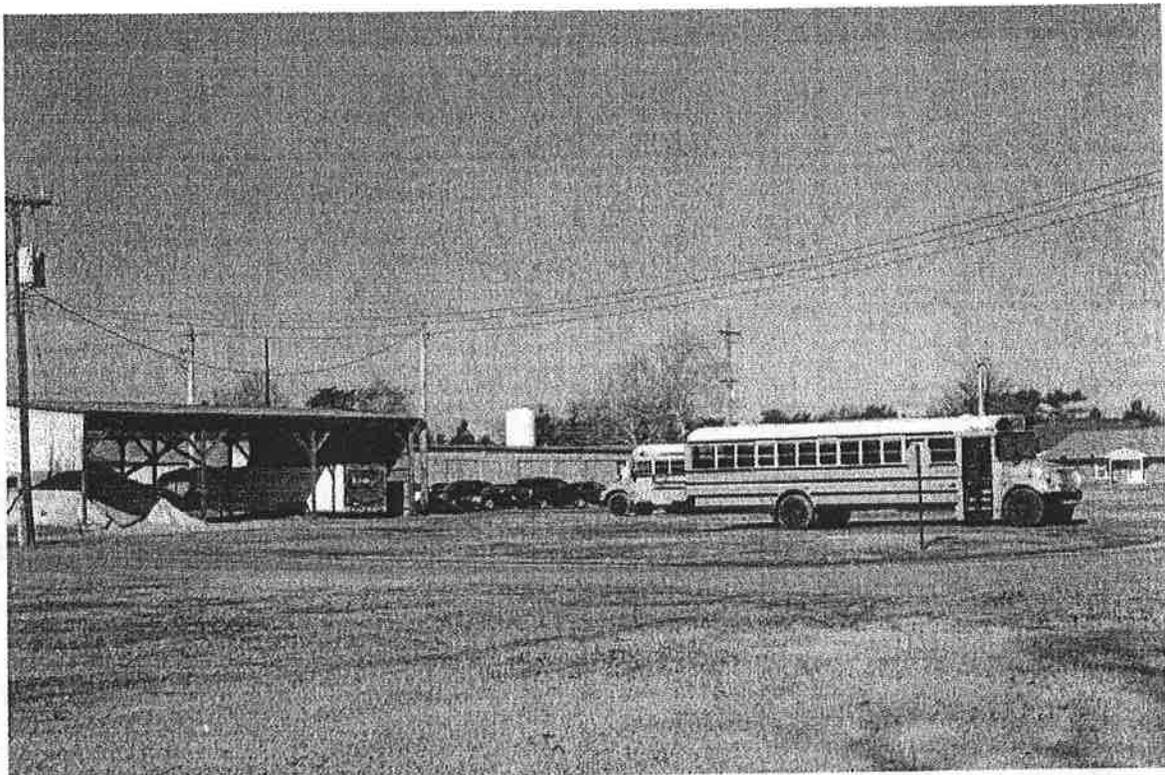
Photograph 1 – Fenced Portion of Site Taken from Northeast



Photograph 2 - Fenced Gas Transmission Lines



Photograph 3 - Portion of the Former Parsons Brothers & Co. West of Site



Photograph 4 - Portion of the Former Parsons Brothers & Co. North of Site



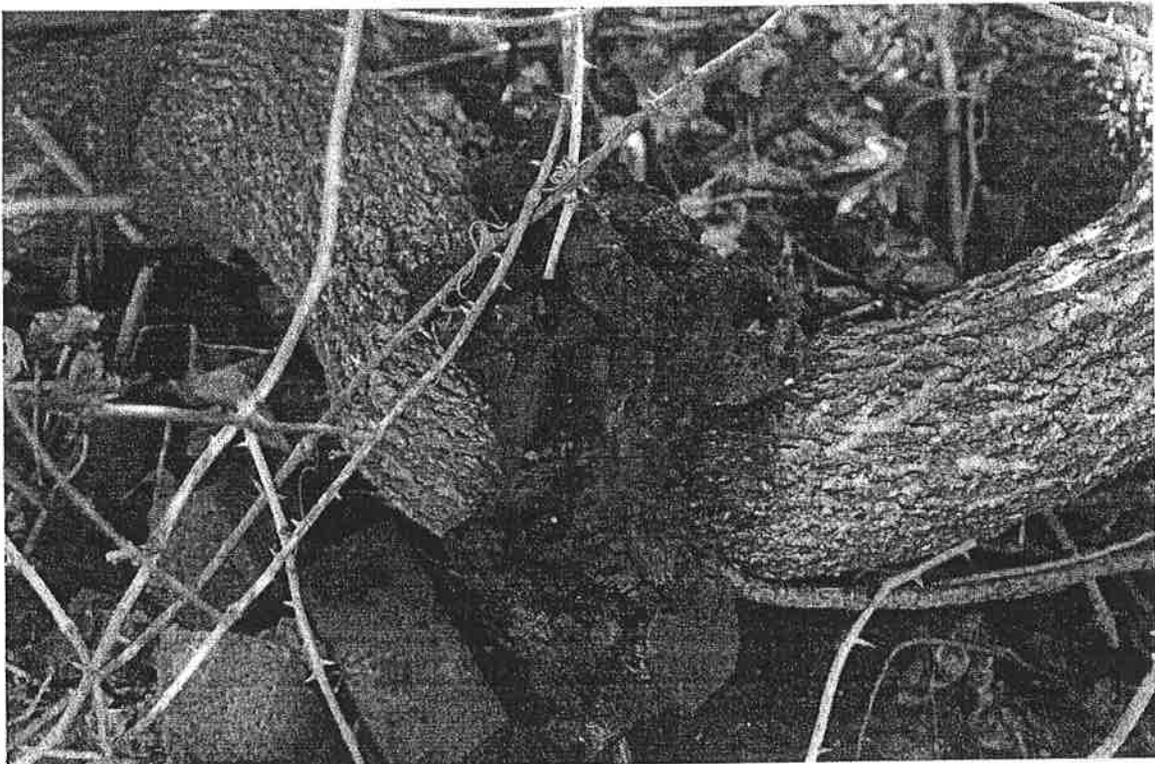
Photograph 5 - Railroad Related Materials and Railroad Tracks South of Site



Photograph 6 - Railroad Related Materials and Railroad Tracks South of Site (cont.)

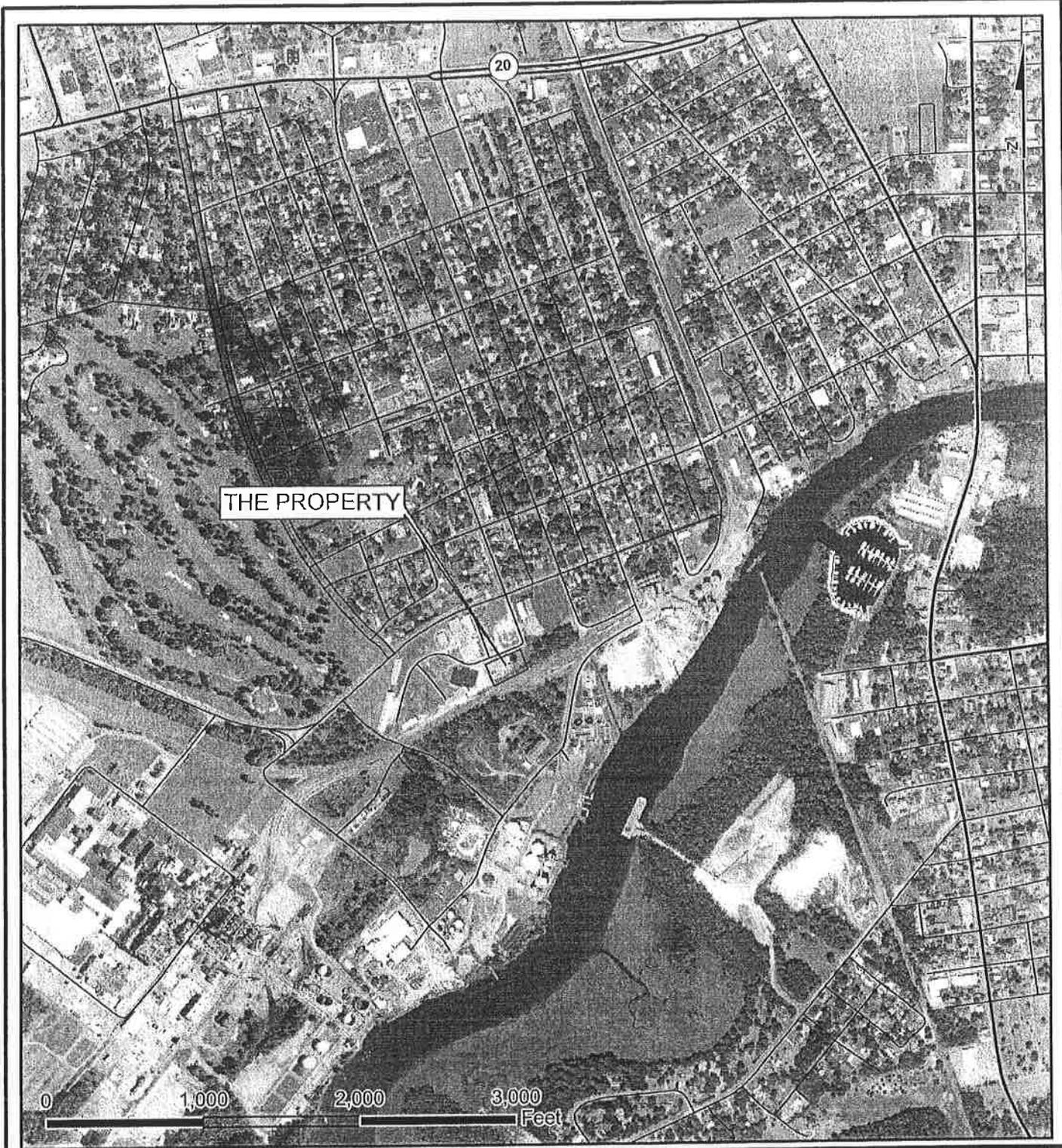


Photograph 7 - Charred Material from Fire at Southwest Site Boundary



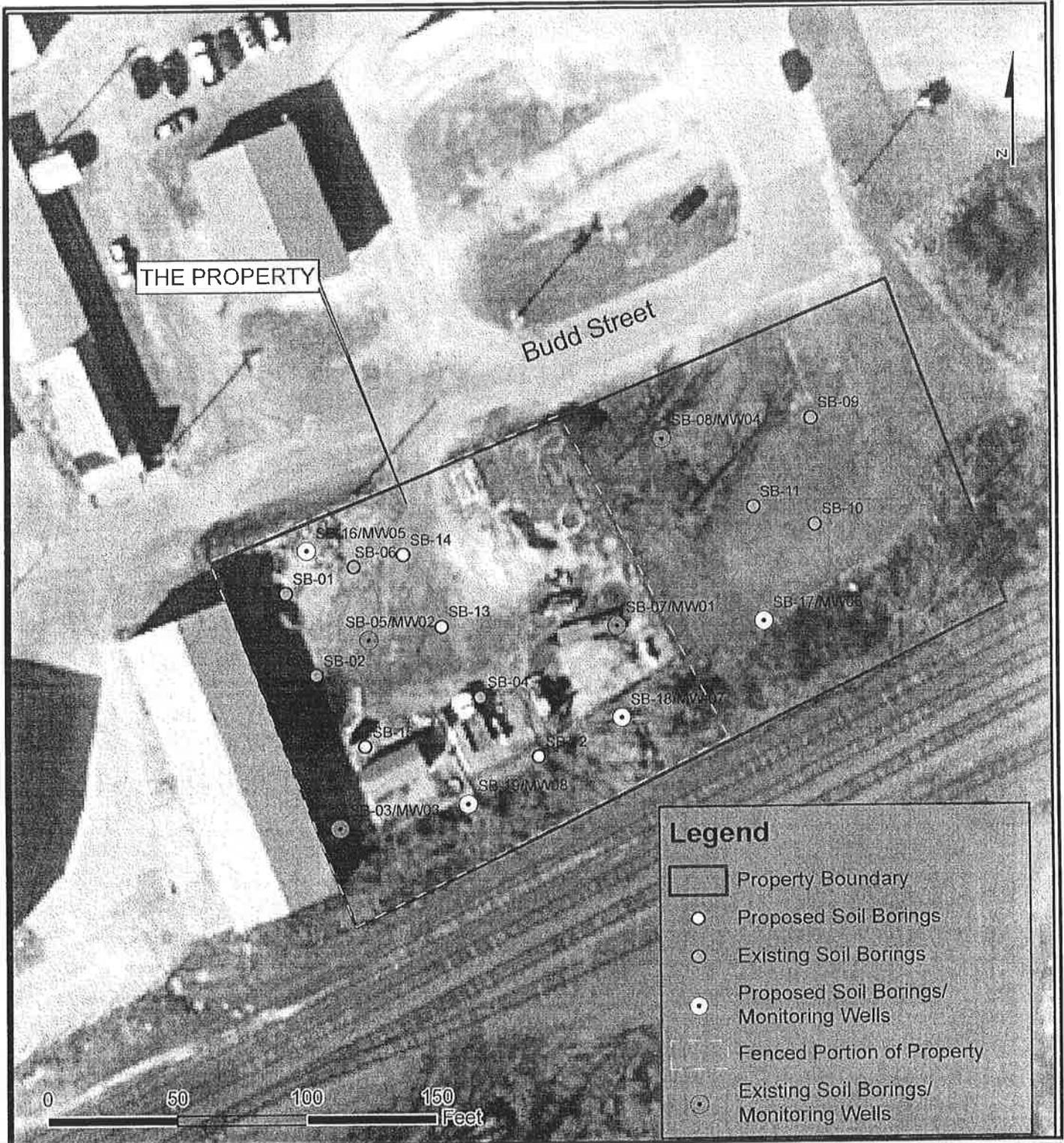
Photograph 8 - Melted Tar Material from Fire at Southwest Site Boundary

FIGURES



**This topographic map is courtesy of the 2013 United States Geological Survey (USGS) topographic mapping.

<p>Date: 05/2015</p>	<p align="center">FIGURE 1 OVERVIEW MAP</p> <p align="center">Seaford Town Gas Site (DE-0069) Conceptual Site Model & Sampling Analysis Plan</p> <p align="center">SEAFORD~SUSSEX COUNTY~DELAWARE</p>	<p>DESIGNED BY: JCR</p>	 <p>DUFFIELD ASSOCIATES Soil, Water & the Environment</p>
<p>SCALE: AS SHOWN</p>		<p>DRAWN BY: JCR</p>	<p>5400 LIMESTONE ROAD WILMINGTON, DE 19808-1232 TEL. (302)239-6634 FAX (302)239-8485</p>
<p>PROJECT NO. 10642.EB</p>		<p>CHECKED BY: CCW</p>	<p>OFFICES IN PENNSYLVANIA, SOUTHERN DELAWARE, MARYLAND AND NEW JERSEY</p> <p>EMAIL: DUFFIELD@DUFFNET.COM</p>
<p>SHEET: FIGURE 1</p>		<p>FILE: Figure 1-Overview Map</p>	



**The historical aerial photograph is courtesy of the DEMAC Web Map Service.

Date: 05/2015
SCALE: AS SHOWN
PROJECT NO. 10642.EA
SHEET: FIGURE 2

FIGURE 2
SAMPLE LOCATION SKETCH

Seaford Town Gas Site (DE-0069)
Conceptual Site Model &
Sampling Analysis Plan

SEAFORD~SUSSEX COUNTY~DELAWARE

DESIGNED BY: JCR
DRAWN BY: JCR
CHECKED BY: CCW
FILE: FIGURE2_SAMPLE LOCATION SKETCH.mxd

DUFFIELD ASSOCIATES
Soil, Water & the Environment

6400 LIMESTONE ROAD
WILMINGTON, DE 19808-1232
TEL. (302)239-6634
FAX (302)239-8485

OFFICES IN PENNSYLVANIA,
SOUTHERN DELAWARE,
MARYLAND AND NEW JERSEY

EMAIL: DUFFIELD@DUFFNET.COM

APPENDIX A
DNREC's March 1984 Preliminary
Assessment report

FOIA

A Preliminary Assessment

of

Kenford Town Gas

EPA No. DE-61

Emergency and Remedial Response Information System

Grant No. X-003282-01-0

March, 1984

**Presented to: Mr. P. Shaul, Chief of Waste Enforcement
U.S. EPA, Region III**

**Prepared by: Delaware Department of Natural Resources
and Environmental Control, Solid Waste
Branch**

Andrew Wollen, ERRIS Investigator

Robert Pickart, ERRIS Coordinator

Table of Contents

- I. Introduction
- II. Site History
- III. Environmental Setting
- IV. Preliminary Assessment Form
- V. Field Trip Summary Report
- VI. Maps and Drawings
- VII. Photographs
- VIII. References

I. Introduction

Inquiry Source

U. S. EPA Region III Headquarters, Philadelphia, PA.

Summary

Seaford Town Gas, located on Budd Street along the Nanticoke River in Seaford, Delaware, was used as a coal gas plant until approximately 1950.¹ In the coal gas operation, coal was burned at low temperature and oxygen to produce a gas which then goes through scrubbers to remove impurities.¹ The gas was then supplied to customers. The impurities included coal tar and naphthalene. These products were sold to roofers for roofing material.^{1&2} Seaford Town Gas was bought by Chesapeake Utilities about 1950 and the facility on Budd Street was switched to propane/air.¹ In 1958 the facility was changed to natural gas. The facility is now used as a transfer station for natural gas and as storage for propane tanks.^{1&2}

Recommendations

No records can be found in Chesapeake Utilities files on any waste disposal site, the waste was said to be sold to roofers, and a site visit showed no evidence of contamination. However, this information is inconclusive and the Delaware Department of Natural Resources and Environmental Control recommends that a low priority site inspection be performed. The installation of monitoring wells should be completed prior to the site inspection.

II. Site History

Permits

No permits were ever issued by the Delaware Department of Natural Resources and Environmental Control to Seaford Town Gas.

Site Owner

Chesapeake Utilities Co.

Area Residents

Mr. Schieferstein, who lives adjacent to the Budd Street facility, worked for Chesapeake Utility Co. for over 30 years and retired in 1983. According to Mr. Schieferstein the coal gas operation was used during the 1940's and was switched to propane air around 1950. Other accounts by Mr. Schieferstein are referenced in the summary.

Media Coverage

No coverage of the Seaford Town Gas site was found in the Delaware State News Library.

Regulatory Action

No regulatory action was ever taken at this site by the Delaware DMREC.

III. Environmental Setting

Surface Water

The Chesapeake Utilities Co. Budd St. facility is located on or adjacent to the Nanticoke River flood plain. The historic water quality in the Nanticoke River has been good to excellent with only minor fecal coliform exceedences.

Ground Water

Due to the proximity of the Nanticoke River, the water table at the site is close to the surface (less than ten feet), is about 100 ft. thick. Its potentiometric surface is less than 25 ft. below the surface.

Geology and Soils

The original surface material at the site was composed of silts and sands of the Columbia formation. These occur between 20 and 30 ft. thick in the Seaford area. The original soil at the site was a loamy sand of the Synchro-Rumford formation.

Population Distribution

The population of Seaford and Blades in 1980 was less than 6000.

Water Supply

The water in the area of the Chesapeake Utility Co.'s Budd Street facility is supplied by the City of Seaford.

Land Use

Land use to the north of the site is primarily residential, to the south between the site and the Nanticoke River, is a light industrial site.

IV. Preliminary Assessment Form

		POTENTIAL HAZARDOUS WASTE SITE IDENTIFICATION AND PRELIMINARY ASSESSMENT		REGION III	SITE NUMBER (to be assigned by Reg) DE-61
NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections.					
GENERAL INSTRUCTIONS: Complete Sections I and III through X as completely as possible before Section II (Preliminary Assessment). File this form in the Regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (EW-JJ3); 401 M St., SW, Washington, DC 20460.					
I. SITE IDENTIFICATION					
A. SITE NAME Seaford Town Gas		B. STREET (or other identifier) Budd Street			
C. CITY Seaford		D. STATE DE	E. ZIP CODE 19973	F. COUNTY NAME Sussex	
G. OWNER/OPERATOR (if known) 1. NAME Chesapeake Utilities		2. ADDRESS Salisbury, MD		3. TELEPHONE NUMBER 302-629-4563	
H. TYPE OF OWNERSHIP <input type="checkbox"/> 1. FEDERAL <input type="checkbox"/> 2. STATE <input type="checkbox"/> 3. COUNTY <input checked="" type="checkbox"/> 4. MUNICIPAL <input type="checkbox"/> 5. PRIVATE <input type="checkbox"/> 6. UNKNOWN					
I. SITE DESCRIPTION					
J. HOW IDENTIFIED (e.g., citizen's complaint, OSHA citation, etc.)				K. DATE IDENTIFIED (month, day, & yr.)	
L. PRINCIPAL STATE CONTACT 1. NAME Robert Pickart		2. ADDRESS Solid Waste Branch, Delaware DNRDC		3. TELEPHONE NUMBER 302-736-4781	
II. PRELIMINARY ASSESSMENT (complete check sections 1-5)					
A. APPARENT SERIOUSNESS OF PROBLEM <input type="checkbox"/> 1. HIGH <input type="checkbox"/> 2. MEDIUM <input type="checkbox"/> 3. LOW <input type="checkbox"/> 4. NONE <input type="checkbox"/> 5. UNKNOWN					
B. RECOMMENDATION <input type="checkbox"/> 1. NO ACTION NEEDED (no record) <input type="checkbox"/> 2. IMMEDIATE SITE INSPECTION NEEDED a. TENTATIVELY SCHEDULED FOR _____ b. WILL BE PERFORMED BY _____ <input type="checkbox"/> 3. SITE INSPECTION NEEDED a. TENTATIVELY SCHEDULED FOR _____ b. WILL BE PERFORMED BY _____ <input type="checkbox"/> 4. SITE INSPECTION NEEDED (low priority)					
C. PREPARER INFORMATION 1. NAME Andrew Bullen		2. ADDRESS Solid Waste Branch		3. TELEPHONE NUMBER 302-736-4781	4. DATE (month, day, & yr.) 2/29/84
III. SITE INFORMATION					
A. SITE STATUS <input type="checkbox"/> 1. ACTIVE (Those industrial or municipal sites which are being used for waste treatment, storage, or disposal or a continuing past, even if inactive.) <input checked="" type="checkbox"/> 2. INACTIVE (Those sites which no longer receive wastes.) <input type="checkbox"/> 3. OTHER (Specify: _____) (These sites, that include such activities like "on-site" dumping, where no regular or continuing use of the site for waste disposal has occurred.)					
B. IS GENERATOR OF SITE? <input type="checkbox"/> 1. NO <input checked="" type="checkbox"/> 2. YES (Specify generator's four-digit SIC Code): _____					
C. AREA OF SITE (in acres) 1/2 acre		D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES 1. LATITUDE (deg.-min.-sec.) _____ 2. LONGITUDE (deg.-min.-sec.) _____			
E. ARE THERE BUILDINGS ON THE SITE? <input type="checkbox"/> 1. NO <input checked="" type="checkbox"/> 2. YES (Specify): _____					

IV. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking "X" in the appropriate boxes.

A. TRANSPORTER	B. STORER	C. TREATER	D. DISPOSER
1. RAIL	1. RAIL	1. FILTRATION	1. LANDFILL
2. TRUCK	2. SURFACE IMPOUNDMENT	2. INCINERATION	2. LANDFARM
3. BARGE	3. DUMPS	3. VOLUME REDUCTION	3. OPEN DUMP
4. TRUCK	4. TANK, ABOVE GROUND	4. RECYCLING/RECOVERY	4. SURFACE IMPOUNDMENT
5. PIPELINE	5. TANK, BELOW GROUND	5. CHEM./PHYS. TREATMENT	5. MOUND DUMPING
6. OTHER (specify):	6. OTHER (specify):	6. BIOLOGICAL TREATMENT	6. INCINERATION
		7. WASTE OIL REPROCESSING	7. UNDERGROUND INJECTION
		8. SOLVENT RECOVERY	8. OTHER (specify):
		9. OTHER (specify):	

V. SPECIFY DETAILS OF SITE ACTIVITIES AS NEEDED

Saxford Town Gas, now owned by Chesapeake Utilitiw, Company, manufactured coal gas at the site until approximately 1950. Scrubbers and filteres were used to remove impurities from the gas.

VI. WASTE RELATED INFORMATION

1. WASTE TYPE

1. UNKNOWN 2. LIQUID 3. SOLID 4. SLUDGE 5. GAS

2. WASTE CHARACTERISTICS

1. UNKNOWN 2. CORROSIVE 3. IGHITABLE 4. RADIOACTIVE 5. HIGHLY VOLATILE
 6. TOXIC 7. REACTIVE 8. INERT 9. FLAMMABLE

3. OTHER (specify):

4. WASTE CATEGORIES

1. Are records of wastes available? Specify from such as manifests, inventories, etc. below.

2. Estimate the amount (specify unit of measure) of waste by category; mark "X" to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE
(1) PAINT RESIDUES	(1) FLUID WASTES	(1) HALOGENATED SOLVENTS	(1) ACIDS	(1) FLYASH	(1) LABORATORY WASTEWATER
(2) METALS SLUDGES	(2) OTHER (specify):	(2) NON-HALOGENATED SOLVENTS	(2) FICKLING LIQUORS	(2) ASPHALT	(2) INDUSTRIAL
(3) OTHER	CONC. CAT INDUSTRIAL	(3) OTHER (specify):	(3) CAUSTICS	(3) MILLING/ MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE		(4) PETICIDES	(4) FERROUS METAL WASTES	(4) MUNICIPAL	
(5) OTHER (specify):		(5) DYES/PIGMENTS	(5) NON-FERROUS METAL WASTES	(5) OTHER (specify):	
		(6) CYANIDE			
		(7) PHENOLS			
		(8) HALOGENS			
		(9) PEST			
	(10) METALS				
	(11) OTHER (specify):				

Continued From Page 2

V. WASTE RELATED INFORMATION (continued)

1. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE (place in descending order of hazard).

No evidence of any substances of any concern on the site.

2. ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

VI. HAZARD DESCRIPTION

A. TYPE OF HAZARD	B. POTENTIAL HAZARD (mark 'X')	C. ALLEGED INCIDENT (mark 'X')	D. DATE OF INCIDENT (mm/dd/yy, etc.)	E. REMARKS
1. NO HAZARD				
2. HUMAN HEALTH				
3. NONWORKER INJURY/EXPOSURE				
4. WORKER INJURY				
5. CONTAMINATION OF WATER SUPPLY				
6. CONTAMINATION OF FOOD CHAIN				
7. CONTAMINATION OF GROUND WATER				
8. CONTAMINATION OF SURFACE WATERS				
9. DAMAGE TO PLANT/FAUNA				
10. FISH KILL				
11. CONTAMINATION OF AIR				
12. NOT CLEARABLE ODORS				
13. CONTAMINATION OF SOIL				
14. PROPERTY DAMAGE				
15. FIRE OR EXPLOSION				
16. SPILLS/LEAKING CONTAINERS/ RUMPLED/STANDING LIQUIDS				
17. SLURRY BEANS/ OTHER PROBLEMS				
18. EMISSION PROBLEMS				
19. HAZARD SATE SECURITY				
20. INCOMPLETE SUE WAYS				
21. HIGH SITE DUMPING				
22. OTHER (specify):				

Continued From Front

VII. PERMIT INFORMATION			
A. INDICATE ALL APPLICABLE PERMITS HELD BY THE SITE.			
<input type="checkbox"/> 1. NPDES PERMIT	<input type="checkbox"/> 2. SPCC PLAN	<input type="checkbox"/> 3. STATE PERMIT (specify)	
<input type="checkbox"/> 4. AID PERMITS	<input type="checkbox"/> 5. LOCAL PERMIT	<input type="checkbox"/> 6. RCRA TRANSPORTER	
<input type="checkbox"/> 7. RCRA STORER	<input type="checkbox"/> 8. RCRA TREATER	<input type="checkbox"/> 9. RCRA DISPOSER	
<input type="checkbox"/> 10. OTHER (specify):			
B. IN COMPLIANCE?			
<input type="checkbox"/> 1. YES		<input type="checkbox"/> 2. NO	
<input type="checkbox"/> 3. UNKNOWN			
C. WITH RESPECT TO (list regulation name & number):			
VIII. PAST REGULATORY ACTIONS			
<input type="checkbox"/> A. NONE		<input type="checkbox"/> B. YES (specify date below)	
IX. INSPECTION ACTIVITY (past or on-going)			
<input type="checkbox"/> A. NONE		<input type="checkbox"/> B. YES (complete items 1, 2, 3, & 4 below)	
1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY (EPA/State)	4. DESCRIPTION
X. REMEDIAL ACTIVITY (past or on-going)			
<input type="checkbox"/> A. NONE		<input type="checkbox"/> B. YES (complete items 1, 2, 3, & 4 below)	
1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY (EPA/State)	4. DESCRIPTION
NOTE: Based on the information in Sections III through X, fill out the Preliminary Assessment (Section II) information on the first page of this form.			

V. Field Trip Summary Report

FIELD TRIP SUMMARY REPORT

This summary should be prepared in conjunction with the Preliminary Assessment Form, (EPA Form T2070-2), so that a proper site rating can be assigned.

Name of Site Seaford Town Gas

EPA Case Number DE-61

TDD Number _____

I. If site is active, has owner/operator notified EPA in accordance with Section 3010 of RCRA. Yes _____ No X

If Yes: a) Note EPA T.D. No. _____

b) Is the site a generator, storer, creator or disposer of hazardous waste? (CIRCLE ONE).

II. If the answers submitted in Part VI (Hazard Description) of EPA Form T2070-2 or observations warrant a more thorough site investigation/sampling, please attach a sketch map showing those areas of concern. (i.e.: lagoons, leachate seeps, drum storage, monitoring wells, etc.).

III. Please list site contacts and accompanying inspectors; include name, title and phone numbers:

Andrew Bullen, Tom Gainer, DNREC Solid Waste Branch, 302-736-4781

Charles Russell, Chesapeake Utilities, 302-629-4563

Mr. Schieferstein, Chesapeake Utilities (Retired)

IV. Site observations: (attach a topo map).

A. Population within 1000 ft. of the site is (CIRCLE ONE)

1. 0-10 people
2. 10-100 people
3. greater than 100 people

B. List surrounding land use: (wood lot, agricultural, playground, industrial, etc.).

North: vacant lot and residential

South: railroad and Nantuxoke River

East: Mr. Schieferstein's house and property

West: warehouses

FIELD TRIP SUMMARY REPORT

TOD Number _____

Page 2

C. Water supply for area. (CIRCLE ONE)

1. Surface intakes (locate on attached map)
2. Municipal wells (locate on map)
3. Domestic wells:
 - a. Approximate number within 1/4 mile. _____
 - b. Locate a minimum of 3 wells on attached map and list below:

Property owner _____

Address _____

Phone No. _____

Well records	YES	NO	YES	NO	YES	NO
Odor Problems	YES	NO	YES	NO	YES	NO
Taste Problems	YES	NO	YES	NO	YES	NO

c. If odor or taste problems are reported please elaborate: _____

D. Are surface or subsurface, (leachate), drainage areas from site apparent?
 YES _____ NO X. If yes:

1. Were unusual odors or stains noted? YES _____ NO _____
2. Was stressed vegetation noted? YES _____ NO _____

E. Are streams or receiving waters adjacent to site? YES X NO _____
 If yes, list observations: (i.e. - change in benthic community, change in plant density/diversity, change in color, siltation, etc.). _____

Nanticoke River flows within two hundred yards of the site.

F. Site topography: (i.e. - plateau, strip mine ravines, etc.). _____

Flat

G. Other observations: (i.e. - erosion, located in flood plain, etc.). _____

Close to, if not on the Nanticoke River flood plain

FIELD TRIP SUMMARY REPORT

TDD Number _____

Page 3

- V. Were photographs taken? YES ___ NO X
If yes: Who has custody of photographs?

Name: _____

Agency: _____

Phone No.: _____

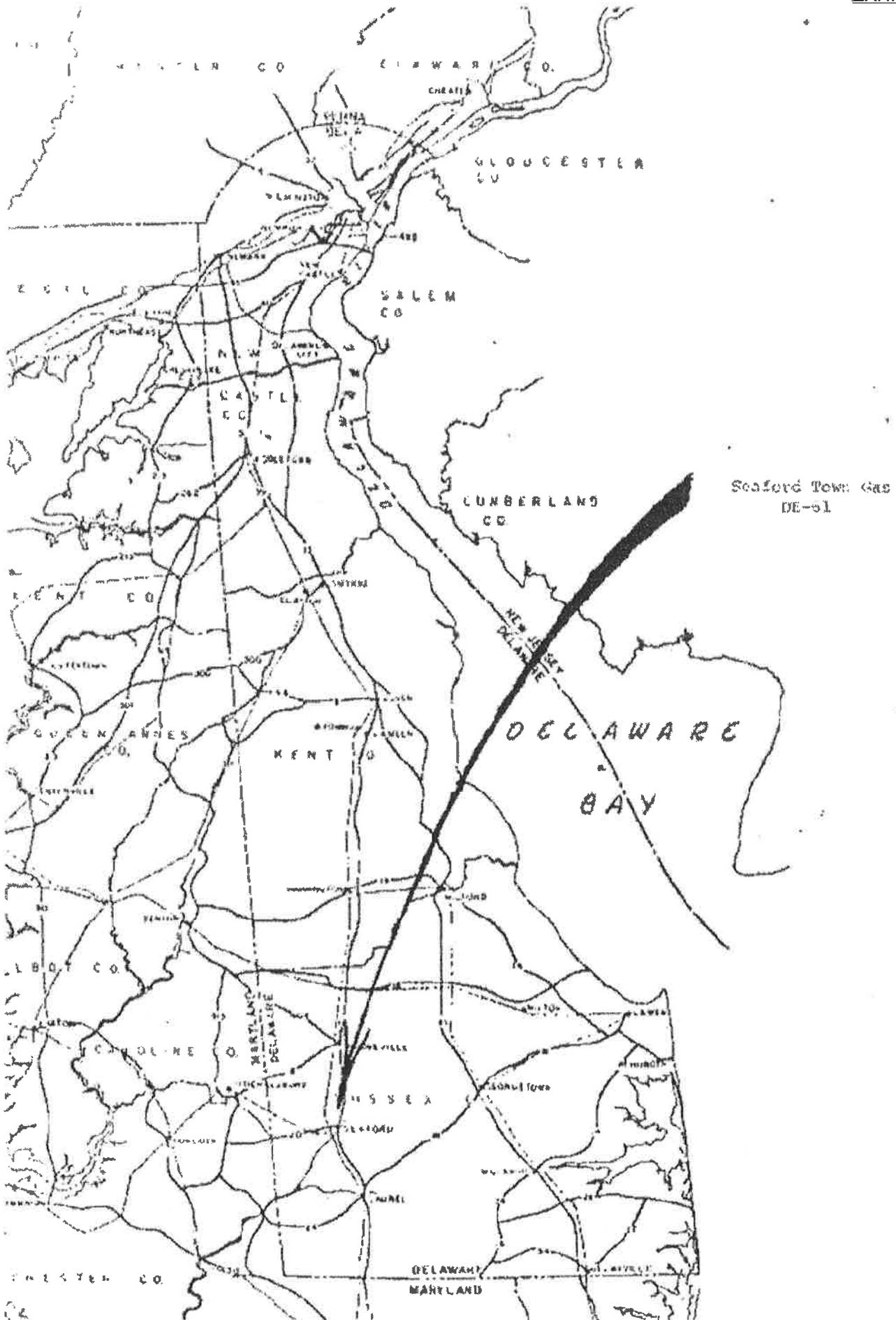
- VI. Is a hydrogeological survey for this site attached? YES ___ NO X
If no, Section III D of EPA Form T2070-2 must be completed.

- VII. Please attach pertinent copies of reports or data reviewed by inspector:
(i.e. - State monitoring data, consultant reports, etc.).

VIII. Name of Inspector: Andrew Bullen

Agency: Delaware DNREC, Solid Waste BranchPhone No.: 302-736-4781Time on Site: 2:00 - 3:00 p.m. 2/29/84Weather Conditions: 30°F windy, partly cloudy

VI. Maps and Drawings



APPENDIX B

**TetraTech's February 2015 Facility
Evaluation Report**



Facility Evaluation Report

Seaford Town Gas Site (DE-0061)

FINAL

Prepared For

Department of Natural Resources & Environmental Control
Division of Waste & Hazardous Substances
Site Investigation & Restoration Section
391 Lukens Drive
New Castle, DE 19720

February 2015

FE Report
Seaford Town Gas Site

February 2015

Facility Evaluation Report

Seaford Town Gas Site (DE-0061)
Tetra Tech Project No. 103S257406

REPRESENTATIONS

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1.0 INTRODUCTION

This Facility Evaluation report has been prepared by Tetra Tech, Inc. (Tetra Tech) for the Delaware Department of Natural Resources and Environmental Control (DNREC) Site Investigation and Restoration Section (SIRS) for the investigation of the Seaford Town Gas site located in Seaford, Delaware. The report provides an evaluation of environmental conditions at the site, and recommendations as to whether further investigation is required.

The Scope of Work (SOW) involved the following tasks:

- Project planning and coordination.
- Preparation of a work plan for proposed field activities.
- Implementation of the proposed field related activities.
- Data evaluation.
- Preparation of a report documenting the findings of the field activities, including recommendations for additional work, if required.

2.0 BACKGROUND

The Seaford Town Gas Site (DE-0061; Tax ID #5-31-13.00-0006.00) in Seaford, Delaware 19973, is located on Shipley Street at coordinates 38.63589°, -75.61965° (**Figure 1**). The site was also identified as the "Sussex Gas Company" and is referred to in previous DNREC investigations as a "former coal gas plant". The Environmental Protection Agency (EPA) inspected the site in May 1985 and made a determination that no further action was necessary. This determination was based upon information provided by employees of Chesapeake Utilities—that no waste was disposed of on-site and that the generated waste/byproduct was sold to roofers. No other known environmental investigation related activities have been documented for the site.

The site was historically used for coal gas plant operations, and is currently a storage and staging area for trucks and equipment for Chesapeake Utilities. The site is approximately 0.9 acre in size and consists of an existing shed and a fenced gravel parking lot. (**Figure 2**). The area immediately adjacent to the site consists of commercial businesses to the north, east, and west, and railroad tracks to the south.

The Seaford Town Gas site lies within the Atlantic Coastal Plain Physiographic Province consisting of Holocene sediments of the Columbia Group. Site soils are mapped entirely as Henlopen-Rosedale-Urban land complex. This type of soil consists of sandy eolian deposits and loamy fluviomarine sediments, and is somewhat excessively drained to well drained with a water table typically 42 to greater than 80 inches

below the surface. Site soils beneath the shallow fill materials encountered were consistent with the descriptions for these soil series (NRCS Web Soil Survey, USDA).

The nearest surface water body to the site is the Nanticoke River, which is located approximately 0.15 mile southeast of the site.

A Preliminary Assessment (PA) was conducted in March 1984 under the DNREC Superfund (Pre-Remedial) Program. Based upon the findings of the PA, no further action was recommended under CERCLA at that time. No work has been conducted at the site since then. A copy of the PA report dated March 1984 is provided in **Appendix A**.

3.0 SUMMARY OF FIELD ACTIVITIES

For this investigation, Tetra Tech conducted soil boring and monitoring well installation and sampling activities. Field activities were conducted in accordance with DNREC-SIRS Standard Operating Procedures for soil and groundwater sampling during the investigation process.

3.1 Preliminary Site Visit

Prior to the field investigation, Tetra Tech met with Chesapeake Utilities (Site Owner) on-site on October 7, 2014, to walk the property and to identify areas of investigation and areas of potential concern. During the walk-through, Tetra Tech and Chesapeake personnel discussed the objectives of the facility evaluation and selected soil boring locations and locations for groundwater sampling. The sampling locations were further refined using a close-up aerial image and confirmed with DNREC before finalizing. Based upon the presence of subsurface utilities and the possible presence of coal gas-related structures (e.g., gasholder) a geophysical survey was warranted.

3.2 Geophysical Survey

Tetra Tech contracted with Advanced Geological Services (AGS) of Malvern, PA to conduct a geophysical survey of the site. The geophysical survey was conducted on October 17, 2014. AGS used the electromagnetic (EM) method to determine the lateral extent of site utilities and any underground anomalies or structures. The EM survey was conducted with an EM31 instrument by Geonics, Inc. and a Trimble ProXRS Global Positioning System (GPS). The EM data was subjected to a Kriging contour process, and the data was presented as annotated color contour maps of the survey area. The geophysical survey highlighted anomalies that suggested the presence of utilities, fill, debris and subsurface structural features. The AGS report is attached as **Appendix B**.

3.3 Soil Borings

Tetra Tech contracted Vironex to provide a Delaware-licensed well driller and a truck-mounted Geoprobe drill rig to advance soil borings, collect soil samples, and install and develop monitoring wells. The drilling and well installation was conducted between November 19 and 20, 2014. A total of eleven soil borings were advanced and four monitoring wells installed at the site. The boring and well locations are depicted on **Figure 3**.

The work plan called for each boring to be advanced to approximately 20 feet below ground surface (bgs). However, borings where monitoring wells were installed were advanced from 23 to 25 feet bgs in order to accommodate installation of a 10-foot screen in the saturated zone. In addition, three of the borings (SB-9, SB-10, and SB-11) were only advanced to 15 feet bgs because groundwater was not encountered and no apparent contamination detected (staining, odors or elevated PID readings). Continuous soil samples were collected in disposable acetate sleeves at each location.

Soil samples were collected and submitted to the DNREC screening laboratory for analysis for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, PCBs and total metals from each of the eleven boring locations. The soil samples were collected from either areas of elevated organic vapor concentrations determined by the PID, areas observed to have soil staining/discoloration based on field observations, or at the water table interface, typically observed from about 14 to 18 feet bgs in each of the borings. The shallow samples were identified with the letter "S" (i.e., SS-01), and the deep samples were identified with a letter "D" (i.e. SD-01) at each of the boring locations. Each soil boring was logged in the field; boring logs are provided as **Appendix C**. Photographs of the soil cores are also included in Appendix C. A chain-of-custody was maintained at all times for the samples. All of the samples were stored on ice after collection and up to their receipt at the DNREC laboratory.

Additionally, quality assurance/quality control (QA/QC) samples were collected and included a Matrix Spike/Matrix Spike Duplicate (MS/MSD) collected at location SD-03, and a field duplicate sample collected at location SS-05, designated as SS-13. Soil sampling was conducted according to DNREC sampling protocols and Tetra Tech standard operating procedures.

Based upon the screening results, DNREC and Tetra Tech selected twelve samples (eleven plus one duplicate) for fixed laboratory analysis. The criteria for selection of the fixed laboratory samples was based upon the goal of obtaining a representative geographical distribution of the samples as well as focusing on samples with the most elevated screening results. The soil samples were submitted by DNREC to TestAmerica Laboratories Inc. for analysis of VOCs, SVOCs and total metals; the results are included in **Tables 2, 3, and 4** and the findings discussed in Section 4.0.

3.4 Well Installation and Groundwater Sampling

Well permits were obtained from the DNREC Water Supply Section in advance of the start of field activities. Wells were GPS located at the soil boring locations that were surveyed by AGS on October 17, 2014, and the well details are provided in **Table 1**. Permanent flush-mount wells were installed by the Geoprobe contractor at four boring locations on November 19 and 20, 2014; well permits are provided in **Appendix D**. The wells were constructed of 1-inch diameter polyvinyl chloride (PVC), with pre-packed 10-slot (0.010) PVC screen installed to a depths of 23 to 25 feet bgs. After installation, the wells were purged on November 21, 2014, using a peristaltic pump with dedicated high density polyethylene (HDPE) sample tubing. The purging process was continued until the purge water was observed to be relatively clear of fine sediment and water quality parameters (temperature, pH, conductivity) were stable (within 10%) as noted on the YSI instrument. All purge water was discharged to a bucket and transferred to a 55-gallon drum for containment and staged on site pending analytical results. A table of well construction information is provided as **Table 1**. The low flow sampling logs are provided in **Appendix E**.

Water levels were measured at each well prior to conducting groundwater sampling. A summary of the water table elevation are provided in **Table 1**. A groundwater contour plan was compiled based on these water table elevations and is presented as **Figure 4**. The contour plan indicates that the apparent groundwater flow is to the southeast toward the Nanticoke River with an approximate flow gradient ranging from 0.01 to 0.017 ft./ft. It should be noted that the gradient and flow contours are based upon a limited number of points (four).

Groundwater samples were collected from each of the four installed wells on November 21, 2014, at boring locations SB-03 (MW-03), SB-05 (MW-02), SB-07 (MW-01), and SB-08 (MW-04). The groundwater samples were identified with the letters "MW" (i.e., MW-01). Quality assurance/quality control (QA/QC) samples included a Matrix Spike/Matrix Spike Duplicate (MS/MSD) collected from MW-04, and a field duplicate sample collected from MW-02 (designated as MW-05). Groundwater sampling was conducted according to DNREC sampling protocols and Tetra Tech Standard Operating Procedures. The four groundwater samples were submitted to TestAmerica Laboratories for TCL VOCs, TCL SVOCs, pesticides, PCBs, total cyanide and total/dissolved metals analyses; the results are summarized in **Tables 5 - 10** and discussed in the following section.

4.0 FINDINGS

4.1 Field Observations

Tetra Tech installed eleven soil borings to a maximum depth of 25 feet bgs throughout the Seaford Town Gas Property. Site soils were generally sandy with gravel content increasing with depth. Some soil staining was observed within the fenced portion of the site but was not observed in soils outside of the fenced area.

The typical soil columns encountered in the borings within the fenced portion of the study area (SB01 through SB07) were as follows:

- 0 to 4.5 ft. Brown medium-coarse sand with trace silt and few gravel. Slight tar-like odor observed at one location (SB01).
- 4.5 to 11 ft. Variegated brown silty fine-medium sand with few clay plugs. Gray mottles, black tar-like stains between 6 to 8 feet bgs at several locations.
- 11 to 20 ft. Stratified layers of reddish-brown and light gray medium-coarse sand with few rounded gravel.

The typical soil columns encountered in the borings in the grassy field portion of the study area (SB08 through SB11) were as follows:

- 0 to 1 ft. Topsoil - black fine-medium sand with trace silt and few gravel. Organic.
- 1 to 5 ft. Light brown medium-coarse sand with trace silt and few small gravel.
- 5 to 8 ft. Brown with gray mottles medium-coarse sand with some silt and trace clay.
- 8 to 11 ft. Variegated gray with reddish-brown mottles fine sandy clay with some silt and few small gravel.
- 11 to 15 ft. Variegated gray and reddish-brown medium-coarse sand with few round gravel.

The water table was encountered at approximately 14 to 18 feet bgs across the entire study area. The water elevations across the site wells are nearly identical resulting in an almost flat hydraulic gradient. However, given the proximity to the Nanticoke River it is presumed that groundwater flow is to the south across the railroad tracks and into the river. Detailed soil boring logs and soil core photographs are provided as **Appendix C**.

4.2 Soil Analytical Results

4.2.1 DNREC Screening Lab Results

The results of the DNREC screening laboratory analyses indicated the presence of elevated levels of polycyclic aromatic hydrocarbons (PAHs), diesel-range organics (DRO) and a broad array of tentatively identified compounds (TICs) in the soil borings contained within the fenced portion of the site (SB-01 through SB-07). A summary of the soil screening results has been tabulated and is presented in **Appendix F**.

4.2.2 Fixed Laboratory Analysis

Based upon the screening results, twelve soil samples were subsequently submitted to TestAmerica for fixed laboratory analysis for VOCs, SVOCs and TCL metals. The soil samples submitted to the laboratory were collected from boring locations SB-01 (SS-01, SD-01), SB-02 (SS-02, SD-02), SB-03 (SS-03, SD-03), SB-05 (SS-05, SD-05), SB-07 (SS-07, SD-07), and SB-8 (SS-08, SD-08). The soil boring locations are depicted on **Figure 3**.

A summary of the soil analytical results has been tabulated and is presented in **Tables 2-4**. A copy of the analytical data package for the soil samples is included on a CD-ROM provided as **Appendix G**.

The results of the fixed laboratory analysis indicate the following.

Volatile Organic Compounds

Six VOCs were detected in the soil samples at concentrations greater than their Method Detection Limits (MDLs). These include benzene, ethylbenzene, isopropylbenzene, styrene, toluene and total xylenes. These VOCs were detected in soil borings SB-02 and SB-03 (and the duplicate from SB-02 identified as SB-05). A summary of the soil analytical results for VOCs is presented as **Table 2**.

Benzene and total xylenes were the only VOCs detected in soil samples at concentrations greater than the DNREC-SIRS Screening Levels (SLs). These exceedances were detected in soil boring SB-02. At this location ethylbenzene was detected in the deep soil boring at a concentration of 28 mg/kg, which exceeds the SL of 5.8 mg/kg. Total xylenes were also detected in the deep soil boring from SB-02 at a concentration of 73 mg/kg, which exceeds the SL of 58 mg/kg.

A number of TICs were quantified in sample SD-02, including several naphthalene isomers.

Semi-Volatile Organic Compounds

A number of SVOCs were detected in the soil samples at concentrations greater than their MDLs; these include the following:

- | | |
|--------------------------|--------------------------|
| • 1,1'-Biphenyl | • Chrysene |
| • 2-Chlorophenol | • Carbazole |
| • 2-Methylnaphthalene | • Dibenz(a,h)anthracene |
| • Acenaphthylene | • Fluoranthene |
| • Acetophenone | • Fluorene |
| • Anthracene | • Dibenzofuran |
| • Benzo(a)anthracene | • Indeno(1,2,3-cd)pyrene |
| • Benzo(a)pyrene | • Naphthalene |
| • Benzo(b)fluoranthene | • Phenanthrene |
| • Benzo(g,h,i)perylene | • Pyrene |
| • Dibenzo(k)fluoranthene | |

The majority of the positive detects for SVOCs are classified as PAHs, which are typically found in soils at former coal gas sites. The SVOCs/PAHs were detected in both the shallow and deep samples; however, the shallow samples demonstrated a broader array of constituents with generally higher concentrations (generally 1 to 2 orders of magnitude difference).

Similar to the soil VOC data, a broad array of TICs were detected in a number of samples with naphthalene and phenanthrene isomers dominating the mix.

The following SVOCs were detected at concentrations exceeding the DNREC SL for soils:

- | | |
|------------------------|---------------------------|
| • 1,1'-Biphenyl | • Benzo(k)fluoranthene |
| • 2-methylnaphthalene | • Dibenzo(a, h)anthracene |
| • Benzo(a)anthracene | • Indeno(1,2,3-cd)pyrene |
| • Benzo(a)pyrene | • Naphthalene |
| • Benzo(b)fluoranthene | |

The exceedances were primarily detected in samples collected from soil borings SB-02 and SB-03, which are located in the southwest corner of the property. The deep sample from SB-02 exhibited higher levels of SVOCs, while the shallow sample from SB-03 exhibited higher levels of SVOCs. A summary of the soil analytical results for SVOCs is presented as **Table 3**.

Metals

A variety of metals were detected in the soil samples at concentrations greater than their MDLs. These include aluminum, arsenic, calcium, chromium, copper, iron, lead, manganese, vanadium, zinc, and mercury. None of the exceedances for the metals exceed the DNREC SL except for mercury, which was detected in SB-05 (the duplicate sample from SB-02). At that location mercury was detected at a concentration of 5.3 mg/kg, which exceeds the SL of 0.94 mg/kg. A summary of the soil analytical results for metals is presented as **Table 4**.

The most frequently detected metals and range of concentrations include the following:

- *Aluminum* – detected in 12 of 13 soil samples with concentrations ranging from 688 to 12,300 mg/kg. All of the concentrations were less than the DNREC SL of 51,200 mg/kg.
- *Barium* – detected in all 13 soil samples with concentrations ranging from 2.9 to 31.4 mg/kg. All of the concentrations were less than the DNREC SL of 15,000 mg/kg.
- *Chromium (total)* – detected in all 13 soil samples with concentrations ranging from 1.8 to 12.3 mg/kg. All of the concentrations were less than the DNREC SL of 214 mg/kg.
- *Iron* – detected in all 13 samples with concentrations ranging from 506 to 20,100 mg/kg. All of the concentrations were less than the DNREC SL of 74,767 mg/kg.
- *Lead* – detected in 12 of 13 soil samples from both the shallow and deep with concentrations ranging from 1.4 to 40.5 mg/kg. All of the concentrations were less than the DNREC SL of 400 mg/kg.
- *Manganese* – detected in all 13 soil samples with concentrations ranging from 1.1 to 83.1 mg/kg. All of the concentrations were less than the DNREC SL of 2,100 mg/kg.
- *Vanadium* – detected in all 13 soil samples with concentrations ranging from 0.93 to 27.6 mg/kg. All of the concentrations were less than the DNREC SL of 390 mg/kg.
- *Mercury* – detected in 5 soil samples with concentrations ranging from 0.015 to 5.3 mg/kg. All of the concentrations were less than the DNREC SL of 0.94 mg/kg except for the shallow soil sample SS-05 collected from the 0 to 4 feet bgs.interval at SB-05, in which mercury was detected at 5.3 mg/kg.

4.3 Groundwater Analytical Results

Four groundwater samples and one duplicate sample were submitted to TestAmerica for fixed laboratory analysis for VOCs, SVOCs, pesticides, polychlorinated biphenyls (PCBs), total cyanide and total/dissolved metals. Additionally, the QA/QC samples collected included a Matrix Spike/Matrix Spike Duplicate (MS/MSD) collected at boring location SB-08 (MW-04); and a field duplicate sample collected at boring location SB-05 (MW-02), designated as MW-05. The boring/temporary well point locations are depicted on **Figure 3**.

A summary of the groundwater analytical results are tabulated and presented in **Tables 5-10**. A copy of the analytical data package for the groundwater samples is included on a CD-ROM provided as **Appendix F**.

The results of the fixed laboratory analysis indicate the following:

Volatile Organic Compounds

Six VOCs were detected in the groundwater samples collected during this investigation at concentrations greater than the laboratory MDL; these include benzene, ethylbenzene, isopropylbenzene, styrene, toluene and total xylenes. Benzene, ethylbenzene and total xylenes were detected at concentrations greater than their respective SL (0.45, 1.5, and 19 ug/L) in samples collected from wells MW-02 and MW-03. Benzene was detected at a concentration of 9.1 ug/L at MW-02 and 27 ug/L at MW-03. Ethylbenzene was detected at a concentration of 6 ug/L at MW-02 and 30 ug/L at MW-03. Total xylenes were detected at a concentration of 46 ug/L at MW-02 and 180 ug/L at MW-03.

In addition, a number of TICs were quantified in the samples from MW-02 and MW-03 including several benzene and naphthalene isomers.

Semi-Volatile Organic Compounds

SVOCs were detected in two of the four samples collected from monitoring wells installed during this investigation. Eleven SVOCs were detected in the groundwater samples at concentrations greater than the laboratory MDLs. These include:

- 1,1'-Biphenyl
- 2-Methylnaphthalene
- Acenaphthene
- Acenaphthylene
- Acetophenone
- Anthracene
- Benzo(a)pyrene
- Fluorene
- Naphthalene
- Phenanthrene
- Pyrene

Six of the eleven SVOCs were detected at concentrations exceeding DNREC SL for groundwater. These include the following:

- *1,1'-Biphenyl* – The SL of 0.083 ug/L was exceeded at MW-02 (6.3 ug/L) and MW-03 (22 ug/L).
- *2-Methylnaphthalene* – The SL of 3.6 ug/L was exceeded at MW-02 (51 ug/L along with the duplicate sample at this location at 47 ug/L) and at MW-03 (150 ug/L).
- *Benzo(a)pyrene* – The SL of 0.0034 ug/L was exceeded at MW-03 (0.84 ug/L).
- *Fluorene* – The SL of 29 ug/L was exceeded at MW-03 (40 ug/L). Lower level detections of fluorene were exhibited at MW-02 (and its duplicate).
- *Naphthalene* – The SL of 0.17 ug/L was exceeded at MW-02 (280 ug/L along with the duplicate sample at this location at 310 ug/L) and at MW-03 (880 ug/L).
- *Phenanthrene* – The SL of 12 ug/L was exceeded at MW-02 (27 ug/L along with the duplicate sample at this location at 25 ug/L) and at MW-03 (47 ug/L).

The majority of the positive detects and SL exceedances for SVOCs are classified as PAHs, which are typically detected in groundwater at former coal gas sites.

Similar to the VOC data, a broad array of TICs were detected in the samples from MW-2 and MW-3 with benzene, indene, and naphthalene isomers dominating the mix.

Pesticides and PCBs

The groundwater samples were analyzed for pesticides and polychlorinated biphenyls (PCBs) by EPA Methods 8081 and 8082, respectively. No pesticides or aroclors were detected greater than their laboratory MDLs in any of the groundwater samples.

Total Metals

Thirteen metals were detected in the unfiltered groundwater samples collected during this investigation at concentrations greater than the laboratory MDL. These include the following:

- Aluminum
- Barium
- Calcium
- Chromium
- Cobalt
- Iron
- Magnesium
- Manganese
- Nickel
- Potassium
- Sodium
- Zinc
- Mercury

Total iron, manganese, and mercury were detected at concentrations greater than the DNREC SL.

- *Iron* – The SL of 1,400 ug/L was exceeded in all four groundwater samples with concentrations ranging from 7,930 ug/L at MW-02 to 22,000 ug/L at MW-03.
- *Manganese* – The SL of 43 ug/L was exceeded in all four groundwater samples with concentrations ranging from 68.8 ug/L at MW-02 to 591 ug/L at MW-03.
- *Mercury* – The SL of 0.063 ug/L was exceeded in two of the four groundwater samples with concentrations ranging from 0.2 to 0.3 ug/L at wells MW-01 and MW-03, respectively.

Dissolved Metals

Thirteen metals were detected in the filtered groundwater samples collected during this investigation at concentrations greater than the laboratory MDL. These include the following:

- Aluminum
- Barium
- Calcium
- Chromium
- Cobalt
- Iron
- Magnesium
- Manganese
- Nickel
- Potassium

- Sodium
- Zinc
- Mercury

Dissolved cobalt, iron, manganese, and mercury were detected at concentrations greater than their DNREC SLs.

- *Cobalt* – The SL of 0.6 ug/L was exceeded in the groundwater sample collected from MW-04 where it was detected at a concentration of 4.1 ug/L.
- *Iron* – The SL of 1,400 ug/L was exceeded in all four groundwater samples with concentrations ranging from 8,320 ug/L at MW-02 to 20,900 ug/L at MW-04.
- *Manganese* – The SL of 43 ug/L was exceeded in all four groundwater samples with concentrations ranging from 65.2 ug/L at MW-02 to 512 ug/L at MW-03.
- *Mercury* – The SL of 0.063 ug/L was exceeded in the groundwater sample collected from MW-03 where it was detected at a concentration of 0.20 ug/L.

Total Cyanide

All four groundwater samples were also analyzed for total cyanide by EPA Method 335.4. Cyanide is a compound typically identified in soil and groundwater at former coal gas sites. The analytical results indicate that total cyanide was not detected at a concentration greater than the MDL in three of the four samples. Total cyanide was detected in the sample collected from MW-3 at a concentration of 0.023 ug/L. However, this concentration is less than the DNREC SL of 0.15 ug/L. It should also be noted that this sample was flagged as "B" by the laboratory, indicating that the contaminant was also found in the laboratory blank sample.

5.0 FINDINGS AND CONCLUSIONS

Tetra Tech performed an evaluation of the Seaford Town Gas Site (DE-0061) located in Seaford, Delaware. Based on the data collected during the FE, the following findings and conclusions are offered:

- Nine SVOCs were detected at concentrations greater than their respective DNREC Screening Level (SL) in seven of the twelve soil samples (includes one QA/QC duplicate sample). The exceedances were primarily associated with samples collected from borings installed within the fenced in portion of the property (SB-01, SB-02, and SB-03).
- SVOCs (primarily PAHs) were detected in both shallow and deep soil samples for borings outside the fenced area; however, the detections were all less than the DNREC SL.

- A number of SVOCs (primarily PAHs) were detected in groundwater at concentrations exceeding the DNREC SL.
- Benzene, ethylbenzene and total xylenes were detected in groundwater at concentrations exceeding the DNREC SL in the samples collected from MW-02 (and in its duplicate MW-05) and MW-03.
- The groundwater exceedances were primarily associated with the wells installed on the west (fenced) portion of the site.
- A broad array of metals were detected in both the shallow and deep soil samples, which are probably an artifact of the site's historic industrial/commercial usage. However, the detected concentrations of metals are less than the DNREC SL for metals in soil with the exception of mercury detected in the shallow soil duplicate sample from SB-02.
- Iron and manganese were detected in all of the groundwater samples at concentrations exceeding the DNREC SL.
- Mercury was detected at MW-01 and MW-03 at concentrations greater than the DNREC SL, and cobalt was detected from the dissolved sample analyzed from MW-04.
- The analytical results for pesticides, PCBs and cyanide were all either less than the laboratory MDL, or where positively detected, less than the respective DNREC SL.

Based on the findings of the Facility Evaluation, the following conclusions are offered:

- The contaminants of potential concern (COPC) at the site are SVOCs in soil, VOCs and SVOCs in groundwater, and mercury in groundwater.
- Shallow groundwater at the site is impacted by low levels of metals above their respective DNREC Screening Levels. The presence of aluminum, arsenic, chromium, cobalt, iron, manganese, and vanadium suggest an anthropogenic source of contamination. The aluminum and manganese concentrations may be attributable to background water quality conditions. These too may be attributable to historical site activities presumably associated with historic coal gas-related activities.
- Based on the findings of the field investigation, Tetra Tech recommends further investigation be conducted at the site to delineate the extent of soil and groundwater impact associated with historic site operations.

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Seaford Town Gas Site*

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FIGURES

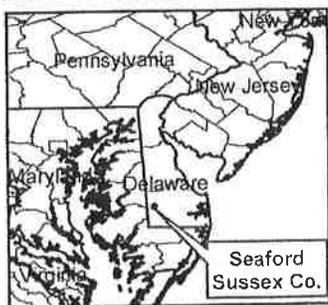
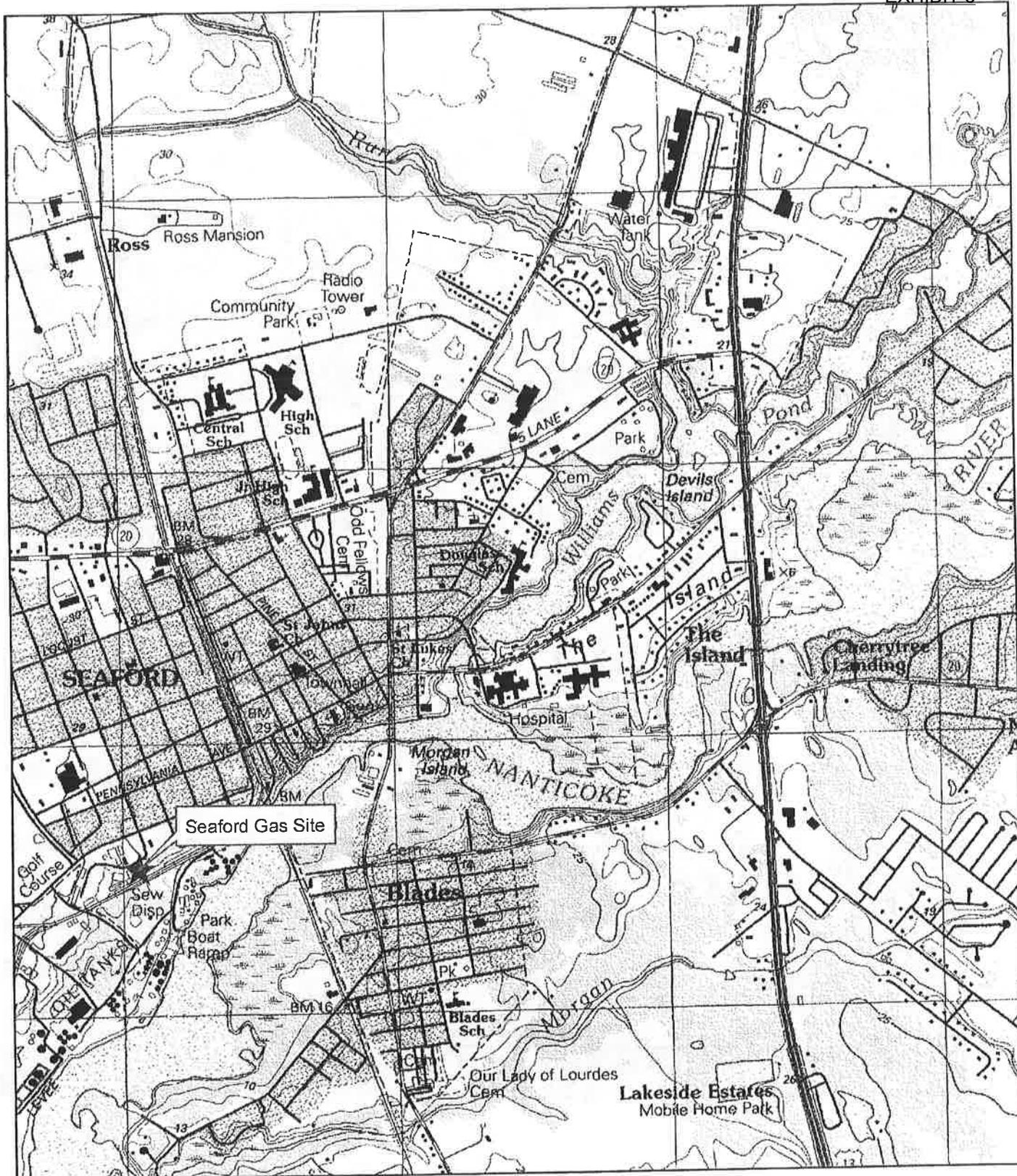


Figure 1
 Site Location Map
 Seaford Gas Site
 Seaford, Sussex Co., DE



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S:\03-projects\03-01-01\03-01-01-001 - Seaford Gas\3 - Working Files\Figures\Figure 2 - Site Layout Map.mxd

Legend

-  Approximate Historical Structure Locations
-  Property Boundary



Figure 2
 Site Layout Map
 Seaford Gas Site
 Seaford, Sussex Co., DE

0 20 40 80
 Feet

1 inch = 40 feet



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 Toll Free: (800) 462-0910
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S:\00-Proposed\State & Local\DE-CNR\EC1\08\627\AS - Seaford Gas\3 - Seaford Gas\3 - Working Files\Figures\Figure 3 - Boring Locations.mxd

Legend

- Soil Boring
- ◆ Soil Boring Converted to Well
- Approximate Historical Structure Locations
- Property Boundary

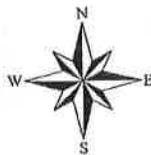


Figure 3
 Boring Locations Map
 Seaford Gas Site
 Seaford, Sussex Co., DE

0 20 40 80
 Feet

1 inch = 40 feet



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Ground surface elevations are estimated based upon Google Earth™

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

S:\03-Projects\State & Local\DE-CNREC\103257405 - Seaford Gas\0 - Seaford Gas\0 - Working Files\Figures\Figure 3 - Boring Locations.mxd

Legend

- ⊙ Soil Boring
- ⊕ Soil Boring Converted to Well
- ▭ Approximate Historical Structure Locations
- ▭ Property Boundary
- - - Limit of Fenced Area
- GW Elevation Contour Line (dash where inferred) - Ft. MSL
- GW Flow Direction (Inferred)

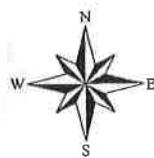


Figure 4
Groundwater Contour Plan
Seaford Gas Site
Seaford, Sussex Co., DE

0 20 40 80
Feet

1 inch = 40 feet

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TABLES

SEAFORD, DE

Well Permit #	Easting	Northing	Date Installed	Well Diameter	Well Construction	Total Depth (Ft. Bgs)	Screened Interval (Ft. Bgs)	Casing Stick-up	Depth to Water (Ft. Bgs)	Ground Surface Elevation (Ft. MSL)
249004	182338.0488	70600.4511	11/19/2014	1"	Prepack unit	23	13-23	Flush	15.55	20
249004	182308.0398	70598.9133	11/19/2014	1"	Prepack unit	25	15-25	Flush	15.50	21
249004	182304.5901	70577.4249	11/20/2014	1"	Prepack unit	24.5	14.5-24.5	Flush	15.90	21
249004	182342.8286	70622.3136	11/20/2014	1"	Prepack unit	25	15-25	Flush	15.63	21

elow ground surface
 above Mean Sea Level

: elevations are approximate, based upon review of Delaware DataMil

Soils	11/19/2014 10:30:00				11/19/2014 11:20:00				11/19/2014 11:30:00				11/19/2014 14:10:00				11/19/2014 14:10:00							
	mg/kg	Result	Q	MDL	mg/kg	Result	Q	MDL	mg/kg	Result	Q	MDL	mg/kg	Result	Q	MDL	mg/kg	Result	Q	MDL	mg/kg	Result	Q	MDL
810	0.007	U	0.007	0.034	0.034	U	0.034	0.061	0.061	U	0.061	0.066	0.066	U	0.066	0.006	0.006	U	0.006	0.006	0.006	U	0.006	0.006
0.6	0.018	U	0.018	0.087	0.087	U	0.087	0.16	0.16	U	0.16	0.17	0.17	U	0.17	0.015	0.015	U	0.015	0.015	0.015	U	0.015	0.015
4000	0.0092	U	0.0092	0.045	0.045	U	0.045	0.081	0.081	U	0.081	0.087	0.087	U	0.087	0.008	0.008	U	0.008	0.008	0.008	U	0.008	0.008
0.15	0.021	U	0.021	0.10	0.10	U	0.10	0.19	0.19	U	0.19	0.20	0.20	U	0.20	0.018	0.018	U	0.018	0.018	0.018	U	0.018	0.018
3.6	0.015	U	0.015	0.072	0.072	U	0.072	0.13	0.13	U	0.13	0.14	0.14	U	0.14	0.013	0.013	U	0.013	0.013	0.013	U	0.013	0.013
23	0.0099	U	0.0099	0.049	0.049	U	0.049	0.087	0.087	U	0.087	0.093	0.093	U	0.093	0.0086	0.0086	U	0.0086	0.0086	0.0086	U	0.0086	0.0086
5.8	0.038	U	0.038	0.19	0.19	U	0.19	0.34	0.34	U	0.34	0.36	0.36	U	0.36	0.033	0.033	U	0.033	0.033	0.033	U	0.033	0.033
0.0053	0.045	U	0.045	0.22	0.22	U	0.22	0.39	0.39	U	0.39	0.42	0.42	U	0.42	0.039	0.039	U	0.039	0.039	0.039	U	0.039	0.039
0.036	0.031	U	0.031	0.15	0.15	U	0.15	0.27	0.27	U	0.27	0.29	0.29	U	0.29	0.027	0.027	U	0.027	0.027	0.027	U	0.027	0.027
180	0.023	U	0.023	0.11	0.11	U	0.11	0.20	0.20	U	0.20	0.22	0.22	U	0.22	0.020	0.020	U	0.020	0.020	0.020	U	0.020	0.020
0.46	0.021	U	0.021	0.10	0.10	U	0.10	0.19	0.19	U	0.19	0.20	0.20	U	0.20	0.018	0.018	U	0.018	0.018	0.018	U	0.018	0.018
1	0.0097	U	0.0097	0.047	0.047	U	0.047	0.085	0.085	U	0.085	0.091	0.091	U	0.091	0.0084	0.0084	U	0.0084	0.0084	0.0084	U	0.0084	0.0084
NA	0.015	U	0.015	0.075	0.075	U	0.075	0.13	0.13	U	0.13	0.14	0.14	U	0.14	0.013	0.013	U	0.013	0.013	0.013	U	0.013	0.013
2.6	0.026	U	0.026	0.13	0.13	U	0.13	0.23	0.23	U	0.23	0.24	0.24	U	0.24	0.023	0.023	U	0.023	0.023	0.023	U	0.023	0.023
2700	0.26	U	0.26	1.3	1.3	U	1.3	2.3	2.3	U	2.3	2.4	2.4	U	2.4	0.24	0.24	U	0.24	0.24	0.24	U	0.24	0.24
20	0.056	U	0.056	0.28	0.28	U	0.28	0.49	0.49	U	0.49	0.53	0.53	U	0.53	0.049	0.049	U	0.049	0.049	0.049	U	0.049	0.049
530	0.11	U	0.11	0.54	0.54	U	0.54	0.97	0.97	U	0.97	1.0	1.0	U	1.0	0.10	0.10	U	0.10	0.10	0.10	U	0.10	0.10
6100	0.30	U	0.30	1.5	1.5	U	1.5	2.6	2.6	U	2.6	2.8	2.8	U	2.8	0.28	0.28	U	0.28	0.28	0.28	U	0.28	0.28
1.2	0.0093	U	0.0093	0.045	0.045	U	0.045	0.081	0.081	U	0.081	0.087	0.087	U	0.087	0.0087	0.0087	U	0.0087	0.0087	0.0087	U	0.0087	0.0087
67	0.022	U	0.022	0.11	0.11	U	0.11	0.19	0.19	U	0.19	0.20	0.20	U	0.20	0.019	0.019	U	0.019	0.019	0.019	U	0.019	0.019
0.68	0.020	U	0.020	0.10	0.10	U	0.10	0.18	0.18	U	0.18	0.19	0.19	U	0.19	0.018	0.018	U	0.018	0.018	0.018	U	0.018	0.018
77	0.014	U	0.014	0.069	0.069	U	0.069	0.12	0.12	U	0.12	0.13	0.13	U	0.13	0.012	0.012	U	0.012	0.012	0.012	U	0.012	0.012
0.65	0.0064	U	0.0064	0.031	0.031	U	0.031	0.056	0.056	U	0.056	0.061	0.061	U	0.061	0.0055	0.0055	U	0.0055	0.0055	0.0055	U	0.0055	0.0055
28	0.012	U	0.012	0.061	0.061	U	0.061	0.11	0.11	U	0.11	0.12	0.12	U	0.12	0.011	0.011	U	0.011	0.011	0.011	U	0.011	0.011
0.73	0.022	U	0.022	0.11	0.11	U	0.11	0.20	0.20	U	0.20	0.21	0.21	U	0.21	0.021	0.021	U	0.021	0.021	0.021	U	0.021	0.021
1400	0.019	U	0.019	0.093	0.093	U	0.093	0.17	0.17	U	0.17	0.18	0.18	U	0.18	0.017	0.017	U	0.017	0.017	0.017	U	0.017	0.017
0.32	0.0088	U	0.0088	0.043	0.043	U	0.043	0.078	0.078	U	0.078	0.083	0.083	U	0.083	0.0076	0.0076	U	0.0076	0.0076	0.0076	U	0.0076	0.0076
11	0.011	U	0.011	0.053	0.053	U	0.053	0.095	0.095	U	0.095	0.10	0.10	U	0.10	0.0094	0.0094	U	0.0094	0.0094	0.0094	U	0.0094	0.0094
16	0.020	U	0.020	0.098	0.098	U	0.098	0.17	0.17	U	0.17	0.19	0.19	U	0.19	0.019	0.019	U	0.019	0.019	0.019	U	0.019	0.019
NA	0.021	U	0.021	0.10	0.10	U	0.10	0.18	0.18	U	0.18	0.19	0.19	U	0.19	0.018	0.018	U	0.018	0.018	0.018	U	0.018	0.018
650	0.018	U	0.018	0.087	0.087	U	0.087	0.16	0.16	U	0.16	0.17	0.17	U	0.17	0.017	0.017	U	0.017	0.017	0.017	U	0.017	0.017
0.29	0.014	U	0.014	0.069	0.069	U	0.069	0.12	0.12	U	0.12	0.13	0.13	U	0.13	0.012	0.012	U	0.012	0.012	0.012	U	0.012	0.012
8.7	0.024	U	0.024	0.12	0.12	U	0.12	0.21	0.21	U	0.21	0.23	0.23	U	0.23	0.023	0.023	U	0.023	0.023	0.023	U	0.023	0.023
5.8	0.016	U	0.016	0.086	0.086	U	0.086	0.14	0.14	U	0.14	0.15	0.15	U	0.15	0.014	0.014	U	0.014	0.014	0.014	U	0.014	0.014
190	0.018	U	0.018	0.098	0.098	U	0.098	0.17	0.17	U	0.17	0.19	0.19	U	0.19	0.019	0.019	U	0.019	0.019	0.019	U	0.019	0.019
7800	0.038	U	0.038	0.18	0.18	U	0.18	0.33	0.33	U	0.33	0.35	0.35	U	0.35	0.035	0.035	U	0.035	0.035	0.035	U	0.035	0.035
47	0.015	U	0.015	0.076	0.076	U	0.076	0.14	0.14	U	0.14	0.15	0.15	U	0.15	0.015	0.015	U	0.015	0.015	0.015	U	0.015	0.015
NA	0.015	U	0.015	0.075	0.075	U	0.075	0.13	0.13	U	0.13	0.14	0.14	U	0.14	0.014	0.014	U	0.014	0.014	0.014	U	0.014	0.014
35	0.020	U	0.020	0.10	0.10	U	0.10	0.18	0.18	U	0.18	0.19	0.19	U	0.19	0.019	0.019	U	0.019	0.019	0.019	U	0.019	0.019
600	0.013	U	0.013	0.065	0.065	U	0.065	0.12	0.12	U	0.12	0.13	0.13	U	0.13	0.012	0.012	U	0.012	0.012	0.012	U	0.012	0.012
8.1	0.011	U	0.011	0.054	0.054	U	0.054	0.096	0.096	U	0.096	0.10	0.10	U	0.10	0.010	0.010	U	0.010	0.010	0.010	U	0.010	0.010
490	0.017	U	0.017	0.082	0.082	U	0.082	0.15	0.15	U	0.15	0.16	0.16	U	0.16	0.016	0.016	U	0.016	0.016	0.016	U	0.016	0.016
160	0.014	U	0.014	0.071	0.071	U	0.071	0.13	0.13	U	0.13	0.14	0.14	U	0.14	0.014	0.014	U	0.014	0.014	0.014	U	0.014	0.014
NA	0.027	U	0.027	0.13	0.13	U	0.13	0.24	0.24	U	0.24	0.26	0.26	U	0.26	0.026	0.026	U	0.026	0.026	0.026	U	0.026	0.026
0.41	0.010	U	0.010	0.051	0.051	U	0.051	0.091	0.091	U	0.091	0.097	0.097	U	0.097	0.0097	0.0097	U	0.0097	0.0097	0.0097	U	0.0097	0.0097
73	0.016	U	0.016	0.080	0.080	U	0.080	0.14	0.14	U	0.14	0.15	0.15	U	0.15	0.015	0.015	U	0.015	0.015	0.015	U	0.015	0.015
0.059	0.016	U	0.016	0.080	0.080	U	0.080	0.14	0.14	U	0.14	0.15	0.15	U	0.15	0.015	0.015	U	0.015	0.015	0.015	U	0.015	0.015
58	0.040	U	0.040	0.20	0.20	U	0.20	0.35	0.35	U	0.35	0.38	0.38	U	0.38	0.038	0.038	U	0.038	0.038	0.038	U	0.038	0.038
NA	0.034	U	0.034	0.17	0.17	U	0.17	0.29	0.29	U	0.29	0.31	0.31	U	0.31	0.031	0.031	U	0.031	0.031	0.031	U	0.031	0.031
NA	NA		NA	NA	NA		NA	NA	NA		NA	NA	NA		NA	NA	NA		NA	NA	NA		NA	NA

DNREC SIRS Screening Levels Soils July 2014	SG-FB1-1114 460-86962-2 11/19/2014 16:00:00 Soil			SG-FB2-1114 460-86962-3 11/20/2014 11:00:00 Soil			SG-SS03-1114 460-86962-4 11/19/2014 08:50:00 Soil			SG-SD03-1114 460-86962-5 11/19/2014 09:10:00 Soil			SG-SS02-1114 460-86962-6 11/19/2014 09:50:00 Soil		
	mg/kg	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL
4.7	0.028	U	0.028	U	0.028	0.31	U	0.31	0.33	J	0.059	0.061	U	0.061	
4.9	0.014	U	0.014	U	0.014	0.15	U	0.15	0.028	U	0.028	0.029	U	0.029	
620	0.033	U	0.033	U	0.033	0.36	U	0.36	0.068	U	0.068	0.071	U	0.071	
6.2	0.0094	U	0.0094	U	0.0094	0.10	U	0.10	0.020	U	0.020	0.020	U	0.020	
18	0.0078	U	0.0078	U	0.0078	0.085	U	0.085	0.016	U	0.016	0.017	U	0.017	
120	0.073	U	0.073	U	0.073	0.79	U	0.79	0.15	U	0.15	0.16	U	0.16	
12	0.25	U	0.25	U	0.25	2.7	U	2.7	0.52	U	0.52	0.54	U	0.54	
1.7	0.013	U	0.013	U	0.013	0.14	U	0.14	0.027	U	0.027	0.028	U	0.028	
0.36	0.018	U	0.018	U	0.018	0.19	U	0.19	0.037	U	0.037	0.038	U	0.038	
630	0.0075	U	0.0075	U	0.0075	0.081	U	0.081	0.016	U	0.016	0.016	U	0.016	
39	0.0084	U	0.0084	U	0.0084	0.091	U	0.091	0.017	U	0.017	0.018	U	0.018	
1	0.0073	U	0.0073	U	0.0073	0.12	J	0.079	0.24	J	0.015	0.12	J	0.016	
310	0.014	U	0.014	U	0.014	0.16	U	0.16	0.030	U	0.030	0.031	U	0.031	
61	0.011	U	0.011	U	0.011	0.12	U	0.12	0.023	U	0.023	0.024	U	0.024	
NA	0.011	U	0.011	U	0.011	0.12	U	0.12	0.023	U	0.023	0.024	U	0.024	
1.2	0.037	U	0.037	U	0.037	0.40	U	0.40	0.077	U	0.077	0.080	U	0.080	
NA	0.0098	U	0.0098	U	0.0098	0.11	U	0.11	0.020	U	0.020	0.021	U	0.021	
0.49	0.088	U	0.088	U	0.088	0.96	U	0.96	0.18	U	0.18	0.19	U	0.19	
NA	0.010	U	0.010	U	0.010	0.11	U	0.11	0.022	U	0.022	0.023	U	0.023	
620	0.014	U	0.014	U	0.014	0.15	U	0.15	0.030	U	0.030	0.031	U	0.031	
2.7	0.0085	U	0.0085	U	0.0085	0.092	U	0.092	0.018	U	0.018	0.018	U	0.018	
NA	0.0099	U	0.0099	U	0.0099	0.11	U	0.11	0.021	U	0.021	0.021	U	0.021	
620	0.009	U	0.009	U	0.009	0.098	U	0.098	0.019	U	0.019	0.019	U	0.019	
25	0.012	U	0.012	U	0.012	0.14	U	0.14	0.026	U	0.026	0.027	U	0.027	
NA	0.16	U	0.16	U	0.16	1.7	U	1.7	0.33	U	0.33	0.34	U	0.34	
270	0.008	U	0.008	U	0.008	0.087	U	0.087	0.41	J	0.017	0.060	J	0.017	
NA	0.0085	U	0.0085	U	0.0085	3.7	U	0.092	0.072	J	0.018	0.18	U	0.018	
780	0.0072	U	0.0072	U	0.0072	0.078	U	0.078	0.015	U	0.015	0.016	J	0.016	
1000	0.031	U	0.031	U	0.031	1.6	J	0.34	0.83	U	0.065	0.26	J	0.068	
2.3	0.015	U	0.015	U	0.015	0.16	U	0.16	0.031	U	0.031	0.032	U	0.032	
780	0.025	U	0.025	U	0.025	0.27	U	0.27	0.052	U	0.052	0.055	U	0.055	
0.9	0.028	U	0.028	U	0.028	13	U	0.30	1.0	U	0.057	0.060	U	0.060	
0.09	0.010	U	0.010	U	0.010	26	U	0.11	0.42	U	0.021	1.8	U	0.022	
0.9	0.013	U	0.013	U	0.013	21	U	0.14	0.68	U	0.027	0.75	U	0.028	
NA	0.019	U	0.019	U	0.019	28	U	0.21	0.48	J	0.040	6.4	U	0.041	
9	0.014	U	0.014	U	0.014	11	U	0.16	0.33	U	0.030	0.15	U	0.031	
18	0.010	U	0.010	U	0.010	0.11	U	0.11	0.021	U	0.021	0.022	U	0.022	
0.23	0.0078	U	0.0078	U	0.0078	0.085	U	0.085	0.016	U	0.016	0.017	U	0.017	
38	0.013	U	0.013	U	0.013	0.14	U	0.14	0.027	U	0.027	0.028	U	0.028	
280	0.13	J	0.13	J	0.10	0.11	U	0.11	0.021	U	0.021	0.022	U	0.022	
3100	0.024	U	0.024	U	0.024	0.26	U	0.26	0.050	U	0.050	0.051	U	0.051	
NA	0.0082	U	0.0082	U	0.0082	0.089	U	0.089	0.017	U	0.017	0.018	U	0.018	
87	0.009	U	0.009	U	0.009	16	U	0.098	1.0	U	0.019	0.019	U	0.019	
0.09	0.017	U	0.017	U	0.017	3.8	U	0.19	0.065	J	0.036	0.54	U	0.037	
7.2	0.010	U	0.010	U	0.010	0.11	U	0.11	0.076	J	0.021	0.022	U	0.022	
4900	0.0094	U	0.0094	U	0.0094	0.10	U	0.10	0.020	U	0.020	0.020	U	0.020	
NA	0.0096	U	0.0096	U	0.0096	0.10	U	0.10	0.020	U	0.020	0.021	U	0.021	

DNREC SIRS Screening Levels Soils July 2014	SG-FB1-1114		SG-FB2-1114		SG-SS03-1114		SG-SD03-1114		SG-SS02-1114	
	460-86962-2	460-86962-3	460-86962-4	460-86962-5	460-86962-6	460-86962-7	460-86962-8	460-86962-9	460-86962-10	460-86962-11
	11/19/2014 16:00:00	11/20/2014 11:00:00	11/20/2014 11:00:00	11/19/2014 08:50:00	11/19/2014 08:50:00	11/19/2014 09:10:00	11/19/2014 09:10:00	11/19/2014 09:10:00	11/19/2014 09:50:00	11/19/2014 09:50:00
	Soil									
mg/kg	1	1	1	10	2	2	2	2	2	2
	mg/kg									
	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result
	0.022	U	0.022	0.022	U	0.24	0.37	U	0.046	5.7
560	0.0071	U	0.0071	0.0071	U	0.077	0.015	U	0.015	0.015
5	0.0084	U	0.0084	0.0084	U	0.091	0.053	J	0.017	0.21
5.1	0.010	U	0.010	0.010	U	0.11	0.022	U	0.022	0.023
0.076	0.011	U	0.011	0.011	U	0.12	0.023	U	0.023	0.024
110	0.030	U	0.030	0.030	U	0.33	0.062	U	0.062	0.065
0.99	0.040	U	0.040	0.040	U	0.43	0.083	U	0.083	0.087
1000	0.0088	U	0.0088	0.0088	U	0.16	6.1	U	0.018	0.076
1800	0.011	U	0.011	0.011	U	0.12	0.022	U	0.022	0.023
230	0.015	U	0.015	0.015	U	0.16	3.2	U	0.031	0.41
NA	0.13			211.67			19.756			17.433
NA	0*T			96.4			38			12.06

limits : or matrix spike recoveries reported are calculated from diluted samples.

MDL and the concentration is an approximate value.

ie MDL and the concentration is an approximate value.

Shaded Concentrations shown in normal type face exceed laboratory method detection limit (MDL)

DNREC SIRS Screening Levels Soils	SG-SD01-1114			SG-SS05-1114			SG-SD05-1114			SG-SS07-1114			SG-SD07-1114		
	460-86962-9	460-86962-10	460-86962-11	460-86962-10	460-86962-11	460-86962-11	460-86962-17	460-86962-17	460-86962-17	460-86962-18	460-86962-18	460-86962-18	460-86962-18	460-86962-18	
11/19/2014 10:50:00	11/19/2014 11:20:00	11/19/2014 11:30:00	11/19/2014 11:30:00	11/19/2014 11:30:00	11/19/2014 11:30:00	11/19/2014 14:00:00	11/19/2014 14:00:00	11/19/2014 14:00:00	11/19/2014 14:00:00	11/19/2014 14:00:00	11/19/2014 14:00:00	11/19/2014 14:00:00	11/19/2014 14:00:00		
Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q		
4.7	0.14	J	0.032	3.2	J	0.033	J	0.033	0.031	U	0.031	0.034	U		
4.9	0.016	U	0.016	1.6	U	0.016	U	0.016	0.015	U	0.015	0.017	U		
620	0.038	U	0.038	3.8	U	0.038	U	0.038	0.036	U	0.036	0.040	U		
6.2	0.011	U	0.011	1.1	U	0.011	U	0.011	0.010	U	0.010	0.011	U		
18	0.0089	U	0.0089	0.89	U	0.0091	U	0.0091	0.0084	U	0.0084	0.0095	U		
120	0.083	U	0.083	8.3	U	0.084	U	0.084	0.079	U	0.079	0.088	U		
12	0.29	U	0.29	29	U	0.29	U	0.29	0.27	U	0.27	0.30	U		
1.7	0.015	U	0.015	1.5	U	0.015	U	0.015	0.014	U	0.014	0.016	U		
0.36	0.020	U	0.020	2.0	U	0.020	U	0.020	0.019	U	0.019	0.021	U		
630	0.0086	U	0.0086	0.86	U	0.0087	U	0.0087	0.0081	U	0.0081	0.0091	U		
39	0.0096	U	0.0096	0.96	U	0.0097	U	0.0097	0.0091	U	0.0091	0.010	U		
1	0.0083	U	0.0083	0.83	U	0.0085	U	0.0085	0.0079	U	0.0079	0.0089	U		
310	0.016	U	0.016	1.6	U	0.017	U	0.017	0.016	U	0.016	0.018	U		
61	0.012	U	0.012	1.2	U	0.013	U	0.013	0.012	U	0.012	0.013	U		
NA	0.013	U	0.013	1.3	U	0.013	U	0.013	0.012	U	0.012	0.013	U		
1.2	0.042	U	0.042	4.2	U	0.043	U	0.043	0.040	U	0.040	0.045	U		
NA	0.011	U	0.011	1.1	U	0.011	U	0.011	0.011	U	0.011	0.012	U		
0.49	0.10	U	0.10	10	U	0.10	U	0.10	0.096	U	0.096	0.11	U		
NA	0.012	U	0.012	1.2	U	0.012	U	0.012	0.011	U	0.011	0.013	U		
620	0.016	U	0.016	1.6	U	0.016	U	0.016	0.015	U	0.015	0.017	U		
2.7	0.0097	U	0.0097	0.97	U	0.0099	U	0.0099	0.0092	U	0.0092	0.010	U		
NA	0.011	U	0.011	1.1	U	0.011	U	0.011	0.011	U	0.011	0.012	U		
620	0.010	U	0.010	1.0	U	0.010	U	0.010	0.0097	U	0.0097	0.011	U		
25	0.014	U	0.014	1.4	U	0.015	U	0.015	0.014	U	0.014	0.015	U		
NA	0.18	U	0.18	18	U	0.18	U	0.18	0.17	U	0.17	0.19	U		
270	0.084	J	0.091	42	D	0.093	J	0.093	0.087	U	0.087	0.097	U		
NA	0.14	J	0.097	23	J	0.099	J	0.099	0.092	U	0.092	0.10	U		
780	0.082	U	0.082	0.82	U	0.084	U	0.084	0.078	U	0.078	0.088	U		
1000	0.26	J	0.036	37	J	0.036	J	0.036	0.034	U	0.034	0.038	U		
2.3	0.017	U	0.017	1.7	U	0.017	U	0.017	0.016	U	0.016	0.018	U		
780	0.029	U	0.029	2.9	U	0.029	U	0.029	0.027	U	0.027	0.031	U		
0.9	0.37	U	0.032	61	D	0.032	D	0.032	0.030	U	0.030	0.034	U		
0.09	0.26	U	0.011	49	D	0.012	U	0.012	0.011	U	0.011	0.012	U		
0.9	0.24	U	0.015	76	D	0.015	U	0.015	0.014	U	0.014	0.016	U		
NA	0.14	J	0.022	62	D	0.022	J	0.022	0.021	U	0.021	0.023	U		
9	0.10	U	0.016	34	D	0.016	U	0.016	0.016	U	0.016	0.018	U		
18	0.012	U	0.012	1.2	U	0.012	U	0.012	0.011	U	0.011	0.013	U		
0.23	0.089	U	0.089	0.89	U	0.091	U	0.091	0.084	U	0.084	0.095	U		
38	0.015	U	0.015	1.5	U	0.015	U	0.015	0.014	U	0.014	0.016	U		
280	0.012	U	0.012	1.2	U	0.012	U	0.012	0.011	U	0.011	0.012	U		
3100	0.027	U	0.027	2.7	U	0.028	U	0.028	0.026	U	0.026	0.029	U		
NA	0.0084	U	0.0084	0.94	U	0.0095	U	0.0095	0.0089	U	0.0089	0.010	U		
87	0.39	U	0.010	79	D	0.010	U	0.010	0.0097	U	0.0097	0.011	U		
0.09	0.028	J	0.020	9.0	D	0.020	J	0.020	0.019	U	0.019	0.021	U		
7.2	0.011	U	0.011	4.8	J	0.011	J	0.011	0.011	U	0.011	0.012	U		
4900	0.011	U	0.011	1.1	U	0.011	U	0.011	0.010	U	0.010	0.011	U		
NA	0.011	U	0.011	1.1	U	0.011	U	0.011	0.010	U	0.010	0.012	U		

DNREC SIRS Screening Levels Soils July 2014	SG-SD01-1114		SG-SS05-1114		SG-SD05-1114		SG-SS07-1114		SG-SD07-1114	
	460-86962-9	460-86962-10	460-86962-11	460-86962-17	460-86962-18	460-86962-17	460-86962-17	460-86962-17	460-86962-18	
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	
Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL	
0.9	0.13	0.025	2.5	0.026	0.024	0.024	0.024	0.055	0.027	
560	0.0081	0.0081	0.81	0.0082	0.0077	0.0077	0.0077	0.0086	0.0086	
5	0.83	0.0096	0.96	0.21	0.17	0.17	0.0091	0.023	0.010	
5.1	0.012	0.012	1.2	0.012	0.011	0.011	0.011	0.013	0.013	
0.076	0.013	0.013	1.3	0.013	0.012	0.012	0.012	0.013	0.013	
110	0.034	0.034	3.4	0.035	0.032	0.032	0.032	0.036	0.036	
0.99	0.046	0.046	4.6	0.046	0.043	0.043	0.043	0.049	0.049	
1000	1.1	0.010	1.0	4.2	0.016	0.016	0.0095	0.011	0.011	
1800	0.012	0.012	1.2	0.013	0.012	0.012	0.012	0.013	0.013	
230	1.1	0.017	1.7	3.1	0.016	0.016	0.016	0.062	0.018	
NA	6.742	1394.8	15.623	0.263	0.263	0.263	0.366	0.366	0.366	
NA	10.72	290	5.15	0*T	0*T	0*T	0.33	0.33	0.33	

limits
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DNREC SIRS Screening Levels Soils July 2014	SG-SS03-1114			SG-SD03-1114			SG-SS02-1114			SG-SD02-1114			SG-SS01-1114					
	mg/kg	Result	Q	mg/kg	MDL	Result	Q	mg/kg	MDL	Result	Q	mg/kg	MDL	Result	Q	mg/kg	MDL	
460-86962-4	11/19/2014 08:50:00	Soil		460-86962-5	11/19/2014 09:10:00	Soil		460-86962-6	11/19/2014 09:50:00	Soil		460-86962-7	11/19/2014 10:10:00	Soil		460-86962-8	11/19/2014 10:40:00	Soil
51200	4050	22.0	688	21.7	3100	21.8	1530	20.8	1530	2520	19.5	20.8	1530	2520	19.5	20.8	1530	2520
3.1	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
11	1.2	0.82	0.80	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
1500	24.3	1.7	2.9	1.7	18.5	1.7	4.3	1.6	4.3	18.7	1.5	1.6	4.3	18.7	1.5	1.6	4.3	18.7
16	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
7	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
NA	157	76.1	75.2	75.2	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4
214	4.4	0.80	2.1	0.79	3.4	0.79	1.8	0.75	1.8	3.1	0.71	0.75	1.8	3.1	0.71	0.75	1.8	3.1
34	0.90	0.90	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
310	1.8	1.8	1.7	1.7	19.8	1.7	1.7	1.7	1.7	1.6	1.6	1.7	1.7	1.6	1.6	1.7	1.7	1.6
74767	2910	24.8	506	24.5	1860	24.5	303	23.5	303	2510	22.0	23.5	303	2510	22.0	23.5	303	2510
400	4.4	0.82	0.81	0.81	2.8	0.81	1.4	0.77	1.4	2.3	0.72	0.77	1.4	2.3	0.72	0.77	1.4	2.3
NA	294	66.1	65.3	65.3	206	65.4	62.5	62.5	62.5	198	58.6	62.5	62.5	198	58.6	62.5	62.5	198
2100	19.1	0.86	1.1	0.85	7.7	0.85	2.2	0.81	2.2	17.1	0.76	0.81	2.2	17.1	0.76	0.81	2.2	17.1
150	3.2	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.7	1.6	1.6	1.7	1.7	1.6	1.6	1.7	1.7	1.6
NA	140	27.5	32.6	27.1	109	27.2	80.2	26.0	80.2	105	24.4	26.0	80.2	105	24.4	26.0	80.2	105
39	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.1	1.1	1.0	1.0	1.1	1.1	1.0
39	0.39	0.39	0.38	0.38	0.38	0.38	0.37	0.37	0.37	0.34	0.34	0.37	0.37	0.34	0.34	0.37	0.37	0.34
NA	75.2	75.2	74.3	74.3	74.5	74.5	71.2	71.2	71.2	66.7	66.7	71.2	71.2	66.7	66.7	71.2	71.2	66.7
0.078	2.0	2.0	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.7	1.7	1.8	1.8	1.7	1.7	1.8	1.8	1.7
134	5.5	0.82	1.4	0.81	4.9	0.81	0.93	0.78	0.93	4.4	0.73	0.78	0.93	4.4	0.73	0.78	0.93	4.4
2300	29.9	1.7	1.7	1.7	5.1	1.7	1.6	1.6	1.6	3.3	1.5	1.6	1.6	3.3	1.5	1.6	1.6	3.3
0.94	0.10	0.013	0.013	0.013	0.013	0.013	0.012	0.012	0.012	0.013	0.013	0.012	0.012	0.013	0.013	0.012	0.012	0.013

DNREC SL
: MDL and the concentration is an approximate value.

CAS#	DNREC SIRS Screening Levels Soils July 2014	SG-SD05-1114			SG-SS07-1114			SG-SD07-1114			SG-SS08-1114						
		mg/kg	Result	Q	MDL	mg/kg	Result	Q	MDL	mg/kg	Result	Q	MDL	mg/kg	Result	Q	MDL
7429-90-5	51200	6450			25.7	2550			21.6	12300			25.7	5490			23.6
7440-36-0	3.1	1.8	U	1.8	1.5	1.5	U	1.5	1.5	1.8	U	1.8	1.8	1.6	U	1.6	1.6
7440-38-2	11	0.95	U	0.95	1.5	1.5		0.80	0.80	1.2		1.2	0.95	1.3		1.3	0.88
7440-39-3	1500	12.1	J	11.8	2.0	11.8	J	1.7	1.7	16.9	J	16.9	2.0	19.7	J	19.7	1.8
7440-41-7	16	0.32	U	0.32	0.32	0.27	U	0.27	0.27	0.32	U	0.32	0.32	0.29	U	0.29	0.29
7440-43-9	7	0.33	U	0.33	0.33	0.28	U	0.28	0.28	0.33	U	0.33	0.33	0.30	U	0.30	0.30
7440-70-2	NA	371	J	74.8	88.9	74.8	U	74.8	74.8	583	J	583	88.8	345	J	345	81.8
7440-47-3	214	5.9		3.7	0.93	3.7		0.78	0.78	12.3		12.3	0.93	5.9		5.9	0.86
7440-48-4	34	1.0	U	0.88	1.0	0.88	U	0.88	0.88	1.0	U	1.0	1.0	0.96	U	0.96	0.96
7440-50-8	310	2.0	U	3.3	2.0	3.3	J	1.7	1.7	3.1	J	3.1	2.0	1.9	U	1.9	1.9
7439-89-6	74767	2440		2910	28.9	2910		24.3	24.3	3590		3590	28.9	3680		3680	26.6
7439-92-1	400	4.3		3.2	0.95	3.2		0.80	0.80	8.1		8.1	0.95	3.4		3.4	0.88
7439-95-4	NA	207	J	77.2	77.2	216	J	64.9	64.9	259	J	259	77.1	245	J	245	71.0
7439-96-5	2100	11.6		1.0	1.0	25.5		0.84	0.84	8.7		8.7	1.0	11.5		11.5	0.92
7440-02-0	150	2.1	U	2.1	2.1	1.8	U	1.8	1.8	2.1	J	2.1	2.1	1.9	J	1.9	1.9
7440-09-7	NA	224	J	32.1	32.1	95.3	J	27.0	27.0	421	J	421	32.1	208	J	208	29.5
7782-49-2	39	1.3	U	1.3	1.3	1.1	U	1.1	1.1	1.3	U	1.3	1.3	1.2	U	1.2	1.2
7440-22-4	39	0.45	U	0.45	0.45	0.38	U	0.38	0.38	0.45	U	0.45	0.45	0.41	U	0.41	0.41
7440-23-5	NA	87.9	U	87.9	87.9	73.9	U	73.9	73.9	87.8	U	87.8	87.8	80.8	U	80.8	80.8
7440-28-0	0.078	2.3	U	2.3	2.3	1.9	U	1.9	1.9	2.3	U	2.3	2.3	2.1	U	2.1	2.1
7440-62-2	134	6.9	J	0.96	0.96	6.4	J	0.81	0.81	17.8		17.8	0.96	9.6	J	9.6	0.88
7440-66-6	2300	4.3	J	7.4	2.0	7.4		1.7	1.7	16.0		16.0	2.0	7.7		7.7	1.8
7439-97-6	0.94	0.014	U	0.014	0.014	0.13		0.012	0.012	0.036		0.036	0.015	0.017	J	0.017	0.013

ons shown in bold type face exceed DNREC SL
 ie RL but greater than or equal to the MDL and the conce
 a was analyzed for but not detected.

UNIVERSITY	460-86962-27				460-86962-28				460-86962-29				460-86962-30				460-86962-31			
	Result	Q	MDL	ug/l	Result	Q	MDL	ug/l	Result	Q	MDL	ug/l	Result	Q	MDL	ug/l	Result	Q	MDL	ug/l
Greening Levels																				
Groundwater																				
July 2014																				
ug/l																				
200	0.060	U	0.060	0.060	U	0.060	0.30	0.30	U	0.060	0.060	0.060	U	0.060	0.060	0.060	U	0.060	0.060	
5500	0.080	U	0.080	0.080	U	0.080	0.40	0.40	U	0.080	0.080	0.080	U	0.080	0.080	0.080	U	0.080	0.080	
0.041	0.19	U	0.19	0.19	U	0.19	0.95	0.95	U	0.19	0.19	0.19	U	0.19	0.19	0.19	U	0.19	0.19	
2.7	0.13	U	0.13	0.13	U	0.13	0.65	0.65	U	0.13	0.13	0.13	U	0.13	0.13	0.13	U	0.13	0.13	
7	0.090	U	0.090	0.090	U	0.090	0.45	0.45	U	0.090	0.090	0.090	U	0.090	0.090	0.090	U	0.090	0.090	
0.4	0.34	U	0.34	0.34	U	0.34	1.7	1.7	U	0.34	0.34	0.34	U	0.34	0.34	0.34	U	0.34	0.34	
0.00033	0.40	U	0.40	0.40	U	0.40	2.0	2.0	U	0.40	0.40	0.40	U	0.40	0.40	0.40	U	0.40	0.40	
0.0075	0.28	U	0.28	0.28	U	0.28	1.4	1.4	U	0.28	0.28	0.28	U	0.28	0.28	0.28	U	0.28	0.28	
30	0.21	U	0.21	0.21	U	0.21	1.1	1.1	U	0.21	0.21	0.21	U	0.21	0.21	0.21	U	0.21	0.21	
0.17	0.19	U	0.19	0.19	U	0.19	0.95	0.95	U	0.19	0.19	0.19	U	0.19	0.19	0.19	U	0.19	0.19	
0.44	0.090	U	0.090	0.090	U	0.090	0.45	0.45	U	0.090	0.090	0.090	U	0.090	0.090	0.090	U	0.090	0.090	
NA	0.14	U	0.14	0.14	U	0.14	0.70	0.70	U	0.14	0.14	0.14	U	0.14	0.14	0.14	U	0.14	0.14	
0.48	0.23	U	0.23	0.23	U	0.23	1.2	1.2	U	0.23	0.23	0.23	U	0.23	0.23	0.23	U	0.23	0.23	
560	2.3	U	2.3	2.3	U	2.3	12	12	U	2.3	2.3	2.3	U	2.3	2.3	2.3	U	2.3	2.3	
3.8	0.50	U	0.50	0.50	U	0.50	2.5	2.5	U	0.50	0.50	0.50	U	0.50	0.50	0.50	U	0.50	0.50	
120	0.99	U	0.99	0.99	U	0.99	5.0	5.0	U	0.99	0.99	0.99	U	0.99	0.99	0.99	U	0.99	0.99	
1400	2.7	U	2.7	2.7	U	2.7	13	13	U	2.7	2.7	2.7	U	2.7	2.7	2.7	U	2.7	2.7	
0.45	0.080	U	0.080	0.080	U	0.080	9.1	9.1	U	0.080	0.080	0.080	U	0.080	0.080	0.080	U	0.080	0.080	
9.2	0.19	U	0.19	0.19	U	0.19	0.95	0.95	U	0.19	0.19	0.19	U	0.19	0.19	0.19	U	0.19	0.19	
0.75	0.18	U	0.18	0.18	U	0.18	0.90	0.90	U	0.18	0.18	0.18	U	0.18	0.18	0.18	U	0.18	0.18	
81	0.13	U	0.13	0.13	U	0.13	0.65	0.65	U	0.13	0.13	0.13	U	0.13	0.13	0.13	U	0.13	0.13	
0.45	0.060	U	0.060	0.060	U	0.060	0.30	0.30	U	0.060	0.060	0.060	U	0.060	0.060	0.060	U	0.060	0.060	
7.8	0.11	U	0.11	0.11	U	0.11	0.55	0.55	U	0.11	0.11	0.11	U	0.11	0.11	0.11	U	0.11	0.11	
0.17	0.20	U	0.20	0.20	U	0.20	1.0	1.0	U	0.20	0.20	0.20	U	0.20	0.20	0.20	U	0.20	0.20	
2100	0.17	U	0.17	0.17	U	0.17	0.85	0.85	U	0.17	0.17	0.17	U	0.17	0.17	0.17	U	0.17	0.17	
0.22	0.080	U	0.080	0.080	U	0.080	0.40	0.40	U	0.080	0.080	0.080	U	0.080	0.080	0.080	U	0.080	0.080	
19	0.10	U	0.10	0.10	U	0.10	0.50	0.50	U	0.10	0.10	0.10	U	0.10	0.10	0.10	U	0.10	0.10	
3.6	0.18	U	0.18	0.18	U	0.18	0.90	0.90	U	0.18	0.18	0.18	U	0.18	0.18	0.18	U	0.18	0.18	
NA	0.18	U	0.18	0.18	U	0.18	0.90	0.90	U	0.18	0.18	0.18	U	0.18	0.18	0.18	U	0.18	0.18	
1300	0.16	U	0.16	0.16	U	0.16	0.80	0.80	U	0.16	0.16	0.16	U	0.16	0.16	0.16	U	0.16	0.16	
0.13	0.12	U	0.12	0.12	U	0.12	0.60	0.60	U	0.12	0.12	0.12	U	0.12	0.12	0.12	U	0.12	0.12	
20	0.22	U	0.22	0.22	U	0.22	1.1	1.1	U	0.22	0.22	0.22	U	0.22	0.22	0.22	U	0.22	0.22	
1.5	0.10	U	0.10	0.10	U	0.10	0.50	0.50	U	0.10	0.10	0.10	U	0.10	0.10	0.10	U	0.10	0.10	
45	0.080	U	0.080	0.080	U	0.080	3.1	3.1	U	0.080	0.080	0.080	U	0.080	0.080	0.080	U	0.080	0.080	
2000	0.34	U	0.34	0.34	U	0.34	1.7	1.7	U	0.34	0.34	0.34	U	0.34	0.34	0.34	U	0.34	0.34	
10	0.14	U	0.14	0.14	U	0.14	0.70	0.70	U	0.14	0.14	0.14	U	0.14	0.14	0.14	U	0.14	0.14	
NA	0.14	U	0.14	0.14	U	0.14	0.70	0.70	U	0.14	0.14	0.14	U	0.14	0.14	0.14	U	0.14	0.14	
5	0.18	U	0.18	0.18	U	0.18	0.90	0.90	U	0.18	0.18	0.18	U	0.18	0.18	0.18	U	0.18	0.18	
100	0.12	U	0.12	0.12	U	0.12	0.60	0.60	U	0.12	0.12	0.12	U	0.12	0.12	0.12	U	0.12	0.12	
1	0.10	U	0.10	0.10	U	0.10	0.50	0.50	U	0.10	0.10	0.10	U	0.10	0.10	0.10	U	0.10	0.10	
110	0.15	U	0.15	0.15	U	0.15	0.75	0.75	U	0.15	0.15	0.15	U	0.15	0.15	0.15	U	0.15	0.15	
36	0.13	U	0.13	0.13	U	0.13	0.65	0.65	U	0.13	0.13	0.13	U	0.13	0.13	0.13	U	0.13	0.13	
NA	0.24	U	0.24	0.24	U	0.24	1.2	1.2	U	0.24	0.24	0.24	U	0.24	0.24	0.24	U	0.24	0.24	
0.28	0.090	U	0.090	0.090	U	0.090	0.45	0.45	U	0.090	0.090	0.090	U	0.090	0.090	0.090	U	0.090	0.090	
110	0.15	U	0.15	0.15	U	0.15	0.75	0.75	U	0.15	0.15	0.15	U	0.15	0.15	0.15	U	0.15	0.15	
0.079	0.14	U	0.14	0.14	U	0.14	0.70	0.70	U	0.14	0.14	0.14	U	0.14	0.14	0.14	U	0.14	0.14	
19	0.13	U	0.13	0.13	U	0.13	0.65	0.65	U	0.13	0.13	0.13	U	0.13	0.13	0.13	U	0.13	0.13	

EXHIBIT 3

CAS#	ug/l	SG-MW01-1114			SG-MW02-1114			SG-MW03-1114			SG-MW04-1114			SG-MW05-1114		
		Result	Q	MDL												
DNREC SIRS		450-86962-27			460-86962-28			460-86962-29			460-86962-30			460-86962-31		
Screening Levels		11/21/2014 09:00:00			11/21/2014 10:30:00			11/21/2014 12:00:00			11/21/2014 13:30:00			11/21/2014 10:00:00		
Groundwater		Water			Water			Water			Water			Water		
July 2014		1			2			5			1			2		
CAS#	ug/l	Result	Q	MDL												
3-52-4	0.083	1.8	U	1.8	6.3	J	3.6	22	J	9.4	1.9	U	1.9	5.9	J	3.6
3-60-1	0.36	1.3	U	1.3	2.6	U	2.6	6.8	U	6.8	1.4	U	1.4	2.6	U	2.6
3-95-4	120	2.2	U	2.2	4.4	U	4.4	11	U	11	2.3	U	2.3	4.4	U	4.4
3-06-2	1.2	1.4	U	1.4	2.8	U	2.8	7.3	U	7.3	1.5	U	1.5	2.8	U	2.8
3-83-2	4.6	1.1	U	1.1	2.2	U	2.2	5.7	U	5.7	1.1	U	1.1	2.2	U	2.2
3-67-9	36	1.2	U	1.2	2.4	U	2.4	6.3	U	6.3	1.3	U	1.3	2.4	U	2.4
3-28-5	3.9	2.0	U	2.0	4.0	U	4.0	10	U	10	2.1	U	2.1	4.0	U	4.0
3-14-2	0.24	0.28	U	0.28	0.56	U	0.56	1.5	U	1.5	0.29	U	0.29	0.56	U	0.56
3-20-2	0.048	0.27	U	0.27	0.54	U	0.54	1.4	U	1.4	0.28	U	0.28	0.54	U	0.54
3-58-7	75	1.3	U	1.3	2.6	U	2.6	6.8	U	6.8	1.4	U	1.4	2.6	U	2.6
3-57-8	9.1	0.93	U	0.93	1.9	U	1.9	4.8	U	4.8	0.97	U	0.97	1.9	U	1.9
3-57-6	3.6	1.5	U	1.5	3.0	U	3.0	150	U	7.8	1.6	U	1.6	47	U	3.0
3-48-7	93	1.4	U	1.4	2.8	U	2.8	7.3	U	7.3	1.5	U	1.5	2.8	U	2.8
3-74-4	19	2.0	U	2.0	4.0	U	4.0	10	U	10	2.1	U	2.1	4.0	U	4.0
3-75-5	NA	0.68	U	0.68	1.4	U	1.4	3.5	U	3.5	0.71	U	0.71	1.4	U	1.4
3-94-1	0.12	3.2	U	3.2	6.4	U	6.4	17	U	17	3.3	U	3.3	6.4	U	6.4
3-09-2	NA	2.9	U	2.9	5.8	U	5.8	15	U	15	3.0	U	3.0	5.8	U	5.8
3-52-1	0.15	3.0	U	3.0	6.0	U	6.0	16	U	16	3.1	U	3.1	6.0	U	6.0
3-55-3	NA	1.1	U	1.1	2.2	U	2.2	5.7	U	5.7	1.1	U	1.1	2.2	U	2.2
3-50-7	140	1.1	U	1.1	2.2	U	2.2	5.7	U	5.7	1.1	U	1.1	2.2	U	2.2
3-47-8	0.36	0.32	U	0.32	0.64	U	0.64	1.7	U	1.7	0.33	U	0.33	0.64	U	0.64
3-72-3	NA	1.5	U	1.5	3.0	U	3.0	7.8	U	7.8	1.6	U	1.6	3.0	U	3.0
3-44-5	190	1.0	U	1.0	2.0	U	2.0	5.2	U	5.2	1.0	U	1.0	2.0	U	2.0
3-01-6	3.8	2.9	U	2.9	5.8	U	5.8	15	U	15	3.0	U	3.0	5.8	U	5.8
3-02-7	NA	2.0	U	2.0	4.0	U	4.0	10	U	10	2.1	U	2.1	4.0	U	4.0
3-32-9	53	1.1	U	1.1	2.2	U	2.2	5.3	U	5.3	1.1	U	1.1	2.2	U	2.2
3-96-8	NA	1.8	U	1.8	3.6	U	3.6	9.2	U	9.2	1.9	U	1.9	3.6	U	3.6
3-86-2	190	0.89	U	0.89	1.8	J	1.8	4.6	U	4.6	0.93	U	0.93	1.8	J	1.8
3-12-7	180	0.85	U	0.85	1.7	J	1.7	8.6	J	4.4	0.89	U	0.89	1.7	J	1.7
3-24-9	0.3	1.0	U	1.0	2.0	U	2.0	5.2	U	5.2	1.0	U	1.0	2.0	U	2.0
3-52-7	190	2.1	U	2.1	4.2	U	4.2	11	U	11	2.2	U	2.2	4.2	U	4.2
3-55-3	0.034	0.18	U	0.18	0.36	U	0.36	0.94	U	0.94	0.19	U	0.19	0.36	U	0.36
3-32-8	0.0034	0.14	U	0.14	0.28	U	0.28	0.84	J	0.73	0.15	U	0.15	0.28	U	0.28
3-99-2	0.034	0.21	U	0.21	0.42	U	0.42	1.1	U	1.1	0.22	U	0.22	0.42	U	0.42
3-24-2	NA	0.93	U	0.93	1.9	U	1.9	4.8	U	4.8	0.97	U	0.97	1.9	U	1.9
3-08-9	0.34	0.14	U	0.14	0.28	U	0.28	0.73	U	0.73	0.15	U	0.15	0.28	U	0.28
3-91-1	5.9	1.0	U	1.0	2.0	U	2.0	5.2	U	5.2	1.0	U	1.0	2.0	U	2.0
3-44-4	0.014	0.30	U	0.30	0.60	U	0.60	1.6	U	1.6	0.31	U	0.31	0.60	U	0.60
3-81-7	5.6	0.81	U	0.81	1.6	U	1.6	4.2	U	4.2	0.84	U	0.84	1.6	U	1.6
3-68-7	16	1.4	U	1.4	2.8	U	2.8	7.3	U	7.3	1.5	U	1.5	2.8	U	2.8
3-60-2	990	0.91	U	0.91	1.8	U	1.8	4.7	U	4.7	0.95	U	0.95	1.8	U	1.8
3-74-8	NA	1.2	U	1.2	2.4	U	2.4	6.3	U	6.3	1.3	U	1.3	2.4	U	2.4
3-01-9	3.4	1.4	U	1.4	2.8	U	2.8	7.3	U	7.3	1.5	U	1.5	2.8	U	2.8

CAS#	DNREC SIRS Screening Levels Groundwater July 2014	SG-MW01-1114				SG-MW02-1114				SG-MW03-1114				SG-MW04-1114				SG-MW05-1114			
		Result	Q	MDL	ug/l	Result	Q	MDL	ug/l	Result	Q	MDL	ug/l	Result	Q	MDL	ug/l	Result	Q	MDL	ug/l
				1				1					1				1				1
				Water				Water					Water				Water				Water
				11/21/2014 09:00:00				11/21/2014 10:30:00					11/21/2014 12:00:00				11/21/2014 13:30:00				11/21/2014 10:00:00
				0.0097	U*	0.0097	0.020	0.0094	U	0.0094	U	0.0094	U	0.0094	U	0.0094	U	0.0094	U	0.0094	U
				0.0082	U*	0.0082	0.017	0.0082	U	0.0082	U	0.0082	U	0.0082	U	0.0082	U	0.0082	U	0.0082	U
				0.0087	U*	0.0087	0.018	0.0087	U	0.0087	U	0.0087	U	0.0087	U	0.0087	U	0.0087	U	0.0087	U
				0.0087	U	0.0087	0.018	0.0087	U	0.0087	U	0.0087	U	0.0087	U	0.0087	U	0.0087	U	0.0087	U
				0.0046	U	0.0046	0.0094	0.0046	U	0.0046	U	0.0046	U	0.0046	U	0.0046	U	0.0046	U	0.0046	U
				0.0082	U*	0.0082	0.017	0.0082	U	0.0082	U	0.0082	U	0.0082	U	0.0082	U	0.0082	U	0.0082	U
				0.0066	U	0.0066	0.014	0.0066	U	0.0066	U	0.0066	U	0.0066	U	0.0066	U	0.0066	U	0.0066	U
				0.0061	U	0.0061	0.013	0.0061	U	0.0061	U	0.0061	U	0.0061	U	0.0061	U	0.0061	U	0.0061	U
				0.011	U*	0.011	0.023	0.011	U*	0.011	U*	0.011	U*	0.011	U*	0.011	U*	0.011	U*	0.011	U*
				0.0082	U*	0.0082	0.017	0.0082	U*	0.0082	U*	0.0082	U*	0.0082	U*	0.0082	U*	0.0082	U*	0.0082	U*
				0.0082	U*	0.0082	0.017	0.0082	U*	0.0082	U*	0.0082	U*	0.0082	U*	0.0082	U*	0.0082	U*	0.0082	U*
				0.0082	U*	0.0082	0.017	0.0082	U*	0.0082	U*	0.0082	U*	0.0082	U*	0.0082	U*	0.0082	U*	0.0082	U*
				0.0087	U	0.0087	0.017	0.0087	U	0.0087	U	0.0087	U	0.0087	U	0.0087	U	0.0087	U	0.0087	U
				0.0082	U*	0.0082	0.017	0.0082	U*	0.0082	U*	0.0082	U*	0.0082	U*	0.0082	U*	0.0082	U*	0.0082	U*
				0.0071	U	0.0071	0.015	0.0071	U	0.0071	U	0.0071	U	0.0071	U	0.0071	U	0.0071	U	0.0071	U
				0.0077	U*	0.0077	0.016	0.0077	U*	0.0077	U*	0.0077	U*	0.0077	U*	0.0077	U*	0.0077	U*	0.0077	U*
				0.0071	U*	0.0071	0.015	0.0071	U*	0.0071	U*	0.0071	U*	0.0071	U*	0.0071	U*	0.0071	U*	0.0071	U*
				0.0082	U	0.0082	0.017	0.0082	U	0.0082	U	0.0082	U	0.0082	U	0.0082	U	0.0082	U	0.0082	U
				0.0077	U*	0.0077	0.016	0.0077	U*	0.0077	U*	0.0077	U*	0.0077	U*	0.0077	U*	0.0077	U*	0.0077	U*
				0.17	U	0.17	0.35	0.17	U	0.17	U	0.17	U	0.17	U	0.17	0.35	0.17	U	0.17	0.34

it detected.

CAS#	DNREC SIRS Screening Levels Groundwater July 2014	SG-MW01-1114		SG-MW02-1114		SG-MW03-1114		SG-MW04-1114		SG-MW05-1114	
		460-86962-27	460-86962-28	460-86962-29	460-86962-30	460-86962-31	460-86962-32	460-86962-33	460-86962-34	460-86962-35	
		11/21/2014 09:00:00	11/21/2014 10:30:00	11/21/2014 12:00:00	11/21/2014 13:30:00	11/21/2014 15:00:00	11/21/2014 16:30:00	11/21/2014 18:00:00	11/21/2014 19:30:00	11/21/2014 21:00:00	11/21/2014 22:30:00
		Water									
		1	1	1	1	1	1	1	1	1	1
		ug/l									
		MDL									
		Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
		Result									
		0.14	0.14	0.28	0.28	0.28	0.28	0.28	0.28	0.27	0.27
		0.14	0.14	0.28	0.28	0.28	0.28	0.28	0.28	0.27	0.27
		0.14	0.14	0.28	0.28	0.28	0.28	0.28	0.28	0.27	0.27
		0.14	0.14	0.28	0.28	0.28	0.28	0.28	0.28	0.27	0.27
		0.14	0.14	0.28	0.28	0.28	0.28	0.28	0.28	0.27	0.27
		0.11	0.11	0.22	0.22	0.22	0.22	0.22	0.22	0.21	0.21
		0.11	0.11	0.22	0.22	0.22	0.22	0.22	0.22	0.21	0.21

it detected.

CAS#	DNREC SIRS	SG-MW01-1114		SG-MW02-1114		SG-MW03-1114		SG-MW04-1114		SG-MW05-1		
		460-86962-27	460-86962-28	460-86962-28	460-86962-29	460-86962-30	460-86962-30	460-86962-30	460-86962-30	460-86962-30	460-86962-30	
	Screening Levels	11/21/2014 09:00:00	11/21/2014 10:30:00	11/21/2014 12:00:00	11/21/2014 13:30:00	11/21/2014 13:30:00	11/21/2014 13:30:00	11/21/2014 13:30:00	11/21/2014 13:30:00	11/21/2014 13:30:00	11/21/2014 10:00:00	
	Groundwater	Water										
	July 2014											
	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	
		Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q
7440-09-7	NA	2950	J	281	1780	J	281	5010	J	281	3350	J
7440-09-7	NA	3100	J	281	1820	J	281	5140	J	281	3390	J
7782-49-2	10	6.7	U	6.7	6.7	U	6.7	6.7	U	6.7	6.7	U
7782-49-2	10	6.7	U	6.7	6.7	U	6.7	6.7	U	6.7	6.7	U
7440-22-4	9.4	1.9	U	1.9	1.9	U	1.9	1.9	U	1.9	1.9	U
7440-22-4	9.4	1.9	U	1.9	1.9	U	1.9	1.9	U	1.9	1.9	U
7440-23-5	NA	74900		514	5060		514	6690		514	17400	
7440-23-5	NA	81500		514	5080		514	7140		514	17300	
7440-28-0	0.02	9.2	U	9.2	9.2	U	9.2	9.2	U	9.2	9.2	U
7440-28-0	0.02	9.2	U	9.2	9.2	U	9.2	9.2	U	9.2	9.2	U
7440-62-2	8.6	4.2	U	4.2	4.2	U	4.2	4.2	U	4.2	4.2	U
7440-62-2	8.6	4.2	U	4.2	4.2	U	4.2	4.2	U	4.2	4.2	U
7440-66-6	600	12.2	J	5.9	5.9	U	5.9	30.0	J	5.9	20.2	J
7440-66-6	600	13.6	J	5.9	5.9	U	5.9	21.0	J	5.9	17.8	J
7439-97-6	0.063	0.30	J	0.16	0.16	U	0.16	0.20	U	0.16	0.16	U
7439-97-6	0.063	0.18	J	0.16	0.16	U	0.16	0.16	U	0.16	0.16	U

Id type face exceed DNREC SL than or equal to the MDL and the concentration is an approximate value. or but not detected.

APPENDIX C
Sampling and Analysis Plan

Proposed Sampling and Analyses Plan for Seaford Town Gas Site (DE-0061)

1.0 Proposed Sampling and Analyses Plan Table

Sampling Matrix	Locations, depths and number of Samples	Sample Collection Methodology	DNREC-SIRS Lab Screening	HSCA Laboratory Analysis	Comments/Justification
Surface soil (0 to 2 feet, "shallow")	Approximately eight shallow grab soil samples will be collected from eight soil borings within the two feet of the existing ground surface.	Samples will be collected in accordance with DNREC-SIRS Standard Operating Procedures (SOP) for Surface Soil. USEPA, 1987, <i>A Compendium of Superfund Field Operations Methods</i> . One (1) set of QA/QC samples will be collected per batch of samples (i.e. 20 samples or less). This will include a matrix spike, a matrix spike duplicate, and a duplicate. For each day of soil sampling, one lab-prepared trip blank will be submitted with samples.	Samples are proposed to be screened by Test America Laboratories, Inc. for the following: <ul style="list-style-type: none"> • TCL VOCs, • TCL SVOCs, • TCL Pesticides • TCL PCBs; and • TAL Metals. 	Up to four selected samples will be analyzed in accordance with DNREC, 2008, " <u>Standard Operating Procedures for Chemical Analytical Programs under the Hazardous Substance Cleanup Act</u> " (SOPCAP), Version 5.0 Rev. 7. Soil samples that are submitted to Test America will be analyzed using EPA SW-846 methodologies for all or part of the following: <ul style="list-style-type: none"> - TCL VOCs, - TCL SVOCs, - TCL Pesticides - PCB Homologs; and - TAL Metals. 	

Sampling Matrix	Locations, depths and number of Samples	Sample Collection Methodology	DNREC-SIRS Lab Screening	HSCA Laboratory Analysis	Comments/Justification
<p>Subsurface Soil (>2 feet, "deep")</p>	<p>Approximately eight deep grab soil samples will be collected from eight soil borings within the two feet of the existing groundwater table or in the area exhibiting the greatest environmental impact (i.e., high PID, staining, odors).</p>	<p>Samples will be collected in accordance with DNREC-SIRS Standard Operating Procedures (SOP) for Subsurface Soil. USEPA, 1987, <i>A Compendium of Superfund Field Operations Methods</i>. One (1) set of QA/QC samples will be collected per batch of samples (i.e. 20 samples or less). This will include a matrix spike, a matrix spike duplicate, and a duplicate. For each day of soil sampling, one lab-prepared trip blank will be submitted with samples.</p>	<p>Samples are proposed to be screened by Test America Laboratories, Inc. for the following:</p> <ul style="list-style-type: none"> • TCL VOCs, • TCL SVOCs, • TCL Pesticides • TCL PCBs; and • TAL Metals. 	<p>Up to four selected samples will be analyzed in accordance with DNREC, 2008, "<u>Standard Operating Procedures for Chemical Analytical Programs under the Hazardous Substance Cleanup Act</u>" (SOPCAP), Version 5.0 Rev. 7.</p> <p>Soil samples that are submitted to Test America will be analyzed using EPA SW-846 methodologies for all or part of the following:</p> <ul style="list-style-type: none"> - TCL VOCs, - TCL SVOCs, - TCL Pesticides - PCB Homologs; and - TAL Metals. 	

Sampling Matrix	Locations, depths and number of Samples	Sample Collection Methodology	DNREC-SIRS Lab Screening	HSCA Laboratory Analysis	Comments/Justification
<p>Groundwater</p>	<p>Four of the eight soil boring locations will be converted into permanent monitoring wells and installed to intercept the shallow, unconfined groundwater aquifer. A maximum drilling depth of 25 feet per well location is anticipated.*** The wells will be constructed using 10 feet of 0.020 slot, 3/4-inch diameter Schedule 40 PVC well screen and designed so that approximately 2 to 3 feet of the well screen casing extends above the anticipated depth of the water table. Riser pipe will be constructed with up to 20 feet of Schedule 40, 3/4-inch PVC well casing. The wells will be grouted from the top of the gravel pack to the ground surface. The wells will be finished with locking expandable caps and flush-mount well covers.</p>	<p>One groundwater sample will be collected from each of the four newly-installed monitoring wells as well as the four existing monitoring wells on the Site. The sample collected for TAL metals analysis will be field-filtered using a 0.45 micron filter, constituting the dissolved metals sample.</p> <p>The monitoring wells will be installed and the samples will be collected in accordance with the following:</p> <p>USEPA, 1987, <i>A Compendium of Superfund Field Operations Methods</i>.</p> <p>DNREC DWR, 1997, <i>Delaware Regulations Governing the Construction and use of Wells</i>.</p> <p>Low-flow sampling Method</p>	<p>No screening of groundwater samples is proposed.</p>	<p>Groundwater samples will be analyzed in accordance with DNREC, 2008, "Standard Operating Procedures for Chemical Analytical Programs under the Hazardous Substance Cleanup Act" (SOPCAP), Version 5.0 Rev. 7.</p> <p>Groundwater samples that are submitted to Test America will be analyzed using EPA SW-846 methodologies for all of the following:</p> <ul style="list-style-type: none"> - TCL VOCs, - TCL SVOCs, - TCL Pesticides - PCB Homologs; and - TAL Dissolved Metals. 	<p>***Sampling and analysis of groundwater from depths greater than 25 feet below ground surface will be addressed following the receipt and evaluation of shallow groundwater data.</p>

Sampling Matrix	Locations, depths and number of Samples	Sample Collection Methodology	DNREC-SIRS Lab Screening	HSCA Laboratory Analysis	Comments/Justification
	<p>Approximately eight groundwater samples will be collected from the four existing monitoring wells and four newly-installed monitoring wells.</p>	<p>by USEPA 1996-“Low-Flow (Minimal Draw-down) Ground-Water Sampling Procedures.”</p> <p>One (1) set of QA/QC samples will be collected per batch of samples (i.e. 20 samples or less). This will include a matrix spike, a matrix spike duplicate, and a duplicate.</p> <p>For each day of groundwater sampling, one lab-prepared trip blank will be submitted with samples.</p>			
Soil gas (vapor intrusion related)	None proposed.				
Sediment	None proposed.				
Surface Water	None proposed.				

2.0 Proposed Sampling Location Maps

Figure 1 – Overview Map
 Figure 2 – Sampling Location Map

EXHIBIT "B"

SCHEDULE

1. DNREC – Respondent Startup Meeting - Ten (10) days from date of execution of the Agreement and Approval of the CSM and SAP
2. Permit Approvals - Thirty (30) days from date of startup meeting
3. Filed work for well installation and - well and soil sampling Thirty (30) days from date of Permit approvals
4. Laboratory analysis and results - Twenty (20) days from completion of field work.
5. Evaluation of sampling results and performance of risk assessment – submission of VCP draft report to DNREC Twenty (20) days from completion of laboratory analysis and results.
6. Finalize VCP report - Ten (10) days from date of final comments from DNREC on draft VCP report
7. Prepare and submit draft LTS plan - to DNREC Thirty (30) days from date of DNREC approval of VCP report.
8. Finalize LTS plan - Five (5) days from date of final comments from DNREC on draft LTS plan.
9. Prepare and submit request for COCR - Five (5) days from final approval of remedial action and filing of any required UECA covenant.

