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VOLUNTARY REMEDIATION PROGRAM COMPIANCE STATUS REPORT
SPALDING CORNERS SHOPPING CENTER
7700 SPALDING DRIVE
SANDY SPRINGS, FULTON COUNTY, GEORGIA
HSI #10639

SEA JOB #102-063

SUBMITTED:
MARCH 31, 2016

Prepared for:
Selig Enterprises, Inc.

SEA

SAILORS ENGINEERING ASSOCIATES, INC.

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March 31, 2016

Ms. Robin S. Futch
Georgia Department of Natural Resources
Environmental Protection Division
2 Martin Luther King Jr. Drive, SE
Suite 1054 East
Atlanta, Georgia 30334

RE: Voluntary Remediation Program
Compliance Status Report
Spalding Corners Shopping Center
7700 Spalding Drive
Sandy Springs, Fulton County, Georgia
HSI #10639
SEA Job #102-063

Dear Ms. Futch:

Sailors Engineering Associates, Inc. (SEA) has completed the Voluntary Remediation Program Compliance Status Report (VRP-CSR) for the property referenced above on behalf of Selig Enterprises, Inc. and is pleased to submit this copy for your review. As noted in our February email, this VRP-CSR is complete except for those portions relating to the redevelopment plan, including the final development plan and the final EUECA covenant. This VRP-CSR demonstrates compliance with the residential Type 1 Risk Reduction Standards for soil and with the residential Type 1 Risk Reduction Standards for groundwater at the Point of Exposure (POE).

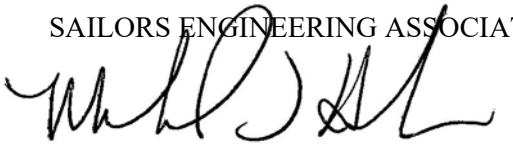
Once the rezoning for the proposed redevelopment is complete, a final version of the UECA covenant and a final development Plan will be submitted, along with a signed compliance certification page.

I certify, under penalty of law, that the enclosed electronic copy is complete, identical to the paper copy, and virus free.

If we can provide additional information concerning this project, please contact us at your convenience.

Respectfully submitted,

SAILORS ENGINEERING ASSOCIATES, INC.



Michael J. Haller, P.G.
Principal Geologist

CERTIFICATION STATEMENT

I, Bonnie Dean, as Vice President of Selig Enterprises, Inc., certify under penalty of law that this Compliance Status Report and all attachments were prepared by Sailors Engineering Associates, Inc. under my direction in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Based on my review of the findings of this report with respect to the risk reduction standards of the Georgia Voluntary Remediation Act, I have determined that Tax Parcel Identification Numbers 06-0313-LL009-1 (Spalding Corners Property) and 06-0313-LL034-9 (River Exchange Property) is in compliance with the Type 1 risk reduction standards for soil and groundwater as measured according to the Voluntary Remediation Program Act, and that the site complies with applicable standards for vapor intrusion risk provided use of the property adheres to institutional controls described in this compliance status report.

_____

Date

By: _____

Bonnie Dean, Vice President

Selig Enterprises, Inc.

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GROUNDWATER SCIENTIST STATEMENT

I certify that I am a qualified groundwater scientist who has received a baccalaureate degree in geology, and have sufficient training and experience in groundwater hydrology and related fields, as demonstrated by state registration and completion of accredited university courses, that enable me to make sound professional judgments regarding groundwater monitoring and contaminant fate and transport. I further certify that this report was prepared by myself and others working under my direction, and has been reviewed by myself.

Michael J. Haller, P.G.
Georgia Registration Number 1062

EXECUTIVE SUMMARY

This Voluntary Compliance Status Report (VRP-CSR) was prepared by Sailors Engineering Associates, Inc. (SEA) on behalf of Selig Enterprises, Inc. (Selig) and Dunwoody Place Ventures LLC that is managed by Selig. The VRP-CSR is for Spalding Corners Shopping Center (tax parcel 06-0313-LL009-1) and the adjoining River Exchange Property (tax parcel 06-0313-LL034-9) which were listed on the Georgia Hazardous Sites Inventory (HSI #10639) in December 2000. The Spalding Corners HSI Site (Site) was accepted into Georgia's Voluntary Remediation Program (VRP) on October 12, 2010. This VRP-CSR is intended to provide an overview of historical Site investigation and remediation activities, provide an overview of Site investigation activities and groundwater modeling results conducted since the Site entered the VRP, and to certify compliance with the Type 1 residential risk reduction standards (RRS) for soils and groundwater for the regulated substances detected in the soil and groundwater at the property.

The shopping center parcel of the Spalding Corners HSI Site or Spalding Corners Shopping Center was originally constructed in 1979, consists of four buildings comprised of several small retail shops and is anchored by a Publix Super Market. The Spalding Cleaners was once a tenant in Suite 7702 located on the southwestern end of the shopping center and used chlorinated dry cleaning solvents from 1980 to 2000 when the on-site dry cleaning activities were discontinued. The undeveloped wooded parcel of the Spalding Corners HSI Site or the River Exchange Property is the adjoining property to the southwest of the shopping center parcel and was acquired in 2005 by Selig as Dunwoody Place Ventures LLC. In 2013, the River Exchange Property was subdivided into two tracts. The northern, unimpacted tract was delisted from the Spalding Corners HSI Site and sold for development of senior residential apartments.

Soil investigation and remediation was completed in December 2003 with the excavation and off-site disposal of approximately 131 tons of impacted soil from beneath the dry cleaning operations at the former dry cleaner location. EPD issued a letter dated February 8, 2005 concurring that soils complied with the Type 3 RRS. Following several years of groundwater remediation pilot testing, Selig began the VRP application process for the Spalding Cleaners HSI Site. EPD issued a letter dated October 12, 2010 approving the VRP Application with a comment stating that EPD concurs that the soil complies with Type 1 RRS, so no further corrective action is required for soil.

Groundwater investigation and remediation has been ongoing since 2000 and PCE was identified as the principal chemical of concern while low concentrations of other VOCs have been detected in several monitoring wells. Numerous monitoring wells have been installed and sampled to achieve horizontal and vertical delineation of groundwater impact. With the exception of PCE, contaminants are in compliance with the Type 1 RRS within the groundwater plume. Contaminant fate and transport modeling and groundwater surface water mixing calculations determined that any PCE impact of Crooked Creek would be negligible and not result in an exceedance of the In-Stream Water Quality Standard. Further, it was determined that Crooked Creek is the groundwater receptor for the impacts and that the creek would act as a barrier for further migration and that a POE 1,000 feet downgradient of the plume would not be impacted.

In addition, it was determined that an exposure above the target risk levels under a commercial scenario would not occur as a result of vapor intrusion at the Spalding Corners Shopping Center. Further, based on the planned use of an engineered vapor barrier for the developments on the River Exchange Property, the vapor intrusion pathway is incomplete and requires no further evaluation.

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APPENDICES

1.0 INTRODUCTION

Selig Enterprises, Inc. (Selig) submitted a Voluntary Remediation Program (VRP) Application to the Georgia Department of Natural Resources Environmental Protection Division (EPD) on May 10, 2010 for the Spalding Corners Shopping Center (Spalding Corners) HSI Site #10639 (see Figure 1: Area Plan). The Spalding Corners HSI Site was accepted into the VRP on October 12, 2010.

1.1 Purpose

The purpose of this Voluntary Remediation Program Compliance Status Report (VRP-CSR) is to document the current condition of the Spalding Corners HSI Site properties located at 7700 Spalding Drive and River Exchange Drive, Sandy Springs, Fulton County, Georgia, with regard to the Type 1 residential risk reduction standards (RRS) for soils and groundwater for the regulated substances detected in the soil and groundwater at the property. This report was completed based on site conditions documented during previous investigations and the investigations conducted by SEA.

1.2 Site Description

The Spalding Corners HSI Site consists of two parcels of land totaling 15.71 acres and is located in Land Lot 313 of the 6th District, City of Sandy Springs, Fulton County, Georgia. According to the Fulton County Tax Assessor's website, the two parcels are the Spalding Corners Property occupying 9.02 acres and the River Exchange Property occupying 6.69 acres and are identified as Tax Parcel Identification Numbers 06-0313-LL009-1 and 06-0313-LL034-9, respectively. The current property owners are listed as Selig Enterprises, Inc. for the Spalding Corners Property and as Dunwoody Place Ventures LLC for the River Exchange Property. Dunwoody Place Ventures LLC is managed by Selig. The River Exchange Property was once a larger tract of 11.05 acres until the property was subdivided into two tracts. The non-impacted northwestern most portion of the River Exchange Property (Tract #1) was delisted from the Spalding Corners HSI Site and sold on March 28, 2013. Tract #1 consists of 4.31 acres and is now occupied by The Mansions at Sandy Springs, a senior residence, with the physical address of 3175 River Exchange Drive. Tract #1 is identified as Tax Parcel Identification Number 06-0313-LL037-2 (see Figure 2: Revised Site Plan). Copies of the legal descriptions and survey for the property and a copy of the current Warranty Deeds recorded in March 28, 2013 (Deed Book 52429, Page 207) are included in Appendix 3.

The shopping center parcel of the Spalding Corners HSI Site, Spalding Corners Shopping Center, is located in the western quadrant of the Spalding Drive-Holcomb Bridge Road intersection in Sandy Springs, Georgia. The shopping center, originally constructed in 1979, consists of four buildings totaling 70, 645 square feet and is comprised of several small retail shops that are anchored by a Publix Super Market. The Spalding Cleaners was once a tenant in Suite 7702 located on the southwestern end of the shopping center and used chlorinated dry cleaning solvents from 1980 to 2000 when the on-site dry cleaning activities were discontinued.

The undeveloped wooded parcel of the Spalding Corners HSI Site, the River Exchange Property, is the adjoining property to the southwest of the shopping center parcel and is located in the northeastern quadrant of the River Exchange Drive-Spalding Drive intersection. In 2005, Selig,

as Dunwoody Place Ventures LLC acquired the River Exchange Property. In 2013, the River Exchange Property was subdivided into two tracts. The northern, unimpacted tract was delisted from the Spalding Corners HSI Site and sold for development of senior residential apartments. The adjoining properties appeared as follows:

- To the northwest of the Spalding Corners HSI Site from east to west is River Exchange, a 5-story office building located at 3295 River Exchange Drive and The Mansions at Sandy Springs, a senior residence, at 3175 River Exchange Drive.

- To the northeast of the Spalding Corners HSI Site from north to south are Ideal Jewelry and Pawn, SunTrust Bank, and Sam's Mart Shell, beyond which is the Holcomb Bridge Road right-of-way and the Fulton County-Gwinnett County boundary followed by a Georgia Power substation, Spalding Center retail center, and a Chevron Food Mart.

- To the southeast of the Spalding Corners HSI Site is a Firestone Complete Auto Care facility beyond which is the Spalding Drive right-of-way and Fulton County-Gwinnett County boundary followed by Spalding Plaza retail center and Riverwood Plantation Apartments.

- To the southwest of the Spalding Corners HSI Site is the 60-foot right-of-way of River Exchange Drive beyond which from north to south is The Retreat at River Park Apartments and an undeveloped wooded parcel owned by the City of Sandy Springs (a.k.a. the Sandy Springs Property) that includes a DeKalb County Water and Sewer water pipeline easement that originates from the pumping station on the Chattahoochee River at Holcomb Bridge Road followed by Crooked Creek.

Commercial properties including apartments, office buildings, shopping centers, automobile service facilities, gasoline dispensing convenience stores, banks, restaurants and other commercial businesses as well as single-family residences are located within the Sandy Springs-Peachtree Corners area.

1.3 River Exchange Property Development Plan

The River Exchange Property is currently vacant but is slated for redevelopment as an assisted living facility with construction expected to begin in the latter part of 2016 or 2017. The conceptual layout is depicted on the attached Figure 9. Although all construction details have not been established, all buildings to be inhabited on the River Exchange Property will utilize a multi-layered, engineered vapor barrier designed to prevent the migration of vapors into the buildings. The vapor barrier will be installed by a qualified contractor, have a minimum thickness of 60 mils and be smoke tested by an independent inspector to visually verify the proper installation of the vapor barrier system. Any modifications to the essential features of the development plan will be subject to the institutional controls described in Section 8 of this compliance status report.

1.4 Historical Investigations and Reports

The Spalding Corners HSI Site has been the subject of numerous environmental assessments and investigations by various consultants between 1999 and 2014, which identified regulated substances in the soil and groundwater at the site. The following is a summary of those investigations and findings which were utilized for this report.

- A Limited Phase II Environmental Site Assessment (ESA) on the River Exchange Property dated September 27, 1999, was prepared by Gallet and Associates (Gallet) for MetroGroup Development. Gallet installed three direct-push borings to obtain groundwater samples along the common boundary between the River Exchange and Spalding Corners properties. The groundwater samples were collected and analyzed for VOCs by EPA Method 8260. The laboratory results indicated groundwater impacts from chlorinated organic compounds in the vicinity of the borings.

- A Release Notification for the River Exchange Property dated November 24, 1999, was submitted by Jim Cowart, Inc. for the presence of tetrachloroethene (PCE) and chloroform (TCMA) in the groundwater exceeding their respective MCLs. The document attributed the source of the groundwater impacts to the dry cleaning facility at Spalding Corners.

- EPD issued a Release Notification Call-In letter dated February 25, 2000, notifying Selig that a suspected release occurred on the Spalding Corners Shopping Center property.

- Rindt-McDuff Associates Inc. (RMA) was retained by Selig to investigate the suspected release. A Soil and Groundwater Investigation dated March 30, 2000, was prepared by RMA for Selig. The laboratory results indicated soil impacts from PCE, TCE, and cDCE. PCE was detected at 4.200 mg/kg in the soil next to the dry cleaning machine in B-1 (3'). Groundwater was not encountered.

- A Release Notification for Spalding Corners Shopping Center dated March 31, 2000, was submitted by Selig for the presence of PCE in the soil exceeding the HSRA notification concentration.

- Based on the groundwater contaminants detected by Gallet in 1999 and the subsequent release notification, EPD issued a letter dated December 18, 2000, listing Spalding Corners Shopping Center on Hazardous Site Inventory (HSI #10639) as a Class II site.

- EPD issued a Compliance Status Report (CSR) Call-In letter dated May 3, 2002.

- A CSR dated November 18, 2002, and CSR Addendum in response to comments were prepared by Pyramid. The CSR documented the presence of soil and groundwater impacts above the Type 1 RRS.

- Following review of the CSR Addendum and response to EPD's NOD dated March 26, 2003, EPD issued a second NOD letter dated September 29, 2003, itemizing the deficiencies that remained and required correction.

- A CSR Addendum and CAP dated March 2004, was prepared by Peachtree. The report discussed the development of RRS for soils and groundwater, the horizontal and vertical extent of impacted soil and impacted groundwater requiring corrective action, and the selection of remediation for soil and groundwater.

- EPD issued a letter dated February 8, 2005, approving the CAP with comments.

- EPD issued a letter dated February 15, 2005, reclassifying Spalding Corners Shopping Center as a Class V site on the HSI effective July 23, 2003.

- From June 2005 until October 2007, Peachtree conducted semi-annual sampling events and submitted several semi-annual reports. A CAP Addendum dated August 2008 in which Peachtree concluded groundwater conditions were not sufficient to support the in-situ biological treatment approach and proposed utilizing ISCO in area of the highest PCE concentrations and MNA in areas of a decreasing PCE trend or less than 0.100 mg/L.

- ISCO pilot test was performed in September 2008 by applying activated sodium persulfate into four (4) infiltration trenches (IT-1 to IT-4) located down the plume centerline from MW-18S to MW-20S. A single injection well installed north of MW-16S.

- Following review of the CAP Addendum, EPD issued a letter dated December 4, 2009 approving the CAP Addendum and schedule with an annual report submitted by December 31, 2009.

- In lieu of the scheduled annual report, a VRP Application dated December 21, 2009, prepared by Peachtree discusses the previous corrective actions conducted at the site. If subsequent sampling and modeling show groundwater impacts remain on the site that might exceed RRS to appropriate points of compliance, additional ISCO treatments will be implemented in the earlier treatment area.

- Between December 2009 and May 2010, Peachtree forwarded several additional submittals in order to satisfy the VRP application requirements and EPDs comments to their submittals.

- EPD issued a Consent Order No. EPD-VRP-001 on October 8, 2010

- EPD issued a letter dated October 12, 2010 approving the VRP Application with comments.

- Selig retained Sailors Engineering Associates, Inc. (SEA) in February 2011 to respond to October 12, 2010 EPD comments and prepare the Semi-Annual VRP Progress Reports documenting the site progress.

- Between April 2011 and October 2014, SEA conducted sampling and submitted semi-annual reports to EPD. The last semi-annual report was submitted for the October 2014 sampling

event. That report recommended that the site had met the remediation objectives and that a Compliance Status Report be prepared.

- Following review of the VRP 2nd 2014 Semi-Annual Progress Reports, EPD issued a letter dated January 29, 2015 commenting that additional work is required prior to CSR submission including the drafting of UECs and an update of the groundwater model and a vapor intrusion assessment.

- Following a meeting with EPD to discuss the outstanding items, a copy of the BIOCHLOR Model was forwarded to Robin Futch of EPD on October 19, 2015 for review.

- EPD responded via email on November 4, 2015, stating that the BIOCHLOR model discussion input parameters and calculations all appear to be consistent and the data conclusions look acceptable.

1.5 Regulatory Status

A Release Notification for the River Exchange Property dated November 24, 1999 was submitted by Jim Cowart, Inc. for the presence of tetrachloroethene (PCE) and chloroform (TCMA) in the groundwater. The document attributed the dry cleaning facility at Spalding Corners as the source. A Release Notification for the Spalding Corners Shopping Center dated March 31, 2000 was submitted by Selig following the detection of PCE in the soil beneath the dry cleaner tenant space at the property.

On December 18, 2000, EPD issued a letter listing Spalding Corners Shopping Center on the Hazardous Sites Inventory as a Class II site (HSI #10639). EPD issued a Compliance Status Report (CSR) Call-In letter dated May 3, 2002 for CSR submittal by November 3, 2002. EPD issued a letter dated February 15, 2005 to Selig reclassifying Spalding Corners Shopping Center as a Class V site on the HSI effective July 23, 2003.

Selig Enterprises, Inc., the owners of Spalding Corners Shopping Center, elected to apply for the Voluntary Remediation Program (VRP) through the Georgia EPD. The VRP application submitted for Spalding Corners Shopping Center located at 7700 Spalding Drive in Sandy Springs, Fulton County, Georgia; HSI #10639, dated May 10, 2010 was approved on October 12, 2010.

2.0 SITE HYDROGEOLOGY

The Spalding Corners HSI Site is located in the physiographic province known as the Piedmont, which extends from the Hudson River at the north to Alabama at the south. The Piedmont, the least mountainous portion of the Appalachian Highlands, is an area of intensely folded and faulted igneous and metamorphic rocks. The surface of the Piedmont can be described as a broadly undulating or rolling topography with low knobs or ridges, and valleys 30 to 300 feet thick. The underlying crystalline rocks of the Piedmont are metamorphic schists, gneisses, quartzites and slates, and igneous granites and gabbros.

According to the *Physiographic Map of Georgia* (Clark and Zisa, 1976), the Spalding Corners HSI Site is located in the Gainesville Ridges District of the Upland Georgia Subsection of the Southern Piedmont Section of the Piedmont Province. The Gainesville Ridges District is described as a series of northeast trending, low, linear, parallel ridges separated by narrow valleys from an elevation varying from 1500 to 1600 feet in the northeast to 700 feet in the southwest. The ridges are composed of quartzite and gneiss while the valleys are underlain by phyllonites and schists. The course of the Chattahoochee River and its tributaries are strongly controlled by the ridges. The southern boundary follows a ridge that is continuous throughout most of its extent and serves as a drainage divide between streams flowing southwest and streams flowing south.

Based upon a review of Georgia Geologic Survey – *Geologic Map of Georgia, 1976*, the bedrock underlying the Spalding Corners HSI Site is described as biotite gneiss, mica schist and amphibolite (fg3) of the Piedmont Province. Based upon a review of Georgia Geologic Survey *Bulletin 96 - Geology of the Greater Atlanta Region* (McConnell and Costello, 1980), the bedrock underlying Spalding Corners HSI Site are the undifferentiated ductilely sheared rocks of the Brevard zone (bz) including button schists. The western portion of the subject property is in the vicinity of the inferred contact between the Brevard zone and the Powers Ferry Formation undifferentiated (pfu) of the Sandy Springs Group of the Southern Piedmont. This unit of the Powers Ferry Formation is described as a lower unit of intercalated biotite gneiss, mica schist and amphibolite.

According to a *Custom Soil Resource Report for Fulton County*, *Georgia* acquired from the United States Department of Agriculture, National Resources Conservation Service website, the soils at the Spalding Corners HSI Site are identified as Cecil Sandy Loam, 6 to 10 % slopes, moderately eroded (CeC2). Cecil Sandy Loam is described as a sandy loam at the surface underlain by sandy clay loam followed by clay, clay loam and sandy clay loam. Cecil sandy loam is residuum weathered from igneous and metamorphic rock and is usually well drained. The Spalding Corners HSI Site primarily slopes from a local topographic high located at the eastern property corner radially to the northwest, west and southwest.

Groundwater in the Piedmont is generally found in the shallow unconfined surficial aquifer, consisting of primary and secondary voids in the residuum and saprolite. Shallow unconfined water table conditions are present throughout the Piedmont physiographic province. Precipitation percolates through the residuum and saprolite until further vertical migration is impeded by the parent rock. In the Piedmont, the groundwater surface is generally a subdued reflection of surface topography. Recharge to the groundwater occurs from precipitation that averages approximately 49 inches per year within the Greater Atlanta area. Rainfall occurs throughout the year, although increased amounts of rainfall are typical during the spring months. Soils within the area consist predominantly of sandy silts and silty sands that allow rapid percolation of rainfall. Typically, the infiltration of precipitation through the soil to the groundwater occurs within a few days after rainfall.

According to the Georgia Geologic Survey Information Circular 63 titled *Ground Water in the Greater Atlanta Region*, the Spalding Corners HSI Site is located on Plate 1, in Unit "G." Well depths in Unit "G" range from 110 feet to 800 feet below ground surface (BGS), averaging 323 feet BGS. Well yields range from 20 gallons to 225 gallons per minute, averaging 74 gallons per

minute. Hydrologic zone "G" generally includes cataclastic rocks and unaltered rocks in the Brevard zone.

2.1 Groundwater Elevation and Flow Direction

The depth to groundwater, measured in October 2014 in the groundwater monitoring wells, for the Spalding Corners HSI Site range from approximately 36.5 feet in MW-15S, the source well at Spalding Corners Shopping Center, to approximately 14 feet in MW-6S near River Exchange Drive. The depth to water in each monitoring well was gauged from the top of the well casing (TOC) using an electronic water level indicator (Slope Indicator 100-foot Water Level Indicator Model No. 51670810). On October 6, 2014, prior to purging and sampling, the depth to water in each monitoring well was gauged from the TOC. The groundwater flow direction has been established to be to the southwest toward Crooked Creek. The water level data was used to determine the volume of water to be purged from each well prior to sample collection and to create a potentiometric surface map. The most recent Potentiometric Surface Map, October 6, 2014 depicting the groundwater flow direction is included as Figure 3 in Appendix 1 and a Historic Groundwater Elevation Summary for the Spalding Corners HSI Site is included as Table 3 of Appendix 2.

2.1.1 General Approach and Procedure for Measuring Groundwater Elevations

Groundwater elevation and well depths were measured in general accordance with published protocol USEPA Region 4 Science and Ecosystem Support Division "Groundwater Level and Well Depth Measurement" Operating Procedure (SESDPROC-105-R2, January 29, 2013). Water levels are measured using an electronic water level indicator accurate to 0.01 feet. Groundwater level measurements are made relative to an established reference point on the top of well casing (TOC) identified with a permanent mark. The reference point is tied to an arbitrary datum common to all wells. To minimize the risk of cross-contamination between wells when conducting water level measurements, the device is decontaminated between wells, in accordance with (SESDPROC-205). When possible, water level measurements are conducted from the least suspected contaminated area to the most suspected contaminated area. Total well depth measurements are collected when necessary.

2.1.2 Decontamination Procedures

All downhole and/or reusable field equipment and instruments were properly decontaminated between wells in general accordance with published protocols including USEPA Region 4 Science and Ecosystem Support Division "Field Equipment Cleaning and Decontamination" Operating Procedure (SESDPROC-205-R2, December 20, 2011). The electronic water level meter was decontaminated following *Well Sounders or Tapes* (Section 3.5), where unless conditions warrant, the wetted portion of the meter was decontaminated using the procedure listed below:

1. Wash with laboratory grade Liqui-Nox® detergent diluted with deionized water
2. Rinse with deionized water

The water quality meter was decontaminated following *"Classical Parameter" Sampling Equipment* (Section 3.3), where the meter and flow cell was decontaminated by rinsing with deionized water. The bladder pump was decontaminated following *Sample Collection Equipment Contaminated with Environmental Media* (Section 2.5), where the pump was decontaminated using the procedure listed below:

1. Disassemble the pump and remove and discard the bladder
2. Wash with laboratory grade Liqui-Nox® detergent diluted with deionized water
3. Rinse with deionized water
4. Install a new bladder and reassemble the pump

3.0 DESCRIPTION OF THE RELEASE SOURCE

Results of soil and groundwater assessment activities indicate that a release of regulated substances to the soil and groundwater occurred at the site.

3.1 Regulated Substances Released

The regulated substances identified in the soil are:

Chloroform (CAS No. 67-66-3)
cis-1,2-Dichloroethalene (CAS No. 156-59-2)
Tetrachloroethene (CAS No. 127-18-4)
Trichloroethene (CAS No. 79-01-6)
Xylenes (CAS No. 133-020-7)

The regulated substances identified in the groundwater are:

1,1,2-Trichloroethane (CAS 79-00-5)
2-Butanone (CAS No. 78-93-3)
Acetone (CAS No. 67-64-1)
Benzene (CAS No. 71-43-2)
Chloroform (CAS No. 67-66-3)
cis-1,2-Dichloroethene (CAS No. 156-59-2)
Tetrachloroethene (CAS No. 127-18-4)
Toluene (CAS No. 108-88-3)
Trichloroethene (CAS No. 79-01-6)
Xylenes (CAS No. 133-020-7)

3.2 Source of Release

A Limited Phase II Environmental Site Assessment (ESA) on the River Exchange Property dated September 27, 1999 was prepared by Gallet and Associates for MetroGroup Development. Gallet installed three direct-push borings to obtain groundwater samples along the common boundary between the River Exchange and Spalding Corners properties. The groundwater samples were

collected and analyzed for VOCs by EPA Method 8260. The laboratory results indicated groundwater impacts from chlorinated organic compounds in the vicinity of the borings.

A Release Notification for the River Exchange Property dated November 24, 1999 was submitted by Jim Cowart, Inc. for the presence of tetrachloroethene (PCE) and chloroform (TCMA) in the groundwater exceeding their respective MCLs. The document attributed the dry cleaning facility at Spalding Corners as the source.

3.3 Description of the Source

Based on the previous investigations conducted by others, the source of the release was attributed to the use of chlorinated solvents in the former dry cleaning process located in the tenant space of Spalding Corners Shopping Center with the address of 7702 Spalding Drive. The highest PCE concentration detected in the soil was in February 2000 at 4,200 mg/kg in soil sample B-1 (3') located near the former dry cleaning machine. The highest PCE concentration detected in the groundwater was in March 2004 at 4.300 mg/L collected from MW-15S located at the rear of the dry cleaner's tenant space.

3.4 Chronology of the Release

Specific information regarding the chronology of the release(s) is unknown. Historical research of the site and vicinity indicated that several dry cleaning tenants using the names Spalding Cleaners or Spalding Corners Cleaners, occupied the tenant space from 1980 to 2003. On-site dry cleaning activities were discontinued in 2000.

4.0 EXTENT OF CONTAMINATION

4.1 Horizontal and Vertical Extent of Soil Impacts

The potential for soil impacts has been investigated as part of separate investigations performed on Spalding Corners by Rindt-McDuff Associates (RMA), Pyramid Environmental Consultants, Inc. (Pyramid), and Peachtree Environmental, Inc. (Peachtree). Based on those investigations, the source of the soil and groundwater impacts on Spalding Corners has been documented to be the soil beneath the dry cleaning operations at the former dry cleaner location. RMA's investigation report indicated that soil contamination was detected inside the Spalding Cleaners tenant space near the former dry cleaning machines and concluded that the soil under the slab inside the space and the soil immediately west of the dry cleaner's space were those most highly impacted. A maximum reported PCE concentration of 4,200 milligrams per kilogram (mg/kg) was identified in soil inside the space and in the vicinity of the former dry cleaning machine (RMA boring B-1(3')). In November and December 2003, Peachtree excavated and disposed approximately 131 tons of impacted soil off-site. A total of nine soil confirmation samples were collected and analyzed for VOCs with the highest remaining PCE soil impact at the Spalding Cleaners HSI Site at 0.260 mg/Kg, which is below both the Type 1 and Type 3 Risk Reduction Standard. The results of the soil investigations conducted were the horizontal and vertical delineation of soil impacts in and immediately west of the dry cleaner tenant space. The soil source removal was presented in the CSR Addendum and CAP dated March 2004. EPD issued a letter dated February 8, 2005 approving the CAP and stated that Selig complied with the soil portion of the CAP, meeting the

Type 3 RRS for soils. In 2009, following several years of groundwater remediation pilot testing, Selig began the VRP application process for the Spalding Cleaners HSI Site. EPD issued a letter dated October 12, 2010 approving the VRP Application with a comment stating that EPD concurs that the soil complies with Type 1 RRS, so no further corrective action is required for soil. A tabular summary of the historic soil sampling results and a plan depicting the location of the samples are included in the Appendix.

4.2 Horizontal Extent of Groundwater Impacts

The initial groundwater assessment activities on-site were conducted by Gallet and Associates in 1999, during Phase I and Phase II investigations as part of pre-purchase due diligence and identified groundwater impacts on the undeveloped parcel, immediately west of the Spalding Cleaners space. Subsequent groundwater delineation activities have been conducted at the site and include the groundwater monitoring performed as part of the VRP semi-annual monitoring program for the HSI site.

From the initial site investigation conducted in August 2000 through the CSR Addendum and CAP dated March 2004 over 41 shallow monitoring wells and seven deep monitoring wells were installed on the Spalding Corners HSI Site. Of those wells, twelve shallow monitoring wells and one deep monitoring well were located on the shopping Center property in the vicinity of the former dry cleaners while the remaining wells were located on the River Exchange Property. Once the downgradient horizontal extent of impact was completed shallow monitoring wells that were deemed redundant or no longer necessary for delineation activities were decommissioned. Also, due to improper installation, the six deep monitoring wells were decommissioned. The remaining wells were re-designated to MW-1S through MW-20S. Six shallow monitoring wells, MW-1S and MW-11S through MW-15S, remain on the shopping center property with MW-15S designated as the source well. Fourteen shallow monitoring wells MW-2S through MW-20S remain of the River Exchange Property. A new deep well, MW-1D, located in the vicinity of MW-15S is the vertical delineation well. Following entering the VRP, two addition delineation wells were installed. MW-21S is located on the River Exchange Property downgradient of MW-5S and MW-22S is located on the Sandy Springs Property across River Exchange Drive downgradient of MW-6S.

The horizontal extent of the dissolved PCE plume extended from the source well approximately 680 feet southwest to MW-6S before River Exchange Drive. The width of the dissolved PCE plume ranged from approximately 50 feet at the source well to approximately 200 feet at the center tapering to approximately 75 feet at the leading edge of the plume. The vertical extent of impacted groundwater is defined as the point where highly weathered/fractured upper bedrock transitions to highly competent bedrock which is at 65 feet below the surface in MW-1D.

Following soil source removal in November and December 2003, the PCE concentration in the source well, MW-15S, initially increased to 4.300 mg/L in March 2004 but has since continued a decreasing trend to 0.200 mg/L in October 2014. The center of the plume also exhibits a decreasing trend in PCE concentrations since soil source removal as in MW-18S from 1.200 mg/L in August 2004 to 0.240 mg/L in October 2014. The leading edge of the plume also has exhibited a decreasing trend in PCE concentrations in the POD well MW-6S from 0.073 mg/L in March

2010 to 0.0032 mg/L in October 2014. However, MW-5S is exhibiting an increasing trend in PCE concentrations and MW-21S is fluctuating with changing groundwater elevations. SEA notes that the upgradient MW-19s shared a similar increasing trend prior to peaking in 2007, then experienced a rapid decreasing trend to the most current concentration of 0.017 mg/L PCE.

The results of the October 2014 monitoring event indicate that TCE was detected at low concentrations (below 0.005 mg/L) in five locations and cDCE was detected in two locations at low concentrations (below 0.070 mg/L). Specifically, TCE was detected in MW-15S, MW-16S, MW-18S, MW-19S and MW-20S below 0.005 mg/L, and cDCE was detected in MW-19S and MW-20S below 0.070 mg/L. Vinyl Chloride was not detected in the groundwater samples collected from any of the selected sampling locations this period. Chloroform was detected at three sampling locations at very low concentrations. Chloroform was detected in MW-15S at 0.0054 mg/L, MW-16S at 0.0054 mg/L and MW-17S at 0.013 mg/L. Methyl tert-butyl ether (MTBE) was not detected this period. The current increases in PCE concentrations appear to coincide with seasonal fluctuations in the water table. Current and historic laboratory summaries are included in Table 1 and Table 2, respectively, of Appendix 2. Historic Groundwater and Seep Water PCE Trend Graphs are included in Appendix 7.

4.2.1 Well Purging and Sampling

From March 2011 through October 2014, SEA purged monitoring wells prior to sample collection with either a GeoPump 12-volt DC, variable-speed peristaltic pump for wells with less than 30 feet of hydraulic head or a non-dedicated Geotech 12-volt DC, Geocontrol Pro stainless steel submersible bladder pump with a variable-speed controller and air compressor for the wells with more than 30 feet of hydraulic head. Water quality parameters pH, temperature, conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP) and turbidity were measured throughout the purging process using a YSI-556 MPS (Multiprobe System) multi-parameter meter attached to a flow cell and a Hanna 98703 Turbidimeter. The water level was measured with an electronic water level indicator prior to purging. Once the purging and sampling pump was setup, the pump and tubing was submerged to the appropriate level in the water column. After the electronic water level indicator was again lowered into the well to monitor the water level, the pump was then energized and the cycle frequency increased until water was discharged at the surface, adjusting the pumping rate to minimize any drawdown. The flow rate was then measured using a calibrated container and a stop watch. As required, the flow rate was adjusted to a rate between 0.5 L/min and 0.1 L/min. Once the pumping rate was stabilized and any turbid water removed, the flow cell of the multi-parameter meter was attached to the discharge tubing for parameter stabilization. Once three consecutive readings indicate stable parameters, without stopping the submersible pump, the flow cell was removed from the discharge stream by cutting the inlet hose and the pumping rate was lowered to collect the VOC samples directly from the discharge hose in laboratory supplied containers. As required when using a peristaltic pump, the VOC samples were collected by the “soda straw” method. The “soda straw” method was performed by stopping the pump, removing the intake tubing from the well, turning the pump in reverse and then collecting the VOC samples in laboratory supplied containers from the intake end of the tubing making sure the water in the tubing did not passed through the flexible tubing in the pump head. When necessary to collect an adequate sample volume, the tubing was returned to the well for refilling and the process was repeated. The sample containers were placed in sealable

plastic bags and immediately placed on ice prior for delivery to the laboratory under chain-of-custody procedures. Copies of the Groundwater Sampling Logs are included in Appendix 5.

4.2.2 General Approach and Procedures for Groundwater Sampling and Analysis

Samples were collected in general accordance with published protocols including USEPA Region 4 Science and Ecosystem Support Division "Groundwater Sampling" Operating Procedure (SESDPROC-301-R3, March 6, 2013) with the exception of the recommended tubing material as noted below. Well purging was conducted using either the *"Tubing-in-Screened-Interval" Method* (Section 3.2.2), where the intake was positioned in the approximate mid-portion of the screened interval or the *Purging with Pumps, Peristaltic Pumps* method (Section 3.3.1.1.1), where the intake was placed in the uppermost portion of the water column when the recovery rate was equal to the purge rate. Groundwater samples were obtained from each well either directly from the submersible pump discharge tubing (Section 4.3.1.3) or from *Peristaltic Pump, Direct from Pump Head Tubing* (Section 4.3.1.1) for MNA parameter samples or *Peristaltic Pump/Vacuum Jug* "soda straw" method B (Section 4.3.1.2) for VOC samples. Due to the relatively high cost of the recommended Teflon® tubing disposable polyethylene tubing was utilized for pump intake and discharge. Disposable polyethylene bladders were used in the bladder pump and disposable silicon tubing was used in the peristaltic pump head. New tubing and bladders were used for each well. Samples were collected following *Order of Sampling with Respect to Analytes* (Section 4.7.2). The various MNA parameter samples were collected in laboratory supplied containers in the recommended order followed by the VOC samples at the end. VOC samples were collected in laboratory supplied 40-ml sample vials preserved with HCL. A Teflon®-lined cap was placed on the vial, and the vial was inverted to ensure zero headspace. The samples were immediately packed in ice and transported to the analytical laboratory under chain-of-custody procedures. To minimize the risk of cross-contamination between wells when conducting groundwater sampling, the pumps and instruments are decontaminated between wells, in accordance with (SESDPROC-205). When possible, groundwater sampling was conducted from the least suspected contaminated area to the most suspected contaminated area. Copies of the laboratory data sheets for the most recent event are included in Appendix 4.

5.0 EXPOSURE PATHWAY ASSESSMENT

Potential Exposure Pathways for the site were evaluated. The exposure assessment included soil and groundwater pathways. As discussed in section 4.1 above, the site has been determined to be in compliance with the Type 1 RRS with regard to soil and no additional corrective action is required for soil and no additional exposure assessment is required. The potential exposure pathways for groundwater evaluated include direct exposure, exposure to groundwater migrating to the groundwater receptor Crooked Creek and the potential for exposure to vapors from groundwater impacts.

The potential for direct exposure to groundwater is an incomplete pathway since no groundwater withdrawal points exist within the plume. Further, a groundwater use restriction will be placed on the impacted properties to prevent future direct exposure to impacted groundwater.

The potential for groundwater migrating to Crooked Creek and resulting in an exceedance of the in-stream water quality standards was evaluated as more fully described below in Section 5.1 using a conservative groundwater fate and transport model and groundwater to surface water mixing calculations.

The potential for exposure resulting from groundwater to vapor transport was also evaluated as described in Section 5.2 below.

5.1 Groundwater Modeling

A mass transport model and a remedial timeframe model were presented in the VRP 1st Semi-Annual Progress Report, dated April 12, 2011, to estimate whether Crooked Creek would be impacted by the contaminant plume. SEA utilized REMChlor to model the fate and transport of impacted groundwater on site because it can simultaneously account for both source and plume remediation and SourceDK to evaluate the possibility that MNA will attenuate the impacted groundwater to levels that will not affect Crooked Creek in a timely fashion.

REMChlor predicted that the leading edge of the contaminant plume, if no additional remedial efforts are conducted at the site, would reach Crooked Creek in approximately ten years or 2021 at a PCE concentration of 0.00885 mg/l. However, since groundwater from the VRP Property represents only a small fraction of the total contribution to Crooked Creek, it is highly unlikely that impacts would ever be detectable at any level in the surface water.

SourceDK indicated that the plume is shrinking and is not expected to expand beyond its present geometry. The most downgradient well analyzed, MW-20S, would be in compliance with the Type 1/3 RRS for PCE by 2014 and that the groundwater impacts from the VRP Property could not impact a hypothetical point of compliance 1,000 feet from the VRP Property.

In the March 6, 2012 Comment Letter regarding the 1st and 2nd Semi-Annual Progress Reports, EPD issued several comments which related to groundwater modeling. Also, following review of the Response to EPD Comments and the 3rd and 4th Semi-Annual VRP Progress Reports, EPD issued a letter dated January 10, 2014 with comments regarding groundwater modeling. Based on EPD's January 10, 2014 comments, SEA attempted to revise the REMChlor model, however, the model was too difficult to calibrate to field observations. Therefore, SEA elected to use the BIOCHLOR model discussed in Section 8.1.

The use of SourceDK was also abandoned with the exception of analyzing the Spalding Drive Property source area. The Tier 1 model, based on the existing analytical data for monitoring wells, specifically MW-15S, was used to predict the cleanup date and estimate the Source Decay Constant (k_s) for PCE, the contaminant of concern (COC). Once a k_s value was estimated for PCE, the k_s value was directly entered into the BIOCHLOR model.

5.1.1 BIOCHLOR – Groundwater Fate and Transport Model

BIOCHLOR was the groundwater fate and transport model selected to evaluate whether the plume has the potential to impact a hypothetical point of compliance 1000 feet from the VRP Property.

BIOCHLOR, the public domain computer program distributed by the United States Environmental Protection Agency, is a screening model that simulates remediation of dissolved solvents at chlorinated solvent release sites by natural attenuation. It is based on the Domenico analytical solute transport model and has the ability to simulate one-dimensional advection, three-dimensional dispersion, linear adsorption and biotransformation via the reductive dechlorination process. BIOCHLOR (version 1.0) was co-published in January 2000 by the US EPA and US Air Force (USEPA 2000). It was subsequently revised in March 2002 (version 2.2). The revised version includes source decay and has a module to estimate site-specific biodegradation rates based on field data (USEPA 2002). Since remediation of the source area by soil excavation and the plume by nutrient injection and chemical oxidation were performed at the site, portions of BIOCHLOR are contraindicated.

The Natural Attenuation Screening Protocol portion of the BIOCHLOR model was used to aid in the determination of the biotransformation at individual wells. In February 2011 through October 2014, limited to no evidence of anaerobic biodegradation was seen in the monitoring wells. SEA interprets the results in downgradient wells MW-19S and MW-20S, where nutrients were injected into the soil and groundwater through the BioNet system in 2006, to indicate that conditions are favorable for reductive dechlorination and interprets the results in MW-14S, MW-15S, MW-16S and MW-18S to indicate that conditions are not favorable for reductive dechlorination.

The highest PCE concentration in groundwater documented for the site was 4.3 mg/L in MW-15S in March 2004. This PCE concentration occurred shortly after the source removal by soil excavation inside the former dry cleaner tenant space conducted in November and December 2003. MW-15S is located immediately behind the dry cleaner and because of its high PCE concentration was designated as the source well.

Because we could not determine when the release occurred at the dry cleaner when comparing the PCE concentrations in wells near the dry cleaner with the higher PCE concentrations in downgradient wells, we used March 2004 as the t=0, rather than the earliest possible release date of 1980 when the dry cleaners began operating. The reasoning for this was that the groundwater PCE concentrations in the source well (MW-15S) did not exceed 0.135 mg/L (2000 and 2003) until after the source removal. Monitoring wells installed in 2002 on the River Exchange parcel adjoining the shopping center to the southwest had initial PCE concentrations exceeding the source well's earlier PCE concentrations. Initial PCE concentrations in River Exchange wells exceeding those in MW-15S were 0.236 mg/L at MW-10S, 0.151 mg/L at MW-17S, 0.373 mg/L at MW-18S and 0.145 mg/L at MW-19S. It appears that the release occurred earlier but the groundwater plume had detached from the source area.

We used a Decaying Single Planer Source with the source concentration at 4.3 mg/L and a source decay constant (k_s) of 0.145 per year (1/yr), as calculated for MW-15S by the SourceDK Tier 1 model. The MW-15S March 2014 data was omitted from the SourceDK calculations because the concentrations were unusually low creating a larger source decay constant. By omitting the March 2014 data the source decay constant was more consistent with earlier calculations. The Source Options tab in BIOCHLOR recommended a source decay constant of <0.059, but the calculated k_s for MW-15S was added to the column beside the Source Concentration by activating the "Unprotect Sheet" tab. Once setup, we ran the model for 1 year and 2.3, 3.3, 6, 7, 8, 10.6 years

using the corresponding data from the source well MW-15S and the centerline wells MW-16S, MW-17S, MW-18S, MW-19S, MW-20S, MW-5S, MW-6S, MW-21S and MW-22S, as well as, seep water location SW-1. The model was run for up to 112 years in order to predict the maximum PCE concentrations to impact the Sandy Springs Property and Crooked Creek.

The model does not calibrate to the PCE concentrations in downgradient monitoring wells that were impacted before the source removal, but as the plume progresses further downgradient the PCE concentrations in those wells are consistent with the model. The PCE concentrations above the "No Degradation & Biotransformation" lines on the plots correspond to the release prior to the source removal, whereas, the concentrations below the lines correspond to the decaying source from MW-15S to MW-22S. The Sandy Springs Property is located 825 feet downgradient from the source well and Crooked Creek is located 1,250 feet from the source well. The decaying source plume model predicted the Sandy Springs Property would be impacted at 0.001 mg/L in June 2007 (3.3 years) and at 0.007 mg/L in March 2012 (8 years). The October 2014 (10.6 years) run predicted the Sandy Springs Property would be impacted at 0.021 mg/L, which is similar to the Maxis' PCE results collected from their boring B-1 in November 2013. The model predicted that the maximum PCE impact on the Sandy Springs Property would be at 0.078 mg/L in 25.1 years and the maximum PCE impact to Crooked Creek would be 0.054 mg/L in 31 years. The model predicted the PCE plume completely dissipated in 112 years

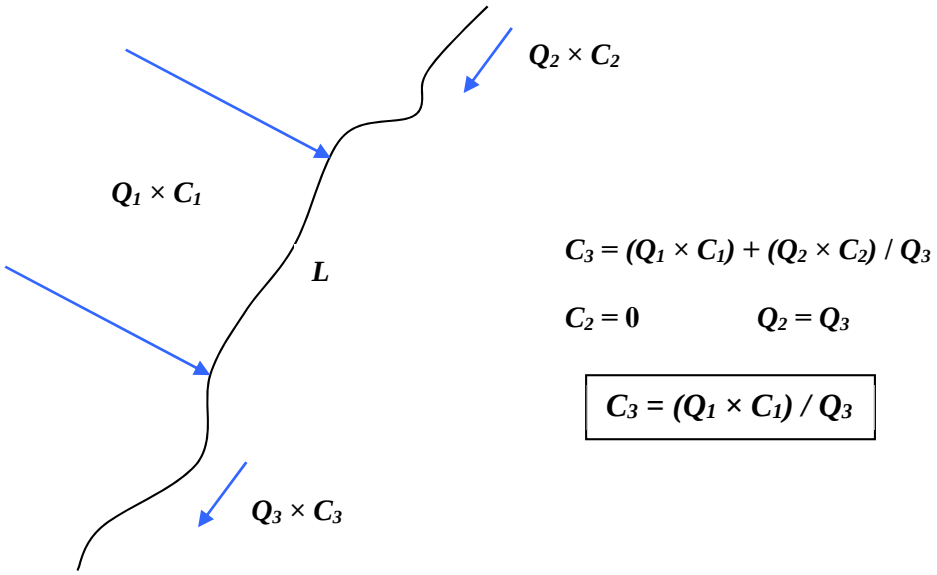
We also ran a Continuous Single Planer Source model using the same input parameters in order to demonstrate the asymptotic groundwater concentration. The asymptotic groundwater concentration appears to occur at 118 years with a PCE concentration of 0.291 mg/L at Crooked Creek, which is well below the revised PCE concentration of 29.17 mg/L in MW-6S necessary to result in an in-stream concentration above the applicable standard of 0.0033 mg/L for PCE. The highest PCE concentration in MW-6S was 0.073 mg/L in March 2010.

A sensitivity analysis was performed to evaluate parameters with the greatest potential impact on future downgradient PCE concentrations. Component parameters which are used to calculate model input values were not included in the sensitivity analysis. The actual model input values provided sufficient indication of the model's sensitivity to the component parameters. Since vertical dispersivity is essentially zero, it was not included in the sensitivity analysis. In addition, the following model inputs that do not affect model predictions were not included in the sensitivity analysis: modeled area width, modeled area length, zone 1 length and biotransformation parameters. As shown in the attached table, individual input parameters that were changed by ±10% had little effect on the resulting predicted PCE concentrations for the Sandy Springs Property. The input parameters, BIOCHLOR input and output sheets, Time Step table and figures, and the sensitivity analysis are included in Appendix 10.

5.1.2 Groundwater–Surface Water Mixing Calculations

In order to model the effect of the groundwater impacts on the groundwater receptor, Crooked Creek, SEA performed site specific groundwater-surface water mixing calculations. With regard to the use of 7Q10 data, as stated in our April 2012 letter, the regulations for ISWQS clearly state that concentrations are to be measured "under annual average or higher stream flow conditions." Rule 391-3-6-.03(5)(d). Therefore, SEA respectfully suggests 7Q10 values would be irrelevant.

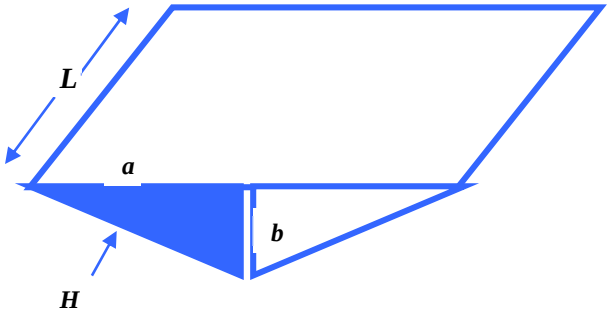
Further, Crooked Creek does not have any published 7Q10 data and only has eleven years of consistent data from which to draw. SEA used data from USGS Gaging Station 02335350 (Crooked Creek near Norcross, GA) to perform simple mixing calculations to ensure concentrations will not exceed the ISWQS in Crooked Creek. USGS Gaging Station 02335350 is located at the bridge on Spalding Drive approximately 500 feet southwest of the Spalding Drive-River Exchange Drive intersection. SEA revised the original site specific groundwater-surface water mixing calculations based on the March 6, 2012 Comment Letter regarding the 3rd and 4th Semi-Annual Progress Reports, in which EPD issued several comments (Comment Numbers 3 through 6) which related to surface water mixing calculations. The revised parameters in the following tables are indicated as **bold**. The schematic below shows the key elements of the calculations where:



Q_1 is the flow rate of impacted groundwater entering the stream segment (in cfs).
Q_2 is the average annual daily streamflow immediately upgradient of the site (in cfs).
Q_3 is the average annual daily streamflow immediately downgradient of the site (in cfs).
C_1 is the dissolved concentration of PCE in groundwater represented by MW-6S (in mg/l).
C_2 is the upgradient concentration in the stream (assumed 0).
C_3 is the resulting concentration of PCE in the stream after mixing (in mg/l).
L is the length of the stream segment receiving impacted groundwater (in feet).

The flux of impacted groundwater discharging into Crooked Creek (Q_1) is calculated using the following equations (see calculations below)

$$Q_1 = A \times v_d$$
$$Q_1 = L \times H \times i$$



v_d is the groundwater (Darcy) velocity.
A is the cross-sectional area of discharge.
a is the half-width of the surface water.
b is the depth of water in the stream (average daily mean gage height).
H is the side-face of groundwater discharge calculated from a and b.

Table A1 shows the result calculation for the given input parameters together with the applicable ISWQS for the highest PCE concentration detected to date in MW-6S, located 575 feet or 175 meters upgradient of Crooked Creek. The length of the segment, L, is the width of the dissolved plume at MW-6S (from MW-7S to MW-21S). To be conservative, the plume segment from MW-6S to Crooked Creek is assumed to have a PCE concentration of 0.073 mg/L throughout and does not experience any horizontal dispersivity or degradation. As can be seen in Table A1, the concentration of PCE in Crooked Creek after mixing of surface water with impacted groundwater, C_3, is three orders of magnitude below the applicable ISWQS and also below the laboratory detection limit.

Table A1 – Calculation of PCE concentration in Crooked Creek after mixing with impacted groundwater, parameter C_3

K (ft/s)	i	L (ft)	a (ft)	b (ft)	H (ft)	A (sf)	v_d (ft/s)	Q_1 (cfs)
3.18E-05	0.017	200	16.5	3.785	16.929	3385.8	**5.41E-07**	**0.001832**

COC	C_1 (mg/L)	Q_1 (cfs)	$Q_2 = Q_3$ (cfs)	C_3 (mg/L)	ISWQS (mg/L)
PCE	0.073	**0.001832**	16.7	**8.01E-06**	0.0033

The maximum allowable concentration of PCE at MW-6S that would still be protective of the applicable ISWQS is shown in Table A2 (value C_1). As can be seen in the table below, this calculated concentration of PCE that would result in impact to Crooked Creek above ISWQS is much higher than the maximum groundwater concentration observed at the source area.

Table A2 - Maximum allowable concentration of PCE at MW-6S protective of the applicable ISWQS, parameter C_1

COC	C_1 (mg/L)	Q_1 (cfs)	$Q_2 = Q_3$ (cfs)	C_3 (mg/L)	ISWQS (mg/L)
PCE	**29.17**	**0.001832**	16.7	0.0032	0.0033

An additional exercise was conducted to determine the minimum mean daily streamflow in Crooked Creek that would still be protective of the applicable ISWQS for the PCE concentration of 0.073 mg/l at MW-6S is shown in Table A3 (value Q_2). The mean daily streamflow calculated and presented in Table A3 is more than an order of magnitude lower than the minimum mean daily streamflow recorded for USGS Gaging Station 02335350 (0.51 cfs on October 7, 2008).

Table A3 - Minimum mean daily streamflow in Crooked Creek for the PCE concentration at 0.73 mg/l at MW-6S to be protective of the applicable ISWQS, parameter Q_2

COC	C_1 (mg/L)	Q_1 (cfs)	$Q_2 = Q_3$ (cfs)	C_3 (mg/L)	ISWQS (mg/L)
PCE	0.073	**0.001832**	**0.0405**	0.0032	0.0033

In conclusion, the dissolved contaminant plume would not impact Crooked Creek after mixing surface water with impacted groundwater. The maximum allowable concentration of PCE calculated for MW-6S that would still be protective of the applicable ISWQS (0.0033 mg/L) was 29.17 mg/L, which is much higher than the maximum concentration observed at the source area well MW-15S (4.300 mg/L on March 9, 2004) and also much higher than the highest future PCE concentration at MW-6S of 0.083 mg/L predicted by BIOCHLOR.

5.1.3 Conclusion

The BIOCHLOR model predicted that groundwater reaching Crooked Creek would reach the highest impact at 0.054 mg/L PCE in 31 years and at 0.291 mg/L PCE in 118 years with no degradation. However, the groundwater-surface water mixing calculations demonstrate that Crooked Creek would not be impacted by the dissolved contaminant plume above the current ISWQS.

5.2 Potential for Vapor Intrusion

SEA evaluated the potential for vapor intrusion exceeding either a Target Carcinogenic Risk of 1E-5 or a Target Non-Carcinogenic Hazard Quotient of 1 from PCE using the USEPA's *OSWER Vapor Intrusion Assessment, Vapor Intrusion Screening Level (VISL) Calculator Version 3.4, June 2015 RSLs.* SEA evaluated the Spalding Corners Shopping Center Parcel and the River Exchange Parcel separately. For the Spalding Corners Shopping Center Parcel, SEA used the October 2014 concentration of PCE detected in the groundwater at the source well MW-15S, which was 0.200 mg/L, as the input value for the *Groundwater Concentration to Indoor Air Concentration (GWC-IAC) worksheet of the VISL Calculator*. Since the current use of the Spalding Corners Shopping

Center Parcel is commercial, the commercial use scenario was used to evaluate the risk of exposure. Using the Commercial Scenario for Spalding Corners Shopping Center, the October 2014 PCE concentration in MW-15S would not exceed the target CR and HQ with results of a CR of 2.2E-06 and a HQ of 0.59.

The River Exchange Parcel is currently vacant but scheduled for redevelopment as described in Section 1.3 of this compliance status report. The redevelopment will utilize an engineered vapor barrier that will result in the groundwater to vapor pathway to be incomplete. Therefore, vapor intrusion as an Exposure Pathway for groundwater will be eliminated.

Copies of the *GWC-IAC worksheets* are located in Appendix 9.

6.0 RISK REDUCTION STANDARDS

Risk Reduction Standards (RRS) under HSRA rules are based on property use and available site specific information. Types 1 and 2 RRS are residential standards. Types 3 and 4 are applicable only to non-residential sites. Types 2 and 4 are based on site specific calculations in determining the applicable standard. Type 5 RRS are applicable to either residential or non-residential use and can include engineering and/or institutional controls to minimize the risk of exposure.

The Spalding Corners HSI Site is located in Sandy Springs, Fulton County, Georgia. Soil impacts of the VOCs: Chloroform, cis-1,2-Dichloroethalene (cDCE), Tetrachloroethene (PCE), Trichloroethene (TCE), and Xylenes were detected in soil samples collected on the site. PCE was the only compound that exceeded the Type 1 RRS. Following soil source removal within the dry cleaner tenant space in November and December 2004, all VOCs were below the Type 3 RRS. In October 12, 2010, EPD stated that the soil complies with Type 1 RRS.

In accordance with the Voluntary Remediation Program Act, the risk reduction standards for groundwater are determined based on a point of compliance located 1000 feet down gradient of the delineated site contamination. For the purposes of calculating the Risk Reduction Standards for groundwater, Crooked Creek is the receptor for groundwater at this site and serves as a groundwater barrier for further migration. The Point of Exposure (POE) is a theoretical groundwater withdrawal point located 1000 feet down gradient of Crooked Creek that will not be impacted above the appropriate standards. Of note, Crooked Creek operates as a hydro geologic barrier to ground water flow. Therefore, based on the relatively low levels present at the subject site, it is impossible for regulated substances from the subject site to reach the theoretical point of exposure at detectible concentrations.

Groundwater impacts of the VOCs: 1,1,2-Trichloroethane (1,1,2-TCA), 2-Butanone, Acetone, Benzene Chloroform, cis-1,2-Dichloroethalene (cDCE), Tetrachloroethene (PCE), Toluene, Trichloroethene (TCE), and Xylenes were detected in groundwater samples collected on the site. Only 1,1,2-TCA, cDCE, PCE, and TCE have ever exceeded the Type 1 RRS anywhere within the plume and, as of October 2014, only PCE exceeds the Type 1 RRS anywhere within the groundwater plume. The October 2014 PCE concentrations range in Type 1 RRS exceedances from 0.0068 mg/L to 0.280 mg/L. As demonstrated using a conservative model described in Section 5.1 above, the current and expected future groundwater concentrations reaching Crooked

Creek will not cause it to exceed either the in-stream water quality standards. The potential for vapor intrusion as a possible exposure pathway was evaluated as described in Section 5.2 above.

Based on the results of the evaluation of the POE, the potential for impact to Crooked Creek and the assessment of other potential groundwater exposure pathways as more fully described above, it has been determined that the groundwater concentrations are in compliance with the Type 1 RRS for the constituents detected at the site as measured in accordance with the Voluntary Remediation Program. A copy of the Type 1 Risk Reduction Standards Evaluation for the subject property is in Appendix 8.

7.0 SUMMARY OF PREVIOUS ACTIONS TAKEN TO ELIMINATE, CONTROL, OR MINIMIZE ANY POTENTIAL RISK AT THE SITE

In November and December 2003, Peachtree excavated and disposed off-site approximately 131 tons of impacted soil. A total of nine (9) soil confirmation samples were collected and analyzed for VOCs with the highest remaining PCE soil impact at the Spalding Cleaners HSI Site at 0.260 mg/Kg, which is below both the Type 1 and Type 3 Risk Reduction Standard. EPD issued a letter dated February 8, 2005 approving the CAP stating that the soil portion of their CAP complies with Type 3 RRS. Later, EPD issued a letter dated October 12, 2010 approving the VRP Application with a comment stating that EPD concurs that the soil complies with Type 1 RRS, so no further corrective action is required for soil.

A system of five BioNets was installed in April to May 2005 down the axis of the groundwater plume from MW-16S to MW-20S; one BioNet was between MW-16S and MW-17S; one BioNet was between MW-18S and MW-19S; and three BioNets were between MW-19S and MW-20S. A CAP Addendum dated August 2008 discusses the 2+ year BioNets™ pilot study results indicated groundwater conditions were not sufficient to support the in-situ biological treatment approach and proposed remediation utilizing ISCO to address VOC-impacted groundwater.

An ISCO pilot test was performed in September 2008 by applying activated sodium persulfate into four (4) infiltration trenches (IT-1 to IT-4) located down the plume centerline from MW-18S to MW-20S and a single injection well installed north of MW-16S. Decreases in constituent concentration were observed in groundwater samples collected from centerline wells (principally MW-19S and MW-20S) from August 2008 through March 2010. MNA has been utilized following the ISCO pilot test.

8.0 INSTITUTIONAL CONTROLS

Institutional controls will be implemented through the use of Environmental Covenants (UECs) executed in conformance with the Georgia Uniform Environmental Covenants Act (OCGA § 44-16-1) substantially in the form included in Appendix 8.

9.0 CONCLUSION

Parcel Numbers 06-0313-LL009-1 (Spalding Corners Shopping Center) and 06-0313-LL034-9 (River Exchange Property), Sandy Springs, Fulton County, Georgia are in compliance with the

Type 1 RRS for VOCs with regard to soil. No additional actions are necessary or recommended for soil.

The BIOCHLOR model, using a Decaying Single Planer Source with the source concentration at 4.3 mg/L and a source decay constant (k_s) of 0.145 per year (1/yr), predicted that the maximum PCE impact on the Sandy Springs Property would be at 0.078 mg/L in 25.1 years and the maximum PCE impact to Crooked Creek would be 0.054 mg/L in 31 years. The maximum PCE concentration predicted on the Sandy Springs Property is below the default Type 4 RRS of 0.098 mg/L for PCE.

Running the Continuous Single Planer Source model of BIOCHLOR and using the same input parameters in order to demonstrate the asymptotic groundwater concentration, the asymptotic groundwater concentration appears to occur at 118 years with a PCE concentration of 0.291 mg/L at Crooked Creek. However, based on the mixing calculations, no impacts to Crooked Creek above the in-stream water quality standards would occur. Further, since the stream serves to intercept groundwater, it is not possible for impacts to reach a theoretical point of exposure 1000 feet down gradient from the site as contemplated by the Voluntary Remediation Program. Accordingly, Parcel Numbers 06-0313-LL009-1 (Spalding Corners Shopping Center) and 06-0313-LL034-9 (River Exchange Property), Sandy Springs, Fulton County, Georgia are in compliance with the Type 1 RRS for VOCs with regard to groundwater under the Voluntary Remediation Program.

The potential for vapor intrusion from groundwater was evaluated using an approved vapor intrusion screening model. Based on the results of the model using default and site specific input values for groundwater, the incremental exposure risk for vapor exposure will not be exceeded on the Spalding Corners Shopping Center under a commercial use scenario. Although all construction details have not been established, all buildings to be inhabited on the River Exchange Property will utilize a multi-layered, engineered vapor barrier designed to prevent the migration of vapors into the buildings. The vapor barrier will be installed by a qualified contractor, have a minimum thickness of 60 mils and be smoke tested by an independent inspector to visually verify the proper installation of the vapor barrier system. Based on the planned use of an engineered vapor barrier for the developments on the River Exchange Property, the vapor intrusion pathway is incomplete and requires no further evaluation.

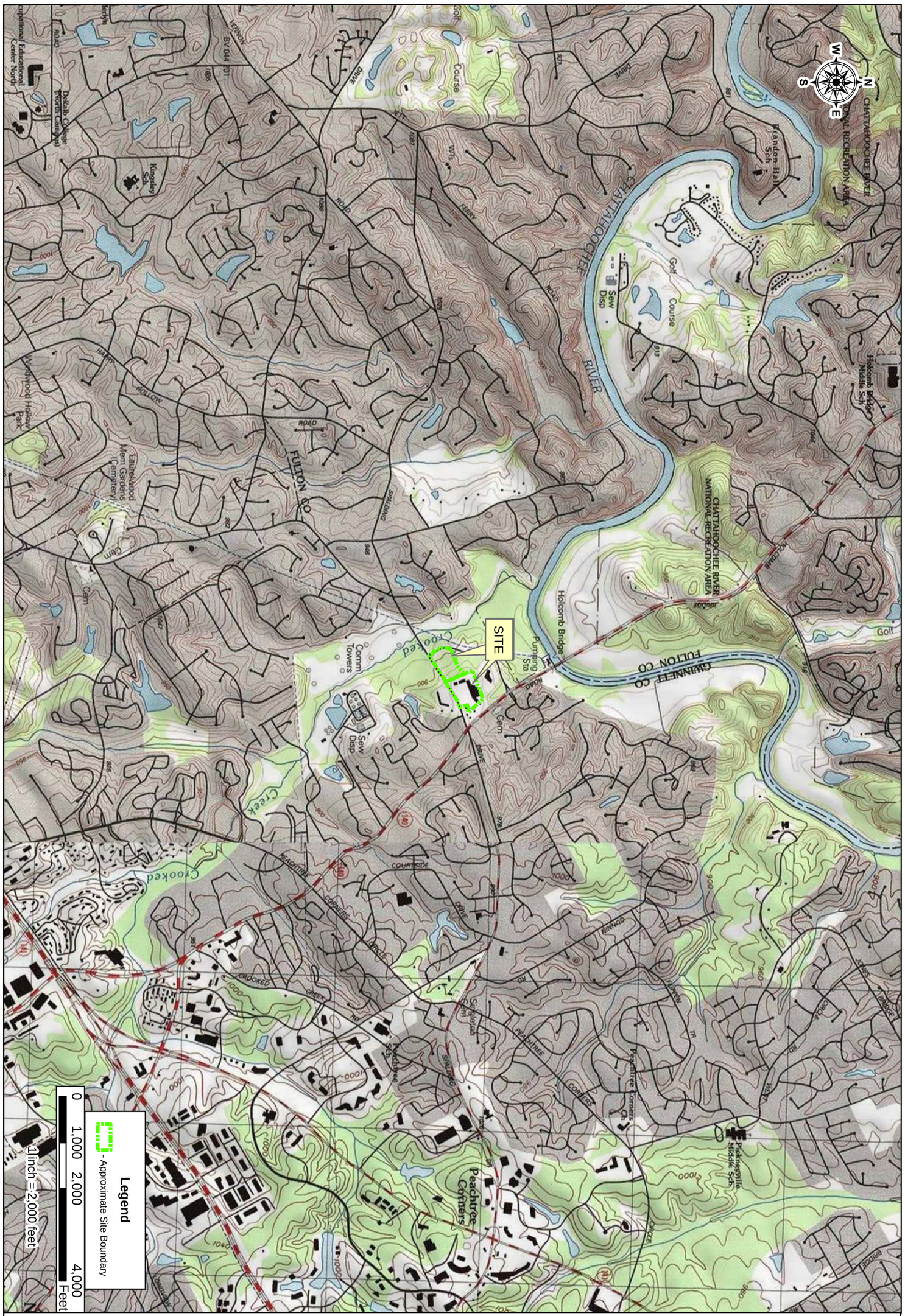
APPENDICES

Appendix 1 Figures

Appendix 2 Tables

APPENDIX 1

FIGURES



DATA SOURCES: - 1:24,000 Chamblee, Georgia USGS 7.5' Topographic Map Quadrangle courtesy of ESRI Map Services

SEA
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ENVIRONMENTAL/GEOTECHNICAL
1675 SPECTRUM DRIVE
LAWRENCEVILLE, GEORGIA 30043
(770) 962-5922 FAX 962-7964

REVISED AREA PLAN

Figure 1

SPALDING CORNERS SHOPPING CENTER
7700 Spalding Drive
Sandy Springs, Fulton County, Georgia
HSI# 10639

Job No. 102-063

SEA-2203

REVISED SITE PLAN

Figure 2

SPALDING CORNERS SHOPPING CENTER
7700 Spalding Drive
Sandy Springs, Fulton County, Georgia
HSI #10639

Job No. 102-063

SEA-2203

SAILORS ENGINEERING ASSOCIATES, INC.
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DATA SOURCES: - 2014 aerial photography courtesy of *Google Earth*

06-0313 LL-0372
SANDY SPRINGS SENIOR HOLDINGS LLC

06-0313 LL-036-4
"SANDY SPRINGS PROPERTY"

06-0313 LL-034-9
DUNWOODY PLACE VENTURES LLC

06-0313 LL-037-2
SELIG ENTERPRISES INC

RIVER EXCHANGE DRIVE

SPALDING DRIVE

Dekalb County
24" Water Main
Easement
(Approximate)

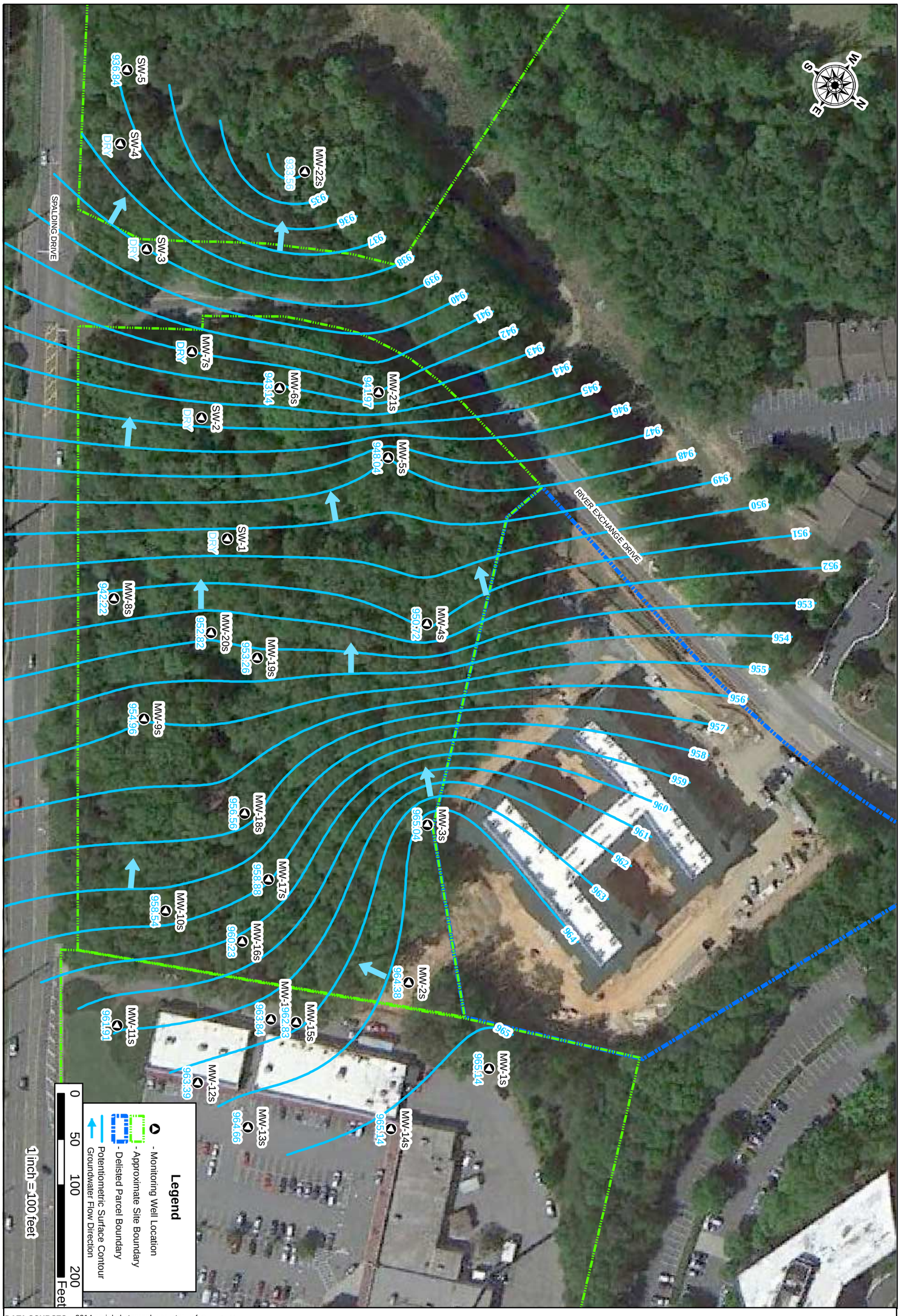
MW-1s
MW-2s
Abandoned
MW-3s
MW-4s
MW-5s
MW-6s
MW-7s
MW-8s
MW-9s
MW-10s
MW-11s
MW-12s
MW-13s
MW-14s
MW-15s
MW-16s
MW-17s
MW-18s
MW-19s
MW-20s
MW-21s
MW-22s
MW-1d
SW-1
SW-2
SW-3
SW-4
SW-5

Legend

- Monitoring Well Location
- Approximate Site Boundary
- Delisted Parcel Boundary

0 50 100 200 Feet

1 inch = 100 feet



DATA SOURCES: - 2014 aerial photography courtesy of ***Google Maps***

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LAWRENCEVILLE, GEORGIA 30043

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POTENTIOMETRIC SURFACE MAP

OCTOBER 6, 2014
Figure3

SPALDING CORNERS SHOPPING CENTER

7700 Spalding Drive
Sandy Springs, Fulton County, Georgia
HSI# 10639

Job No. 122-081

SEA-2203

RIVER EXCHANGE DRIVE

SPALDING DRIVE

MW-1s NA

MW-2s NA

MW-3s NA

MW-4s NA

MW-5s 0.067

MW-6s 0.0032

MW-7s DRY

MW-8s NA

MW-9s NA

MW-10s 0.061

MW-11s NA

MW-12s NA

MW-13s 0.0019

MW-14s 0.0068

MW-15s 0.200

MW-16s 0.280

MW-17s 0.130

MW-18s 0.240

MW-19s 0.017

MW-20s 0.018

MW-21s 0.020

MW-22s <0.001

MW-1d <0.001

SW-1 DRY

SW-2 DRY

SW-3 DRY

SW-4 DRY

SW-5 <0.001

0.200

0.100

0.0050

Legend

- Monitoring Well Location
- Approximate Site Boundary
- Delisted Parcel Boundary
- PCE Isoconcentration Contour
- NA - Not Analyzed

PCE concentration in mg/L

0 50 100 200 Feet

1 inch = 100 feet

DATA SOURCES: - 2014 aerial photography courtesy of *Google Earth*

PCE ISOCONCENTRATION MAP

OCTOBER 2014

Figure 4

SPALDING CORNERS SHOPPING CENTER

7700 Spalding Drive
Sandy Springs, Fulton County, Georgia
HSI# 10639

Job No. 102-063

SEA-2203

SAILORS ENGINEERING ASSOCIATES, INC.
ENVIRONMENTAL/GEOTECHNICAL
1675 SPECTRUM DRIVE
LAWRENCEVILLE, GEORGIA 30043
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RIVER EXCHANGE DRIVE

SPALDING DRIVE

MW-1s NA
MW-2s NA
MW-3s NA
MW-4s NA
MW-5s <0.001
MW-6s <0.001
MW-7s DRY
MW-8s NA
MW-9s NA
MW-10s <0.001
MW-11s NA
MW-12s NA
MW-13s <0.001
MW-14s <0.001
MW-15s <0.001
MW-16s 0.0024
MW-17s <0.001
MW-18s 0.0028
MW-19s 0.0023
MW-20s 0.0038
MW-21s <0.001
MW-22s <0.001
SW-1 DRY
SW-2 DRY
SW-3 DRY
SW-4 DRY
SW-5 <0.001
MW-1d 0.0019
MW-1d <0.001
<0.001
<0.001
<0.001
<0.001

Legend

- Monitoring Well Location
- Approximate Site Boundary
- Delisted Parcel Boundary
- TCE Isoconcentration Contour
- NA - Not Analyzed
- TCE Concentration in mg/L

0 50 100 200 Feet

1 inch = 100 feet

DATA SOURCES: - 2014 aerial photography courtesy of *Google Earth*

TCE ISOCONCENTRATION MAP

OCTOBER 2014

Figure 5

SPALDING CORNERS SHOPPING CENTER

7700 Spalding Drive
Sandy Springs, Fulton County, Georgia
HSI# 10639

Job No. 102-063

SEA-2203

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ENVIRONMENTAL/GEOTECHNICAL
1675 SPECTRUM DRIVE
LAWRENCEVILLE, GEORGIA 30043
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RIVER EXCHANGE DRIVE

SPALDING DRIVE

MW-1s NA
MW-2s NA
MW-3s NA
MW-4s NA
MW-5s <0.001
MW-6s <0.001
MW-7s DRY
MW-8s NA
MW-9s NA
MW-10s <0.001
MW-11s NA
MW-12s NA
MW-13s <0.001
MW-14s <0.001
MW-15s
MW-16s <0.001
MW-17s <0.001
MW-18s <0.001
MW-19s 0.0011
MW-20s 0.0041
MW-21s <0.001
MW-22s <0.001
MW-1d <0.001
<0.001
SW-1 DRY
SW-2 DRY
SW-3 DRY
SW-4 DRY
SW-5 <0.001

Legend

- Monitoring Well Location
- Approximate Site Boundary
- Delisted Parcel Boundary
- cDCE Isoconcentration Contour
- NA - Not Analyzed

cDCE Concentration in mg/L

0 50 100 200 Feet

1 inch = 100 feet

DATA SOURCES: - 2014 aerial photography courtesy of *Google Earth*

cDCE ISOCONCENTRATION MAP

OCTOBER 2014

Figure 6

SPALDING CORNERS SHOPPING CENTER

7700 Spalding Drive
Sandy Springs, Fulton County, Georgia
HSI# 10639

Job No. 102-063

SEA-2203

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LAWRENCEVILLE, GEORGIA 30043
(770) 962-5922 FAX 962-7964

DATA SOURCES: - 2014 aerial photography courtesy of *Google Earth*

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1675 SPECTRUM DRIVE
LAWRENCEVILLE, GEORGIA 30043
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SEA

CHLOROFORM ISOCONCENTRATION MAP
OCTOBER 2014
Figure 7

SPALDING CORNERS SHOPPING CENTER
7700 Spalding Drive
Norcross; Fulton County, Georgia
HSI# 10639

Job No. 102-063

SEA-2203

N
W E
S

MW1-N (5.0 ft.)
5/23/2003
BDL
(15.0 ft.)
BDL
(25.0 ft.)
BDL

SSB-8-N (5.0 ft.)
6/2/2003
C BDL
cDCE BDL
PCE 0.0110
TCE BDL
X BDL
(15.0 ft.)
C BDL
cDCE BDL
PCE 0.0100
TCE BDL
X BDL
(25.0 ft.)
BDL

B-4 (1.0 ft.)
2/21/2000
C NA
cDCE BDL
PCE 0.0057
TCE BDL
X NA

SS-2 (5.0 ft.*)
12/11/2003
C BDL
cDCE 0.0096
PCE 0.2300
TCE BDL
X BDL

SS-6 (10.0 ft.*)
12/11/2003
C BDL
cDCE BDL
PCE 0.1700
TCE BDL
X BDL

B-1 (3.0 ft.)
2/21/2000
C NA
cDCE BDL
PCE 4.200
TCE BDL
X NA

SS-1 (5.0 ft.*)
12/11/2003
C BDL
cDCE BDL
PCE 0.2200
TCE BDL
X BDL

SS-10 (5.0 ft.*)
12/11/2003
C BDL
cDCE BDL
PCE 0.0330
TCE BDL
X BDL

SSB-1 (5.0 ft)
1-13-2003
BDL
(35.0 ft.)
BDL

B-7 (1.0 ft.)
2/21/2000
C NA
cDCE BDL
PCE 0.0640
TCE 0.0270
X NA

SS-12 (10.0 ft.*)
12/16/2003
C BDL
cDCE BDL
PCE 0.0460
TCE BDL
X BDL

SS-3 (5.0 ft.*)
12/11/2003
C BDL
cDCE BDL
PCE 0.2600
TCE BDL
X BDL

SMW-11 (NR)
12/20/2002
BDL

SSB-7 (5.0 ft.)
1-17-2003
BDL
(35.0 ft.)
BDL

B-10 (3.0 ft.)
2/21/2000
C NA
cDCE BDL
PCE 0.0390
TCE BDL
X NA

SS-11 (2.5 ft.*)
12/11/2003
C BDL
cDCE BDL
PCE 0.0150
TCE BDL
X BDL

B-6 (3.0 ft.)
2/21/2000
C NA
cDCE 0.3900
PCE 0.0250
TCE BDL
X NA

B-3 (1.0 ft.)
2/21/2000
C NA
cDCE BDL
PCE 0.0390
TCE BDL
X NA

SS-4 (5.0 ft.*)
12/11/2003
C BDL
cDCE BDL
PCE 0.1300
TCE BDL
X BDL

SS-5 (2.5 ft.*)
12/11/2003
C BDL
cDCE BDL
PCE BDL
TCE 0.0410
X BDL

SSB-2 (5.0 ft.)
1-13-2003
C BDL
cDCE BDL
PCE 0.0230
TCE BDL
X BDL
(35.0 ft.)
BDL

SSB-6 (5.0 ft.)
1-17-2003
BDL
(35.0 ft.)
BDL

B-8 (1.0 ft.)
2/21/2000
C NA
cDCE BDL
PCE 0.0290
TCE BDL
X NA

B-5 (1.0 ft.)
2/21/2000
C NA
cDCE BDL
PCE 0.0390
TCE BDL
X NA

SSB-8-V (5.0 ft.)
6/2/2003
BDL
(15.0 ft.)
BDL
(25.0 ft.)
BDL

B-2 (2.0 ft.)
2/21/2000
C NA
cDCE 0.1500
PCE 0.0073
TCE BDL
X NA

SSB-8-E (5.0 ft.)
6/2/2003
BDL
(15.0 ft.)
BDL
(25.0 ft.)
BDL

MW1-S (5.0 ft.)
5/23/2003
BDL
(15.0 ft.)
BDL
(25.0 ft.)
BDL

SSB-5 (5.0 ft.)
1-17-2003
BDL
(37.0 ft.)
BDL

SSB-3 (5.0 ft.)
1-13-2003
C BDL
cDCE BDL
PCE 0.0240
TCE BDL
X BDL
(40.0 ft.)
BDL

SSB-8-S (5.0 ft.)
6/2/2003
C BDL
cDCE BDL
PCE 0.0190
TCE BDL
X BDL
(15.0 ft.)
BDL
(25.0 ft.)
BDL

SSB-4 (5.0 ft.)
1-13-2003
C BDL
cDCE BDL
PCE 0.0090
TCE BDL
X BDL
(35.0 ft.)
C BDL
cDCE BDL
PCE 0.0080
TCE BDL
X BDL

SMW-23 (NR)
12/20/2002
BDL

SMW-12 (NR)
12/20/2002
BDL

C- Chloroform
cDCE- cis-1,2-Dichlroethene
PCE- Tetrachloroethene
TCE- Trichloroethene
X- Xylenes
BDL- Below Detection Limits
NA- Not Analyzed

Legend
- Approximate Site Boundary
- Approximate Excavation Area
- Soil Sample Location

Concentration results in mg/Kg
*Depth estimated from previous report data

0 10 20 40 Feet

1 inch = 20 feet

DATA SOURCES: - 2009 aerial photography courtesy of *Gwinnett County GIS Department*

HISTORIC SOIL CONCENTRATION PLAN

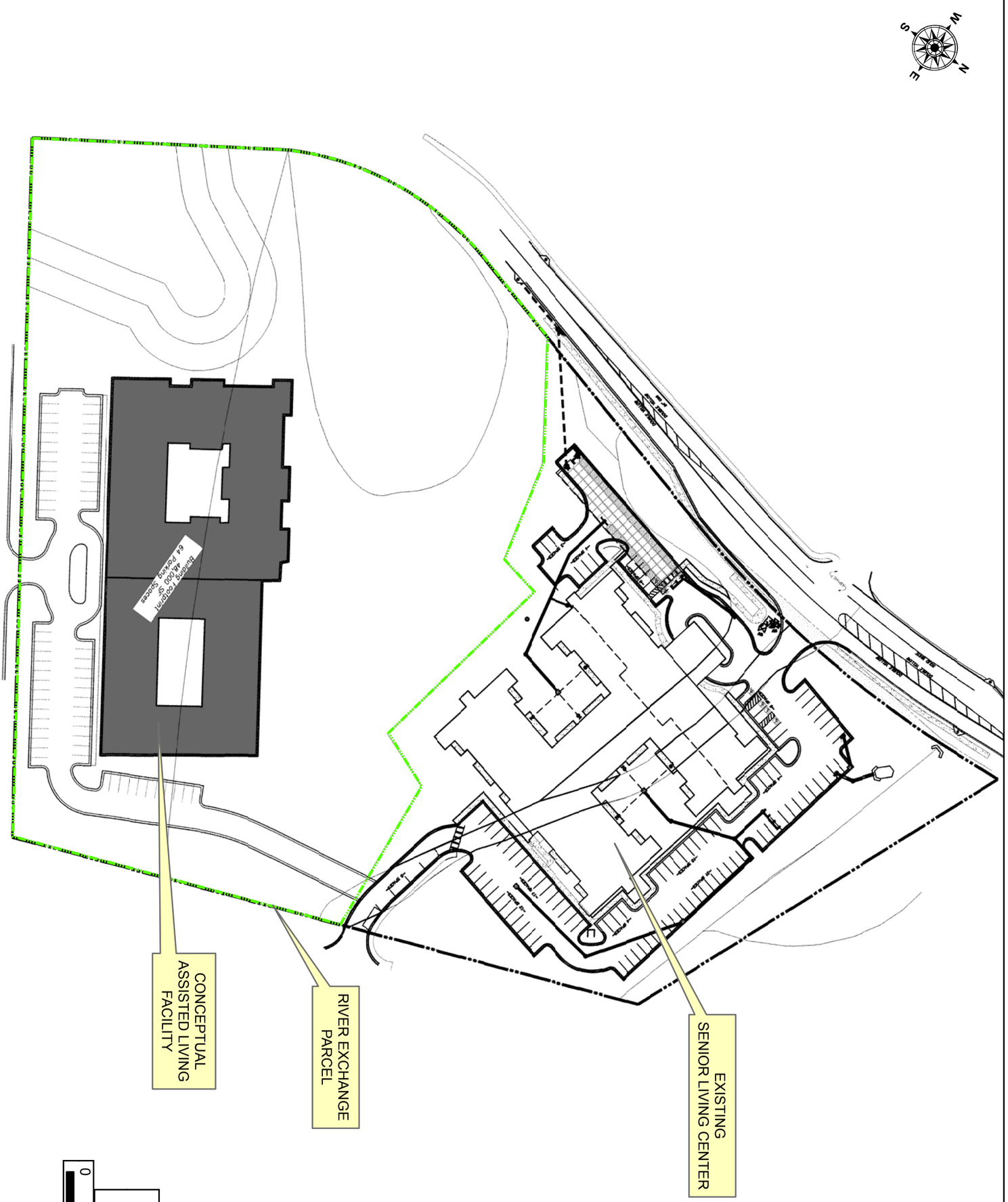
Figure 8

SEA-2203

SPALDING CORNERS SHOPPING CENTER
7700 Spalding Drive
Sandy Springs, Fulton County, Georgia
HSI #10639

Job No. 102-063

SAILORS ENGINEERING ASSOCIATES, INC.
ENVIRONMENTAL/GEOTECHNICAL
1675 SPECTRUM DRIVE
LAWRENCEVILLE, GEORGIA 30043
(770) 962-5922 FAX 962-7964



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1675 SPECTRUM DRIVE
LAWRENCEVILLE, GEORGIA 30043
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RIVER EXCHANGE
CONCEPTUAL DEVELOPMENT
PLAN
Figure 9

SPALDING CORNERS SHOPPING CENTER
7700 Spalding Drive
Sandy Springs, Fulton County, Georgia
HSI #10639

Job No. 102-063

APPENDIX 2

TABLES

TABLE 1

Spalding Corners Shopping Center
Norcross, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063
Current Groundwater Analytical Results Summary

Location	Date Sampled	2-Butonone	Acetone	Benzene	Chloroform	cis-1,2-Dichloroethene	Methyl tert-butyl ether	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Total Xylenes
MW-5S	10/13/2014	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.067**	<0.005	<0.001	<0.001	<0.010
MW-6S	10/9/2014	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.0032**	<0.005	<0.001	<0.001	<0.010
MW-7S	10/6/2014	DRY										
MW-8S	10/6/2014	Not Sampled										
MW-9S	10/6/2014	Not Sampled										
MW-10S	10/8/2014	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.061**	<0.005	<0.001	<0.001	<0.010
MW-13S	10/7/2014	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.0019**	<0.005	<0.001	<0.001	<0.010
MW-14S	10/7/2014	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.0068**	<0.005	<0.001	<0.001	<0.010
MW-15S	10/7/2014	<0.050	<0.050	<0.005	**0.0054**	<0.001	<0.005	**0.200**	<0.005	**0.0019**	<0.001	<0.010
MW-16S	10/7/2014	<0.050	<0.050	<0.005	**0.0054**	<0.001	<0.005	**0.280**	<0.005	**0.0024**	<0.001	<0.010
MW-17S	10/8/2014	<0.050	<0.050	<0.005	**0.013**	<0.001	<0.005	**0.130**	<0.005	<0.001	<0.001	<0.010
MW-18S	10/9/2014	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.240**	<0.005	**0.0028**	<0.001	<0.010
MW-19S	10/9/2014	<0.050	<0.050	<0.005	<0.005	**0.0011**	<0.005	**0.017**	<0.005	**0.0023**	<0.001	<0.010
MW-20S	10/9/2014	<0.050	<0.050	<0.005	<0.005	**0.0041**	<0.005	**0.018**	<0.005	**0.0038**	<0.001	<0.010
MW-21S	10/13/2014	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.020**	<0.005	<0.001	<0.001	<0.010
MW-22S	10/13/2014	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	<0.001	<0.005	<0.001	<0.001	<0.010
MW-1D	10/8/2014	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	<0.001	<0.005	<0.001	<0.001	<0.010
SW-1	10/6/2014	DRY										
SW-2	10/6/2014	DRY										
SW-3	10/6/2014	DRY										
SW-4 (SEA)	10/6/2014	DRY										
SW-5 (SEA)	10/13/2014	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	<0.001	<0.005	<0.001	<0.001	<0.010
Type I & 3 Risk Reduction Standard		**2.000**	**4.000**	**0.005**	**0.100**	**0.070**	**Not Applicable**	**0.005**	**1.000**	**0.005**	**0.002**	**10.000**

Note: All concentrations listed in mg/L
HIGHLIGHTED RESULTS EXCEED TYPE 1 RRS
2014 sampling performed by Sailors Engineering Associates, Inc.

TABLE 2

Spalding Corners Shopping Center
Norcross, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063
Historic Groundwater Analytical Results Summary

Location	Date Sampled	1,1,2-Trichloroethane	2-Butonone	Acetone	Benzene	Chloroform	cis-1,2-Dichloroethene	Methyl tert-butyl ether	Tetrachloroethene	Toluene	Trichloroethene	Total Xylenes
MW-1S	10/22/2003	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	NA	<0.005	<0.005
(SMW-13 N2)	3/7/2005	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	5/31/2006	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	5/30/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/23/2010	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
MW-2S	2/4/2003	<0.005	NA	NA	<0.005	NA	NA	<0.005	NA	<0.005	NA	<0.005
(SMW-24)	2/12/2003	<0.005	NA	NA	<0.005	**0.0320**	<0.005	<0.005	**0.0090**	<0.005	<0.005	<0.005
	12/12/2003	<0.005	<0.010	<0.020	<0.005	**0.014**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/7/2005	<0.005	<0.010	<0.020	<0.005	**0.0063**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	5/31/2006	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	5/31/2007	<0.005	<0.050	<0.050	<0.005	**0.012**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/22/2010	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
MW-3S	1/15/2003	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
(SMW-20)	3/9/2004	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	NA	<0.005	<0.005
	3/7/2005	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	5/31/2006	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	5/31/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/22/2010	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
MW-4S	5/12/2003	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
(SMW-26 N)	3/7/2005	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	6/1/2006	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	6/1/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/22/2010	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
MW-5S	12/31/2002	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
(SMW-17)	3/9/2004	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	NA	<0.005	<0.005
	3/7/2005	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	6/1/2006	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.0080**	<0.005	<0.005	<0.010
	6/1/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.010**	<0.005	<0.005	<0.010
	8/21/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.012**	<0.005	<0.005	<0.010
	10/26/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.019**	<0.005	<0.005	<0.010
	3/22/2010	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.014**	<0.005	<0.005	<0.010
	2/28/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.023**	<0.005	<0.005	<0.010
	9/14/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.024**	<0.005	<0.005	<0.010
	3/16/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/12/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.032**	<0.005	<0.005	<0.010
	3/19/2014	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0011**	<0.005	**0.048**	<0.005	<0.001	<0.010
	10/13/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.067**	<0.005	<0.001	<0.010
Type I & 3 Risk Reduction Standard		**0.005**	**2.000**	**4.000**	**0.005**	**0.100**	**0.070**	**Not Applicable**	**0.005**	**1.000**	**0.005**	**10.000**

All concentrations listed in mg/L
HIGHLIGHTED RESULTS EXCEED TYPE 1 RRS
Sampling: 2000 by Rindt-McDuff; 2002-2003 by Pyramid;
2004-2010 by Peachtree Environmental
2011-current by SEA

TABLE 2

Spalding Corners Shopping Center
Norcross, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063
Historic Groundwater Analytical Results Summary

Location	Date Sampled	1,1,2-Trichloroethane	2-Butonone	Acetone	Benzene	Chloroform	cis-1,2-Dichloroethene	Methyl tert-butyl ether	Tetrachloroethene	Toluene	Trichloroethene	Total Xylenes
MW-6S	8/20/2002	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
(SMW-10)	3/9/2004	NA	NA	NA	NA	<0.005	<0.005	<0.005	**0.020**	NA	<0.005	<0.005
	3/19/2004	NA	NA	NA	NA	NA	NA	NA	**0.016**	NA	NA	NA
	8/19/2004	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	**0.012**	<0.005	<0.005	<0.005
	3/9/2005	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	**0.011**	<0.005	<0.005	<0.010
	1/31/2006	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.0062**	<0.005	<0.005	<0.010
	6/1/2006	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	11/29/2006	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	**0.0055**	<0.005	<0.005	<0.010
	6/1/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.0094**	<0.005	<0.005	<0.010
	3/22/2010	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.073**	<0.005	<0.005	<0.010
	2/28/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.044**	<0.005	<0.005	<0.010
	9/16/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.014**	<0.005	<0.005	<0.010
	3/15/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.041**	<0.005	<0.005	<0.010
	9/10/2012		DRY									
	3/18/2014	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0018**	<0.005	**0.0019**	<0.005	<0.001	<0.010
	10/9/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.0032**	<0.005	<0.001	<0.010
MW-7S	3/2/2004	NA	NA	NA	NA	<0.005	<0.005	NA	**0.0081**	NA	<0.005	NA
(SC-2)	3/8/2005	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	6/1/2006	<0.005	<0.050	<0.050	<0.005	<0.005	**0.059**	<0.005	**0.012**	<0.005	**0.017**	<0.010
	6/1/2007	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0083**	<0.005	**0.0051**	<0.005	<0.005	<0.010
	3/22/2010	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/2/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/12/2011		DRY									
	3/15/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/10/2012		DRY									
	3/20/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	<0.001	<0.005	<0.001	<0.010
	10/6/2014		DRY									
MW-8S	3/2/2004	NA	NA	NA	NA	NA	<0.005	NA	<0.005	NA	NA	NA
(SC-1)	3/7/2005	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	5/30/2006	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	5/29/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/24/2010	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/2/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/12/2011		DRY									
	3/14/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/14/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
Type I & 3 Risk Reduction Standard		**0.005**	**2.000**	**4.000**	**0.005**	**0.100**	**0.070**	**Not Applicable**	**0.005**	**1.000**	**0.005**	**10.000**

All concentrations listed in mg/L
HIGHLIGHTED RESULTS EXCEED TYPE 1 RRS
Sampling: 2000 by Rindt-McDuff; 2002-2003 by Pyramid;
2004-2010 by Peachtree Environmental
2011-current by SEA

TABLE 2

Spalding Corners Shopping Center
Norcross, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063
Historic Groundwater Analytical Results Summary

Location	Date Sampled	1,1,2-Trichloroethane	2-Butonone	Acetone	Benzene	Chloroform	cis-1,2-Dichloroethene	Methyl tert-butyl ether	Tetrachloroethene	Toluene	Trichloroethene	Total Xylenes
MW-9S	8/7/2002	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
(SMW-7)	3/9/2004	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	NA	<0.005	<0.010
	3/8/2005	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	5/30/2006	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	5/29/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/24/2010	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/1/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/15/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/14/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/13/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
MW-10S	7/29/2002	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005	**0.236**	<0.005	<0.005	<0.005
(SMW-3 SE)	3/9/2004	NA	NA	NA	NA	<0.005	<0.005	<0.005	**0.0075**	NA	<0.005	<0.005
	3/19/2004	NA	NA	NA	NA	NA	NA	NA	**0.0062**	NA	NA	NA
	8/19/2004	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	**0.015**	<0.005	<0.005	<0.010
	3/8/2005	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	**0.022**	<0.005	<0.005	<0.010
	5/30/2006	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.018**	<0.005	<0.005	<0.010
	11/29/2006	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	**0.026**	<0.005	<0.005	<0.010
	6/1/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.021**	<0.005	<0.005	<0.010
	3/24/2010	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.024**	<0.005	<0.005	<0.010
	3/2/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.034**	<0.005	<0.005	<0.010
	9/14/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.065**	<0.005	<0.005	<0.010
	3/14/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.052**	<0.005	<0.005	<0.010
	9/13/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.018**	<0.005	<0.005	<0.010
	3/19/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.043**	<0.005	<0.001	<0.010
	10/8/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.061**	<0.005	<0.001	<0.010
MW-11S	5/28/2003	<0.005	NA	NA	<0.005	**0.0050**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
(MW-3 SE)	10/22/2003	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA
	8/13/2004	<0.005	<0.010	<0.020	<0.005	**0.0084**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	3/8/2005	<0.005	<0.010	**0.180**	<0.005	**0.0062**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	6/1/2006	<0.005	<0.050	<0.050	<0.005	**0.0070**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	5/30/2007	<0.005	<0.050	<0.050	<0.005	**0.018**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/23/2010	<0.005	<0.050	<0.050	<0.005	**0.018**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
MW-12S	5/28/2003	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
(MW-1 S)	3/8/2005	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	5/31/2006	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	5/30/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/23/2010	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
Type I & 3 Risk Reduction Standard		**0.005**	**2.000**	**4.000**	**0.005**	**0.100**	**0.070**	**Not Applicable**	**0.005**	**1.000**	**0.005**	**10.000**

All concentrations listed in mg/L
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Norcross, Fulton County, Georgia
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Historic Groundwater Analytical Results Summary

Location	Date Sampled	1,1,2-Trichloroethane	2-Butonone	Acetone	Benzene	Chloroform	cis-1,2-Dichloroethene	Methyl tert-butyl ether	Tetrachloroethene	Toluene	Trichloroethene	Total Xylenes
MW-13S	12/30/2002	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
(SMW-11)	3/9/2004	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	NA	<0.005	<0.005
	3/8/2005	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	6/1/2006	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	5/30/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/23/2010	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	2/28/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/13/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/12/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/11/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/19/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	**0.0051**	<0.001	<0.005	<0.001	<0.010
	10/7/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.0019**	<0.005	<0.001	<0.010
MW-14S	5/28/2003	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA
(MW-1 N2)	10/22/2003	NA	NA	NA	NA	<0.005	<0.005	<0.005	NA	NA	<0.005	<0.005
	3/8/2005	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	6/1/2006	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	5/30/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/23/2010	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	2/28/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/13/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.011**	<0.005	<0.005	<0.010
resample	9/23/2011	NA	NA	NA	NA	NA	<0.005	NA	**0.011**	NA	<0.005	NA
	9/12/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.0050**	<0.005	<0.005	<0.010
	3/19/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.0019**	<0.005	<0.001	<0.010
	10/7/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.0068**	<0.005	<0.001	<0.010
MW-15S	2/21/2000	<0.005	NA	NA	<0.005	NA	BRL	BRL	**0.110**	<0.005	BRL	BRL
(MW-2)	7/20/2000	<0.005	NA	NA	<0.005	<0.005	**0.045**	<0.005	**0.135**	<0.005	<0.005	<0.005
	2/12/2003	<0.005	NA	NA	<0.005	NA	NA	<0.005	NA	<0.005	NA	<0.005
	2/21/2003	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005	**0.1350**	<0.005	<0.005	<0.005
	3/9/2004	<0.005	<0.010	<0.020	<0.005	**0.0065**	**0.045**	<0.005	**4.300**	<0.005	**0.058**	<0.005
	8/13/2004	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	**1.000**	<0.005	**0.017**	<0.010
	3/9/2005	<0.005	<0.010	**0.033**	<0.005	<0.005	<0.005	<0.005	**0.500**	<0.005	**0.0083**	<0.010
	11/29/2005	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.800**	<0.005	**0.012**	<0.010
	6/1/2006	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0057**	<0.005	**0.950**	<0.005	**0.013**	<0.010
	11/29/2006	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	**0.130**	<0.005	<0.005	<0.010
	5/31/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.260**	<0.005	<0.005	<0.010
	3/23/2010	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.430**	<0.005	<0.005	<0.010
	3/2/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.490**	<0.005	<0.005	<0.010
	9/13/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.450**	<0.005	<0.005	<0.010
	3/13/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.290**	<0.005	<0.005	<0.010
	9/12/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.340**	<0.005	<0.005	<0.010
	3/18/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.025**	<0.005	<0.001	<0.010
	10/7/2014	<0.005	<0.050	<0.050	<0.005	**0.0054**	<0.001	<0.005	**0.200**	<0.005	**0.0019**	<0.010
Type I & 3 Risk Reduction Standard		**0.005**	**2.000**	**4.000**	**0.005**	**0.100**	**0.070**	**Not Applicable**	**0.005**	**1.000**	**0.005**	**10.000**

All concentrations listed in mg/L
HIGHLIGHTED RESULTS EXCEED TYPE 1 RRS
Sampling: 2000 by Rindt-McDuff; 2002-2003 by Pyramid;
2004-2010 by Peachtree Environmental
2011-current by SEA

TABLE 2

Spalding Corners Shopping Center
Norcross, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063
Historic Groundwater Analytical Results Summary

Location	Date Sampled	1,1,2-Trichloroethane	2-Butonone	Acetone	Benzene	Chloroform	cis-1,2-Dichloroethene	Methyl tert-butyl ether	Tetrachloroethene	Toluene	Trichloroethene	Total Xylenes
MW-16S	2/4/2003	<0.005	NA	NA	<0.005	NA	NA	<0.005	NA	<0.005	NA	<0.005
(SMW-23)	2/12/2003	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005	**0.1860**	<0.005	<0.005	<0.005
	3/10/2004	NA	NA	NA	NA	<0.005	<0.005	<0.005	**0.440**	NA	**0.0051**	<0.005
	8/13/2004	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	**0.350**	<0.005	<0.005	<0.010
	3/9/2005	<0.005	<0.010	**1.600**	<0.005	<0.005	<0.005	<0.005	**0.230**	<0.005	**0.0055**	<0.010
	8/31/2005	<0.005	<0.050	<0.050	<0.005	**0.0052**	**0.0092**	<0.005	**0.520**	<0.005	**0.0077**	<0.010
	9/29/2005	<0.005	<0.050	<0.050	<0.005	<0.005	**0.019**	<0.005	**0.960**	<0.005	**0.019**	<0.010
	10/31/2005	<0.005	<0.050	<0.050	<0.005	**0.0051**	**0.0089**	<0.005	**0.700**	<0.005	**0.0088**	<0.010
	11/29/2005	<0.005	<0.050	<0.050	<0.005	<0.005	**0.012**	<0.005	**0.670**	<0.005	**0.012**	<0.010
	1/31/2006	<0.005	<0.050	<0.050	<0.005	<0.005	**0.013**	<0.005	**0.610**	<0.005	**0.011**	<0.010
	6/2/2006	<0.005	<0.050	<0.050	<0.005	<0.005	**0.014**	<0.005	**0.810**	<0.005	**0.014**	<0.010
	11/29/2006	<0.005	<0.010	<0.020	<0.005	<0.005	**0.0072**	<0.005	**0.500**	<0.005	**0.0081**	<0.010
	6/1/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.240**	<0.005	<0.005	<0.010
	8/21/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.190**	<0.005	<0.005	<0.010
	10/26/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.160**	<0.005	<0.005	<0.010
	8/18/2008	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.120**	<0.005	<0.005	<0.010
	3/24/2010	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.240**	<0.005	<0.005	<0.010
	3/2/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.390**	<0.005	<0.005	<0.010
	9/14/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.390**	<0.005	<0.005	<0.010
	3/12/2012	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0050**	<0.005	**0.560**	<0.005	**0.0072**	<0.010
	9/12/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.280**	<0.005	<0.005	<0.010
	3/19/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.170**	<0.005	**0.0014**	<0.010
	10/7/2014	<0.005	<0.050	<0.050	<0.005	**0.0054**	<0.001	<0.005	**0.280**	<0.005	**0.0024**	<0.010
MW-17S	12/31/2002	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005	**0.1510**	<0.005	<0.005	<0.005
(SMW-14)	3/10/2004	<0.005	<0.010	<0.020	<0.005	**0.0064**	<0.005	<0.005	**0.190**	<0.005	<0.005	<0.005
	8/13/2004	<0.005	<0.010	**0.028**	<0.005	**0.013**	<0.005	<0.005	**0.110**	<0.005	<0.005	<0.010
	3/9/2005	<0.005	<0.010	**0.028**	<0.005	**0.020**	<0.005	<0.005	**0.071**	<0.005	<0.005	<0.010
	8/31/2005	<0.005	<0.050	<0.050	<0.005	**0.017**	<0.005	<0.005	**0.041**	<0.005	<0.005	<0.010
	9/29/2005	<0.005	<0.050	<0.050	<0.005	**0.018**	<0.005	<0.005	**0.082**	<0.005	<0.005	<0.010
	10/31/2005	<0.005	<0.050	<0.050	<0.005	**0.026**	<0.005	<0.005	**0.073**	<0.005	<0.005	<0.010
	11/29/2005	<0.005	<0.050	<0.050	<0.005	**0.015**	<0.005	<0.005	**0.072**	<0.005	<0.005	<0.010
	1/31/2006	<0.005	<0.050	<0.050	<0.005	**0.017**	<0.005	<0.005	**0.084**	<0.005	<0.005	<0.010
	6/2/2006	<0.005	<0.050	<0.050	<0.005	**0.015**	<0.005	<0.005	**0.087**	<0.005	<0.005	<0.010
	11/29/2006	<0.005	<0.010	<0.020	<0.005	**0.011**	<0.005	<0.005	**0.034**	<0.005	<0.005	<0.010
	5/31/2007	<0.005	<0.050	<0.050	<0.005	**0.011**	<0.005	<0.005	**0.032**	<0.005	<0.005	<0.010
	8/21/2007	<0.005	<0.050	<0.050	<0.005	**0.010**	<0.005	<0.005	**0.035**	<0.005	<0.005	<0.010
	10/26/2007	<0.005	<0.050	<0.050	<0.005	**0.0089**	<0.005	<0.005	**0.072**	<0.005	<0.005	<0.010
	8/18/2008	<0.005	<0.050	<0.050	<0.005	**0.0089**	<0.005	<0.005	**0.047**	<0.005	<0.005	<0.010
	3/24/2010	<0.005	<0.050	<0.050	<0.005	**0.0084**	<0.005	<0.005	**0.035**	<0.005	<0.005	<0.010
	2/28/2011	<0.005	<0.050	<0.050	<0.005	**0.0083**	<0.005	<0.005	**0.086**	<0.005	<0.005	<0.010
	3/15/2012	<0.005	<0.050	<0.050	<0.005	**0.0080**	<0.005	<0.005	**0.150**	<0.005	<0.005	<0.010
	9/11/2012	<0.005	<0.050	<0.050	<0.005	**0.012**	<0.005	<0.005	**0.140**	<0.005	<0.005	<0.010
	3/19/2014	<0.005	<0.050	<0.050	<0.005	**0.010**	<0.001	<0.005	**0.110**	<0.005	<0.001	<0.010
	10/8/2014	<0.005	<0.050	<0.050	<0.005	**0.013**	<0.001	<0.005	**0.130**	<0.005	<0.001	<0.010
Type I & 3 Risk Reduction Standard		**0.005**	**2.000**	**4.000**	**0.005**	**0.100**	**0.070**	**Not Applicable**	**0.005**	**1.000**	**0.005**	**10.000**

All concentrations listed in mg/L
HIGHLIGHTED RESULTS EXCEED TYPE 1 RRS
Sampling: 2000 by Rindt-McDuff; 2002-2003 by Pyramid;
2004-2010 by Peachtree Environmental
2011-current by SEA

TABLE 2

Spalding Corners Shopping Center
Norcross, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063
Historic Groundwater Analytical Results Summary

Location	Date Sampled	1,1,2-Trichloroethane	2-Butonone	Acetone	Benzene	Chloroform	cis-1,2-Dichloroethene	Methyl tert-butyl ether	Tetrachloroethene	Toluene	Trichloroethene	Total Xylenes
MW-18S (SMW-2b)	7/29/2002	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005	**0.3730**	<0.005	<0.005	<0.005
	3/9/2004	<0.005	<0.010	<0.020	<0.005	<0.005	**0.011**	<0.005	**0.870**	<0.005	**0.014**	<0.005
	8/13/2004	<0.005	<0.010	<0.020	<0.005	<0.005	**0.015**	<0.005	**1.200**	<0.005	**0.019**	<0.010
	3/9/2005	<0.005	<0.010	<0.020	<0.005	<0.005	**0.012**	<0.005	**1.000**	<0.005	**0.017**	<0.010
	8/31/2005	<0.005	<0.050	<0.050	<0.005	**0.0067**	**0.011**	<0.005	**0.740**	<0.005	**0.013**	<0.010
	9/29/2005	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0091**	<0.005	**0.790**	<0.005	**0.012**	<0.010
	10/31/2005	<0.005	<0.050	<0.050	<0.005	**0.0085**	**0.014**	<0.005	**0.730**	<0.005	**0.014**	<0.010
	11/29/2005	<0.005	<0.050	<0.050	<0.005	**0.0057**	**0.013**	<0.005	**0.900**	<0.005	**0.014**	<0.010
	6/2/2006	<0.005	<0.050	<0.050	<0.005	**0.0061**	**0.0071**	<0.005	**0.700**	<0.005	**0.010**	<0.010
	11/29/2006	<0.005	<0.010	<0.020	<0.005	**0.014**	**0.017**	<0.005	**0.870**	<0.005	**0.019**	<0.010
	6/1/2007	<0.005	<0.050	<0.050	<0.005	**0.0092**	**0.040**	<0.005	**1.300**	<0.005	**0.024**	<0.010
	8/21/2007	<0.005	<0.050	<0.050	<0.005	**0.011**	**0.018**	<0.005	**0.830**	<0.005	**0.018**	<0.010
	10/26/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.680**	<0.005	<0.005	<0.010
	8/18/2008	<0.005	<0.050	<0.050	<0.005	**0.0092**	**0.0054**	<0.005	**0.290**	<0.005	**0.0074**	<0.010
	3/24/2010	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.043**	<0.005	<0.005	<0.010
	3/3/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.310**	<0.005	<0.005	<0.010
	9/14/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.280**	<0.005	<0.005	<0.010
	3/15/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.140**	<0.005	<0.005	<0.010
	9/13/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.370**	<0.005	<0.005	<0.010
	3/19/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.0055**	<0.005	<0.001	<0.010
	10/9/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.240**	<0.005	**0.0028**	<0.010
Type I & 3 Risk Reduction Standard		**0.005**	**2.000**	**4.000**	**0.005**	**0.100**	**0.070**	**Not Applicable**	**0.005**	**1.000**	**0.005**	**10.000**

All concentrations listed in mg/L
HIGHLIGHTED RESULTS EXCEED TYPE 1 RRS
Sampling: 2000 by Rindt-McDuff; 2002-2003 by Pyramid;
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Spalding Corners Shopping Center
Norcross, Fulton County, Georgia
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Historic Groundwater Analytical Results Summary

Location	Date Sampled	1,1,2-Trichloroethane	2-Butonone	Acetone	Benzene	Chloroform	cis-1,2-Dichloroethene	Methyl tert-butyl ether	Tetrachloroethene	Toluene	Trichloroethene	Total Xylenes
MW-19S	8/7/2002	<0.005	NA	NA	<0.005	<0.005	**0.0050**	<0.005	**0.1450**	<0.005	<0.005	<0.005
(SMW-6)	3/9/2004	<0.005	<0.010	<0.020	<0.005	**0.0054**	**0.0082**	<0.005	**0.560**	<0.005	**0.0059**	<0.005
	8/13/2004	<0.005	<0.010	<0.020	<0.005	<0.005	**0.0054**	<0.005	**0.380**	<0.005	<0.005	<0.010
	3/9/2005	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	**0.540**	<0.005	**0.0081**	<0.010
	6/21/2005	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.350**	<0.005	**0.0064**	<0.010
	7/28/2005	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.310**	<0.005	**0.0074**	<0.010
	8/31/2005	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.440**	<0.005	**0.0071**	<0.010
	9/29/2005	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.570**	<0.005	**0.0094**	<0.010
	10/31/2005	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0071**	<0.005	**0.560**	<0.005	**0.012**	<0.010
	11/29/2005	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0060**	<0.005	**0.660**	<0.005	**0.011**	<0.010
	6/2/2006	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0069**	<0.005	**0.730**	<0.005	**0.014**	<0.010
	7/13/2006	<0.005	**0.046**	**0.062**	**0.0020**	<0.005	**0.038**	<0.005	**0.230**	**1.500**	**0.0089**	<0.010
	9/22/2006	<0.005	<0.050	<0.050	<0.005	**0.0056**	**0.034**	<0.005	**0.570**	<0.005	**0.130**	<0.010
	11/29/2006	<0.005	<0.010	<0.020	<0.005	**0.0063**	**0.130**	<0.005	**0.350**	<0.005	**0.050**	<0.010
	1/23/2007	<0.005	<0.050	<0.050	<0.005	**0.0072**	**0.095**	<0.005	**0.460**	<0.005	**0.063**	<0.010
	6/1/2007	<0.005	<0.050	<0.050	<0.005	**0.0070**	**0.024**	<0.005	**0.530**	<0.005	**0.020**	<0.010
	8/21/2007	**0.014**	<0.050	<0.050	<0.005	**0.0066**	**0.0065**	<0.005	**0.400**	<0.005	**0.015**	<0.010
	10/26/2007	<0.005	<0.050	<0.050	<0.005	**0.011**	**0.016**	<0.005	**0.740**	<0.005	**0.016**	<0.010
	8/18/2008	<0.005	<0.050	<0.050	<0.005	**0.0074**	**0.016**	<0.005	**0.210**	<0.005	**0.0063**	<0.010
	11/11/2008	<0.005	<0.050	<0.050	<0.005	**0.012**	**0.0066**	<0.005	**0.510**	<0.005	**0.010**	<0.010
	3/24/2010	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0077**	<0.005	**0.018**	<0.005	**0.013**	<0.010
	3/2/2011	<0.005	<0.050	<0.050	<0.005	<0.005	**0.013**	<0.005	**0.052**	<0.005	**0.0051**	<0.010
	9/15/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0051**	<0.010
	3/14/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/13/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/18/2014	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0035**	<0.005	**0.032**	<0.005	**0.0022**	<0.010
	10/9/2014	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0011**	<0.005	**0.017**	<0.005	**0.0023**	<0.010
Type I & 3 Risk Reduction Standard		**0.005**	**2.000**	**4.000**	**0.005**	**0.100**	**0.070**	**Not Applicable**	**0.005**	**1.000**	**0.005**	**10.000**

All concentrations listed in mg/L
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SEA Job#102-063
Historic Groundwater Analytical Results Summary

Location	Date Sampled	1,1,2-Trichloroethane	2-Butonone	Acetone	Benzene	Chloroform	cis-1,2-Dichloroethene	Methyl tert-butyl ether	Tetrachloroethene	Toluene	Trichloroethene	Total Xylenes
MW-20S	10/22/2003	NA	NA	NA	NA	<0.025	NA	<0.005	NA	NA	NA	<0.025
(SMW-6 SW2)	8/13/2004	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	**0.410**	<0.005	**0.0091**	<0.010
	3/9/2005	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	**0.330**	<0.005	**0.0092**	<0.010
	6/21/2005	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.370**	<0.005	**0.0076**	<0.010
	7/28/2005	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.350**	<0.005	**0.010**	<0.010
	11/29/2005	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.370**	<0.005	**0.0083**	<0.010
	3/31/2006	<0.005	<0.050	<0.050	<0.005	<0.005	**0.039**	<0.005	**0.330**	**0.430**	**0.0096**	<0.010
	6/2/2006	<0.005	**0.055**	**0.076**	<0.005	<0.005	**0.036**	<0.005	**0.320**	**0.850**	**0.0083**	<0.010
	7/13/2006	<0.005	<0.050	<0.050	<0.005	**0.0059**	**0.0067**	<0.005	**0.600**	**0.014**	**0.013**	<0.010
	9/22/2006	<0.005	<0.050	<0.050	<0.005	<0.005	**0.031**	<0.005	**0.450**	**0.200**	**0.012**	<0.010
	11/29/2006	<0.005	<0.010	<0.020	<0.005	<0.005	**0.022**	<0.005	**0.390**	**0.019**	**0.0084**	<0.010
	1/23/2007	<0.005	<0.050	<0.050	<0.005	<0.005	**0.029**	<0.005	**0.300**	<0.005	**0.0095**	<0.010
	6/1/2007	<0.005	<0.050	<0.050	<0.005	<0.005	**0.028**	<0.005	**0.720**	<0.005	**0.014**	<0.010
	8/21/2007	**0.026**	<0.050	<0.050	<0.005	<0.005	**0.033**	<0.005	**0.650**	<0.005	**0.016**	<0.010
	10/26/2007	<0.005	<0.050	<0.050	<0.005	<0.005	**0.029**	<0.005	**1.600**	<0.005	**0.023**	<0.010
	8/18/2008	<0.005	<0.050	<0.050	<0.005	**0.0074**	**0.022**	<0.005	**0.700**	<0.005	**0.023**	<0.010
	11/11/2008	<0.005	<0.050	<0.050	<0.005	<0.005	**0.020**	<0.005	**1.700**	<0.005	**0.025**	<0.010
	2/13/2009	<0.005	<0.050	<0.050	<0.005	<0.005	**0.020**	<0.005	**0.190**	<0.005	<0.005	<0.010
	3/24/2010	<0.005	<0.050	<0.050	<0.005	<0.005	**0.018**	<0.005	<0.005	<0.005	**0.0059**	<0.010
	3/2/2011	<0.005	<0.050	<0.050	<0.005	<0.005	**0.012**	<0.005	<0.005	<0.005	<0.005	<0.010
	9/15/2011	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0081**	<0.005	**0.048**	<0.005	<0.005	<0.010
	3/12/2012	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0062**	<0.005	**0.041**	<0.005	<0.005	<0.010
	9/13/2012	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0067**	<0.005	**0.050**	<0.005	<0.005	<0.010
	3/18/2014	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0060**	<0.005	**0.0027**	<0.005	**0.0019**	<0.010
	10/9/2014	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0041**	<0.005	**0.018**	<0.005	**0.0038**	<0.010
MW-21S	2/28/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/15/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/16/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.035**	<0.005	<0.005	<0.010
	9/13/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.0053**	<0.005	<0.005	<0.010
	3/19/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.0048**	<0.005	<0.001	<0.010
	10/13/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.020**	<0.005	<0.001	<0.010
MW-22S	10/13/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	<0.001	<0.005	<0.001	<0.010
MW-1D	3/15/2004	NA	NA	NA	NA	<0.005	<0.005	NA	<0.005	NA	<0.005	NA
	3/24/2004	NA	NA	NA	NA	<0.005	<0.005	NA	<0.005	NA	<0.005	NA
	3/7/2005	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/7/2005	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.0064**	<0.005	<0.005	<0.010
	5/31/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/23/2010	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/2/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/14/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/14/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/12/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/18/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.0012**	<0.005	<0.001	<0.010
	10/8/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	<0.001	<0.005	<0.001	<0.010
Type I & 3 Risk Reduction Standard		**0.005**	**2.000**	**4.000**	**0.005**	**0.100**	**0.070**	**Not Applicable**	**0.005**	**1.000**	**0.005**	**10.000**

All concentrations listed in mg/L
HIGHLIGHTED RESULTS EXCEED TYPE 1 RRS
Sampling: 2000 by Rindt-McDuff; 2002-2003 by Pyramid;
2004-2010 by Peachtree Environmental
2011-current by SEA

TABLE 2

Spalding Corners Shopping Center
Norcross, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063
Historic Groundwater Analytical Results Summary

Location	Date Sampled	1,1,2-Trichloroethane	2-Butonone	Acetone	Benzene	Chloroform	cis-1,2-Dichloroethene	Methyl tert-butyl ether	Tetrachloroethene	Toluene	Trichloroethene	Total Xylenes
SW-1	3/2/2004	NA	NA	NA	NA	<0.005	**0.022**	NA	**0.050**	NA	**0.012**	NA
	3/7/2005	<0.005	<0.010	<0.020	<0.005	<0.005	**0.011**	<0.005	**0.031**	<0.005	**0.0059**	<0.005
	6/21/2005	<0.005	<0.050	<0.050	<0.005	<0.005	**0.056**	<0.005	**0.030**	<0.005	**0.014**	<0.010
	7/28/2005	<0.005	<0.050	<0.050	<0.005	<0.005	**0.059**	<0.005	**0.020**	<0.005	**0.012**	<0.010
	8/31/2005	<0.005	<0.050	<0.050	<0.005	<0.005	**0.090**	<0.005	**0.019**	<0.005	**0.011**	<0.010
	9/29/2005	<0.005	<0.050	<0.050	<0.005	<0.005	**0.077**	<0.005	<0.005	<0.005	<0.005	<0.010
	11/29/2005	<0.005	<0.050	<0.050	<0.005	<0.005	**0.075**	<0.005	**0.018**	<0.005	**0.0095**	<0.010
	2/1/2006	<0.005	<0.050	<0.050	<0.005	<0.005	**0.028**	<0.005	**0.031**	<0.005	**0.0089**	<0.010
	3/31/2006	<0.005	<0.050	<0.050	<0.005	<0.005	**0.029**	<0.005	**0.032**	<0.005	**0.010**	<0.010
	1/23/2007	<0.005	<0.050	<0.050	<0.005	<0.005	**0.014**	<0.005	**0.041**	<0.005	**0.0083**	<0.010
	3/24/2010	<0.005	<0.050	<0.050	<0.005	<0.005	**0.017**	<0.005	**0.092**	<0.005	**0.0086**	<0.010
	2/25/2011		DRY									
	9/12/2011		DRY									
	3/12/2012		DRY									
	9/10/2012		DRY									
	3/20/2014		DRY									
	10/6/2014		DRY									
SW-2	3/5/2004	NA	NA	NA	NA	<0.005	**0.0071**	NA	**0.013**	NA	<0.005	NA
	3/7/2005	<0.005	<0.010	<0.020	<0.005	<0.005	<0.005	<0.005	**0.010**	<0.005	<0.005	<0.005
	6/21/2005	<0.005	<0.050	<0.050	<0.005	<0.005	**0.020**	<0.005	**0.0092**	<0.005	<0.005	<0.010
	7/28/2005	<0.005	<0.050	<0.050	<0.005	<0.005	**0.023**	<0.005	**0.0063**	<0.005	<0.005	<0.010
	8/31/2005	<0.005	<0.050	<0.050	<0.005	<0.005	**0.042**	<0.005	**0.0072**	<0.005	<0.005	<0.010
	9/29/2005	<0.005	<0.050	<0.050	<0.005	<0.005	**0.027**	<0.005	<0.005	<0.005	<0.005	<0.010
	11/29/2005	<0.005	<0.050	<0.050	<0.005	<0.005	**0.044**	<0.005	**0.0077**	<0.005	<0.005	<0.010
	2/1/2006	<0.005	<0.050	<0.050	<0.005	<0.005	**0.019**	<0.005	**0.018**	<0.005	**0.0050**	<0.010
	3/31/2006	<0.005	<0.050	<0.050	<0.005	<0.005	**0.020**	<0.005	**0.016**	<0.005	<0.005	<0.010
	1/23/2007	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0088**	<0.005	**0.022**	<0.005	**0.0051**	<0.010
	3/24/2010	<0.005	<0.050	<0.050	<0.005	<0.005	**0.011**	<0.005	**0.045**	<0.005	**0.0054**	<0.010
	2/25/2011	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0068**	<0.005	**0.014**	<0.005	<0.005	<0.010
	9/12/2011		DRY									
	3/16/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/10/2012		DRY									
	3/20/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.0043**	<0.005	<0.001	<0.010
	10/6/2014		DRY									
Type I & 3 Risk Reduction Standard		**0.005**	**2.000**	**4.000**	**0.005**	**0.100**	**0.070**	**Not Applicable**	**0.005**	**1.000**	**0.005**	**10.000**

All concentrations listed in mg/L
HIGHLIGHTED RESULTS EXCEED TYPE 1 RRS
Sampling: 2000 by Rindt-McDuff; 2002-2003 by Pyramid;
2004-2010 by Peachtree Environmental
2011-current by SEA

TABLE 2

Spalding Corners Shopping Center
Norcross, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063
Historic Groundwater Analytical Results Summary

Location	Date Sampled	1,1,2-Trichloroethane	2-Butonone	Acetone	Benzene	Chloroform	cis-1,2-Dichloroethene	Methyl tert-butyl ether	Tetrachloroethene	Toluene	Trichloroethene	Total Xylenes
SW-3	3/5/2004	NA	NA	NA	NA	<0.005	<0.005	NA	<0.005	NA	<0.005	NA
	6/21/2005	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	7/28/2005	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	8/31/2005	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	2/1/2006	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/31/2006	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	1/23/2007	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	**0.0072**	<0.005	<0.005	<0.010
	3/24/2010	<0.005	<0.050	<0.050	<0.005	<0.005	**0.0052**	<0.005	**0.019**	<0.005	<0.005	<0.010
	2/25/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/12/2011		DRY									
	3/16/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/10/2012		DRY									
	3/20/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	**0.0015**	<0.005	<0.001	<0.010
	10/6/2014		DRY									
SW-4	3/3/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/12/2011		DRY									
	3/12/2012		DRY									
	9/10/2012		DRY									
	3/20/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	<0.001	<0.005	<0.001	<0.010
	10/6/2014		DRY									
SW-5	2/25/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/16/2011	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	3/19/2012	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010
	9/10/2012		DRY									
	3/20/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	<0.001	<0.005	<0.001	<0.010
	10/13/2014	<0.005	<0.050	<0.050	<0.005	<0.005	<0.001	<0.005	<0.001	<0.005	<0.001	<0.010
Type I & 3 Risk Reduction Standard		**0.005**	**2.000**	**4.000**	**0.005**	**0.100**	**0.070**	**Not Applicable**	**0.005**	**1.000**	**0.005**	**10.000**

All concentrations listed in mg/L
HIGHLIGHTED RESULTS EXCEED TYPE 1 RRS
Sampling: 2000 by Rindt-McDuff; 2002-2003 by Pyramid;
2004-2010 by Peachtree Environmental
2011-current by SEA

TABLE 3
Spalding Corners Shopping Center
Norcross Park, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063
HISTORIC GROUNDWATER ELEVATION SUMMARY

WELL NO.	DATE SAMPLED	GROUND ELEVATION	TOP OF CASING ELEVATION	SCREENED INTERVAL	STATIC WATER LEVEL	GROUND WATER ELEVATION
MW-1S	6/24/2003	not measured	996.93	30-40	not measured	
	3/9/2004				31.16	965.77
	5/30/2006				30.52	966.41
	11/29/2006				34.57	962.36
	5/30/2007				33.29	963.64
	3/22/2010				30.55	966.38
	2/24/2011				33.19	963.74
	9/12/2011				34.03	962.90
	3/12/2012				34.41	962.52
	9/10/2012				35.61	961.32
	3/18/2014				31.35	965.58
	9/6/2014				31.79	965.14
MW-2S	6/24/2003	not measured	998.49	35-40	32.60	965.89
	3/9/2004				33.48	965.01
	5/30/2006				32.91	965.58
	11/29/2006				35.92	962.57
	5/31/2007				35.63	962.86
	3/22/2010				32.67	965.82
	2/24/2011				35.53	962.96
	9/12/2011				36.18	962.31
	3/12/2012				36.87	961.62
	9/10/2012				37.88	960.61
	3/18/2014				33.92	964.57
	9/6/2014				34.11	964.38
MW-3S	6/24/2003	not measured	990.89	15-25	23.30	967.59
	3/9/2004				25.11	965.78
	5/30/2006				24.33	966.56
	11/29/2006				30.17	960.72
	5/31/2007				28.48	962.41
	3/22/2010				22.44	968.45
	2/24/2011				29.83	961.06
	9/12/2011				30.73	960.16
	3/12/2012				32.52	958.37
	9/10/2012				34.61	956.28
	3/18/2014				25.30	965.59
	9/6/2014				25.85	965.04
MW-4S	6/24/2003	not measured	975.94	20-35	19.35	956.59
	3/9/2004				20.97	954.97
	5/30/2006				20.91	955.03
	11/29/2006				25.91	950.03
	6/1/2007				24.54	951.40
	3/22/2010				18.79	957.15
	2/24/2011				24.55	951.39
	9/12/2011				27.42	948.52
	3/12/2012				27.19	948.75
	9/10/2012				27.45	948.49
	3/18/2014				21.89	954.05
	9/6/2014				25.22	950.72
MW-5S	6/24/2003	not measured	965.95	25-35	12.80	953.15
	3/9/2004				12.78	953.17
	5/30/2006				13.49	952.46
	11/29/2006				16.94	949.01
	6/21/2007				16.94	949.01
	8/21/2007				18.81	947.14
	10/26/2007				20.21	945.74
	3/22/2010				11.25	954.70
	2/24/2011				15.54	950.41
	9/12/2011	963.34			20.33	945.62
	3/12/2012				17.93	948.02
	9/10/2012				22.05	943.90
	3/18/2014				13.98	951.97
	9/6/2014				17.91	948.04

Static water level taken from top of casing (TOC).
Elevations based on March 2004 survey
by Grant Shepherd Associates, Inc.

TABLE 3
Spalding Corners Shopping Center
Norcross Park, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063
HISTORIC GROUNDWATER ELEVATION SUMMARY

WELL NO.	DATE SAMPLED	GROUND ELEVATION	TOP OF CASING ELEVATION	SCREENED INTERVAL	STATIC WATER LEVEL	GROUND WATER ELEVATION
MW-6S	6/24/2003	not measured	959.38	5.0-15.0	10.83	948.55
	3/9/2004				11.53	947.85
	5/30/2006				12.52	946.86
	11/29/2006				14.40	944.98
	6/1/2007				14.10	945.28
	3/22/2010				10.71	948.67
	2/24/2011				12.27	947.11
	9/12/2011				18.56	940.82
	3/12/2012				14.31	945.07
	9/10/2012				DRY	
	3/18/2014				12.51	946.87
	9/6/2014				16.21	943.17
MW-7S	3/22/2010	not measured	949.56	3.0-8.0	4.55	945.01
	2/24/2011				4.93	944.63
	9/12/2011				DRY	
	3/12/2012				4.92	944.64
	9/10/2012				DRY	
	3/18/2014				4.40	945.16
	9/6/2014				DRY	
MW-8S	2/18/2004	not measured	969.45	20-30	24.60	944.85
	3/25/2004				24.30	945.15
	5/30/2006				24.70	944.75
	11/29/2006				26.67	942.78
	5/29/2007				26.10	943.35
	3/22/2010				22.72	946.73
	2/24/2011				25.85	943.60
	9/12/2011				DRY	
	3/12/2012				26.60	942.85
	9/10/2012				29.02	940.43
	3/18/2014				24.59	944.86
	9/6/2014				27.23	942.22
MW-9S	6/24/2003	not measured	976.17	31.5-41.5	16.60	959.57
	3/9/2004				16.68	959.49
	5/30/2006				17.39	958.78
	11/29/2006				20.64	955.53
	5/29/2007				20.08	956.09
	3/22/2010				15.53	960.64
	2/24/2011				19.45	956.72
	9/12/2011				22.55	953.62
	3/12/2012				21.29	954.88
	9/10/2012				24.34	951.83
	3/18/2014				17.75	958.42
	9/6/2014				21.21	954.96
MW-10S	6/24/2003	not measured	987.32	30-40	not measured	
	3/9/2004				25.77	961.55
	5/30/2006				27.73	959.59
	11/29/2006				28.91	958.41
	6/1/2007				28.45	958.87
	3/22/2010				25.01	962.31
	2/24/2011				28.13	959.19
	9/12/2011				29.83	957.49
	3/12/2012				29.90	957.42
	9/10/2012				31.82	955.50
	3/18/2014				27.02	960.30
	9/6/2014				28.78	958.54

Static water level taken from top of casing (TOC).
Elevations based on March 2004 survey
by Grant Shepherd Associates, Inc.

TABLE 3
Spalding Corners Shopping Center
Norcross Park, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063
HISTORIC GROUNDWATER ELEVATION SUMMARY

WELL NO.	DATE SAMPLED	GROUND ELEVATION	TOP OF CASING ELEVATION	SCREENED INTERVAL	STATIC WATER LEVEL	GROUND WATER ELEVATION
MW-11S	6/24/2003	not measured	991.13	40-50	27.20	963.93
	3/9/2004				27.06	964.07
	5/30/2006				26.83	964.30
	11/29/2006				29.41	961.72
	5/30/2007				29.38	961.75
	3/22/2010				28.01	963.12
	2/24/2011				29.14	961.99
	9/12/2011				29.76	961.37
	3/12/2012				35.50	955.63
	9/10/2012				31.62	959.51
	3/18/2014				28.39	962.74
	9/6/2014				29.22	961.91
MW-12S	6/24/2003	not measured	999.27	41.5-51.5	34.00	965.27
	3/9/2004				34.53	964.74
	5/30/2006				34.15	965.12
	11/29/2006				36.60	962.67
	5/30/2007				36.56	962.71
	3/22/2010				35.00	964.27
	2/24/2011				36.37	962.90
	9/12/2011				36.70	962.57
	3/12/2012				37.82	961.45
	9/10/2012				38.60	960.67
	3/18/2014				35.74	963.53
	9/6/2014				35.88	963.39
MW-13S	6/24/2003	not measured	997.91	40-50	32.10	965.81
	3/9/2004				32.48	965.43
	5/30/2006				32.56	965.35
	11/29/2006				34.35	963.56
	5/30/2007				34.48	963.43
	3/22/2010				33.13	964.78
	2/24/2011	998.54			34.22	963.69
	9/12/2011				34.40	963.51
	3/12/2012				35.90	962.01
	9/10/2012				36.26	961.65
	3/18/2014				33.63	964.28
	9/6/2014				33.25	964.66
MW-14S	6/24/2003	not measured	999.73	35-45	34.00	965.73
	3/9/2004				34.10	965.63
	5/30/2006				33.58	966.15
	11/29/2006				35.94	963.79
	5/30/2007				35.89	963.84
	3/22/2010				34.38	965.35
	2/24/2011	1000.22			35.78	963.95
	9/12/2011				36.03	963.70
	3/12/2012				37.00	962.73
	9/10/2012				37.69	962.04
	3/18/2014				34.71	965.02
	9/6/2014				34.59	965.14
MW-15S	6/24/2003	not measured	999.00	35-55	34.50	964.50
	3/9/2004				34.50	964.50
	11/29/2005				35.33	963.67
	5/30/2006				34.58	964.42
	11/29/2006				37.27	961.73
	5/31/2007				37.10	961.90
	3/22/2010				35.28	963.72
	2/24/2011	999.42			37.05	961.95
	9/12/2011				37.44	961.56
	3/12/2012				38.57	960.43
	9/10/2012				39.35	959.65
	3/18/2014				36.14	962.86
	9/6/2014				36.17	962.83

Static water level taken from top of casing (TOC).
Elevations based on March 2004 survey
by Grant Shepherd Associates, Inc.

TABLE 3
Spalding Corners Shopping Center
Norcross Park, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063
HISTORIC GROUNDWATER ELEVATION SUMMARY

WELL NO.	DATE SAMPLED	GROUND ELEVATION	TOP OF CASING ELEVATION	SCREENED INTERVAL	STATIC WATER LEVEL	GROUND WATER ELEVATION
MW-16S	6/24/2003	not measured	991.90	38-43	30.10	961.80
	3/10/2004				29.29	962.61
	6/21/2005				28.31	963.59
	7/28/2005				28.71	963.19
	8/11/2005				28.55	963.35
	8/31/2005				28.95	962.95
	9/29/2005				29.39	962.51
	11/29/2005				30.46	961.44
	5/30/2006				29.16	962.74
	11/29/2006				32.20	959.70
	6/1/2007				31.84	960.06
	8/21/2007				32.93	958.97
	10/26/2007				33.63	958.27
	3/22/2010				29.23	962.67
	2/24/2011				31.61	960.29
	9/12/2011				32.74	959.16
	3/12/2012				33.34	958.56
	9/10/2012				34.78	957.12
	3/18/2014				30.72	961.18
	9/6/2014				31.67	960.23
MW-17S	6/24/2003	not measured	988.61	36-46	26.34	962.27
	3/10/2004				29.96	958.65
	6/21/2005				30.18	958.43
	7/28/2005				26.22	962.39
	8/11/2005				26.18	962.43
	8/31/2005				26.52	962.09
	9/29/2005				27.06	961.55
	11/29/2005				27.86	960.75
	5/30/2006				26.72	961.89
	11/29/2006				31.01	957.60
	5/31/2007				29.49	959.12
	8/21/2007				30.88	957.73
	10/26/2007				31.76	956.85
	3/22/2010				26.51	962.10
	2/24/2011				29.34	959.27
	9/12/2011				30.91	957.70
	3/12/2012				31.22	957.39
	9/10/2012				33.04	955.57
	3/18/2014				28.28	960.33
	9/6/2014				29.73	958.88
MW-18S	6/24/2003	not measured	983.52	23.5-33.5	19.65	963.87
	3/9/2004				20.66	962.86
	3/25/2003				23.27	960.25
	6/21/2005				22.69	960.83
	7/28/2005				23.14	960.38
	8/11/2005				23.23	960.29
	8/31/2005				23.44	960.08
	9/29/2005				24.17	959.35
	11/29/2005				24.82	958.70
	5/30/2006				23.50	960.02
	11/29/2006				27.03	956.49
	6/1/2007				26.26	957.26
	8/21/2007				28.03	955.49
	10/26/2007				29.11	954.41
	3/22/2010				21.81	961.71
	2/24/2011				25.52	958.00
	9/12/2011				28.18	955.34
	3/12/2012				27.19	956.33
	9/10/2012				30.17	953.35
	3/18/2014				23.65	959.87
	9/6/2014				26.96	956.56

Static water level taken from top of casing (TOC).
Elevations based on March 2004 survey
by Grant Shepherd Associates, Inc.

TABLE 3
Spalding Corners Shopping Center
Norcross Park, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063
HISTORIC GROUNDWATER ELEVATION SUMMARY

WELL NO.	DATE SAMPLED	GROUND ELEVATION	TOP OF CASING ELEVATION	SCREENED INTERVAL	STATIC WATER LEVEL	GROUND WATER ELEVATION
MW-19S	6/24/2003	not measured	970.84	23-33	12.60	958.24
	3/9/2004				13.23	957.61
	6/21/2005				13.20	957.64
	7/28/2005				13.47	957.37
	8/11/2005				13.25	957.59
	8/31/2005				13.78	957.06
	9/29/2005				14.65	956.19
	10/31/2005				14.92	955.92
	11/29/2005				15.06	955.78
	5/30/2006				14.04	956.80
	11/29/2006				17.07	953.77
	6/1/2007				16.62	954.22
	8/21/2007				18.78	952.06
	10/26/2007				19.92	950.92
	3/22/2010				11.98	958.86
	2/24/2011				15.68	955.16
	9/12/2011				19.44	951.40
	3/12/2012				17.17	953.67
	9/10/2012				21.13	949.71
	3/18/2014				13.28	957.56
	9/6/2014				17.58	953.26
MW-20S	3/24/2003	not measured	968.82	15-25	not measured	
	3/9/2004				11.68	957.14
	6/21/2005				11.82	957.00
	7/28/2005				12.00	956.82
	8/11/2005				11.96	956.86
	8/31/2005				12.33	956.49
	9/29/2005				13.22	955.60
	10/31/2005				13.37	955.45
	11/29/2005				13.43	955.39
	5/30/2006				12.60	956.22
	11/29/2006				15.31	953.51
	6/1/2007				15.03	953.79
	8/21/2007				17.12	951.70
	10/26/2007				18.24	950.58
	3/22/2010				10.60	958.22
	2/24/2011				14.04	954.78
	9/12/2011				17.83	950.99
	3/12/2012				15.40	953.42
	9/10/2012				19.48	949.34
	3/18/2014				11.60	957.22
	9/6/2014				16.00	952.82
MW-21S	2/7/2011	963.86	964.00	14-29	15.52	948.48
	2/24/2011				18.33	945.67
*	9/12/2011	963.86	967.41		26.81	940.60
	3/12/2012				26.23	941.18
	9/10/2012				29.00	938.41
	3/18/2014				23.11	944.30
	9/6/2014				25.44	941.97
MW-22S	9/6/2014	957.52	957.19	10-25	23.63	933.56
MW-1D	5/15/2002	not measured	not measured	98-108	not measured	
	10/22/2003				not measured	
	10/31/2005				not measured	
	3/22/2010				33.56	964.68
	2/24/2011	998.78	998.24		34.67	963.57
	9/12/2011				35.40	962.84
	3/12/2012				36.89	961.35
	9/10/2012				36.58	961.66
	3/18/2014				34.08	964.16
	9/6/2014				34.40	963.84

* Elevations of MW-21S measured 9-15-11 based on MW-5S TOC elevation
Revised MW-21S February 2011 ground elevation (970.58) and TOC elevation (970.72) to 9-15-11 ground elevation (963.86).

Static water level taken from top of casing (TOC).
Elevations based on March 2004 survey
by Grant Shepherd Associates, Inc.

Table 4
Spalding Corners Shopping Center
Norcross, Fulton County, Georgia
HSI #10639
SEA Job #102-063
Current MNA Screening Laboratory Results Summary

Location		MW-5S	MW-6S	MW-7S	MW-10S	MW-13S	MW-14S	MW-15S	MW-16S	MW-17S	MW-18S	MW-19S	MW-20S	MW-21S	MW-22S	MW-1D
Sampling Date		10/13/2014	10/9/2014	10/6/2014	10/8/2014	10/7/2014	10/7/2014	10/7/2014	10/7/2014	10/8/2014	10/9/2014	10/9/2014	10/9/2014	10/13/2014	10/13/2014	10/8/2014
pH	mgL	6.19	5.57	DRY	5.76	6.04	6.15	6.05	10.78	6.05	6.64	6.09	6.95	5.84	6.22	8.08
Dissolved Oxygen	mg/L	4.37	0.25		5.39	5.30	5.72	4.76	5.30	4.86	4.27	0.40	0.17	4.44	0.40	0.16
Temperature	deg C	16.27	19.47		18.30	21.89	19.64	21.29	19.80	17.73	15.87	16.97	17.66	16.95	18.07	23.69
ORP	mV	7.4	13.1		61.9	70.9	73	67.7	47.7	-39.5	13.5	12.7	-6.5	13.9	-57.0	-218.9
DCE	mg/L	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.0011**	**0.0041**	<0.001	<0.001	<0.001
PCE	mg/L	**0.067**	**0.0032**		**0.061**	**0.0019**	**0.0068**	**0.200**	**0.280**	**0.130**	**0.240**	**0.017**	**0.018**	**0.020**	<0.001	<0.001
TCE	mg/L	<0.001	<0.001		<0.001	<0.001	<0.001	**0.0019**	**0.0024**	<0.001	**0.0028**	**0.0023**	**0.0038**	<0.001	<0.001	<0.001
VC	mg/L	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
TOC	mg/L		<1.00				1.99	1.00	1.05		<1.00	<1.00	1.43			
Sulfide	mgL		<2.00				<2.00	<2.00	<2.00		<2.00	<2.00	<2.00			
Chloride	mgL		3.8				4.4	5.7	6.5		4.3	2.7	3.4			
Nitrate	mgL		<0.25				2.6	3.3	2.6		1.6	0.50	<0.25			
Nitrite	mgL		<0.25				<0.25	<0.25	<0.25		<0.25	<0.25	<0.25			
Sulfate	mgL		44				1.3	<1.0	9.0		<1.0	6.2	9.6			
Ethane	mgL		<0.009				<0.007	<0.007	<0.007		<0.007	<0.007	<0.007			
Ethene	mgL		<0.007				<0.009	<0.009	<0.009		<0.009	<0.009	<0.009			
Methane	mgL		0.360				<0.004	<0.004	<0.004		0.013	<0.004	0.047			
Iron II	mgL		<0.100				<0.100	<0.100	<0.100		<0.100	<0.100	<0.100			
Iron III	mg/L		3.79				0.454	0.150	0.382		0.888	0.117	<0.100			
Total Iron	mg/L		3.79				0.454	0.150	0.382		0.888	0.117	<0.100			
CO_2	mg/L															
Alkalinity	mgL															
COD	mg/L															
Sulfite	mg/L															
Natural Attenuation Screening Worksheet Score*			**6**				**-1**	**5**	**0**		**5**	**12**	**12**			

* Natural Attenuation Screening Worksheet Scoring for evidence for anaerobic biodegradation of chlorinated organics: 0 to 5 = Inadequate evidence; 6 to 14 = Limited evidence; 15 to 20 Adequate evidence; >20 = Strong evidence

Table 5
Spalding Corners Shopping Center
Norcross, Fulton County, Georgia
HSI #10639
SEA Job #102-063
Historic MNA Screening Laboratory Results Summary

Location		MW-15S								MW-16S							
Sampling Date		3/9/2004	3/9/2005	3/2/2011**	9/13/2011	3/13/2012	9/12/2012	3/18/2014	10/7/2014	3/9/2004	3/9/2005	3/2/2011	9/14/2011	3/12/2012	9/12/2012	3/19/2014	10/7/2014
pH	mgL	6.49	Not Recorded	6.97	5.88	5.36	6.70	7.55	6.05	7.04	6.13	11.52	11.52	11.98	10.00	10.55	10.78
Dissolved Oxygen	mg/L	0.39	Not Recorded	5.71	9.81	5.58	5.35	9.10	4.76		6.34	15.80	15.80	10.03	7.05	5.05	5.30
Temperature	deg C	19.05	Not Recorded	17.70	21.26	19.60	20.70	17.73	21.29	16.82	15.14	16.81	16.81	17.10	18.79	16.48	19.80
ORP	mV	175	Not Recorded	15.5	88.0	-13.7	-135.5	46.4	67.7		236	-23.0	-23.0	-100.9	-198.5	-45.5	47.7
DCE	mg/L	**0.045**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	0.0050	<0.005	<0.001	<0.001
PCE	mg/L	**4.300**	**0.500**	**0.490**	**0.450**	**0.290**	**0.340**	**0.025**	**0.200**	**0.440**	**0.230**	**0.390**	**0.390**	**0.560**	**0.280**	**0.170**	**0.280**
TCE	mg/L	**0.058**	**0.0083**	<0.005	<0.005	<0.005	<0.005	<0.001	**0.0019**	**0.0051**	**0.0055**	<0.005	<0.005	**0.0072**	<0.005	**0.0014**	**0.0024**
VC	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001
TOC	mg/L	1.5	<1.0	<1.0	<1.0	<1.0	1.09	<1.00	1.00		<1.0	<5.0	1.36	<1.00	<1.00	<1.00	1.05
Sulfide	mgL		<1.0		<2.00	<2.00	<2.00	<2.00	<2.00		<1.0		<2.00	<2.00	<2.00	<2.00	<2.00
Chloride	mgL				7.1	6.2	5.9	6.1	5.7				6.4	<10	6.4	6.2	6.5
Nitrate	mgL	1.59	3.3	3.02	3.0	2.6	2.7	2.7	3.3		3.6	<12.5	3.2	2.7	3.0	2.8	2.6
Nitrite	mgL	<0.250	<0.25		<0.25	<0.25	<0.25	<0.25	<0.25		<0.25		<0.25	<0.25	<0.25	<0.25	<0.25
Sulfate	mgL	<1.0	<1.0	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0		2.3	552	230	110	81	20	9.0
Ethane	mgL		<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007		<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007
Ethene	mgL		<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009		<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
Methane	mgL	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004		<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron II	mgL		Dissolved Fe = <0.100	<1.00	<0.100	<0.100	<0.100	<0.500	<0.100		Dissolved Fe = <0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Iron III	mg/L				0.955	1.05	5.72	10.7	0.150				0.60	0.240	0.187	0.485	0.382
Total Iron	mg/L	10.80			0.955	1.05	5.72	10.7	0.150				0.60	0.240	0.187	0.485	0.382
CO_2	mg/L		79.8								69.6						
Alkalinity	mgL		22.3								28.2						
COD	mg/L			40.0								15.4					
Sulfite	mg/L	<2.00															
Natural Attenuation Screening Worksheet Score ***		**12 (9*)**	**6**	**0**	**0**	**0**	**2**	**0**	**5**		**3**	**0**	**-4**	**2**	**-3**	**-2**	**0**

* If no Fe II present. Since only Total Fe was analyzed, it was assumed that >1 mg/L Fe II was present.
** Low-flow purging was conducted on 3-1-2011 and was resampled on 3-2-2011.
***Natural Attenuation Screening Worksheet Scoring for evidence for anaerobic biodegradation of chlorinated organics:
0 to 5 = Inadequate evidence; 6 to 14 = Limited evidence; 15 to 20 Adequate evidence; >20 = Strong evidence

Table 5
Spalding Corners Shopping Center
Norcross, Fulton County, Georgia
HSI #10639
SEA Job #102-063

Historic MNA Screening Laboratory Results Summary

Location		MW-17S								MW-18S							
Sampling Date		3/9/2004	3/7/2005	2/28/2011	9/15/2011	3/15/2012	9/11/2012	3/19/2014	10/8/2014	3/9/2004	3/7/2005	3/3/2011	9/14/2011	3/15/2012	9/13/2012	3/19/2014	10/9/2014
pH	mgL	7.07	6.35	6.78	5.63	5.81	6.87	5.84	6.05	6.63	5.79	9.41	9.41	8.19	7.41	5.67	6.64
Dissolved Oxygen	mg/L	0.25	8.8	6.50	3.68	4.72	4.90	5.99	4.86	0.44	6.93	3.31	3.31	3.72	4.20	3.11	4.27
Temperature	deg C	15.31	15.55	16.10	17.67	18.54	17.95	14.26	17.73	15.74	15.81	14.70	14.70	17.17	16.74	12.99	15.87
ORP	mV	229	242	52.0	71.6	0.8	-84.4	40.0	-39.5	217	273	-17.1	-17.1	-49.0	-56.9	23.5	13.5
DCE	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	**0.011**	**0.012**	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001
PCE	mg/L	**0.190**	**0.071**	**0.086**	**0.140**	**0.150**	**0.140**	**0.110**	**0.130**	**0.870**	**1.000**	**0.310**	**0.280**	**0.140**	**0.370**	**0.0055**	**0.240**
TCE	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	**0.014**	**0.017**	<0.005	<0.005	<0.005	<0.005	<0.001	**0.0028**
VC	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001
TOC	mg/L	<1.0	<1.0		1.89					1.9	<1.0	<5	<1.00	<10.0	<1.00	<1.00	<1.00
Sulfide	mgL		<1.0		<2.00						<1.0		<2.00	<2.00	<2.00	<2.00	<2.00
Chloride	mgL				8.3								5.3	7.1	7.3	7.3	4.3
Nitrate	mgL	2.41	1.4		1.7					2.24	1.8	<0.250	1.2	1.3	1.7	1.7	1.6
Nitrite	mgL	<0.250	<0.25		<0.25					<0.250	<0.25		<0.25	<0.25	<0.25	<0.25	<0.25
Sulfate	mgL	<1.00	<1.00		1.5					<1.00	<1.0	3.63	1.4	8.8	<1.0	<1.0	<1.0
Ethane	mgL		<0.007		<0.007						<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007
Ethene	mgL		<0.009		<0.009						<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
Methane	mgL	<0.004	<0.004		<0.004					<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.013
Iron II	mgL		Dissolved Fe = <0.100		<0.100						Dissolved Fe = <0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Iron III	mg/L				1.11								0.832	0.382	0.320	<0.100	0.888
Total Iron	mg/L	9.20			1.11					2.86			0.832	0.382	0.320	<0.100	0.888
CO_2	mg/L		69.5								96.8						
Alkalinity	mgL		45.5								31.0						
COD	mg/L											15.4					
Sulfite	mg/L	<2.00								<2.00							
Natural Attenuation Screening Worksheet Score ***		**8 (5*)**	**1**		**2**					**12 (9*)**	**5**	**3**	**2**	**3**	**1**	**5**	**5**

* If no Fe II present. Since only Total Fe was analyzed, it was assumed that >1 mg/L Fe II was present.
** Low-flow purging was conducted on 3-1-2011 and was resampled on 3-2-2011.
***Natural Attenuation Screening Worksheet Scoring for evidence for anaerobic biodegradation of chlorinated organics:
0 to 5 = Inadequate evidence; 6 to 14 = Limited evidence; 15 to 20 Adequate evidence; >20 = Strong evidence

Table 5
Spalding Corners Shopping Center
Norcross, Fulton County, Georgia
HSI #10639
SEA Job #102-063

Historic MNA Screening Laboratory Results Summary

Location		MW-19S								MW-20S							
Sampling Date		3/9/2004	3/9/2005	3/2/2011	9/15/2011	3/14/2012	9/13/2012	3/18/2014	10/9/2014	3/9/2004	3/9/2005	3/2/2011	9/15/2011	3/12/2012	9/13/2012	3/18/2014	10/9/2014
pH	mgL	6.88	5.90	5.24	6.08	6.61	7.05	5.75	6.09		5.56	6.40	8.65	7.34	6.85	7.01	6.95
Dissolved Oxygen	mg/L	0.50	8.25	0.00	0.46	0.16	1.83	0.66	0.40		7.54	0.00	0.50	0.29	1.14	0.34	0.17
Temperature	deg C	15.34	15.29	16.11	17.10	17.43	16.94	14.25	16.97		14.70	15.32	16.60	15.68	18.46	13.36	17.66
ORP	mV	196	262	100.4	243.2	346	-89.8	-2.2	12.7		197	-120.7	56.8	41.8	18.0	-24.9	-6.5
DCE	mg/L	**0.0082**	<0.005	**0.013**	<0.005	<0.005	<0.005	**0.0035**	**0.0011**		<0.005	**0.012**	**0.0081**	**0.0062**	**0.0067**	**0.0060**	**0.0041**
PCE	mg/L	**0.560**	**0.540**	**0.052**	<0.005	<0.005	<0.005	**0.032**	**0.017**		**0.330**	<0.005	**0.048**	**0.041**	**0.050**	**0.0027**	**0.018**
TCE	mg/L	**0.0059**	**0.0081**	**0.0051**	<0.005	<0.005	<0.005	**0.0022**	**0.0023**		**0.0092**	<0.005	<0.005	<0.005	<0.005	**0.0019**	**0.0038**
VC	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001		<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001
TOC	mg/L	1.8	<1.0	<1.0	<1.00	<5.00	1.48	<1.00	<1.00		<1.0	<1.0	<1.00	<1.00	<1.00	<1.00	1.43
Sulfide	mgL		<1.0		<2.00	<2.00	<2.00	<2.00	<2.00		<1.0		<2.00	<2.00	<2.00	<2.00	<2.00
Chloride	mgL				6.2	3.0	3.7	5.1	2.7				3.8	4.9	6.3	3.0	3.4
Nitrate	mgL	1.52	2.21	0.259	<0.25	<0.25	0.76	0.39	0.50		2.0	<0.250	0.42	0.36	1.1	<0.25	<0.25
Nitrite	mgL	<0.250	<0.25		<0.25	<0.25	<0.25	<0.25	<0.25		<0.25		<0.25	<0.25	<0.25	<0.25	<0.25
Sulfate	mgL	<1.00	<1.0	61.0	50	32	170	12	6.2		1.1	9.90	43	20	19	1.4	9.6
Ethane	mgL		<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007		<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007
Ethene	mgL		<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009		<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
Methane	mgL	<0.004	<0.004	0.080	0.065	0.020	0.031	0.006	<0.004		<0.004	0.350	0.140	0.018	0.013	0.019	0.047
Iron II	mgL		Dissolved Fe = <0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100		Dissolved Fe = <0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Iron III	mg/L				<0.100	<0.100	<0.100	<0.100	0.117				0.137	0.173	<0.100	<0.100	<0.100
Total Iron	mg/L	9.95			<0.100	<0.100	<0.100	<0.100	0.117				0.137	0.173	<0.100	<0.100	<0.100
CO_2	mg/L		93.2								100.0						
Alkalinity	mgL		36.1								12.8						
COD	mg/L			15.4								<10.0					
Sulfite	mg/L	<2.00															
Natural Attenuation Screening Worksheet Score ***		**12 (9*)**	**3**	**9**	**5**	**3**	**3**	**9**	**12**		**3**	**12**	**7**	**8**	**5**	**10**	**12**

* If no Fe II present. Since only Total Fe was analyzed, it was assumed that >1 mg/L Fe II was present.
** Low-flow purging was conducted on 3-1-2011 and was resampled on 3-2-2011.
***Natural Attenuation Screening Worksheet Scoring for evidence for anaerobic biodegradation of chlorinated organics:
0 to 5 = Inadequate evidence; 6 to 14 = Limited evidence; 15 to 20 Adequate evidence; >20 = Strong evidence

TABLE 6

Spalding Corners Shopping Center
Sandy Springs, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063
Historic Soil Analytical Results Summary

Sample ID	Depth (ft)	Date	Chloroform (mg/Kg)	cis-1,2-Dichlroethene (mg/Kg)	Tetrachloroethene (mg/Kg)	Trichloroethene (mg/Kg)	total Xylenes (mg/Kg)
B-1 (see Note 2)	3.0	2/21/2000	NA	<0.250	4.2000	<0.250	NA
B-2	2.0	2/21/2000	NA	0.1500	0.0073	<0.0047	NA
B-3	1.0	2/21/2000	NA	<0.0049	0.0390	<0.0049	NA
B-4	1.0	2/21/2000	NA	<0.0049	0.0057	<0.0049	NA
B-5	1.0	2/21/2000	NA	<0.0049	0.0390	<0.0049	NA
B-6	3.0	2/21/2000	NA	0.3900	0.0250	<0.0050	NA
B-7	2.0	2/21/2000	NA	<0.0049	0.0640	0.0270	NA
B-8	1.0	2/21/2000	NA	<0.0049	0.0290	<0.0049	NA
B-10	3.0	2/21/2000	NA	<0.0049	0.0390	<0.0049	NA
SED-1	0.5[*1]	7/20/2000	<0.0039	0.0170	0.1300	0.0160	NA
SED-2	0.5[*1]	7/20/2000	<0.0038	<0.0038	0.0046	0.0085	NA
SED-3	0.5[*1]	7/20/2000	<0.0043	<0.0043	0.0110	0.0082	NA
SED-4	0.5[*1]	7/20/2000	<0.0060	<0.0060	<0.0060	<0.0060	NA
SED-5	0.5[*1]	7/20/2000	<0.0042	<0.0042	<0.0042	<0.0042	NA
SMW-11	Not Reported	12/20/2002	<0.005	<0.005	<0.005	<0.005	<0.005
SMW-12	Not Reported	12/20/2002	<0.005	<0.005	<0.005	<0.005	<0.005
SMW-23	Not Reported	12/20/2002	<0.005	<0.005	<0.005	<0.005	<0.005
SSB-1	5.0	1/13/2003	<0.005	<0.005	<0.005	<0.005	<0.005
	35.0	1/13/2003	<0.005	<0.005	<0.005	<0.005	<0.005
SSB-2	5.0	1/13/2003	<0.005	<0.005	0.0230	<0.005	<0.005
	35.0	1/13/2003	<0.005	<0.005	<0.005	<0.005	<0.005
SSB-3	5.0	1/13/2003	<0.005	<0.005	0.0240	<0.005	<0.005
	40.0	1/13/2003	<0.005	<0.005	<0.005	<0.005	<0.005
SSB-4	5.0	1/13/2003	<0.005	<0.005	0.0090	<0.005	<0.005
	35.0	1/13/2003	<0.005	<0.005	0.0080	<0.005	<0.005
SSB-5	5.0	1/17/2003	<0.005	<0.005	<0.005	<0.005	<0.005
	37.0	1/17/2003	<0.005	<0.005	<0.005	<0.005	<0.005
SSB-6	5.0	1/17/2003	<0.005	<0.005	<0.005	<0.005	<0.005
	35.0	1/17/2003	<0.005	<0.005	<0.005	<0.005	<0.005
SSB-7	5.0	1/17/2003	<0.005	<0.005	<0.005	<0.005	<0.005
	35.0	1/17/2003	<0.005	<0.005	<0.005	<0.005	<0.005

TABLE 6

Spalding Corners Shopping Center
Sandy Springs, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063
Historic Soil Analytical Results Summary

Sample ID	Depth (ft)	Date	Chloroform (mg/Kg)	cis-1,2-Dichlroethene (mg/Kg)	Tetrachloroethene (mg/Kg)	Trichloroethene (mg/Kg)	total Xylenes (mg/Kg)
MW-1-N	5.0	5/23/2003	<0.005	<0.005	<0.005	<0.005	<0.005
	15.0	5/23/2003	<0.005	<0.005	<0.005	<0.005	<0.005
	25.0	5/23/2003	<0.005	<0.005	<0.005	<0.005	<0.005
MW-1-S	5.0	5/23/2003	<0.005	<0.005	<0.005	<0.005	<0.005
	15.0	5/23/2003	<0.005	<0.005	<0.005	<0.005	<0.005
	25.0	5/23/2003	<0.005	<0.005	<0.005	<0.005	<0.005
SSB-8-S	5.0	6/2/2003	<0.005	<0.005	0.0190	<0.005	<0.005
	15.0	6/2/2003	<0.005	<0.005	<0.005	<0.005	<0.005
	25.0	6/2/2003	<0.005	<0.005	<0.005	<0.005	<0.005
SSB-8-V	5.0	6/2/2003	<0.005	<0.005	<0.005	<0.005	<0.005
	15.0	6/2/2003	<0.005	<0.005	<0.005	<0.005	<0.005
	25.0	6/2/2003	<0.005	<0.005	<0.005	<0.005	<0.005
SSB-8-N	5.0	6/2/2003	<0.005	<0.005	0.0110	<0.005	<0.005
	15.0	6/2/2003	<0.005	<0.005	0.0100	<0.005	<0.005
	25.0	6/2/2003	<0.005	<0.005	<0.005	<0.005	<0.005
SSB-8-E	5.0	6/2/2003	<0.005	<0.005	<0.005	<0.005	<0.005
	15.0	6/2/2003	<0.005	<0.005	<0.005	<0.005	<0.005
	25.0	6/2/2003	<0.005	<0.005	<0.005	<0.005	<0.005
SC-1203-SS1	5.0[*1]	12/11/2003	<0.0034	<0.0034	0.2200	<0.0034	<0.0068
SC-1203-SS2	5.0[*1]	12/11/2003	<0.0036	0.0096	0.2300	<0.0036	<0.0072
SC-1203-SS3	5.0[*1]	12/11/2003	<0.0041	<0.0041	0.2600	<0.0041	<0.0081
SC-1203-SS4	5.0[*1]	12/11/2003	<0.0037	<0.0037	0.1300	<0.0037	<0.0074
SC-1203-SS5	2.5[*1]	12/11/2003	<0.0043	<0.0043	<0.0043	0.0410	<0.0087
SC-1203-SS6	10.0[*1]	12/11/2003	<0.0051	<0.0051	0.1700	<0.0051	<0.010
SC-1203-SS10	5.0[*1]	12/11/2003	<0.0043	<0.0043	0.0330	<0.0043	<0.0043
SC-1203-SS11	2.5[*1]	12/11/2003	<0.0042	<0.0042	0.0150	<0.0042	<0.0042
SC-1203-SS12	10.0[*1]	12/16/2003	<0.0044	<0.0044	0.0460	<0.0044	<0.0088

2/21/2000 & 7/20/2000 sampling performed by Rindt-McDuff Associates.
2002 & 2003 sampling performed by Pyramid.

Notes: 1. Depth estimated from previous report data
2. The soil represented by B-1 was removed as part of the 2003 soil excavation performed by Peachtree Environmental
SC-1203-SS1 through SC-1203-SS12 represent the excavation confirmation samples

APPENDIX 3

LEGAL DESCRIPTIONS AND TAX MAPS

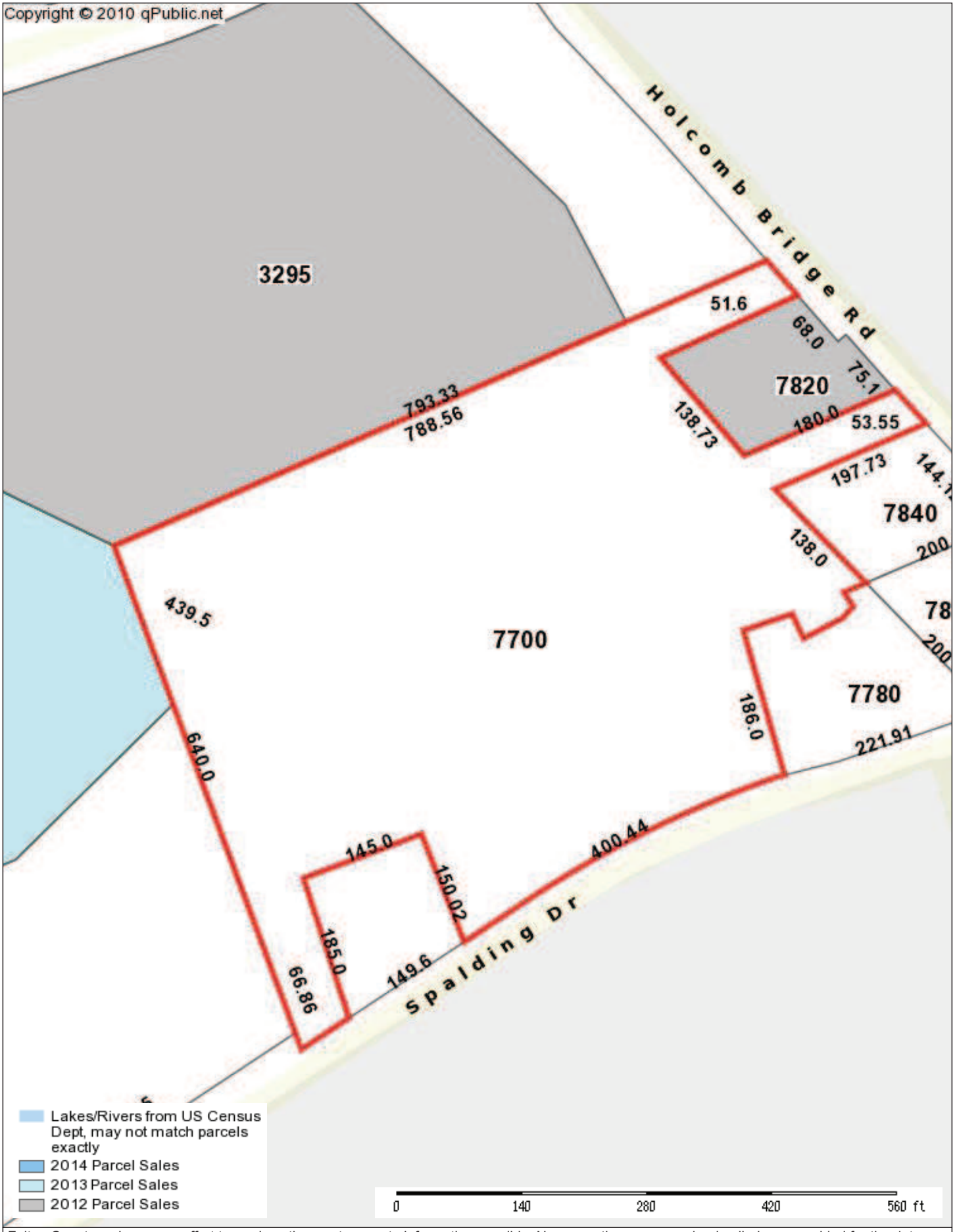
EXHIBIT "A"

Legal Description of the Shopping Center Tract

ALL THAT TRACT or parcel of land lying and being in Land Lot 313 of the 6th District of Fulton County, Georgia, and being more particularly described as follows:

BEGINNING at the intersection of the western right-of-way of Holcomb Bridge Road (Variable Right-of-Way) with the northern right-of-way of Spalding Drive (Variable Right-of-Way) and thence running along the northern right-of-way of Spalding Drive South 68° 36' 29" West a distance of 388.11 feet to a point; thence continuing along said right-of-way running South 68° 27' 19" West a distance of 33.79 feet to a point and iron pin found, said point being the **TRUE POINT OF BEGINNING**; thence from said **TRUE POINT OF BEGINNING** running along the northern right-of-way of Spalding Drive South 66° 17' 36" West a distance of 67.18 feet to a point; thence continuing along said right-of-way running South 61° 29' 39" West a distance of 101.44 feet to a point; thence continuing along said right-of-way running South 57° 10' 08" West a distance of 86.14 feet to a point; thence continuing along said right-of-way running South 54° 36' 00" West a distance of 145.73 feet to a point and iron pin found; thence continuing along said right-of-way running South 55° 17' 38" West a distance of 149.11 feet to a point and iron pin found; thence continuing along said right-of-way running South 54° 50' 54" West a distance of 65.87 feet to a point; thence departing said right-of-way running North 21° 34' 08" West a distance of 640.00 feet to a point and iron pin found; thence running North 66° 54' 19" East a distance of 788.77 feet to a point and iron pin found on the western right-of-way of Holcomb Bridge Road; thence running along the western right-of-way of Holcomb Bridge Road South 43° 22' 53" East a distance of 42.40 feet to a point; thence departing said right-of-way running South 66° 54' 18" West a distance of 164.81 feet to a point; thence running South 43° 08' 53" East a distance of 139.11 feet to a point and iron pin found; thence running North 67° 10' 04" East a distance of 179.77 feet to a point and iron pin found on the western right-of-way of Holcomb Bridge Road; thence running along the western right-of-way of Holcomb Bridge Road South 43° 49' 53" East a distance of 53.55 feet to a point; thence departing said right-of-way running South 67° 08' 18" West a distance of 197.73 feet to a point and iron pin found; thence running South 43° 49' 53" East a distance of 138.06 feet to a point and iron pin found; thence running South 68° 33' 22" West a distance of 144.83 feet to a point and iron pin found; thence running South 21° 21' 33" East a distance of 186.00 feet to a point and iron pin found on the northern right-of-way of Spalding Drive, said point being the **TRUE POINT OF BEGINNING**.

Said tract contain **9.02** acres as shown on plat of survey prepared for Selig Enterprises, Inc. by Dixon-Ross Surveying, J.B. Dixon, Georgia Registered Land Surveyor No. 1878, dated May 12, 1999.



Date printed: 11/06/14 : 10:01:13

EXHIBIT "B-1"

Legal Description of the Excess Dunwoody Place Venture Tract

All that tract or parcel of land lying and being in Land Lot 313 of the 6th District, City of Sandy Springs, Fulton County, Georgia, being more particularly described as follows:

Beginning at a the intersection of the northwestern right of way of Spalding Drive (right of way varies) and the northeastern right of way of River Exchange Drive (right of way varies); thence proceeding along said right of way of River Exchange Drive the following courses and distances: North 33 degrees 58 minutes 03 seconds West a distance of 129.96 feet to a point, South 56 degrees 01 minutes 57 seconds West a distance of 10.00 feet to a point, North 33 degrees 58 minutes 02 seconds West a distance of 86.41 feet to a point, along a curve to the right with a radius of 300.00 feet and an arc length of 249.32 feet (said curve having a chord bearing of North 10 degrees 09 minutes 33 seconds West and a chord distance of 242.21 feet) to a point and North 13 degrees 38 minutes 57 seconds East a distance of 91.16 feet to a point; thence leaving said right of way of River Exchange Drive and proceeding South 76 degrees 21 minutes 03 seconds East a distance of 50.00 feet to a 1/2" rebar set; thence proceeding North 67 degrees 58 minutes 03 seconds East a distance of 348.53 feet to a 1/2" rebar set; thence proceeding North 45 degrees 23 minutes 16 seconds East a distance of 209.62 feet to a 1/2" rebar set; thence proceeding South 21 degrees 31 minutes 12 seconds East a distance of 433.93 feet to a point on the northwestern right of way of Spalding; thence proceeding along said right of way of Spalding the following courses and distances: South 54 degrees 39 minutes 04 seconds West a distance of 101.63 feet to a point, South 55 degrees 13 minutes 57 seconds West a distance of 79.68 feet to a point, South 55 degrees 30 minutes 24 seconds West a distance of 228.66 feet to a point, South 56 degrees 10 minutes 53 seconds West a distance of 105.18 feet to a point and South 56 degrees 01 minutes 58 seconds West a distance of 127.18 feet to the Point of Beginning.

Said tract contains 291,348 square feet or **6.69** acres.

Date printed: 11/06/14 : 10:07:47

APPENDIX 4

LABORATORY DATA SHEETS - GROUNDWATER

AND LABORATORY CERTIFICATION

State of Florida

Department of Health, Bureau of Public Health Laboratories

This is to certify that

E87582

ANALYTICAL ENVIRONMENTAL SERVICES, INC.
3080 PRESIDENTIAL DRIVE
ATLANTA, GA 30340

has complied with Florida Administrative Code 64E-1,
for the examination of environmental samples in the following categories

DRINKING WATER - MICROBIOLOGY, DRINKING WATER - PRIMARY INORGANIC CONTAMINANTS, DRINKING WATER - SECONDARY INORGANIC CONTAMINANTS, NON-POTABLE WATER - EXTRACTABLE ORGANICS, NON-POTABLE WATER - GENERAL CHEMISTRY, NON-POTABLE WATER - METALS, NON-POTABLE WATER - MICROBIOLOGY, NON-POTABLE WATER - PESTICIDES-HERBICIDES-PCB'S, NON-POTABLE WATER - VOLATILE ORGANICS, SOLID AND CHEMICAL MATERIALS - EXTRACTABLE ORGANICS, SOLID AND CHEMICAL MATERIALS - GENERAL CHEMISTRY, SOLID AND CHEMICAL MATERIALS - METALS, SOLID AND CHEMICAL MATERIALS - PESTICIDES-HERBICIDES-PCB'S, SOLID AND CHEMICAL MATERIALS - VOLATILE ORGANICS

Continued certification is contingent upon successful on-going compliance with the NELAC Standards and FAC Rule 64E-1 regulations. Specific methods and analytes certified are cited on the Laboratory Scope of Accreditation for this laboratory and are on file at the Bureau of Public Health Laboratories, P. O. Box 210, Jacksonville, Florida 32231. Clients and customers are urged to verify with this agency the laboratory's certification status in Florida for particular methods and analytes.

Date Issued: July 01, 2014 Expiration Date: June 30, 2015

William H. Anderson, DHA, FACHE, Director
Division of Emergency Preparedness and Community Support
DH Form 1697, 7/04
NON-TRANSFERABLE E87582-24-07/01/2014
Supersedes all previously issued certificates

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

October 16, 2014

Rick Rudolph
Sailors Engineering Associates
1675 Spectrum Drive
Lawrenceville GA 30043

TEL: (770) 962-5922
FAX: (770) 962-7964

RE: Spalding Crnrs S/C

Dear Rick Rudolph: Order No: 1410658

Analytical Environmental Services, Inc. received 5 samples on 10/7/2014 6:15:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES' certifications are as follows:
-NELAC/Florida Certification number E87582 for analysis of Environmental Water, soil/hazardous waste, and Drinking Water Microbiology, effective 07/01/14-06/30/15.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Inorganics), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 09/01/15.

These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Dorothy deBruyn
Project Manager

3080 Presidential Drive • Atlanta, Georgia 30340 • Tel: 770.457.8177 • Fax: 770.457.8188 • Toll Free: 800.972.4889
www.aesatlanta.com

ANALYTICAL ENVIRONMENTAL SERVICES, INC

3080 Presidential Drive, Atlanta GA 30340-3704
TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1410658

Date: 10/7/14 Page 1 of 1

COMPANY:	ADDRESS:
Sailors Eng. Assoc.	1675 Spectrum Dr Lawrenceville, GA 30043
PHONE: 770-962-5922	FAX:
SAMPLED BY: Michael Short	SIGNATURE:

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	VOC 8260B	MEE	Total Iron	Chloride, Sulfate	Nitrate, Nitrite	Ferrous Iron	Sulfide	TOC	REMARKS	No # of Containers
	PRESERVATION (See codes)															
1	Trip Blank	10/7				W	/									2
2	MW-14S	10/7	8:55	/		GW	/	/	/	/	/	/	/	/		8
3	MW-13S	10/7	10:44	/		GW	/									2
4	MW-15S	10/7	14:04	/		GW	/	/	/	/	/	/	/	/		8
5	MW-16S	10/7	17:08	/		GW	/	/	/	/	/	/	/	/		8
6																
7																
8																
9																
10																
11																
12																
13																
14																

Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1:	10/7/14 18:15	1:	10/7/14 6:15
2:		2:	
3:		3:	

PROJECT INFORMATION

PROJECT NAME: Spalding Corners S/C
PROJECT #: 102-863
SITE ADDRESS: 7720 Spalding Dr Doraville
SEND REPORT TO: Mike Hatler
INVOICE TO: (IF DIFFERENT FROM ABOVE)
QUOTE #: PO#:

RECEIPT

Total # of Containers: 28

Turnaround Time Request
- ● Standard 5 Business Days
- ○ 2 Business Day Rush
- ○ Next Business Day Rush
- ○ Same Day Rush (auth req.)
- ○ Other

STATE PROGRAM (if any):
E-mail? Y / N; Fax? Y / N
DATA PACKAGE: I II III IV

SPECIAL INSTRUCTIONS/COMMENTS: Short Hold Time

SHIPMENT METHOD
OUT / / VIA:
IN / / VIA:
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER

SAMPLES RECEIVED AFTER 3PM OR ON SATURDAY ARE CONSIDERED RECEIVED THE NEXT BUSINESS DAY. IF TURNAROUND TIME IS NOT INDICATED, AES WILL PROCEED WITH STANDARD TAT OF SAMPLES.
SAMPLES ARE DISPOSED 30 DAYS AFTER REPORT COMPLETION UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify) WW = Waste Water
PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	TRIP BLANK
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/7/2014
Lab ID:	1410658-001	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
1,1,2-Trichloroethane	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
1,1-Dichloroethane	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
1,1-Dichloroethene	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
1,2-Dibromoethane	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
1,2-Dichlorobenzene	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
1,2-Dichloroethane	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
1,2-Dichloropropane	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
1,3-Dichlorobenzene	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
1,4-Dichlorobenzene	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
2-Butanone	BRL	50		ug/L	197550	1	10/10/2014 18:09	GC
2-Hexanone	BRL	10		ug/L	197550	1	10/10/2014 18:09	GC
4-Methyl-2-pentanone	BRL	10		ug/L	197550	1	10/10/2014 18:09	GC
Acetone	BRL	50		ug/L	197550	1	10/10/2014 18:09	GC
Benzene	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Bromodichloromethane	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Bromoform	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Bromomethane	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Carbon disulfide	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Carbon tetrachloride	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Chlorobenzene	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Chloroethane	BRL	10		ug/L	197550	1	10/10/2014 18:09	GC
Chloroform	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Chloromethane	BRL	10		ug/L	197550	1	10/10/2014 18:09	GC
cis-1,2-Dichloroethene	BRL	1.0		ug/L	197550	1	10/10/2014 18:09	GC
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Cyclohexane	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Dibromochloromethane	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Dichlorodifluoromethane	BRL	10		ug/L	197550	1	10/10/2014 18:09	GC
Ethylbenzene	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Freon-113	BRL	10		ug/L	197550	1	10/10/2014 18:09	GC
Isopropylbenzene	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
m,p-Xylene	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Methyl acetate	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Methyl tert-butyl ether	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Methylcyclohexane	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Methylene chloride	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
o-Xylene	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	TRIP BLANK
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/7/2014
Lab ID:	1410658-001	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Tetrachloroethene	BRL	1.0		ug/L	197550	1	10/10/2014 18:09	GC
Toluene	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197550	1	10/10/2014 18:09	GC
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Trichloroethene	BRL	1.0		ug/L	197550	1	10/10/2014 18:09	GC
Trichlorofluoromethane	BRL	5.0		ug/L	197550	1	10/10/2014 18:09	GC
Vinyl chloride	BRL	1.0		ug/L	197550	1	10/10/2014 18:09	GC
Surr: 4-Bromofluorobenzene	96.4	66.2-120		%REC	197550	1	10/10/2014 18:09	GC
Surr: Dibromofluoromethane	105	79.5-121		%REC	197550	1	10/10/2014 18:09	GC
Surr: Toluene-d8	93.7	77-117		%REC	197550	1	10/10/2014 18:09	GC

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-14S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/7/2014 8:55:00 AM
Lab ID:	1410658-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Organic Carbon (TOC) SW9060A								
Organic Carbon, Total	1.99	1.00		mg/L	R277523	1	10/09/2014 16:49	JM
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
1,1,2-Trichloroethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
1,1-Dichloroethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
1,1-Dichloroethene	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
1,2-Dibromoethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
1,2-Dichlorobenzene	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
1,2-Dichloroethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
1,2-Dichloropropane	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
1,3-Dichlorobenzene	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
1,4-Dichlorobenzene	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
2-Butanone	BRL	50		ug/L	197550	1	10/10/2014 23:16	GC
2-Hexanone	BRL	10		ug/L	197550	1	10/10/2014 23:16	GC
4-Methyl-2-pentanone	BRL	10		ug/L	197550	1	10/10/2014 23:16	GC
Acetone	BRL	50		ug/L	197550	1	10/10/2014 23:16	GC
Benzene	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Bromodichloromethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Bromoform	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Bromomethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Carbon disulfide	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Carbon tetrachloride	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Chlorobenzene	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Chloroethane	BRL	10		ug/L	197550	1	10/10/2014 23:16	GC
Chloroform	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Chloromethane	BRL	10		ug/L	197550	1	10/10/2014 23:16	GC
cis-1,2-Dichloroethene	BRL	1.0		ug/L	197550	1	10/10/2014 23:16	GC
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Cyclohexane	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Dibromochloromethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Dichlorodifluoromethane	BRL	10		ug/L	197550	1	10/10/2014 23:16	GC
Ethylbenzene	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Freon-113	BRL	10		ug/L	197550	1	10/10/2014 23:16	GC
Isopropylbenzene	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
m,p-Xylene	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Methyl acetate	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Methyl tert-butyl ether	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-14S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/7/2014 8:55:00 AM
Lab ID:	1410658-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Methylcyclohexane	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Methylene chloride	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
o-Xylene	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Styrene	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Tetrachloroethene	6.8	1.0		ug/L	197550	1	10/10/2014 23:16	GC
Toluene	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197550	1	10/10/2014 23:16	GC
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Trichloroethene	BRL	1.0		ug/L	197550	1	10/10/2014 23:16	GC
Trichlorofluoromethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:16	GC
Vinyl chloride	BRL	1.0		ug/L	197550	1	10/10/2014 23:16	GC
Surr: 4-Bromofluorobenzene	90.7	66.2-120		%REC	197550	1	10/10/2014 23:16	GC
Surr: Dibromofluoromethane	104	79.5-121		%REC	197550	1	10/10/2014 23:16	GC
Surr: Toluene-d8	97.6	77-117		%REC	197550	1	10/10/2014 23:16	GC
Sulfide by SW9030B/9034				**(SW9030B)**				
Sulfide	BRL	2.00		mg/L	197576	1	10/13/2014 12:30	AB
ION SCAN SW9056A								
Chloride	4.4	1.0		mg/L	R277601	1	10/08/2014 11:33	YS
Nitrate	2.6	0.25		mg/L	R277601	1	10/08/2014 11:33	YS
Nitrite	BRL	0.25		mg/L	R277601	1	10/08/2014 11:33	YS
Sulfate	1.3	1.0		mg/L	R277601	1	10/08/2014 11:33	YS
GC Analysis of Gaseous Samples SOP-RSK 175				**(RSK175)**				
Ethane	BRL	9		ug/L	197401	1	10/09/2014 16:27	SH
Ethylene	BRL	7		ug/L	197401	1	10/09/2014 16:27	SH
Methane	BRL	4		ug/L	197401	1	10/09/2014 16:27	SH
Ferrous Iron SM3500-Fe-B								
Iron, as Ferric (Fe+3)	0.454	0.100		mg/L	R277615	1	10/08/2014 08:50	AB
Iron, as Ferrous (Fe+2)	BRL	0.100		mg/L	R277615	1	10/08/2014 08:50	AB
METALS, TOTAL SW6010C				**(SW3010A)**				
Iron	0.454	0.100		mg/L	197391	1	10/13/2014 00:40	TA

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-13S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/7/2014 10:44:00 AM
Lab ID:	1410658-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
1,1,2-Trichloroethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
1,1-Dichloroethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
1,1-Dichloroethene	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
1,2-Dibromoethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
1,2-Dichlorobenzene	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
1,2-Dichloroethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
1,2-Dichloropropane	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
1,3-Dichlorobenzene	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
1,4-Dichlorobenzene	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
2-Butanone	BRL	50		ug/L	197550	1	10/10/2014 23:44	GC
2-Hexanone	BRL	10		ug/L	197550	1	10/10/2014 23:44	GC
4-Methyl-2-pentanone	BRL	10		ug/L	197550	1	10/10/2014 23:44	GC
Acetone	BRL	50		ug/L	197550	1	10/10/2014 23:44	GC
Benzene	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Bromodichloromethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Bromoform	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Bromomethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Carbon disulfide	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Carbon tetrachloride	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Chlorobenzene	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Chloroethane	BRL	10		ug/L	197550	1	10/10/2014 23:44	GC
Chloroform	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Chloromethane	BRL	10		ug/L	197550	1	10/10/2014 23:44	GC
cis-1,2-Dichloroethene	BRL	1.0		ug/L	197550	1	10/10/2014 23:44	GC
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Cyclohexane	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Dibromochloromethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Dichlorodifluoromethane	BRL	10		ug/L	197550	1	10/10/2014 23:44	GC
Ethylbenzene	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Freon-113	BRL	10		ug/L	197550	1	10/10/2014 23:44	GC
Isopropylbenzene	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
m,p-Xylene	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Methyl acetate	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Methyl tert-butyl ether	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Methylcyclohexane	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Methylene chloride	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
o-Xylene	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-13S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/7/2014 10:44:00 AM
Lab ID:	1410658-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Tetrachloroethene	1.9	1.0		ug/L	197550	1	10/10/2014 23:44	GC
Toluene	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197550	1	10/10/2014 23:44	GC
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Trichloroethene	BRL	1.0		ug/L	197550	1	10/10/2014 23:44	GC
Trichlorofluoromethane	BRL	5.0		ug/L	197550	1	10/10/2014 23:44	GC
Vinyl chloride	BRL	1.0		ug/L	197550	1	10/10/2014 23:44	GC
Surr: 4-Bromofluorobenzene	91.9	66.2-120		%REC	197550	1	10/10/2014 23:44	GC
Surr: Dibromofluoromethane	108	79.5-121		%REC	197550	1	10/10/2014 23:44	GC
Surr: Toluene-d8	103	77-117		%REC	197550	1	10/10/2014 23:44	GC

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-15S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/7/2014 2:04:00 PM
Lab ID:	1410658-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Organic Carbon (TOC) SW9060A								
Organic Carbon, Total	1.00	1.00		mg/L	R277523	1	10/09/2014 17:09	JM
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
1,1,2-Trichloroethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
1,1-Dichloroethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
1,1-Dichloroethene	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
1,2-Dibromoethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
1,2-Dichlorobenzene	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
1,2-Dichloroethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
1,2-Dichloropropane	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
1,3-Dichlorobenzene	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
1,4-Dichlorobenzene	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
2-Butanone	BRL	50		ug/L	197550	1	10/11/2014 00:12	GC
2-Hexanone	BRL	10		ug/L	197550	1	10/11/2014 00:12	GC
4-Methyl-2-pentanone	BRL	10		ug/L	197550	1	10/11/2014 00:12	GC
Acetone	BRL	50		ug/L	197550	1	10/11/2014 00:12	GC
Benzene	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Bromodichloromethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Bromoform	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Bromomethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Carbon disulfide	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Carbon tetrachloride	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Chlorobenzene	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Chloroethane	BRL	10		ug/L	197550	1	10/11/2014 00:12	GC
Chloroform	5.4	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Chloromethane	BRL	10		ug/L	197550	1	10/11/2014 00:12	GC
cis-1,2-Dichloroethene	BRL	1.0		ug/L	197550	1	10/11/2014 00:12	GC
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Cyclohexane	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Dibromochloromethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Dichlorodifluoromethane	BRL	10		ug/L	197550	1	10/11/2014 00:12	GC
Ethylbenzene	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Freon-113	BRL	10		ug/L	197550	1	10/11/2014 00:12	GC
Isopropylbenzene	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
m,p-Xylene	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Methyl acetate	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Methyl tert-butyl ether	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-15S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/7/2014 2:04:00 PM
Lab ID:	1410658-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Methylcyclohexane	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Methylene chloride	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
o-Xylene	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Styrene	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Tetrachloroethene	200	10		ug/L	197550	10	10/13/2014 18:19	GC
Toluene	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197550	1	10/11/2014 00:12	GC
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Trichloroethene	1.9	1.0		ug/L	197550	1	10/11/2014 00:12	GC
Trichlorofluoromethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:12	GC
Vinyl chloride	BRL	1.0		ug/L	197550	1	10/11/2014 00:12	GC
Surr: 4-Bromofluorobenzene	80.4	66.2-120		%REC	197550	10	10/13/2014 18:19	GC
Surr: 4-Bromofluorobenzene	91.7	66.2-120		%REC	197550	1	10/11/2014 00:12	GC
Surr: Dibromofluoromethane	109	79.5-121		%REC	197550	10	10/13/2014 18:19	GC
Surr: Dibromofluoromethane	111	79.5-121		%REC	197550	1	10/11/2014 00:12	GC
Surr: Toluene-d8	97.1	77-117		%REC	197550	10	10/13/2014 18:19	GC
Surr: Toluene-d8	98.4	77-117		%REC	197550	1	10/11/2014 00:12	GC
Sulfide by SW9030B/9034				**(SW9030B)**				
Sulfide	BRL	2.00		mg/L	197576	1	10/13/2014 12:30	AB
ION SCAN SW9056A								
Chloride	5.7	1.0		mg/L	R277601	1	10/08/2014 11:48	YS
Nitrate	3.3	0.25		mg/L	R277601	1	10/08/2014 11:48	YS
Nitrite	BRL	0.25		mg/L	R277601	1	10/08/2014 11:48	YS
Sulfate	BRL	1.0		mg/L	R277601	1	10/08/2014 11:48	YS
GC Analysis of Gaseous Samples SOP-RSK 175				**(RSK175)**				
Ethane	BRL	9		ug/L	197401	1	10/09/2014 16:37	SH
Ethylene	BRL	7		ug/L	197401	1	10/09/2014 16:37	SH
Methane	BRL	4		ug/L	197401	1	10/09/2014 16:37	SH
Ferrous Iron SM3500-Fe-B								
Iron, as Ferric (Fe+3)	0.150	0.100		mg/L	R277615	1	10/08/2014 08:50	AB
Iron, as Ferrous (Fe+2)	BRL	0.100		mg/L	R277615	1	10/08/2014 08:50	AB
METALS, TOTAL SW6010C				**(SW3010A)**				
Iron	0.150	0.100		mg/L	197391	1	10/14/2014 16:00	TA

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-16S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/7/2014 5:08:00 PM
Lab ID:	1410658-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Organic Carbon (TOC) SW9060A								
Organic Carbon, Total	1.05	1.00		mg/L	R277523	1	10/09/2014 17:29	JM
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
1,1,2-Trichloroethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
1,1-Dichloroethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
1,1-Dichloroethene	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
1,2-Dibromoethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
1,2-Dichlorobenzene	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
1,2-Dichloroethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
1,2-Dichloropropane	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
1,3-Dichlorobenzene	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
1,4-Dichlorobenzene	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
2-Butanone	BRL	50		ug/L	197550	1	10/11/2014 00:39	GC
2-Hexanone	BRL	10		ug/L	197550	1	10/11/2014 00:39	GC
4-Methyl-2-pentanone	BRL	10		ug/L	197550	1	10/11/2014 00:39	GC
Acetone	BRL	50		ug/L	197550	1	10/11/2014 00:39	GC
Benzene	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Bromodichloromethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Bromoform	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Bromomethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Carbon disulfide	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Carbon tetrachloride	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Chlorobenzene	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Chloroethane	BRL	10		ug/L	197550	1	10/11/2014 00:39	GC
Chloroform	5.4	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Chloromethane	BRL	10		ug/L	197550	1	10/11/2014 00:39	GC
cis-1,2-Dichloroethene	BRL	1.0		ug/L	197550	1	10/11/2014 00:39	GC
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Cyclohexane	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Dibromochloromethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Dichlorodifluoromethane	BRL	10		ug/L	197550	1	10/11/2014 00:39	GC
Ethylbenzene	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Freon-113	BRL	10		ug/L	197550	1	10/11/2014 00:39	GC
Isopropylbenzene	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
m,p-Xylene	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Methyl acetate	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Methyl tert-butyl ether	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-16S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/7/2014 5:08:00 PM
Lab ID:	1410658-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Methylcyclohexane	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Methylene chloride	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
o-Xylene	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Styrene	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Tetrachloroethene	280	10		ug/L	197550	10	10/13/2014 18:47	GC
Toluene	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197550	1	10/11/2014 00:39	GC
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Trichloroethene	2.4	1.0		ug/L	197550	1	10/11/2014 00:39	GC
Trichlorofluoromethane	BRL	5.0		ug/L	197550	1	10/11/2014 00:39	GC
Vinyl chloride	BRL	1.0		ug/L	197550	1	10/11/2014 00:39	GC
Surr: 4-Bromofluorobenzene	83.7	66.2-120		%REC	197550	10	10/13/2014 18:47	GC
Surr: 4-Bromofluorobenzene	90.4	66.2-120		%REC	197550	1	10/11/2014 00:39	GC
Surr: Dibromofluoromethane	108	79.5-121		%REC	197550	10	10/13/2014 18:47	GC
Surr: Dibromofluoromethane	111	79.5-121		%REC	197550	1	10/11/2014 00:39	GC
Surr: Toluene-d8	94.4	77-117		%REC	197550	10	10/13/2014 18:47	GC
Surr: Toluene-d8	99.2	77-117		%REC	197550	1	10/11/2014 00:39	GC
Sulfide by SW9030B/9034				**(SW9030B)**				
Sulfide	BRL	2.00		mg/L	197576	1	10/13/2014 12:30	AB
ION SCAN SW9056A								
Chloride	6.5	1.0		mg/L	R277601	1	10/08/2014 12:03	YS
Nitrate	2.6	0.25		mg/L	R277601	1	10/08/2014 12:03	YS
Nitrite	BRL	0.25		mg/L	R277601	1	10/08/2014 12:03	YS
Sulfate	9.0	1.0		mg/L	R277601	1	10/08/2014 12:03	YS
GC Analysis of Gaseous Samples SOP-RSK 175				**(RSK175)**				
Ethane	BRL	9		ug/L	197401	1	10/09/2014 16:41	SH
Ethylene	BRL	7		ug/L	197401	1	10/09/2014 16:41	SH
Methane	BRL	4		ug/L	197401	1	10/09/2014 16:41	SH
Ferrous Iron SM3500-Fe-B								
Iron, as Ferric (Fe+3)	0.382	0.100		mg/L	R277615	1	10/08/2014 08:50	AB
Iron, as Ferrous (Fe+2)	BRL	0.100		mg/L	R277615	1	10/08/2014 08:50	AB
METALS, TOTAL SW6010C				**(SW3010A)**				
Iron	0.382	0.100		mg/L	197391	1	10/13/2014 00:20	TA

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc.

Sample/Cooler Receipt Checklist

Client SEA Work Order Number 1410658

Checklist completed by [signature] 10/7/14
Signature Date

Carrier name: FedEx __ UPS __ Courier __ Client __ US Mail ✓ Other _____

Shipping container/cooler in good condition? Yes ✓ No __ Not Present __

Custody seals intact on shipping container/cooler? Yes __ No __ Not Present ✓

Custody seals intact on sample bottles? Yes __ No __ Not Present ✓

Container/Temp Blank temperature in compliance? (0°≤6°C)* Yes ✓ No __

Cooler #1 3.1° Cooler #2 _____ Cooler #3 _____ Cooler #4 _____ Cooler#5 _____ Cooler #6 _____

Chain of custody present? Yes ✓ No __

Chain of custody signed when relinquished and received? Yes ✓ No __

Chain of custody agrees with sample labels? Yes ✓ No __

Samples in proper container/bottle? Yes ✓ No __

Sample containers intact? Yes ✓ No __

Sufficient sample volume for indicated test? Yes ✓ No __

All samples received within holding time? Yes ✓ No __

Was TAT marked on the COC? Yes ✓ No __

Proceed with Standard TAT as per project history? Yes __ No __ Not Applicable ✓

Water - VOA vials have zero headspace? No VOA vials submitted __ Yes ✓ No __

Water - pH acceptable upon receipt? Yes ✓ No __ Not Applicable __

Adjusted? _____ Checked by MJ

Sample Condition: Good ✓ Other(Explain) _____

(For diffusive samples or AIHA lead) Is a known blank included? Yes __ No ✓

See Case Narrative for resolution of the Non-Conformance.

* Samples do not have to comply with the given range for certain parameters.

\\Aes_server\I\Sample Receipt\My Documents\COCs and pH Adjustment Sheet\Sample_Cooler_Recipt_Checklist_Rev1.rtf

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410658

ANALYTICAL QC SUMMARY REPORT

BatchID: 197391

Sample ID: **MB-197391**	Client ID:			Units: **mg/L**	Prep Date: **10/09/2014**	Run No: **277692**
SampleType: **MBLK**	TestCode: **METALS, TOTAL** **SW6010C**			BatchID: **197391**	Analysis Date: **10/12/2014**	Seq No: **5867936**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Iron	BRL	0.100									

Sample ID: **LCS-197391**	Client ID:			Units: **mg/L**	Prep Date: **10/09/2014**	Run No: **277692**
SampleType: **LCS**	TestCode: **METALS, TOTAL** **SW6010C**			BatchID: **197391**	Analysis Date: **10/13/2014**	Seq No: **5867939**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Iron	10.11	0.100	10.00		101	80	120				

Sample ID: **1410658-005BMS**	Client ID: **MW-16S**			Units: **mg/L**	Prep Date: **10/09/2014**	Run No: **277692**
SampleType: **MS**	TestCode: **METALS, TOTAL** **SW6010C**			BatchID: **197391**	Analysis Date: **10/13/2014**	Seq No: **5867941**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Iron	10.42	0.100	10.00	0.3818	100	75	125				

Sample ID: **1410658-005BMSD**	Client ID: **MW-16S**			Units: **mg/L**	Prep Date: **10/09/2014**	Run No: **277692**
SampleType: **MSD**	TestCode: **METALS, TOTAL** **SW6010C**			BatchID: **197391**	Analysis Date: **10/13/2014**	Seq No: **5867942**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Iron	10.28	0.100	10.00	0.3818	98.9	75	125	10.42	1.44	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410658

ANALYTICAL QC SUMMARY REPORT

BatchID: 197401

Sample ID: **MB-197401** Client ID: Units: **ug/L** Prep Date: **10/09/2014** Run No: **277503**
SampleType: **MBLK** TestCode: **GC Analysis of Gaseous Samples SOP-RSK 175** BatchID: **197401** Analysis Date: **10/09/2014** Seq No: **5863108**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Ethane	BRL	9									
Ethylene	BRL	7									
Methane	BRL	4									

Sample ID: **LCS-197401** Client ID: Units: **ug/L** Prep Date: **10/09/2014** Run No: **277503**
SampleType: **LCS** TestCode: **GC Analysis of Gaseous Samples SOP-RSK 175** BatchID: **197401** Analysis Date: **10/09/2014** Seq No: **5863111**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Ethane	103.2	9	200.0		51.6	41.6	115				
Ethylene	72.01	7	200.0		36.0	26.9	115				
Methane	114.0	4	200.0		57.0	45.2	115				

Sample ID: **LCSD-197401** Client ID: Units: **ug/L** Prep Date: **10/09/2014** Run No: **277503**
SampleType: **LCSD** TestCode: **GC Analysis of Gaseous Samples SOP-RSK 175** BatchID: **197401** Analysis Date: **10/09/2014** Seq No: **5863114**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Ethane	100.0	9	200.0		50.0	41.6	115	103.2	3.07	20	
Ethylene	69.89	7	200.0		34.9	26.9	115	72.01	2.99	20	
Methane	110.7	4	200.0		55.3	45.2	115	114.0	2.94	20	

Sample ID: **1410571-004BMS** Client ID: Units: **ug/L** Prep Date: **10/09/2014** Run No: **277503**
SampleType: **MS** TestCode: **GC Analysis of Gaseous Samples SOP-RSK 175** BatchID: **197401** Analysis Date: **10/09/2014** Seq No: **5863142**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Ethane	115.0	9	200.0		57.5	40.1	115				
Ethylene	78.10	7	200.0		39.0	24.5	115				
Methane	126.6	4	200.0		63.3	41.1	115				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410658

ANALYTICAL QC SUMMARY REPORT

BatchID: 197401

Sample ID: **1410571-004BMSD** Client ID:
SampleType: **MSD** TestCode: **GC Analysis of Gaseous Samples SOP-RSK 175**
Units: **ug/L** BatchID: **197401**
Prep Date: **10/09/2014** Analysis Date: **10/09/2014**
Run No: **277503** Seq No: **5863842**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Ethane	114.0	9	200.0		57.0	40.1	115	115.0	0.909	20	
Ethylene	77.49	7	200.0		38.7	24.5	115	78.10	0.784	20	
Methane	124.9	4	200.0		62.4	41.1	115	126.6	1.37	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410658

ANALYTICAL QC SUMMARY REPORT

BatchID: 197550

Sample ID: **MB-197550** Client ID: Units: **ug/L** Prep Date: **10/10/2014** Run No: **277603**
SampleType: **MBLK** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197550** Analysis Date: **10/10/2014** Seq No: **5869632**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	BRL	5.0									
1,1,2,2-Tetrachloroethane	BRL	5.0									
1,1,2-Trichloroethane	BRL	5.0									
1,1-Dichloroethane	BRL	5.0									
1,1-Dichloroethene	BRL	5.0									
1,2,4-Trichlorobenzene	BRL	5.0									
1,2-Dibromo-3-chloropropane	BRL	5.0									
1,2-Dibromoethane	BRL	5.0									
1,2-Dichlorobenzene	BRL	5.0									
1,2-Dichloroethane	BRL	5.0									
1,2-Dichloropropane	BRL	5.0									
1,3-Dichlorobenzene	BRL	5.0									
1,4-Dichlorobenzene	BRL	5.0									
2-Butanone	BRL	50									
2-Hexanone	BRL	10									
4-Methyl-2-pentanone	BRL	10									
Acetone	BRL	50									
Benzene	BRL	5.0									
Bromodichloromethane	BRL	5.0									
Bromoform	BRL	5.0									
Bromomethane	BRL	5.0									
Carbon disulfide	BRL	5.0									
Carbon tetrachloride	BRL	5.0									
Chlorobenzene	BRL	5.0									
Chloroethane	BRL	10									
Chloroform	BRL	5.0									
Chloromethane	BRL	10									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410658

ANALYTICAL QC SUMMARY REPORT

BatchID: 197550

Sample ID: **MB-197550** Client ID: Units: **ug/L** Prep Date: **10/10/2014** Run No: **277603**
SampleType: **MBLK** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197550** Analysis Date: **10/10/2014** Seq No: **5869632**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	BRL	5.0									
cis-1,3-Dichloropropene	BRL	5.0									
Cyclohexane	BRL	5.0									
Dibromochloromethane	BRL	5.0									
Dichlorodifluoromethane	BRL	10									
Ethylbenzene	BRL	5.0									
Freon-113	BRL	10									
Isopropylbenzene	BRL	5.0									
m,p-Xylene	BRL	5.0									
Methyl acetate	BRL	5.0									
Methyl tert-butyl ether	BRL	5.0									
Methylcyclohexane	BRL	5.0									
Methylene chloride	BRL	5.0									
o-Xylene	BRL	5.0									
Styrene	BRL	5.0									
Tetrachloroethene	BRL	5.0									
Toluene	BRL	5.0									
trans-1,2-Dichloroethene	BRL	5.0									
trans-1,3-Dichloropropene	BRL	5.0									
Trichloroethene	BRL	5.0									
Trichlorofluoromethane	BRL	5.0									
Vinyl chloride	BRL	2.0									
Surr: 4-Bromofluorobenzene	49.08	0	50.00		98.2	66.2	120				
Surr: Dibromofluoromethane	53.98	0	50.00		108	79.5	121				
Surr: Toluene-d8	47.40	0	50.00		94.8	77	117				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410658

ANALYTICAL QC SUMMARY REPORT

BatchID: 197550

Sample ID: **LCS-197550** Client ID: Units: **ug/L** Prep Date: **10/10/2014** Run No: **277603**
SampleType: **LCS** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197550** Analysis Date: **10/10/2014** Seq No: **5869645**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	56.31	5.0	50.00		113	63.1	140				
Benzene	54.39	5.0	50.00		109	74.2	129				
Chlorobenzene	49.80	5.0	50.00		99.6	70	129				
Toluene	52.39	5.0	50.00		105	74.2	129				
Trichloroethene	57.71	5.0	50.00		115	71.2	135				
Surr: 4-Bromofluorobenzene	53.70	0	50.00		107	66.2	120				
Surr: Dibromofluoromethane	52.84	0	50.00		106	79.5	121				
Surr: Toluene-d8	48.52	0	50.00		97.0	77	117				

Sample ID: **1410658-003AMS** Client ID: **MW-13S** Units: **ug/L** Prep Date: **10/10/2014** Run No: **277672**
SampleType: **MS** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197550** Analysis Date: **10/13/2014** Seq No: **5868812**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	65.68	5.0	50.00		131	60.2	159				
Benzene	66.21	5.0	50.00		132	70.2	138				
Chlorobenzene	65.98	5.0	50.00		132	70.1	133				
Toluene	65.70	5.0	50.00		131	70	139				
Trichloroethene	63.92	5.0	50.00		128	70.1	144				
Surr: 4-Bromofluorobenzene	44.68	0	50.00		89.4	66.2	120				
Surr: Dibromofluoromethane	50.51	0	50.00		101	79.5	121				
Surr: Toluene-d8	45.96	0	50.00		91.9	77	117				

Sample ID: **1410658-003AMSD** Client ID: **MW-13S** Units: **ug/L** Prep Date: **10/10/2014** Run No: **277672**
SampleType: **MSD** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197550** Analysis Date: **10/13/2014** Seq No: **5868923**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	65.13	5.0	50.00		130	60.2	159	65.68	0.841	19.2	
Benzene	65.87	5.0	50.00		132	70.2	138	66.21	0.515	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410658

ANALYTICAL QC SUMMARY REPORT

BatchID: 197550

Sample ID: **1410658-003AMSD** Client ID: **MW-13S** Units: **ug/L** Prep Date: **10/10/2014** Run No: **277672**
SampleType: **MSD** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197550** Analysis Date: **10/13/2014** Seq No: **5868923**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Chlorobenzene	65.04	5.0	50.00		130	70.1	133	65.98	1.43	20	
Toluene	64.64	5.0	50.00		129	70	139	65.70	1.63	20	
Trichloroethene	63.51	5.0	50.00		127	70.1	144	63.92	0.643	20	
Surr: 4-Bromofluorobenzene	44.88	0	50.00		89.8	66.2	120	44.68	0	0	
Surr: Dibromofluoromethane	50.99	0	50.00		102	79.5	121	50.51	0	0	
Surr: Toluene-d8	46.23	0	50.00		92.5	77	117	45.96	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410658

ANALYTICAL QC SUMMARY REPORT

BatchID: 197576

Sample ID: **MB-197576** Client ID: Units: **mg/L** Prep Date: **10/13/2014** Run No: **277719**
SampleType: **MBLK** TestCode: **Sulfide by SW9030B/9034** BatchID: **197576** Analysis Date: **10/13/2014** Seq No: **5868473**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfide	BRL	2.00									

Sample ID: **LCS-197576** Client ID: Units: **mg/L** Prep Date: **10/13/2014** Run No: **277719**
SampleType: **LCS** TestCode: **Sulfide by SW9030B/9034** BatchID: **197576** Analysis Date: **10/13/2014** Seq No: **5868474**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfide	352.0	2.00	352.0		100	40	120				

Sample ID: **1410571-004EMS** Client ID: Units: **mg/L** Prep Date: **10/13/2014** Run No: **277719**
SampleType: **MS** TestCode: **Sulfide by SW9030B/9034** BatchID: **197576** Analysis Date: **10/13/2014** Seq No: **5868484**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfide	17.40	2.00	17.60		98.9	76.7	120				

Sample ID: **1410571-004EMSD** Client ID: Units: **mg/L** Prep Date: **10/13/2014** Run No: **277719**
SampleType: **MSD** TestCode: **Sulfide by SW9030B/9034** BatchID: **197576** Analysis Date: **10/13/2014** Seq No: **5868487**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfide	16.80	2.00	17.60		95.5	76.7	120	17.40	3.51	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410658

ANALYTICAL QC SUMMARY REPORT

BatchID: R277523

Sample ID: **MB-R277523** Client ID: Units: **mg/L** Prep Date: Run No: **277523**
SampleType: **MBLK** TestCode: **Total Organic Carbon (TOC) SW9060A** BatchID: **R277523** Analysis Date: **10/09/2014** Seq No: **5863723**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Organic Carbon, Total	BRL	1.00									

Sample ID: **LCS-R277523** Client ID: Units: **mg/L** Prep Date: Run No: **277523**
SampleType: **LCS** TestCode: **Total Organic Carbon (TOC) SW9060A** BatchID: **R277523** Analysis Date: **10/09/2014** Seq No: **5863720**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Organic Carbon, Total	26.63	1.00	25.00		107	90	110				

Sample ID: **1410538-002CMS** Client ID: Units: **mg/L** Prep Date: Run No: **277523**
SampleType: **MS** TestCode: **Total Organic Carbon (TOC) SW9060A** BatchID: **R277523** Analysis Date: **10/09/2014** Seq No: **5863756**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Organic Carbon, Total	28.82	1.00	25.00	3.719	100	80	120				

Sample ID: **1410538-002CMSD** Client ID: Units: **mg/L** Prep Date: Run No: **277523**
SampleType: **MSD** TestCode: **Total Organic Carbon (TOC) SW9060A** BatchID: **R277523** Analysis Date: **10/09/2014** Seq No: **5863757**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Organic Carbon, Total	29.89	1.00	25.00	3.719	105	80	120	28.82	3.65	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410658

ANALYTICAL QC SUMMARY REPORT

BatchID: R277601

Sample ID: **MB-R277601** Client ID: Units: **mg/L** Prep Date: Run No: **277601**
SampleType: **MBLK** TestCode: **ION SCAN SW9056A** BatchID: **R277601** Analysis Date: **10/08/2014** Seq No: **5867519**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Chloride	BRL	1.0									
Nitrate	BRL	0.25									
Nitrite	BRL	0.25									
Sulfate	BRL	1.0									

Sample ID: **LCS-R277601** Client ID: Units: **mg/L** Prep Date: Run No: **277601**
SampleType: **LCS** TestCode: **ION SCAN SW9056A** BatchID: **R277601** Analysis Date: **10/08/2014** Seq No: **5867520**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Chloride	9.904	1.0	10.00		99.0	90	110				
Nitrate	4.873	0.25	5.000		97.5	90	110				
Nitrite	4.930	0.25	5.000		98.6	90	110				
Sulfate	27.33	1.0	25.00		109	90	110				

Sample ID: **1410658-002EMS** Client ID: **MW-14S** Units: **mg/L** Prep Date: Run No: **277601**
SampleType: **MS** TestCode: **ION SCAN SW9056A** BatchID: **R277601** Analysis Date: **10/08/2014** Seq No: **5867529**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Chloride	14.27	1.0	10.00	4.403	98.7	90	110				
Nitrate	7.663	0.25	5.000	2.571	102	90	110				
Nitrite	5.376	0.25	5.000		108	90	110				
Sulfate	24.87	1.0	25.00	1.322	94.2	90	110				

Sample ID: **141708-001DMS** Client ID: Units: **mg/L** Prep Date: Run No: **277601**
SampleType: **MS** TestCode: **ION SCAN SW9056A** BatchID: **R277601** Analysis Date: **10/08/2014** Seq No: **5867564**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Chloride	27.32	1.0	10.00	18.27	90.5	90	110				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410658

ANALYTICAL QC SUMMARY REPORT

BatchID: R277601

Sample ID: **141708-001DMS** Client ID: Units: **mg/L** Prep Date: Run No: **277601**
SampleType: **MS** TestCode: **ION SCAN SW9056A** BatchID: **R277601** Analysis Date: **10/08/2014** Seq No: **5867564**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	4.761	0.25	5.000		95.2	90	110				
Nitrite	5.115	0.25	5.000	0.2323	97.7	90	110				
Sulfate	36.80	1.0	25.00	12.91	95.6	90	110				

Sample ID: **1410658-002EMSD** Client ID: **MW-14S** Units: **mg/L** Prep Date: Run No: **277601**
SampleType: **MSD** TestCode: **ION SCAN SW9056A** BatchID: **R277601** Analysis Date: **10/08/2014** Seq No: **5867531**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Chloride	14.60	1.0	10.00	4.403	102	90	110	14.27	2.28	20	
Nitrate	7.671	0.25	5.000	2.571	102	90	110	7.663	0.102	20	
Nitrite	5.497	0.25	5.000		110	90	110	5.376	2.24	20	
Sulfate	25.32	1.0	25.00	1.322	96.0	90	110	24.87	1.80	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410658

ANALYTICAL QC SUMMARY REPORT

BatchID: R277615

Sample ID: **MB-R277615** Client ID: Units: **mg/L** Prep Date: Run No: **277615**
SampleType: **MBLK** TestCode: **Ferrous Iron** **SM3500-Fe-B** BatchID: **R277615** Analysis Date: **10/07/2014** Seq No: **5865690**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Iron, as Ferrous (Fe+2)	BRL	0.100									

Sample ID: **LCS-R277615** Client ID: Units: **mg/L** Prep Date: Run No: **277615**
SampleType: **LCS** TestCode: **Ferrous Iron** **SM3500-Fe-B** BatchID: **R277615** Analysis Date: **10/07/2014** Seq No: **5865691**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Iron, as Ferrous (Fe+2)	0.5038	0.100	0.5000		101	85	115				

Sample ID: **1410571-004DMS** Client ID: Units: **mg/L** Prep Date: Run No: **277615**
SampleType: **MS** TestCode: **Ferrous Iron** **SM3500-Fe-B** BatchID: **R277615** Analysis Date: **10/07/2014** Seq No: **5865704**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Iron, as Ferrous (Fe+2)	0.5118	0.100	0.5000		102	80	120				

Sample ID: **1410571-004DMSD** Client ID: Units: **mg/L** Prep Date: Run No: **277615**
SampleType: **MSD** TestCode: **Ferrous Iron** **SM3500-Fe-B** BatchID: **R277615** Analysis Date: **10/07/2014** Seq No: **5865705**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Iron, as Ferrous (Fe+2)	0.4958	0.100	0.5000		99.2	80	120	0.5118	3.18	30	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

October 20, 2014

Rick Rudolph
Sailors Engineering Associates
1675 Spectrum Drive
Lawrenceville GA 30043

TEL: (770) 962-5922
FAX: (770) 962-7964

RE: Spalding Crnrs S/C

Dear Rick Rudolph: Order No: 1410929

Analytical Environmental Services, Inc. received 8 samples on 10/9/2014 5:32:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES' certifications are as follows:
-NELAC/Florida Certification number E87582 for analysis of Environmental Water, soil/hazardous waste, and Drinking Water Microbiology, effective 07/01/14-06/30/15.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Inorganics), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 09/01/15.

These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Dorothy deBruyn
Project Manager

3080 Presidential Drive • Atlanta, Georgia 30340 • Tel: 770.457.8177 • Fax: 770.457.8188 • Toll Free: 800.972.4889
www.aesatlanta.com

ANALYTICAL ENVIRONMENTAL SERVICES, INC
3080 Presidential Drive, Atlanta GA 30340-3704
AES TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1410929

Date: 10/9/14 Page 1 of 1

COMPANY: Sailors Eng Assoc.
ADDRESS: 1675 Spectrum Dr Lawrenceville, GA 30043
PHONE: 770-962-5922
FAX:
SAMPLED BY: Michael Short
SIGNATURE:

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	VOC	MEE	Total Iron	Chloride, Sulfate	Nitrate, Nitrite	Ferrous, Ferric	Sul Sulfide	TOC	REMARKS	No # of Containers
	PRESERVATION (See codes)															
1	Trip Blank	10/8				W	✓									2
2	MW-1D	10/8	12:04	✓		GW	✓									2
3	MW-10S	10/8	14:13	✓		GW	✓									2
4	MW-17S	10/8	16:19	✓		GW	✓									2
5	MW-18S	10/9	9:37	✓		GW	✓	✓	✓	✓	✓	✓	✓	✓		8
6	MW-19S	10/9	11:57	✓		GW	✓	✓	✓	✓	✓	✓	✓	✓		8
7	MW-20S	10/9	14:52	✓		GW	✓	✓	✓	✓	✓	✓	✓	✓		8
8	MW-6S	10/9	16:38	✓		GW	✓	✓	✓	✓	✓	✓	✓	✓		8
9																
10																
11																
12																
13																
14																

Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1: Michael Short	10/9/14 17:32	1: NS	10/9/14 17:32
2:		2:	
3:		3:	

PROJECT INFORMATION
PROJECT NAME: Spalding Corners S/C
PROJECT #: 102-563
SITE ADDRESS: 7720 Spalding Dr Doraville GA
SEND REPORT TO: Rick Rebligh
INVOICE TO: (IF DIFFERENT FROM ABOVE)
QUOTE #: PO#:

RECEIPT
Total # of Containers: 40

Turnaround Time Request
- ✓ Standard 5 Business Days
- 2 Business Day Rush
- Next Business Day Rush
- Same Day Rush (auth req.)
- Other

STATE PROGRAM (if any):
E-mail? Y / N Fax? Y / N
DATA PACKAGE: I II III IV

SPECIAL INSTRUCTIONS/COMMENTS:
Short holding times

SHIPMENT METHOD
OUT / / VIA:
IN: / / VIA:
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER

SAMPLES RECEIVED AFTER 3PM OR ON SATURDAY ARE CONSIDERED RECEIVED THE NEXT BUSINESS DAY. IF TURNAROUND TIME IS NOT INDICATED, AES WILL PROCEED WITH STANDARD TAT OF SAMPLES.
SAMPLES ARE DISPOSED 30 DAYS AFTER REPORT COMPLETION UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify) WW = Waste Water
PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Analytical Environmental Services, Inc **Date:** 20-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	TRIP BLANK
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/8/2014
Lab ID:	1410929-001	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
1,1-Dichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
1,1-Dichloroethene	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
1,2-Dibromoethane	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
1,2-Dichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
1,2-Dichloropropane	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
2-Butanone	BRL	50		ug/L	197537	1	10/12/2014 11:28	NP
2-Hexanone	BRL	10		ug/L	197537	1	10/12/2014 11:28	NP
4-Methyl-2-pentanone	BRL	10		ug/L	197537	1	10/12/2014 11:28	NP
Acetone	BRL	50		ug/L	197537	1	10/12/2014 11:28	NP
Benzene	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Bromodichloromethane	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Bromoform	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Bromomethane	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Carbon disulfide	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Carbon tetrachloride	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Chlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Chloroethane	BRL	10		ug/L	197537	1	10/12/2014 11:28	NP
Chloroform	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Chloromethane	BRL	10		ug/L	197537	1	10/12/2014 11:28	NP
cis-1,2-Dichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 11:28	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Cyclohexane	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Dibromochloromethane	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Dichlorodifluoromethane	BRL	10		ug/L	197537	1	10/12/2014 11:28	NP
Ethylbenzene	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Freon-113	BRL	10		ug/L	197537	1	10/12/2014 11:28	NP
Isopropylbenzene	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
m,p-Xylene	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Methyl acetate	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Methylcyclohexane	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Methylene chloride	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
o-Xylene	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 20-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	TRIP BLANK
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/8/2014
Lab ID:	1410929-001	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Tetrachloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 11:28	NP
Toluene	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 11:28	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Trichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 11:28	NP
Trichlorofluoromethane	BRL	5.0		ug/L	197537	1	10/12/2014 11:28	NP
Vinyl chloride	BRL	1.0		ug/L	197537	1	10/12/2014 11:28	NP
Surr: 4-Bromofluorobenzene	85	66.2-120		%REC	197537	1	10/12/2014 11:28	NP
Surr: Dibromofluoromethane	110	79.5-121		%REC	197537	1	10/12/2014 11:28	NP
Surr: Toluene-d8	95.4	77-117		%REC	197537	1	10/12/2014 11:28	NP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 20-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-1D
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/8/2014 12:04:00 PM
Lab ID:	1410929-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
1,1-Dichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
1,1-Dichloroethene	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
1,2-Dibromoethane	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
1,2-Dichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
1,2-Dichloropropane	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
2-Butanone	BRL	50		ug/L	197537	1	10/12/2014 13:07	NP
2-Hexanone	BRL	10		ug/L	197537	1	10/12/2014 13:07	NP
4-Methyl-2-pentanone	BRL	10		ug/L	197537	1	10/12/2014 13:07	NP
Acetone	BRL	50		ug/L	197537	1	10/12/2014 13:07	NP
Benzene	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Bromodichloromethane	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Bromoform	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Bromomethane	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Carbon disulfide	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Carbon tetrachloride	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Chlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Chloroethane	BRL	10		ug/L	197537	1	10/12/2014 13:07	NP
Chloroform	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Chloromethane	BRL	10		ug/L	197537	1	10/12/2014 13:07	NP
cis-1,2-Dichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 13:07	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Cyclohexane	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Dibromochloromethane	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Dichlorodifluoromethane	BRL	10		ug/L	197537	1	10/12/2014 13:07	NP
Ethylbenzene	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Freon-113	BRL	10		ug/L	197537	1	10/12/2014 13:07	NP
Isopropylbenzene	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
m,p-Xylene	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Methyl acetate	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Methylcyclohexane	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Methylene chloride	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
o-Xylene	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 20-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-1D
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/8/2014 12:04:00 PM
Lab ID:	1410929-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Tetrachloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 13:07	NP
Toluene	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 13:07	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Trichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 13:07	NP
Trichlorofluoromethane	BRL	5.0		ug/L	197537	1	10/12/2014 13:07	NP
Vinyl chloride	BRL	1.0		ug/L	197537	1	10/12/2014 13:07	NP
Surr: 4-Bromofluorobenzene	87.8	66.2-120		%REC	197537	1	10/12/2014 13:07	NP
Surr: Dibromofluoromethane	111	79.5-121		%REC	197537	1	10/12/2014 13:07	NP
Surr: Toluene-d8	95.6	77-117		%REC	197537	1	10/12/2014 13:07	NP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 20-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-10S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/8/2014 2:13:00 PM
Lab ID:	1410929-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
1,1-Dichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
1,1-Dichloroethene	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
1,2-Dibromoethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
1,2-Dichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
1,2-Dichloropropane	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
2-Butanone	BRL	50		ug/L	197537	1	10/12/2014 14:22	NP
2-Hexanone	BRL	10		ug/L	197537	1	10/12/2014 14:22	NP
4-Methyl-2-pentanone	BRL	10		ug/L	197537	1	10/12/2014 14:22	NP
Acetone	BRL	50		ug/L	197537	1	10/12/2014 14:22	NP
Benzene	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Bromodichloromethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Bromoform	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Bromomethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Carbon disulfide	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Carbon tetrachloride	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Chlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Chloroethane	BRL	10		ug/L	197537	1	10/12/2014 14:22	NP
Chloroform	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Chloromethane	BRL	10		ug/L	197537	1	10/12/2014 14:22	NP
cis-1,2-Dichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 14:22	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Cyclohexane	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Dibromochloromethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Dichlorodifluoromethane	BRL	10		ug/L	197537	1	10/12/2014 14:22	NP
Ethylbenzene	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Freon-113	BRL	10		ug/L	197537	1	10/12/2014 14:22	NP
Isopropylbenzene	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
m,p-Xylene	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Methyl acetate	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Methylcyclohexane	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Methylene chloride	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
o-Xylene	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 20-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-10S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/8/2014 2:13:00 PM
Lab ID:	1410929-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Tetrachloroethene	61	1.0		ug/L	197537	1	10/12/2014 14:22	NP
Toluene	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 14:22	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Trichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 14:22	NP
Trichlorofluoromethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:22	NP
Vinyl chloride	BRL	1.0		ug/L	197537	1	10/12/2014 14:22	NP
Surr: 4-Bromofluorobenzene	84.4	66.2-120		%REC	197537	1	10/12/2014 14:22	NP
Surr: Dibromofluoromethane	110	79.5-121		%REC	197537	1	10/12/2014 14:22	NP
Surr: Toluene-d8	95.5	77-117		%REC	197537	1	10/12/2014 14:22	NP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 20-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-17S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/8/2014 4:19:00 PM
Lab ID:	1410929-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
1,1-Dichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
1,1-Dichloroethene	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
1,2-Dibromoethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
1,2-Dichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
1,2-Dichloropropane	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
2-Butanone	BRL	50		ug/L	197537	1	10/12/2014 14:46	NP
2-Hexanone	BRL	10		ug/L	197537	1	10/12/2014 14:46	NP
4-Methyl-2-pentanone	BRL	10		ug/L	197537	1	10/12/2014 14:46	NP
Acetone	BRL	50		ug/L	197537	1	10/12/2014 14:46	NP
Benzene	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Bromodichloromethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Bromoform	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Bromomethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Carbon disulfide	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Carbon tetrachloride	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Chlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Chloroethane	BRL	10		ug/L	197537	1	10/12/2014 14:46	NP
Chloroform	13	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Chloromethane	BRL	10		ug/L	197537	1	10/12/2014 14:46	NP
cis-1,2-Dichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 14:46	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Cyclohexane	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Dibromochloromethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Dichlorodifluoromethane	BRL	10		ug/L	197537	1	10/12/2014 14:46	NP
Ethylbenzene	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Freon-113	BRL	10		ug/L	197537	1	10/12/2014 14:46	NP
Isopropylbenzene	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
m,p-Xylene	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Methyl acetate	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Methylcyclohexane	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Methylene chloride	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
o-Xylene	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 20-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-17S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/8/2014 4:19:00 PM
Lab ID:	1410929-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Tetrachloroethene	130	1.0		ug/L	197537	1	10/12/2014 14:46	NP
Toluene	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 14:46	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Trichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 14:46	NP
Trichlorofluoromethane	BRL	5.0		ug/L	197537	1	10/12/2014 14:46	NP
Vinyl chloride	BRL	1.0		ug/L	197537	1	10/12/2014 14:46	NP
Surr: 4-Bromofluorobenzene	84.8	66.2-120		%REC	197537	1	10/12/2014 14:46	NP
Surr: Dibromofluoromethane	113	79.5-121		%REC	197537	1	10/12/2014 14:46	NP
Surr: Toluene-d8	96.3	77-117		%REC	197537	1	10/12/2014 14:46	NP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 20-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-18S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/9/2014 9:27:00 AM
Lab ID:	1410929-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Organic Carbon (TOC) SW9060A								
Organic Carbon, Total	BRL	1.00		mg/L	R277878	1	10/14/2014 19:27	JM
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
1,1-Dichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
1,1-Dichloroethene	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
1,2-Dibromoethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
1,2-Dichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
1,2-Dichloropropane	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
2-Butanone	BRL	50		ug/L	197537	1	10/12/2014 15:11	NP
2-Hexanone	BRL	10		ug/L	197537	1	10/12/2014 15:11	NP
4-Methyl-2-pentanone	BRL	10		ug/L	197537	1	10/12/2014 15:11	NP
Acetone	BRL	50		ug/L	197537	1	10/12/2014 15:11	NP
Benzene	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Bromodichloromethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Bromoform	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Bromomethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Carbon disulfide	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Carbon tetrachloride	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Chlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Chloroethane	BRL	10		ug/L	197537	1	10/12/2014 15:11	NP
Chloroform	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Chloromethane	BRL	10		ug/L	197537	1	10/12/2014 15:11	NP
cis-1,2-Dichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 15:11	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Cyclohexane	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Dibromochloromethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Dichlorodifluoromethane	BRL	10		ug/L	197537	1	10/12/2014 15:11	NP
Ethylbenzene	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Freon-113	BRL	10		ug/L	197537	1	10/12/2014 15:11	NP
Isopropylbenzene	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
m,p-Xylene	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Methyl acetate	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 20-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-18S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/9/2014 9:27:00 AM
Lab ID:	1410929-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Methylcyclohexane	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Methylene chloride	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
o-Xylene	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Styrene	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Tetrachloroethene	240	10		ug/L	197537	10	10/13/2014 12:25	NP
Toluene	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 15:11	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Trichloroethene	2.8	1.0		ug/L	197537	1	10/12/2014 15:11	NP
Trichlorofluoromethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:11	NP
Vinyl chloride	BRL	1.0		ug/L	197537	1	10/12/2014 15:11	NP
Surr: 4-Bromofluorobenzene	84.5	66.2-120		%REC	197537	1	10/12/2014 15:11	NP
Surr: 4-Bromofluorobenzene	85.2	66.2-120		%REC	197537	10	10/13/2014 12:25	NP
Surr: Dibromofluoromethane	107	79.5-121		%REC	197537	10	10/13/2014 12:25	NP
Surr: Dibromofluoromethane	112	79.5-121		%REC	197537	1	10/12/2014 15:11	NP
Surr: Toluene-d8	92.5	77-117		%REC	197537	10	10/13/2014 12:25	NP
Surr: Toluene-d8	95.2	77-117		%REC	197537	1	10/12/2014 15:11	NP
Sulfide by SW9030B/9034				**(SW9030B)**				
Sulfide	BRL	2.00		mg/L	197736	1	10/14/2014 14:50	AB
ION SCAN SW9056A								
Chloride	4.3	1.0		mg/L	R278037	1	10/10/2014 10:29	YS
Nitrate	1.6	0.25		mg/L	R278037	1	10/10/2014 10:29	YS
Nitrite	BRL	0.25		mg/L	R278037	1	10/10/2014 10:29	YS
Sulfate	BRL	1.0		mg/L	R278037	1	10/10/2014 10:29	YS
GC Analysis of Gaseous Samples SOP-RSK 175				**(RSK175)**				
Ethane	BRL	9		ug/L	197461	1	10/15/2014 17:27	JM
Ethylene	BRL	7		ug/L	197461	1	10/15/2014 17:27	JM
Methane	13	4		ug/L	197461	1	10/15/2014 17:27	JM
Ferrous Iron SM3500-Fe-B								
Iron, as Ferric (Fe+3)	0.888	0.100		mg/L	R277874	1	10/10/2014 08:45	AB
Iron, as Ferrous (Fe+2)	BRL	0.100		mg/L	R277874	1	10/10/2014 08:45	AB
METALS, TOTAL SW6010C				**(SW3010A)**				
Iron	0.888	0.100		mg/L	197606	1	10/14/2014 20:10	JL

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 20-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-19S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/9/2014 11:57:00 AM
Lab ID:	1410929-006	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Organic Carbon (TOC) SW9060A								
Organic Carbon, Total	BRL	1.00		mg/L	R277878	1	10/14/2014 20:55	JM
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
1,1-Dichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
1,1-Dichloroethene	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
1,2-Dibromoethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
1,2-Dichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
1,2-Dichloropropane	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
2-Butanone	BRL	50		ug/L	197537	1	10/12/2014 15:35	NP
2-Hexanone	BRL	10		ug/L	197537	1	10/12/2014 15:35	NP
4-Methyl-2-pentanone	BRL	10		ug/L	197537	1	10/12/2014 15:35	NP
Acetone	BRL	50		ug/L	197537	1	10/12/2014 15:35	NP
Benzene	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Bromodichloromethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Bromoform	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Bromomethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Carbon disulfide	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Carbon tetrachloride	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Chlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Chloroethane	BRL	10		ug/L	197537	1	10/12/2014 15:35	NP
Chloroform	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Chloromethane	BRL	10		ug/L	197537	1	10/12/2014 15:35	NP
cis-1,2-Dichloroethene	1.1	1.0		ug/L	197537	1	10/12/2014 15:35	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Cyclohexane	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Dibromochloromethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Dichlorodifluoromethane	BRL	10		ug/L	197537	1	10/12/2014 15:35	NP
Ethylbenzene	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Freon-113	BRL	10		ug/L	197537	1	10/12/2014 15:35	NP
Isopropylbenzene	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
m,p-Xylene	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Methyl acetate	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 20-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-19S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/9/2014 11:57:00 AM
Lab ID:	1410929-006	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Methylcyclohexane	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Methylene chloride	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
o-Xylene	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Styrene	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Tetrachloroethene	17	1.0		ug/L	197537	1	10/12/2014 15:35	NP
Toluene	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 15:35	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Trichloroethene	2.3	1.0		ug/L	197537	1	10/12/2014 15:35	NP
Trichlorofluoromethane	BRL	5.0		ug/L	197537	1	10/12/2014 15:35	NP
Vinyl chloride	BRL	1.0		ug/L	197537	1	10/12/2014 15:35	NP
Surr: 4-Bromofluorobenzene	85.6	66.2-120		%REC	197537	1	10/12/2014 15:35	NP
Surr: Dibromofluoromethane	113	79.5-121		%REC	197537	1	10/12/2014 15:35	NP
Surr: Toluene-d8	97.4	77-117		%REC	197537	1	10/12/2014 15:35	NP
Sulfide by SW9030B/9034				**(SW9030B)**				
Sulfide	BRL	2.00		mg/L	197736	1	10/14/2014 14:50	AB
ION SCAN SW9056A								
Chloride	2.7	1.0		mg/L	R278037	1	10/10/2014 10:44	YS
Nitrate	0.50	0.25		mg/L	R278037	1	10/10/2014 10:44	YS
Nitrite	BRL	0.25		mg/L	R278037	1	10/10/2014 10:44	YS
Sulfate	6.2	1.0		mg/L	R278037	1	10/10/2014 10:44	YS
GC Analysis of Gaseous Samples SOP-RSK 175				**(RSK175)**				
Ethane	BRL	9		ug/L	197461	1	10/15/2014 17:32	JM
Ethylene	BRL	7		ug/L	197461	1	10/15/2014 17:32	JM
Methane	BRL	4		ug/L	197461	1	10/15/2014 17:32	JM
Ferrous Iron SM3500-Fe-B								
Iron, as Ferric (Fe+3)	0.117	0.100		mg/L	R277874	1	10/10/2014 08:45	AB
Iron, as Ferrous (Fe+2)	BRL	0.100		mg/L	R277874	1	10/10/2014 08:45	AB
METALS, TOTAL SW6010C				**(SW3010A)**				
Iron	0.117	0.100		mg/L	197606	1	10/14/2014 20:13	JL

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 20-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-20S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/9/2014 2:52:00 PM
Lab ID:	1410929-007	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Organic Carbon (TOC) SW9060A								
Organic Carbon, Total	1.43	1.00		mg/L	R277878	1	10/14/2014 21:15	JM
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
1,1-Dichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
1,1-Dichloroethene	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
1,2-Dibromoethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
1,2-Dichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
1,2-Dichloropropane	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
2-Butanone	BRL	50		ug/L	197537	1	10/12/2014 16:00	NP
2-Hexanone	BRL	10		ug/L	197537	1	10/12/2014 16:00	NP
4-Methyl-2-pentanone	BRL	10		ug/L	197537	1	10/12/2014 16:00	NP
Acetone	BRL	50		ug/L	197537	1	10/12/2014 16:00	NP
Benzene	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Bromodichloromethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Bromoform	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Bromomethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Carbon disulfide	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Carbon tetrachloride	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Chlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Chloroethane	BRL	10		ug/L	197537	1	10/12/2014 16:00	NP
Chloroform	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Chloromethane	BRL	10		ug/L	197537	1	10/12/2014 16:00	NP
cis-1,2-Dichloroethene	4.1	1.0		ug/L	197537	1	10/12/2014 16:00	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Cyclohexane	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Dibromochloromethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Dichlorodifluoromethane	BRL	10		ug/L	197537	1	10/12/2014 16:00	NP
Ethylbenzene	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Freon-113	BRL	10		ug/L	197537	1	10/12/2014 16:00	NP
Isopropylbenzene	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
m,p-Xylene	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Methyl acetate	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 20-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-20S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/9/2014 2:52:00 PM
Lab ID:	1410929-007	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Methylcyclohexane	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Methylene chloride	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
o-Xylene	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Styrene	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Tetrachloroethene	18	1.0		ug/L	197537	1	10/12/2014 16:00	NP
Toluene	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 16:00	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Trichloroethene	3.8	1.0		ug/L	197537	1	10/12/2014 16:00	NP
Trichlorofluoromethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:00	NP
Vinyl chloride	BRL	1.0		ug/L	197537	1	10/12/2014 16:00	NP
Surr: 4-Bromofluorobenzene	84.4	66.2-120		%REC	197537	1	10/12/2014 16:00	NP
Surr: Dibromofluoromethane	112	79.5-121		%REC	197537	1	10/12/2014 16:00	NP
Surr: Toluene-d8	97.8	77-117		%REC	197537	1	10/12/2014 16:00	NP
Sulfide by SW9030B/9034				**(SW9030B)**				
Sulfide	BRL	2.00		mg/L	197736	1	10/14/2014 14:50	AB
ION SCAN SW9056A								
Chloride	3.4	1.0		mg/L	R278037	1	10/10/2014 10:59	YS
Nitrate	BRL	0.25		mg/L	R278037	1	10/10/2014 10:59	YS
Nitrite	BRL	0.25		mg/L	R278037	1	10/10/2014 10:59	YS
Sulfate	9.6	1.0		mg/L	R278037	1	10/10/2014 10:59	YS
GC Analysis of Gaseous Samples SOP-RSK 175				**(RSK175)**				
Ethane	BRL	9		ug/L	197461	1	10/15/2014 17:36	JM
Ethylene	BRL	7		ug/L	197461	1	10/15/2014 17:36	JM
Methane	47	4		ug/L	197461	1	10/15/2014 17:36	JM
Ferrous Iron SM3500-Fe-B								
Iron, as Ferric (Fe+3)	BRL	0.100		mg/L	R277874	1	10/10/2014 08:45	AB
Iron, as Ferrous (Fe+2)	BRL	0.100		mg/L	R277874	1	10/10/2014 08:45	AB
METALS, TOTAL SW6010C				**(SW3010A)**				
Iron	BRL	0.100		mg/L	197606	1	10/14/2014 20:17	JL

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 20-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-6S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/9/2014 4:38:00 PM
Lab ID:	1410929-008	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Organic Carbon (TOC) SW9060A								
Organic Carbon, Total	1.62	1.00		mg/L	R277878	1	10/14/2014 21:40	JM
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
1,1-Dichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
1,1-Dichloroethene	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
1,2-Dibromoethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
1,2-Dichloroethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
1,2-Dichloropropane	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
2-Butanone	BRL	50		ug/L	197537	1	10/12/2014 16:25	NP
2-Hexanone	BRL	10		ug/L	197537	1	10/12/2014 16:25	NP
4-Methyl-2-pentanone	BRL	10		ug/L	197537	1	10/12/2014 16:25	NP
Acetone	BRL	50		ug/L	197537	1	10/12/2014 16:25	NP
Benzene	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Bromodichloromethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Bromoform	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Bromomethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Carbon disulfide	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Carbon tetrachloride	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Chlorobenzene	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Chloroethane	BRL	10		ug/L	197537	1	10/12/2014 16:25	NP
Chloroform	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Chloromethane	BRL	10		ug/L	197537	1	10/12/2014 16:25	NP
cis-1,2-Dichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 16:25	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Cyclohexane	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Dibromochloromethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Dichlorodifluoromethane	BRL	10		ug/L	197537	1	10/12/2014 16:25	NP
Ethylbenzene	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Freon-113	BRL	10		ug/L	197537	1	10/12/2014 16:25	NP
Isopropylbenzene	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
m,p-Xylene	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Methyl acetate	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 20-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-6S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/9/2014 4:38:00 PM
Lab ID:	1410929-008	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Methylcyclohexane	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Methylene chloride	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
o-Xylene	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Styrene	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Tetrachloroethene	3.2	1.0		ug/L	197537	1	10/12/2014 16:25	NP
Toluene	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 16:25	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Trichloroethene	BRL	1.0		ug/L	197537	1	10/12/2014 16:25	NP
Trichlorofluoromethane	BRL	5.0		ug/L	197537	1	10/12/2014 16:25	NP
Vinyl chloride	BRL	1.0		ug/L	197537	1	10/12/2014 16:25	NP
Surr: 4-Bromofluorobenzene	84.5	66.2-120		%REC	197537	1	10/12/2014 16:25	NP
Surr: Dibromofluoromethane	110	79.5-121		%REC	197537	1	10/12/2014 16:25	NP
Surr: Toluene-d8	97.2	77-117		%REC	197537	1	10/12/2014 16:25	NP
Sulfide by SW9030B/9034				**(SW9030B)**				
Sulfide	BRL	2.00		mg/L	197736	1	10/14/2014 14:50	AB
ION SCAN SW9056A								
Chloride	4.4	1.0		mg/L	R278037	1	10/10/2014 11:14	YS
Nitrate	BRL	0.25		mg/L	R278037	1	10/10/2014 11:14	YS
Nitrite	BRL	0.25		mg/L	R278037	1	10/10/2014 11:14	YS
Sulfate	48	1.0		mg/L	R278037	1	10/10/2014 11:14	YS
GC Analysis of Gaseous Samples SOP-RSK 175				**(RSK175)**				
Ethane	BRL	9		ug/L	197461	1	10/15/2014 17:41	JM
Ethylene	BRL	7		ug/L	197461	1	10/15/2014 17:41	JM
Methane	260	4		ug/L	197461	1	10/15/2014 17:41	JM
Ferrous Iron SM3500-Fe-B								
Iron, as Ferric (Fe+3)	3.09	0.100		mg/L	R277874	1	10/10/2014 08:45	AB
Iron, as Ferrous (Fe+2)	BRL	0.100		mg/L	R277874	1	10/10/2014 08:45	AB
METALS, TOTAL SW6010C				**(SW3010A)**				
Iron	3.09	0.100		mg/L	197606	1	10/14/2014 19:20	JL

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc.

Sample/Cooler Receipt Checklist

Client Sailors Work Order Number 1410929

Checklist completed by _____ 10/9/14
Signature Date

Carrier name: FedEx __ UPS __ Courier __ Client ✓ US Mail __ Other _____

Shipping container/cooler in good condition? Yes ✓ No __ Not Present __

Custody seals intact on shipping container/cooler? Yes __ No __ Not Present ✓

Custody seals intact on sample bottles? Yes __ No __ Not Present ✓

Container/Temp Blank temperature in compliance? (0°≤6°C)* Yes ✓ No __

Cooler #1 3.6°C Cooler #2 _____ Cooler #3 _____ Cooler #4 _____ Cooler#5 _____ Cooler #6 _____

Chain of custody present? Yes ✓ No __

Chain of custody signed when relinquished and received? Yes ✓ No __

Chain of custody agrees with sample labels? Yes ✓ No __

Samples in proper container/bottle? Yes ✓ No __

Sample containers intact? Yes ✓ No __

Sufficient sample volume for indicated test? Yes ✓ No __

All samples received within holding time? Yes ✓ No __

Was TAT marked on the COC? Yes ✓ No __

Proceed with Standard TAT as per project history? Yes __ No __ Not Applicable ✓

Water - VOA vials have zero headspace? No VOA vials submitted __ Yes ✓ No __

Water - pH acceptable upon receipt? Yes ✓ No __ Not Applicable __

Adjusted? _____ Checked by _____

Sample Condition: Good ✓ Other(Explain) _____

(For diffusive samples or AIHA lead) Is a known blank included? Yes __ No ✓

See Case Narrative for resolution of the Non-Conformance.

* Samples do not have to comply with the given range for certain parameters.

\\Aes_server\I\Sample Receipt\My Documents\COCs and pH Adjustment Sheet\Sample_Cooler_Recipt_Checklist_Rev1.rtf

Client: Sailors Engineering Associates
Project: Spalding Crnrs S/C
Lab Order: 1410929

Dates Report

Lab Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1410929-001A	TRIP BLANK	10/8/2014 12:00:00AM	Aqueous	TCL VOLATILE ORGANICS		10/12/2014	10/12/2014
1410929-002A	MW-1D	10/8/2014 12:04:00PM	Groundwater	TCL VOLATILE ORGANICS		10/12/2014	10/12/2014
1410929-003A	MW-10S	10/8/2014 2:13:00PM	Groundwater	TCL VOLATILE ORGANICS		10/12/2014	10/12/2014
1410929-004A	MW-17S	10/8/2014 4:19:00PM	Groundwater	TCL VOLATILE ORGANICS		10/12/2014	10/12/2014
1410929-005A	MW-18S	10/9/2014 9:27:00AM	Groundwater	TCL VOLATILE ORGANICS		10/12/2014	10/12/2014
1410929-005A	MW-18S	10/9/2014 9:27:00AM	Groundwater	TCL VOLATILE ORGANICS		10/12/2014	10/13/2014
1410929-005B	MW-18S	10/9/2014 9:27:00AM	Groundwater	GC Analysis of Gaseous Samples		10/14/2014	10/15/2014
1410929-005C	MW-18S	10/9/2014 9:27:00AM	Groundwater	TOTAL METALS BY ICP		10/14/2014	10/14/2014
1410929-005D	MW-18S	10/9/2014 9:27:00AM	Groundwater	Total Organic Carbon (TOC)			10/14/2014
1410929-005E	MW-18S	10/9/2014 9:27:00AM	Groundwater	Sulfide by SW9030/9034		10/14/2014	10/14/2014
1410929-005F	MW-18S	10/9/2014 9:27:00AM	Groundwater	ION SCAN			10/10/2014
1410929-005F	MW-18S	10/9/2014 9:27:00AM	Groundwater	Ferrous Iron			10/10/2014
1410929-006A	MW-19S	10/9/2014 11:57:00AM	Groundwater	TCL VOLATILE ORGANICS		10/12/2014	10/12/2014
1410929-006B	MW-19S	10/9/2014 11:57:00AM	Groundwater	GC Analysis of Gaseous Samples		10/14/2014	10/15/2014
1410929-006C	MW-19S	10/9/2014 11:57:00AM	Groundwater	TOTAL METALS BY ICP		10/14/2014	10/14/2014
1410929-006D	MW-19S	10/9/2014 11:57:00AM	Groundwater	Total Organic Carbon (TOC)			10/14/2014
1410929-006E	MW-19S	10/9/2014 11:57:00AM	Groundwater	Sulfide by SW9030/9034		10/14/2014	10/14/2014
1410929-006F	MW-19S	10/9/2014 11:57:00AM	Groundwater	ION SCAN			10/10/2014
1410929-006F	MW-19S	10/9/2014 11:57:00AM	Groundwater	Ferrous Iron			10/10/2014
1410929-007A	MW-20S	10/9/2014 2:52:00PM	Groundwater	TCL VOLATILE ORGANICS		10/12/2014	10/12/2014
1410929-007B	MW-20S	10/9/2014 2:52:00PM	Groundwater	GC Analysis of Gaseous Samples		10/14/2014	10/15/2014
1410929-007C	MW-20S	10/9/2014 2:52:00PM	Groundwater	TOTAL METALS BY ICP		10/14/2014	10/14/2014
1410929-007D	MW-20S	10/9/2014 2:52:00PM	Groundwater	Total Organic Carbon (TOC)			10/14/2014
1410929-007E	MW-20S	10/9/2014 2:52:00PM	Groundwater	Sulfide by SW9030/9034		10/14/2014	10/14/2014
1410929-007F	MW-20S	10/9/2014 2:52:00PM	Groundwater	ION SCAN			10/10/2014
1410929-007F	MW-20S	10/9/2014 2:52:00PM	Groundwater	Ferrous Iron			10/10/2014
1410929-008A	MW-6S	10/9/2014 4:38:00PM	Groundwater	TCL VOLATILE ORGANICS		10/12/2014	10/12/2014
1410929-008B	MW-6S	10/9/2014 4:38:00PM	Groundwater	GC Analysis of Gaseous Samples		10/14/2014	10/15/2014
1410929-008C	MW-6S	10/9/2014 4:38:00PM	Groundwater	TOTAL METALS BY ICP		10/14/2014	10/14/2014

Client: Sailors Engineering Associates
Project: Spalding Crnrs S/C
Lab Order: 1410929

Dates Report

Lab Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1410929-008D	MW-6S	10/9/2014 4:38:00PM	Groundwater	Total Organic Carbon (TOC)			10/14/2014
1410929-008E	MW-6S	10/9/2014 4:38:00PM	Groundwater	Sulfide by SW9030/9034		10/14/2014	10/14/2014
1410929-008F	MW-6S	10/9/2014 4:38:00PM	Groundwater	ION SCAN			10/10/2014
1410929-008F	MW-6S	10/9/2014 4:38:00PM	Groundwater	Ferrous Iron			10/10/2014

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410929

ANALYTICAL QC SUMMARY REPORT

BatchID: 197461

Sample ID: **MB-197461** Client ID: Units: **ug/L** Prep Date: **10/14/2014** Run No: **277898**
SampleType: **MBLK** TestCode: **GC Analysis of Gaseous Samples SOP-RSK 175** BatchID: **197461** Analysis Date: **10/15/2014** Seq No: **5872526**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Ethane	BRL	9									
Ethylene	BRL	7									
Methane	BRL	4									

Sample ID: **LCS-197461** Client ID: Units: **ug/L** Prep Date: **10/14/2014** Run No: **277898**
SampleType: **LCS** TestCode: **GC Analysis of Gaseous Samples SOP-RSK 175** BatchID: **197461** Analysis Date: **10/15/2014** Seq No: **5872529**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Ethane	107.4	9	200.0		53.7	41.6	115				
Ethylene	71.67	7	200.0		35.8	26.9	115				
Methane	117.7	4	200.0		58.9	45.2	115				

Sample ID: **LCSD-197461** Client ID: Units: **ug/L** Prep Date: **10/14/2014** Run No: **277898**
SampleType: **LCSD** TestCode: **GC Analysis of Gaseous Samples SOP-RSK 175** BatchID: **197461** Analysis Date: **10/15/2014** Seq No: **5872532**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Ethane	104.5	9	200.0		52.2	41.6	115	107.4	2.78	20	
Ethylene	69.87	7	200.0		34.9	26.9	115	71.67	2.55	20	
Methane	114.5	4	200.0		57.3	45.2	115	117.7	2.75	20	

Sample ID: **1410921-043BMS** Client ID: Units: **ug/L** Prep Date: **10/14/2014** Run No: **277898**
SampleType: **MS** TestCode: **GC Analysis of Gaseous Samples SOP-RSK 175** BatchID: **197461** Analysis Date: **10/15/2014** Seq No: **5873548**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Ethane	100.4	9	200.0		50.2	40.1	115				
Ethylene	69.56	7	200.0		34.8	24.5	115				
Methane	110.8	4	200.0	5.989	52.4	41.1	115				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410929

ANALYTICAL QC SUMMARY REPORT

BatchID: 197461

Sample ID: **1410921-043BMSD** Client ID:
SampleType: **MSD** TestCode: **GC Analysis of Gaseous Samples SOP-RSK 175**
Units: **ug/L** BatchID: **197461**
Prep Date: **10/14/2014** Analysis Date: **10/15/2014**
Run No: **277898** Seq No: **5873549**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Ethane	99.48	9	200.0		49.7	40.1	115	100.4	0.882	20	
Ethylene	69.03	7	200.0		34.5	24.5	115	69.56	0.763	20	
Methane	108.7	4	200.0	5.989	51.3	41.1	115	110.8	1.97	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410929

ANALYTICAL QC SUMMARY REPORT

BatchID: 197537

Sample ID: **MB-197537** Client ID: Units: **ug/L** Prep Date: **10/12/2014** Run No: **277650**
SampleType: **MBLK** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197537** Analysis Date: **10/12/2014** Seq No: **5867012**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	BRL	5.0									
1,1,2,2-Tetrachloroethane	BRL	5.0									
1,1,2-Trichloroethane	BRL	5.0									
1,1-Dichloroethane	BRL	5.0									
1,1-Dichloroethene	BRL	5.0									
1,2,4-Trichlorobenzene	BRL	5.0									
1,2-Dibromo-3-chloropropane	BRL	5.0									
1,2-Dibromoethane	BRL	5.0									
1,2-Dichlorobenzene	BRL	5.0									
1,2-Dichloroethane	BRL	5.0									
1,2-Dichloropropane	BRL	5.0									
1,3-Dichlorobenzene	BRL	5.0									
1,4-Dichlorobenzene	BRL	5.0									
2-Butanone	BRL	50									
2-Hexanone	BRL	10									
4-Methyl-2-pentanone	BRL	10									
Acetone	BRL	50									
Benzene	BRL	5.0									
Bromodichloromethane	BRL	5.0									
Bromoform	BRL	5.0									
Bromomethane	BRL	5.0									
Carbon disulfide	BRL	5.0									
Carbon tetrachloride	BRL	5.0									
Chlorobenzene	BRL	5.0									
Chloroethane	BRL	10									
Chloroform	BRL	5.0									
Chloromethane	BRL	10									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410929

ANALYTICAL QC SUMMARY REPORT

BatchID: 197537

Sample ID: **MB-197537** Client ID: Units: **ug/L** Prep Date: **10/12/2014** Run No: **277650**
SampleType: **MBLK** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197537** Analysis Date: **10/12/2014** Seq No: **5867012**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	BRL	5.0									
cis-1,3-Dichloropropene	BRL	5.0									
Cyclohexane	BRL	5.0									
Dibromochloromethane	BRL	5.0									
Dichlorodifluoromethane	BRL	10									
Ethylbenzene	BRL	5.0									
Freon-113	BRL	10									
Isopropylbenzene	BRL	5.0									
m,p-Xylene	BRL	5.0									
Methyl acetate	BRL	5.0									
Methyl tert-butyl ether	BRL	5.0									
Methylcyclohexane	BRL	5.0									
Methylene chloride	BRL	5.0									
o-Xylene	BRL	5.0									
Styrene	BRL	5.0									
Tetrachloroethene	BRL	5.0									
Toluene	BRL	5.0									
trans-1,2-Dichloroethene	BRL	5.0									
trans-1,3-Dichloropropene	BRL	5.0									
Trichloroethene	BRL	5.0									
Trichlorofluoromethane	BRL	5.0									
Vinyl chloride	BRL	2.0									
Surr: 4-Bromofluorobenzene	44.14	0	50.00		88.3	66.2	120				
Surr: Dibromofluoromethane	51.99	0	50.00		104	79.5	121				
Surr: Toluene-d8	47.15	0	50.00		94.3	77	117				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410929

ANALYTICAL QC SUMMARY REPORT

BatchID: 197537

Sample ID: **LCS-197537** Client ID: Units: **ug/L** Prep Date: **10/12/2014** Run No: **277650**
SampleType: **LCS** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197537** Analysis Date: **10/12/2014** Seq No: **5867011**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	52.67	5.0	50.00		105	63.1	140				
Benzene	52.98	5.0	50.00		106	74.2	129				
Chlorobenzene	52.83	5.0	50.00		106	70	129				
Toluene	52.52	5.0	50.00		105	74.2	129				
Trichloroethene	52.61	5.0	50.00		105	71.2	135				
Surr: 4-Bromofluorobenzene	45.81	0	50.00		91.6	66.2	120				
Surr: Dibromofluoromethane	48.74	0	50.00		97.5	79.5	121				
Surr: Toluene-d8	45.49	0	50.00		91.0	77	117				

Sample ID: **1410929-002AMS** Client ID: **MW-1D** Units: **ug/L** Prep Date: **10/12/2014** Run No: **277650**
SampleType: **MS** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197537** Analysis Date: **10/12/2014** Seq No: **5867021**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	61.85	5.0	50.00		124	60.2	159				
Benzene	60.32	5.0	50.00		121	70.2	138				
Chlorobenzene	60.70	5.0	50.00		121	70.1	133				
Toluene	60.50	5.0	50.00		121	70	139				
Trichloroethene	58.68	5.0	50.00		117	70.1	144				
Surr: 4-Bromofluorobenzene	44.10	0	50.00		88.2	66.2	120				
Surr: Dibromofluoromethane	51.79	0	50.00		104	79.5	121				
Surr: Toluene-d8	45.45	0	50.00		90.9	77	117				

Sample ID: **1410929-002AMSD** Client ID: **MW-1D** Units: **ug/L** Prep Date: **10/12/2014** Run No: **277650**
SampleType: **MSD** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197537** Analysis Date: **10/12/2014** Seq No: **5867023**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	62.17	5.0	50.00		124	60.2	159	61.85	0.516	19.2	
Benzene	61.10	5.0	50.00		122	70.2	138	60.32	1.28	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410929

ANALYTICAL QC SUMMARY REPORT

BatchID: 197537

Sample ID: **1410929-002AMSD** Client ID: **MW-1D** Units: **ug/L** Prep Date: **10/12/2014** Run No: **277650**
SampleType: **MSD** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197537** Analysis Date: **10/12/2014** Seq No: **5867023**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Chlorobenzene	61.57	5.0	50.00		123	70.1	133	60.70	1.42	20	
Toluene	62.10	5.0	50.00		124	70	139	60.50	2.61	20	
Trichloroethene	59.79	5.0	50.00		120	70.1	144	58.68	1.87	20	
Surr: 4-Bromofluorobenzene	44.79	0	50.00		89.6	66.2	120	44.10	0	0	
Surr: Dibromofluoromethane	53.58	0	50.00		107	79.5	121	51.79	0	0	
Surr: Toluene-d8	46.91	0	50.00		93.8	77	117	45.45	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410929

ANALYTICAL QC SUMMARY REPORT

BatchID: 197606

Sample ID: **MB-197606** Client ID: Units: **mg/L** Prep Date: **10/14/2014** Run No: **277888**
SampleType: **MBLK** TestCode: **METALS, TOTAL** **SW6010C** BatchID: **197606** Analysis Date: **10/14/2014** Seq No: **5872409**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Iron	BRL	0.100									

Sample ID: **LCS-197606** Client ID: Units: **mg/L** Prep Date: **10/14/2014** Run No: **277888**
SampleType: **LCS** TestCode: **METALS, TOTAL** **SW6010C** BatchID: **197606** Analysis Date: **10/14/2014** Seq No: **5872410**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Iron	10.28	0.100	10.00		103	80	120				

Sample ID: **1410929-008CMS** Client ID: **MW-6S** Units: **mg/L** Prep Date: **10/14/2014** Run No: **277888**
SampleType: **MS** TestCode: **METALS, TOTAL** **SW6010C** BatchID: **197606** Analysis Date: **10/14/2014** Seq No: **5872412**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Iron	13.02	0.100	10.00	3.088	99.3	75	125				

Sample ID: **1410929-008CMSD** Client ID: **MW-6S** Units: **mg/L** Prep Date: **10/14/2014** Run No: **277888**
SampleType: **MSD** TestCode: **METALS, TOTAL** **SW6010C** BatchID: **197606** Analysis Date: **10/14/2014** Seq No: **5872413**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Iron	13.19	0.100	10.00	3.088	101	75	125	13.02	1.33	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410929

ANALYTICAL QC SUMMARY REPORT

BatchID: 197736

Sample ID: **MB-197736**	Client ID:			Units: **mg/L**		Prep Date: **10/14/2014**		Run No: **277930**	
SampleType: **MBLK**	TestCode: **Sulfide by SW9030B/9034**			BatchID: **197736**		Analysis Date: **10/14/2014**		Seq No: **5873403**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfide	BRL	2.00									

Sample ID: **LCS-197736**	Client ID:			Units: **mg/L**		Prep Date: **10/14/2014**		Run No: **277930**	
SampleType: **LCS**	TestCode: **Sulfide by SW9030B/9034**			BatchID: **197736**		Analysis Date: **10/14/2014**		Seq No: **5873404**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfide	384.0	2.00	384.0		100	40	120				

Sample ID: **1410929-005EMS**	Client ID: **MW-18S**			Units: **mg/L**		Prep Date: **10/14/2014**		Run No: **277930**	
SampleType: **MS**	TestCode: **Sulfide by SW9030B/9034**			BatchID: **197736**		Analysis Date: **10/14/2014**		Seq No: **5873414**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfide	18.60	2.00	19.20		96.9	76.7	120				

Sample ID: **1410929-005EMSD**	Client ID: **MW-18S**			Units: **mg/L**		Prep Date: **10/14/2014**		Run No: **277930**	
SampleType: **MSD**	TestCode: **Sulfide by SW9030B/9034**			BatchID: **197736**		Analysis Date: **10/14/2014**		Seq No: **5873415**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfide	18.80	2.00	19.20		97.9	76.7	120	18.60	1.07	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410929

ANALYTICAL QC SUMMARY REPORT

BatchID: R277874

Sample ID: **MB-R277874**	Client ID:			Units: **mg/L**	Prep Date:		Run No: **277874**
SampleType: **MBLK**	TestCode: **Ferrous Iron** **SM3500-Fe-B**			BatchID: **R277874**	Analysis Date: **10/09/2014**		Seq No: **5871984**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Iron, as Ferrous (Fe+2)	BRL	0.100									

Sample ID: **LCS-R277874**	Client ID:			Units: **mg/L**	Prep Date:		Run No: **277874**
SampleType: **LCS**	TestCode: **Ferrous Iron** **SM3500-Fe-B**			BatchID: **R277874**	Analysis Date: **10/09/2014**		Seq No: **5871985**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Iron, as Ferrous (Fe+2)	0.5011	0.100	0.5000		100	85	115				

Sample ID: **1410771-004EMS**	Client ID:			Units: **mg/L**	Prep Date:		Run No: **277874**
SampleType: **MS**	TestCode: **Ferrous Iron** **SM3500-Fe-B**			BatchID: **R277874**	Analysis Date: **10/09/2014**		Seq No: **5872000**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Iron, as Ferrous (Fe+2)	0.4931	0.100	0.5000		98.6	80	120				

Sample ID: **1410771-004EMSD**	Client ID:			Units: **mg/L**	Prep Date:		Run No: **277874**
SampleType: **MSD**	TestCode: **Ferrous Iron** **SM3500-Fe-B**			BatchID: **R277874**	Analysis Date: **10/09/2014**		Seq No: **5872001**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Iron, as Ferrous (Fe+2)	0.5091	0.100	0.5000		102	80	120	0.4931	3.19	30	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410929

ANALYTICAL QC SUMMARY REPORT

BatchID: R277878

Sample ID: **MB-R277878** Client ID: Units: **mg/L** Prep Date: Run No: **277878**
SampleType: **MBLK** TestCode: **Total Organic Carbon (TOC) SW9060A** BatchID: **R277878** Analysis Date: **10/14/2014** Seq No: **5872121**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Organic Carbon, Total	BRL	1.00									

Sample ID: **LCS-R277878** Client ID: Units: **mg/L** Prep Date: Run No: **277878**
SampleType: **LCS** TestCode: **Total Organic Carbon (TOC) SW9060A** BatchID: **R277878** Analysis Date: **10/14/2014** Seq No: **5872119**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Organic Carbon, Total	24.09	1.00	25.00		96.4	90	110				

Sample ID: **1410789-001CMS** Client ID: Units: **mg/L** Prep Date: Run No: **277878**
SampleType: **MS** TestCode: **Total Organic Carbon (TOC) SW9060A** BatchID: **R277878** Analysis Date: **10/14/2014** Seq No: **5872149**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Organic Carbon, Total	26.59	1.00	25.00	1.537	100	80	120				

Sample ID: **1410789-001CMSD** Client ID: Units: **mg/L** Prep Date: Run No: **277878**
SampleType: **MSD** TestCode: **Total Organic Carbon (TOC) SW9060A** BatchID: **R277878** Analysis Date: **10/14/2014** Seq No: **5872151**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Organic Carbon, Total	27.42	1.00	25.00	1.537	104	80	120	26.59	3.07	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410929

ANALYTICAL QC SUMMARY REPORT

BatchID: R278037

Sample ID: **MB-R278037** Client ID: Units: **mg/L** Prep Date: Run No: **278037**
SampleType: **MBLK** TestCode: **ION SCAN SW9056A** BatchID: **R278037** Analysis Date: **10/10/2014** Seq No: **5875456**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Chloride	BRL	1.0									
Nitrate	BRL	0.25									
Nitrite	BRL	0.25									
Sulfate	BRL	1.0									

Sample ID: **LCS-R278037** Client ID: Units: **mg/L** Prep Date: Run No: **278037**
SampleType: **LCS** TestCode: **ION SCAN SW9056A** BatchID: **R278037** Analysis Date: **10/10/2014** Seq No: **5875457**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Chloride	9.931	1.0	10.00		99.3	90	110				
Nitrate	5.015	0.25	5.000		100	90	110				
Nitrite	5.254	0.25	5.000		105	90	110				
Sulfate	22.96	1.0	25.00		91.9	90	110				

Sample ID: **1410929-005FMS** Client ID: **MW-18S** Units: **mg/L** Prep Date: Run No: **278037**
SampleType: **MS** TestCode: **ION SCAN SW9056A** BatchID: **R278037** Analysis Date: **10/10/2014** Seq No: **5875463**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Chloride	14.53	1.0	10.00	4.304	102	90	110				
Nitrate	6.598	0.25	5.000	1.589	100	90	110				
Nitrite	5.293	0.25	5.000		106	90	110				
Sulfate	24.15	1.0	25.00	0.9523	92.8	90	110				

Sample ID: **1410929-005FMSD** Client ID: **MW-18S** Units: **mg/L** Prep Date: Run No: **278037**
SampleType: **MSD** TestCode: **ION SCAN SW9056A** BatchID: **R278037** Analysis Date: **10/10/2014** Seq No: **5875464**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Chloride	14.37	1.0	10.00	4.304	101	90	110	14.53	1.07	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410929

ANALYTICAL QC SUMMARY REPORT

BatchID: R278037

Sample ID: **1410929-005FMSD** Client ID: **MW-18S** Units: **mg/L** Prep Date: Run No: **278037**
SampleType: **MSD** TestCode: **ION SCAN SW9056A** BatchID: **R278037** Analysis Date: **10/10/2014** Seq No: **5875464**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	6.596	0.25	5.000	1.589	100	90	110	6.598	0.026	20	
Nitrite	5.392	0.25	5.000		108	90	110	5.293	1.85	20	
Sulfate	24.02	1.0	25.00	0.9523	92.3	90	110	24.15	0.568	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

October 16, 2014

Rick Rudolph
Sailors Engineering Associates
1675 Spectrum Drive
Lawrenceville GA 30043

TEL: (770) 962-5922
FAX: (770) 962-7964

RE: Spalding Crnrs S/C

Dear Rick Rudolph: Order No: 1410C02

Analytical Environmental Services, Inc. received 5 samples on 10/13/2014 3:07:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES' certifications are as follows:
-NELAC/Florida Certification number E87582 for analysis of Environmental Water, soil/hazardous waste, and Drinking Water Microbiology, effective 07/01/14-06/30/15.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Inorganics), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 09/01/15.

These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Dorothy deBruyn
Project Manager

3080 Presidential Drive • Atlanta, Georgia 30340 • Tel: 770.457.8177 • Fax: 770.457.8188 • Toll Free: 800.972.4889
www.aesatlanta.com

ANALYTICAL ENVIRONMENTAL SERVICES, INC
3080 Presidential Drive, Atlanta GA 30340-3704
AES TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1410C02

Date: 10/13/14 Page 1 of 1

COMPANY:	ADDRESS:
Sailors Eng. Assoc	1675 Spectrum Dr Lawrenceville, GA 30043
PHONE: 770-962-5922	FAX:
SAMPLED BY: Michael Short	SIGNATURE:

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	ANALYSIS REQUESTED: VOC	PRESERVATION (See codes)	REMARKS	No # of Containers
1	MW-2S	10/13	10:14	✓		GW	✓			2
2	MW-21S	10/13	11:17	✓		GW	✓			2
3	SW-5	10/13	12:37	✓		GW	✓			2
4	MW-22S	10/13	14:34	✓		GW	✓			2
5	Trip Blank	10/13				W	✓			2
6										
7										
8										
9										
10										
11										
12										
13										
14										

Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.

RELINQUISHED BY:	DATE/TIME	RECEIVED BY	DATE/TIME
1:	10/13/14 15:07	1: Cataya Reeves	10/13/14 3:07p
2:		2:	
3:		3:	

SPECIAL INSTRUCTIONS/COMMENTS:

SHIPMENT METHOD
OUT / / VIA:
IN / / VIA:
CLIENT FedEx UPS MAIL COURIER GREYHOUND OTHER_____

PROJECT INFORMATION
PROJECT NAME: Spalding Corners S/C
PROJECT #: 102-063
SITE ADDRESS: 720 Spalding Dr
SEND REPORT TO: Rick Rudolph
INVOICE TO: (IF DIFFERENT FROM ABOVE)
QUOTE #:_____ PO#:_____

RECEIPT
Total # of Containers: 10

Turnaround Time Request
- (●) Standard 5 Business Days
- ( ) 2 Business Day Rush
- ( ) Next Business Day Rush
- ( ) Same Day Rush (auth req.)
- ( ) Other _____

STATE PROGRAM (if any): _____
E-mail? Y / N: Fax? Y / N
DATA PACKAGE: I II III IV

SAMPLES RECEIVED AFTER 3PM OR ON SATURDAY ARE CONSIDERED RECEIVED THE NEXT BUSINESS DAY. IF TURNAROUND TIME IS NOT INDICATED, AES WILL PROCEED WITH STANDARD TAT OF SAMPLES.
SAMPLES ARE DISPOSED 30 DAYS AFTER REPORT COMPLETION UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify) WW = Waste Water
PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-5S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/13/2014 10:14:00 AM
Lab ID:	1410C02-001	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
1,1,2-Trichloroethane	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
1,1-Dichloroethane	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
1,1-Dichloroethene	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
1,2-Dibromoethane	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
1,2-Dichlorobenzene	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
1,2-Dichloroethane	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
1,2-Dichloropropane	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
1,3-Dichlorobenzene	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
1,4-Dichlorobenzene	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
2-Butanone	BRL	50		ug/L	197667	1	10/15/2014 09:36	GK
2-Hexanone	BRL	10		ug/L	197667	1	10/15/2014 09:36	GK
4-Methyl-2-pentanone	BRL	10		ug/L	197667	1	10/15/2014 09:36	GK
Acetone	BRL	50		ug/L	197667	1	10/15/2014 09:36	GK
Benzene	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Bromodichloromethane	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Bromoform	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Bromomethane	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Carbon disulfide	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Carbon tetrachloride	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Chlorobenzene	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Chloroethane	BRL	10		ug/L	197667	1	10/15/2014 09:36	GK
Chloroform	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Chloromethane	BRL	10		ug/L	197667	1	10/15/2014 09:36	GK
cis-1,2-Dichloroethene	BRL	1.0		ug/L	197667	1	10/15/2014 09:36	GK
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Cyclohexane	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Dibromochloromethane	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Dichlorodifluoromethane	BRL	10		ug/L	197667	1	10/15/2014 09:36	GK
Ethylbenzene	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Freon-113	BRL	10		ug/L	197667	1	10/15/2014 09:36	GK
Isopropylbenzene	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
m,p-Xylene	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Methyl acetate	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Methyl tert-butyl ether	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Methylcyclohexane	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Methylene chloride	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
o-Xylene	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-5S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/13/2014 10:14:00 AM
Lab ID:	1410C02-001	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Tetrachloroethene	67	1.0		ug/L	197667	1	10/15/2014 09:36	GK
Toluene	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197667	1	10/15/2014 09:36	GK
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Trichloroethene	BRL	1.0		ug/L	197667	1	10/15/2014 09:36	GK
Trichlorofluoromethane	BRL	5.0		ug/L	197667	1	10/15/2014 09:36	GK
Vinyl chloride	BRL	1.0		ug/L	197667	1	10/15/2014 09:36	GK
Surr: 4-Bromofluorobenzene	90.1	66.2-120		%REC	197667	1	10/15/2014 09:36	GK
Surr: Dibromofluoromethane	99.7	79.5-121		%REC	197667	1	10/15/2014 09:36	GK
Surr: Toluene-d8	97.4	77-117		%REC	197667	1	10/15/2014 09:36	GK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-21S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/13/2014 11:17:00 AM
Lab ID:	1410C02-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
1,1,2-Trichloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
1,1-Dichloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
1,1-Dichloroethene	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
1,2-Dibromoethane	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
1,2-Dichlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
1,2-Dichloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
1,2-Dichloropropane	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
1,3-Dichlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
1,4-Dichlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
2-Butanone	BRL	50		ug/L	197667	1	10/16/2014 07:38	GK
2-Hexanone	BRL	10		ug/L	197667	1	10/16/2014 07:38	GK
4-Methyl-2-pentanone	BRL	10		ug/L	197667	1	10/16/2014 07:38	GK
Acetone	BRL	50		ug/L	197667	1	10/16/2014 07:38	GK
Benzene	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Bromodichloromethane	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Bromoform	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Bromomethane	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Carbon disulfide	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Carbon tetrachloride	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Chlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Chloroethane	BRL	10		ug/L	197667	1	10/16/2014 07:38	GK
Chloroform	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Chloromethane	BRL	10		ug/L	197667	1	10/16/2014 07:38	GK
cis-1,2-Dichloroethene	BRL	1.0		ug/L	197667	1	10/16/2014 07:38	GK
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Cyclohexane	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Dibromochloromethane	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Dichlorodifluoromethane	BRL	10		ug/L	197667	1	10/16/2014 07:38	GK
Ethylbenzene	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Freon-113	BRL	10		ug/L	197667	1	10/16/2014 07:38	GK
Isopropylbenzene	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
m,p-Xylene	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Methyl acetate	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Methyl tert-butyl ether	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Methylcyclohexane	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Methylene chloride	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
o-Xylene	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-21S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/13/2014 11:17:00 AM
Lab ID:	1410C02-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Tetrachloroethene	20	1.0		ug/L	197667	1	10/16/2014 07:38	GK
Toluene	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197667	1	10/16/2014 07:38	GK
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Trichloroethene	BRL	1.0		ug/L	197667	1	10/16/2014 07:38	GK
Trichlorofluoromethane	BRL	5.0		ug/L	197667	1	10/16/2014 07:38	GK
Vinyl chloride	BRL	1.0		ug/L	197667	1	10/16/2014 07:38	GK
Surr: 4-Bromofluorobenzene	88.4	66.2-120		%REC	197667	1	10/16/2014 07:38	GK
Surr: Dibromofluoromethane	98.1	79.5-121		%REC	197667	1	10/16/2014 07:38	GK
Surr: Toluene-d8	97.9	77-117		%REC	197667	1	10/16/2014 07:38	GK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	SW-5
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/13/2014 12:37:00 PM
Lab ID:	1410C02-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
1,1,2-Trichloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
1,1-Dichloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
1,1-Dichloroethene	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
1,2-Dibromoethane	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
1,2-Dichlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
1,2-Dichloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
1,2-Dichloropropane	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
1,3-Dichlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
1,4-Dichlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
2-Butanone	BRL	50		ug/L	197667	1	10/16/2014 08:05	GK
2-Hexanone	BRL	10		ug/L	197667	1	10/16/2014 08:05	GK
4-Methyl-2-pentanone	BRL	10		ug/L	197667	1	10/16/2014 08:05	GK
Acetone	BRL	50		ug/L	197667	1	10/16/2014 08:05	GK
Benzene	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Bromodichloromethane	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Bromoform	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Bromomethane	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Carbon disulfide	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Carbon tetrachloride	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Chlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Chloroethane	BRL	10		ug/L	197667	1	10/16/2014 08:05	GK
Chloroform	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Chloromethane	BRL	10		ug/L	197667	1	10/16/2014 08:05	GK
cis-1,2-Dichloroethene	BRL	1.0		ug/L	197667	1	10/16/2014 08:05	GK
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Cyclohexane	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Dibromochloromethane	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Dichlorodifluoromethane	BRL	10		ug/L	197667	1	10/16/2014 08:05	GK
Ethylbenzene	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Freon-113	BRL	10		ug/L	197667	1	10/16/2014 08:05	GK
Isopropylbenzene	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
m,p-Xylene	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Methyl acetate	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Methyl tert-butyl ether	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Methylcyclohexane	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Methylene chloride	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
o-Xylene	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	SW-5
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/13/2014 12:37:00 PM
Lab ID:	1410C02-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Tetrachloroethene	BRL	1.0		ug/L	197667	1	10/16/2014 08:05	GK
Toluene	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197667	1	10/16/2014 08:05	GK
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Trichloroethene	BRL	1.0		ug/L	197667	1	10/16/2014 08:05	GK
Trichlorofluoromethane	BRL	5.0		ug/L	197667	1	10/16/2014 08:05	GK
Vinyl chloride	BRL	1.0		ug/L	197667	1	10/16/2014 08:05	GK
Surr: 4-Bromofluorobenzene	87.6	66.2-120		%REC	197667	1	10/16/2014 08:05	GK
Surr: Dibromofluoromethane	95.6	79.5-121		%REC	197667	1	10/16/2014 08:05	GK
Surr: Toluene-d8	98.1	77-117		%REC	197667	1	10/16/2014 08:05	GK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-22S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/13/2014 2:34:00 PM
Lab ID:	1410C02-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
1,1,2-Trichloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
1,1-Dichloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
1,1-Dichloroethene	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
1,2-Dibromoethane	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
1,2-Dichlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
1,2-Dichloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
1,2-Dichloropropane	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
1,3-Dichlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
1,4-Dichlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
2-Butanone	BRL	50		ug/L	197667	1	10/16/2014 11:00	GK
2-Hexanone	BRL	10		ug/L	197667	1	10/16/2014 11:00	GK
4-Methyl-2-pentanone	BRL	10		ug/L	197667	1	10/16/2014 11:00	GK
Acetone	BRL	50		ug/L	197667	1	10/16/2014 11:00	GK
Benzene	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Bromodichloromethane	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Bromoform	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Bromomethane	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Carbon disulfide	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Carbon tetrachloride	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Chlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Chloroethane	BRL	10		ug/L	197667	1	10/16/2014 11:00	GK
Chloroform	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Chloromethane	BRL	10		ug/L	197667	1	10/16/2014 11:00	GK
cis-1,2-Dichloroethene	BRL	1.0		ug/L	197667	1	10/16/2014 11:00	GK
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Cyclohexane	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Dibromochloromethane	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Dichlorodifluoromethane	BRL	10		ug/L	197667	1	10/16/2014 11:00	GK
Ethylbenzene	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Freon-113	BRL	10		ug/L	197667	1	10/16/2014 11:00	GK
Isopropylbenzene	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
m,p-Xylene	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Methyl acetate	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Methyl tert-butyl ether	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Methylcyclohexane	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Methylene chloride	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
o-Xylene	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	MW-22S
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/13/2014 2:34:00 PM
Lab ID:	1410C02-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Tetrachloroethene	BRL	1.0		ug/L	197667	1	10/16/2014 11:00	GK
Toluene	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197667	1	10/16/2014 11:00	GK
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Trichloroethene	BRL	1.0		ug/L	197667	1	10/16/2014 11:00	GK
Trichlorofluoromethane	BRL	5.0		ug/L	197667	1	10/16/2014 11:00	GK
Vinyl chloride	BRL	1.0		ug/L	197667	1	10/16/2014 11:00	GK
Surr: 4-Bromofluorobenzene	90.7	66.2-120		%REC	197667	1	10/16/2014 11:00	GK
Surr: Dibromofluoromethane	96.5	79.5-121		%REC	197667	1	10/16/2014 11:00	GK
Surr: Toluene-d8	128	77-117	S	%REC	197667	1	10/16/2014 11:00	GK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	TRIP BLANK
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/13/2014
Lab ID:	1410C02-005	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
1,1,2-Trichloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
1,1-Dichloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
1,1-Dichloroethene	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
1,2-Dibromoethane	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
1,2-Dichlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
1,2-Dichloroethane	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
1,2-Dichloropropane	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
1,3-Dichlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
1,4-Dichlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
2-Butanone	BRL	50		ug/L	197667	1	10/16/2014 01:49	GK
2-Hexanone	BRL	10		ug/L	197667	1	10/16/2014 01:49	GK
4-Methyl-2-pentanone	BRL	10		ug/L	197667	1	10/16/2014 01:49	GK
Acetone	BRL	50		ug/L	197667	1	10/16/2014 01:49	GK
Benzene	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Bromodichloromethane	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Bromoform	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Bromomethane	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Carbon disulfide	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Carbon tetrachloride	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Chlorobenzene	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Chloroethane	BRL	10		ug/L	197667	1	10/16/2014 01:49	GK
Chloroform	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Chloromethane	BRL	10		ug/L	197667	1	10/16/2014 01:49	GK
cis-1,2-Dichloroethene	BRL	1.0		ug/L	197667	1	10/16/2014 01:49	GK
cis-1,3-Dichloropropene	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Cyclohexane	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Dibromochloromethane	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Dichlorodifluoromethane	BRL	10		ug/L	197667	1	10/16/2014 01:49	GK
Ethylbenzene	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Freon-113	BRL	10		ug/L	197667	1	10/16/2014 01:49	GK
Isopropylbenzene	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
m,p-Xylene	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Methyl acetate	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Methyl tert-butyl ether	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Methylcyclohexane	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Methylene chloride	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
o-Xylene	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 16-Oct-14

Client:	Sailors Engineering Associates	**Client Sample ID:**	TRIP BLANK
Project Name:	Spalding Crnrs S/C	**Collection Date:**	10/13/2014
Lab ID:	1410C02-005	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Tetrachloroethene	BRL	1.0		ug/L	197667	1	10/16/2014 01:49	GK
Toluene	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
trans-1,2-Dichloroethene	BRL	1.0		ug/L	197667	1	10/16/2014 01:49	GK
trans-1,3-Dichloropropene	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Trichloroethene	BRL	1.0		ug/L	197667	1	10/16/2014 01:49	GK
Trichlorofluoromethane	BRL	5.0		ug/L	197667	1	10/16/2014 01:49	GK
Vinyl chloride	BRL	1.0		ug/L	197667	1	10/16/2014 01:49	GK
Surr: 4-Bromofluorobenzene	90.2	66.2-120		%REC	197667	1	10/16/2014 01:49	GK
Surr: Dibromofluoromethane	95.7	79.5-121		%REC	197667	1	10/16/2014 01:49	GK
Surr: Toluene-d8	99	77-117		%REC	197667	1	10/16/2014 01:49	GK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc.

Sample/Cooler Receipt Checklist

Client Sailors Engineering Work Order Number 1410C02

Checklist completed by Tomas Pacurar 10/13/14
Signature Date

Carrier name: FedEx __ UPS __ Courier __ Client ✓ US Mail __ Other _____

Shipping container/cooler in good condition? Yes ✓ No __ Not Present __

Custody seals intact on shipping container/cooler? Yes __ No __ Not Present ✓

Custody seals intact on sample bottles? Yes __ No __ Not Present ✓

Container/Temp Blank temperature in compliance? (0°≤6°C)* Yes ✓ No __

Cooler #1 3.1°C Cooler #2 _____ Cooler #3 _____ Cooler #4 _____ Cooler#5 _____ Cooler #6 _____

Chain of custody present? Yes ✓ No __

Chain of custody signed when relinquished and received? Yes ✓ No __

Chain of custody agrees with sample labels? Yes ✓ No __

Samples in proper container/bottle? Yes ✓ No __

Sample containers intact? Yes ✓ No __

Sufficient sample volume for indicated test? Yes ✓ No __

All samples received within holding time? Yes ✓ No __

Was TAT marked on the COC? Yes ✓ No __

Proceed with Standard TAT as per project history? Yes __ No __ Not Applicable ✓

Water - VOA vials have zero headspace? No VOA vials submitted __ Yes ✓ No __

Water - pH acceptable upon receipt? Yes ✓ No __ Not Applicable __

Adjusted? _____ Checked by _____

Sample Condition: Good ✓ Other(Explain) _____

(For diffusive samples or AIHA lead) Is a known blank included? Yes __ No ✓

See Case Narrative for resolution of the Non-Conformance.

* Samples do not have to comply with the given range for certain parameters.

\\Aes_server\l\Sample Receipt\My Documents\COCs and pH Adjustment Sheet\Sample_Cooler_Recipt_Checklist_Rev1.rtf

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410C02

ANALYTICAL QC SUMMARY REPORT

BatchID: 197667

Sample ID: **MB-197667** Client ID: Units: **ug/L** Prep Date: **10/14/2014** Run No: **277845**
SampleType: **MBLK** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197667** Analysis Date: **10/15/2014** Seq No: **5871734**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	BRL	5.0									
1,1,2,2-Tetrachloroethane	BRL	5.0									
1,1,2-Trichloroethane	BRL	5.0									
1,1-Dichloroethane	BRL	5.0									
1,1-Dichloroethene	BRL	5.0									
1,2,4-Trichlorobenzene	BRL	5.0									
1,2-Dibromo-3-chloropropane	BRL	5.0									
1,2-Dibromoethane	BRL	5.0									
1,2-Dichlorobenzene	BRL	5.0									
1,2-Dichloroethane	BRL	5.0									
1,2-Dichloropropane	BRL	5.0									
1,3-Dichlorobenzene	BRL	5.0									
1,4-Dichlorobenzene	BRL	5.0									
2-Butanone	BRL	50									
2-Hexanone	BRL	10									
4-Methyl-2-pentanone	BRL	10									
Acetone	BRL	50									
Benzene	BRL	5.0									
Bromodichloromethane	BRL	5.0									
Bromoform	BRL	5.0									
Bromomethane	BRL	5.0									
Carbon disulfide	BRL	5.0									
Carbon tetrachloride	BRL	5.0									
Chlorobenzene	BRL	5.0									
Chloroethane	BRL	10									
Chloroform	BRL	5.0									
Chloromethane	BRL	10									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410C02

ANALYTICAL QC SUMMARY REPORT

BatchID: 197667

Sample ID: **MB-197667** Client ID: Units: **ug/L** Prep Date: **10/14/2014** Run No: **277845**
SampleType: **MBLK** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197667** Analysis Date: **10/15/2014** Seq No: **5871734**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	BRL	5.0									
cis-1,3-Dichloropropene	BRL	5.0									
Cyclohexane	BRL	5.0									
Dibromochloromethane	BRL	5.0									
Dichlorodifluoromethane	BRL	10									
Ethylbenzene	BRL	5.0									
Freon-113	BRL	10									
Isopropylbenzene	BRL	5.0									
m,p-Xylene	BRL	5.0									
Methyl acetate	BRL	5.0									
Methyl tert-butyl ether	BRL	5.0									
Methylcyclohexane	BRL	5.0									
Methylene chloride	BRL	5.0									
o-Xylene	BRL	5.0									
Styrene	BRL	5.0									
Tetrachloroethene	BRL	5.0									
Toluene	BRL	5.0									
trans-1,2-Dichloroethene	BRL	5.0									
trans-1,3-Dichloropropene	BRL	5.0									
Trichloroethene	BRL	5.0									
Trichlorofluoromethane	BRL	5.0									
Vinyl chloride	BRL	2.0									
Surr: 4-Bromofluorobenzene	45.11	0	50.00		90.2	66.2	120				
Surr: Dibromofluoromethane	49.95	0	50.00		99.9	79.5	121				
Surr: Toluene-d8	49.78	0	50.00		99.6	77	117				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410C02

ANALYTICAL QC SUMMARY REPORT

BatchID: 197667

Sample ID: **LCS-197667** Client ID: Units: **ug/L** Prep Date: **10/14/2014** Run No: **277845**
SampleType: **LCS** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197667** Analysis Date: **10/14/2014** Seq No: **5871733**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	51.89	5.0	50.00		104	63.1	140				
Benzene	48.27	5.0	50.00		96.5	74.2	129				
Chlorobenzene	46.75	5.0	50.00		93.5	70	129				
Toluene	46.99	5.0	50.00		94.0	74.2	129				
Trichloroethene	46.43	5.0	50.00		92.9	71.2	135				
Surr: 4-Bromofluorobenzene	45.04	0	50.00		90.1	66.2	120				
Surr: Dibromofluoromethane	49.41	0	50.00		98.8	79.5	121				
Surr: Toluene-d8	48.62	0	50.00		97.2	77	117				

Sample ID: **1410C02-001AMS** Client ID: **MW-5S** Units: **ug/L** Prep Date: **10/14/2014** Run No: **277845**
SampleType: **MS** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197667** Analysis Date: **10/15/2014** Seq No: **5872038**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	40.42	5.0	50.00		80.8	60.2	159				
Benzene	46.90	5.0	50.00		93.8	70.2	138				
Chlorobenzene	46.16	5.0	50.00		92.3	70.1	133				
Toluene	46.81	5.0	50.00		93.6	70	139				
Trichloroethene	46.46	5.0	50.00		92.9	70.1	144				
Surr: 4-Bromofluorobenzene	44.79	0	50.00		89.6	66.2	120				
Surr: Dibromofluoromethane	49.48	0	50.00		99.0	79.5	121				
Surr: Toluene-d8	49.64	0	50.00		99.3	77	117				

Sample ID: **1410C02-001AMSD** Client ID: **MW-5S** Units: **ug/L** Prep Date: **10/14/2014** Run No: **277845**
SampleType: **MSD** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197667** Analysis Date: **10/15/2014** Seq No: **5872040**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	39.73	5.0	50.00		79.5	60.2	159	40.42	1.72	19.2	
Benzene	46.20	5.0	50.00		92.4	70.2	138	46.90	1.50	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Sailors Engineering Associates
Project Name: Spalding Crnrs S/C
Workorder: 1410C02

ANALYTICAL QC SUMMARY REPORT

BatchID: 197667

Sample ID: **1410C02-001AMSD** Client ID: **MW-5S** Units: **ug/L** Prep Date: **10/14/2014** Run No: **277845**
SampleType: **MSD** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **197667** Analysis Date: **10/15/2014** Seq No: **5872040**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Chlorobenzene	45.07	5.0	50.00		90.1	70.1	133	46.16	2.39	20	
Toluene	45.12	5.0	50.00		90.2	70	139	46.81	3.68	20	
Trichloroethene	45.36	5.0	50.00		90.7	70.1	144	46.46	2.40	20	
Surr: 4-Bromofluorobenzene	44.98	0	50.00		90.0	66.2	120	44.79	0	0	
Surr: Dibromofluoromethane	48.46	0	50.00		96.9	79.5	121	49.48	0	0	
Surr: Toluene-d8	49.08	0	50.00		98.2	77	117	49.64	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

APPENDIX 5

GROUNDWATER SAMPLING LOGS

Sailors Engineering Associates, Inc
Low Flow Groundwater Sampling Log

Project No: 102-0[illegible]63 Project Name: Spalding Corners S/C

Project Manager: R Rudolph Well No: MW-55 Date: 10/13/14

Well Depth: 35 Screened Interval / Length: 25 / 35 Well Diameter: 2" Casing Type: PVC

Sampling Device (s): YSI-556 Tubing Type: 1/4 poly Water Level: 17.99

Pump Intake Depth: 30' Pump Type: Peristaltic Pumping Rate: 85 ml/min

Other Information: Can't pump any slower.

Sampling Personnel:

		± 5%	0.2 mg/L or ± 10%	± 0.1	± 10%	± 10%		per USEPA Region 4 (10-28-2011	
Time	Temperature (°C/°F)	Conductivity (mS/cm or µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Water Level [TOC] (feet)	Cumulative Volume Purged (gallons)	Notes
9:10	16.33	72	6.95	5.99	2.1	9.31	16.89	0.2	
9:20	16.20	72	5.38	6.16	5.9	6.01	20.18	0.6	
9:30	16.26	73	4.87	6.18	5.4	4.10	20.50	0.8	
9:40	16.25	73	4.56	6.19	6.0	3.57	21.37	1.1	
9:50	16.27	73	4.50	6.19	6.5	2.09	21.98	1.3	
10:00	16.23	73	4.41	6.19	7.2	1.77	22.63	1.6	
10:10	16.27	73	4.37	6.19	7.4	1.69	23.16	1.8	

Analyses & Time of Sampling:

Sailors Engineering Associates, Inc
Low Flow Groundwater Sampling Log

Project No: 102-063 Project Name: Spalding Caverns S/C

Project Manager: R. Rudolph Well No: MW-6S Date: 10/9/14

Well Depth: 15 Screened Interval / Length: 5 / 15 Well Diameter: 2" Casing Type: PVC

Sampling Device (s): YSI-556 Tubing Type: 1/4 poly Water Level: 16.33

Pump Intake Depth: 14.5 Pump Type: peristaltic Pumping Rate: 130 ml/min

Other Information:

Sampling Personnel: Short

		± 5%	0.2 mg/L or ± 10%	± 0.1	± 10%	± 10%		per USEPA Region 4 (10-28-2011	
Time	Temperature (°C/°F)	Conductivity (mS/cm or µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Water Level [TOC] (feet)	Cumulative Volume Purged (gallons)	Notes
15:30	18.87	134	1.33	5.92	-22.8	21.3	16.68	0.2	
15:35	19.11	130	1.12	5.89	-18.3	12.4	16.68	0.3	
15:40	19.63	135	1.03	5.84	-16.1	9.80	16.68	0.4	
15:45	19.75	135	0.94	5.82	-13.6	9.90	16.68	0.5	
15:50	19.50	132	0.65	5.66	-3.8	9.71	16.68	0.6	
15:55	19.22	134	0.47	5.62	2.8	9.51	16.68	0.7	
16:00	19.35	137	0.38	5.60	7.3	8.99	16.68	0.9	
16:05	19.69	140	0.34	5.59	8.4	8.90	16.68	1.0	
16:15	19.34	141	0.30	5.58	10.4	8.21	16.68	1.3	
16:20	19.53	142	0.27	5.56	11.5	7.75	16.68	1.4	
16:25	19.47	142	0.25	5.57	13.1	7.90	16.68	1.5	

Analyses & Time of Sampling:

Sailors Engineering Associates, Inc
Low Flow Groundwater Sampling Log

Project No: 102-063 Project Name: Spalding Corners S/C

Project Manager: R Rudolph Well No: MW-10S Date: 10/8/14

Well Depth: 40 Screened Interval / Length: 30 / 40 Well Diameter: 2" Casing Type: PVC

Sampling Device (s): YSI-556 Tubing Type: 1/4 poly Water Level: 28.78

Pump Intake Depth: 35 Pump Type: Bladder Pumping Rate: 235 mL/min

Other Information:

Sampling Personnel: Short

	± 5%	0.2 mg/L or ± 10%	± 0.1	± 10%	± 10%		per USEPA Region 4 (10-28-2011	
Time	Temperature (°C/°F)	Conductivity (mS/cm or µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Water Level [TOC] (feet)	Cumulative Volume Purged (gallons)	Notes
13:45	18.41	64	5.43	5.59	-83.0	13.6	29.00	0.8	
13:55	18.33	63	5.37	5.69	-69.7	11.7	29.00	1.3	
14:00	18.31	63	5.38	5.71	-66.7	8.80	29.00	1.6	
14:05	18.27	65	5.38	5.75	-63.1	9.63	29.00	1.9	
14:10	18.30	65	5.39	5.76	61.9	6.85	29.00	2.2	

Analyses & Time of Sampling: 14:13

Sailors Engineering Associates, Inc
Low Flow Groundwater Sampling Log

Project No: 102-063 Project Name: Spalding Corners S/C

Project Manager: R. Rudolph Well No: MW-13S Date: 10/7/14

Well Depth: 40 Screened Interval / Length: 40 / 50 Well Diameter: 2" Casing Type: PVC

Sampling Device (s): YSI-556 Tubing Type: 1/4 poly Water Level: 33.45

Pump Intake Depth: 39 Pump Type: Bladder Pumping Rate: 260 ml/min

Other Information: 2.8 = 1 well volume

Sampling Personnel: Shert

		± 5%	0.2 mg/L or ± 10%	± 0.1	± 10%	± 10%		per USEPA Region 4 (10-28-2011	
Time	Temperature (°C/°F)	Conductivity (mS/cm or µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Water Level [TOC] (feet)	Cumulative Volume Purged (gallons)	Notes
10:00	21.99	89	5.60	6.05	71.9	8.79	34.36	0.9	
10:10	21.73	88	5.38	6.04	72.8	6.31	34.36	1.3	
10:20	21.82	88	5.40	6.05	70.9	6.23	34.36	1.8	
10:30	22.00	88	5.35	6.05	70.0	5.23	34.36	2.5	
10:40	21.89	88	5.30	6.04	70.9	7.00	34.36	2.9	

Analyses & Time of Sampling: _____

Sailors Engineering Associates, Inc
Low Flow Groundwater Sampling Log

Project No: 102-063 Project Name: Spalding Corners S/C

Project Manager: R. Rudolph Well No: MW-14 Date: 10/7/14

Well Depth: 45 Screened Interval / Length: 35 / 45 Well Diameter: 2" Casing Type: PVC

Sampling Device (s): YSI-556 Tubing Type: 1/4 poly Water Level: 34.64

Pump Intake Depth: 39' Pump Type: Bladder Pumping Rate: 180 ml/min

Other Information: 1.8 = 1 well volume

Sampling Personnel: Shart

	± 5%	0.2 mg/L or ± 10%	± 0.1	± 10%	± 10%		per USEPA Region 4 (10-28-2011	
Time	Temperature (°C/°F)	Conductivity (mS/cm or µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Water Level [TOC] (feet)	Cumulative Volume Purged (gallons)	Notes
7:40	19.52	79	6.06	6.29	76.9	40	34.90	0.8	
7:50	19.59	73	5.80	6.27	77.9	37	34.90	1.2	
8:00	19.62	67	5.85	6.23	76.6	30.9	34.90	1.6	
8:10	19.58	63	5.80	6.19	75.5	17.2	34.90	2.0	
8:20	19.75	62	5.75	6.17	74.9	14.6	34.90	2.4	
8:30	19.59	61	5.73	6.16	73.7	16.1	34.90	2.9	
8:40	19.62	61	5.74	6.16	73.4	10.94	34.90	3.4	
8:45	19.64	61	5.72	6.15	73.0	9.11	34.90	3.6	
	Allowed pump to run so long to try to get NTUs								
	below 10								

Analyses & Time of Sampling: _____

Sailors Engineering Associates, Inc
Low Flow Groundwater Sampling Log

Project No: 102-063 Project Name: Spalding Corners S/C

Project Manager: R. Rudolph Well No: MW-155 Date: 10/7/14

Well Depth: 55 Screened Interval / Length: 35 / 55 Well Diameter: 2" Casing Type: PVC

Sampling Device (s): YSI-556 Tubing Type: 1/4 poly Water Level: 36.19

Pump Intake Depth: 40' Pump Type: Bladder Pumping Rate: 130ml/min

Other Information: 3.2 = 1 well volume

Sampling Personnel: Short

Time	Temperature (°C/°F)	Conductivity (mS/cm or µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Water Level [TOC] (feet)	Cumulative Volume Purged (gallons)	Notes
	± 5%	0.2 mg/L or ± 10%	± 0.1	± 10%	± 10%		per USEPA Region 4 (10-28-201		
12:40	21.12	86	5.08	5.84	88.2	21.6	36.50	0.7	
12:55	21.54	85	4.84	6.05	79.4	15.1	36.50	1.3	
13:10	21.71	84	4.78	6.04	72.9	8.59	36.50	1.6	
13:25	21.63	83	4.80	6.04	71.6	6.81	36.50	2.1	
13:40	21.34	82	4.76	6.04	69.5	3.93	36.50	2.6	
13:55	21.29	82	4.76	6.05	67.7	2.77	36.50	3.3	

Analyses & Time of Sampling: _____

Sailors Engineering Associates, Inc
Low Flow Groundwater Sampling Log

Project No: 105-063 Project Name: Spalding Corners S/C

Project Manager: R. Rudolph Well No: MW-163 Date: 10/7/14

Well Depth: 43 Screened Interval / Length: 38 / 43 Well Diameter: 2" Casing Type: _____

Sampling Device (s): YSI-556 Tubing Type: 1/4 poly Water Level: 31.67

Pump Intake Depth: 38 Pump Type: Bladder Pumping Rate: 400 ml/min

Other Information: 1.9 = 3 well vol.

Sampling Personnel: Shert

	± 5%	0.2 mg/L or ± 10%	± 0.1	± 10%	± 10%		per USEPA Region 4 (10-28-2011)	
Time	Temperature (°C/°F)	Conductivity (mS/cm or µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Water Level [TOC] (feet)	Cumulative Volume Purged (gallons)	Notes
15:10	20.28	406	5.89	10.78	68.1	5.67	32.85	0.5	
15:25	20.22	416	5.60	10.80	67.0	6.81	32.85	0.6	
15:55	20.02	384	5.42	10.78	59.6	6.21	32.85	1.0	
16:10	20.03	378	5.36	10.78	55.9	5.98	32.85	1.1	
16:25	19.74	372	5.36	10.77	54.2	5.77	32.85	1.4	
16:40	19.84	369	5.36	10.78	50.0	5.80	32.85	1.6	
16:55	19.80	365	5.30	10.78	47.7	6.01	32.85	1.7	

Analyses & Time of Sampling: _____

Sailors Engineering Associates, Inc
Low Flow Groundwater Sampling Log

Project No: 102-063 Project Name: Spalding Corners S/C

Project Manager: R. Rudolph Well No: MW-17S Date: 10/8/14

Well Depth: 46 Screened Interval / Length: 36 / 46 Well Diameter: 2" Casing Type: PVC

Sampling Device (s): YSI-556 Tubing Type: 1/4 poly Water Level: 29.75

Pump Intake Depth: 39' Pump Type: Bladder Pumping Rate: 135ml/min

Other Information:

Sampling Personnel: Short

		± 5%	0.2 mg/L or ± 10%	± 0.1	± 10%	± 10%		per USEPA Region 4 (10-28-2011	
Time	Temperature (°C/°F)	Conductivity (mS/cm or µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Water Level [TOC] (feet)	Cumulative Volume Purged (gallons)	Notes
15:05	18:53	86	5.69	6.00	-29.2	20.0	31.15	0.6	
15:20	18.22	85	5.21	5.92	-35.3	47.7	31.15	1.0	
15:40	18.17	86	5.00	6.06	-43.9	32.9	31.15	1.6	
15:55	17.91	85	4.89	6.04	-43.4	25.4	31.15	2.1	
16:10	17.67	84	4.89	6.04	-40.3	21.4	31.15	2.5	
16:15	17.73	84	4.86	6.05	-39.5	22.1	31.15	2.7	

Analyses & Time of Sampling: 16:19

Sailors Engineering Associates, Inc
Low Flow Groundwater Sampling Log

Project No: 103-063 Project Name: Spalding Corners S/C

Project Manager: R. Rudolph Well No: MW-18S Date: 10/9/14

Well Depth: 33.5 Screened Interval / Length: 23.5 / 33.5 Well Diameter: 2" Casing Type: PVC

Sampling Device (s): YSI-556 Tubing Type: 1/4 poly Water Level: 27.03

Pump Intake Depth: 30 Pump Type: Bladder Pumping Rate: 180 ml/min

Other Information: 3.3

Sampling Personnel: Sheet

		± 5%	0.2 mg/L or ± 10%	± 0.1	± 10%	± 10%		per USEPA Region 4 (10-28-2011	
Time	Temperature (°C/°F)	Conductivity (mS/cm or µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Water Level [TOC] (feet)	Cumulative Volume Purged (gallons)	Notes
8:25	16.08	89	5.62	5.92	27.8	45	27.25	0.7	
8:30	16.06	95	5.21	6.01	26.2	33	27.25	0.8	
8:35	15.93	103	5.02	6.15	24.4	33	27.25	1.1	
8:40	15.97	112	4.78	6.28	23.7	28	27.25	1.5	
8:45	15.90	116	4.70	6.33	23.3	31	27.25	1.6	
8:50	15.96	126	4.59	6.42	21.7	30	27.25	2.0	
8:55	15.95	131	4.52	6.46	20.2	28	27.25	2.2	
9:00	16.04	138	4.45	6.53	18.0	20	27.25	2.6	
9:05	16.02	144	4.37	6.58	16.1	24	27.25	2.8	
9:10	16.01	147	4.36	6.60	14.9	24	27.25	3.0	
9:15	15.87	153	4.27	6.64	13.5	27	27.25	3.4	

Analyses & Time of Sampling:

Sailors Engineering Associates, Inc
Low Flow Groundwater Sampling Log

Project No: 102-063 Project Name: Spalding Corners S/C

Project Manager: R. Rudolph Well No: MW195 Date: 10/9/14

Well Depth: 33 Screened Interval / Length: 23 / 33 Well Diameter: 2" Casing Type: PVC

Sampling Device (s): YSI-556 Tubing Type: _____ Water Level: 17.68

Pump Intake Depth: 25 Pump Type: Peristaltic Pumping Rate: 185

Other Information: _____

Sampling Personnel: Short

		± 5%	0.2 mg/L or ± 10%	± 0.1	± 10%	± 10%		per USEPA Region 4 (10-28-2011	
Time	Temperature (°C/°F)	Conductivity (mS/cm or µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Water Level [TOC] (feet)	Cumulative Volume Purged (gallons)	Notes
11:05	16.84	95	0.73	6.00	10.8	11	17.87	0.5	
11:15	17.05	101	0.56	5.99	12.4	8.1	17.87	1.1	
11:25	16.89	102	0.48	6.06	11.3	7.3	17.87	1.6	
11:35	16.95	102	0.43	6.08	11.8	4.77	17.87	2.0	
11:45	16.97	102	0.40	6.09	12.7	2.01	17.87	2.5	

Analyses & Time of Sampling: _____

Sailors Engineering Associates, Inc
Low Flow Groundwater Sampling Log

Project No: 102-063 Project Name: Spalding Corners S/E

Project Manager: R. Rudolph Well No: MW-20S Date: 10/3/14

Well Depth: 25 Screened Interval / Length: 15 / 25 Well Diameter: 2" Casing Type: PVC

Sampling Device (s): YSI-556 Tubing Type: 1/4 poly Water Level: 16.06

Pump Intake Depth: 21 Pump Type: Peristaltic Pumping Rate: 120 ml/min

Other Information:

Sampling Personnel: Shard

Time	Temperature (°C/°F)	Conductivity (mS/cm or µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Water Level [TOC] (feet)	Cumulative Volume Purged (gallons)	Notes
	± 5%	0.2 mg/L or ± 10%	± 0.1	± 10%	± 10%		per USEPA Region 4 (10-28-2011		
13:50	18.12	284	1.01	7.24	4.5	1.76	16.13	0.4	
13:55	18.03	280	0.41	7.12	3.5	0.81	16.13	0.5	
14:05	17.78	272	0.25	7.06	1.8	0.44	16.13	0.8	
14:15	17.98	266	0.22	7.01	-1.1	0.39	16.13	1.1	
14:20	18.01	263	0.23	7.00	-2.7	0.41	16.13	1.2	
14:25	18.16	262	0.20	6.96	-3.5	0.33	16.13	1.3	
14:30	18.00	260	0.18	6.96	-5.2	0.29	16.13	1.4	
14:35	17.83	260	0.17	6.95	-5.9	0.34	16.13	1.5	
14:40	17.66	257	0.17	6.95	-6.5	0.35	16.13	1.6	

Analyses & Time of Sampling:

Sailors Engineering Associates, Inc
Low Flow Groundwater Sampling Log

Project No: 102-063 Project Name: Spalding Corners

Project Manager: R. Rudolph Well No: MW-21S Date: 10/13/14

Well Depth: 29 Screened Interval / Length: 14 / 29 Well Diameter: 2" Casing Type: PVC

Sampling Device (s): YSI-556 Tubing Type: 1/4 poly Water Level: 25.57

Pump Intake Depth: 29 Pump Type: peristaltic Pumping Rate: 100ml/min

Other Information:

Sampling Personnel: Shaw

		± 5%	0.2 mg/L or ± 10%	± 0.1	± 10%	± 10%		per USEPA Region 4 (10-28-2011	
Time	Temperature (°C/°F)	Conductivity (mS/cm or µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Water Level [TOC] (feet)	Cumulative Volume Purged (gallons)	Notes
10:45	16.97	64	4.64	5.90	10.5	1.01	25.69	0.1	
10:50	16.77	63	4.29	5.86	11.6	0.95	25.74	0.3	
10:55	16.78	63	4.17	5.87	12.0	0.88	25.80	0.4	
11:00	16.91	63	4.12	5.86	12.7	0.56	25.86	0.6	
11:05	16.84	63	4.53	5.85	13.3	0.39	25.91	0.8	
11:10	16.99	63	4.47	5.83	13.9	0.42	25.93	1.0	
11:15	16.95	63	4.44	5.84	13.9	0.45	25.95	1.1	

Analyses & Time of Sampling:

Sailors Engineering Associates, Inc
Low Flow Groundwater Sampling Log

Project No: 102-063 Project Name: Spalding Leavers S/C

Project Manager: R. Rudolph Well No: MW-225 Date: 10/13/14

Well Depth: 25 Screened Interval / Length: 10 / 25 Well Diameter: 2" Casing Type: PVC

Sampling Device (s): YSI-556 Tubing Type: 1/4 poly Water Level: 23.83

Pump Intake Depth: 25 Pump Type: Peristaltic Pumping Rate: 80 ml/min

Other Information:

Sampling Personnel: Short

		± 5%	0.2 mg/L or ± 10%	± 0.1	± 10%	± 10%		per USEPA Region 4 (10-28-2011	
Time	Temperature (°C/°F)	Conductivity (mS/cm or µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Water Level [TOC] (feet)	Cumulative Volume Purged (gallons)	Notes
13:10	18.34	239	1.24	6.69	-11.9	67.8	23.96	0.2	
13:15	18.01	258	0.47	6.83	-50.0	17.5	24.05	0.4	
13:20	18.07	260	0.40	6.82	-57.0	12.2	24.30	0.5	
		Well gone dry							
After an hour well only recovered to 24.0 TOC sampled for VOC only									

Analyses & Time of Sampling:

Sailors Engineering Associates, Inc
Low Flow Groundwater Sampling Log

Project No: 102-063 Project Name: Spalding Corners S/C

Project Manager: R. Rudolph Well No: MW-1D Date: 10/8/14

Well Depth: 108 Screened Interval / Length: 98 / 108 Well Diameter: 2" Casing Type: PVC

Sampling Device (s): YSI-556 Tubing Type: 1/4 poly Water Level: 34.31

Pump Intake Depth: 50' Pump Type: Bladder Pumping Rate: 40ml/min

Other Information: 12.58 = 1 well volume, 1 well volume @ 40ml/min would take 19.9 hrs. Not Feasible

Sampling Personnel: Short

	± 5%	0.2 mg/L or ± 10%	± 0.1	± 10%	± 10%		per USEPA Region 4 (10-28-2011
Time	Temperature (°C/°F)	Conductivity (mS/cm or µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Water Level [TOC] (feet)	Cumulative Volume Purged (gallons)	Notes
8:10	19.81	334	1.03	7.95	-154.9	0.52	35.95	0.7	
8:55	20.28	347	0.41	7.96	-214.6	0.41	37.40	0.8	
	Had to pull pump & button up well due to impending rain. Testing resumed @ 10:00								
10:10	21.06	353	3.99	7.99	-167.9	0.65	36.85	1.0	
11:00	21.81	368	0.37	8.04	-222	0.44	38.35	1.5	
11:20	22.37	376	0.26	8.06	-223.3	0.41	38.75	1.7	
11:30	22.52	379	0.25	8.07	-221.7	0.40	38.96	1.8	
11:40	22.84	383	0.23	8.08	-219.1	0.40	39.20	1.9	
11:50	23.25	389	0.18	8.08	-220.3	0.40	39.40	2.0	
12:00	23.69	393	0.16	8.08	-218.9	0.40	39.55	2.1	

Analyses & Time of Sampling: 12:04

Sailors Engineering Associates, Inc
Low Flow Groundwater Sampling Log

Project No: 102-063 Project Name: Spalding Corners S/C

Project Manager: R. Rudolph Well No: SW-5 Date: 10/13/14

Well Depth: 6 Screened Interval / Length: 1 / 6 Well Diameter: 2" Casing Type: PVC

Sampling Device (s): YSI-556 Tubing Type: 1/4 poly Water Level: 4.11

Pump Intake Depth: 6' Pump Type: peristaltic Pumping Rate: 90ml/min

Other Information:

Sampling Personnel: Short

		± 5%	0.2 mg/L or ± 10%	± 0.1	± 10%	± 10%		per USEPA Region 4 (10-28-2011	
Time	Temperature (°C/°F)	Conductivity (mS/cm or µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Water Level [TOC] (feet)	Cumulative Volume Purged (gallons)	Notes
12:05	19.39	166	0.87	6.39	-26.6	75	4.32	0.1	
12:10	19.44	86	0.31	5.95	-24.8	225	4.58	0.2	
12:15	19.46	60	0.66	5.45	-8.9	175	4.84	0.4	
12:20	19.50	56	0.93	5.20	-0.7	89.1	5.08	0.6	
12:25	19.54	62	0.70	5.11	3.0	32.5	5.44	0.8	
12:30	19.54	63	0.72	5.09	4.3	19.3	5.75	1.0	
12:35	19.55	63	0.73	5.12	5.1	15.7	6.10	1.1	

Analyses & Time of Sampling:

98½ in Total lenght
25 ⅛ in Stand up

73.375 in ground
6.11 ft total dept

APPENDIX 6

MONITORED NATURAL ATTENUATION

SCREENING PROTOCOL WORKSHEETS

Natural Attenuation Screening Protocol

The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.

Interpretation	Score
Inadequate evidence for anaerobic biodegradation* of chlorinated organics	0 to 5
Limited evidence for anaerobic biodegradation* of chlorinated organics	6 to 14
Adequate evidence for anaerobic biodegradation* of chlorinated organics	15 to 20
Strong evidence for anaerobic biodegradation* of chlorinated organics	>20

Score: 6

Scroll to End of Table

* reductive dechlorination

Analysis	Concentration in Most Contam. Zone	Interpretation	Yes	No	Points Awarded
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	◉	○	3
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	○	◉	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	○	◉	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	○	◉	0
Sulfide*	>1 mg/L	Reductive pathway possible	○	◉	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	○	◉	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	◉	○	1
	<-100mV	Reductive pathway likely	○	◉	0
pH*	5 < pH < 9	Optimal range for reductive pathway	◉	○	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	○	◉	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	○	◉	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	○	○	
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	○	○	
Chloride*	>2x background	Daughter product of organic chlorine	○	◉	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	○	○	
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	○	○	
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	○	◉	0
PCE*		Material released	◉	○	0
TCE*		Daughter product of PCE [a/]	○	◉	0
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE[a/]; 1,1-DCE can be a chem. reaction product of TCA	○	◉	0
VC*		Daughter product of DCE[a/]	○	◉	0
1,1,1-Trichloroethane*		Material released	○	○	
DCA		Daughter product of TCA under reducing conditions	○	○	
Carbon Tetrachloride		Material released	○	○	
Chloroethane*		Daughter product of DCA or VC under reducing conditions	○	○	
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	○	◉	0
	>0.1 mg/L	Daughter product of VC/ethene	○	◉	0
Chloroform		Daughter product of Carbon Tetrachloride	○	○	
Dichloromethane		Daughter product of Chloroform	○	○	

* required analysis.

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE | Reset

End of Form

Natural Attenuation Screening Protocol

The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.

Interpretation	Score
Inadequate evidence for anaerobic biodegradation* of chlorinated organics	0 to 5
Limited evidence for anaerobic biodegradation* of chlorinated organics	6 to 14
Adequate evidence for anaerobic biodegradation* of chlorinated organics	15 to 20
Strong evidence for anaerobic biodegradation* of chlorinated organics	>20

Score: -1

Scroll to End of Table

* reductive dechlorination

Analysis	Concentration in Most Contam. Zone	Interpretation	Yes	No	Points Awarded
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	○	◉	0
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	◉	○	-3
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	○	◉	0
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	○	◉	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Sulfide*	>1 mg/L	Reductive pathway possible	○	◉	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	○	◉	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	○	◉	0
	<-100mV	Reductive pathway likely	○	◉	0
pH*	5 < pH < 9	Optimal range for reductive pathway	◉	○	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	○	◉	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	○	◉	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	○	○	
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	○	○	
Chloride*	>2x background	Daughter product of organic chlorine	○	◉	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	○	○	
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	○	○	
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	○	◉	0
PCE*		Material released	◉	○	0
TCE*		Daughter product of PCE [a/]	○	◉	0
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE[a/]; 1,1-DCE can be a chem. reaction product of TCA	○	◉	0
VC*		Daughter product of DCE[a/]	○	◉	0
1,1,1-Trichloroethane*		Material released	○	○	
DCA		Daughter product of TCA under reducing conditions	○	○	
Carbon Tetrachloride		Material released	○	○	
Chloroethane*		Daughter product of DCA or VC under reducing conditions	○	○	
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	○	◉	0
	>0.1 mg/L	Daughter product of VC/ethene	○	◉	0
Chloroform		Daughter product of Carbon Tetrachloride	○	○	
Dichloromethane		Daughter product of Chloroform	○	○	

* required analysis.

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE | Reset

End of Form

Natural Attenuation Screening Protocol

The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.

Interpretation	Score
Inadequate evidence for anaerobic biodegradation* of chlorinated organics	0 to 5
Limited evidence for anaerobic biodegradation* of chlorinated organics	6 to 14
Adequate evidence for anaerobic biodegradation* of chlorinated organics	15 to 20
Strong evidence for anaerobic biodegradation* of chlorinated organics	>20

Score: 5

Scroll to End of Table

* reductive dechlorination

Analysis	Concentration in Most Contam. Zone	Interpretation	Yes	No	Points Awarded
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	○	◉	0
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	○	◉	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	○	◉	0
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	○	◉	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Sulfide*	>1 mg/L	Reductive pathway possible	○	◉	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	○	◉	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	○	◉	0
	<-100mV	Reductive pathway likely	○	◉	0
pH*	5 < pH < 9	Optimal range for reductive pathway	◉	○	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	○	◉	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	◉	○	1
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	○	○	
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	○	○	
Chloride*	>2x background	Daughter product of organic chlorine	○	◉	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	○	○	
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	○	○	
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	○	◉	0
PCE*		Material released	◉	○	0
TCE*		Daughter product of PCE [a/]	◉	○	2
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE[a/]; 1,1-DCE can be a chem. reaction product of TCA	○	◉	0
VC*		Daughter product of DCE[a/]	○	◉	0
1,1,1-Trichloroethane*		Material released	○	○	
DCA		Daughter product of TCA under reducing conditions	○	○	
Carbon Tetrachloride		Material released	○	○	
Chloroethane*		Daughter product of DCA or VC under reducing conditions	○	○	
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	○	◉	0
	>0.1 mg/L	Daughter product of VC/ethene	○	◉	0
Chloroform		Daughter product of Carbon Tetrachloride	○	○	
Dichloromethane		Daughter product of Chloroform	○	○	

* required analysis.

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE | Reset

End of Form

Spalding Corners Shopping Center
HSI #10639
SEA Job #102-063

MW-16S

NA Parameters
2nd 2014 Semi-Annual, October 2014
Low-Flow Purged and Sampled 10-7--2014

Natural Attenuation Screening Protocol

The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.

Interpretation	Score
Inadequate evidence for anaerobic biodegradation* of chlorinated organics	0 to 5
Limited evidence for anaerobic biodegradation* of chlorinated organics	6 to 14
Adequate evidence for anaerobic biodegradation* of chlorinated organics	15 to 20
Strong evidence for anaerobic biodegradation* of chlorinated organics	>20

Score: 0

Scroll to End of Table

* reductive dechlorination

Analysis	Concentration in Most Contam. Zone	Interpretation	Yes	No	Points Awarded
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	○	◉	0
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	◉	○	-3
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	○	◉	0
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	○	◉	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Sulfide*	>1 mg/L	Reductive pathway possible	○	◉	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	○	◉	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	◉	○	1
	<-100mV	Reductive pathway likely	○	◉	0
pH*	5 < pH < 9	Optimal range for reductive pathway	○	◉	-2
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	○	◉	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	○	◉	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	○	○	
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	○	○	
Chloride*	>2x background	Daughter product of organic chlorine	○	◉	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	○	○	
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	○	○	
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	○	◉	0
PCE*		Material released	◉	○	0
TCE*		Daughter product of PCE [a/]	◉	○	2
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE[a/]; 1,1-DCE can be a chem. reaction product of TCA	○	◉	0
VC*		Daughter product of DCE[a/]	○	◉	0
1,1,1-Trichloroethane*		Material released	○	○	
DCA		Daughter product of TCA under reducing conditions	○	○	
Carbon Tetrachloride		Material released	○	○	
Chloroethane*		Daughter product of DCA or VC under reducing conditions	○	○	
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	○	◉	0
	>0.1 mg/L	Daughter product of VC/ethene	○	◉	0
Chloroform		Daughter product of Carbon Tetrachloride	○	○	
Dichloromethane		Daughter product of Chloroform	○	○	

* required analysis.

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE Reset

End of Form

Spalding Corners Shopping Center
HSI #10639
SEA Job #102-063

MW-18S

NA Parameters
2nd 2014 Semi-Annual, October 2014
Low-Flow Purged and Sampled 10-9--2014

Natural Attenuation Screening Protocol

The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.

Interpretation	Score
Inadequate evidence for anaerobic biodegradation* of chlorinated organics	0 to 5
Limited evidence for anaerobic biodegradation* of chlorinated organics	6 to 14
Adequate evidence for anaerobic biodegradation* of chlorinated organics	15 to 20
Strong evidence for anaerobic biodegradation* of chlorinated organics	>20

Score: 5

Scroll to End of Table

* reductive dechlorination

Analysis	Concentration in Most Contam. Zone	Interpretation	Yes	No	Points Awarded
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	○	◉	0
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	○	◉	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	○	◉	0
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	○	◉	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Sulfide*	>1 mg/L	Reductive pathway possible	○	◉	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	○	◉	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	◉	○	1
	<-100mV	Reductive pathway likely	○	◉	0
pH*	5 < pH < 9	Optimal range for reductive pathway	◉	○	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	○	◉	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	○	◉	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	○	○	
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	○	○	
Chloride*	>2x background	Daughter product of organic chlorine	○	◉	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	○	○	
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	○	○	
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	○	◉	0
PCE*		Material released	◉	○	0
TCE*		Daughter product of PCE [a/]	◉	○	2
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE[a/]; 1,1-DCE can be a chem. reaction product of TCA	○	◉	0
VC*		Daughter product of DCE[a/]	○	◉	0
1,1,1-Trichloroethane*		Material released	○	○	
DCA		Daughter product of TCA under reducing conditions	○	○	
Carbon Tetrachloride		Material released	○	○	
Chloroethane*		Daughter product of DCA or VC under reducing conditions	○	○	
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	○	○	
	>0.1 mg/L	Daughter product of VC/ethene	○	◉	0
Chloroform		Daughter product of Carbon Tetrachloride	○	◉	0
Dichloromethane		Daughter product of Chloroform	○	○	

* required analysis.

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE | Reset

End of Form

Natural Attenuation Screening Protocol

The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.

Interpretation	Score
Inadequate evidence for anaerobic biodegradation* of chlorinated organics	0 to 5
Limited evidence for anaerobic biodegradation* of chlorinated organics	6 to 14
Adequate evidence for anaerobic biodegradation* of chlorinated organics	15 to 20
Strong evidence for anaerobic biodegradation* of chlorinated organics	>20

Score: 12

Scroll to End of Table

* reductive dechlorination

Analysis	Concentration in Most Contam. Zone	Interpretation	Yes	No	Points Awarded
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	◉	○	3
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	○	◉	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	○	◉	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Sulfide*	>1 mg/L	Reductive pathway possible	○	◉	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	○	◉	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	◉	○	1
	<-100mV	Reductive pathway likely	○	◉	0
pH*	5 < pH < 9	Optimal range for reductive pathway	◉	○	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	○	◉	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	○	◉	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	○	○	
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	○	○	
Chloride*	>2x background	Daughter product of organic chlorine	○	◉	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	○	○	
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	○	○	
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	○	◉	0
PCE*		Material released	◉	○	0
TCE*		Daughter product of PCE [a/]	◉	○	2
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE[a/]; 1,1-DCE can be a chem. reaction product of TCA	◉	○	2
VC*		Daughter product of DCE[a/]	○	◉	0
1,1,1-Trichloroethane*		Material released	○	○	
DCA		Daughter product of TCA under reducing conditions	○	○	
Carbon Tetrachloride		Material released	○	○	
Chloroethane*		Daughter product of DCA or VC under reducing conditions	○	○	
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	○	◉	0
	>0.1 mg/L	Daughter product of VC/ethene	○	◉	0
Chloroform		Daughter product of Carbon Tetrachloride	○	○	
Dichloromethane		Daughter product of Chloroform	○	○	

* required analysis.

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE | Reset

End of Form

Natural Attenuation Screening Protocol

The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.

Interpretation	Score
Inadequate evidence for anaerobic biodegradation* of chlorinated organics	0 to 5
Limited evidence for anaerobic biodegradation* of chlorinated organics	6 to 14
Adequate evidence for anaerobic biodegradation* of chlorinated organics	15 to 20
Strong evidence for anaerobic biodegradation* of chlorinated organics	>20

Score: 12

Scroll to End of Table

* reductive dechlorination

Analysis	Concentration in Most Contam. Zone	Interpretation	Yes	No	Points Awarded
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	◉	○	3
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	○	◉	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	○	◉	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Sulfide*	>1 mg/L	Reductive pathway possible	○	◉	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	○	◉	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	◉	○	1
	<-100mV	Reductive pathway likely	○	◉	0
pH*	5 < pH < 9	Optimal range for reductive pathway	◉	○	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	○	◉	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	○	◉	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	○	○	
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	○	○	
Chloride*	>2x background	Daughter product of organic chlorine	○	◉	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	○	○	
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	○	○	
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	○	◉	0
PCE*		Material released	◉	○	0
TCE*		Daughter product of PCE [a/]	◉	○	2
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE[a/]; 1,1-DCE can be a chem. reaction product of TCA	◉	○	2
VC*		Daughter product of DCE[a/]	○	◉	0
1,1,1-Trichloroethane*		Material released	○	○	
DCA		Daughter product of TCA under reducing conditions	○	○	
Carbon Tetrachloride		Material released	○	○	
Chloroethane*		Daughter product of DCA or VC under reducing conditions	○	○	
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	○	◉	0
	>0.1 mg/L	Daughter product of VC/ethene	○	◉	0
Chloroform		Daughter product of Carbon Tetrachloride	○	○	
Dichloromethane		Daughter product of Chloroform	○	○	

* required analysis.

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE Reset

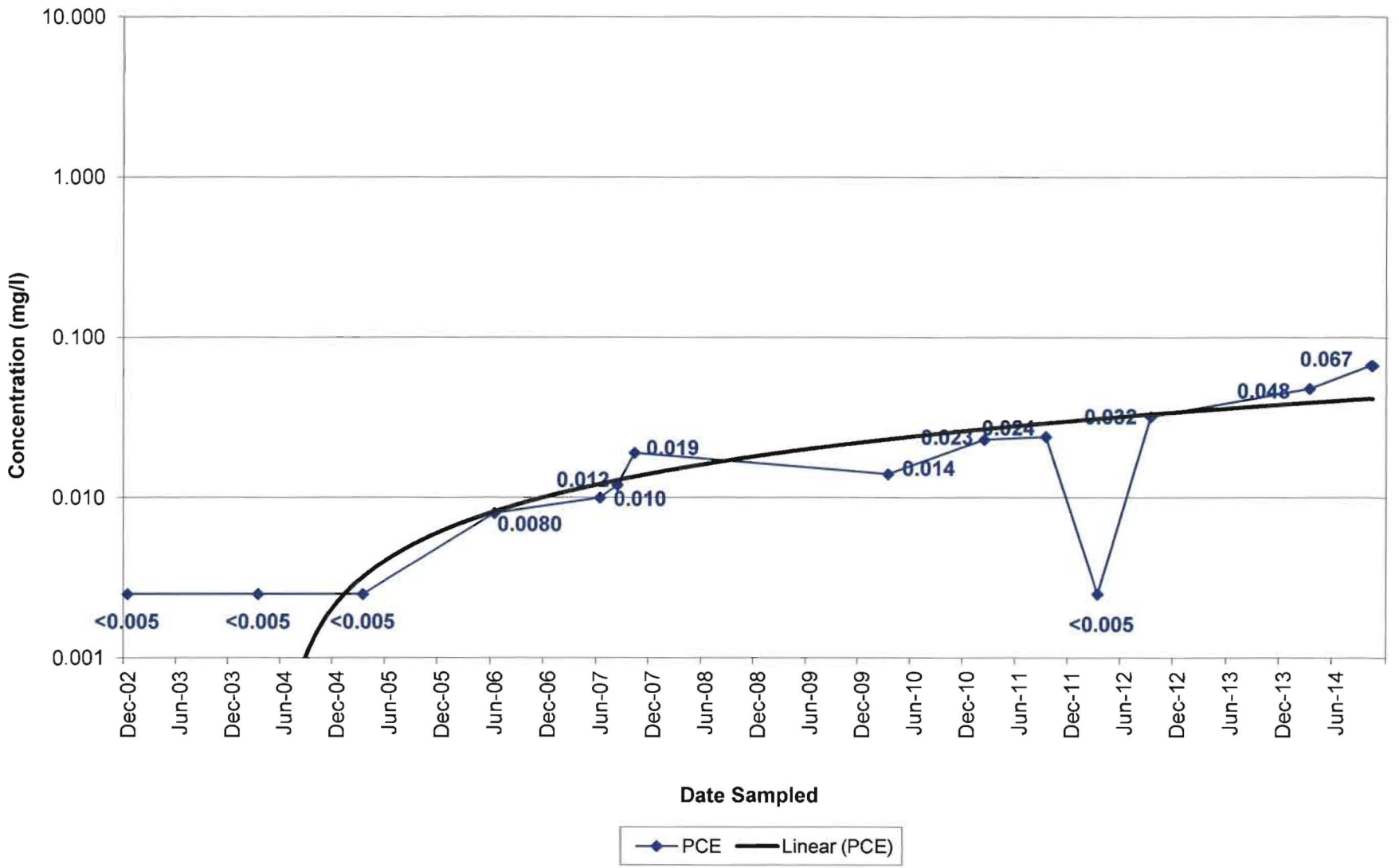
End of Form

APPENDIX 7

HISTORIC GROUNDWATER AND SEEP WATER PCE TREND GRAPHS

MW-5S

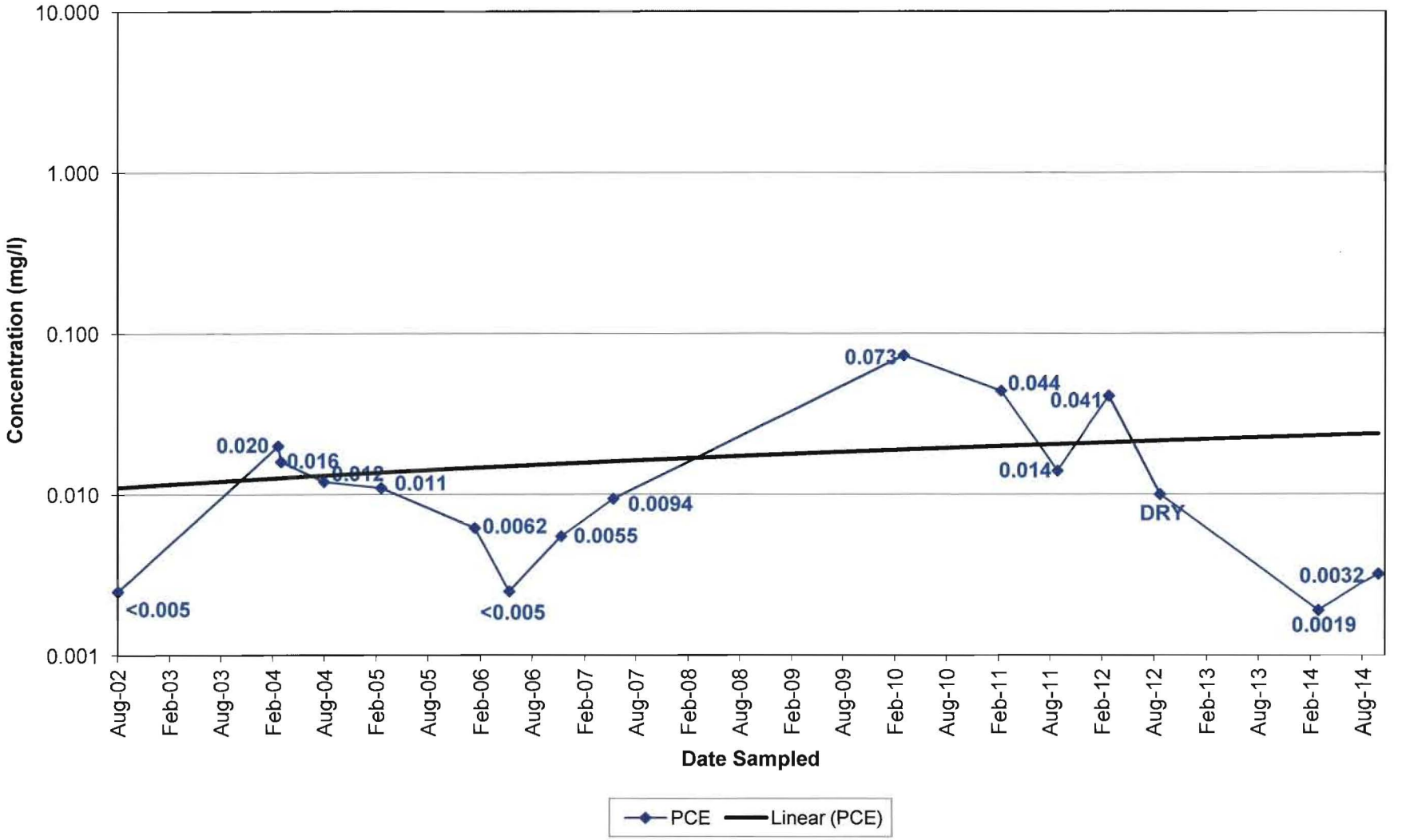
Tetrachlorethene (PCE) Concentrations



Spalding Corners Shopping Center
Norcross, Fulton Co., GA
HSI #10639

Sailors Engineering Associates, Inc.
Lawrenceville, GA
SEA Job #102-063

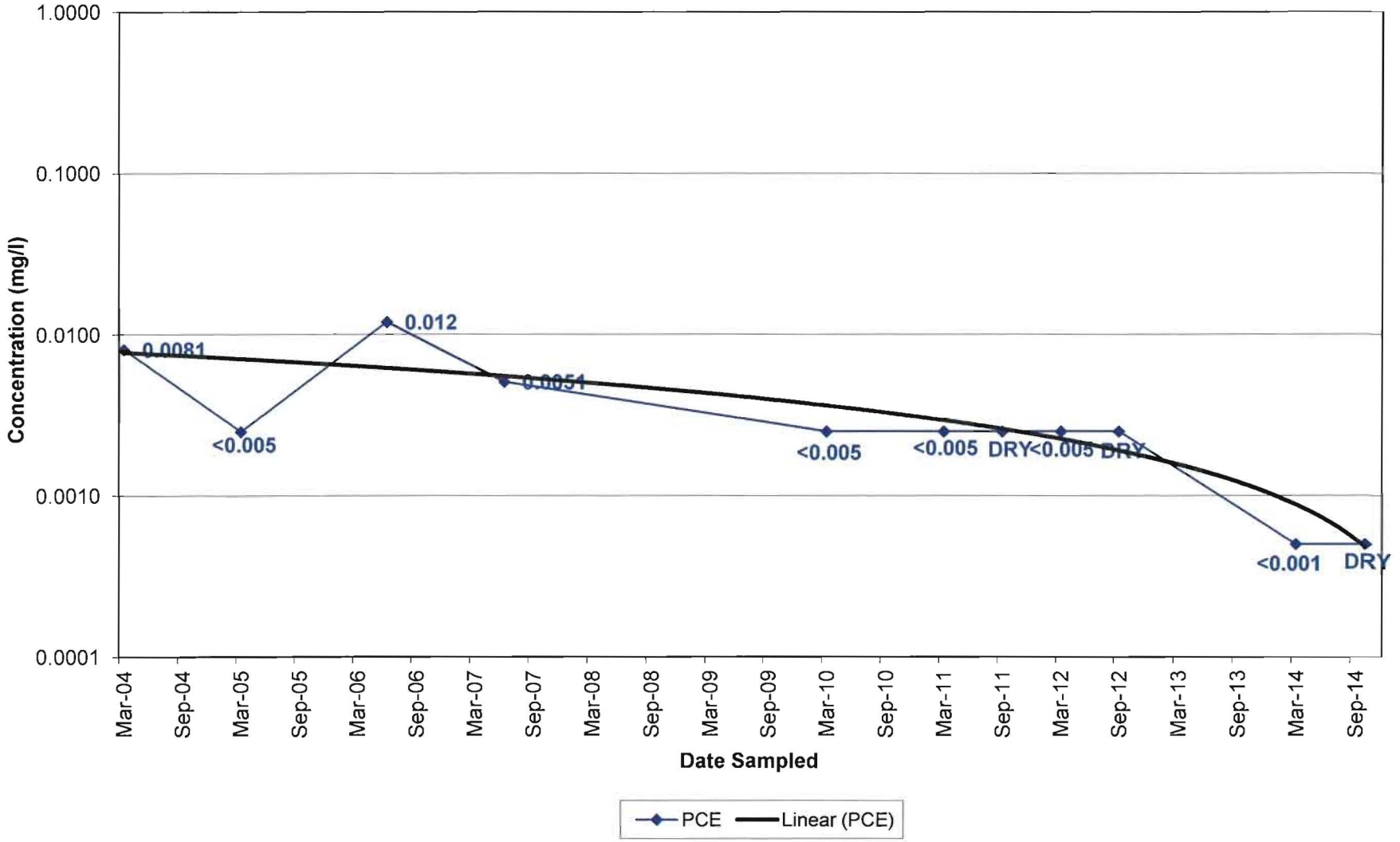
MW-6S
Tetrachloroethene (PCE) Concentrations



Spalding Corners Shopping Center
Norcross, Fulton Co., GA
HSI #10639

Sailors Engineering Associates, Inc.
Lawrenceville, GA
SEA Job #102-063

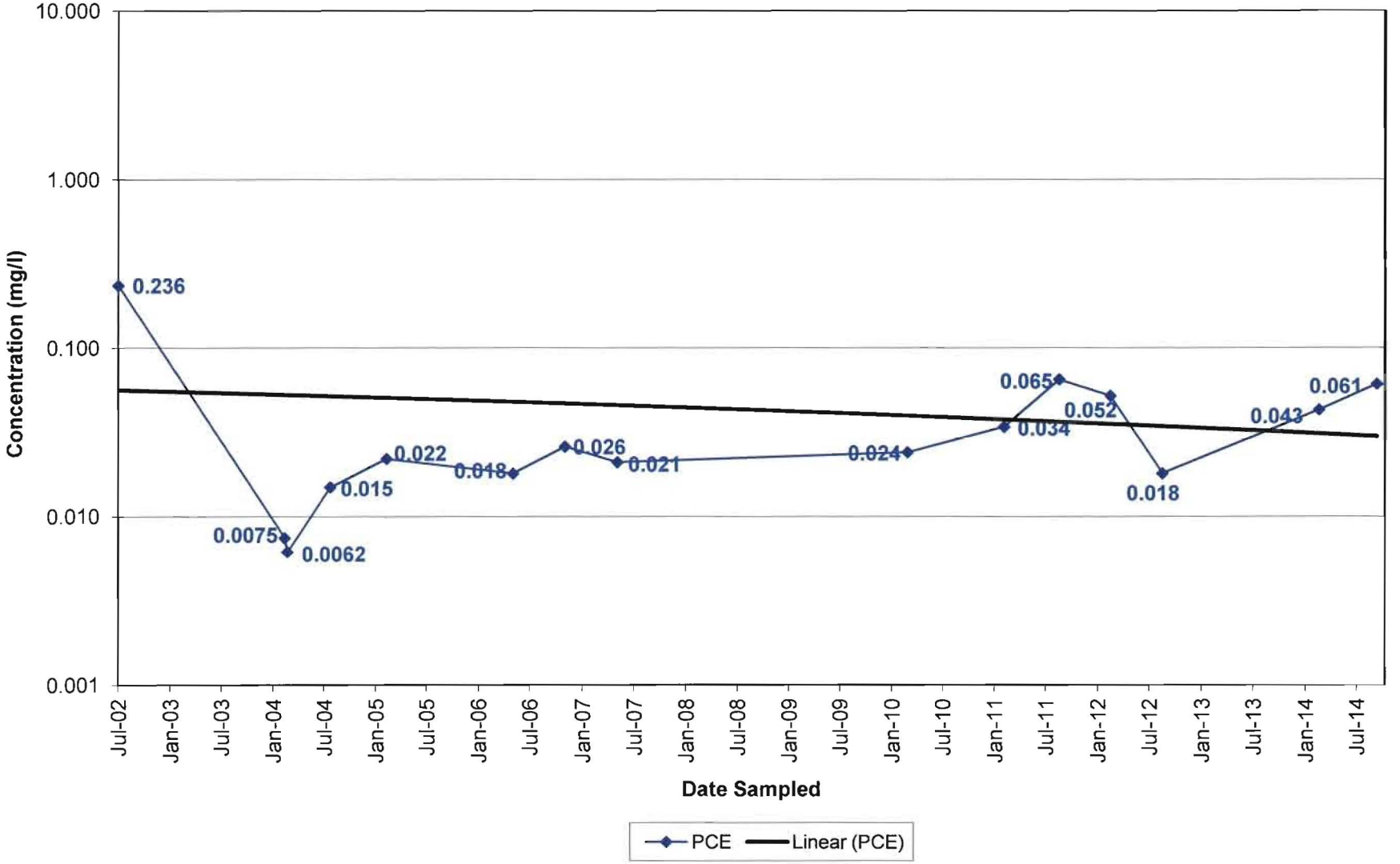
MW-7S
Tetrachloroethene (PCE) Concentrations



Spalding Corners Shopping Center
Norcross, Fulton Co., GA
HSI #10639

Sailors Engineering Associates, Inc.
Lawrenceville, GA
SEA Job 3102-063

MW-10S
Tetrachloroethene (PCE) Concentrations



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HSI #10639

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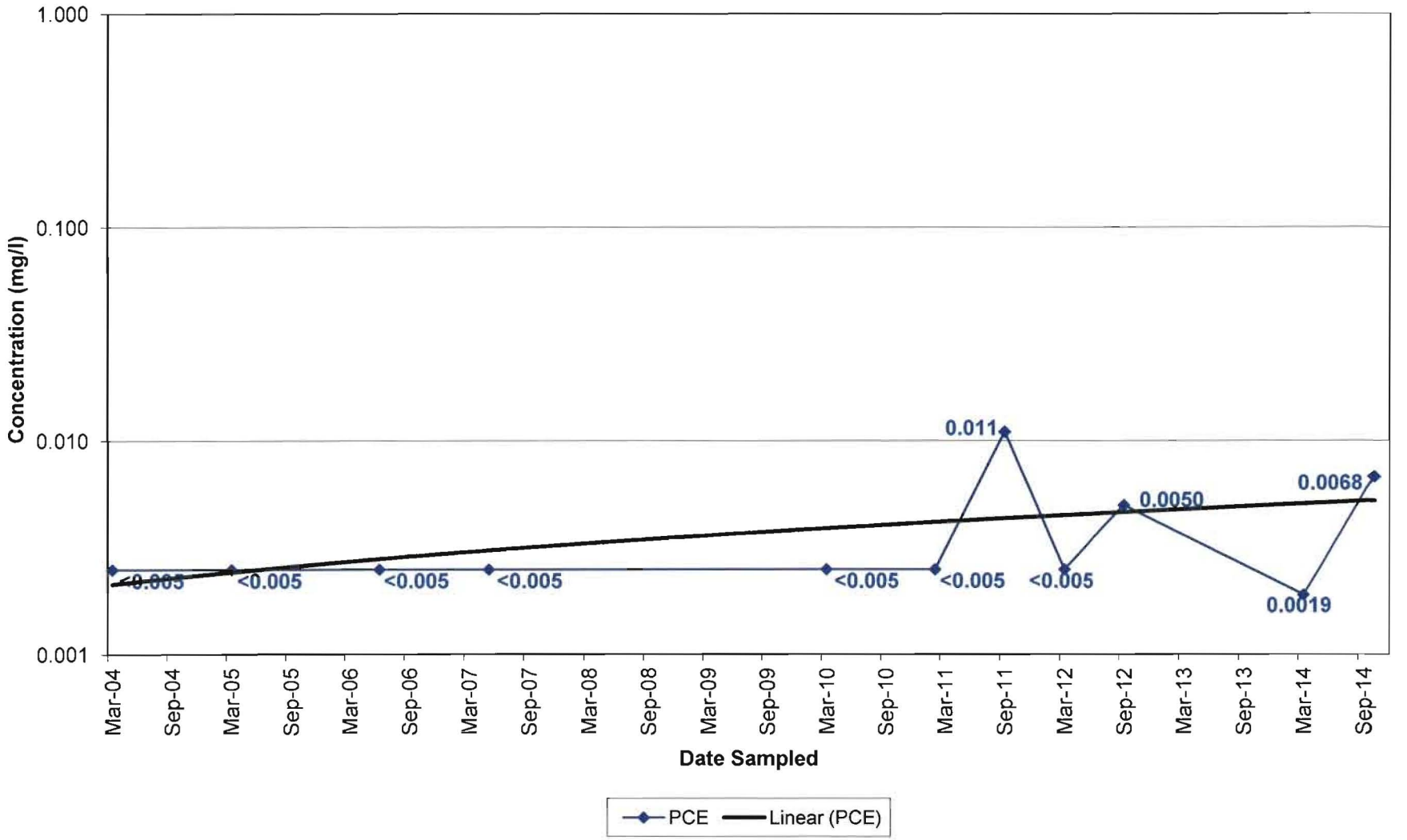
SEA Job #102-063

MW-14S

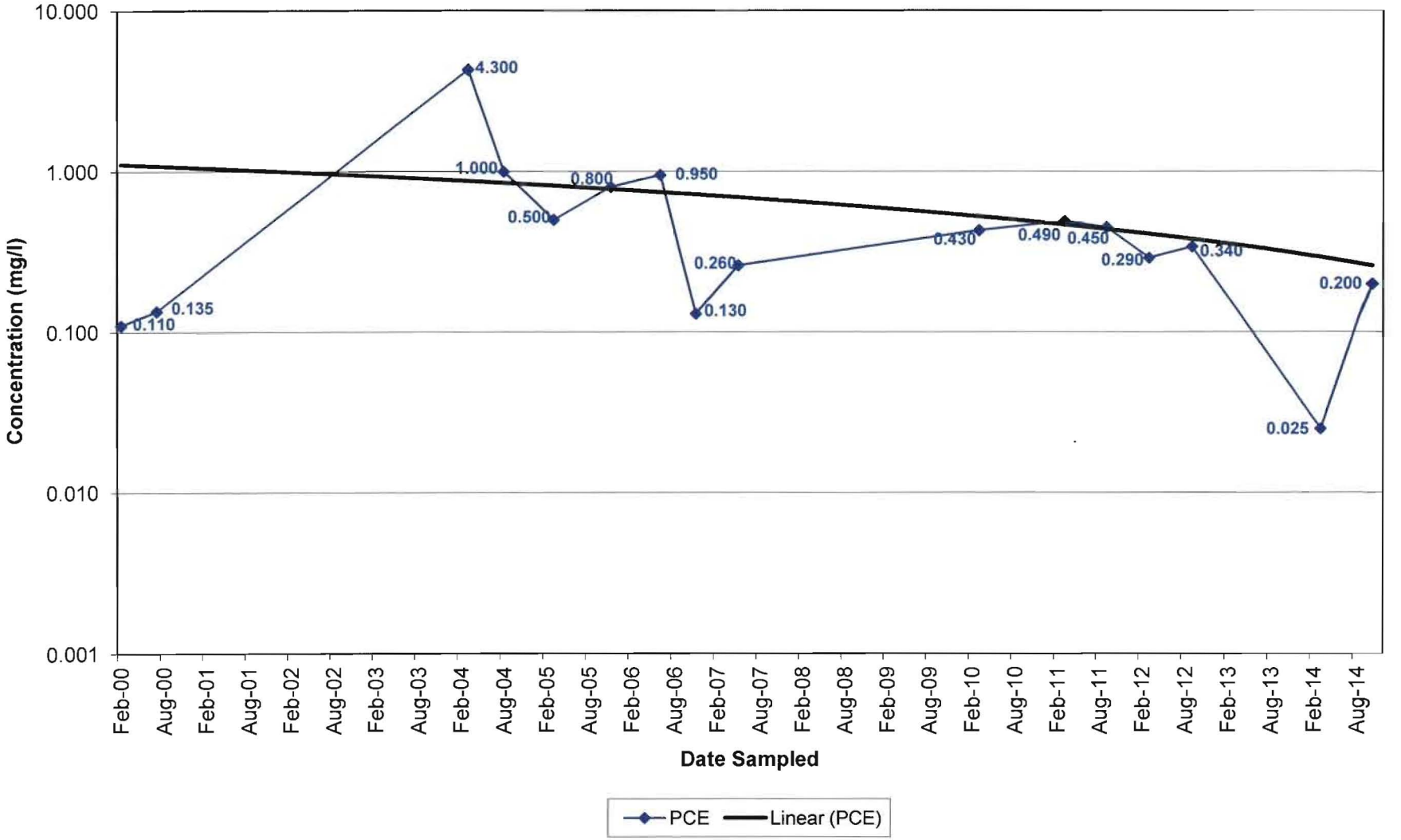
Tetrachloroethene (PCE) Concentrations



Spalding Corners Shopping Center
Norcross, Fulton Co., GA
HSI #10639

Sailors Engineering Associates, Inc.
Lawrenceville, GA
SEA Job #102-063

MW-15S
Tetrachloroethene (PCE) Concentrations



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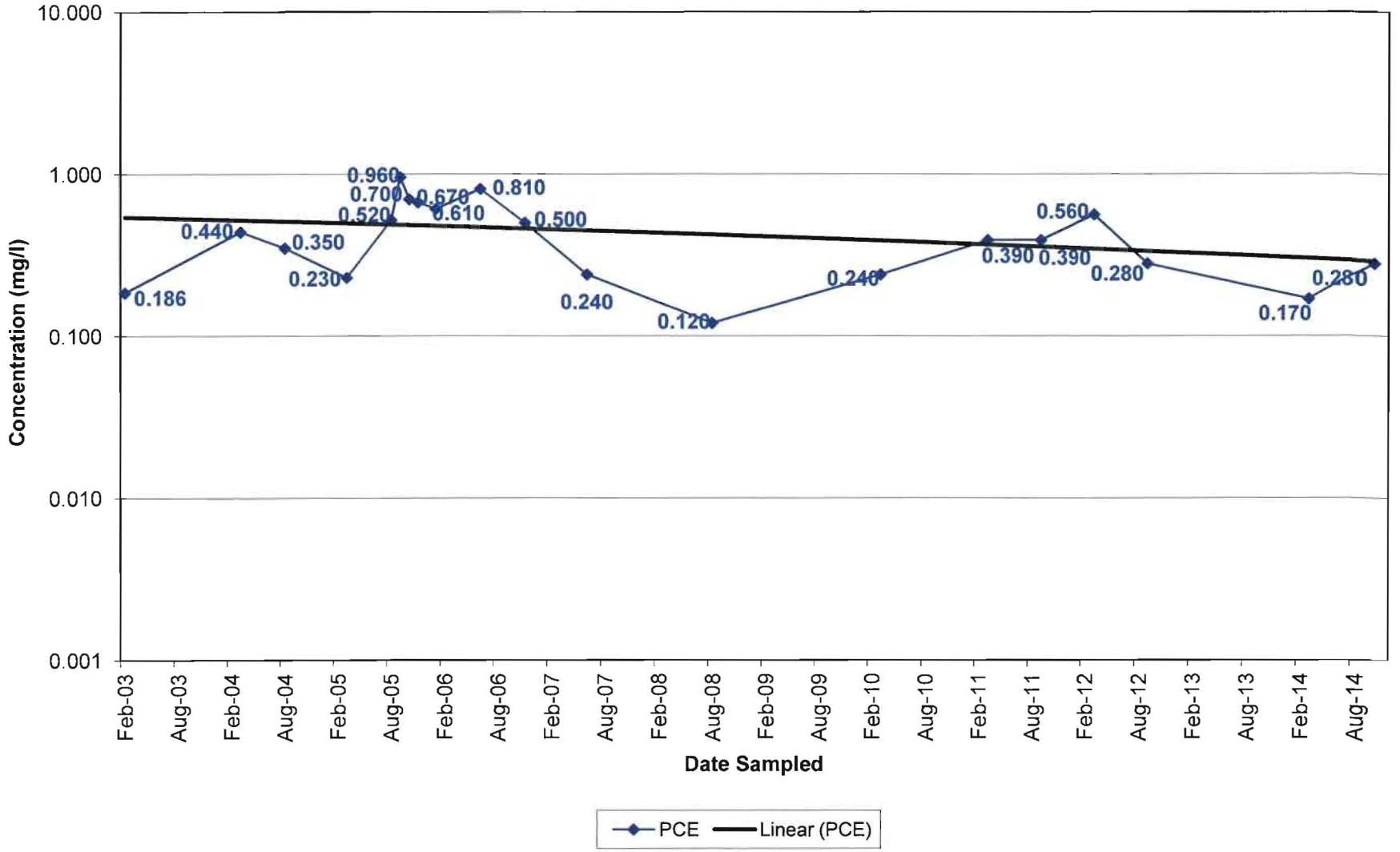
HSI #10639

Sailors Engineering Associates, Inc.
Lawrenceville, GA
SEA Job #102-063

MW-16S
Tetrachloroethene (PCE) Concentrations



Spalding Corners Shopping Center
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HSI #10639

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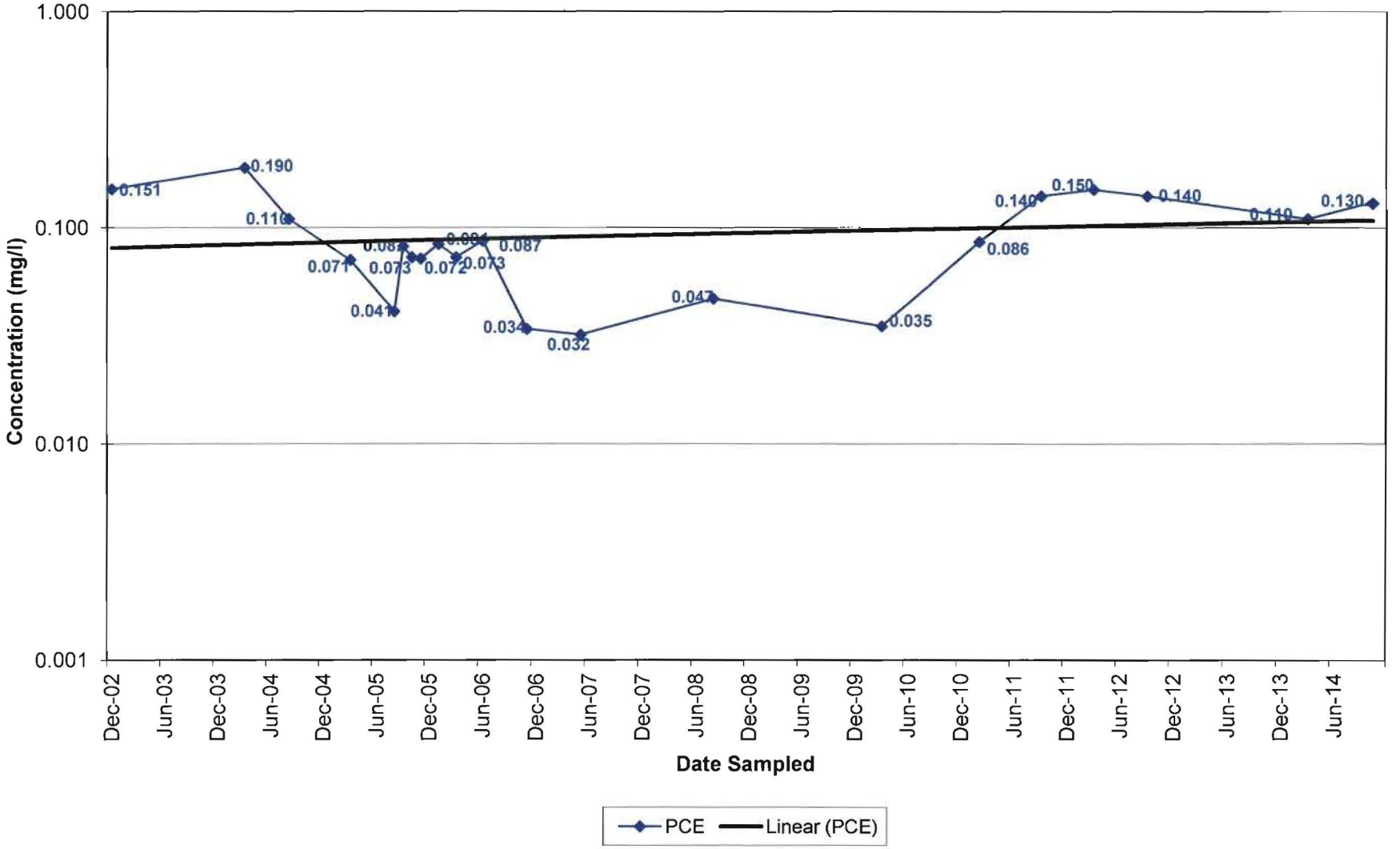
Lawrenceville, GA
SEA Job #102-063

MW-17S
Tetrachlororethene (PCE) Concentrations



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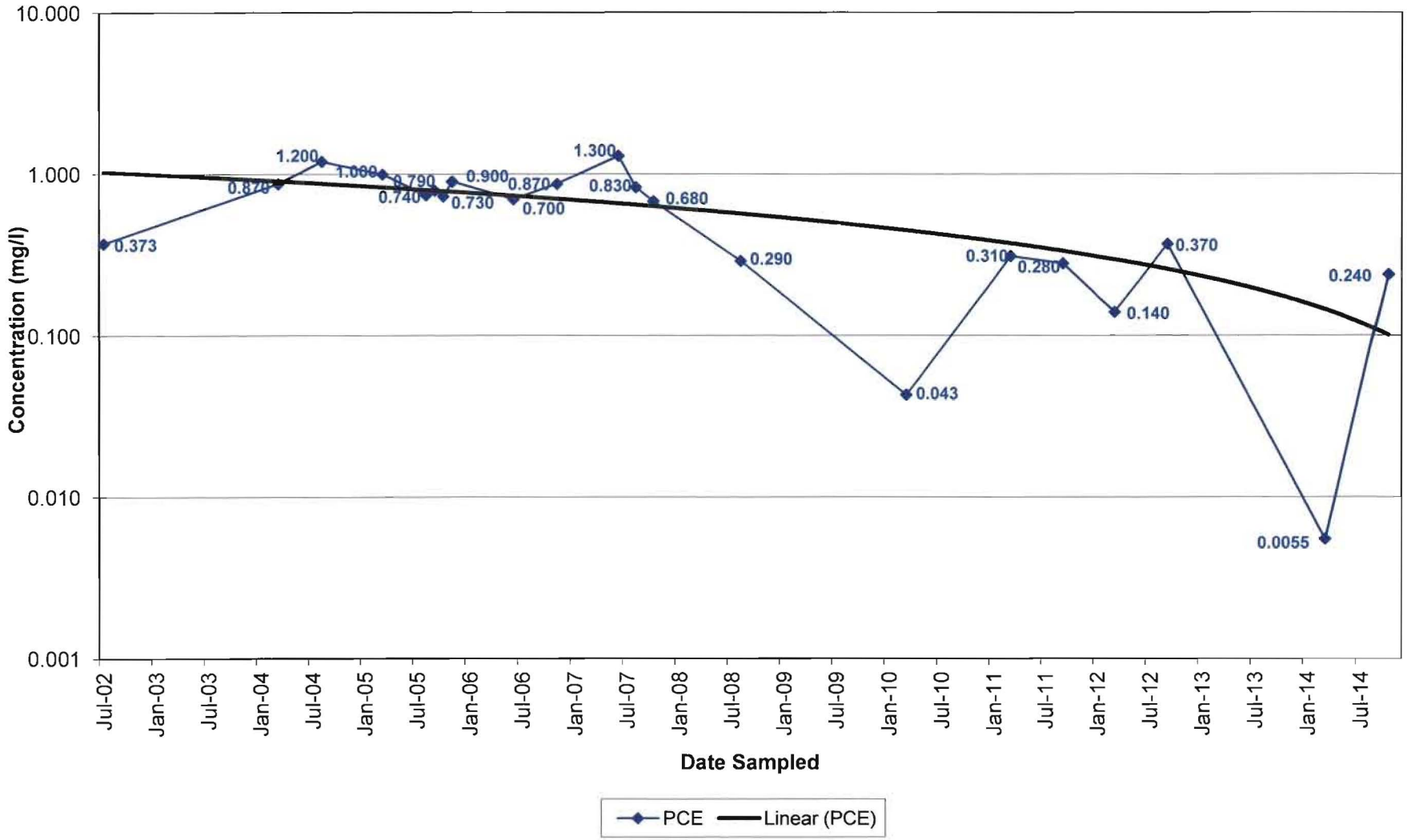
MW-18S
Tetrachloroethene (PCE) Concentrations



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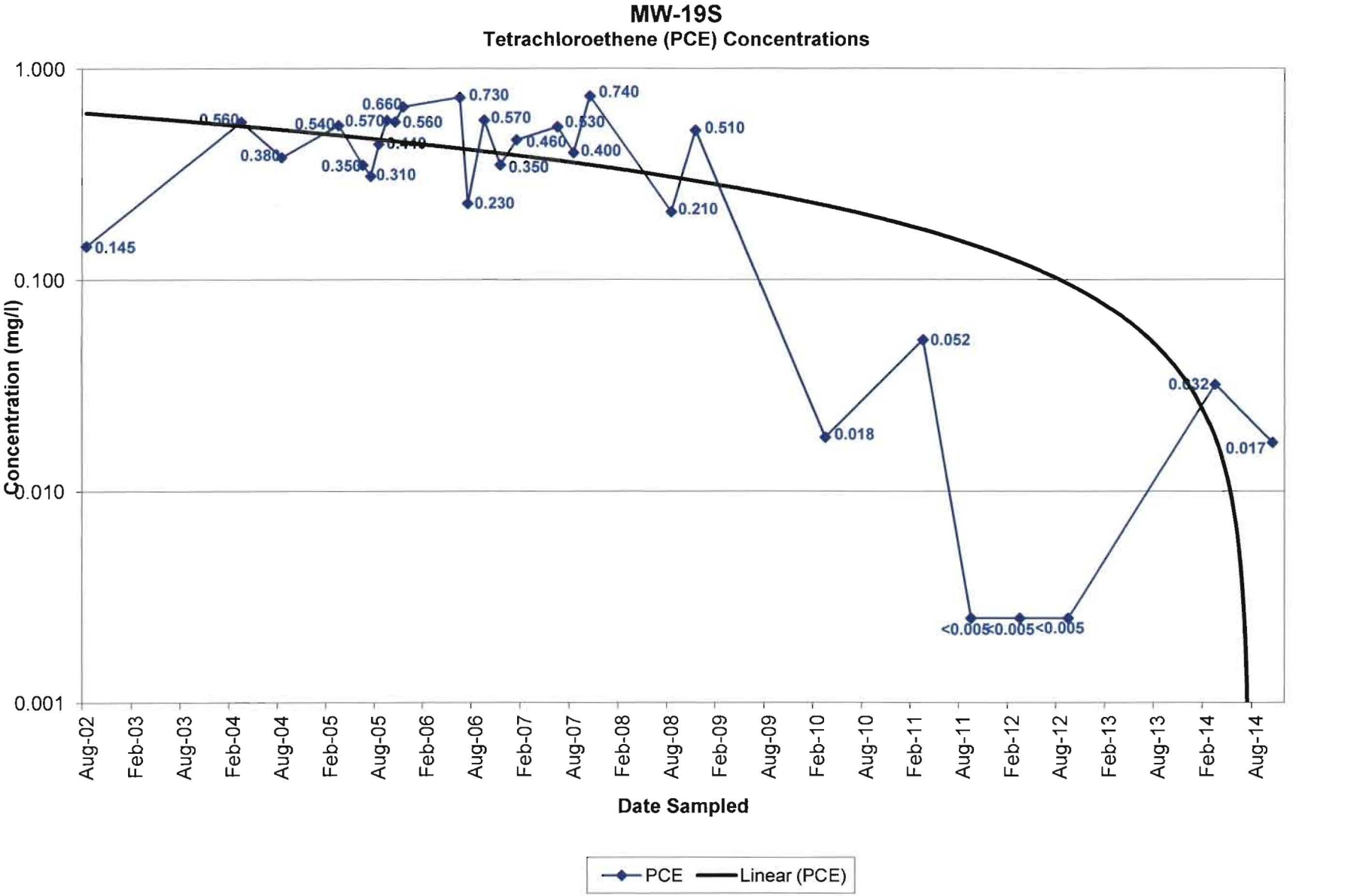

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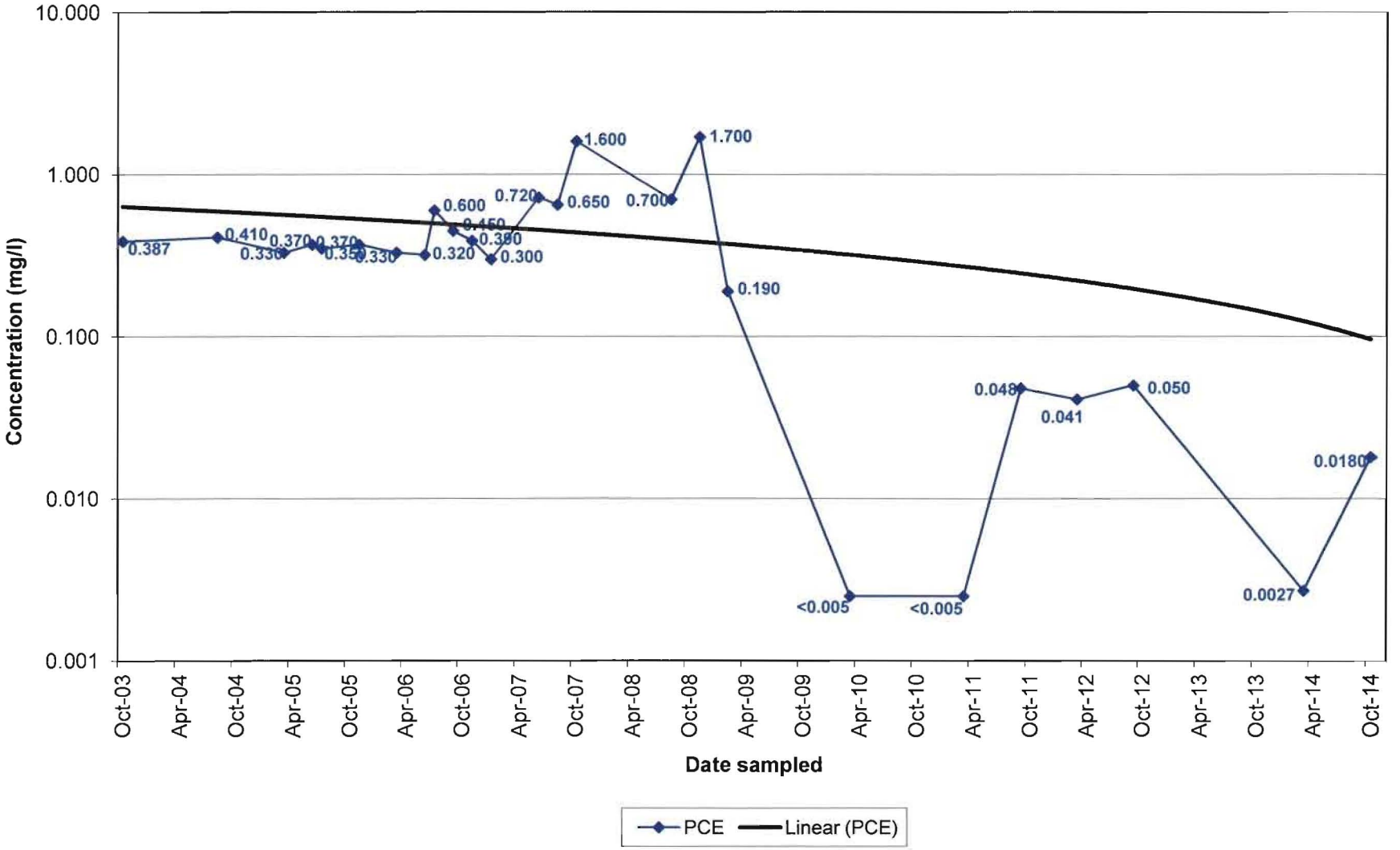
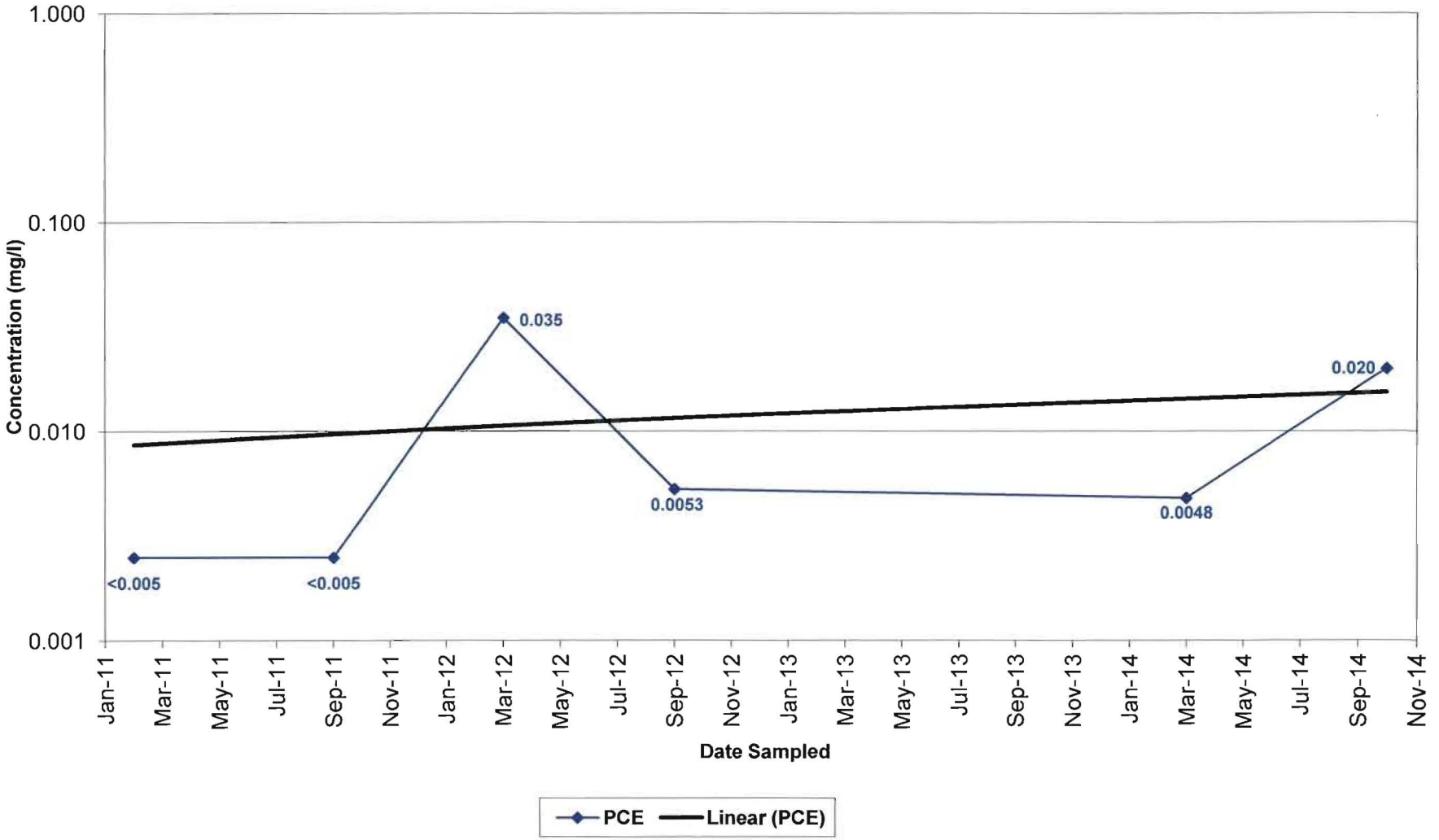
MW-20S
Tetrachloroethene (PCE) Concentrations



Spalding Corners Shopping Center
Norcross, Fulton Co., GA
HSI #10639

Sailors Engineering Associates, Inc.
Lawrenceville, GA
SEA Job #102-063

MW-21S
Tetrachloroethene (PCE) Concentrations

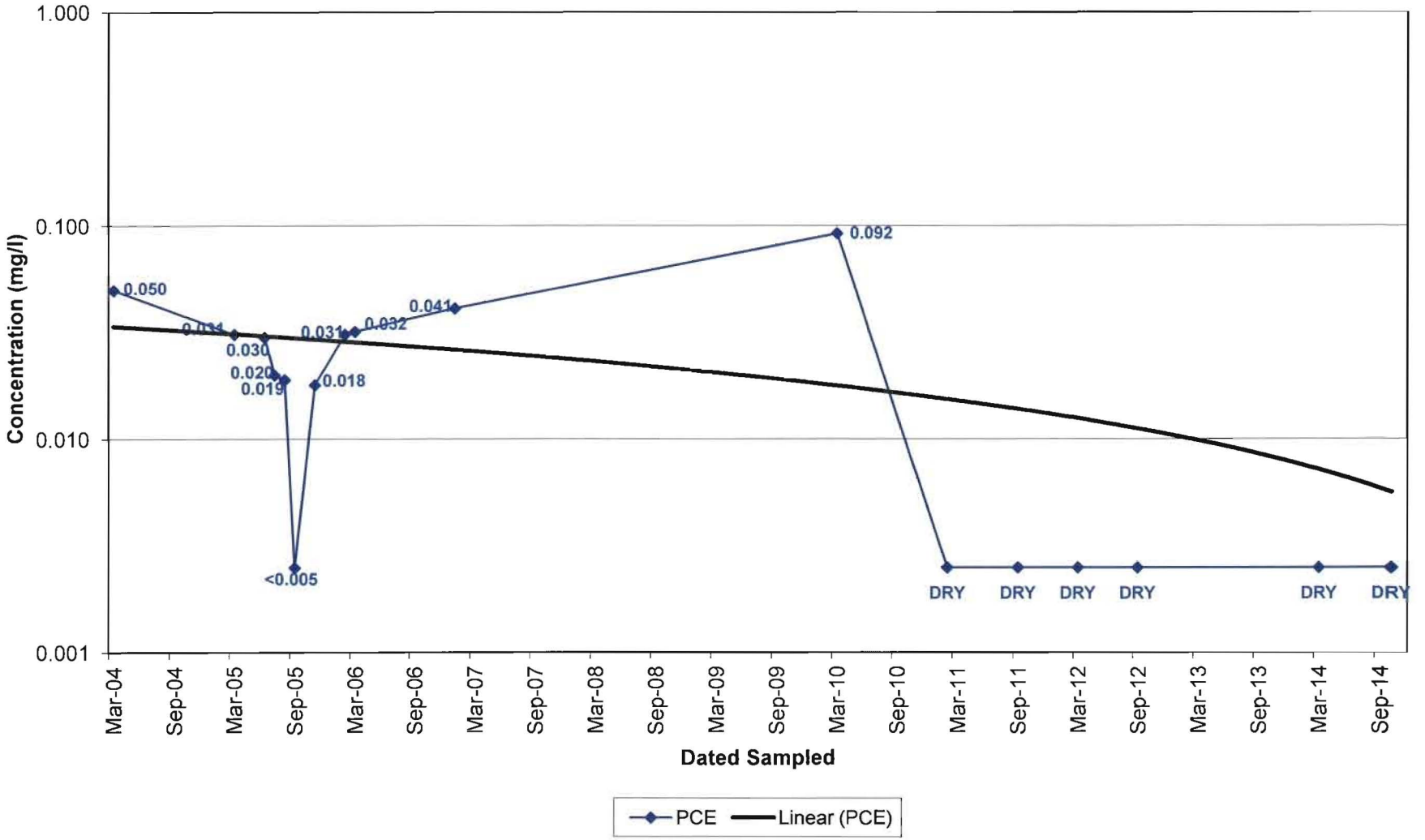


Spalding Corners Shopping Center
Norcross, Fulton Co., GA
HSI #10639

Sailors Engineering Associates, Inc.
Lawrenceville, GA
SEA Job #102-063

SW-1

Tetrachloroethene (PCE) Concentrations

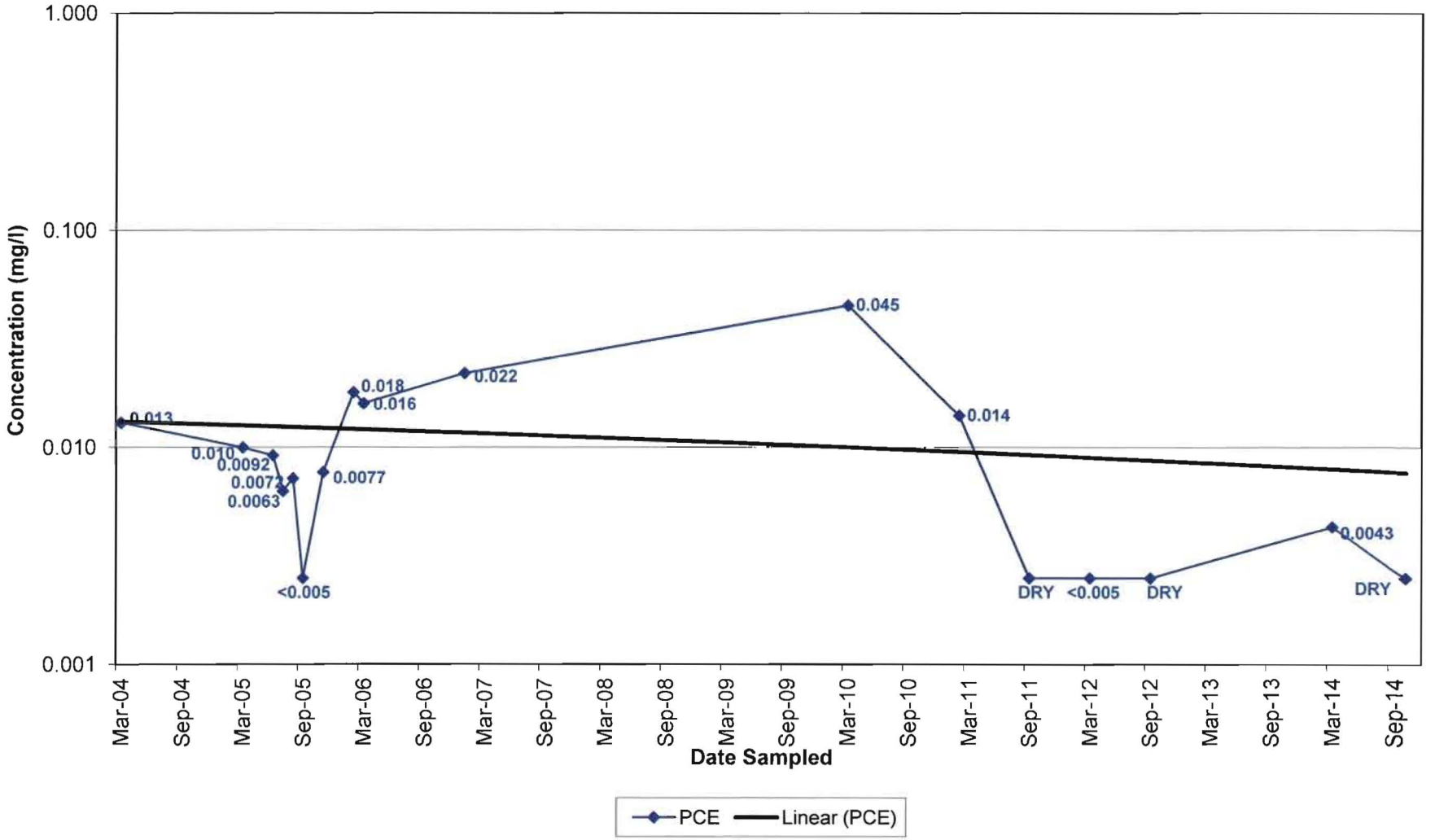


Spalding Corners Shopping Center
Norcross, Fulton Co., GA
HSI #10639

Sailors Engineering Associates, Inc.
Lawrenceville, GA
SEA Job #102-063

SW-2

Tetrachloroethene (PCE) Concentrations

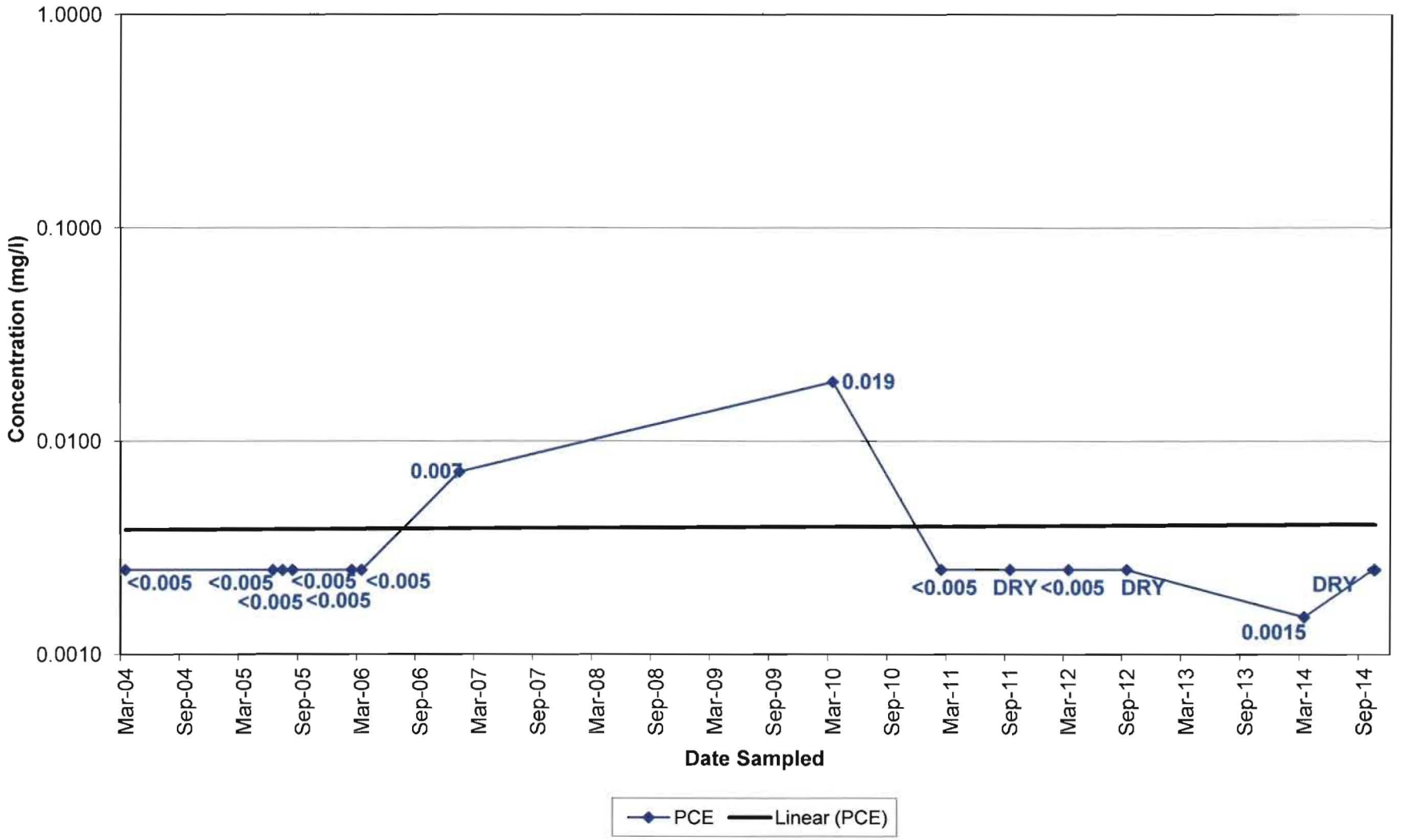


Spalding Corners Shopping Center
Norcross, Fulton Co., GA
HSI #10639

Sailors Engineering Associates, Inc.
Lawrenceville, GA
SEA Job #102-063

SW-3

Tetrachloroethene (PCE) Concentrations



Spalding Corners Shopping Center
Norcross, Fulton Co., GA
HSI #10639

Sailors Engineering Associates, Inc.
Lawrenceville, GA
SEA Job #102-063

APPENDIX 8

RISK REDUCTION STANDARDS EVALUATION

RRS Table 1

Spalding Corners Shopping Center
Norcross, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063

Type 1 Risk Reduction Standards Evaluation

CAS	Chemical	NC (mg/Kg)	Type1/3 GW (mg/L)	Type 1/3 GWx100	Max NC/ GWx100	Carcinogenic Equ 6	Non-Carcinogenic Equ 7	Type 1 RRS (mg/Kg)
79-00-5	1,1,2-Trichloroethane	0.5	0.005					
78-93-3	2-Butanone (MEK)	0.79	2.000					
67-64-1	Acetone	2.74	4.000					
71-43-2	Benzene	0.02	0.005					
67-66-3	Chloroform	0.68	0.100	10	10	3.87E+00	3.56E+02	3.866
156-59-2	cis-1,2-Dichloroethylene	0.53	0.070	7	7	NA	1.17E+03	7.000
127-18-4	Tetrachloroethylene	0.18	0.005	0.5	0.5	3.15E+02	1.42E+02	0.500
108-88-3	Toluene	14.4	1.000					
79-01-6	Trichloroethylene	0.13	0.005	0.5	0.5	1.82E+01	6.65E+00	0.500
1330-20-7	Xylene	20	10.000	1000	1000	NA	1.06E+03	1000.000

RRS Table 2

Spalding Corners Shopping Center
Norcross, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063

Factors Summary

		MW	H'	H=H'/41	Density (g/cm^3)	Di,a	Di,w	Kd	Koc	S	VOC	VF	Oral Slope Factor [1/(mg/kg-day)]	IUR $(ug/m^3)^{-1}$	Sfi=IUR*70/20*1000 Inhalation Slope Factor [1/(mg/kg-day)]	Oral RfD - Chronic (mg/kg-day)	Inhalation RfC (mg/m^3)	RfDi=RfCi*20/70 Inhalation RfD - Chronic (mg/kg-day)	Carcinogen Class	Target Cancer Risk
67-66-3	Chloroform	119.38	1.50E-01	3.67E-03	1.4788	7.69E-02	1.09E-05		3.18E+01	7.95E+03	1	2.76E+03	3.10E-02	2.30E-05	8.05E-02	1.00E-02	9.80E-02	2.80E-02	B	1.00E-05
156-59-2	cis-1,2-Dichloroethylene	96.94	1.67E-01	4.08E-03	1.2837	8.84E-02	1.13E-05		3.96E+01	6.41E+03	1	2.73E+03				2.00E-03				NA
127-18-4	Tetrachloroethylene	165.83	7.24E-01	1.77E-02	1.623	5.05E-02	9.46E-06		9.49E+01	2.06E+02	1	2.65E+03	2.10E-03	2.60E-07	9.10E-04	6.00E-03	4.00E-02	1.14E-02	B	1.00E-05
79-01-6	Trichloroethylene	131.39	4.03E-01	9.85E-03	1.4642	6.87E-02	1.02E-05		6.07E+01	1.28E+03	1	2.44E+03	4.60E-02	4.10E-06	1.44E-02	5.00E-04	2.00E-03	5.71E-04	B	1.00E-05
1330-20-7	Xylene	106.17	2.71E-01	6.63E-03	0.864	6.85E-02	8.46E-06		3.83E+02	1.06E+02	1	7.71E+03				2.00E-01	1.00E-01	2.86E-02		NA

RRS Table 3

Spalding Corners Shopping Center
Norcross, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063

RAGS Equation 6 Residential Soil - Carcinogenic Effects

		Residential	
C	chemical concentration in soil (mg/kg)		calculated
TR	target cancer risk		chemical specific
SF_o	oral cancer slope factor((mg/kg-day)$^{-1}$)		chemical specific
SF_i	inhalation cancer slope factor((mg/kg-day)$^{-1}$)		chemical specific
AT	averaging time (yr)	70	default
EF	exposure frequency (days/year)	350	default
BW	body weight (Kg)	70	default
ED	exposure duration (yr)	30	default
IR_S	daily soil ingestion rate (L/day)	114	default
IR_a	daily inhalation rate (m^3/day)	15	default
PEF	Particulate emision factor (m^3/kg)	4.63e9	default
VF	soil to air volatilization factor (m^3/kg)		from RAGS eq. 8

$$C = \frac{TR \times BW \times AT \times 365 \text{ days/year}}{EF \times ED \times [(SF_o \times 10^{-6} \text{ kg/mg} \times IR_s) + (SF_i \times IR_a \times [1/VF + 1/PEF])]}$$

Chemical	C_{adult}		SF_o	SF_i	VF	TR
Chloroform	3.87E+00		3.10E-02	8.05E-02	2.76E+03	1.00E-05
cis-1,2-Dichloroethylene	NA				2.73E+03	NA
Tetrachloroethylene	3.15E+02		2.10E-03	9.10E-04	2.65E+03	1.00E-05
Trichloroethylene	1.82E+01		4.60E-02	1.44E-02	2.44E+03	1.00E-05
Xylene	NA				7.71E+03	NA

RRS Table 4

Spalding Corners Shopping Center
Norcross, Fulton County, Georgia
HSI No. 10639
SEA Job#102-063

RAGS Equation 7 Residential Soil - Non-Carcinogenic Effects
Adult

C	chemical concentration in soil (mg/L)		calculated	
THI	target hazard index	1	default	
RfD_o	inhalation cancer slope factor((mg/kg-day)$^{-1}$)		chemical specific	
RfD_i	oral cancer slope factor((mg/kg-day)$^{-1}$)		chemical specific	
BW	body weight (Kg)	70	default	
AT	averaging time (yr)	30	equal to ED	
EF	exposure frequency (days/year)	350	default	
ED	exposure duration (yr)	30	default	
IR_s	soil ingestion rate (mg/day)	114	default	
IR_a	daily inhalation rate (m^3/day)	15	default	
PEF	Particulate emision factor (m^3/kg)	4.63E+09	default	
VF	soil to air volatilization factor (m^3/kg)		from RAGS eq. 8	

$$C = \frac{THI \times BW \times AT \times 365 \text{ days/year}}{EF \times ED \times [((1/RfD_o) \times 10^{-6} \text{ kg/mg} \times IR_s) + ((1/RfD_i) \times IR_a \times [1/VF + 1/PEF])]}$$

Chemical	C_{adult}		RfD_o	RfD_i	VF
Chloroform	3.56E+02		1.00E-02	2.80E-02	2.76E+03
cis-1,2-Dichloroethylene	1.17E+03		2.00E-03		2.73E+03
Tetrachloroethylene	1.42E+02		6.00E-03	1.14E-02	2.65E+03
Trichloroethylene	6.65E+00		5.00E-04	5.71E-04	2.44E+03
Xylene	1.06E+03		2.00E-01	2.86E-02	7.71E+03

APPENDIX 9

VAPOR INTRUSION EVALUATION

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-05	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	19	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR ($(ug/m^3)^{-1}$)	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator i
127-18-4	Tetrachloroethylene	2.0E+02	1.04E+02	2.2E-06	5.9E-01	2.60E-07	I	4.00E-02	I	

Notes:

(1) **Inhalation Pathway Exposure Parameters (RME):**

Exposure Scenario	Units	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Averaging time for carcinogens	(yrs)	ATc_R_GW	70	ATc_C_GW	70	ATc_GW	70
Averaging time for non-carcinogens	(yrs)	ATnc_R_GW	26	ATnc_C_GW	25	Atnc_GW	25
Exposure duration	(yrs)	ED_R_GW	26	ED_C_GW	25	ED_GW	25
Exposure frequency	(days/yr)	EF_R_GW	350	EF_C_GW	250	EF_GW	250
Exposure time	(hr/day)	ET_R_GW	24	ET_C_GW	8	ET_GW	8

(2) **Generic Attenuation Factors:**

Source Medium of Vapors	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Groundwater (-)	AFgw_R_GW	0.001	AFgw_C_GW	0.001	AFgw_GW	0.001
Sub-Slab and Exterior Soil Gas (-)	AFss_R_GW	0.03	AFss_C_GW	0.03	AFss_GW	0.03

(3) **Formulas**
Cia, target = MIN(Cia,c; Cia,nc)
Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)
Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RfC x (1000 ug/mg) / (ED x EF x ET)

(4) **Special Case Chemicals**

Trichloroethylene

	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
	mIURTCE_R_GW	1.00E-06	mIURTCE_C_GW	0.00E+00	mIURTCE_GW	0.00E+00
	IURTCE_R_GW	3.10E-06	IURTCE_C_GW	4.10E-06	IURTCE_GW	4.10E-06

Mutagenic Chemicals — The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.

Age Cohort	Exposure Duration	Age-dependent adjustment factor
0 - 2 years	2	10
2 - 6 years	4	3
6 - 16 years	10	3
16 - 26 years	10	1

Mutagenic-mode-of-action (MMOA) adjustment factor 25 — This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride — See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:
I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at: http://www.epa.gov/iris/subst/index.html
P = PPRTV. EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at: http://hhpprtv.ornl.gov/pprtv.shtml
A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at: http://www.atsdr.cdc.gov/mrls/index.html
CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at: http://www.oehha.ca.gov/risk/ChemicalDB/index.asp
H = HEAST. EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at: http://epa-heast.ornl.gov/heast.shtml
S = See RSL User Guide, Section 5
X = PPRTV Appendix
Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).
VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).
TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).
Yellow highlighting indicates site-specific parameters that may be edited by the user.
Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.
Pink highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

APPENDIX 10

GROUNDWATER FATE AND TRANSPORT MODEL – BIOCHLOR

INPUT PARAMETERS

Input Parameter	Symbol	Value	Unit	Remarks
1. ADVECTION				
Seepage velocity or	Vs	92.3	ft/yr	**V_x=Ki/n**
Hydraulic conductivity	K	0.0009705	cm/sec	K = 9.705E-04 cm/sec (2.751 ft/day) average slug tests MW-17S & MW-20S (Peachtree Mar 2010)
Hydraulic gradient	i	0.01839	ft/ft	Hydraulic gradient parallel to flow direction (from MW-15S to MW-20S average)
Porosity	n	0.2	dim. less	Conservative estimate for Piedmont soils (silts & sands based on boring logs; average from Fetter 1980)
2. DISPERSION				
Alpha X		125	ft	One tenth of estimated plume length
(Alpha Y) / (Alpha X)		0.1	ft	Model default
(Alpha Z) / (Alpha X)		1.00E-99	ft	Model default for conservative estimate for no vertical dispersion
3. ADSORPTION				
Retardation Factor	R			see below
or Soil Bulk Density	rho	1.7	kg/L	GA HSRP Default if value unknown
Fraction Organic Carbon	foc	2.00E-03	dim.less	GA HSRP Default if value unknown
Partition Coefficient	Koc		L/kg	
PCE		95	L/kg	Based on GA HSRP Values (USEPA Region 3, May 2015)
TCE			L/kg	Not Used
DCE			L/kg	"
VC			L/kg	"
ETH			L/kg	"
Retardation Factor	R		dim.less	Calculated by model
PCE		2.62		
TCE		1.00		
DCE		1.00		
VC		1.00		
ETH		1.00		
Common R (used in model) =		**2.62**		
4. BIODEGRADATION				
1st Order Decay Coefficient	lambda	0.000	per year	Set to zero due to aerobic conditions in aquifer
PCE to TCE		0.000	per year	"
TCE to DCE		0.000	per year	"
DCE to VC		0.000	per year	"
VC to ETH		0.000	per year	"
Solute half-life	t-half		year	Not Determined

INPUT PARAMETERS

Input Parameter	Symbol	Value	Unit	Remarks
5. GENERAL				
Simulation Time		varies	yr	Maximum PCE concentration in source well MW-15S in March 2004 is t = 0
Model Area Width		300	ft	Most of plume area should be contained within the modeled width
Model Area Length		1250	ft	Distance from source to potential receptor (Crooked Creek)
Zone 1 Length		1250	ft	"
Zone 2 Length		0	ft	Not Used
6. SOURCE DATA				
Source Type				Decaying Single Planar
Source Thickness in Sat. Zone		20	ft	Thickness of saturated zone based on boring log MW-1D
Plume Width		30	ft	Based on source excavation area
Source Decay Constant	k_s	0.145	per year	Calculated by Source DK Tier 1 model for MW-15S; BIOCHLOR calculated 0.058
Source Concentrations				Based on monitoring well results
PCE		4.300	mg/L	MW-15S March 2004 (Maximum PCE concentration)
TCE			mg/L	not used
DCE			mg/L	
VC			mg/L	
ETH			mg/L	
7. FIELD DATA FOR COMPARISION				

Date Data Collected		March-04	March-05	June-06	June-07	June-10	March-11	March-12	October-14	
	Disance from source (ft)	Concentration (mg/L)	Concentration (mg/L)	Concentration (mg/L)	Concentration (mg/L)	Concentration (mg/L)	Concentration (mg/L)	Concentration (mg/L)	Concentration (mg/L)	
SOURCE WELL:- MW-15S - PCE	0	4.300	0.500	0.950	0.260	0.430	0.490	0.290	0.200	
MW-16S - PCE	80	0.440	0.230	0.810	0.240	0.240	0.390	0.560	0.280	
MW-17S - PCE	150	0.190	0.071	0.087	0.032	0.035	0.086	0.150	0.130	
MW-18S - PCE	220	0.870	1.000	0.700	1.300	0.043	0.310	0.140	0.240	
MW-19S - PCE	390	0.560	0.540	0.730	0.530	0.018	0.052	<0.005	0.017	
MW-20S - PCE	410		0.330	0.320	0.720	<0.005	<0.005	0.041	0.018	
SW-1 - PCE (seep water)	515	0.050	0.031	Not Sampled	Not Sampled	0.092	DRY	DRY	DRY	
MW-5S - PCE	620	<0.005	<0.005	0.0080	0.010	0.014	0.023	<0.005	0.067	
MW-6S - PCE	680	0.020	0.011	<0.005	0.0094	0.073	0.044	0.041	0.0032	
MW-21S - PCE	690						<0.005	0.035	0.020	
Sandy Springs Property	825									
MW-22S - PCE	920								<0.001	
Crooked Creek	1,250									

SourceDK

Remediation Timeframe Decision Support System

Air Force Center for Environmental Excellence — *Version 1.0*

TIER 1 Empirical Data

Data Input Instructions:

10.80 → *Enter value directly.*

10.80 → *Value calculated by model. (Don't enter any data)*

Site Location and I.D.:	SEA Job #102-063; Spalding Corners Shopping Center, Norcross, Fulton Co., GA HSI #10639
Constituent of Interest:	MW-15S (Source Well)

1. ENTER CONSTITUENT NAME AND HISTORICAL DATA

Concentration mg/L

	Date (mm/dd/yy)	Constituent A PCE	Constituent B TCE	Constituent C cDCE	Constituent D
1	3/9/2004	4.3	0.058	0.045	
2	8/13/2004	1	0.017		
3	3/9/2005	0.5			
4	11/29/2005	0.8	0.012		
5	6/1/2006	0.95	0.013	0.0057	
6	11/29/2006	0.13			
7	5/31/2007	0.26			
8	3/23/2010	0.43			
9	3/2/2011	0.49			
10	9/13/2011	0.45			
11	3/13/2012	0.29			
12	9/12/2012	0.34			
13	10/7/2014	0.2	0.0019	0.0054	
14					
15					

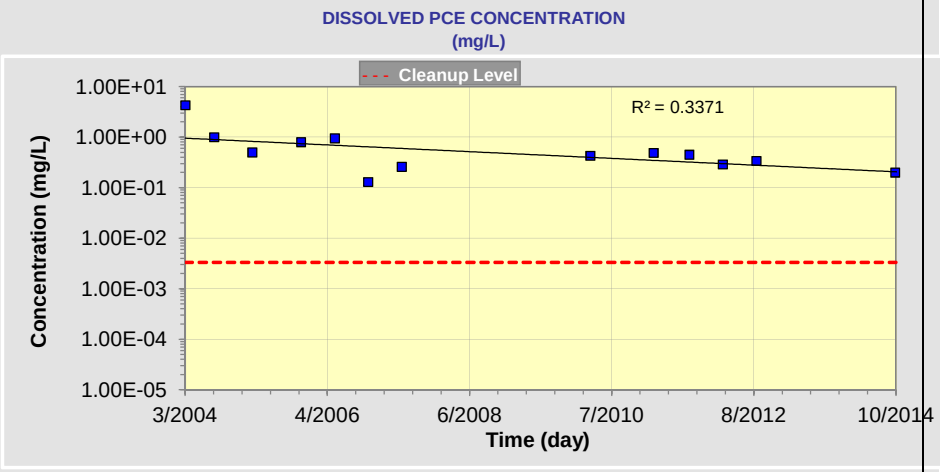
Print Historical Data

2. WHICH CONSTITUENT TO PLOT?

What is the cleanup level?

◉	**PCE**	0.0033 (mg/L)
○	TCE	0.03 (mg/L)
○	cDCE	10 (mg/L)
○	Constituent D	(mg/L)

3. OUTPUT GRAPH



Number of Years Over Which to Plot Graph: 10.6 *(yr)* — Update Graph

4. RESULTS

Predicted Date to Achieve Cleanup: **2043**

Confidence Interval on Predicted Cleanup Date:
(at least 3 data points needed to calculate confidence intervals)

○ 90 % Confidence Interval
◉ 95 % Confidence Interval

2021 (Lower Limit on Confidence Interval) to **> 500 years** (Upper Limit on Confidence Interval)

Source Decay Rate Constant (1/year): **1.45E-01**
(positive numbers represent shrinking plumes while negative numbers represent expanding plumes)

Return To Main Screen | *New Site/Clear Screen* | *Paste Example Data Set* | HELP

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
or
0.02 → 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes (●) Ethanes ( )

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R
or

Soil Bulk Density, rho	1.7	(kg/L)	
FractionOrganicCarbon, foc	2.0E-3	(-)	
Partition Coefficient	Koc		R
PCE	95	(L/kg)	2.62 (-)
TCE		(L/kg)	1.00 (-)
DCE		(L/kg)	1.00 (-)
VC		(L/kg)	1.00 (-)
ETH		(L/kg)	1.00 (-)
Common R (used in model)* =			**2.62**

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

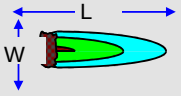
Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45

Zone 2	λ (1/yr)	half-life (yrs)
PCE → TCE	0.000	
TCE → DCE	0.000	
DCE → VC	0.000	
VC → ETH	0.000	

λ HELP

5. GENERAL

Simulation Time*	1	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)



Zone 2=

6. SOURCE DATA

TYPE: Decaying Single Planar

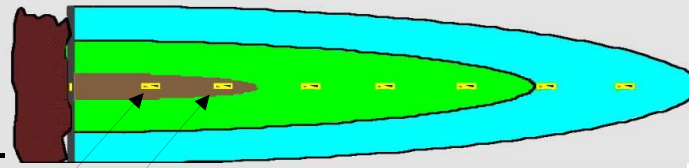
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)	.5	.23	.071	1.0	.54	.33	.031	.003	.011		
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected	3/-/2005										

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | **Help** | Restore Formulas | RESET | *SEE OUTPUT* | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
MAR 2005 - 1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

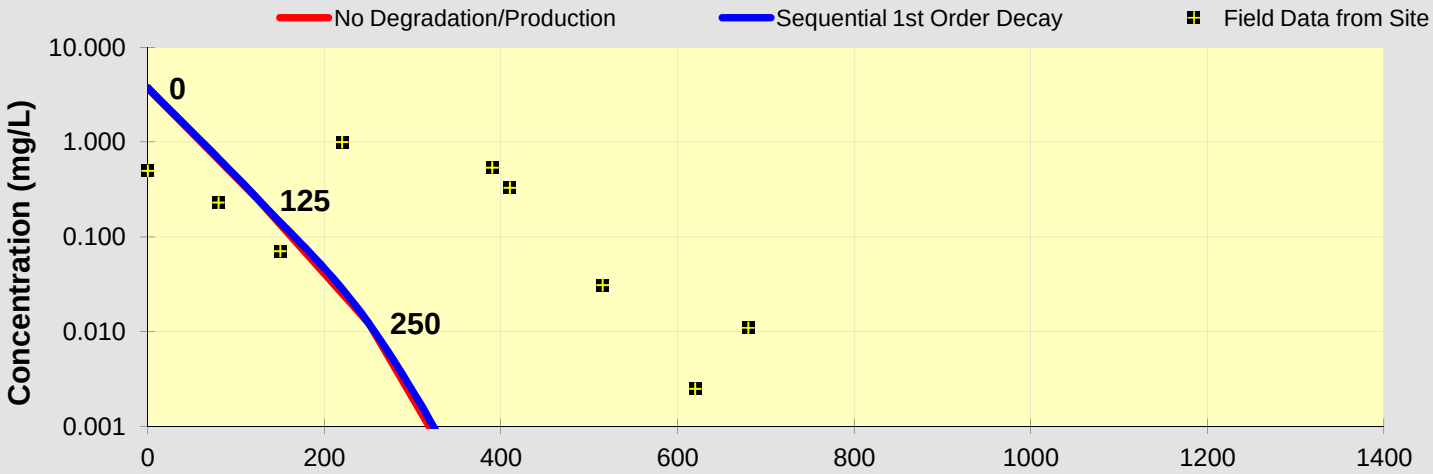
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	3.720	0.248	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Biotransformation	3.7196	0.248	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site	0.500	0.230	0.071	1.000	0.540	0.330	0.031	0.003	0.011		



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

1.0 Years

Log ⟺ Linear

Return to Input

To All

To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
MAR 2005 - 1 YEAR RUN

SPALDING SORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ *or*
0.02 → 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R
or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	2.0E-3	(-)		
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.62**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	2	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2=

6. SOURCE DATA

TYPE: Decaying Single Planar

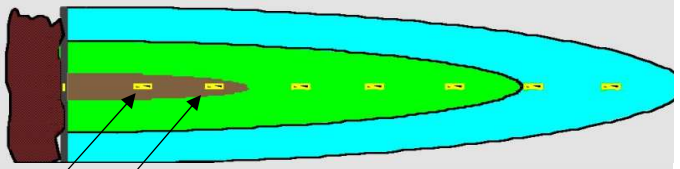
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)	.95	.81	.087	.7	.73	.32		.008	.003		
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920

Date Data Collected: 06/-/2006

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

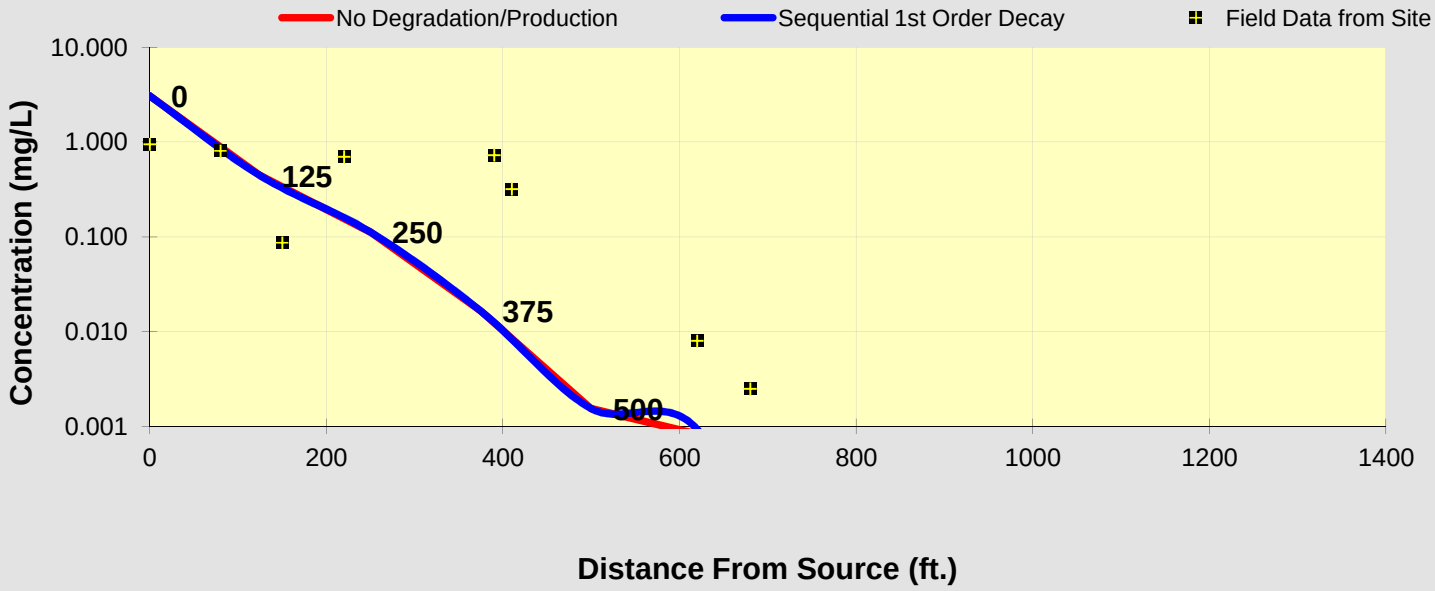
BIOCHLOR INPUT SCREEN
JUN 2006 - 2.3 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

PCE	Distance from Source (ft)										
	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	3.081	0.444	0.112	0.016	0.002	0.001	0.000	0.000	0.000	0.000	0.000
Biotransformation	3.0806	0.444	0.112	0.016	0.002	0.001	0.000	0.000	0.000	0.000	0.000

	Monitoring Well Locations (ft)										
	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site	0.950	0.810	0.087	0.700	0.730	0.320		0.008	0.003		



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

2.3 Years

Log ⟺ Linear

Return to Input

To All

To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
JUN 2006 - 2.3 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
↑ *or*
0.02 → 2. Calculate by filling in gray cells. Press Enter, then (C)

(To restore formulas, hit "Restore Formulas" button)

Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes (◉) Ethanes (○)

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho		1.7	(kg/L)	
FractionOrganicCarbon, foc		2.0E-3	(-)	
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)

Common R (used in model)* = **2.62**

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

	λ (1/yr)	half-life (yrs)	Yield
Zone 1			
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	3	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2=

6. SOURCE DATA

TYPE: Decaying Single Planar

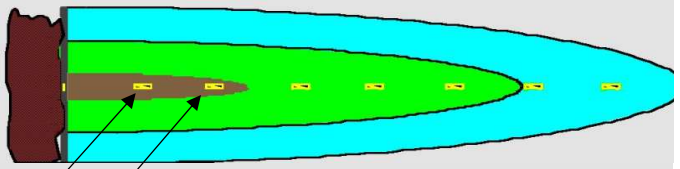
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)	.26	.24	.032	1.3	.53	.72		.01	.009		
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected	6/-/2007										

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
JUN 2007 - 3.3 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

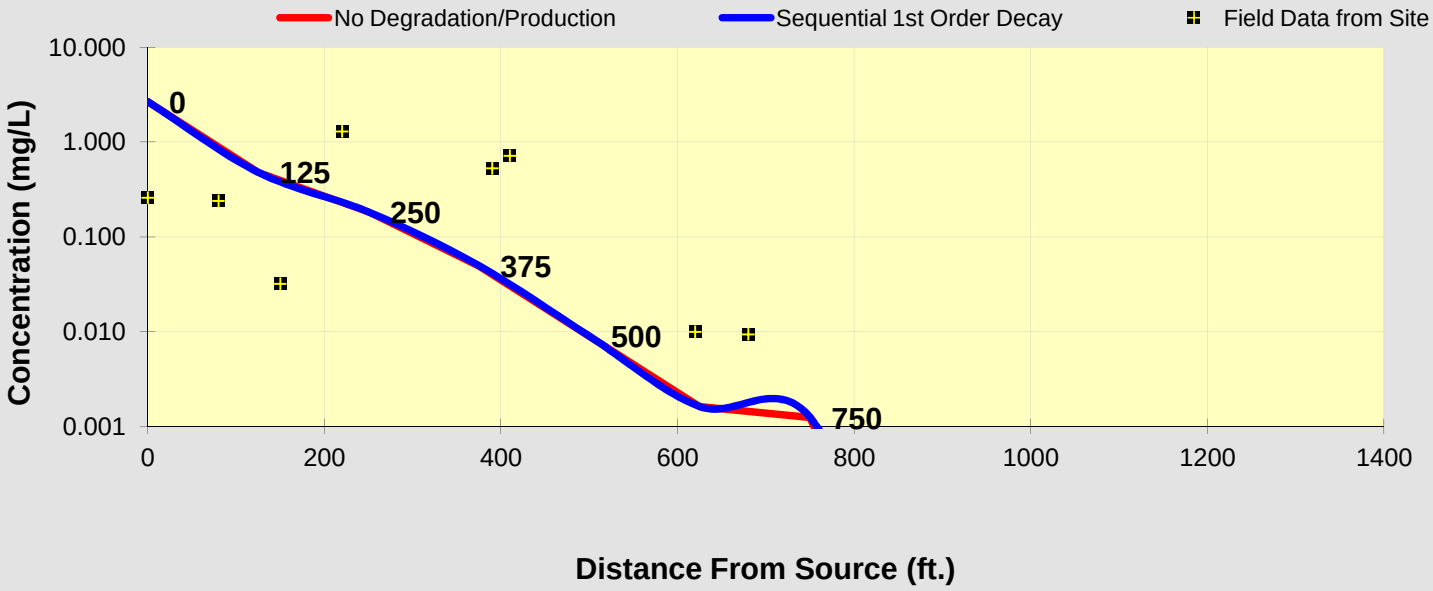
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	2.665	0.479	0.183	0.050	0.009	0.002	0.001	0.000	0.000	0.000	0.000
Biotransformation	2.6648	0.479	0.183	0.050	0.009	0.002	0.001	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site	0.260	0.240	0.032	1.300	0.530	0.720		0.010	0.009		



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

3.3 Years

Log ⟺ Linear

Return to Input

To All

To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
JUN 2007 - 3.3 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ *or* 2. Calculate by filling in gray
0.02 cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	2.0E-3	(-)		
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.62**	

4. BIOTRANSFORMATION

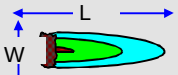
-1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	6	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)



Zone 2=

6. SOURCE DATA

TYPE: Decaying
Single Planar

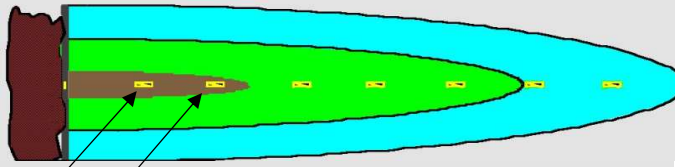
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)	.43	.24	.035	.043	.018	.003	.092	.014	.073		
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920

Date Data Collected: 03/-/2010

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | **Help** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
MAR 2010 - 6 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

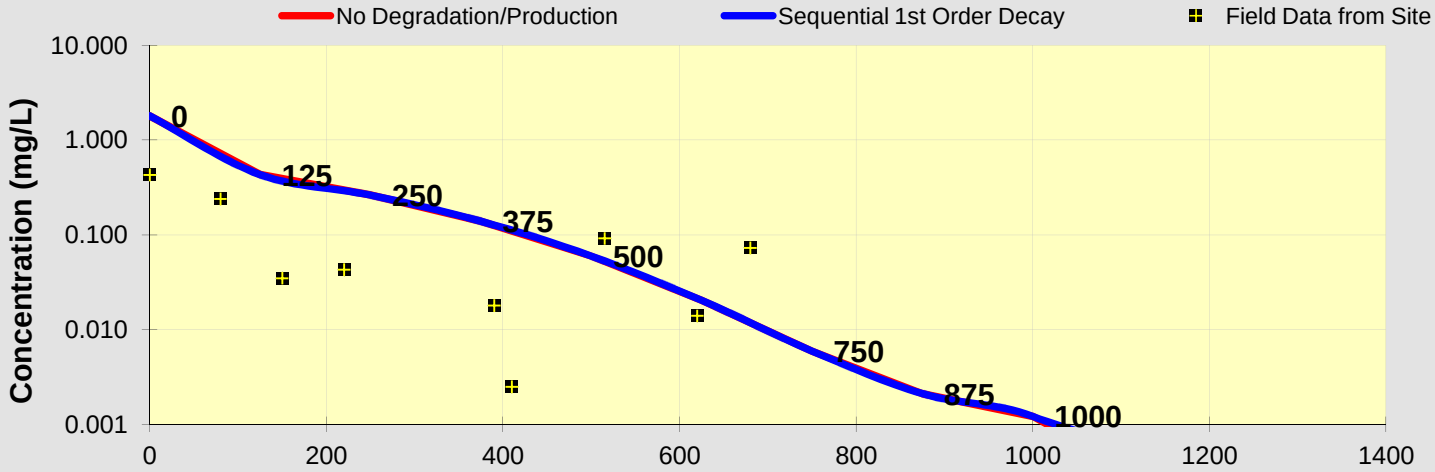
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	1.801	0.432	0.263	0.139	0.060	0.020	0.006	0.002	0.001	0.000	0.000
Biotransformation	1.8015	0.432	0.263	0.139	0.060	0.020	0.006	0.002	0.001	0.000	0.000

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site	0.430	0.240	0.035	0.043	0.018	0.003	0.092	0.014	0.073		



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

6.0 Years

Log ⟺ Linear

Return to Input

To All

To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
MAR 2010 - 6 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ *or*
0.02 ← 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R
or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	2.0E-3	(-)		
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.62**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	7	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2=

6. SOURCE DATA

TYPE: Decaying
Single Planar

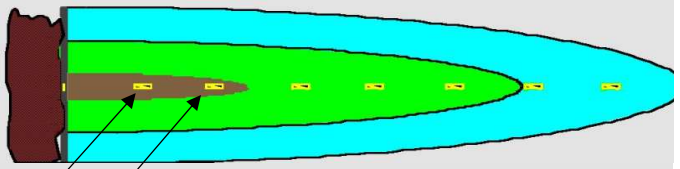
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)	.49	.39	.086	.31	.052	.003		.023	.044	.003	
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected	3/-/2011										

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
MAR 2011 - 7 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

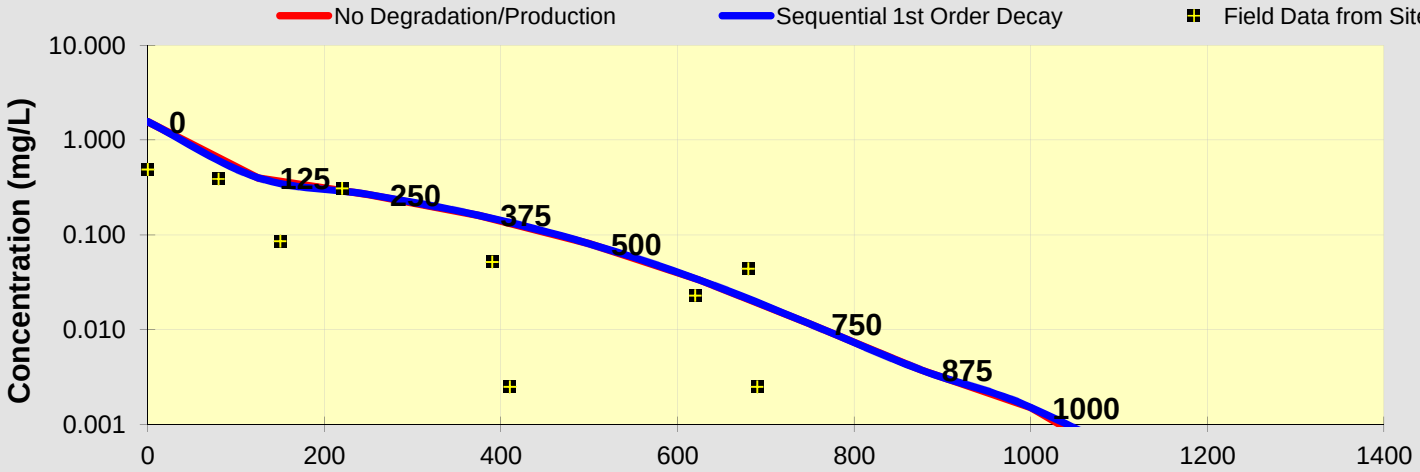
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	1.558	0.399	0.266	0.160	0.081	0.033	0.011	0.004	0.002	0.000	0.000
Biotransformation	1.5583	0.399	0.266	0.160	0.081	0.033	0.011	0.004	0.002	0.000	0.000

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site	0.490	0.390	0.086	0.310	0.052	0.003		0.023	0.044	0.003	



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

7.0 Years

Log ⟺ Linear

Return to Input

To All

To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
MAR 2011 - 7 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ *or*
0.02 ← 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R
or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	2.0E-3	(-)		
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.62**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	8	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2=

6. SOURCE DATA

TYPE: Decaying Single Planar

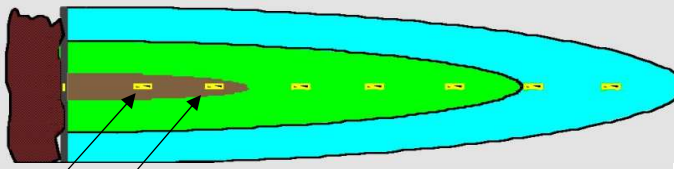
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)	.29	.56	.15	.14	.003	.041		.003	.041	.035	
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected	3/-/2012										

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
MAR 2012 - 8 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

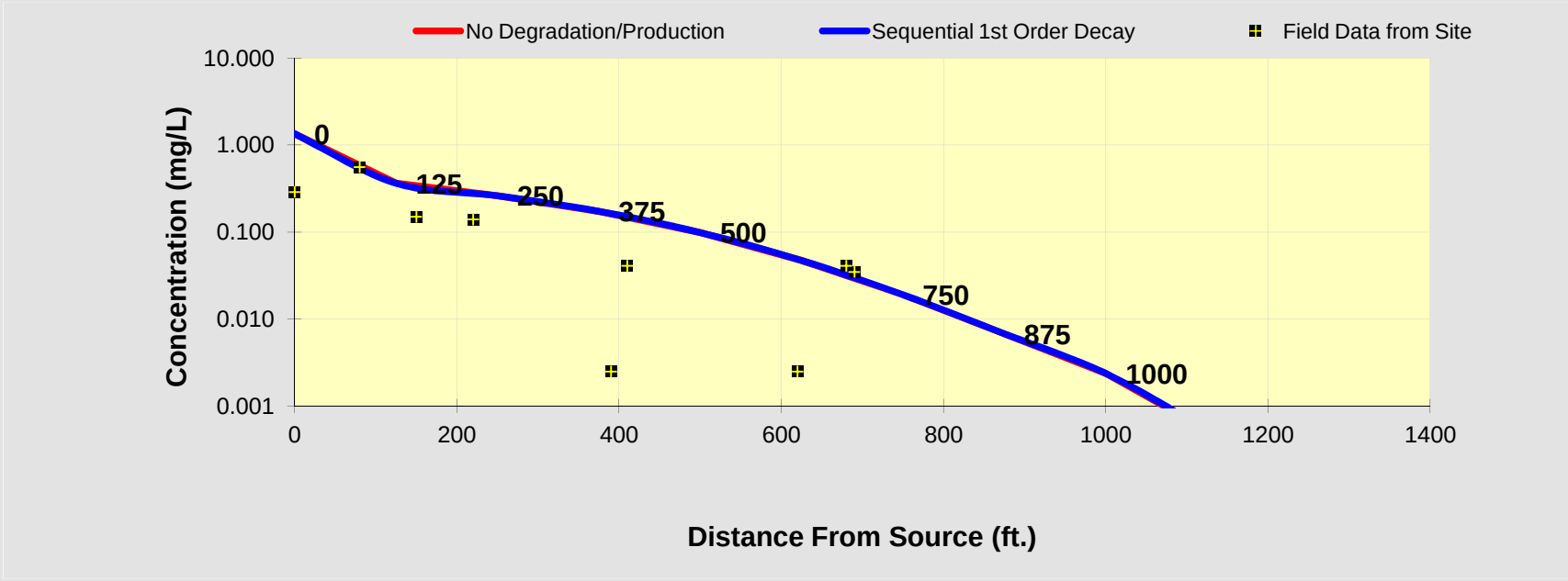
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	1.348	0.364	0.261	0.173	0.099	0.047	0.019	0.007	0.002	0.001	0.000
Biotransformation	1.3480	0.364	0.261	0.173	0.099	0.047	0.019	0.007	0.002	0.001	0.000

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site	0.290	0.560	0.150	0.140	0.003	0.041		0.003	0.041	0.035	



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

8.0 Years

Log ⟺ Linear

Return to Input

To All

To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
MAR 2012 - 8 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
↑ *or*
0.02 → 2. Calculate by filling in gray cells. Press Enter, then (C)

(To restore formulas, hit "Restore Formulas" button)

Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes (◉) Ethanes (○)

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho		1.7	(kg/L)	
FractionOrganicCarbon, foc		2.0E-3	(-)	
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)

Common R (used in model)* = 2.62

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

	λ (1/yr)	half-life (yrs)	Yield
Zone 1			
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	11	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2=

6. SOURCE DATA

TYPE: Decaying Single Planar

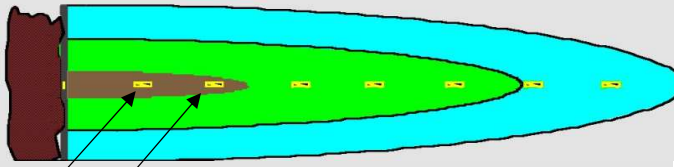
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)	.2	.28	.13	.24	.017	.018		.067	.003	.02	.001
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected	10/-/2014										

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | **Help** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
OCT 2014 - 10.6 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

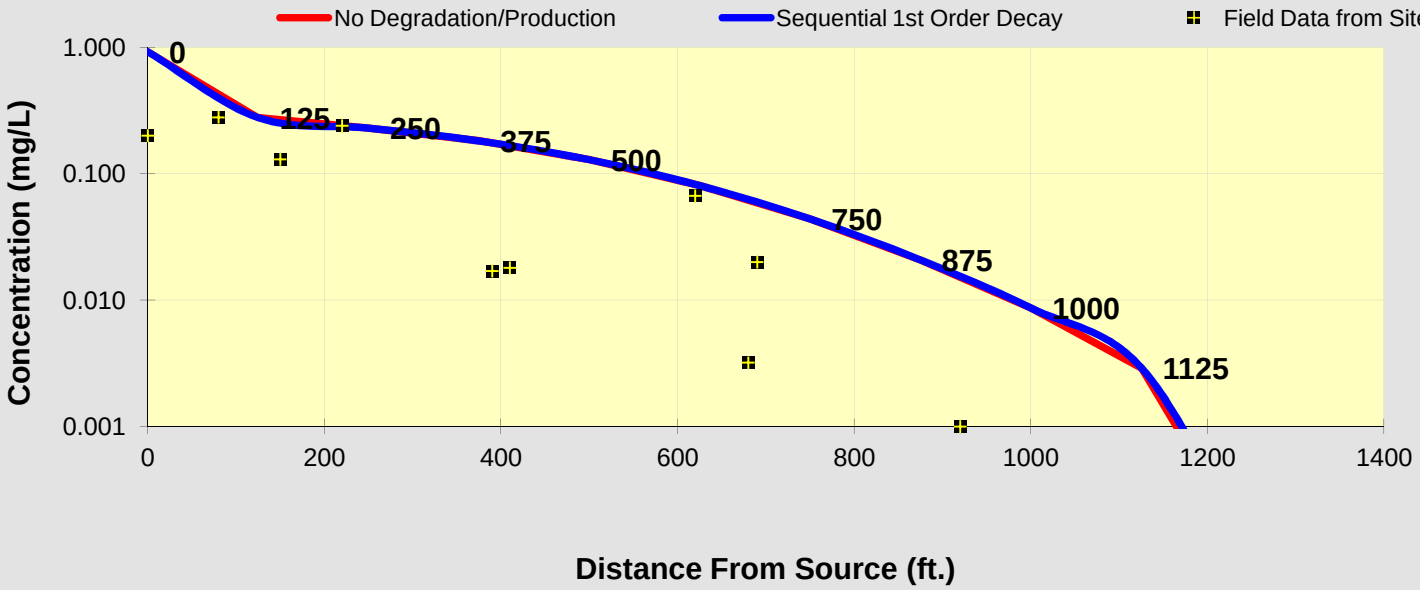
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.925	0.278	0.229	0.182	0.129	0.081	0.044	0.021	0.009	0.003	0.000
Biotransformation	0.9246	0.278	0.229	0.182	0.129	0.081	0.044	0.021	0.009	0.003	0.000

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site	0.200	0.280	0.130	0.240	0.017	0.018		0.067	0.003	0.020	0.001



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: *10.6 Years*

Log ⟺ Linear

Return to Input | To All | To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
OCT 2014 - 10.6 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
↑ *or*
0.02 → 2. Calculate by filling in gray cells. Press Enter, then C

(To restore formulas, hit "Restore Formulas" button)

Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	2.0E-3	(-)		
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.62**	

4. BIOTRANSFORMATION

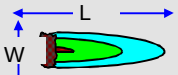
-1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	25	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)



Zone 2=

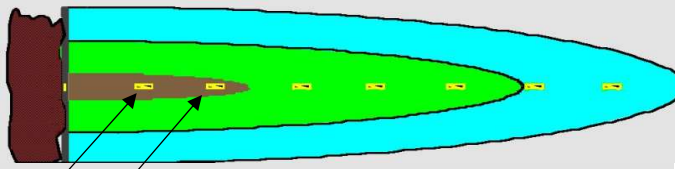
6. SOURCE DATA

TYPE: Decaying Single Planar

Source Options

Source Thickness in Sat. Zone* 20 (ft)

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



	Y1	k_s*
Width* (ft)	30	
Conc. (mg/L)*	C1	(1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

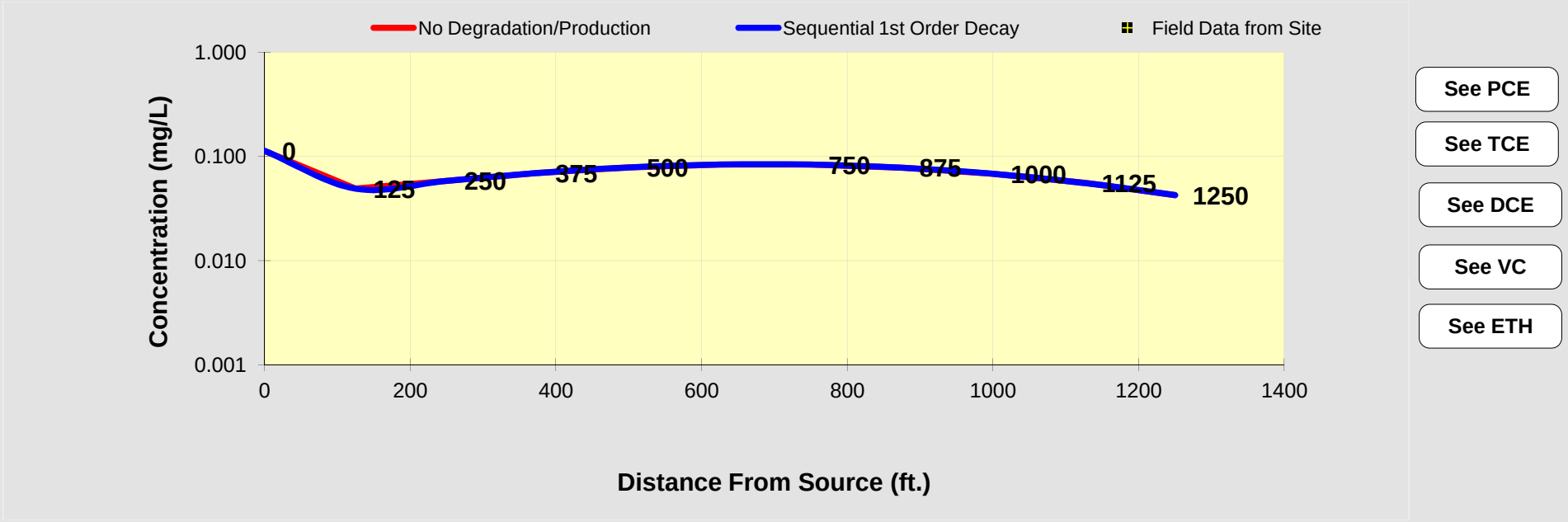
SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
MAX PCE IMPACT TO SANDY SPRGS PROP. - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

PCE	Distance from Source (ft)										
	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.113	0.049	0.058	0.069	0.078	0.083	0.083	0.078	0.068	0.056	0.043
Biotransformation	0.1129	0.049	0.058	0.069	0.078	0.083	0.083	0.078	0.068	0.056	0.043
	Monitoring Well Locations (ft)										
	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: 25.1 Years

Log ⟺ Linear

Return to Input | To All | To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
MAX PCE IMPACT TO SANDY SPRGS PROP. - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ *or*
0.02 ← 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	2.0E-3	(-)		
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.62**	

4. BIOTRANSFORMATION

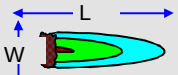
-1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	31	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)



Zone 2=

6. SOURCE DATA

TYPE: Decaying
Single Planar

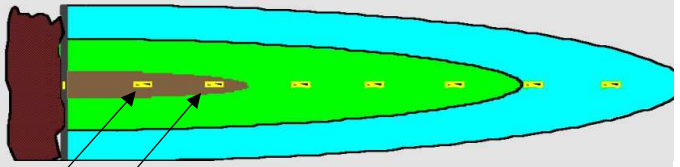
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
MAX PCE IMPACT TO CROOKED CREEK - 31 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

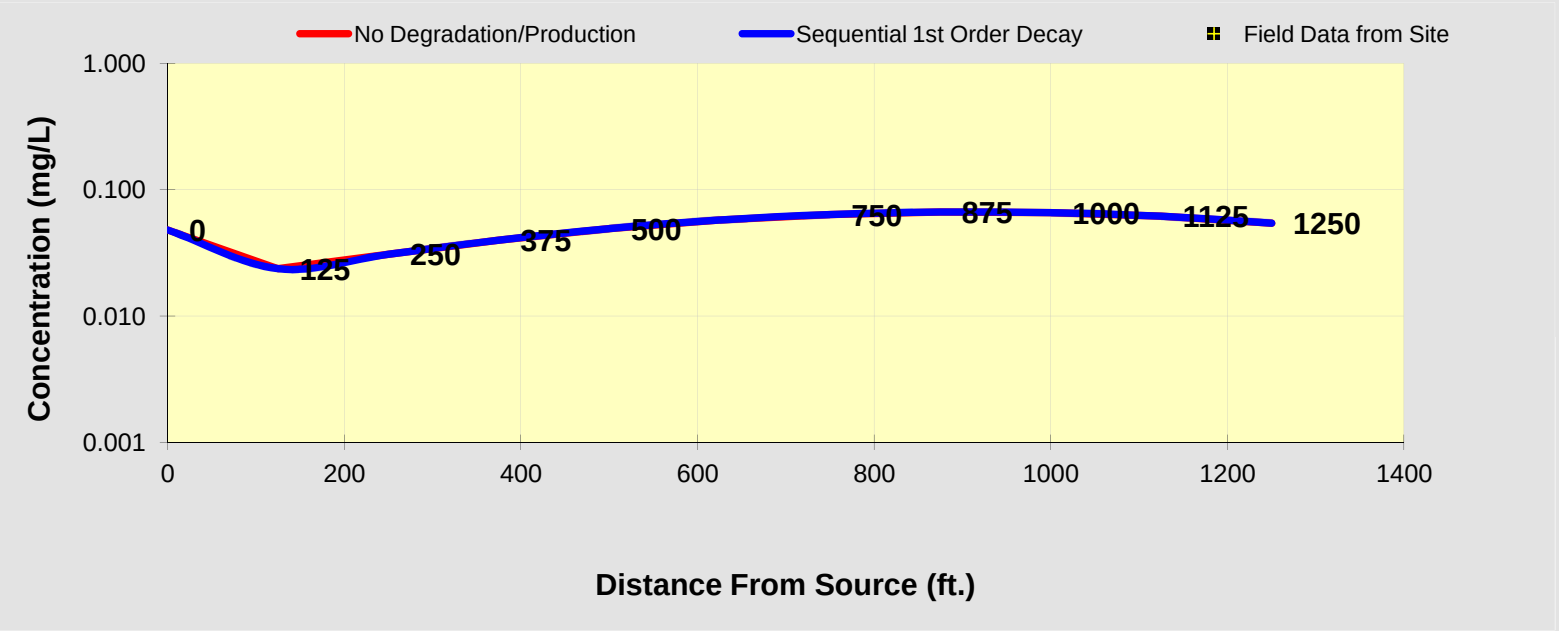
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.048	0.024	0.031	0.040	0.049	0.058	0.064	0.067	0.066	0.062	0.054
Biotransformation	0.0480	0.024	0.031	0.040	0.049	0.058	0.064	0.067	0.066	0.062	0.054

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: 31.1 Years

Log ⟺ Linear

Return to Input | To All | To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
MAXIMUM IMPACT TO CROOKED CREEK - 31 YEARS

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ or
0.02 ← 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R
or

			R	
Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	2.0E-3	(-)		
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.62**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45

Zone 2	λ (1/yr)	half-life (yrs)
PCE → TCE	0.000	
TCE → DCE	0.000	
DCE → VC	0.000	
VC → ETH	0.000	

λ HELP

5. GENERAL

Simulation Time*	112	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2=

6. SOURCE DATA

TYPE: Decaying Single Planar

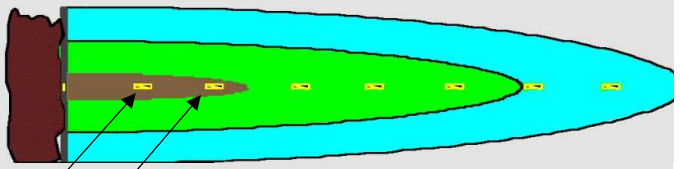
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
PCE PLUME COMPLETELY DISSIPATED - 112 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

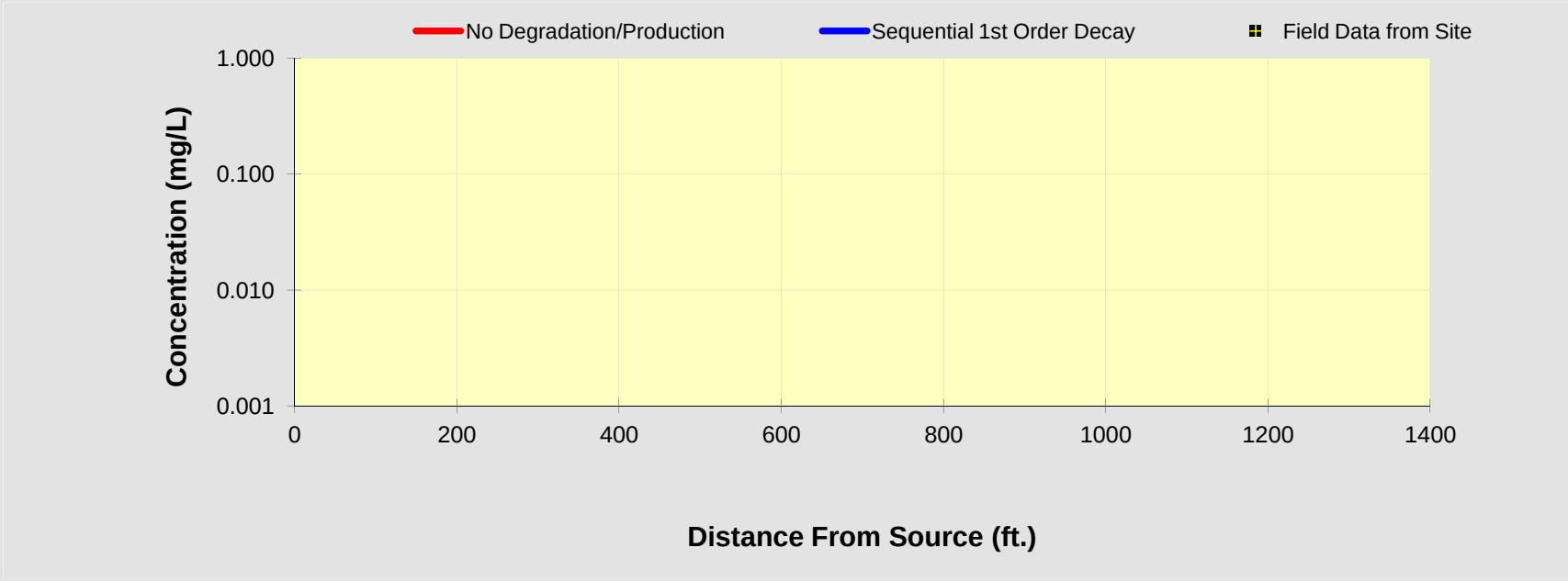
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Biotransformation	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: *112.0 Years*

Log ⟺ Linear

Return to Input | To All | To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
PCE PLUME COMPETELY DISSIPATED - 112 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ *or*
0.02 → 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho		1.7	(kg/L)		
FractionOrganicCarbon, foc		2.0E-3	(-)		
Partition Coefficient	Koc				
PCE	95	(L/kg)	2.62	(-)	
TCE		(L/kg)	1.00	(-)	
DCE		(L/kg)	1.00	(-)	
VC		(L/kg)	1.00	(-)	
ETH		(L/kg)	1.00	(-)	
Common R (used in model)* =			**2.62**		

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000 ←		0.79
TCE → DCE	0.000 ←		0.74
DCE → VC	0.000 ←		0.64
VC → ETH	0.000 ←		0.45

Zone 2	λ (1/yr)	half-life (yrs)
PCE → TCE	0.000 ←	
TCE → DCE	0.000 ←	
DCE → VC	0.000 ←	
VC → ETH	0.000 ←	

λ HELP

5. GENERAL

Simulation Time*	118	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2=

6. SOURCE DATA

TYPE: Continuous Single Planar

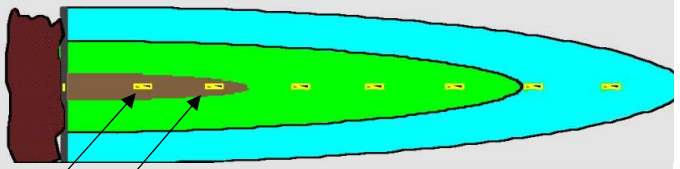
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)											
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

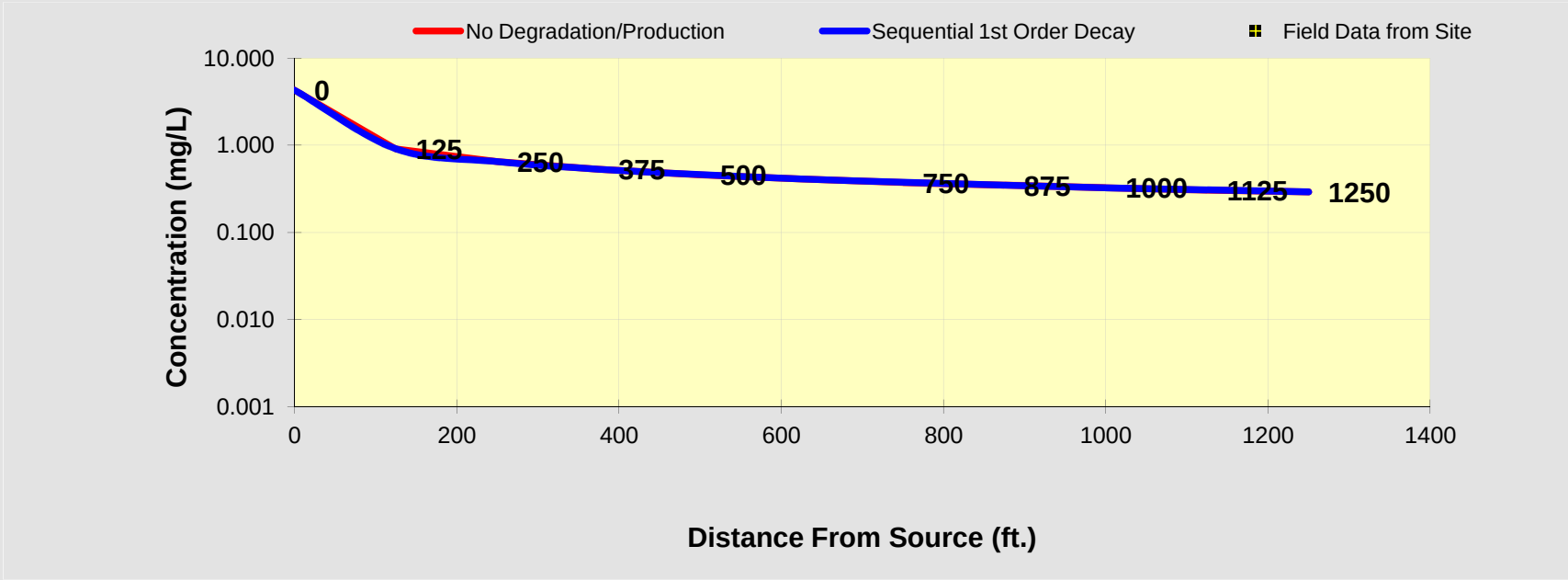
SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
CONTINUOUS SOURCE STEADY STATE - 118 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

	Distance from Source (ft)										
PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	4.300	0.910	0.647	0.529	0.459	0.411	0.375	0.347	0.325	0.306	0.291
Biotransformation	4.3000	0.910	0.647	0.529	0.459	0.411	0.375	0.347	0.325	0.306	0.291
	Monitoring Well Locations (ft)										
Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

118.0 Years

Log ⟺ Linear

Return to Input

To All

To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
CONTINUOUS SOURCE STEADY STATE - 118 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

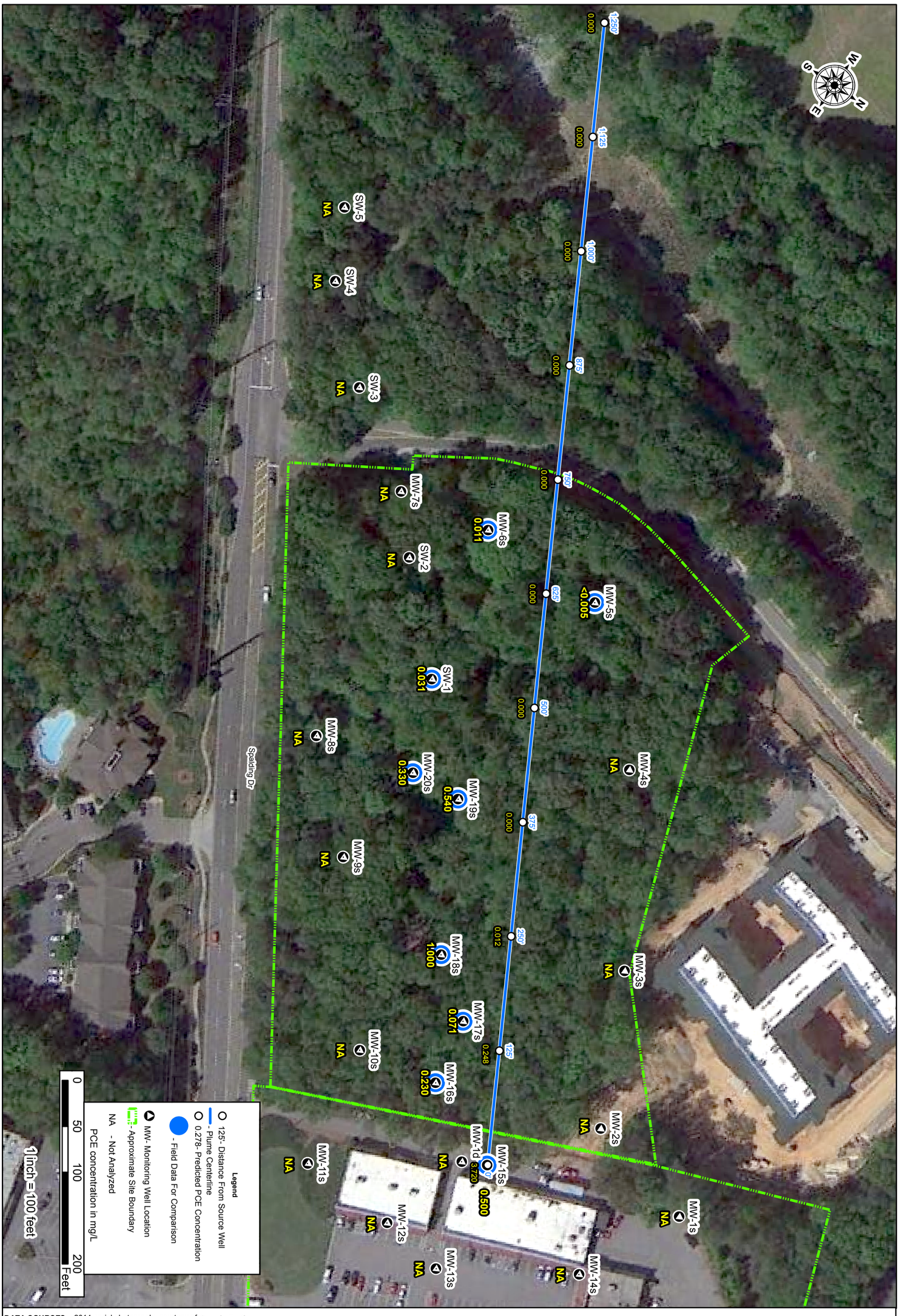
TIME STEP RESULTS

Simulation Time (years) [Date]	Decaying Source Single Planar PCE Concentration in mg/L Distance from Source Area (feet)												
	Source Well MW-15S						POD MW-6S		Sandy Springs Property				Crooked Creek
	0	125	250	375	500	625	[680]	750	[825]	875	1000	1125	1250
1 [March 2005]	3.720	0.248	0.012	0.000	0.000	0.000		0.000		0.000	0.000	0.000	0.000
2.3 [June 2006]	3.081	0.444	0.112	0.016	0.002	0.001		0.000		0.000	0.000	0.000	0.000
3.3 [June 2007]	2.665	0.479	0.183	0.050	0.009	0.002		0.001		0.000	0.000	0.000	0.000
6 [June 2010]	1.801	0.432	0.263	0.139	0.060	0.020		0.006		0.002	0.001	0.000	0.000
7 [March 2011]	1.558	0.399	0.266	0.160	0.081	0.033		0.011		0.004	0.002	0.000	0.000
8 [March 2012]	1.348	0.364	0.261	0.173	0.099	0.047		0.019		0.007	0.002	0.001	0.000
10.6 [October 2014]	0.925	0.278	0.229	0.182	0.129	0.081		0.044		0.021	0.009	0.003	0.000
25.1 [2029]	0.113	0.049	0.058	0.069	0.078	0.083		0.083		0.078	0.068	0.056	0.043
31 [2035]	0.018	0.024	0.031	0.040	0.049	0.058		0.064		0.067	0.066	0.062	0.034
112 [2116]	0.000	0.000	0.000	0.000	0.000	0.000		0.000		0.000	0.000	0.000	0.000

t=0 is March 2004 which coninsides with the highest PCE concentration measured in the Source Well MW-15S (4.300 mg/L)

Simulation Time (years)	Continuous Source Single Planar PCE Concentration in mg/L Distance from Source Area (feet)												
	Source Well MW-15S						POD MW-6S		Sandy Springs Property				Crooked Creek
	0	125	250	375	500	625	[680]	750	[825]	875	1000	1125	1250
118 [2122]	4.300	0.910	0.647	0.529	0.459	0.411		0.375		0.347	0.325	0.306	0.291

t=0 is March 2004 which coninsides with the highest PCE concentration measured in the Source Well MW-15S (4.300 mg/L)



DATA SOURCES: - 2014 aerial photography courtesy of ***Google Earth***

SEA **SAILORS ENGINEERING ASSOCIATES, INC.**
ENVIRONMENTAL/GEOTECHNICAL

1675 SPECTRUM DRIVE
LAWRENCEVILLE, GEORGIA 30043

(770) 962-5922 FAX 962-7964

BIOCHLOR PCE PLUME CENTERLINE OUTPUT 1 YEAR ON PCE CONCENTRATION MAP

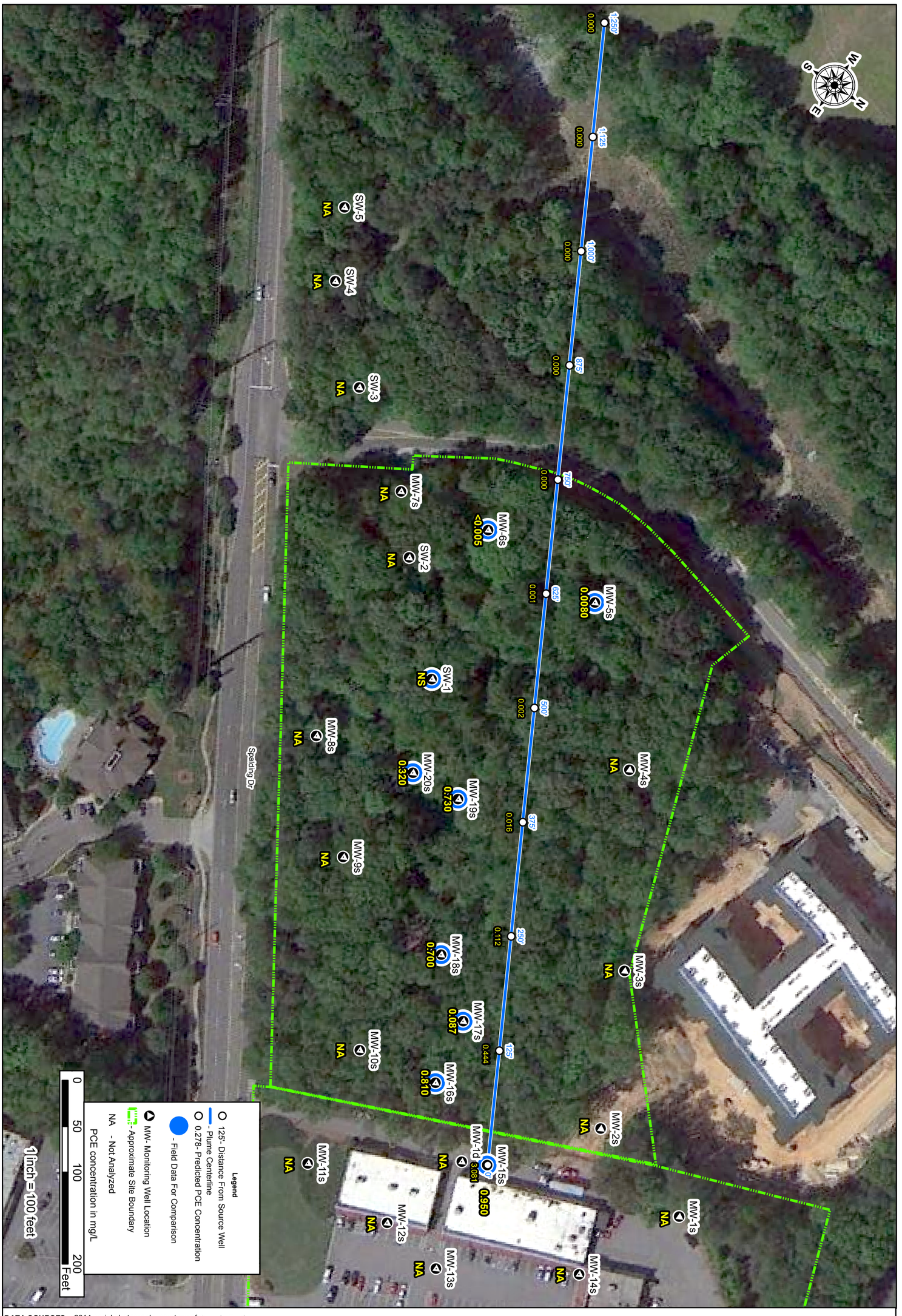
MARCH 2005

SPALDING CORNERS SHOPPING CENTER

7700 Spalding Drive
Norcross; Fulton County, Georgia
HSI# 10639

Job No. 102-063

SEA-2203



DATA SOURCES: - 2014 aerial photography courtesy of ***Google Earth***

SEA
SAILORS ENGINEERING ASSOCIATES, INC.
ENVIRONMENTAL/GEOTECHNICAL
1675 SPECTRUM DRIVE
LAWRENCEVILLE, GEORGIA 30043
(770) 962-5922 FAX 962-7964

BIOCHLOR PCE PLUME CENTERLINE OUTPUT 2.3 YEARS ON PCE CONCENTRATION MAP

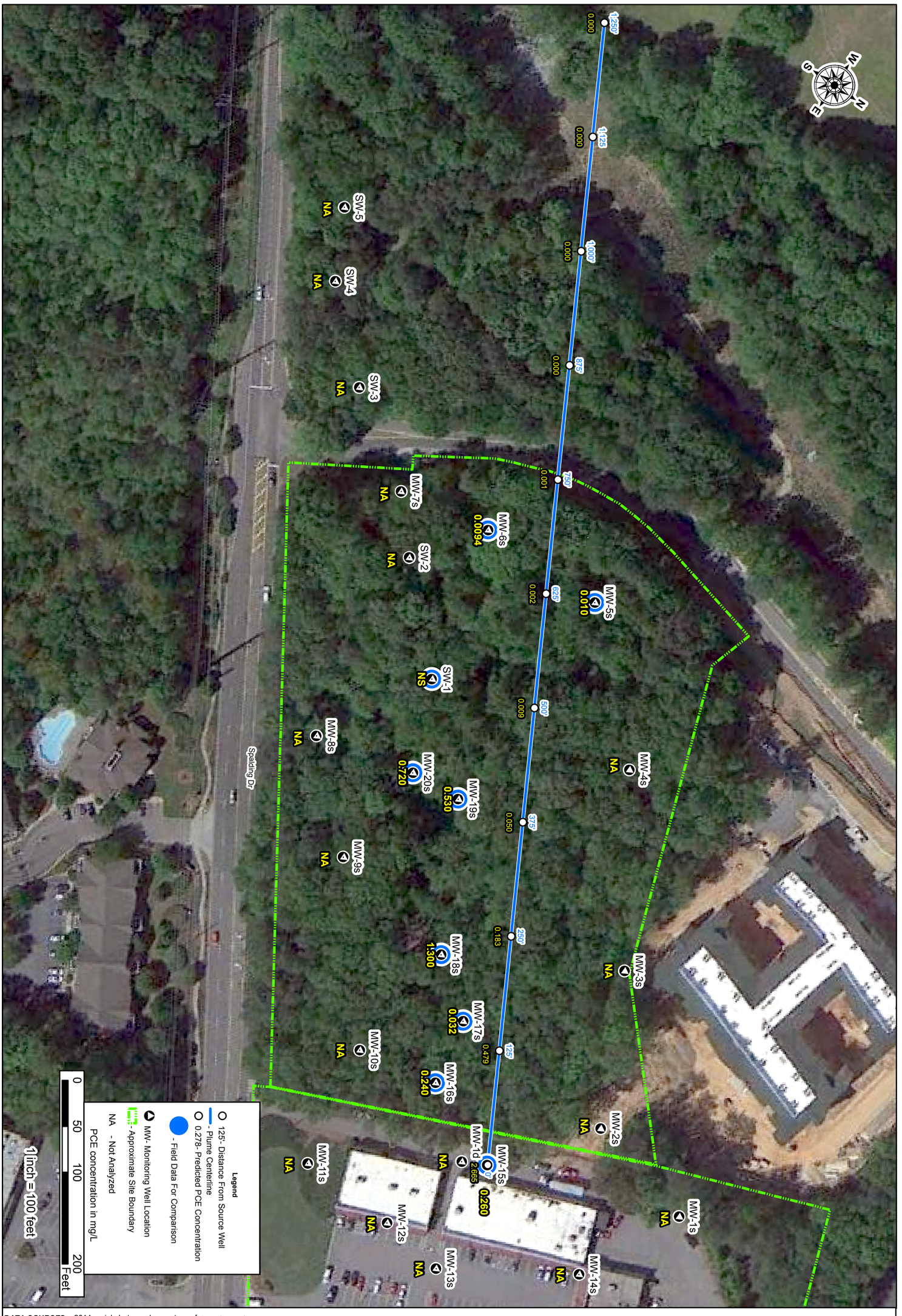
JUNE 2006

SPALDING CORNERS SHOPPING CENTER

7700 Spalding Drive
Norcross; Fulton County, Georgia
HSI# 10639

Job No. 102-063

SEA-2203



DATA SOURCES: - 2014 aerial photography courtesy of ***Google Earth***

SEA
SAILORS ENGINEERING ASSOCIATES, INC.
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LAWRENCEVILLE, GEORGIA 30043
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BIOCHLOR PCE PLUME CENTERLINE OUTPUT 3.3 YEARS ON PCE CONCENTRATION MAP

JUNE 2007

SPALDING CORNERS SHOPPING CENTER

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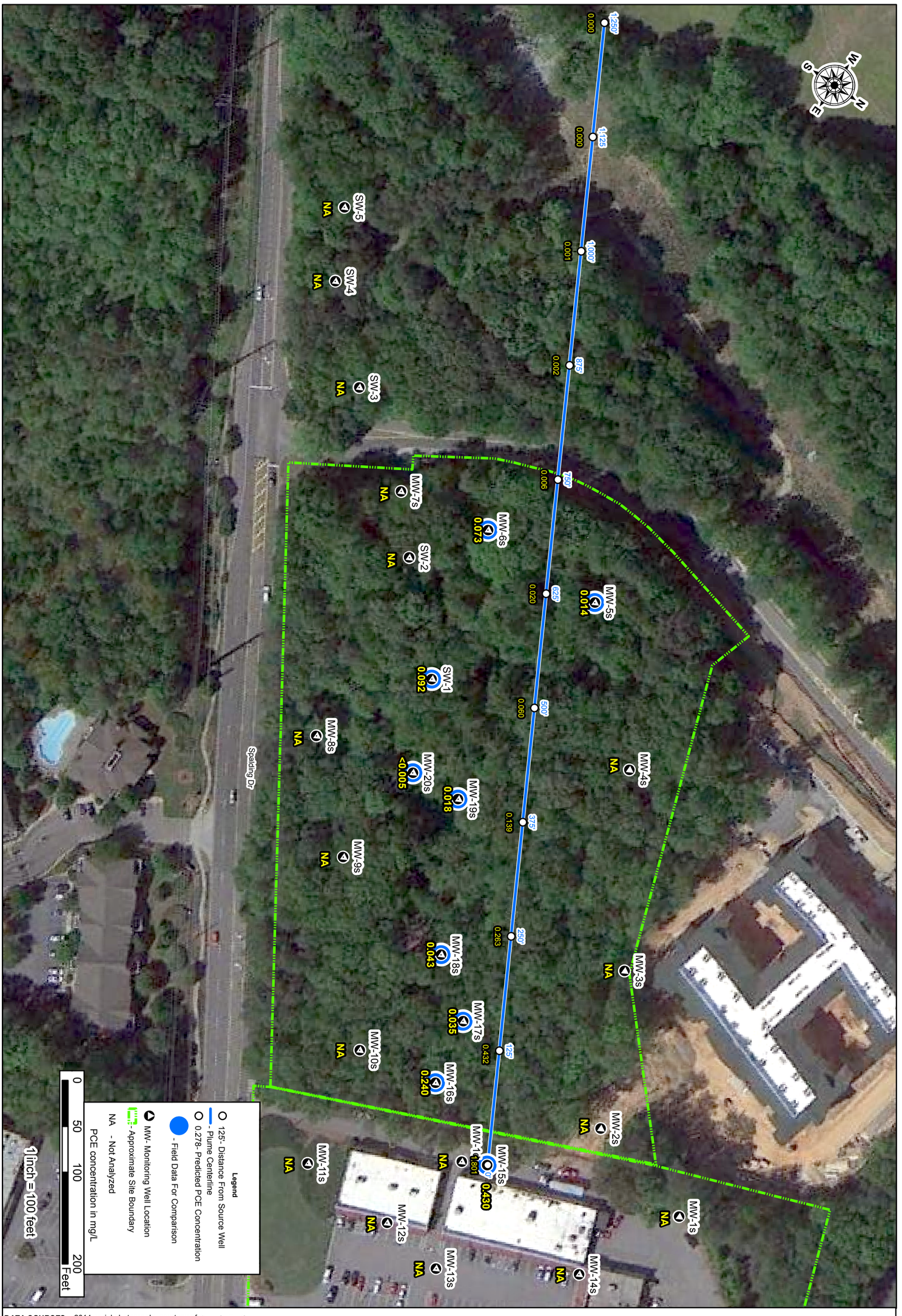
Norcross; Fulton County, Georgia
HSI# 10639

Job No. 102-063

SEA-2203



DATA SOURCES: - 2014 aerial photography courtesy of ***Google Earth***

SEA

SAILORS ENGINEERING ASSOCIATES, INC.
ENVIRONMENTAL/GEOTECHNICAL

1675 SPECTRUM DRIVE
LAWRENCEVILLE, GEORGIA 30043

(770) 962-5922 FAX 962-7964

BIOCHLOR PCE PLUME CENTERLINE OUTPUT 6 YEARS ON PCE CONCENTRATION MAP

JUNE 2010

SPALDING CORNERS SHOPPING CENTER

7700 Spalding Drive
Norcross; Fulton County, Georgia
HSI# 10639

Job No. 102-063

SEA-2203

BIOCHLOR PCE PLUME CENTERLINE OUTPUT 7 YEARS ON PCE ISOCONCENTRATION MAP

MARCH 2011

SPALDING CORNERS SHOPPING CENTER
7700 Spalding Drive
Norcross; Fulton County, Georgia
HSI# 10639

Job No. 102-063

SEA-2203

SAILORS ENGINEERING ASSOCIATES, INC.
ENVIRONMENTAL/GEOTECHNICAL
1675 SPECTRUM DRIVE
LAWRENCEVILLE, GEORGIA 30043
(770) 962-5922 FAX 962-7964

DATA SOURCES: - 2014 aerial photography courtesy of *Google Earth*

Legend
- 125'- Distance From Source Well
- Plume Centerline
- 0.278- Predicted PCE Concentration
- Field Data For Comparison
- MW- Monitoring Well Location
- PCE Isoconcentration Contour
- Approximate Site Boundary
- NA - Not Analyzed

PCE concentration in mg/L

0 45 90 180 Feet

1 inch = 100 feet

Spalding Dr

1,250' 0.000
1,125 0.000
1,000' 0.002
875' 0.004
750' 0.011
625' 0.033
500' 0.081
375' 0.160
250' 0.266
125' 0.399
0' 1.558

MW-1s NA
MW-2s NA
MW-3s NA
MW-4s NA
MW-5s 0.023
MW-6s 0.044
MW-7s <0.005
MW-8s <0.005
MW-9s <0.005
MW-10s 0.034
MW-11s NA
MW-12s NA
MW-13s <0.005
MW-14s <0.005
MW-15s 0.490
MW-16s 0.390
MW-17s 0.086
MW-18s 0.310
MW-19s 0.052
MW-20s <0.005
MW-21s <0.005
MW-1d <0.005
SW-1 DRY
SW-2 0.014
SW-3 <0.005
SW-4 <0.005
SW-5 <0.005

<0.005
0.100
0.200
0.300
0.400

DATA SOURCES: - 2014 aerial photography courtesy of *Google Earth*

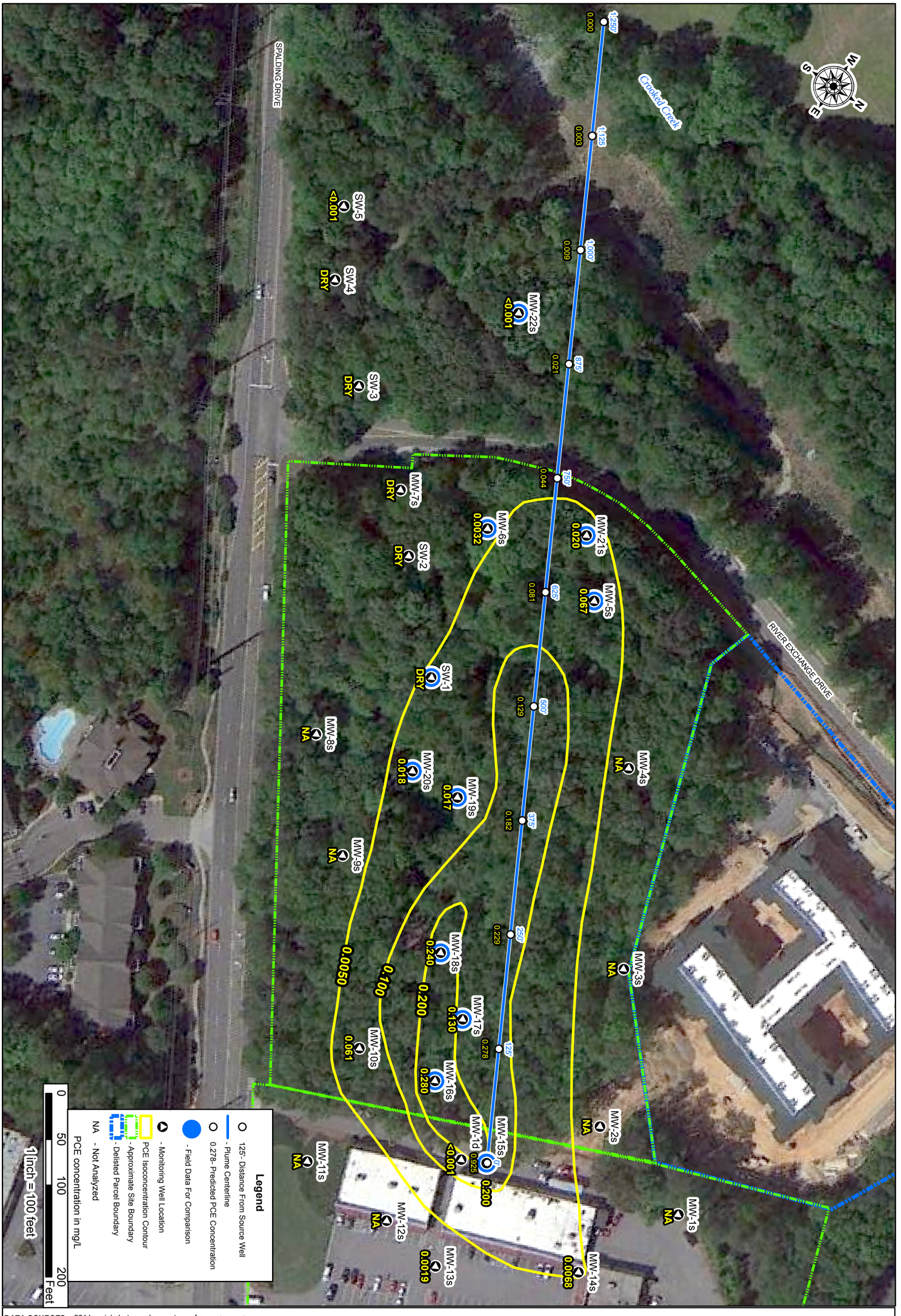
BIOCHLOR PCE PLUME
CENTERLINE OUTPUT 8 YEARS
ON
PCE ISOCONCENTRATION MAP
MARCH 2012

SPALDING CORNERS SHOPPING CENTER
7700 Spalding Drive
Norcross; Fulton County, Georgia
HSI# 10639

Job No. 102-063

SEA-2203

SAILORS ENGINEERING ASSOCIATES, INC.
ENVIRONMENTAL/GEOTECHNICAL
1675 SPECTRUM DRIVE
LAWRENCEVILLE, GEORGIA 30043
(770) 962-5922 FAX 962-7964



DATA SOURCES: - 2014 aerial photography courtesy of ***Google Earth***

SEA **SAILORS ENGINEERING ASSOCIATES, INC.**
ENVIRONMENTAL/GEOTECHNICAL

1675 SPECTRUM DRIVE
LAWRENCEVILLE, GEORGIA 30043

(770) 962-5922 FAX 962-7964

BIOCHLOR PCE PLUME CENTERLINE OUTPUT 10.6 YEARS ON PCE ISOCONCENTRATION MAP

OCTOBER 2014

SPALDING CORNERS SHOPPING CENTER

7700 Spalding Drive
Sandy Springs, Fulton County, Georgia
HSI# 10639

Job No. 102-063

SEA-2203

DATA SOURCES: - 2014 aerial photography courtesy of ***Google Earth***

SEA
SAILORS ENGINEERING ASSOCIATES, INC.
ENVIRONMENTAL/GEOTECHNICAL
1675 SPECTRUM DRIVE
LAWRENCEVILLE, GEORGIA 30043
(770) 962-5922 FAX 962-7964

BIOCHLOR PCE PLUME
CENTERLINE OUTPUT 25.1 YEARS

2029

SPALDING CORNERS SHOPPING CENTER
7700 Spalding Drive
Sandy Springs, Fulton County, Georgia
HSI# 10639

Job No. 102-063

SEA-2203

DATA SOURCES: - 2014 aerial photography courtesy of ***Google Earth***

SEA
SAILORS ENGINEERING ASSOCIATES, INC.
ENVIRONMENTAL/GEOTECHNICAL
1675 SPECTRUM DRIVE
LAWRENCEVILLE, GEORGIA 30043
(770) 962-5922 FAX 962-7964

BIOCHLOR PCE PLUME
CENTERLINE OUTPUT 31 YEARS

2035

SPALDING CORNERS SHOPPING CENTER
7700 Spalding Drive
Sandy Springs, Fulton County, Georgia
HSI# 10639

Job No. 102-063

SEA-2203

DATA SOURCES: - 2014 aerial photography courtesy of ***Google Earth***

SEA
SAILORS ENGINEERING ASSOCIATES, INC.
ENVIRONMENTAL/GEOTECHNICAL
1675 SPECTRUM DRIVE
LAWRENCEVILLE, GEORGIA 30043
(770) 962-5922 FAX 962-7964

BIOCHLOR PCE PLUME
CENTERLINE OUTPUT 112 YEARS

2116

SPALDING CORNERS SHOPPING CENTER
7700 Spalding Drive
Sandy Springs, Fulton County, Georgia
HSI# 10639

Job No. 102-063

SEA-2203

DATA SOURCES: - 2014 aerial photography courtesy of ***Google Earth***

SEA **SAILORS ENGINEERING ASSOCIATES, INC.**
ENVIRONMENTAL/GEOTECHNICAL

1675 SPECTRUM DRIVE
LAWRENCEVILLE, GEORGIA 30043

(770) 962-5922 FAX 962-7964

BIOCHLOR PCE PLUME
CENTERLINE OUTPUT 118 YEARS

2122

SPALDING CORNERS SHOPPING CENTER

7700 Spalding Drive
Sandy Springs, Fulton County, Georgia
HSI# 10639

Job No. 102-063

SEA-2203

SENSITIVITY ANALYSIS

Input Parameters	Units	Input Values				Output PCE Concentrations (mg/L)		
		Low	Base	High		Low	Base	High
Seepage Velocity (Vs)	ft/yr	83.07	92.3	101.53		0.073	0.078	0.08
Longitudinal Dispersivity (alpha x)	ft/yr	112.5	125	137.5		0.084	0.078	0.072
Transverse Dispersivity (alpha y / alpha x)	ft/yr	0.09	0.1	0.11		0.082	0.078	0.074
Retardation Factor or R	dim.less	2.358	2.62	2.882		0.081	0.078	0.074
Source Thickness in Sat. Zone	ft/yr	18	20	22		0.078	0.078	0.078
Source Width	ft/yr	27	30	33		0.07	0.078	0.086
Source Concentration	mg/L	3.87	4.3	4.73		0.07	0.078	0.086
Source Degradation Rate (k_s)	1/yr	0.1305	0.145	0.1595		0.085	0.078	0.072

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ or
0.02 ← 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	83.1	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	2.0E-3	(-)		
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.62**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

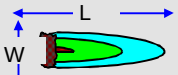
Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45

Zone 2	λ (1/yr)	half-life (yrs)
PCE → TCE	0.000	
TCE → DCE	0.000	
DCE → VC	0.000	
VC → ETH	0.000	

λ HELP

5. GENERAL

Simulation Time*	25	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)



Zone 2=

6. SOURCE DATA

TYPE: Decaying Single Planar

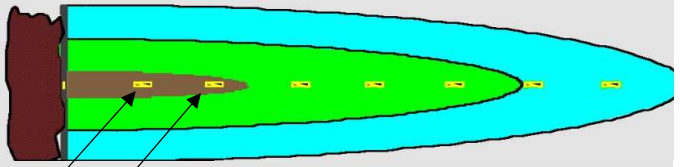
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

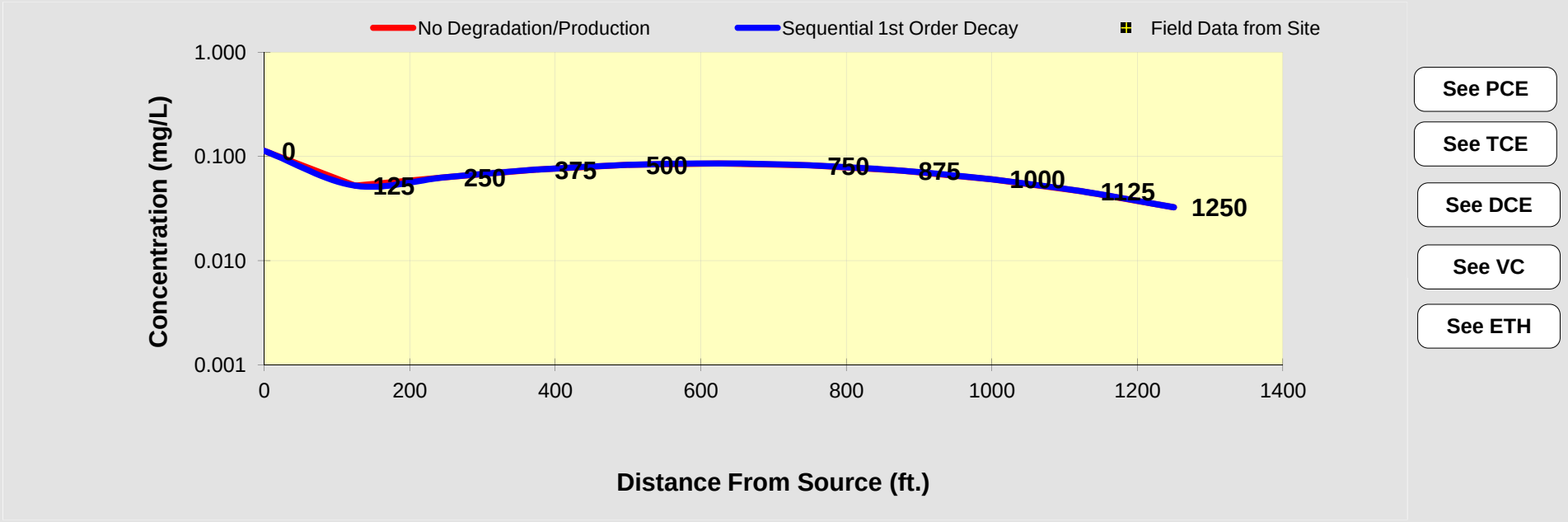
BIOCHLOR INPUT SCREEN
SENSITIVITY ANALYSIS - Vs =83.07 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

PCE	Distance from Source (ft)										
	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.113	0.052	0.063	0.075	0.083	0.086	0.082	0.073	0.060	0.046	0.033
Biotransformation	0.1129	0.052	0.063	0.075	0.083	0.086	0.082	0.073	0.060	0.046	0.033

	Monitoring Well Locations (ft)										
	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

25.1 Years

Log ⟺ Linear

Return to Input

To All

To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
SENSITIVITY ANALYSIS - Vs =83.07 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ or
0.02 ← 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	101.5	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho		1.7	(kg/L)		
FractionOrganicCarbon, foc		2.0E-3	(-)		
Partition Coefficient	Koc				
PCE	95	(L/kg)	2.62	(-)	
TCE		(L/kg)	1.00	(-)	
DCE		(L/kg)	1.00	(-)	
VC		(L/kg)	1.00	(-)	
ETH		(L/kg)	1.00	(-)	
Common R (used in model)* =			**2.62**		

4. BIOTRANSFORMATION

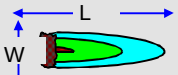
-1st Order Decay Coefficient*

	λ (1/yr)		half-life (yrs)	Yield
Zone 1				
PCE → TCE	0.000	←		0.79
TCE → DCE	0.000	←		0.74
DCE → VC	0.000	←		0.64
VC → ETH	0.000	←		0.45
Zone 2	λ (1/yr)		half-life (yrs)	
PCE → TCE	0.000	←		
TCE → DCE	0.000	←		
DCE → VC	0.000	←		
VC → ETH	0.000	←		

λ HELP

5. GENERAL

Simulation Time*	25	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)



Zone 2=

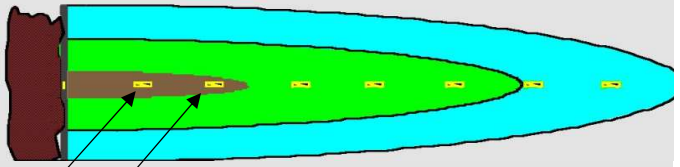
6. SOURCE DATA

TYPE: Decaying Single Planar

Source Options

Source Thickness in Sat. Zone* 20 (ft)

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



	Y1	k_s*
Width* (ft)	30	
Conc. (mg/L)*	C1	(1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

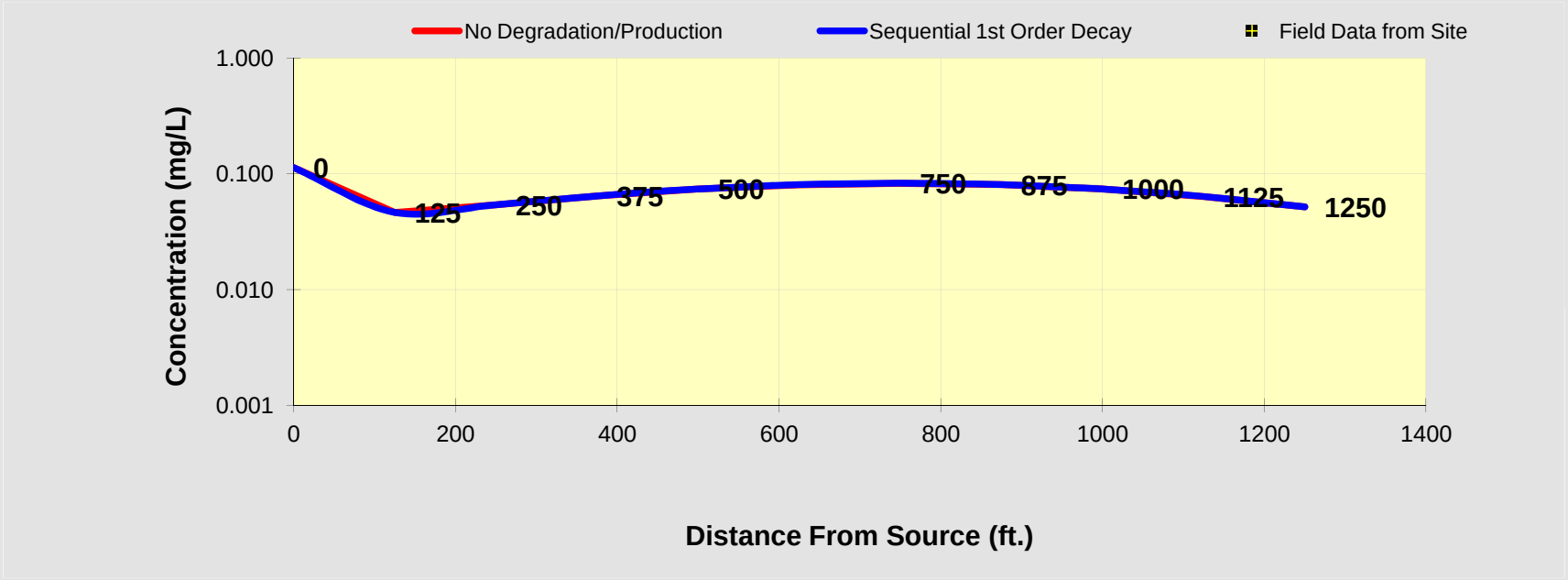
SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
SNSITIVITY ANALYSIS - Vs = 101.53 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

PCE	Distance from Source (ft)										
	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.113	0.046	0.054	0.064	0.074	0.080	0.083	0.080	0.074	0.064	0.052
Biotransformation	0.1129	0.046	0.054	0.064	0.074	0.080	0.083	0.080	0.074	0.064	0.052
	Monitoring Well Locations (ft)										
	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: 25.1 Years

Log ⟺ Linear

Return to Input | To All | To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
SENSITIVITY ANALYSIS - Vs = 101.53 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
↑ *or*
0.02 → 2. Calculate by filling in gray cells. Press Enter, then (C)

(To restore formulas, hit "Restore Formulas" button)

Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes (◉) Ethanes (○)

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	112.5	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho		1.7	(kg/L)		
FractionOrganicCarbon, foc		2.0E-3	(-)		
Partition Coefficient	Koc				
PCE	95	(L/kg)	2.62	(-)	
TCE		(L/kg)	1.00	(-)	
DCE		(L/kg)	1.00	(-)	
VC		(L/kg)	1.00	(-)	
ETH		(L/kg)	1.00	(-)	
Common R (used in model)* =			**2.62**		

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

	λ (1/yr)		half-life (yrs)	Yield
Zone 1				
PCE → TCE	0.000	←		0.79
TCE → DCE	0.000	←		0.74
DCE → VC	0.000	←		0.64
VC → ETH	0.000	←		0.45
Zone 2	λ (1/yr)		half-life (yrs)	
PCE → TCE	0.000	←		
TCE → DCE	0.000	←		
DCE → VC	0.000	←		
VC → ETH	0.000	←		

λ HELP

5. GENERAL

Simulation Time*	25	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2=

6. SOURCE DATA

TYPE: Decaying Single Planar

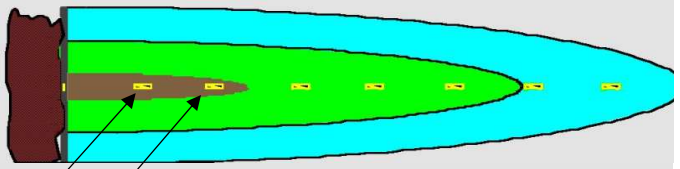
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
SENSITIVITY ANALYSIS - alpha x =112.5 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

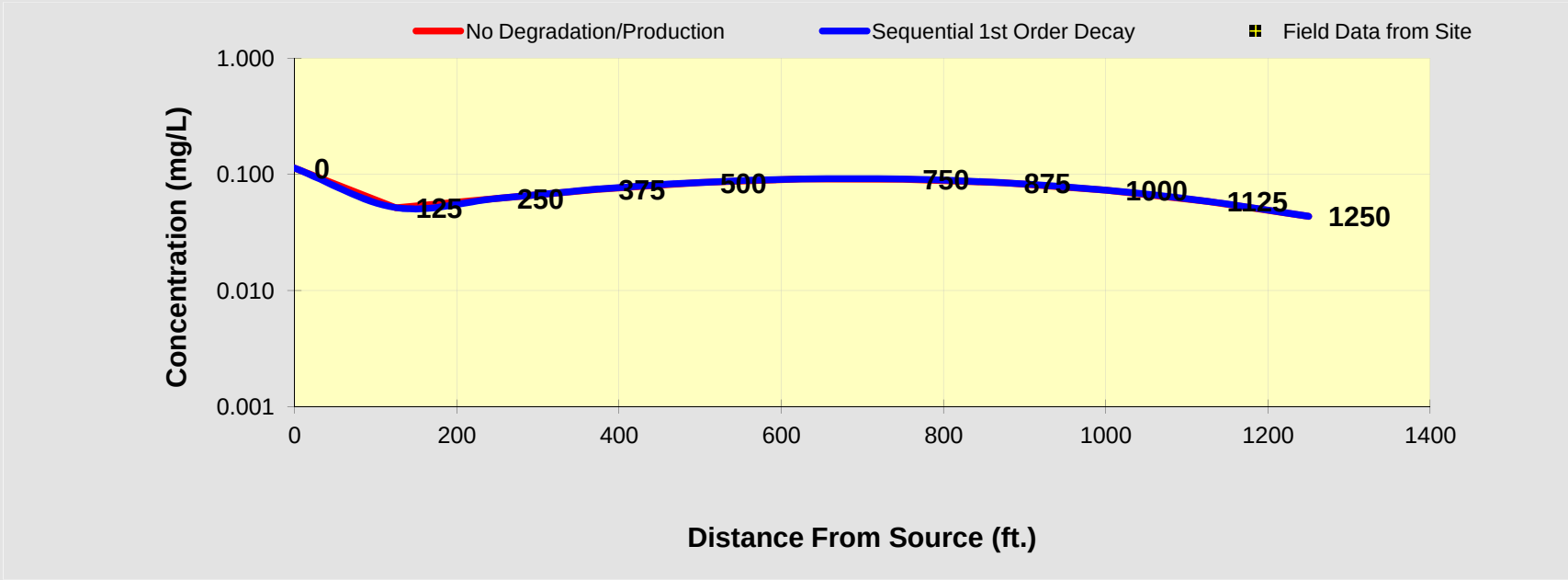
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.113	0.052	0.062	0.075	0.085	0.091	0.091	0.084	0.073	0.059	0.043
Biotransformation	0.1129	0.052	0.062	0.075	0.085	0.091	0.091	0.084	0.073	0.059	0.043

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: *25.1 Years*

Log ⟺ Linear

Return to Input | To All | To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
SENSITIVITY ANALYSIS - alpha x =112.5 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ *or*
0.02 ← 2. Calculate by filling in gray cells. Press Enter, then (C)
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: (◉) Ethenes ( ) Ethanes

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	137.5	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R
or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	2.0E-3	(-)		
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.62**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

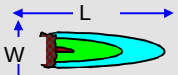
Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45

Zone 2	λ (1/yr)	half-life (yrs)
PCE → TCE	0.000	
TCE → DCE	0.000	
DCE → VC	0.000	
VC → ETH	0.000	

λ HELP

5. GENERAL

Simulation Time*	25	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)



Zone 2=

6. SOURCE DATA

TYPE: Decaying
Single Planar

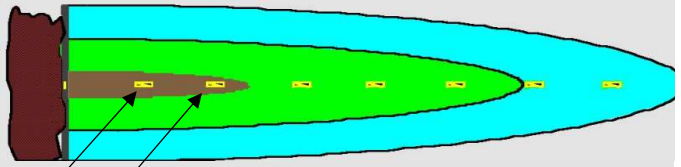
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

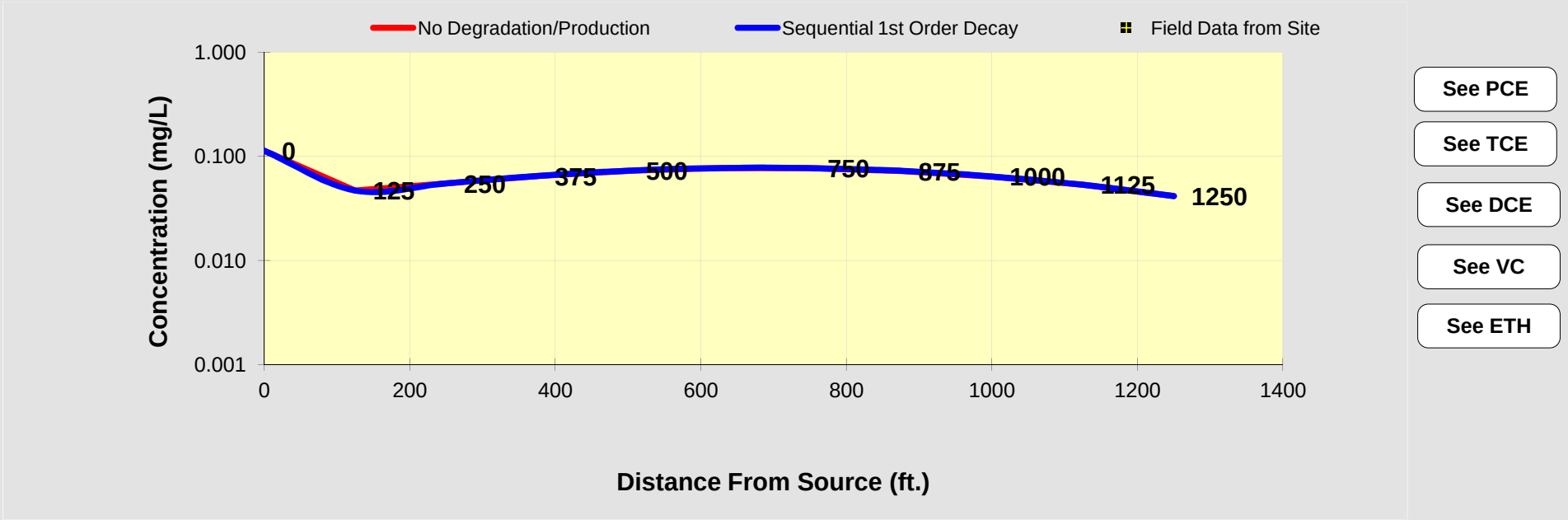
BIOCHLOR INPUT SCREEN
SENSITIVITY ANALYSIS - alpha x =137.5 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

PCE	Distance from Source (ft)										
	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.113	0.047	0.055	0.065	0.073	0.077	0.077	0.072	0.064	0.053	0.042
Biotransformation	0.1129	0.047	0.055	0.065	0.073	0.077	0.077	0.072	0.064	0.053	0.042

	Monitoring Well Locations (ft)										
	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

25.1 Years

Log ⟺ Linear

Return to Input

To All

To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
SENSITIVITY ANALYSIS - alpha x =137.5 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ *or*
0.02 → 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.09	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

	Koc		R	
Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	2.0E-3	(-)		
Partition Coefficient				
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.62**	

4. BIOTRANSFORMATION

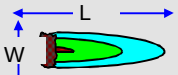
-1st Order Decay Coefficient*

	λ (1/yr)	half-life (yrs)	Yield
Zone 1			
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	25	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)



Zone 2=

6. SOURCE DATA

TYPE: Decaying
Single Planar

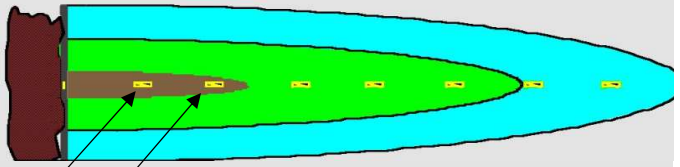
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
SENSITIVITY ANALYSIS - alpha y/x =0.9 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

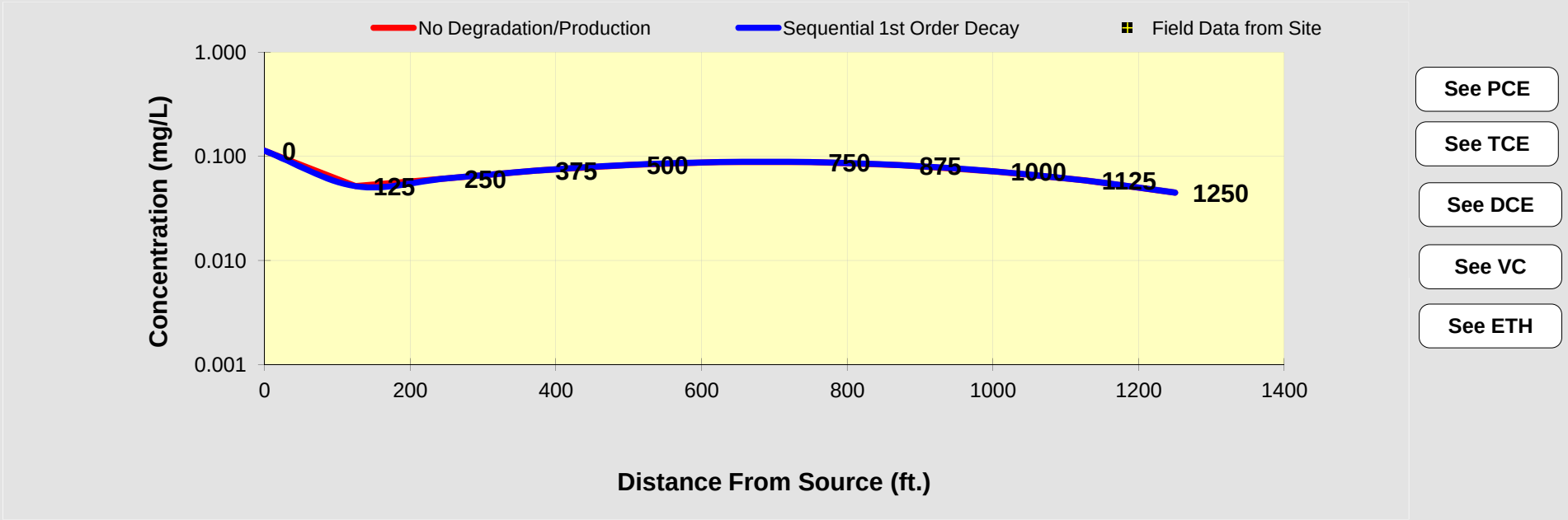
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.113	0.052	0.061	0.073	0.083	0.088	0.088	0.082	0.072	0.059	0.045
Biotransformation	0.1129	0.052	0.061	0.073	0.083	0.088	0.088	0.082	0.072	0.059	0.045

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

25.1 Years

Log ⟺ Linear

Return to Input

To All

To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
SENSITIVITY ANALYSIS - alph y/x =0.09 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ or
0.02 ← 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.11	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

	Koc		R	
Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	2.0E-3	(-)		
Partition Coefficient				
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.62**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

	λ (1/yr)	half-life (yrs)	Yield
Zone 1			
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	25	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2=

6. SOURCE DATA

TYPE: Decaying Single Planar

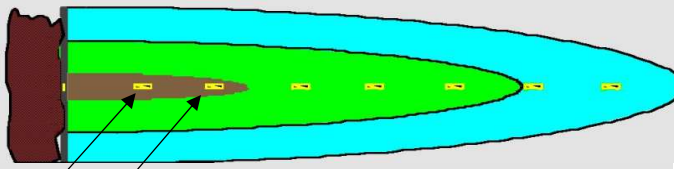
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
SENSITIVITY ANALYSIS - alpha y/x =0.11 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

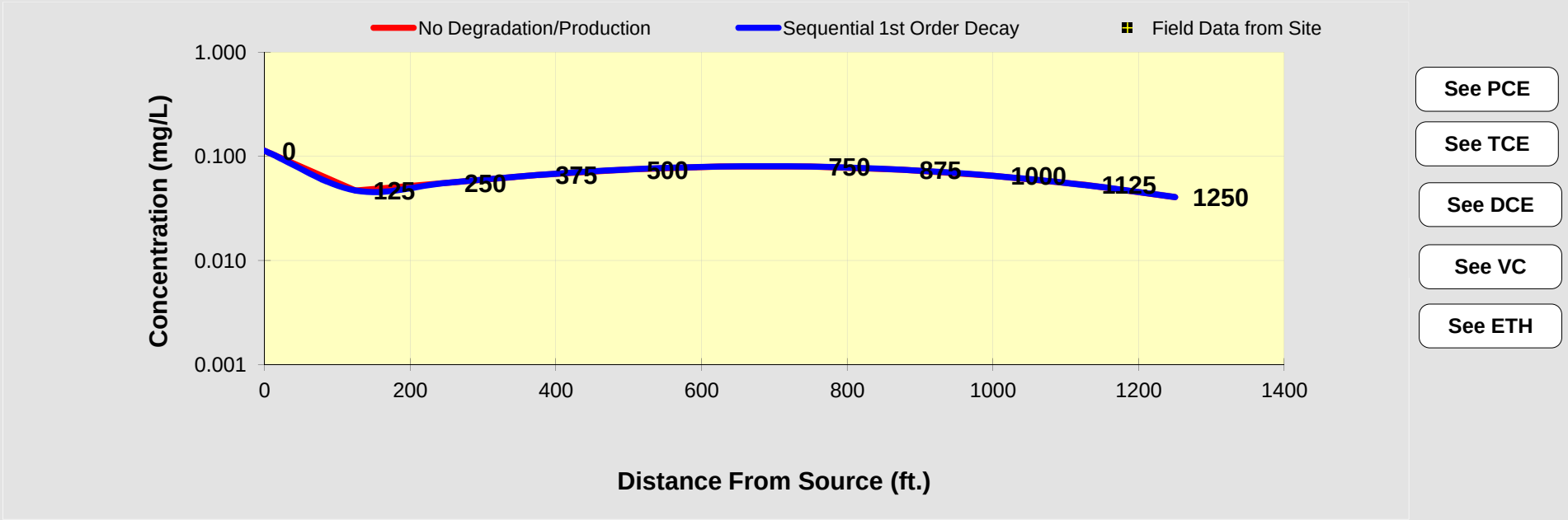
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.113	0.047	0.056	0.066	0.075	0.080	0.079	0.074	0.065	0.053	0.041
Biotransformation	0.1129	0.047	0.056	0.066	0.075	0.080	0.079	0.074	0.065	0.053	0.041

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: *25.1 Years*

Log ⟺ Linear

Return to Input | To All | To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
SENSITIVITY ANALYSIS - alpha y/x=0.11 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ *or*
0.02 ← 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	2.0E-3	(-)		
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.36**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	25	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2=

6. SOURCE DATA

TYPE: Decaying
Single Planar

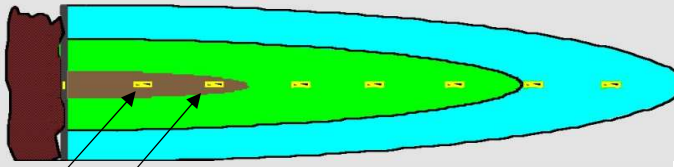
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
SENSITIVITY ANALYSIS - R =2.358 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

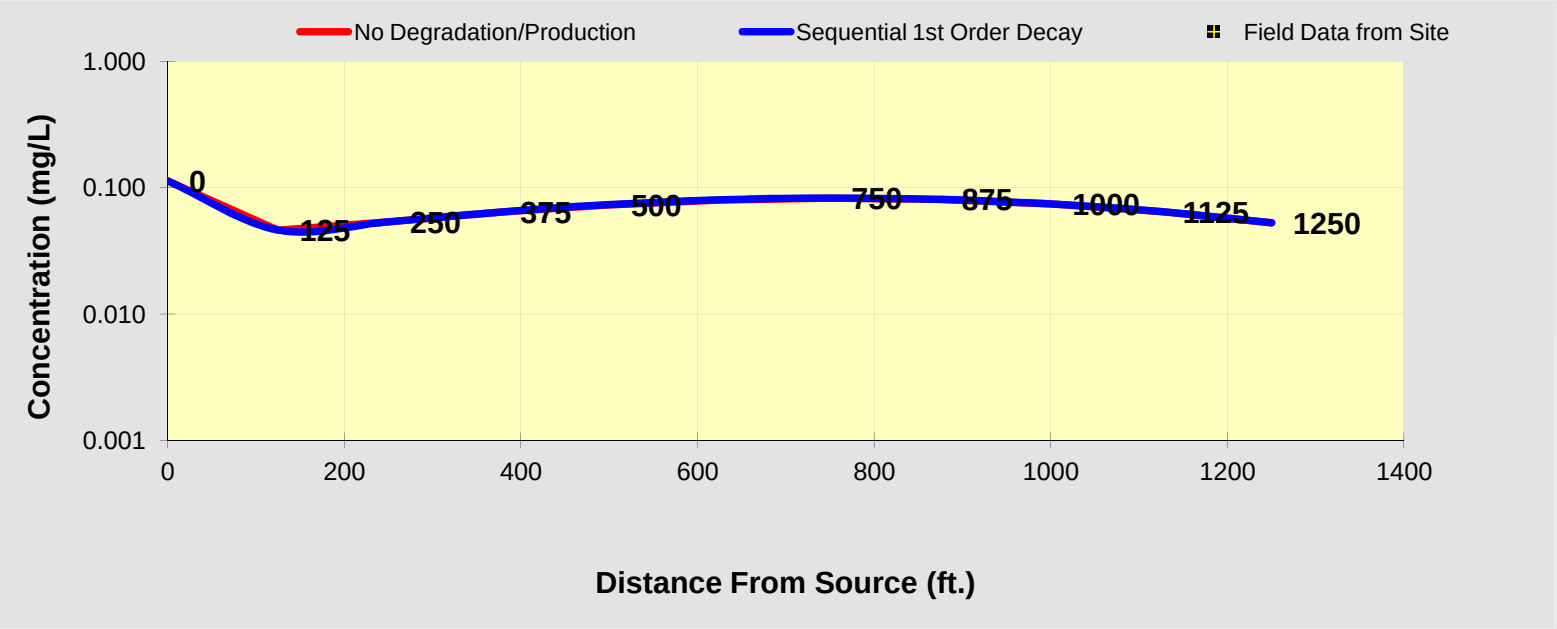
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.113	0.046	0.054	0.064	0.073	0.080	0.083	0.081	0.074	0.064	0.053
Biotransformation	0.1129	0.046	0.054	0.064	0.073	0.080	0.083	0.081	0.074	0.064	0.053

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

25.1 Years

Log ⟺ Linear

Return to Input

To All

To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
SENSITIVITY ANALYSIS - R =2.358 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ *or* 2. Calculate by filling in gray
0.02 cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	2.0E-3	(-)		
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.88**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

		λ (1/yr)	half-life (yrs)	Yield
Zone 1				
PCE →	TCE	0.000 ←		0.79
TCE →	DCE	0.000 ←		0.74
DCE →	VC	0.000 ←		0.64
VC →	ETH	0.000 ←		0.45
Zone 2		λ (1/yr)	half-life (yrs)	
PCE →	TCE	0.000 ←		
TCE →	DCE	0.000 ←		
DCE →	VC	0.000 ←		
VC →	ETH	0.000 ←		

λ HELP

5. GENERAL

Simulation Time*	25	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2=

6. SOURCE DATA

TYPE: Decaying Single Planar

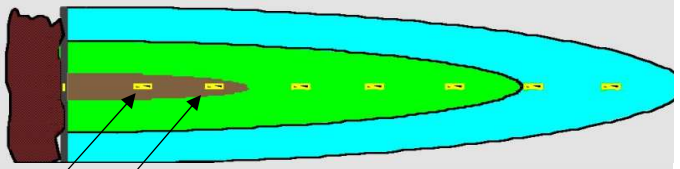
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHOR INPUT SCREEN
SENSITIVITY ANALYSIS - R =2.882 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

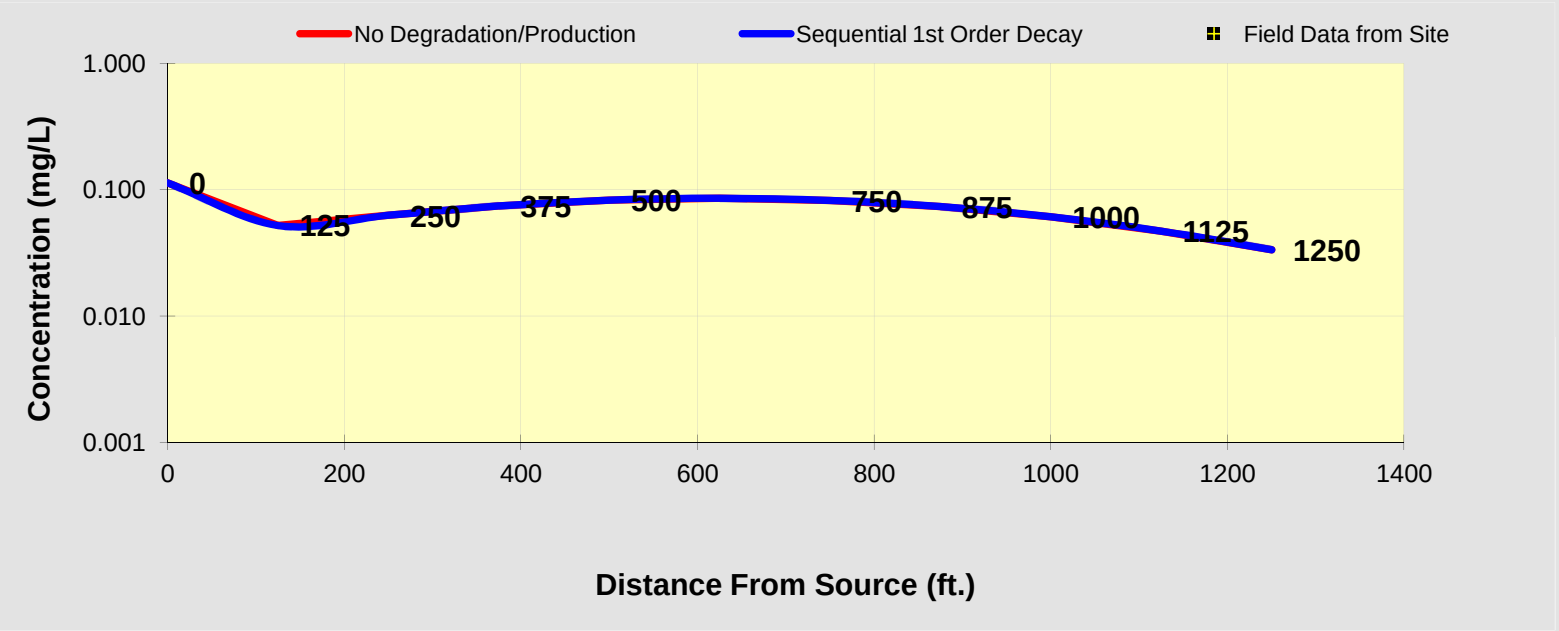
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.113	0.052	0.063	0.074	0.082	0.085	0.082	0.074	0.061	0.047	0.033
Biotransformation	0.1129	0.052	0.063	0.074	0.082	0.085	0.082	0.074	0.061	0.047	0.033

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: *25.1 Years*

Log ⟺ Linear

Return to Input | To All | To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLR, GA

BIOCHLOR OUTPUT SCREEN
SENSITIVITY ANALYSIS - R =2.882 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
↑ *or*
0.02 → 2. Calculate by filling in gray cells. Press Enter, then (C)

(To restore formulas, hit "Restore Formulas" button)

Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes (◉) Ethanes (○)

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	2.0E-3	(-)		
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.62**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

		λ (1/yr)	half-life (yrs)	Yield
Zone 1				
PCE →	TCE	0.000 ←		0.79
TCE →	DCE	0.000 ←		0.74
DCE →	VC	0.000 ←		0.64
VC →	ETH	0.000 ←		0.45
Zone 2		λ (1/yr)	half-life (yrs)	
PCE →	TCE	0.000 ←		
TCE →	DCE	0.000 ←		
DCE →	VC	0.000 ←		
VC →	ETH	0.000 ←		

λ HELP

5. GENERAL

Simulation Time*	25	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2=

6. SOURCE DATA

TYPE: Decaying Single Planar

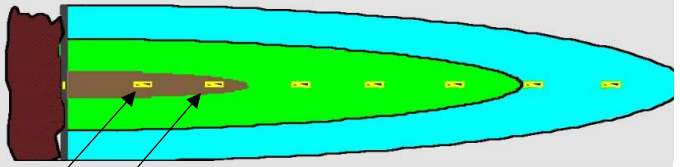
Source Options

Source Thickness in Sat. Zone* 18 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
SENSITIVITY ANALYSIS - THICKNESS = 18 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

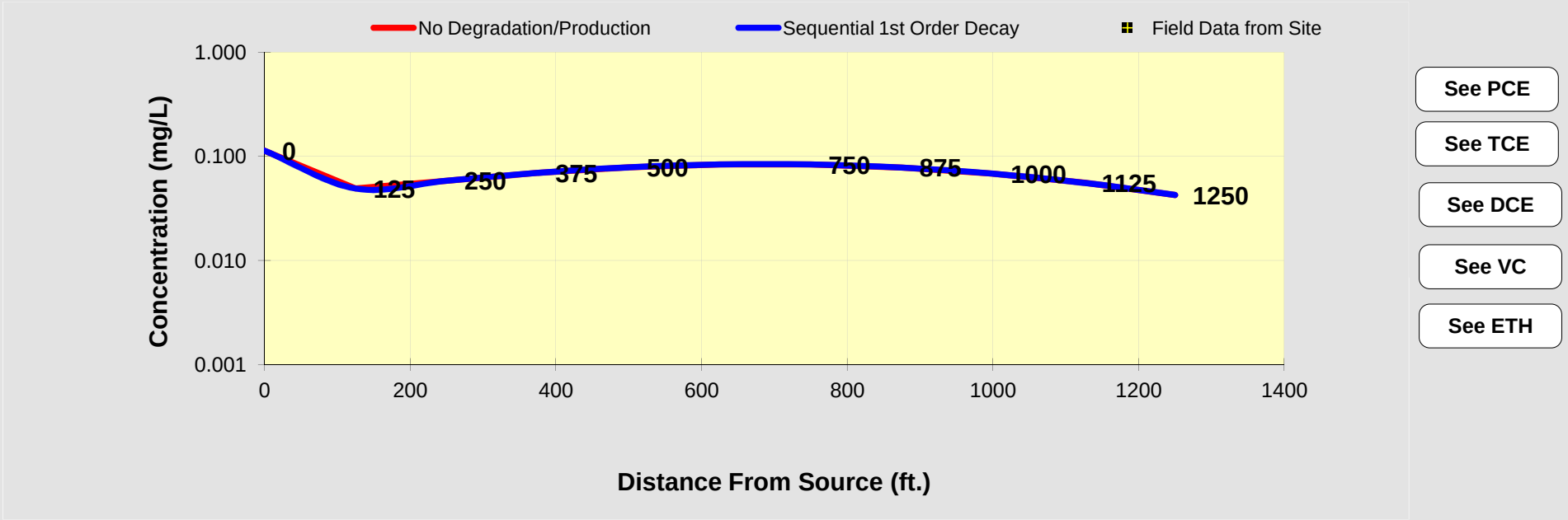
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.113	0.049	0.058	0.069	0.078	0.083	0.083	0.078	0.068	0.056	0.043
Biotransformation	0.1129	0.049	0.058	0.069	0.078	0.083	0.083	0.078	0.068	0.056	0.043

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: *25.1 Years*

Log ⟺ Linear

Return to Input | To All | To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
SENSITIVITY ANALYSIS - THICKNESS =18 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ or
0.02 ← 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho		1.7	(kg/L)	
FractionOrganicCarbon, foc		2.0E-3	(-)	
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.62**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45

Zone 2	λ (1/yr)	half-life (yrs)
PCE → TCE	0.000	
TCE → DCE	0.000	
DCE → VC	0.000	
VC → ETH	0.000	

λ HELP

5. GENERAL

Simulation Time*	25	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2=

6. SOURCE DATA

TYPE: Decaying Single Planar

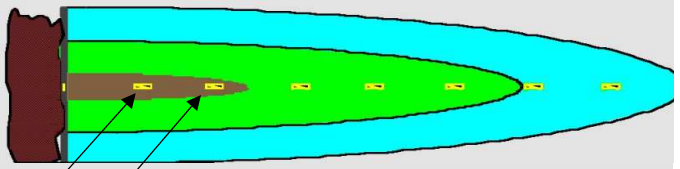
Source Options

Source Thickness in Sat. Zone* 22 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

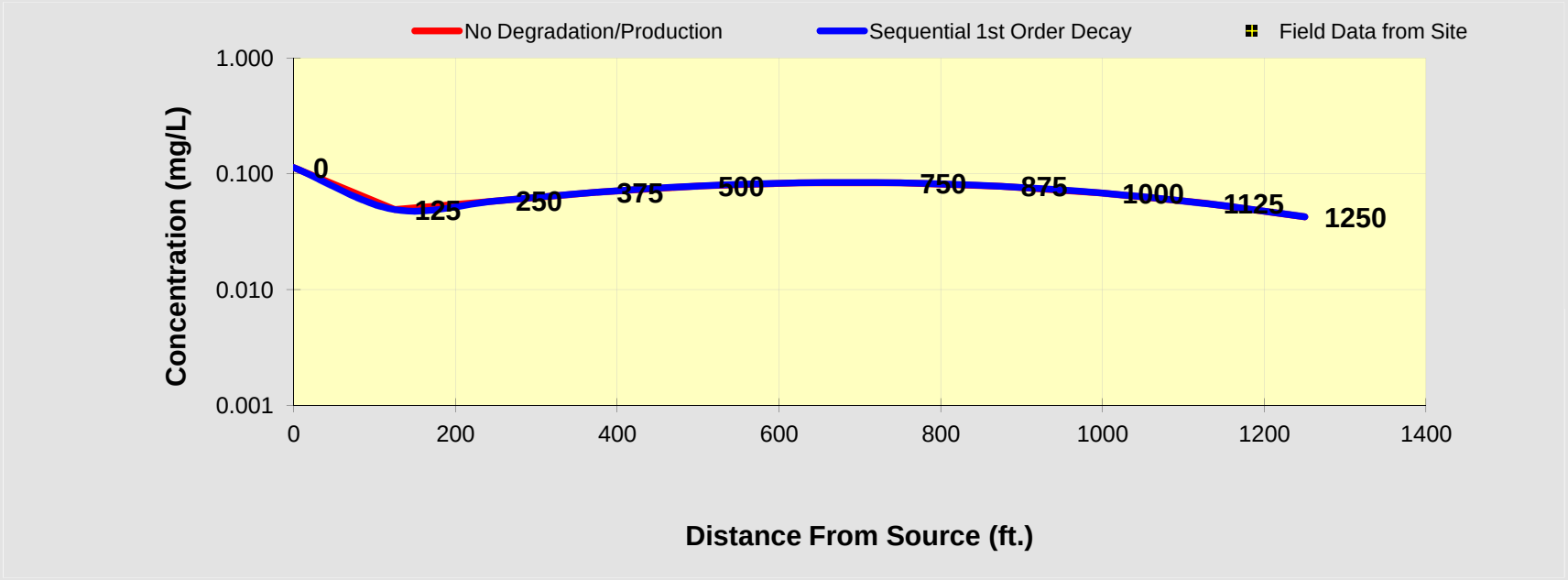
SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
SENSITIVITY ANALYSIS - THICKNESS =22 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

PCE	Distance from Source (ft)										
	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.113	0.049	0.058	0.069	0.078	0.083	0.083	0.078	0.068	0.056	0.043
Biotransformation	0.1129	0.049	0.058	0.069	0.078	0.083	0.083	0.078	0.068	0.056	0.043
	Monitoring Well Locations (ft)										
	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: 25.1 Years

Log ⟺ Linear

Return to Input | To All | To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
SENSITIVITY ANALYSIS - THICKNESS =22 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
↑ *or*
0.02 → 2. Calculate by filling in gray cells. Press Enter, then (C)

(To restore formulas, hit "Restore Formulas" button)

Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes (◉) Ethanes (○)

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho		1.7	(kg/L)	
FractionOrganicCarbon, foc		2.0E-3	(-)	
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.62**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45

Zone 2	λ (1/yr)	half-life (yrs)
PCE → TCE	0.000	
TCE → DCE	0.000	
DCE → VC	0.000	
VC → ETH	0.000	

λ HELP

5. GENERAL

Simulation Time*	25	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2=

6. SOURCE DATA

TYPE: Decaying Single Planar

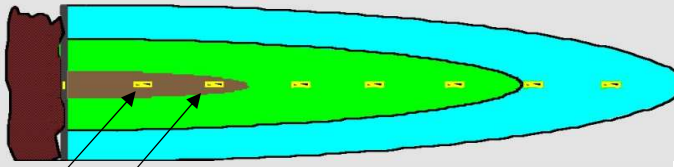
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 27

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
SENSITIVITY ANALYSIS - WIDTH =27 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

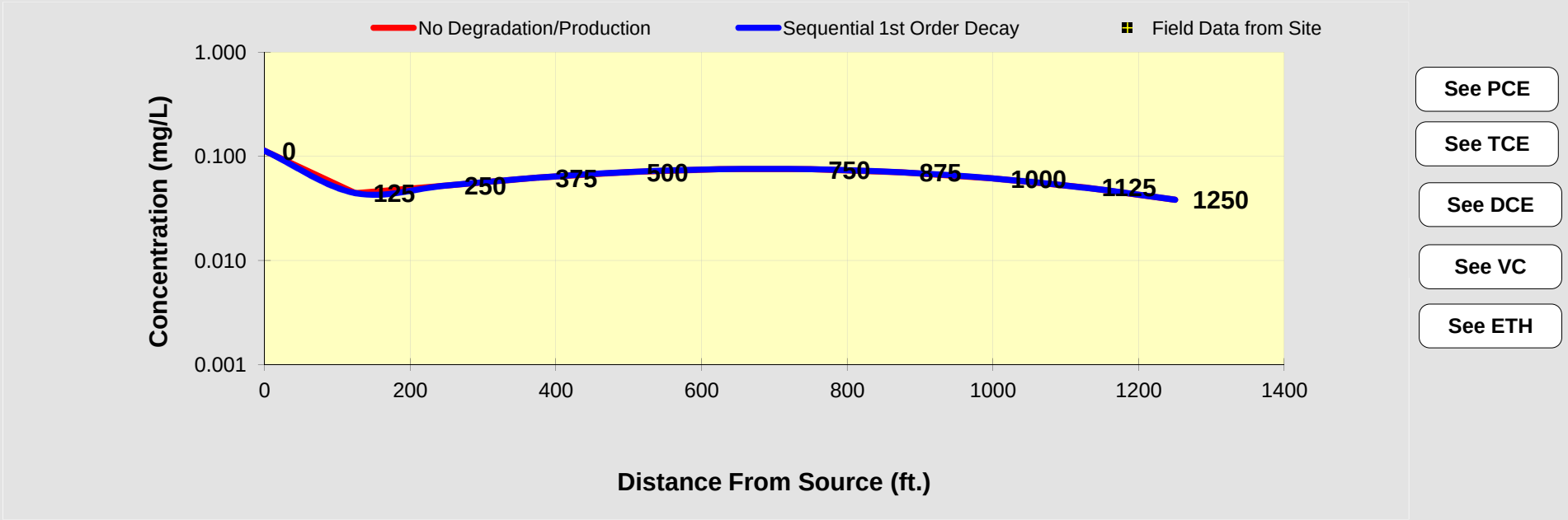
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.113	0.044	0.052	0.062	0.071	0.075	0.075	0.070	0.061	0.050	0.038
Biotransformation	0.1129	0.044	0.052	0.062	0.071	0.075	0.075	0.070	0.061	0.050	0.038

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

25.1 Years

Log ⟺ Linear

Return to Input

To All

To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
SENSITIVITY ANALYSIS - WIDTH =27 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ or
0.02 ← 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R
or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	2.0E-3	(-)		
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.62**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

Zone 1	λ (1/yr)		half-life (yrs)	Yield
PCE → TCE	0.000	←		0.79
TCE → DCE	0.000	←		0.74
DCE → VC	0.000	←		0.64
VC → ETH	0.000	←		0.45
Zone 2	λ (1/yr)		half-life (yrs)	
PCE → TCE	0.000	←		
TCE → DCE	0.000	←		
DCE → VC	0.000	←		
VC → ETH	0.000	←		

λ HELP

5. GENERAL

Simulation Time*	25	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2=

6. SOURCE DATA

TYPE: Decaying Single Planar

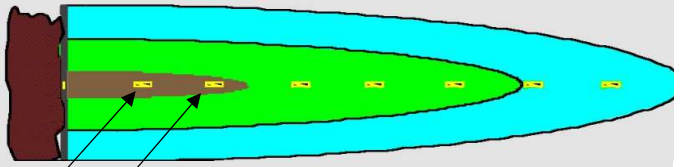
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 33

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
SENSITIVITY ANAYSIS - WIDTH =33 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

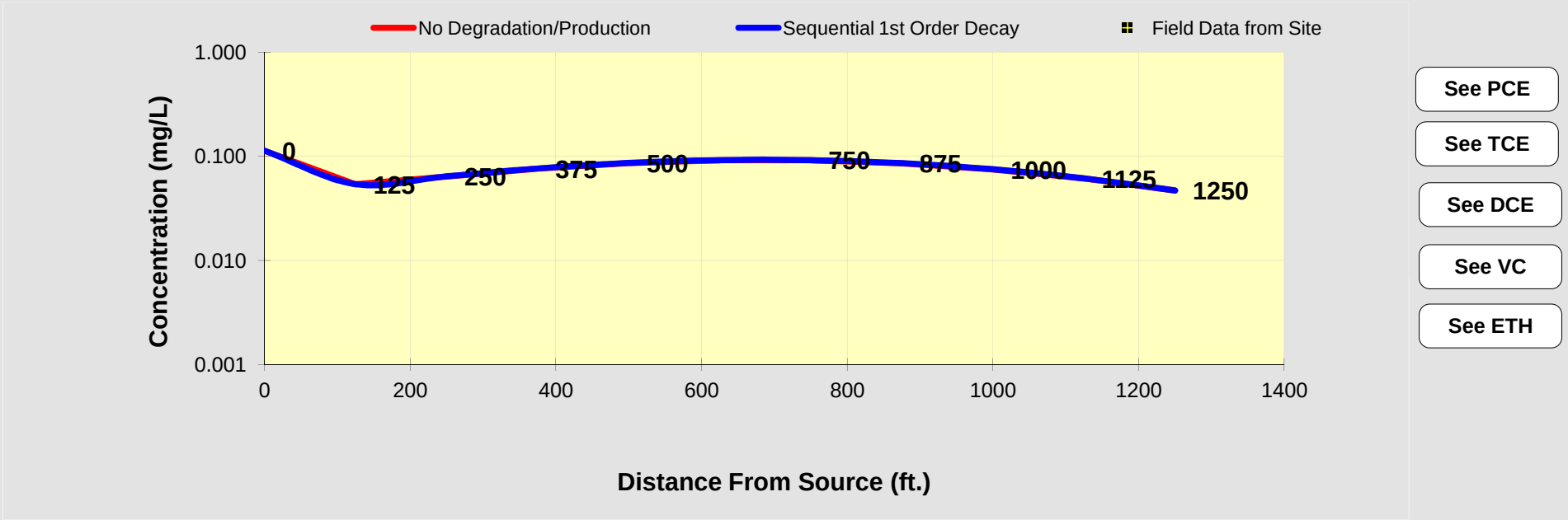
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.113	0.054	0.064	0.076	0.086	0.092	0.092	0.086	0.075	0.061	0.047
Biotransformation	0.1129	0.054	0.064	0.076	0.086	0.092	0.092	0.086	0.075	0.061	0.047

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: *25.1 Years*

Log ⟺ Linear

Return to Input | To All | To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
SENSITIVITY ANALYSIS - WIDTH 33 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ or
0.02 ← 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

			R	
Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	2.0E-3	(-)		
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.62**	

4. BIOTRANSFORMATION

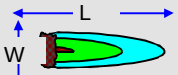
-1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	25	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)



Zone 2=

6. SOURCE DATA

TYPE: Decaying
Single Planar

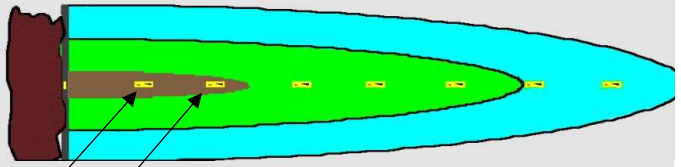
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	3.87	0.145
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
SENSITIVITY ANALYSIS - CONC. =3.87 - 25.1 YEAR RUN -

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

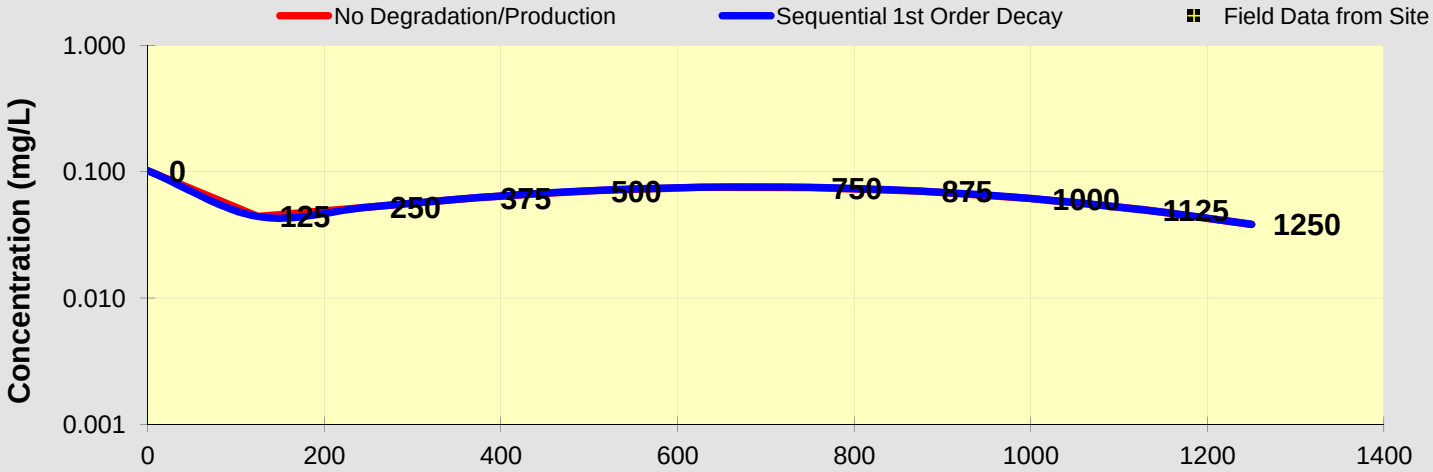
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.102	0.044	0.052	0.062	0.071	0.075	0.075	0.070	0.061	0.050	0.038
Biotransformation	0.1016	0.044	0.052	0.062	0.071	0.075	0.075	0.070	0.061	0.050	0.038

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: *25.1 Years*

Log ⟺ Linear

Return to Input | To All | To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
SENSITIVITY ANALYSIS - CONC =3.87 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
↑ *or*
0.02 → 2. Calculate by filling in gray cells. Press Enter, then (C)

(To restore formulas, hit "Restore Formulas" button)

Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes (◉) Ethanes (○)

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho		1.7	(kg/L)	
FractionOrganicCarbon, foc		2.0E-3	(-)	
Partition Coefficient	Koc			
PCE	95	(L/kg)	2.62	(-)
TCE		(L/kg)	1.00	(-)
DCE		(L/kg)	1.00	(-)
VC		(L/kg)	1.00	(-)
ETH		(L/kg)	1.00	(-)
Common R (used in model)* =			**2.62**	

4. BIOTRANSFORMATION

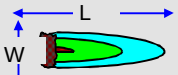
-1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.000		0.74
DCE → VC	0.000		0.64
VC → ETH	0.000		0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	25	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)



Zone 2=

6. SOURCE DATA

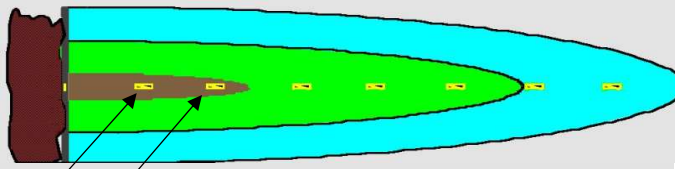
TYPE: Decaying Single Planar

Source Options

Source Thickness in Sat. Zone* 20 (ft)

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations

	Y1	k_s*
Width* (ft)	30	
Conc. (mg/L)*	C1	(1/yr)
PCE	4.73	0.145
TCE		0
DCE		0
VC		0
ETH		0



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
SENSITIVITY ANALYSIS - CONC =4.73 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

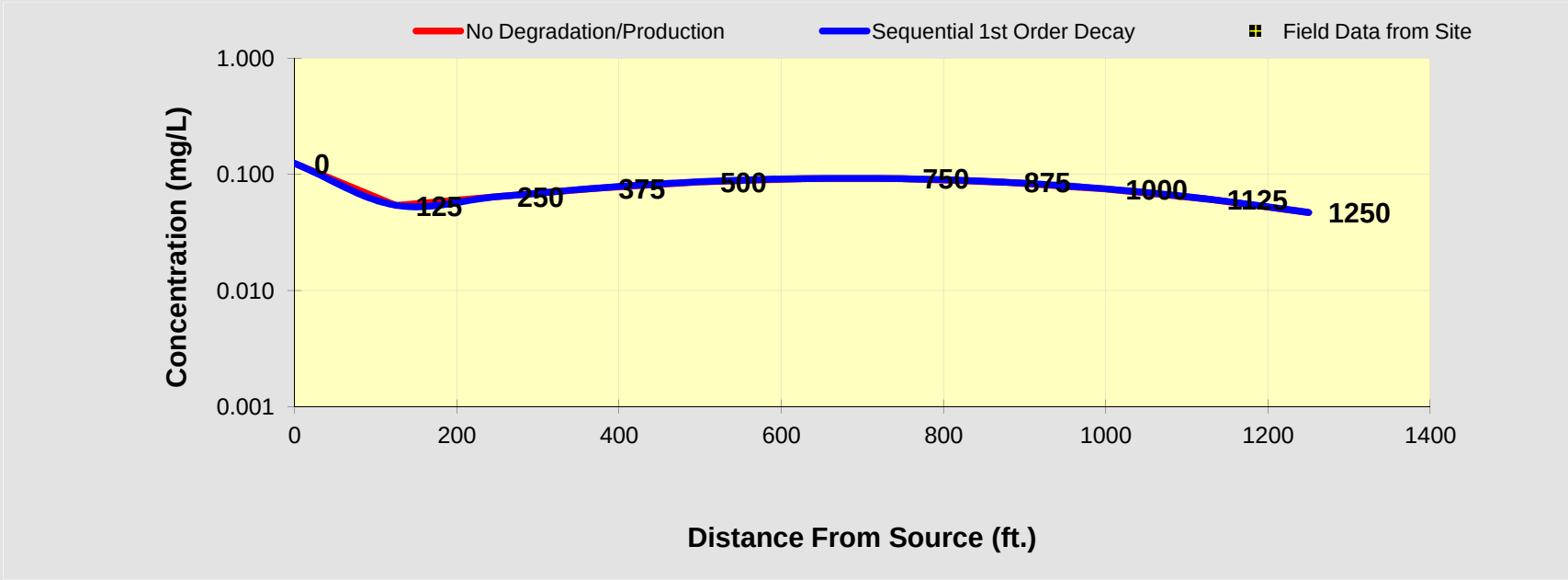
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.124	0.054	0.064	0.076	0.086	0.092	0.092	0.086	0.075	0.061	0.047
Biotransformation	0.1242	0.054	0.064	0.076	0.086	0.092	0.092	0.086	0.075	0.061	0.047

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

25.1 Years

Log ⟺ Linear

Return to Input

To All

To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
SENSITIVITY ANALYSIS - CONC =4.73 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
↑ *or*
0.02 → 2. Calculate by filling in gray cells. Press Enter, then (C)

(To restore formulas, hit "Restore Formulas" button)

Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes (◉) Ethanes (○)

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Calc. Alpha x

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho		1.7	(kg/L)	
FractionOrganicCarbon, foc		2.0E-3	(-)	
Partition Coefficient	Koc			
PCE		95	(L/kg)	2.62 (-)
TCE			(L/kg)	1.00 (-)
DCE			(L/kg)	1.00 (-)
VC			(L/kg)	1.00 (-)
ETH			(L/kg)	1.00 (-)

Common R (used in model)* = 2.62

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000 ←		0.79
TCE → DCE	0.000 ←		0.74
DCE → VC	0.000 ←		0.64
VC → ETH	0.000 ←		0.45

Zone 2	λ (1/yr)	half-life (yrs)
PCE → TCE	0.000 ←	
TCE → DCE	0.000 ←	
DCE → VC	0.000 ←	
VC → ETH	0.000 ←	

λ HELP

5. GENERAL

Simulation Time*	25	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2=

6. SOURCE DATA

TYPE: Decaying Single Planar

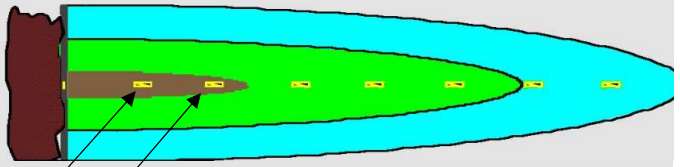
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.131
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR INPUT SCREEN
SENSITIVITY ANALYSIS - k_s =0.1305 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

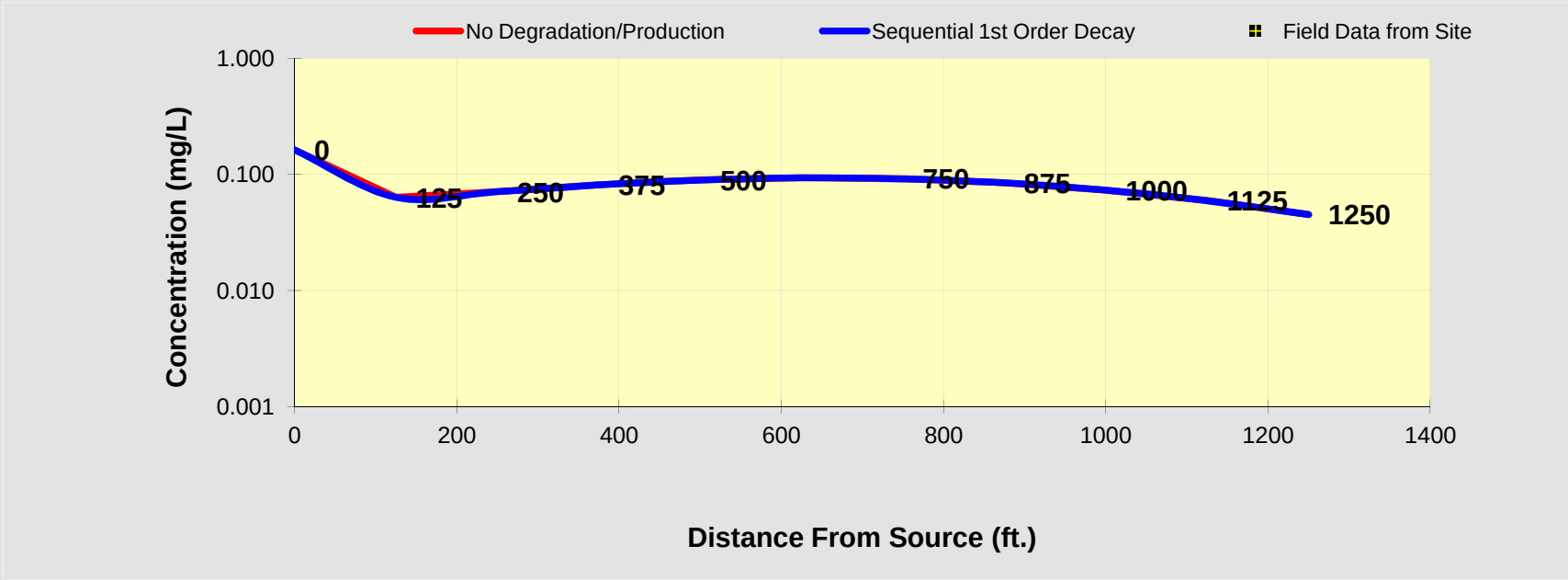
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.163	0.063	0.071	0.081	0.089	0.093	0.092	0.085	0.073	0.059	0.045
Biotransformation	0.1625	0.063	0.071	0.081	0.089	0.093	0.092	0.085	0.073	0.059	0.045

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

25.1 Years

Log ⟺ Linear

Return to Input

To All

To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHLOR OUTPUT SCREEN
SENSITIVITY ANALYSIS - k_s =0.1305 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

HSI #10639
SEA 102-063
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
↑ or
0.02 ← 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	92.3	(ft/yr)
or			
Hydraulic Conductivity	K	9.7E-04	(cm/sec)
Hydraulic Gradient	i	0.01839	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	125	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho		1.7	(kg/L)		
FractionOrganicCarbon, foc		2.0E-3	(-)		
Partition Coefficient	Koc				
PCE		95	(L/kg)	2.62	(-)
TCE			(L/kg)	1.00	(-)
DCE			(L/kg)	1.00	(-)
VC			(L/kg)	1.00	(-)
ETH			(L/kg)	1.00	(-)
Common R (used in model)* =				**2.62**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

		λ (1/yr)	half-life (yrs)	Yield
Zone 1				
PCE →	TCE	0.000 ←		0.79
TCE →	DCE	0.000 ←		0.74
DCE →	VC	0.000 ←		0.64
VC →	ETH	0.000 ←		0.45
Zone 2		λ (1/yr)	half-life (yrs)	
PCE →	TCE	0.000 ←		
TCE →	DCE	0.000 ←		
DCE →	VC	0.000 ←		
VC →	ETH	0.000 ←		

λ HELP

5. GENERAL

Simulation Time*	25	(yr)
Modeled Area Width*	300	(ft)
Modeled Area Length*	1250	(ft)
Zone 1 Length*	1250	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2=

6. SOURCE DATA

TYPE: Decaying Single Planar

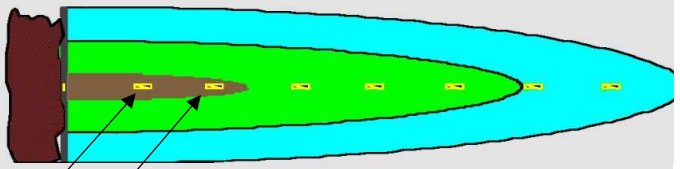
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1: 30

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	4.3	0.16
TCE		0
DCE		0
VC		0
ETH		0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)	0	80	150	220	390	410	515	620	680	690	920
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | **RUN ARRAY** | ***Help*** | Restore Formulas | RESET | ***SEE OUTPUT*** | Paste Example

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

BIOCHOR INPUT SCREEN
SENSITIVITY ANALYSIS - k_s= 0.1595 - 25.1 YEARS RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

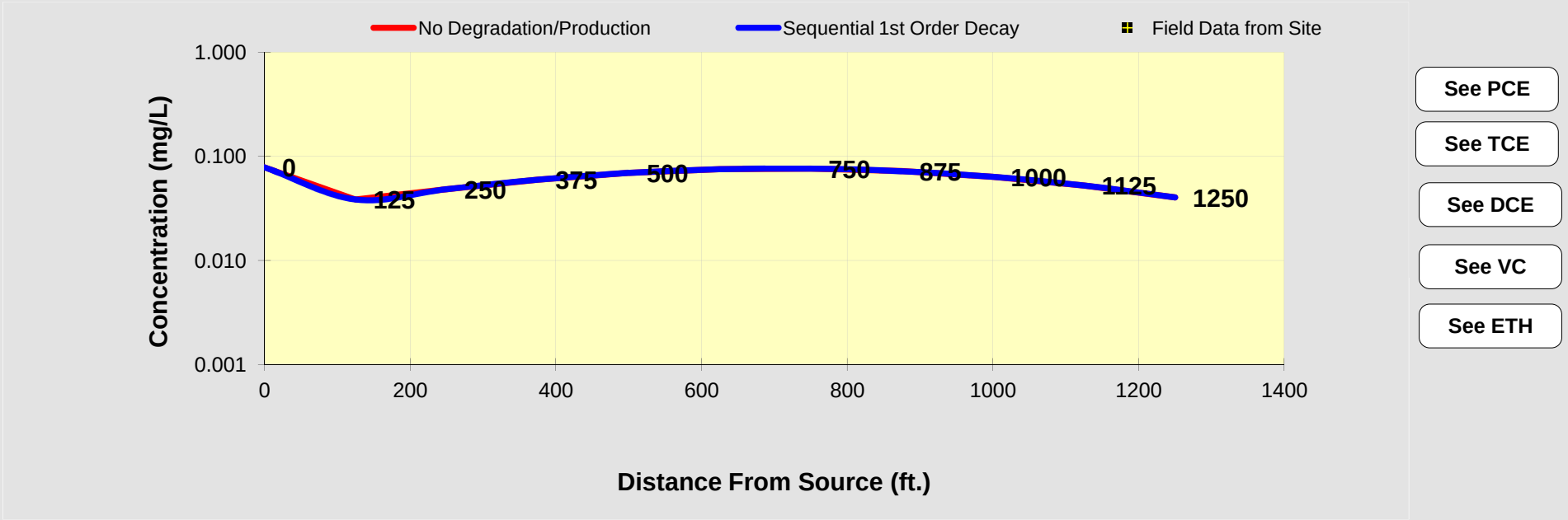
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	125	250	375	500	625	750	875	1000	1125	1250
No Degradation	0.078	0.038	0.048	0.060	0.069	0.075	0.076	0.072	0.064	0.052	0.040
Biotransformation	0.0785	0.038	0.048	0.060	0.069	0.075	0.076	0.072	0.064	0.052	0.040

Monitoring Well Locations (ft)

	0	80	150	220	390	410	515	620	680	690	920
Field Data from Site											



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: *25.1 Years*

Log ⟺ Linear

Return to Input | To All | To Array

SAILORS ENGINEERING ASSOC., INC.
1675 SPECTRUM DR.
LAWRENCEVILLE, GA

VIOCHLOR OUTPUT SCREEN
SENSITIVITY ANALYSIS - k_s= 0.1595 - 25.1 YEAR RUN

SPALDING CORNERS
SANDY SPRINGS, FULTON CO., GA
HSI #10639

APPENDIX 11

DRAFT UNIFORM ENVIRONMENTAL COVENANTS

After Recording Return to:

W. Scott Laseter, Esq.
Kazmarek Mowery Cloud Laseter LLC
1230 Peachtree Street NE, Suite 3600
Atlanta, GA 30309

NOTE TO CLERK:
Please cross-reference to
Deed Book 52429, Page 207 and
Deed Book 8117 Page 355
Fulton County, Georgia Records

Environmental Covenant

This instrument is an Environmental Covenant executed pursuant to the Georgia Uniform Environmental Covenants Act, OCGA § 44-16-1, *et seq.* This Environmental Covenant subjects the Property identified below to the activity and/or use limitations specified in this document. The effective date of this Environmental Covenant shall be the date upon which the fully executed Environmental Covenant has been recorded in accordance with OCGA § 44-16-8(a).

Fee Owner of Property/ Grantor:	Selig Enterprises, Inc. 1100 Spring String NW, Suite 550 Atlanta, GA 30309
Grantee/ Holder:	Selig Enterprises, Inc. 1100 Spring String NW, Suite 550 Atlanta, GA 30309
Grantee/ Entity with express power to enforce:	State of Georgia Department of Natural Resources Environmental Protection Division 2 Martin Luther King Jr. Drive, SE Suite 1054 East Tower Atlanta, GA 30334
***[*Parties with interest in the Property:**	Delete if no other party with interest in Property.***]***

Property:

The property subject to this Environmental Covenant is located at 7700 Spalding Drive, Sandy Springs, Fulton County, Georgia and more particularly described on **Exhibit "A"** attached hereto and incorporated by reference (hereinafter "Property"). The Property was conveyed on April 27, 1982 from The Gates, Ltd. to Selig Enterprises, Inc. and recorded in Deed Book 8117

Page 355 and revised in Deed Book 52429 Page 220, Fulton County Records. The Property is located in Land Lot 313 of the 6th District of Fulton County, Georgia and contains 9.02 acres. A map of the area is attached as **Exhibit "B".**

Tax Parcel Number:

06-0313 LL-009-1 of Fulton County, Georgia

Name and Location of Administrative Records:

The environmental conditions that are the subject of this Environmental Covenant are described in the Compliance Status Report ("CSR") and any subsequent revisions, addendums, modifications or amendments thereto ("CSR Documents"), including:

- Compliance Status Report Addendum & Corrective Action Plan, March 2004
- Corrective Action Plan Addendum, August 2008
- Revised Voluntary Remediation Program Application, May 2010
- [COMPLIANCE STATUS REPORT, __ 2015

These documents are available at the following location in the files for HSI No. 10639:

Georgia Environmental Protection Division
Response and Remediation Program
2 MLK Jr. Drive, SE, Suite 1054 East Tower
Atlanta, GA 30334
M-F 8:00 AM to 4:30 PM excluding state holidays

Description of Contamination and Corrective Action:

This Property has been listed on the state's hazardous site inventory (HSI No. 10639) and has been designated as needing corrective action due to the presence of hazardous wastes, hazardous constituents, or hazardous substances regulated under state law. Contact the property owner or the Georgia Environmental Protection Division for further information concerning environmental conditions on this Property. This notice is provided in compliance with the Georgia Hazardous Site Response Act and Voluntary Remediation Program Act.

This Declaration of Covenant is made pursuant to the Georgia Uniform Environmental Covenants Act, O.C.G.A. § 44-16-1 *et seq.* by Selig Enterprises, Inc., its successors and assigns, and in favor of the State of Georgia, Department of Natural Resources, Environmental Protection Division (hereinafter "EPD"), its successors and assigns. This Environmental Covenant is required because a release of acetone, chloroform, cis-1,2-dichloroethene, tetrachloroethene and trichloroethene, all of which are "regulated substances" as defined under the Georgia Hazardous

Site Response Act, O.C.G.A. § 12-8-90 *et seq.*, and the rules promulgated thereunder (hereinafter "HSRA" and "Rules", respectively). Corrective Action includes the implementation of institutional controls to protect human health and the environment, all as described in this Covenant.

Grantor, Selig Enterprises, Inc. (hereinafter "Selig"), hereby binds Grantor, its successors and assigns to the activity and use restrictions for the Property identified herein and grants such other rights under this Environmental Covenant in favor of Holder and EPD. EPD shall have full right of enforcement of the rights conveyed under this Environmental Covenant pursuant to HSRA and the Rules. Failure to timely enforce compliance with this Environmental Covenant or the use or activity limitations contained herein by any person shall not bar subsequent enforcement by such person and shall not be deemed a waiver of the person's right to take action to enforce any non-compliance. Nothing in this Environmental Covenant shall restrict EPD from exercising any authority under applicable law.

Selig makes the following declaration as to limitations, restrictions, and uses to which the Property may be put and specifies that such declarations shall constitute covenants to run with the land, pursuant to O.C.G.A. § 44-16-5(a); is perpetual, unless modified or terminated pursuant to the terms of this Covenant pursuant to O.C.G.A. § 44-16-9 and 10; and shall be binding on all parties and all persons claiming under them, including all current and future owners of any portion of or interest in the Property (hereinafter "Owner"). Should a transfer or sale of the Property occur before such time as this Environmental Covenant has been amended or revoked, then said Environmental Covenant shall be binding on the transferee(s) or purchaser(s).

The Environmental Covenant shall inure to the benefit of Holder, EPD, Selig and their respective successors and assigns and shall be enforceable by the Director or his agents or assigns, Holder or its successors or assigns, Selig or its successors and assigns, and other party(-ies) as provided for in O.C.G.A. § 44-16-11 in a court of competent jurisdiction.

Activity and/ or Use Limitation(s):

1. Registry. Pursuant to O.C.G.A. § 44-16-12, this Environmental Covenant and any amendment or termination thereof, may be contained in EPD's registry for environmental covenants.

2. Notice. The Owner of the Property shall provide written notice to EPD of the transfer of title to the Property no later than thirty days following the transfer. Additionally, the Owner shall not make any application for rezoning of the Property without first giving EPD notice at least thirty (30) business days in advance of said application. Owner further agrees not to make such an application for rezoning unless Owner has demonstrated to EPD that the proposed change in zoning would not result in concentrations of hazardous substances exceeding risk reduction standards that would apply for the Property based on the use or uses contemplated by the application for rezoning.

3. Activity and Use Limitation(s). The Property shall not be used for residential purposes other than the assisted living facility described in the CSR dated March 31, 2016 unless it is first demonstrated to EPD's satisfaction that there is no risk due to vapor intrusion by one or more

of the following: vapor modeling based on conditions at the time, soil vapor sampling, and/or soil vapor mitigation. Otherwise the Property shall be used only for non-residential uses, as defined in Section 391-3-19-.02 of the Rules and defined in and allowed under Fulton County's zoning regulations as of the date of this Environmental Covenant. Any activity on the Property that may result in the release or exposure to the regulated substances that were contained as part of the Corrective Action, or create a new exposure pathway, is prohibited.

4. Groundwater Limitation. The use or extraction of groundwater beneath the Property for drinking water or for any other non-remedial purposes shall be prohibited.

5. Right of Access. In addition to any rights already possessed by EPD and/or Holder, the Owner shall allow authorized representatives of EPD and/or Holder the right to enter the Property at reasonable times for the purpose of evaluating the Corrective Action; to take samples, to inspect the Corrective Action conducted at the Property, to determine compliance with this Environmental Covenant, and to inspect records that are related to the Corrective Action.

6. Recording of Environmental Covenant and Proof of Notification. Within thirty (30) days after the date of the Director's signature, the Owner shall file this Environmental Covenant with the Recorder of Deeds for each County in which the Property is located, and send a file stamped copy of this Environmental Covenant to EPD within thirty (30) days of recording. Within that time period, the Owner shall also send a file-stamped copy to each of the following: (1) Holder, (2) each person holding a recorded interest in the Property subject to the covenant, (3) each person in possession of the real property subject to the covenant, (4) each municipality, county, consolidated government, or other unit of local government in which real property subject to the covenant is located, and (5) each owner in fee simple whose property abuts the property subject to the Environmental Covenant.

7. Termination or Modification. The Environmental Covenant shall remain in full force and effect in accordance with O.C.G.A. § 44-5-60, unless and until the Director determines that the Environmental Covenant is no longer necessary for the Property to comply with applicable Risk Reduction Standards, as defined in Georgia Rules of Hazardous Site Response (Rules) Section 391-3-19-.07, whereupon the Environmental Covenant may be amended or revoked in accordance with Section 391-3-19-08(7) of the Rules and O.C.G.A. § 44-16-1 *et seq.*

8. Severability. If any provision of this Environmental Covenant is found to be unenforceable in any respect, the validity, legality, and enforceability of the remaining provisions shall not in any way be affected or impaired.

9. No Property Interest Created in EPD. This Environmental Covenant does not in any way create any interest by EPD in the Property that is subject to the Environmental Covenant. Furthermore, the act of approving this Environmental Covenant does not in any way create any interest by EPD in the Property in accordance with O.C.G.A. § 44-16-3(b).

Representations and Warranties:

Grantor hereby represents and warrants to the other signatories hereto:

a) That the Grantor has the power and authority to enter into this Environmental Covenant, to grant the rights and interests herein provided and to carry out all obligations hereunder;

b) That, except for the parties identified on the first page of this Environmental Covenant as "Parties with interest in the Property" (if any), the Grantor is the sole owner of the Property and holds fee simple title which is free, clear and unencumbered.

c) That the Grantor has identified all other parties that hold any interest (e.g., encumbrance) in the Property and notified such parties of the Grantor's intention to enter into this Environmental Covenant;

d) That this Environmental Covenant will not materially violate, contravene, or constitute a material default under any other agreement, document or instrument to which Grantor is a party, by which Grantor may be bound or affected;

e) That the Grantor has served each of the people or entities referenced in Item 6 of the Activity and/or Use Limitations, above, with an identical copy of this Environmental Covenant in accordance with O.C.G.A. § 44-16-4(d).

f) That this Environmental Covenant will not materially violate or contravene any zoning law or other law regulating use of the Property; and

g) That this Environmental Covenant does not authorize a use of the Property that is otherwise prohibited by a recorded instrument that has priority over the Environmental Covenant.

Notices:

Any document or communication required to be sent pursuant to the terms of this Environmental Covenant shall be sent to the following persons:

Georgia Environmental Protection Division
Branch Chief
Land Protection Branch
2 Martin Luther King Jr. Drive SE
Suite 1054 East Tower
Atlanta, GA 30334

Selig Enterprises, Inc.
1100 Spring String NW, Suite 550
Atlanta, GA 30309

[*Signatures on following pages.*]

Grantor has caused this Environmental Covenant to be executed pursuant to The Georgia Uniform Environmental Covenants Act, on the ____ day of _____, 2015.

Signed, sealed, and delivered in the presence of:

For the Grantor:

(Seal)

_____
Unofficial Witness (*Signature*)

_____
Name of Grantor (*Print*)

(Seal)

_____
Unofficial Witness Name (*Print*)

_____
Grantor's Authorized Representative (*Signature*)

_____

_____
Authorized Representative Name (*Print*)

_____
Unofficial Witness Address (*Print*)

_____
Title of Authorized Representative (*Print*)

_____
Notary Public (*Signature*)

Dated:_____

My Commission Expires:_____

(NOTARY SEAL)

Signed, sealed, and delivered in the presence of:

For the State of Georgia

Environmental Protection Division:

(Seal)

Unofficial Witness *(Signature)*

(Signature)

Judson H. Turner

Unofficial Witness Name (*Print*)

Director

Dated:_____

Unofficial Witness Address (*Print*)

(NOTARY SEAL)

Notary Public *(Signature)*

My Commission Expires:_____

Exhibit A
Legal Description