2017 SOIL AND SURFACE WATER DATA GAP INVESTIGATION
WORK PLAN
Former Texaco Research Center
Beacon, New York

SITE ID# 314004
EPA ID # 091894899

Submitted to:

Chevron

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Submitted By:

PARSONS

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REVIEWED AND APPROVED BY:

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LIST OF ACRONYMS

ASP	Analytical Service Protocol
ASTs	Aboveground Storage Tanks
ASTM	American Society for Testing and Materials
bgs	Below Ground Surface
BeB	Bernardston Silt Loam, 3-8% slope
BeC	Bernardston Silt Loam, 8-15% slope
BeD	Bernardston Silt Loam, 15-25% slope
CFR	Code of Federal Regulations
COC	Chain of Custody
COPC	Chemicals of Potential Concern
CtC	Chatfield-Hollis Complex
DOT	Department of Transportation
DDT	Dichlorodiphenyltrichloroethane
DQOs	Data Quality Objectives
EBS	Employee Based Safety
EFGS	Eurofins Frontier Global Sciences
EMC	Environmental Management Company
ETC	Energy Technology Company
Ft.	Feet
FWRIA	Fish and Wild Resources Impact Analysis
GPS	Global Positioning System
Hg	Mercury
HHEA	Human Health Exposure Assessment
HoD	Hollis-Chatfield-Rock Outcrop Complex
ICM	Interim Corrective Measure
IDW	Investigation Derived Waste
IHWS	Inactive Hazardous Waste Site
ISS	Industrial Sewer System
LLI	Lancaster Laboratories, Inc.

LIST OF ACRONYMS (CONTINUED)

NAVD	North American Vertical Datum
NFA	No Further Action
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSOPRHP	New York State Office of Parks, Recreation & Historic Preservation
No.	Number
OU	Operable Unit
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PID	Photoionization Detector
PPM	Parts Per Million
PSHEP	Parsons Safety, Health, and Environmental Plan
PwB	Pittsdown Silt Loam, 3-8% slope
PwC	Pittsdown Silt Loam, 8-15% slope
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SAP	Sampling and Analysis Plan
SHARP	Safety, Health, and Risk Program
SPDES	State Pollution Discharge Elimination System
SSE	Selective Sequential Extraction
SVOCs	Semi-Volatile Organic Compounds
TAL	Target Analyte List
TCL	Target Compound List
TOC	Total Organic Carbon

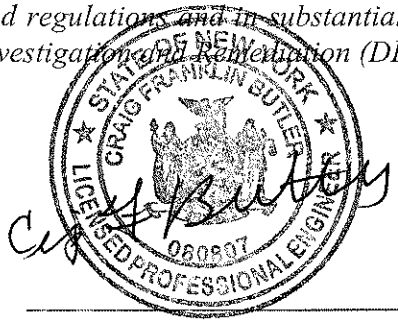
LIST OF ACRONYMS (CONTINUED)

TRCB	Texaco Research Center Beacon
TSS	Total Suspended Solids
Ud	Udorthents
Ur	Urban Land
USACE	U.S. Army Corps of Engineers
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VISL	Vapor Intrusion Screening Level
VOCs	Volatile Organic Compounds
VSP	Visual Sampling Program
WATF	Washington Avenue Tank Farm

ENGINEER'S CERTIFICATION

CERTIFICATION OF COMPLETION

I, Craig F. Butler, certify that I am currently a New York State registered Professional Engineer (P.E.) as defined in 6 NYCRR Part 375 and that the 2017 Soil and Surface Water Data Gap Investigation Work Plan was prepared in accordance with all applicable statues and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).



Craig F. Butler, P.E.
New York, No. 080807
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Date: 03/10/17

SECTION 1

INTRODUCTION

1.1 WORK PLAN OBJECTIVES

The scope of work discussed within this draft work plan was developed to collect analytical data (surface soil and surface water) to address data gaps that exist at the Former Texaco Research Center Beacon (TRCB) facility (Figure 1.1) to satisfy the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) requirements as discussed on a conference call on November 17, 2016, between Chevron Environmental Management Company (EMC), Chevron Energy Technology Company (ETC), and Parsons. Data gap soil and surface water sample collection activities will be performed at TRCB facility parcels known as Operable Units (OUs) and parcels of land located within one-mile of the TRCB facility (herein referred to as Background Parcels). Refer to Figures 1.2 and 1.3 for locations of OUs and Background Parcels. The goal of the study is to address data gaps in the nature and extent of potential contamination on-site, to inform the assessment of potential exposure of humans and ecological receptors to site-related contaminants, and ultimately assist in achieving Chevron's "End State Vision" for each OU. This work plan is based on Data Quality Objectives (DQOs) developed using the DQO Process (USEPA 2006). DQOs (Appendix A) aid in determination of the type, quantity and quality of the data needed to evaluate nature and extent of on-site contaminants. Refer to Appendix A for an outline of the DQOs for each parcel. A summary of the overall sampling objectives are listed below, along with the current "End State Vision" for each OU.

Sampling of Operable Units Objectives

Surface soil data will be obtained from six (6) OUs located at the TRCB facility (OU-1B, OU-1C, OU-1D, OU-1E, OU-3, and OU-4) to address data gaps. In addition, two surface water samples, if surface water is present in a stream in The Back 93 Acre Parcel (OU-1E), will be collected. These data will be used to further define the nature and extent of potential contamination on-site, as well as to inform the assessment of potential exposure of humans and ecological receptors to site-related contaminants. Additionally, these data support the DQOs in Appendix A and the end state vision for each OU.

Sampling of Background Parcel Objectives

Surface soil data will be collected from five (5) Background Parcels to achieve the following:

a. Determine local soil background conditions; and
b. Determine if Chemicals of Potential Concern (COPC) concentrations observed at the TRCB facility are indicative of background soil conditions.

The five (5) Background Parcels were chosen for sampling activities because they met the qualifications for background sampling as defined in the NYSDEC document entitled: "NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (NYSDEC, 2010)". The criteria set forth by the NYSDEC document are as follows:

- The Background Parcel must have similar soil type(s) as present on the subject site;

- The Background Parcel must be unaffected by current and historic subject site activities; and
- The Background Parcel, whenever possible, should be located topographically upgradient and upwind of the subject site.

All the parcels chosen for sampling meet the conditions listed above.

Note:

Sampling of the above listed Background Parcels is contingent upon Chevron EMC obtaining access agreements with parcel owners. If access agreements are not obtained, then alternate Background Parcels will be chosen for sampling activities and the work plan will be revised to reflect changes.

Future Land Use ("End State Vision") for Each Operable Unit

The End State Vision defined for each of the TRCB facility OUs are listed in Table 1.1.

Table 1.1
Future Land Use Plan (End State Vision) by Operable Unit

Operable Unit	Current Plan for the End State Vision [1,2]
OU-1A Main Facility Parcel	Restricted Residential (mixed use commercial/residential multi-family housing)
OU-1B Church Property Parcel	Restricted Residential (residential multi-family housing)
OU-1C Former Washington Avenue Tank Farm Parcel	Industrial
OU-1D Residential Property Parcel	Residential (single family housing)
OU-1E The Back 93 Acre Parcel	Residential (single family housing), with smaller non-housing subareas intended to be: - Restricted Residential (active recreation) - Wetlands Areas (passive recreation) *
OU-1F Fishkill Creek	*No change in use in the future*: Current Occasional Non-Contact Boating Recreation, Fish Consumption upstream/downstream (not part of this data gap investigation)
OU-2 Road Parcel	*No change in use in the future*: Industrial; active Washington Avenue (not part of this data gap investigation)
OU-3 Residential Property Parcel	Residential (single family housing)
OU-4 Hydroelectric Facility and Dam Parcel	*No change in use in the future*: Industrial utility infrastructure

Notes:
(1) As defined in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (NYSDEC, 2010).
(2) Prohibitions on shallow groundwater domestic and potable uses are planned at all OUs as part of the end state vision.
* Future desirable community recreation features such as swimming pools may also be considered under the "passive recreation" (commercial land use) category in a future phase.

1.2 SITE BACKGROUND AND HISTORY

1.2.1 General Site Description

Chevron U.S.A. Inc. (Chevron; also historically known as Texaco and ChevronTexaco) operated the TRCB Facility from 1931 until its closure in 2003. The TRCB is located in Glenham hamlet, Town of Fishkill (population 21,000), Dutchess County, New York (Figure 1.1). Glenham is a small residential community with churches, businesses, and a fire hall in the vicinity of the site. The site is currently owned by Chevron.

The site is located on approximately 153 acres of land bisected by Fishkill Creek. A dam used for generating hydroelectric power spans the creek within the boundaries of the site. The site is divided into distinct OUs for investigation purposes (Figure 1.2). Each of the OUs is described in greater detail below.

1.2.2 Description and History of Operable Units

Main Facility Parcel (OU-1A), Dutchess County Lot Numbers 839339/873373/875360

The Main Facility Parcel, OU-1A, consists of 35.9 acres of land and includes all of the developed areas located north of Fishkill Creek. OU-1A is bounded to the south by Fishkill Creek, to the north by Old Glenham Road, to the west by the Metro-North Railroad line and the former Church Property Parcel (OU-1B), and to the east by private property that includes parking, residential housing, and businesses. From 1811 until 1930, OU-1A was the location of textile mills. The mills were powered by water wheels and steam engines. Blacksmith and carpentry shops operated in support of the mills. More recently, this OU was used as an on-shore, non-production, non-transportation laboratory complex engaged in research, development, and technical services related to petroleum products and energy. This OU contained parking areas, offices and laboratory buildings, aboveground storage tanks (ASTs), underground storage tanks (USTs), roads, a wastewater treatment plant, and storage areas. Petroleum, coal products, and solvents have been used at OU-1A in connection with research operations. Sanitary wastewater and industrial wastewater generated at the TRCB was treated in the on-site wastewater treatment plant. The industrial wastewater conveyance and treatment system was discontinued following closure of the Industrial Sanitary Sewer in 2006; however, the sanitary wastewater system and the on-site waste water treatment plant is active and continues to discharge to Fishkill Creek under a State Pollution Discharge Elimination System (SPDES) permit. The majority of utilities located at OU-1A are underground. These include potable and fire-suppression water, electrical, communication, sanitary sewer, storm sewer, (closed) industrial sewer, natural gas, and fuel product lines. There is one set of aboveground electrical lines that is located in the central western part of OU-1A. Central Hudson maintains a high pressure gas metering station in the Building 50 parking lot. In 2011 and 2012, Chevron conducted a Sitewide Asbestos Containing Material Abatement and Building Demolition project. This project resulted in the demolition of the vast majority of buildings on-site to the basement or slab level, and currently no structures exist on the OU with the exception of a few support buildings. The remaining buildings are shown in Figure 1.4. The current land use and activities performed on this parcel and a description of the remaining buildings follows:

- General landscaping activities performed by local contractors;
- General field activities performed by Chevron EMC contractors (e.g., water sampling, erosion and sediment control inspections, etc.);

- Base of operations in the Building 58/83 Area for a local landscaping contractor (e.g. landscaping material storage, vehicle storage, maintenance on equipment, etc.);
- Storage for site-related documents (Building 58/83 Area);
- General duties, mainly administrative, by Chevron personnel at Building 31;
- Weekly inspections of natural gas line located on-site by local utility workers (parking lot west of former Building 50);
- The Former Potter Bros. Ski-Shop Building was purchased by Chevron in recent years to form a contiguous parcel on the Main Campus property. Currently the building is not being utilized; and
- Other buildings remaining in the OU-1A area are:
    - Building 87/Building 88 is the former Office Building and Garage in the Fleet Test area, now used for storage and restroom facilities.
    - Building 82 is a warehouse building used for site archive records and some equipment storage.
    - Building 85 is a wastewater treatment plant structure for the on-site sanitary sewer system. Treated discharge flows into Fishkill Creek under a National Pollutant Discharge Elimination System (NPDES) Permit.
    - Building 45 represents the primary settling basins for the on-site wastewater treatment plant (see B-85). During facility operations, there were two flow streams into Building 45: one for sanitary waste and one for industrial waste. The industrial wastewater sewer lines were evaluated and closed in place under an Interim Remedial Measure in 2006. Only the on-site sanitary sewer lines are currently active.
    - Building 91 – Former flammable materials storage building, now used for equipment storage by on-site grounds keeping contractor (Stoneledge Landscaping).

Church Property Parcel (OU-1B), Dutchess County Lot Numbers 730327 and 686282

The Church Property Parcel, OU-1B, is a 16.15-acre undeveloped parcel located west of OU-1A. OU-1B once contained a church that was later relocated. TRCB activities conducted on this property included the construction and use of a fire-fighting access road along the western property boundary. Currently, no structures exist on the OU and no activities or occupants currently exist on this parcel.

Former Washington Avenue Tank Farm Parcel (OU-1C), Dutchess County Lot Number 908283

The Former Washington Avenue Tank Farm (WATF) Parcel, OU-1C consists of 5.11 acres of land located south of Fishkill Creek. OU-1C is bounded by Fishkill Creek to the north, Washington Avenue to the east, and the Metro-North Railroad line to the south and west. The entirety of OU-1C is surrounded by a chain link fence. This OU was formerly the site of approximately 30 ASTs and associated facilities. Passenger and freight depots were formerly located in OU-1C. According to historical aerial photographs, these depots pre-date the tank farm structures that were installed in the early 1950s. A rail siding for OU-1C that splits southward off the main rail line into OU-1D was installed to support the WATF. In addition, an underground pipeline runs from unloading areas associated with the rail line to the WATF (OU-1C). All tanks

were decommissioned in 2003. Currently, no structures exist on the OU and the parcel is an open lot with the remains of piping structures from the former rail siding area, stormwater drainage, and a previously operated groundwater recovery system. The current land use and activities performed on this parcel include:

- General landscaping activities performed by local contractors; and
- General field activities performed by Chevron EMC contractors (e.g. water sampling, erosion and sediment control inspections, etc.).

Residential Property Parcel (OU-1D), Dutchess County Lot Number 879250

Residential Property Parcel, OU-1D is a vacant 1.8-acre parcel located along Washington Avenue. An out-of-service rail line (Dutchess County parcel 140293, owned by the Metro-North Commuter Railroad Company) exists immediately north of OU-1D and within the WATF (OU-1C). Currently, no buildings or activities exist on this OU.

The Back 93 Acre Parcel (OU-1E), Dutchess County Lot Number 835088

The Back 93 Acre Parcel, OU-1E, is a 93.66-acre undeveloped property located south of Washington Avenue and Fishkill Creek that consists primarily of unremarkable vegetated areas and variable terrain with elevation changes. At least 76 acres of the parcel are comprised of open space, where site-related contamination is not anticipated. A small stream flows through a portion of OU-1E.

Based on previous investigations in the small subareas for which the nature and extent of contamination was previously established, and as noted in the October 2013 Order on Consent, OU-1E includes a Class 4 Inactive Hazardous Waste Site (IHWS), as listed by the New York State Registry of Inactive Hazardous Waste Sites program, due to the former suspected use of isolated portions of the parcel as a disposal site. Confirmed subareas within OU-1E that have been investigated to establish the nature and extent of impacted media include a historic sludge lagoon, a "new" sludge lagoon permitted under Resource Conservation and Recovery Act (RCRA) Part B status (and now closed under permit), three chemical burial sites, a disposal pit, and a container disposal site. Additionally, four non-hazardous areas referred to as Trash Piles "A" through "D" (Figure 1.5) were used for the disposal of non-hazardous materials. Materials disposed in these locations primarily consisted of wood and metal debris, grass clippings, old empty drums, and general trash. The parcel included four structures (a utility building [located in the picnic area], washroom, storage shed, and picnic shelter). These structures were removed during the site-wide building demolition project that took place in 2011 through 2012. Currently, no buildings exist within the OU with the exception of a Potable Water Well Pumping System House and a Concrete Reservoir. Paved structures include two tennis courts, a slab, and roadways. The current land use of, and activities performed on, this parcel include:

- General landscaping activities performed by a local contractor. These activities include brush and tree limb clearing to maintain vehicular access into the parcel;
- General field activities performed by Chevron EMC contractors (e.g., water sampling, erosion and sediment control inspections, etc.); and
- Storage of landscaping materials (e.g., stone of various sizes) in an area east of the tennis courts by a local landscaping contractor.

Fishkill Creek Parcel (OU-1F)

The Fishkill Creek Parcel, OU-1F, is a surface water body located south of OU-1A and north of OU-1C. OU-1F also bisects the Dam Facilities Parcel, OU-4. The creek was used as a hydroelectric power source for the TRCB in the past. The on-site wastewater treatment plant, currently treating sanitary wastewater, is active and continues to discharge to Fishkill Creek under a SPDES permit. No additional TRCB activities were conducted in the creek.

Fishkill Creek originates approximately 15 miles east of the City of Beacon and traverses the area from east to west with a fall of approximately 23 feet (ft.) per mile. OU-4, including the Texaco Research Center Dam (also called the Hydroelectric Dam, the Chevron Dam, or the Texaco Dam; hereafter referred to as the Texaco Dam), spans Fishkill Creek within the TRCB boundaries: infrastructure associated with the dam on either side of Fishkill Creek is also included in the OU-4 parcel. The elevation of the top of the Texaco Dam is 196 ft. (Texaco, 1998). The height of the dam is approximately 22 ft. The surface water elevations of the creek are controlled by the Texaco Dam and by a dam downstream of the site.

The creek above the Texaco Dam is wide and generally quiescent with an accumulated thickness of sediment. Below the Texaco Dam, the river narrows significantly and the creek flows through a steep-sided channel. The rate of flow downstream of the Texaco Dam is much greater that that upstream, although direct data are not available. Downstream of the TRCB, Fishkill Creek passes through the City of Beacon and discharges to the Hudson River.

Access to Fishkill Creek is difficult due to site fencing and cliffs within the site, and the entire OU lies within the floodplain. Currently, the following activities take place in off-site upstream and downstream portions of Fishkill Creek:

- Recreational fishing; and
- Non-contact recreational boating (e.g., kayaking, canoeing).

Road Parcel (OU-2)

Road Parcel, OU-2, is a 0.233-acre parcel along and underneath Washington Avenue that has been dedicated to the Town of Fishkill. This parcel is located outside of the fence line of the main TRCB property and is maintained by the Town of Fishkill. No TRCB activities were conducted on this parcel, and as noted in the October 2013 agreed Order on Consent, the Town has operated and maintained this portion of Washington Avenue for decades as though it had previously been accepted for dedication. Currently, no structures or activities exist on the OU, other than its use as a public street.

Residential Property Parcel (OU-3), Dutchess County Lot Number 795253

Residential Property Parcel, OU-3, is a 0.67-acre vacant parcel located along Washington Avenue. No TRCB activities were conducted on OU-3. Currently, no buildings or activities exist on this OU.

Hydroelectric Dam and Facilities (OU-4), Dutchess County Lot Number 812290

Hydroelectric Dam and Facilities, OU-4, is a 4.03-acre parcel that includes the Texaco Dam and associated facilities. The Texaco Dam (state identification number 212-5185 and federal identification number NY 14845) is a hydroelectric dam which spans Fishkill Creek between the powerhouse (Building 5) on the north bank to a level control structure on the south bank (Figure 1.4). This dam has been in place the entire time that the TRCB has been in operation by

Chevron. The dam underwent a refurbishment by Chevron in 2005, along with a dam reinforcement project that was completed in 2012. Access to the dam and hydroelectric buildings is provided through this OU on the north side via an easement to Old Glenham Road, and on the south side via access from Washington Avenue. The remaining structures on OU-4 include the dam and hydroelectric facility, Building 5 (which includes the dam controls), and Building 3, Building 4, and a portion of Building 2. Chevron plans to sell the OU-4 parcel to an independent hydroelectric facility operator, who will maintain responsibility for the dam operations and environmental compliance. Currently, the following activities are taking place:

- General maintenance performed by local hydroelectric contractors;
- Dam inspections performed by local hydroelectric contractors and State regulatory agencies; and
- General field activities performed by Chevron EMC contractors (e.g., water sampling, erosion and sediment control inspections, etc.).

1.3 PREVIOUS INVESTIGATIONS

Previous investigations have included follow-up investigations to specific activities such as tank removals and spill investigations. A Phase III RCRA Facility Investigation (RFI) was completed by Texaco in March 2001 (IT, 2001a). In 2006, Chevron completed the closure of the Industrial Sewer System (ISS) and the completion of the former Recreation Area Interim Corrective Measure (ICM). In 2005, a Phase II Environmental Site Assessment (GSC, 2005) was completed by Groundwater Sciences Corporation on behalf of a party interested in acquiring the Site. In the fall of 2006, a Sitewide RFI was conducted by Parsons (Parsons, 2007) for Chevron and in the fall of 2007 a Supplemental RFI was conducted by Parsons (Parsons, 2009). In 2010, various subsurface investigations were conducted to determine soil and groundwater quality (e.g., Sitewide Soil and Groundwater Sampling Events, Mill Building (Part of OU-4) Investigation and neighboring property (Westage Property) investigation). In 2012, three (3) subsurface investigations were conducted (Concrete Foundation Drilling Investigation, Undeveloped Property Investigation [property located south of Main Facility] [Part of OU-4], and Sitewide Groundwater Sampling Event) to also determine soil and groundwater quality, while in 2013, two (2) subsurface investigations (Additional Well Installations and Sitewide Groundwater Sampling Event) were performed to determine subsurface conditions.

1.4 REPORT ORGANIZATION

This work plan has been organized into sections. Each section is briefly described below.

Section 1 – This section includes an introduction and a discussion of site background and the organization of the work plan.

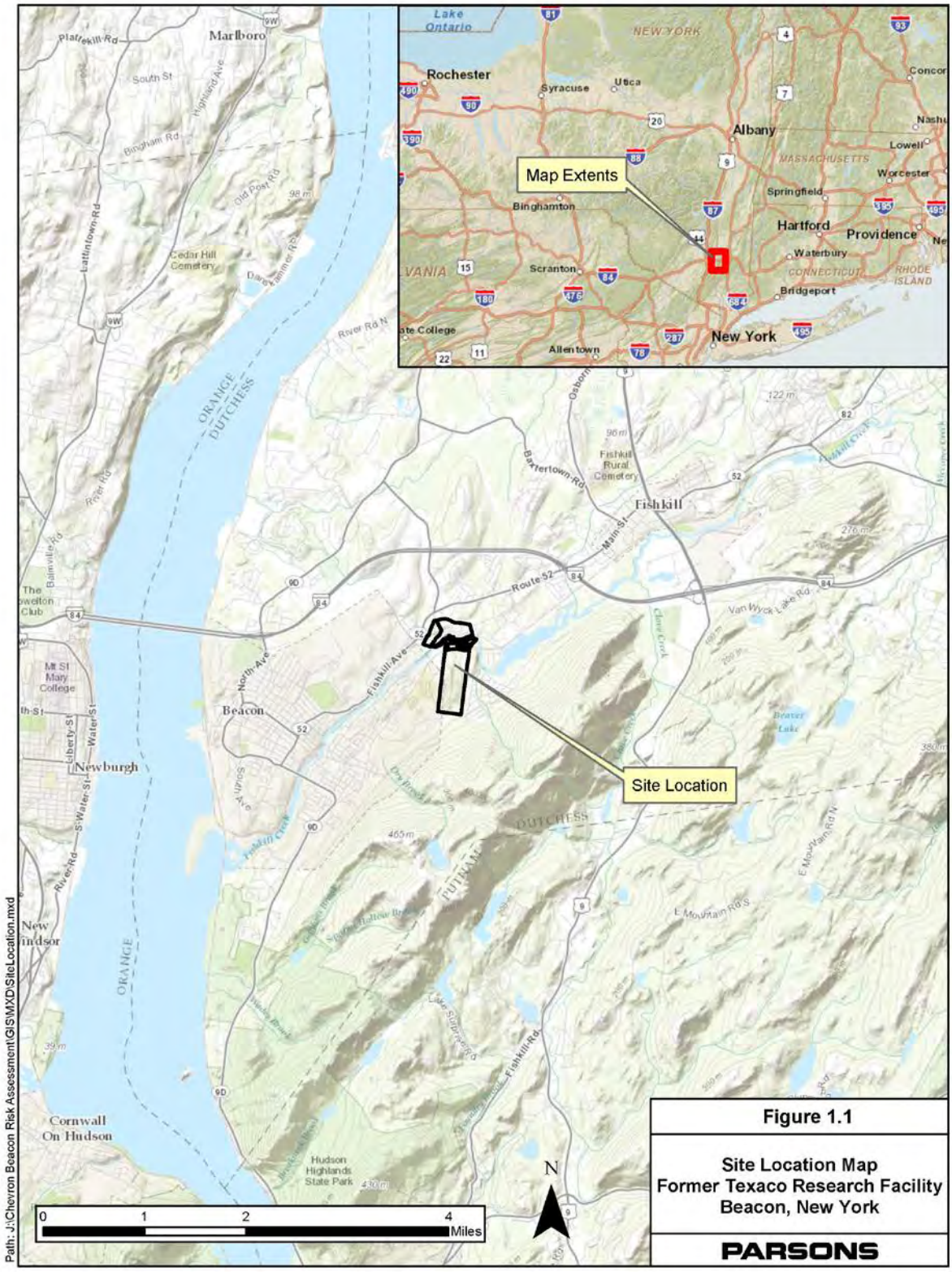
Section 2 – This section contains a discussion of physical characteristics of the site. These include soil composition, general soil depths encountered below ground surface (bgs), drainage capabilities, general characteristics of the soil, and wetlands.

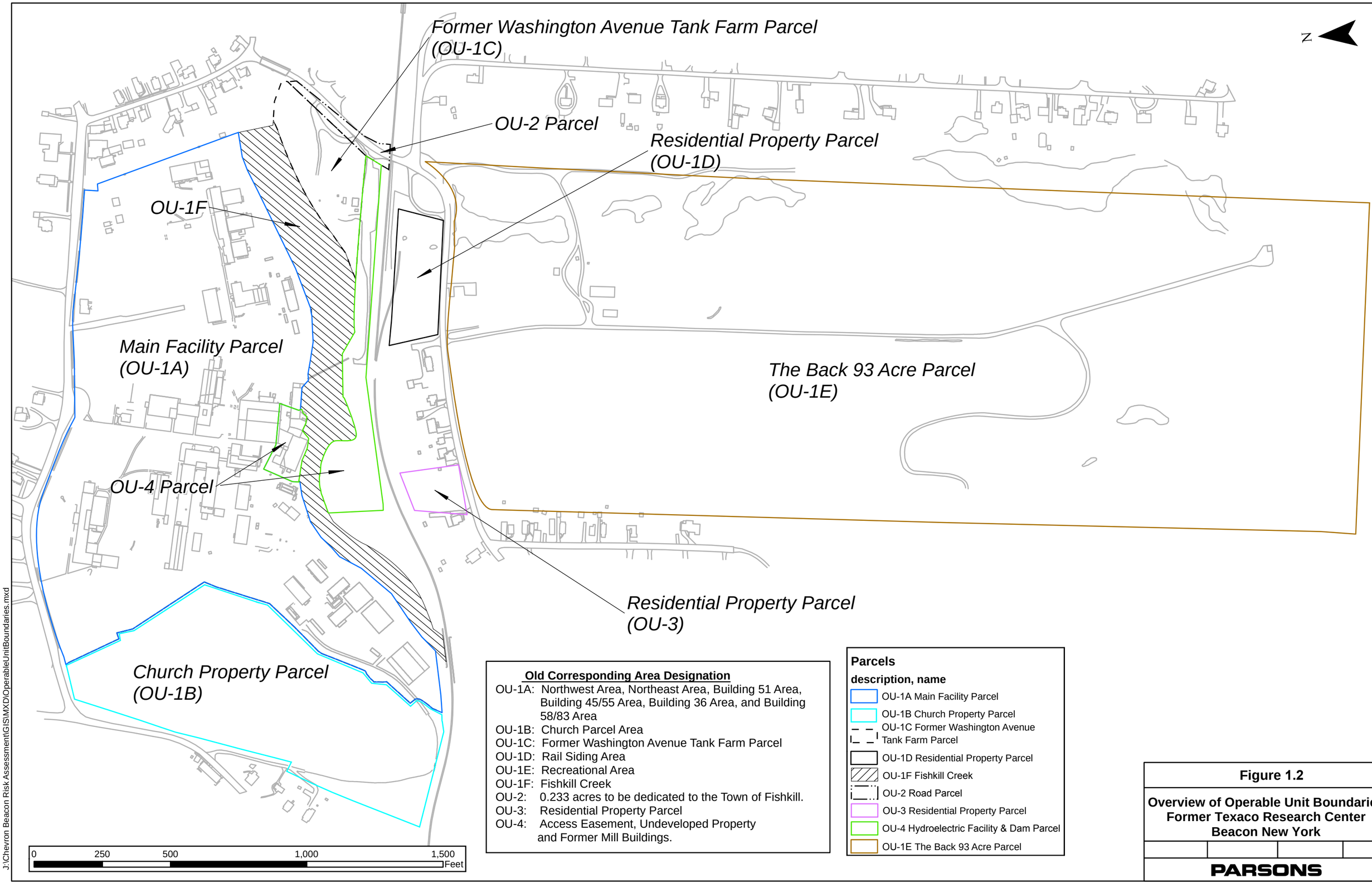
Section 3 – This section describes the proposed scope of work to be performed.

Sections 4 – This section briefly describes the Project Health and Safety Plan and other health and safety issues.

Section 5 – This section discusses the Sampling and Analysis Plan and other general field guidelines.

Section 6 – This section lists all reference material used for developing this work plan.





Old Corresponding Area Designation

OU-1A: Northwest Area, Northeast Area, Building 51 Area, Building 45/55 Area, Building 36 Area, and Building 58/83 Area
OU-1B: Church Parcel Area
OU-1C: Former Washington Avenue Tank Farm Parcel
OU-1D: Rail Siding Area
OU-1E: Recreational Area
OU-1F: Fishkill Creek
OU-2: 0.233 acres to be dedicated to the Town of Fishkill.
OU-3: Residential Property Parcel
OU-4: Access Easement, Undeveloped Property and Former Mill Buildings.

Parcels

description, name

- OU-1A Main Facility Parcel
- OU-1B Church Property Parcel
- OU-1C Former Washington Avenue Tank Farm Parcel
- OU-1D Residential Property Parcel
- OU-1F Fishkill Creek
- OU-2 Road Parcel
- OU-3 Residential Property Parcel
- OU-4 Hydroelectric Facility & Dam Parcel
- OU-1E The Back 93 Acre Parcel

Figure 1.2

Overview of Operable Unit Boundaries
Former Texaco Research Center
Beacon New York

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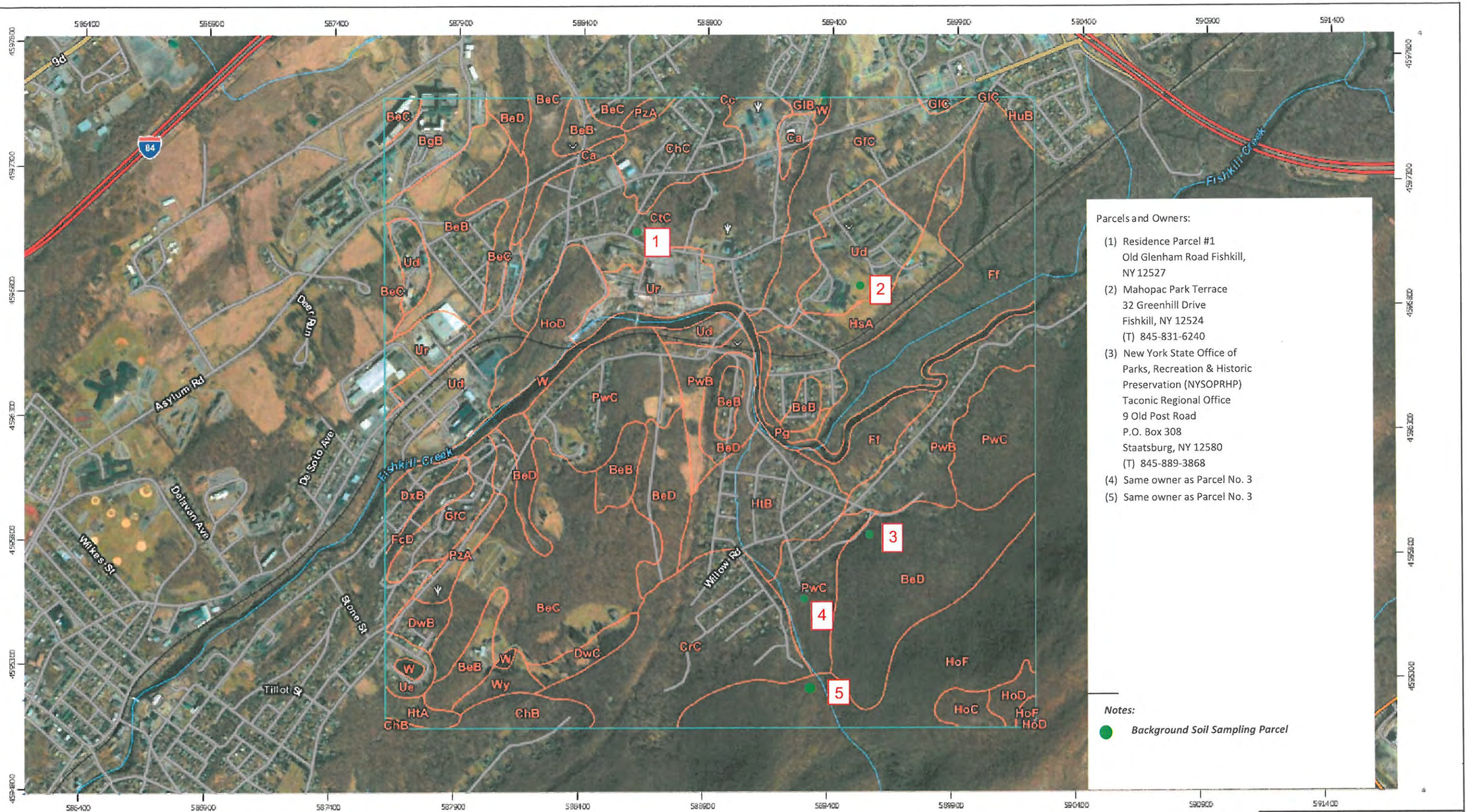

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Background Soil Sampling Parcels and Parcel Owners
Former Texaco Research Center
Beacon New York

Figure 1.3

	C. Oneal	CHKD:	APRD:
	DATE: 5/7/2015		

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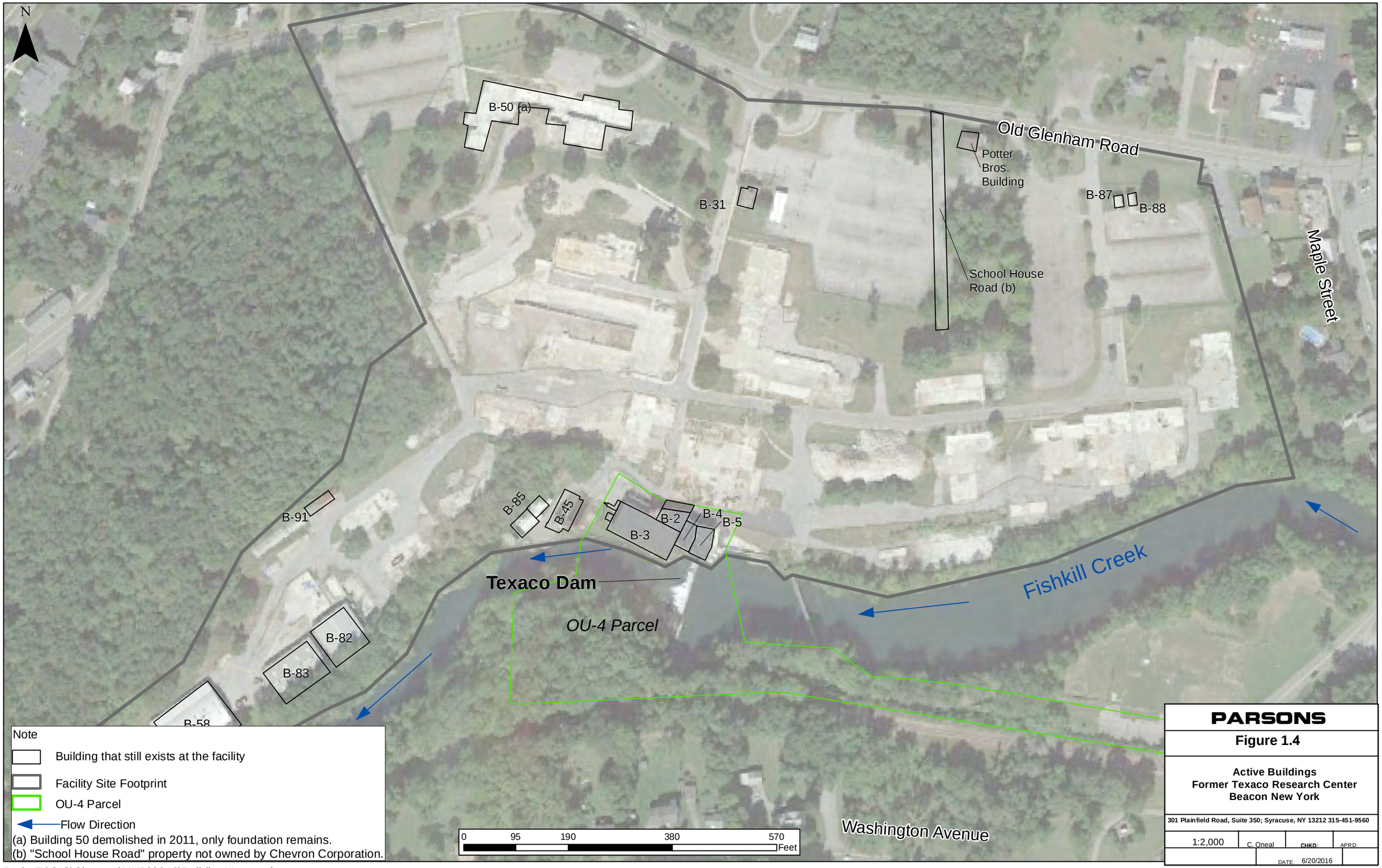

Note

- Building that still exists at the facility
- Facility Site Footprint
- OU-4 Parcel
- Flow Direction

(a) Building 50 demolished in 2011, only foundation remains.
(b) "School House Road" property not owned by Chevron Corporation.

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Figure 1.4

Active Buildings
Former Texaco Research Center
Beacon New York

301 Plainfield Road, Suite 350; Syracuse, NY 13212 315-451-9560

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		DATE: 6/20/2016	

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N

Old Sludge Lagoon

Chemical Burial Site No. 1

Trash Pile A

Central Hudson Gas & Electric

Former Softball Field

Trash Pile D

Ballfield Wetland

Central Hudson Gas & Electric

Trash Pile B

Approximate Stream Location

Chemical Burial Site No. 3

Potable Well Pumphouse

Container Site

Central Wetland

Wetland #2

Approximate Intermittent Stream / Headwater Location

Chemical Burial Site No. 2

Former Bathroom Structure

Tennis Courts Area

Disposal Pit

Approximate Intermittent Stream / Headwater Location

Former Pavilion Area

Trash Pile C

New Sludge Lagoon

Open Dig Excavation Area

Approximate Intermittent Stream / Headwater Location

Wetland #1

Former Borrow Area

Concrete Reservoir

Wet Swale

Wet Hill Swale Savannah

The Back 93 Acre Parcel (OU-1E)

Boundary of Former Disposal Site

Approximate Limit of Excavation

The Back 93 Acre Parcel, OU-1E (Approximate Boundary)

Potable Well Pumphouse

Central Hudson Gas & Electric Property

Stream

Intermittent Stream/Headwater

0 150 300 600 900 Feet

Future Land Uses

Restricted Residential Area

Potential Wetlands Area

Stream Flow Direction

-All other areas located in the Back 93 Acres Parcel not identified as "Restricted Residential Area" or "Wetland Area" are identified as "Residential Area".

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The Back 93 Acre Parcel (Restricted Residential Area) Former Texaco Research Center Beacon, New York

Figure 1.5

C. Oneal | CHKD: | APRD:

2/16/2017

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SECTION 2

PHYSICAL CHARACTERISTICS OF SITE

2.1 SOIL CHARACTERISTICS

Nine (9) different types of soil exist at the OUs located on the Former TRCB facility. Soil types vary from silt loams to generally impervious material that has been altered by construction activities. A list of all soil types that exist at the facility, as well as characteristics of each type (Natural Resources Conservation Service (NRSC) Soil Survey of Dutchess County, NY, 1992), are provided below and graphically represented in Figures 2.1A and 2.1B.

Soil Type and Operable Unit Location

Chatfield-Hollis complex, rolling, very rocky (CtC).
Located in OU-1A.

This unit consists of moderately deep, well drained and somewhat excessively drained Chatfield soils, and shallow, well drained and somewhat excessively drained Hollis soils that formed in glacial till deposits. This unit is on hilltops, narrow ridges, and side slopes that are underlain by folded schist, granite, or gneiss bedrock. Chatfield soils are commonly on lower concave slopes and Hollis soils are commonly on upper slopes, hilltops, and near areas of rock outcrop. This unit consists of a 40 percent Chatfield soils, 40 percent Hollis soils, and 20 percent rock outcrop and other soils. Rock outcrop covers 2 to 10 percent of the surface. The Chatfield and Hollis soils and rock outcrop are in such an intricate pattern that they were not separated in mapping by the NRCS. Depth to bedrock and rock outcroppings over portions of the unit are the main limitations for dwellings with basements. The short uneven slopes are also a limitation. Erosion is a severe hazard during construction. This type of soil is found from the surface to a depth of approximately 30-inches bgs.

Bernardston silt loam, 3-8% slopes (BeB).
Located in OU-1E.

This unit consists of very deep, gently sloping, and well drained soils that formed in glacial till deposits. It is on hilltops and broad till plains. Areas are oval or irregularly shaped. They commonly vary from 5 acres to 130 acres. Slopes are smooth. The seasonal high water table and slow percolation are the main limitations, if this unit is used for dwellings with basements. This type of soil is found from the surface to a depth of approximately 80-inches bgs.

Bernardston silt loam, 8-15% slopes (BeC).
Located in OU-1E.

This unit consists of very deep, strongly sloping and well drained Bernardston soils that formed in glacial till deposits. It is on hills and side slopes. Areas are oval, elongated, or irregularly shaped. They commonly range from 5 to 275 acres. Slopes are smooth. The seasonal high water table, slope, and slow percolation are the main limitations, if this map unit for dwellings with basements. Erosion is a moderate hazard during construction. This type of soil is found from the surface to a depth of approximately 80-inches bgs.

Bernardston silt loam, 15-25% slopes (BeD).
Located in OU-1E.

This map unit consists of very deep, moderately steep, and well drained soils that formed in glacial till deposits. It is on hills and side slopes. Areas are elongated or irregularly shaped. They commonly range from 5 to 200 acres. Slopes are smooth. Slope is the main limitation for dwellings, however a high water table is also a limitation. Erosion potential is severe. This type of soil is found from the surface to a depth of approximately 80-inches bgs.

Hollis-Chatfield-Rock outcrop complex (HoD).
Located in OU-1B.

This unit consists of shallow, well drained and somewhat excessively drained Hollis soils; moderately deep, well drained and somewhat excessively drained Chatfield soils; and areas of rock outcrop. It is on hills and side slopes that are underlain by folded schist, granite, or gneiss bedrock. Hollis soils are commonly on upper slopes and near areas of rock outcrop, and Chatfield soils are commonly on lower concave slopes. This unit consists of about 40 percent Hollis soils, 30 percent Chatfield soils, 15 percent rock outcrop, and 15 percent other soils. The Hollis and Chatfield soils and rock outcrop are in such an intricate pattern that they were not separated in mapping by the NRCS. Shallow depth to bedrock, frequent rock outcroppings, and slope are the main limitations if this unit is used for dwellings with basements. The short uneven slopes are also a limitation. Erosion is a severe hazard during construction. This type of soil is found from the surface to a depth of approximately 30-inches bgs.

Pittsdown silt loam, 3 - 8% slopes (PwB).
Located in OU-1D and OU-1E.

This unit consists of very deep, gently sloping, and moderately well drained Pittstown soils that formed in glacial till deposits. It is on broad hilltops, concave foot slopes, and along drainage ways on till plains. Areas are oval, elongated, or irregularly shaped. They commonly range from 5 to 275 acres. Slopes are smooth. This soil meets the criteria for prime farmland. The seasonal high water table is the main limitation if this unit is used for dwellings with basements. The seasonal high water table and slow percolation are the main limitations, if this unit is used for septic tank absorption fields. This type of soil is found from the surface to a depth of approximately 80-inches bgs.

Pittsdown silt loam, 8-15% slopes (PwC).
Located in OU-1D, OU-1E, and OU-3.

This unit consists of very deep, sloping, and moderately well drained Pittstown soils that formed in glacial till deposits. It is on hills and side slopes. Areas are elongated or irregularly shaped. They commonly range from 5 to 75 acres. Slopes are smooth. The seasonal high water table is the main limitation if this unit is used for dwellings with basements. The seasonal high water table and slow percolation are the main limitations, if this unit is used for septic tank absorption fields. This type of soil is found from the surface to a depth of approximately 80-inches bgs.

Udorthents, smoothed (Ud).
Located in OU-1C, OU-1D, OU-2, and OU-4.

This unit consists of very deep, somewhat excessively drained to moderately well drained soils that have been altered by cutting and filling. It is part of, and adjacent to, urban areas, industrial areas, schoolyards, and borrow areas. Areas are rectangular or irregularly shaped. They commonly range from 5 to 275 acres. Slopes are dominantly 0 to 8 percent but range from 8 to 25 percent on the sides of excavations and along highways.

Urban Land (Ur).
Located in OU-1A.

This unit consists of areas where the soil surface is covered by impervious materials. It is in the business centers of villages and cities, mostly in the western and southern portions of the county. Areas are elongated or rectangular. They commonly vary from 5 to 700 acres in size. Slopes range from 0 to 8 percent. Because these areas are greatly altered by construction, a typical pedon is not provided. The impervious materials include parking lots, shopping centers, industrial parks, and institutional sites. Included with this unit in mapping are areas of somewhat excessively drained and well drained.

2.2 WETLANDS

No federally-designated wetlands (per Section 404 of the Clean Water Act) exist on any of the OUs. In June of 2014, Parsons performed a survey to identify potential wetlands existing within and immediately adjacent to the TRCB parcels, and to characterize the wetland resources in terms of wetland type, size, and functional value. Various wetland features were mapped during the survey. Wetlands are defined by the U.S. Army Corps of Engineers (USACE) as "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (USACE, 1987). Wetlands have hydrophytic vegetation, hydric soils, and occur in areas that are permanently or periodically inundated or saturated with water. Wetlands generally include swamps, marshes, bogs and similar areas. Section 404 of the Clean Water Act extends authorization to the USACE to regulate activities that affect waters of the United States, including wetlands.

A walking survey of all of the parcels was completed and no wetlands or other waters of the U.S. were identified on any of the parcels except OU-1E (The Back 93 Acre Parcel). Six (6) primary areas (Wetland #1, Central Wetland, Ballfield Wetland, Wetland #2, wet swale, and wet hillslope) were identified for detailed wetland delineations. All six (6) areas were on the OU-1E (The Back 93 Acre Parcel). Four (4) (Wetland #1, Central Wetland, Ballfield Wetland, and Wetland #2) of the six (6) areas are potential jurisdictional wetlands based upon the wetland delineation parameters and their adjacency to other waters of the U.S. It is estimated that a significant nexus exists between these waters and regulated streams. Jurisdictional status denotes water bodies that are regulated by USACE under Section 404 of the Clean Water Act. Table 2.1 summarizes size and characteristics of wetlands identified within The Back 93 Acre Parcel and potential jurisdictional status, while Figure 2.2 graphically represents all the potential (but not currently federally-designated) wetlands identified on OU-1E.

Table 2.1 Wetlands Summary for Texaco Research Center in Beacon, New York

Feature	Size (acres)	Wetland Type	Potential Jurisdictional Status and Functional Values
Wetland #1	0.2	Riparian/ emergent	Potential Jurisdictional [(1)]. Due to its small size, Wetland 1 has low functional values for flood protection, water quality improvements, and groundwater recharge, but it does have moderate value for wildlife habitat and the surrounding habitats are largely undisturbed.
Wet Swale	0.21	Forested/ emergent	Non-jurisdictional. Due to its small size the Wet Swale has low functional values for flood protection, water quality improvements, and groundwater recharge, but it does have limited value for wildlife habitat with the surrounding habitats mostly undisturbed.
Wetland #2	0.78	Riparian/ emergent	Potential Jurisdictional. Wetland 2 has low functional values for flood protection, and moderate values for water quality improvements, groundwater recharge, and wildlife.
Central Wetland	0.99	Riparian/ emergent	Potential Jurisdictional. The Central Wetland has low functional values for flood protection, and moderate values for water quality improvements, groundwater recharge, and wildlife.
Ballfield Wetland	1.61	Emergent/ savannah	Potential Jurisdictional. The Ballfield Wetland has low functional values for flood protection, and moderate values for water quality improvements, groundwater recharge, and wildlife.
Wet Hill-Slope Savannah	1.85	Emergent/savannah	Non-jurisdictional. The Wet Hill-Slope Savannah has low functional values for flood protection, and moderate values for water quality improvements, groundwater recharge, and wildlife.

Notes:

(1) Classification of wetlands determined in "TRCB Habitat Assessment and Wetlands Survey, July 2014" (Parsons, 2014). Although potential jurisdictional areas were observed, no federally-designated wetlands (per Section 404 of the Clean Water Act) exist on any of the OUs.

N

CtC

OU-1A
Main Facility Parcel

OU-1B
Church Property Parcel

Ur

HoD

OU-1C
Tank Farm Parcel

OU-1F
(Fishkill Creek)

Ud

PwC

OU-2

OU-3

OU-4
Parcel -Modified

PwB

OU-1D
Parcel -Modified

Main Facility Parcel, OU-1A
Church Property Parcel, OU-1B
Former Washington Avenue Tank Farm Parcel, OU-1C
Residential Property Parcel, OU-1D
The Back 93 Acre Parcel, OU-1E
Fishkill Creek, OU-1F
Parcel OU-2
Residential Property Parcel, OU-3
Parcel -Modified, OU-4

CtC Hollis-Chatfield complex
HoD Hollis-Chatfield-Rock outcrop complex
Ul Urban Land
PwC Pittstown silt loam 8-15% slopes
PwB Pittstown silt loam 3-8% slopes
Ud Udorthents
BeD Bernardston silt loam

0 95 190 380 570 Feet

Soil data source
U.S. Department of Agriculture, Natural Resources Conservation Service
http://websoilsurvey.nrcs.usda.gov

PARSONS

301 Plainfield Road, Suite 350; Syracuse, NY 13212 315-451-9560

Soil Survey Geographic (SSURGO) database Dutchess County Beacon New York

Figure 2.1A

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	DATE: 11/6/2014		

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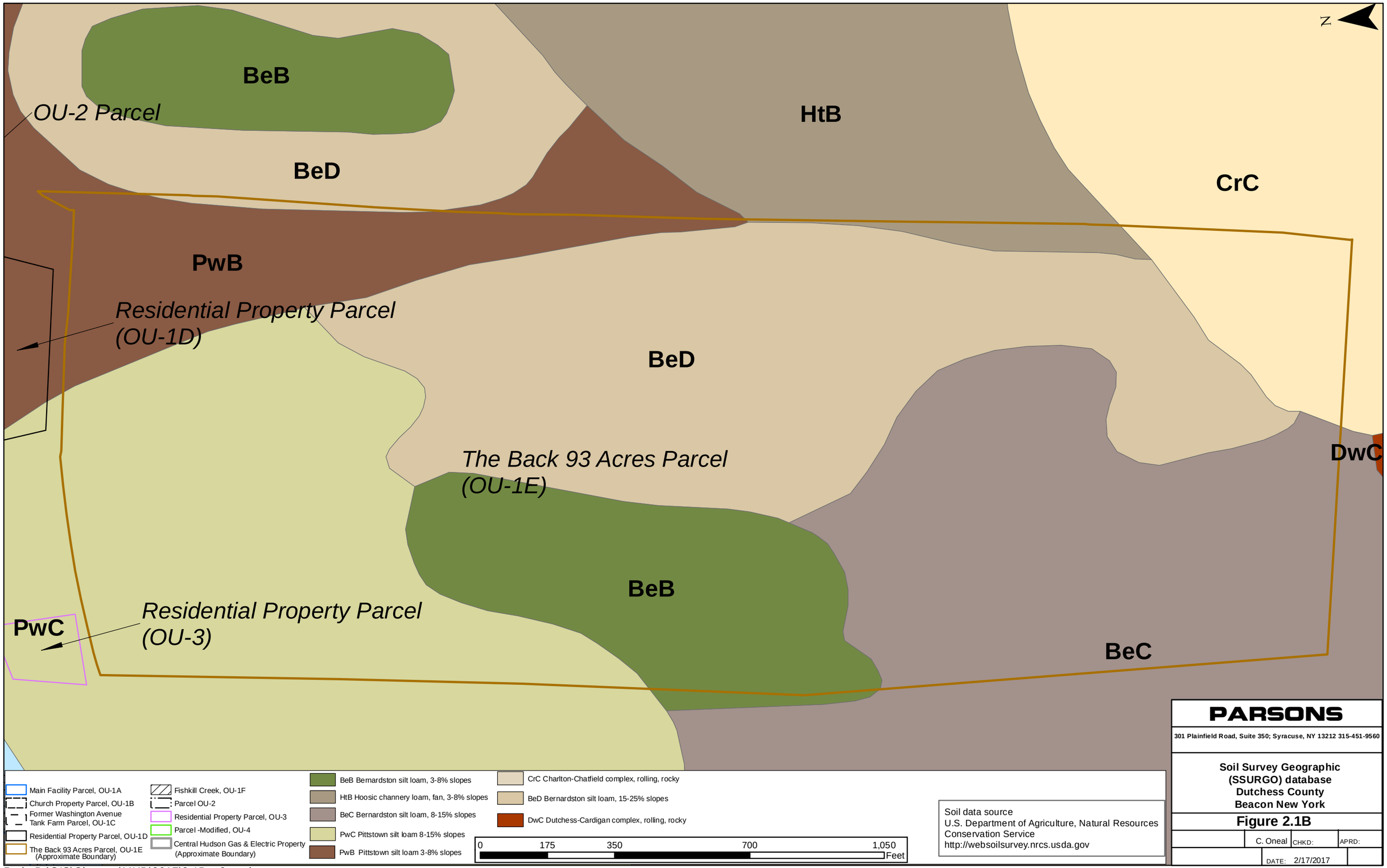

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N

Old Sludge Lagoon

Chemical Burial Site No. 1

Trash Pile A

Central Hudson Gas & Electric

Former Softball Field

Trash Pile D

Ballfield Wetland

Central Hudson Gas & Electric

Trash Pile B

Approximate Stream Location

Chemical Burial Site No. 3

Potable Well Pumphouse

Central Wetland

Container Site

Chemical Burial Site No. 2

Wetland #2

Former Bathroom Structure

Tennis Courts Area

Approximate Intermittent Stream / Headwater Location

Approximate Intermittent Stream / Headwater Location

Disposal Pit

Former Pavilion Area

Trash Pile C

New Sludge Lagoon

Open Dig Excavation Area

Approximate Intermittent Stream / Headwater Location

Wetland #1

Former Borrow Area

Concrete Reservoir

Wet Swale

Wet Hill Swale Savannah

The Back 93 Acre Parcel (OU-1E)

Future Land Uses

- Restricted Residential Area
- Potential Wetlands Area
- Stream Flow Direction

-All other areas located in the Back 93 Acres Parcel not identified as "Restricted Residential Area" or "Wetland Area" are identified as "Residential Area".

- Boundary of Former Disposal Site
- Approximate Limit of Excavation
- The Back 93 Acre Parcel, OU-1E (Approximate Boundary)
- Potable Well Pumphouse
- Central Hudson Gas & Electric Property
- Stream
- Intermittent Stream/Headwater

0 150 300 600 900 Feet

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The Back 93 Acre Parcel (OU-1E)
Former Texaco Research Center
Beacon, New York

Figure 2.2

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	2/13/2017		

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SECTION 3

SAMPLING ACTIVITIES AND ANALYSIS

3.1 INTRODUCTION

The purpose of this section is to describe methods to be used during the soil and surface water data gap sampling program field activities. The data gap sampling program was developed to obtain surface soil and surface water analytical data to address data gaps that exist at the Former TRCB facility per the NYSDEC and NYSDOH requirements and assist in achieving Chevron's End State Vision for each OU.

3.2 PRE-FIELD ACTIVITIES

TRCB Operable Unit Soil Boring Locations

Before subsurface field work begins, the facility superintendent will be contacted to identify potentially buried utility locations. Based on those discussions and a review of the available Site utility maps, a Parsons geologist will locate proposed boring locations to avoid any underground or aboveground utilities. A private utility locator will also be utilized to confirm the location of underground utilities in working areas where no reliable information is available. In areas where there is a concern that underground services may exist, hand clearing to 8.0 ft. bgs will be completed prior to beginning sampling work. Hand clearing will be performed using a hand auger. All excavated material will be containerized in accordance with the procedures discussed below for investigation derived waste. Dig Safely New York (telephone number: * 811) will be contacted to provide clearance of outside underground utilities that are potentially located near the work areas.

The Parsons Project Manager will ensure that the Parsons Pre-Drilling / Subsurface Checklist for Intrusive Field Work (Appendix B) and Chevron EMC's Ground Disturbance, Excavation, and Well Abandonment protocols (Appendix C) will be completed and all appropriate approvals obtained. A complete description of both protocols is provided in Appendix B and C, respectively, and should be reviewed prior to field activities.

Background Parcel Soil Boring Locations

The same procedures outlined for drilling at the TRCB Operable Unit locations will be followed for field activities to be performed at the Background Parcel soil boring locations, with the exception that owners of parcels will be contacted by Chevron EMC prior to field activities and access agreements between Chevron EMC and the parcel owners will be executed.

3.3 SURFACE SOIL SAMPLING AT TRCB FACILITY OPERABLE UNITS

One hundred twenty-seven (127) soil borings will be hand-augered at the TRCB OU locations shown on Figures 3.1A, 3.1B, 3.1C, 3.1D, 3.1E, and 3.1F. Soil borings at each OU are detailed in sections below and summarized in Table 3.1. Actual sampling locations will be based on information collected during field activities and utility constraints/access.

Prior to initiation of field activities, all pre-field procedures as described in Section 3.2 will be followed. All sampling equipment that comes into contact with the subsurface will be

thoroughly decontaminated by utilizing an Alconox and distilled water wash and rinse. Each boring will be advanced using a stainless steel hand auger or similar sampling device to a depth of 2 ft. bgs. All soil samples will be logged in the field by a Parsons geologist. All soil samples retrieved from the borings will be visually inspected for signs of staining and for the presence of hydrocarbon odors and the evolution of organic vapors with a photoionization detector (PID). Soil samples will be collected from the same soil type located within the borehole (e.g.-Ud, CtC, HoD, etc.). Samples will be collected from intervals of 0 to 2-inches (with the 0 - inch mark starting just below any vegetation layer); 2 to 6 inches, 6 to 12 inches, and 12 to 24 inches, with exceptions as noted below in Section 3.6. If additional soil volume is required to fill sampling containers, then additional soil borings will be hand augered. If a different soil type is encountered within the same borehole, then a separate sample of that different soil type will be collected for analytical testing. The different soil type will be noted on the corresponding boring log. Soil samples will be analyzed based on which OU location the samples were collected from. Table 3.1 provides the parameters that each soil sample will be analyzed for based on OU location. All analytical work will be performed in accordance with the Quality Assurance Project Plan (QAPP) dated April 2016 and revised February 2017 (see Appendix D).

Following the completion of sampling activities at each soil boring location, any excess soil cuttings from the soil boring will be placed back into the borehole and bentonite pellets will then be placed into the borehole to within 3-inches of the top of the surface. The remaining void space will then be backfilled with topsoil and grass seed to match the surrounding surface. The soil boring location will then be marked with a pin flag and global positioning system (GPS) coordinates will be completed to denote location for future surveying activities by a New York State licensed surveyor. Once the surveying activities have been completed, the pin flag will be removed.

Methodology Used for Soil Boring Placement

Sample locations were determined using the United States Environmental Protection Agency (USEPA) Visual Sampling Program (VSP), Version 7.4. Sampling locations were determined by assuming a non-statistical sampling plan using a predetermined number of samples for the OU. Sample placement was then performed by using "Systematic Grid Sampling" with a Triangular Grid Type and Random Start. Sample locations at all the OUs were determined using the same methodology.

The Back 93 Acre Parcel (OU-1E) Description of Soil Borings

Future Residential and Wetlands Area

Sixty-five (65) soil borings are designated to be completed within the Residential/Wetlands Area (Non-Disposal Area) located at The Back 93 Acre parcel (OU-1E). Boring locations are shown on Figure 3.1D. Soil samples will be collected for Target Compound List (TCL) Volatile Organic Compounds (VOCs) by EPA Method 5035/8260B (20% of samples) [(1)], TCL Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270D, Target Analyte List (TAL) Metals by EPA Method 6010C/6020A/7471A, Pesticides by EPA Method 8081B (10% of samples)[(2)], Polychlorinated Biphenyls (PCBSs) by EPA Method 8082A (10% of samples) [(2)], Total Organic Carbon (TOC) by the Lloyd Kahn Method, and pH by EPA Method SM 4500-H+200. All samples

will be collected from 0 to 2-inches bgs (with the 0 - inch mark starting just below any vegetation layer); 2 to 6 inches bgs, 6 to 12 inches bgs, and 12 to 24 inches bgs.

Notes:

(1) – Soil samples collected from 0 to 2 inches bgs will not be analyzed for VOCs at all sampling locations, as per NYSDEC and NYSDOH requirements.

(2) - Pesticides and PCBs will be analyzed to satisfy the NYSDEC request to analyze a specific percentage of samples from each OU for the aforementioned parameters in order to ascertain if parameters exceed NYSDEC soil cleanup objectives. Such analysis was performed during previous investigations on certain parcels. Boring locations with associated soil data are provided in Figures 3.9 through 3.12. Only areas that potentially used and/or stored pesticides and PCBs were sampled. In addition, no sampling in the past or the future was/will be performed at OU-2 because the parcel is a right-of-way road shoulder and potentially subject to non-site related contaminant.

Future Recreational Area (Former Disposal Areas)

Twelve (12) soil borings are designated to be completed within or to define outer limits of any No Build Zone (Former Disposal Areas) that would require Restricted Residential land use located at The Back 93 Acre parcel (OU-1E). Boring locations are shown on Figure 3.1E. Sampling activities will be performed following the same protocols as previously described. These samples are proposed to assess potential residual soil contamination at three former disposal areas (New Sludge Lagoon, Trash Pile "C", and Chemical Burial Site No. 3) where disposal activities took place from past TRCB facility operations. Soil samples will be collected for TCL VOCs by EPA Method 5035/8260B, TCL SVOCs by EPA Method 8270D, TAL Metals by EPA Method 6010C/6020A/7471A, pesticides by EPA Method 8081B, PCBs by EPA Method 8082A, TOC by the Lloyd Kahn Method, and pH by EPA Method SM 4500-H+200. All samples will be collected from the same depths as specified for OU-1E.

"No Further Action" (NFA) were granted for the remaining on-site disposal areas by the NYSDEC. No surface soil sampling is proposed at the remaining disposal areas located at the OU-1E parcel as sufficient sampling has been conducted to delineate areas of contamination and remediation has occurred. Refer below for the list of disposal areas that received NFA from the NYSDEC:

1. Trash Pile A
2. Trash Pile B
3. Trash Pile D
4. Chemical Burial Site No. 1
5. Chemical Burial Site No. 2
6. Disposal Pit

7. Open Dig Excavation Area
8. Container Site
9. Old Sludge Lagoon

Based on historical sampling (sampling approved verbally by owner), soils near the former Chemical Burial Site No. 1 located outside of OU-1E, under the ownership of Central Hudson Gas and Electric, may be impacted. Specifically, Chemical Burial Site No. 1 has a confirmation soil boring (ITSB-51) located northeast of the former disposal area with polycyclic aromatic hydrocarbon (PAH) concentrations that exceeded the NYSDEC Soil Cleanup criteria (Benzo(a)anthracene (0.25 ft. bgs), Benzo(a)pyrene (0.25 ft. bgs), Benzo(b)fluoranthene (0.25 ft. bgs), Chrysene (0.25 ft. bgs), and Indeno(1,2,3-cd)pyrene (0.25 ft. bgs.). Further assessment of off-site areas will be addressed in a separate future work plan.

OU-1B Description of Soil Borings

Future Restricted Residential Area

Thirteen (13) soil borings (not including those drilled for mercury speciation, see below Section 3.6) are designated to be completed within the Restricted Residential Area located at the Church Property parcel (OU-1B). Boring locations are shown on Figure 3.1A. Soil boring locations were placed in areas where no previous sampling has been conducted (e.g., the central portion of the site). Soil samples will be collected for TCL VOCs by EPA Method 5035/8260B (20% of samples), TCL SVOCs by EPA Method 8270D, TAL Metals by EPA Method 6010C/6020A/7471A, pesticides by EPA Method 8081B (minimum of 10% of samples), PCBs (minimum of 10% of samples) by EPA Method 8082A, TOC by the Lloyd Kahn Method, and pH by EPA Method SM 4500-H+200. All samples will be collected from the same depths as specified for OU-1E.

OU-1C Description of Soil Borings

Future Industrial Area

Sixteen (16) soil borings are designated to be completed within the Industrial Area located at the Former Washington Avenue Tank Farm parcel (OU-1C). Boring locations are shown on Figure 3.1B. Soil samples will be collected for TCL VOCs by EPA Method 5035/8260B, TCL SVOCs by EPA Method 8270D, TAL Metals by EPA Method 6010C/6020A/7471A, pesticides by EPA Method 8081B (10% of samples), PCBs (10% of samples) by EPA Method 8082A, TOC by the Lloyd Kahn Method, and pH by EPA Method SM 4500-H+200. All samples will be collected from the same depths as specified for OU-1E and OU-1B.

OU-1D Description of Soil Borings

Future Residential Area

Eleven (11) soil borings are designated to be completed within the Residential Area located at the Residential Property parcel (OU-1D). Boring locations are shown on Figure 3.1C. Soil samples will be collected for TCL VOCs by EPA Method 5035/8260B (20% of samples), TCL SVOCs by EPA Method 8270D, TAL Metals by EPA Method 6010C/6020A/7471A, pesticides

by EPA Method 8081B (10% of samples), PCBs (10% of samples) by EPA Method 8082A, TOC by the Lloyd Kahn Method, and pH by EPA Method SM 4500-H+200. All samples will be collected from the same depths as specified in OU-1E, OU-1B, and OU-1C.

OU-3 Description of Soil Borings

Future Residential Area

Five (5) soil borings are designated to be completed within the Residential Area located at the Residential Property parcel (OU-3). Boring locations are shown on Figure 3.1F. Soil samples will be collected for TCL VOCs by EPA Method 5035/8260B (20% of samples), TCL SVOCs by EPA Method 8270D, TAL Metals by EPA Method 6010C/6020A/7471A, pesticides by EPA Method 8081B (10% of samples), PCBs (10% of samples) by EPA Method 8082A, TOC by the Lloyd Kahn Method, and pH by EPA Method SM 4500-H+200. All samples will be collected from the same depths specified for the above OUs.

3.4 SURFACE SOIL SAMPLING AT BACKGROUND PARCELS

Fifty (50) soil borings (ten]10] borings at each Background Parcel location that contains the same or similar soil type that exist on the Former TRCB facility OUs) will be collected at the five (5) Background Parcels shown on Figures 3.2, 3.3, 3.4, 3.5, and 3.6. Ten (10) borings per soil type will be collected for soil type CtC at the Residential Parcel No. 1 (Figure 3.2), soil type Ud at the Mahopac Park Terrace Apartments parcel (Figure 3.3), and soil types BeD; PwC; and HoF at the New York State Office of Parks, Recreation & Historic Preservation (NYSOPRHP) parcels (Figures 3.4 through 3.6). These soil borings will be used to achieve the following: 1) determine the local soil background conditions of metals, SVOCs, and pesticides, and 2) determine if COPC concentrations observed at the TRCB facility are indicative of background soil conditions. Table 3.2 summarizes the number of soil borings and analyses for each Background Parcel. All soil samples will be collected for TCL SVOCs by EPA Method 8270D, TAL Metals by EPA Method 6010C/6020A/7471A, pesticides by EPA Method 8081B (20 % of Samples), TOC by the Lloyd Kahn Method, and pH by EPA Method SM 4500-H+200, while some samples will also be analyzed for Hg speciation, total Sulphur, and grain size. All samples will be collected from the depths specified in Section 3.3. Actual soil boring locations will be based on information collected during field activities and utility constraints/ access.

Note:

1. Sampling of the Background Parcels is contingent upon Chevron EMC obtaining an access agreement with parcel owners. If no access agreement is obtained for a particular parcel, then alternate Background Parcels will be chosen for sampling activities and the work plan will be revised to reflect changes.

3.5 POTENTIAL WETLAND AND STREAM SAMPLING IN THE BACK 93-ACRE PARCEL (OU-1E)

Soil borings located in a designated (potential jurisdictional) wetland areas described in the TRCB Habitat Assessment and Wetlands Survey conducted as a part of the Fish and Wild Resources Impact Analysis (FWRIA) Part I: Resource Characterization (Parsons 2015) in The Back 93 Acre Parcel (OU-1E) will have the following observations made, and the following field sampling activities (including surface water sampling) performed:

Observations/Field Sampling

1. Field personnel will note the general condition of the potential jurisdictional wetland. If the area is submerged by at least one foot of water and the area is at least 0.5 acre in size, then the surface soil sample will be offset outside of the wet area. A surface water sample will be taken from the original location of the soil sample.
2. If conditions of the area do not meet the criteria described above, then surface soil samples will be collected following the same procedures as outlined in Section 3.3 (Surface Soil Sampling at TRCB Operable Units) and analyzed for the same parameters as listed in Table 3.1 for the corresponding OU-1E area.
3. Photographs of the potential wetland will also be taken to document area conditions.
4. A minimum of two (2) surface water samples will be collected from a north stream that was identified in the Ecological Site Assessment (Parsons, 2015) in OU-1E, if the depth of the water is a minimum of one foot deep. Samples will be collected at two (2) locations in the stream following the procedures outlined in the Sampling and Analysis Plan SAP (Appendix F) and analyzed for parameters provided in Table 3.3. Sample locations are shown on Figure 3.7.

3.6 MERCURY SPECIATION SOIL SAMPLING (BACKGROUND PARCELS AND TRCB OPERABLE UNITS)

Fifteen (15) soil borings for mercury speciation analysis will be installed among all five (5) Background Parcels (three [3] borings at each parcel), while six (6) and seven (7) soil borings will be installed at OU-1B and OU-4, respectively. Sampling of listed Background Parcels is contingent upon obtaining access agreements and could potentially change to alternate parcels. The soil borings will be installed using the same field procedures outlined in Section 3.3, with the exception that soil samples will be collected from 0 to 6 inches, 6 to 12 inches, and 12 to 24 inches. All samples will be analyzed for mercury (Hg) speciation analysis by Eurofins Frontier Global Sciences (EFGS) Hg Selective Sequential Extraction Method (Hg SSE Method), total mercury by EPA Method 1631, pH, TOC, total Sulphur by EPA Method 6010C, and grain size analysis by American Society for Testing and Materials (ASTM) Method D422. The data obtained will be used in support of the FWRIA Part 1 report. Refer to Table 3.4 for analytical details and Figures 3.1A, 3.2, 3.3, 3.4, 3.5, 3.6, and 3.8 for sample locations.

Notes:

- All samples collected will be analyzed for total Hg and the 0 to 6 inches samples will be analyzed for Hg SSE.
- If the total Hg exceeds 0.18 parts per million (ppm) then the remaining deeper soil samples will be analyzed for Hg SSE.

3.7 SURVEYING OF SOIL BORING LOCATIONS

Each newly hand-augered soil boring will be surveyed and tied to a common, permanent reference datum. Coordinates will be measured in the New York State Plane Coordinate System, East Zone (NAD-1983) system for the horizontal datum, while the vertical datum will use the site vertical datum established by Texaco in 1957. This datum is 1.07 ft. below North American Vertical Datum (NAVD) 1988 coordinate system. All survey work will be completed by a New York State licensed surveyor.

3.8 INVESTIGATION DERIVED WASTE

All investigation derived waste (IDW), including decontamination water, will be staged in a polyurethane tank or some other holding device and transported to the on-site wastewater treatment system for disposal.

Excess soil samples will be staged in 55-gallon, Department of Transportation (DOT)-approved, 17-H drums, properly labeled, and staged on-site for proper disposal by Chevron.

3.9 REPORT GENERATION

Soil Data Gap Investigation

At the completion of all field activities, a report will be generated and forwarded to Chevron for review and comments. Once Chevron comments have been addressed, the report will then be forwarded to NYSDEC and NYSDOH for review and comments. The report will document the findings of field activities, contain descriptions of database management and data validation (Locus System), provide in-depth soil logs, provide a photographic log documenting field activities, and include recommendations for any additional work, if applicable.

In addition, all analytical data will be submitted separately to the NYSDEC Project Manager in the required EQUiS format in the form of an e-mail and the report, including this work plan, will be signed in accordance with Division of Environmental Remediation - 10 Sections 1.2 and 1.5.

At the completion of field activities, the newly acquired data will be evaluated and reported, to show the data gaps identified in the dataset available at the time of the Human Health Exposure Assessment (HHEA) (Parsons 2015a) and FWRIA Part 1 report (Parsons 2015b) have been addressed for surface soil. The 2017 data gap report will be submitted to the regulatory agencies.

TABLE 3.1

SOIL SAMPLE ANALYTICAL SUMMARY TABLE FOR TRCB OPERABLE UNITS

Operable Unit	Acreage	Number of Soil Borings	TCL Volatile Organic Compounds (VOCs)[1][2][3][4]	TCL Semi-Volatile Organic Compounds (SVOCs)	Target Analyte List (TAL) Metals[5]	Pesticides[6]	Polychlorinated Biphenyls (PCBs)[6]	Total Organic Carbon (TOC)	pH
			SW-846-5035/8260C	SW-846-8270D	SW-846-6010C/6020A/7471B	SW-846-8081B	SW-846-8082A	Lloyd Kahn	SW-846-SM 4500-H+200
OU-1B	15	13	X	X	X	X	X	X	X
OU-1C	5	16	X	X	X	X	X	X	X
OU-1D	2.06	11	X	X	X	X	X	X	X
OU-1E a. Future Residential and wetlands b. Active Recreational (No Build Zones)	a. 81.46 b. 9.74	a. 70 b. 12	X	X	X	X	X	X	X
OU-3	0.67	5	X	X	X	X	X	X	X
Total Number of Borings		127							

Notes:

1. VOCs will be collected utilizing an Encore sampler and analyzed by EPA SW Method 5035/8260C.
2. Samples collected from 0 to 2-inches bgs will not be analyzed for VOCs, while samples collected deeper than 2-inches bgs will be analyzed for VOCs; as per NYSDEC and NYSDOH recommendation.
3. Twenty (20) percent of samples will be collected and analyzed for VOCs at OU-1B, OU-1D, OU-1E, and OU-3; as per NYSDEC and NYSDOH recommendations
4. All the samples collected at OU-1 will be analyzed for VOCs.
5. Metals will be analyzed primarily by EPA SW Method 6020A, then by 6010C for metals that do not analyzed satisfactory by 6020A.
6. Minimum of ten (10) percent of samples will be collected from parcels OU-1B, OU-1C, OU-1D, OU-1E, and OU-3 and analyzed for Pesticides and PCBs; as per NYSDEC and NYSDOH recommendations .

TABLE 3.2

SOIL SAMPLE ANALYTICAL SUMMARY TABLE FOR BACKGROUND PARCELS

Background Parcel[3]	Number of Soil Borings	TCL Semi-Volatile Organic Compounds (SVOCs)	Target Analyte List (TAL) Metals[1]	Pesticides[2]	Total Organic Carbon (TOC)	pH
		SW-846-8270D	SW-846-6010C/6020A/7471B	SW-846-8081B	Lloyd Kahn	SW-846-SM 4500-H+200
Residential Parcel No. 1	10	X	X	X	X	X
Mahopac Park Terrace Apartments (Parcel No. 2)	10	X	X	X	X	X
New York State Office of Parks, Recreation & Historic Preservation (Parcel No. 3)	10	X	X	X	X	X
New York State Office of Parks, Recreation & Historic Preservation (Parcel No. 4)	10	X	X	X	X	X
New York State Office of Parks, Recreation & Historic Preservation (Parcel No. 5)	10	X	X	X	X	X

Notes:

1. Metals will be analyzed primarily by EPA SW Method 6020A, then by 6010C for metals that are not analyzed satisfactorily by 6020A.
2. Only twenty percent (20%) of samples will be collected and analyzed for pesticides at each background parcel.
3. Sampling of Background Parcels listed on table is contingent upon Chevron EMC obtaining access agreements with parcel owners. If access agreements are not obtained, then alternate Background Parcels will be chosen for sampling activities and the table will be revised to reflect changes.

TABLE 3.3
STREAM ANALYTICAL SUMMARY

Location	VOCs	TCL SVOCs[1]	TCL SVOCs[1]	TAL Metals[2] (Dissolved and Total)	Hardness	TSS	pH
	SW-846-8260C	SW-846-8270D	SW-846-8270D SIM	SW-846-6010C/6020A/C 7470A	SW-846- 2340 C-1997	SW-846-SM 2540 D-1997	SW-846-SM 4500-H + -200
Location No. 1	X	X	X	X	X	X	X
Location No. 2	X	X	X	X	X	X	X

Notes:

1. SW Method 8270 will be used first to analyze SVOCs and then 8270 SIM will be used to analyze SVOCs that require lower detection limits.
2. Metals will be analyzed primarily by EPA SW Method 6020A, then by 6010C for metals that are not analyzed satisfactorily by 6020A. Samples will be filtered in the field.

TABLE 3.4
MERCURY SPECIATION ANALYTICAL SUMMARY

Location	Number of Soil Borings	Total Organic Carbon (TOC)	pH	Grain Size Analysis	Total Sulphur	Total Hg[(1)]	Hg Speciation[(2)]
		Lloyd Kahn	SW-846-SM 4500-H+200	ASTM Method D422	SW-846-6010C	SW-846-1631	Hg SSE Method
Residential Parcel No. 1	3	X	X	X	X	X	X
Mahopac Park Terrace Apartments (Parcel No. 2)	3	X	X	X	X	X	X
New York State Office of Parks, Recreation & Historic Preservation (Parcel No. 3)	3	X	X	X	X	X	X
New York State Office of Parks, Recreation & Historic Preservation (Parcel No. 4)	3	X	X	X	X	X	X
New York State Office of Parks, Recreation & Historic Preservation (Parcel No. 5)	3	X	X	X	X	X	X
OU-1B	6	X	X	X	X	X	X
OU-4	7	X	X	X	X	X	X

Notes:

(1) All samples collected will be analyzed for total Hg and the 0 to 6 inch samples will be analyzed for Hg SSE.
(2) If the total Hg exceeds 0.18 ppm then the remaining deeper soil samples will be analyzed for Hg SEE.

N

CPGP-12
CPGP-11
CPGP-13
CPGP-10
CPGP-9
CPGP-17
CPGP-15
CPGP-14
CPGP-16
CPGP-5
CPGP-4
CPGP-1
CPGP-2
CPGP-6
CPGP-7
CPGP-8
CPGP-3

OU-1B
Church Property Parcel

Soil boring locations drilled during SRFI. No soil sampling will be performed during field activities.

Soil boring locations where VOC samples will be collected (20% total of samples), as well as, regular sampling suite (see work plan).

Soil boring locations where pesticides and PCBs will be collected (10% total of samples), as well as, regular sampling suite (see work plan)

Soil boring locations where regular sampling suite (see work plan) will be collected.

Soil boring locations where Hg speciation, total sulfur, pH, TOC, and grain size analysis will be collected.

Church Property Parcel, OU-1B

Notes:
(*) Actual location of soil borings subject to change depending on field conditions (e.g. -presence of structures, underground utilities, not able to obtain desired depth due to subsurface material, etc.)

0 60 120 240 360 Feet

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Soil Borings to be Installed at OU-1B
Former Texaco Research Center
Beacon, New York

Figure 3.1A

1:1,200	C. Oneal	CHKD:	APRD:
	3/7/2017		

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N

Fishkill Creek

OU-1C
Tank Farm Parcel

Soil boring locations where VOC samples will be collected, as well as, regular sampling suite (see work plan).

Soil boring locations where pesticides and PCBs will be collected (10% total of samples), as well as, regular sampling suite (see work plan)

Tank Farm Parcel, OU-1C

0 50 100 200 300 Feet

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Soil Borings to be Installed at OU-1C Former Texaco Research Center Beacon, New York

Figure 3.1B

1:1,020	C. Oneal	CHKD:	APRD:
	2/16/2017		

Path: D:\GIS\Chevron\MXD\2017\3.1B.mxd

N

OU-1D
Residential Property Parcel

Soil boring locations where VOC samples will be collected (20% total of samples), as well as, regular sampling suite (see work plan).

Soil boring locations where pesticides and PCBs will be collected (10% total of samples), as well as, regular sampling suite (see work plan)

Soil boring locations where regular sampling suite (see work plan) will be collected.

Residential Property Parcel, OU-1D

0 37.5 75 150 225 Feet

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Soil Borings to be Installed at OU-1D
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Beacon, New York

Figure 3.1C

1:780	C. Oneal	CHKD:	APRD:
	2/9/2017		

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N

Old Sludge Lagoon

Chemical Burial Site No. 1

Trash Pile A

Central Hudson Gas & Electric

Former Softball Field

Trash Pile D

Central Hudson Gas & Electric

Ballfield Wetland

Trash Pile B

Approximate Stream Location

Chemical Burial Site No. 3

Potable Well Pumphouse

Container Site

Central Wetland

Wetland #2

Approximate Intermittent Stream / Headwater Location

Chemical Burial Site No. 2

Former Bathroom Structure

Tennis Courts Area

Approximate Intermittent Stream / Headwater Location

Disposal Pit

Former Pavilion Area

Trash Pile C

New Sludge Lagoon

Open Dig Excavation Area

Approximate Intermittent Stream / Headwater Location

Wetland #1

Former Borrow Area

Concrete Reservoir

Wet Swale

Wet Hill Swale Savannah

The Back 93 Acre Parcel (OU-1E)

Future Land Uses

Restricted Residential Area

Potential Wetlands Area

-All other areas located in the Back 93 Acres Parcel not identified as "Restricted Residential Area" or "Wetland Area" are identified as "Residential Area".

Boundary of Former Disposal Site

Approximate Limit of Excavation

The Back 93 Acre Parcel, OU-1E (Approximate Boundary)

Potable Well Pumphouse

Central Hudson Gas & Electric Property

Stream Flow Direction

Stream

Intermittent Stream/Headwater

0 150 300 600 900 Feet

Soil boring locations where VOC samples will be collected (20% total of samples), as well as, regular sampling suite (see work plan).

Soil boring locations where pesticides and PCBs will be collected (10% total of samples), as well as, regular sampling suite (see work plan)

Soil boring locations where regular sampling suite (see work plan) will be collected.

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Soil Borings to be Installed at OU-1E (Residential / Wetlands Area)
Former Texaco Research Center
Beacon, New York

Figure 3.1 D

	C. Oneal	CHKD:	APRD:
	2/16/2017		

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N

Old Sludge Lagoon

Chemical Burial Site No. 1

Trash Pile A

Central Hudson Gas & Electric

Former Softball Field

Trash Pile D

Ballfield Wetland

Central Hudson Gas & Electric

Trash Pile B

Approximate Stream Location

Chemical Burial Site No. 3

Potable Well Pumphouse

Container Site

Central Wetland

Wetland #2

Approximate Intermittent Stream / Headwater Location

Chemical Burial Site No. 2

Former Bathroom Structure

Tennis Courts Area

Disposal Pit

Approximate Intermittent Stream / Headwater Location

Former Pavilion Area

Trash Pile C

New Sludge Lagoon

Open Dig Excavation Area

Approximate Intermittent Stream / Headwater Location

Wetland #1

Former Borrow Area

Concrete Reservoir

Wet Swale

Wet Hill Swale Savannah

The Back 93 Acre Parcel (OU-1E)

Boundary of Former Disposal Site

Approximate Limit of Excavation

The Back 93 Acre Parcel, OU-1E (Approximate Boundary)

Potable Well Pumphouse

Central Hudson Gas & Electric Property

Stream

Intermittent Stream/Headwater

0 150 300 600 900 Feet

Future Land Uses

Restricted Residential Area

Potential Wetlands Area

Stream Flow Direction

Soil boring locations where regular sampling suite (see work plan) will be collected.

-All other areas located in the Back 93 Acres Parcel not identified as "Restricted Residential Area" or "Wetland Area" are identified as "Residential Area".

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Soil Borings to be Installed at OU-1E (Restricted Residential Area)
Former Texaco Research Center
Beacon, New York

Figure 3.1 E

C. Oneal | CHKD: | APRD:

2/16/2017

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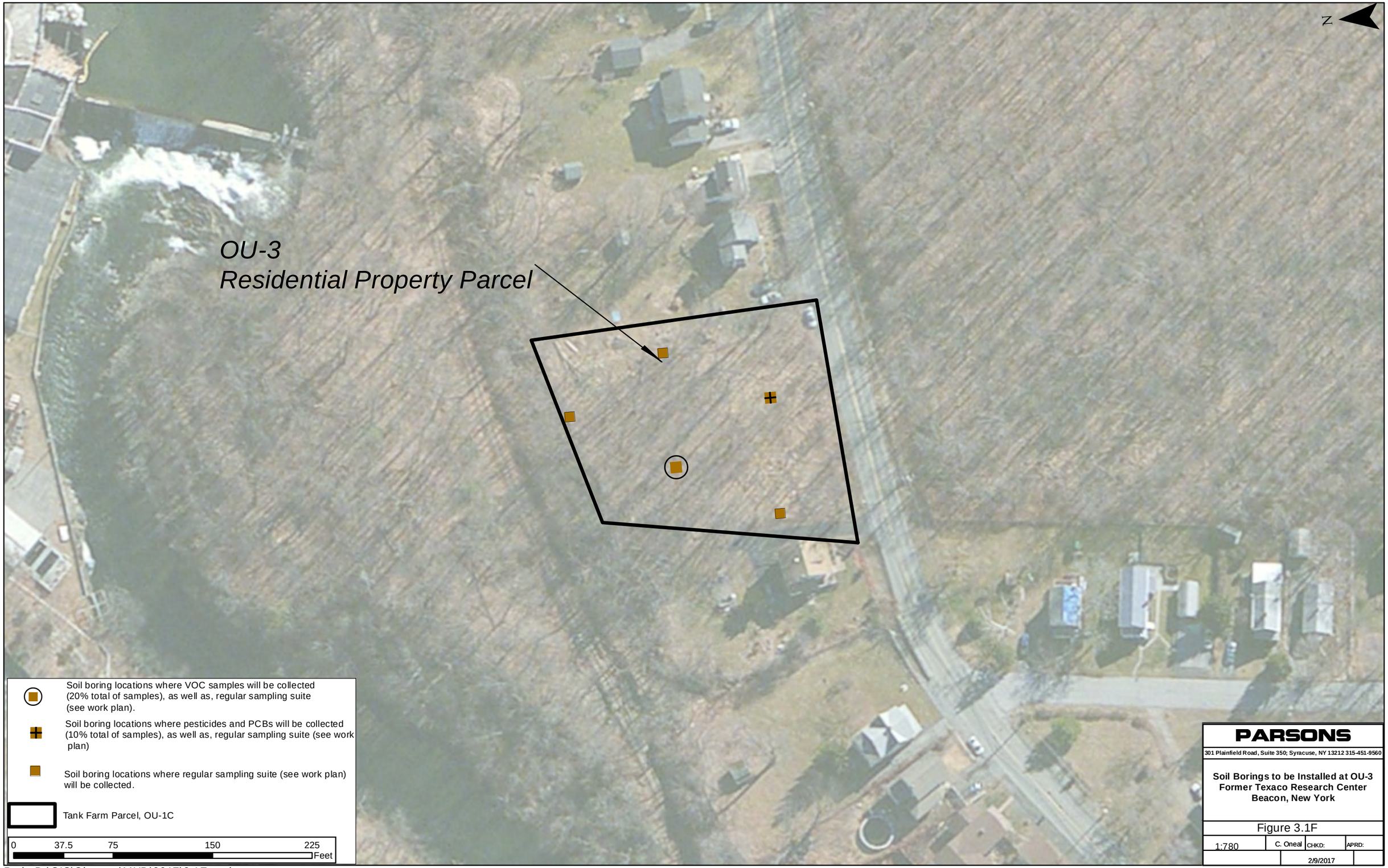

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Soil Borings to be Installed at OU-3 Former Texaco Research Center Beacon, New York

Figure 3.1F

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	2/9/2017		

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Path: D:\GIS\Chevron\MXD\2017\3.2_v2.mxd

Notes:

Soil boring locations where SVOCs, Metals, Pesticides (20% of samples), TOC, and pH will be collected.

Soil boring locations where Hg speciation, total sulphur, pH, TOC, and grain size analysis will be collected.

(*) Actual location of soil borings subject to change depending on field conditions (e.g. presence of structures, underground utilities, not able to obtain desired depth due to subsurface material, etc.)

Disclaimer:
Sampling of Background Parcel shown on figure is contingent upon Chevron EMC obtaining an access agreement with parcel owner. If no access agreement is obtained then an alternate Background parcel will be chosen for sampling activities and an addendum figure showing new parcel with sampling locations will be created and submitted for review.

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Figure 3.3

Location of Soil Borings at Background Parcel -Mahopac Park Terrace Apartments Parcel No. 2 Former Texaco Research Center Beacon, New York

CHKD:	C. Oneal	CHKD:	APRD:
Name	3.3		DATE: 2/13/2017

Path: D:\GIS\Chevron\MXD\2017\3.3.mxd

N

Notes:

Soil Boring locations where SVOCs, Metals, Pesticides (20% of samples), TOC, and pH will be collected.

Soil boring locations where Hg speciation, total sulphur, pH, TOC, and grain size analysis will be collected.

(*) Actual location of soil borings subject to change depending on field conditions (e.g. presence of structures, underground utilities, not able to obtain desired depth due to subsurface material, etc.)

Disclaimer:
Sampling of Background Parcel shown on figure is contingent upon Chevron EMC obtaining an access agreement with parcel owner. If no access agreement is obtained then an alternate Background parcel will be chosen for sampling activities and an addendum figure showing new parcel with sampling locations will be created and submitted for review.

0 30 60 120 180 240 Feet

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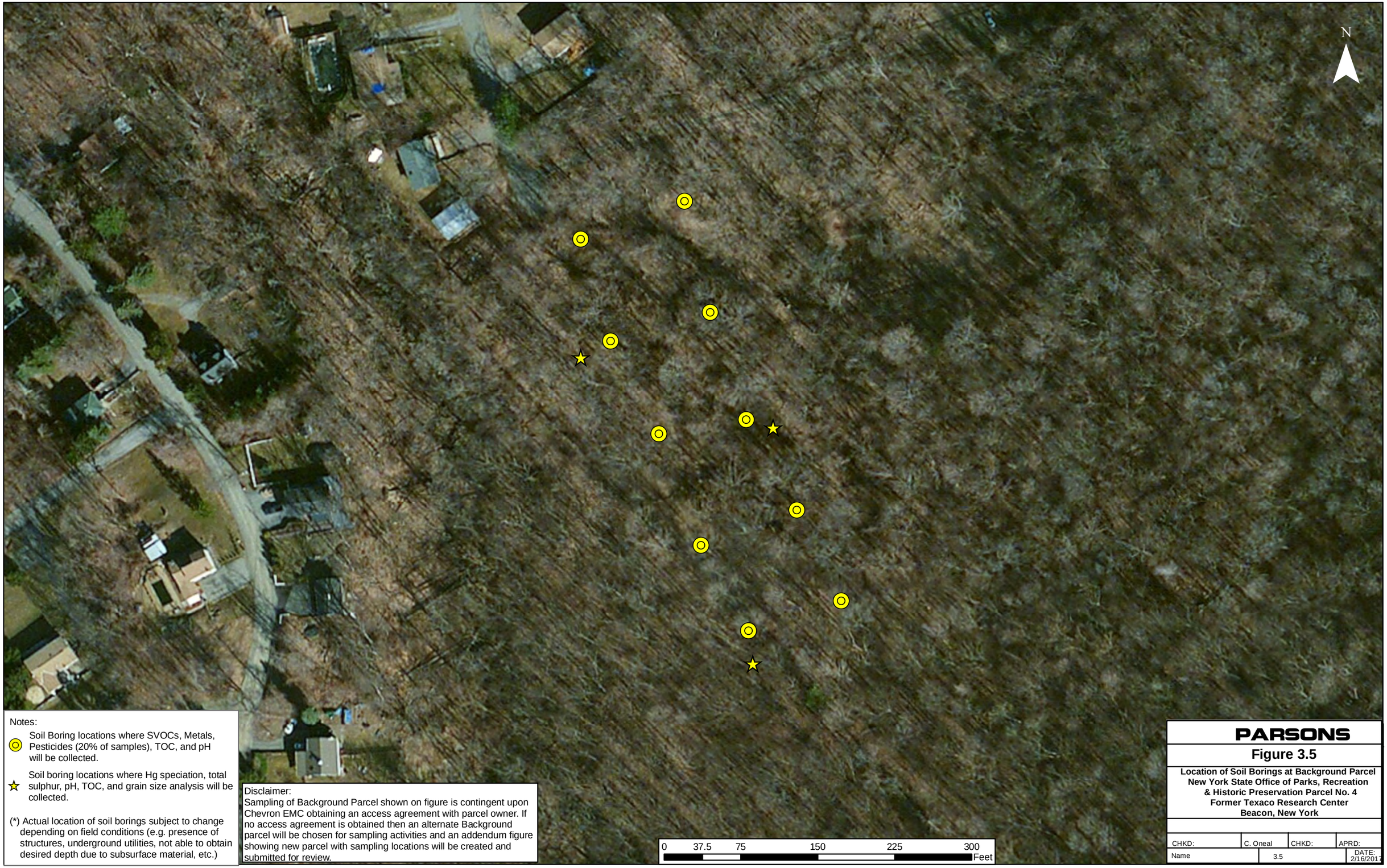
Figure 3.4

Location of Soil Borings at Background Parcel
New York State Office of Parks, Recreation & Historic Preservation Parcel No. 3
Former Texaco Research Center
Beacon, New York

CHKD:	C. Oneal	CHKD:	APRD:
Name	3.4		DATE: 2/16/2017

Path: D:\GIS\Chevron\MXD\2017\3.4.mxd



Notes:

Soil Boring locations where SVOCs, Metals, Pesticides (20% of samples), TOC, and pH will be collected.

Soil boring locations where Hg speciation, total sulphur, pH, TOC, and grain size analysis will be collected.

(*) Actual location of soil borings subject to change depending on field conditions (e.g. presence of structures, underground utilities, not able to obtain desired depth due to subsurface material, etc.)

Disclaimer:
Sampling of Background Parcel shown on figure is contingent upon Chevron EMC obtaining an access agreement with parcel owner. If no access agreement is obtained then an alternate Background parcel will be chosen for sampling activities and an addendum figure showing new parcel with sampling locations will be created and submitted for review.

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Figure 3.5

**Location of Soil Borings at Background Parcel
New York State Office of Parks, Recreation
& Historic Preservation Parcel No. 4
Former Texaco Research Center
Beacon, New York**

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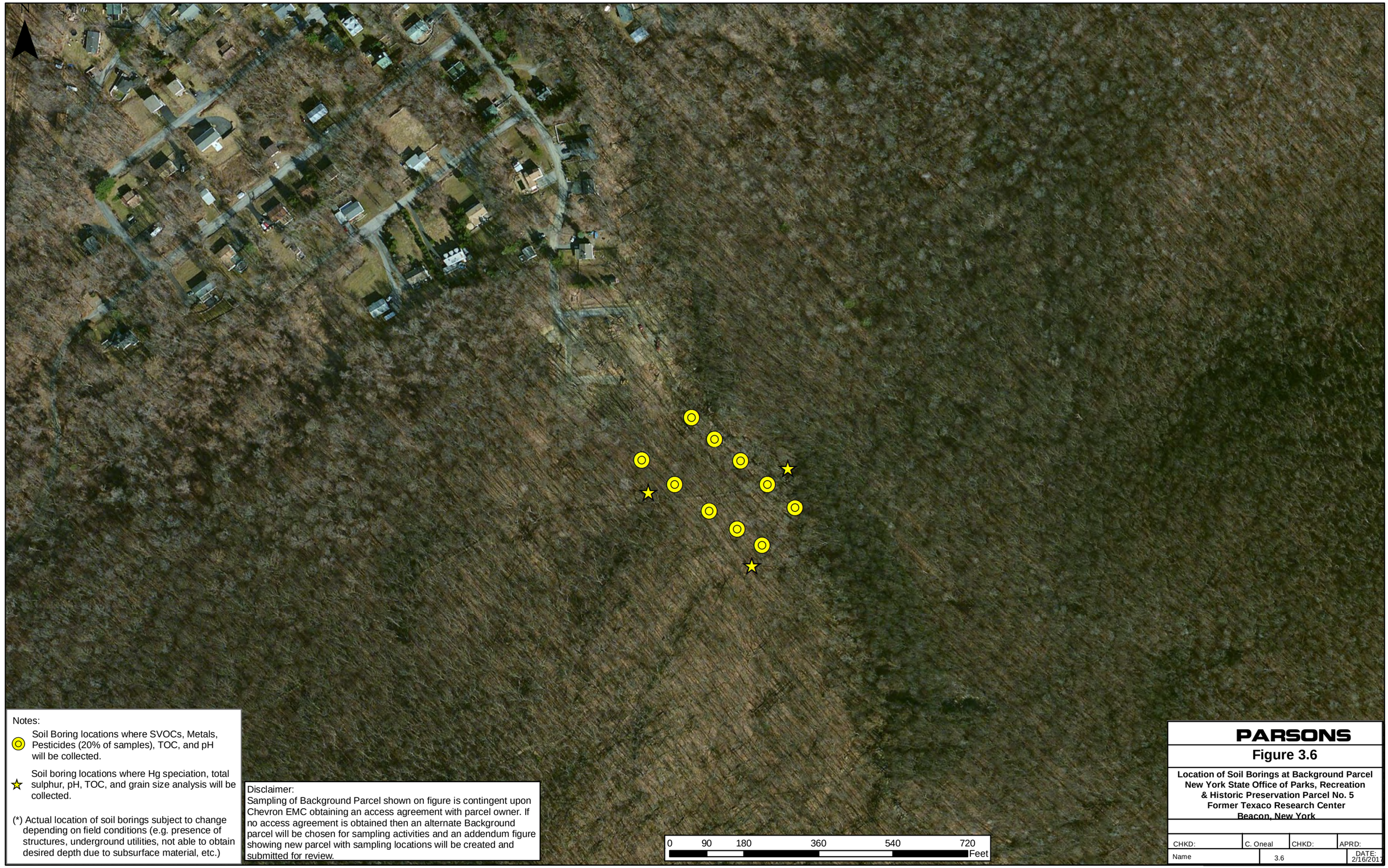

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N

Old Sludge Lagoon

Chemical Burial Site No. 1

Trash Pile A

Central Hudson Gas & Electric

Former Softball Field

Trash Pile D

Ballfield Wetland

Central Hudson Gas & Electric

Trash Pile B

Approximate Stream Location

Chemical Burial Site No. 3

Potable Well Pumphouse

Central Wetland

Wetland #2

Container Site

Chemical Burial Site No. 2

Former Bathroom Structure

Tennis Courts Area

Approximate Intermittent Stream / Headwater Location

Approximate Intermittent Stream / Headwater Location

Disposal Pit

Former Pavilion Area

Trash Pile C

New Sludge Lagoon

Open Dig Excavation Area

Approximate Intermittent Stream / Headwater Location

Wetland #1

Former Borrow Area

Concrete Reservoir

Wet Swale

Wet Hill Swale Savannah

The Back 93 Acre Parcel (OU-1E)

Boundary of Former Disposal Site

Approximate Limit of Excavation

The Back 93 Acre Parcel, OU-1E (Approximate Boundary)

Potable Well Pumphouse

Central Hudson Gas & Electric Property

Stream

Intermittent Stream/Headwater

0 137.5 275 550 825 Feet

Future Land Uses

Restricted Residential Area

Potential Wetlands Area

Stream Flow Direction

Stream Sample Location

-All other areas located in the Back 93 Acres Parcel not identified as "Restricted Residential Area" or "Wetland Area" are identified as "Residential Area".

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Stream Sample Locations in The Back 93 Acre Parcel Former Texaco Research Center Beacon, New York

Figure 3.7

	C. Oneal	CHKD:	APRD:
	2/16/2017		

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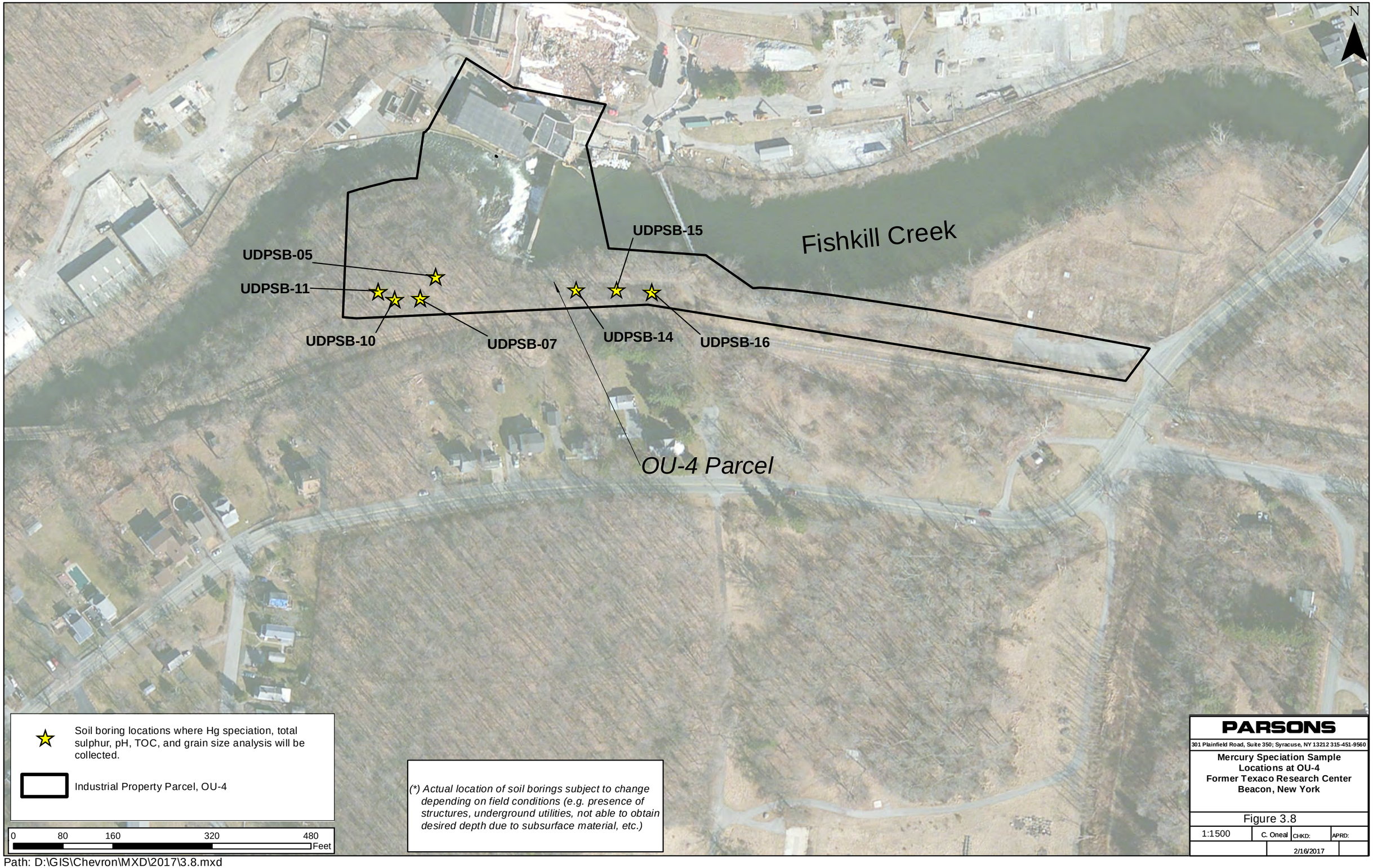

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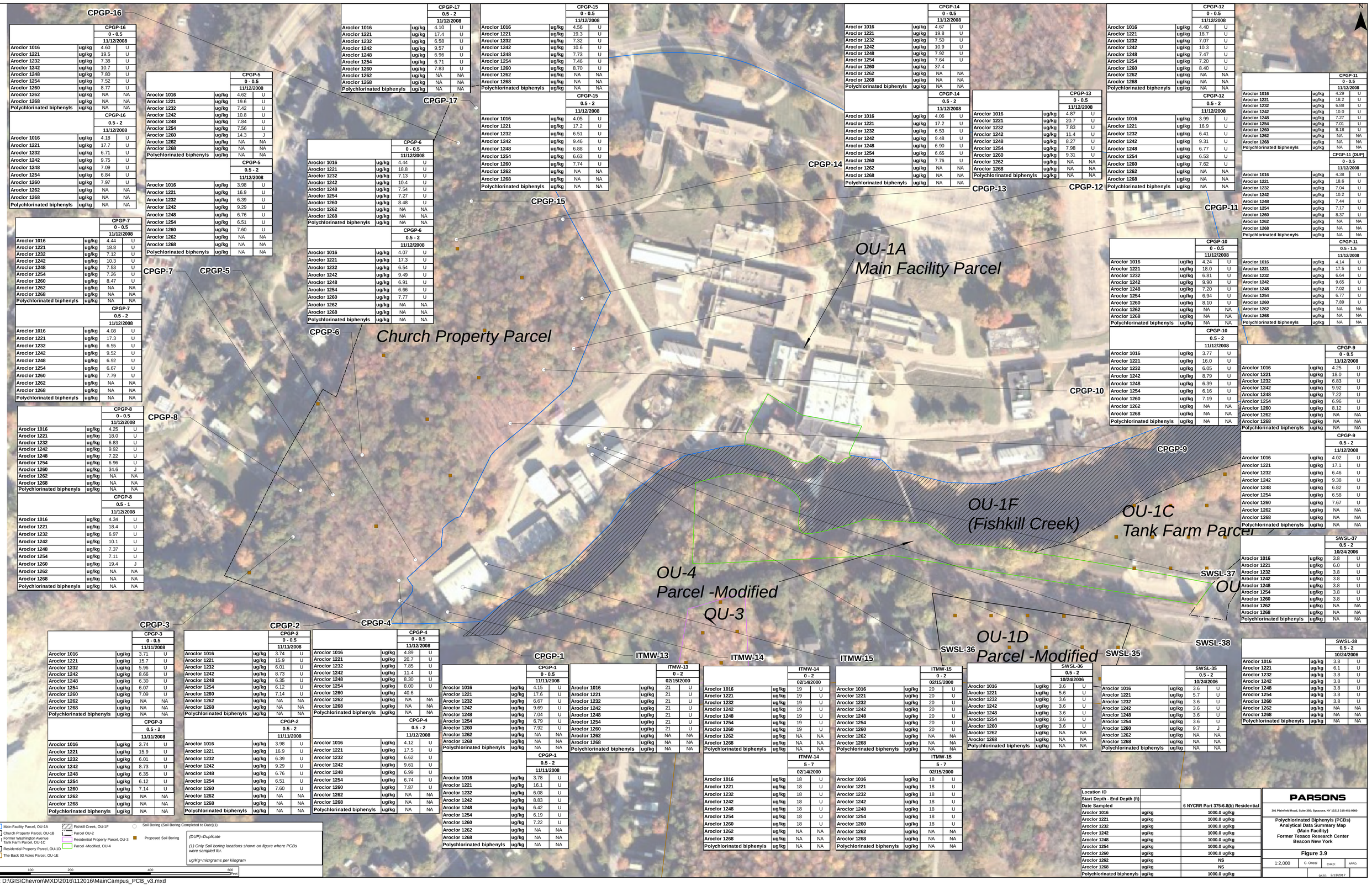
Mercury Speciation Sample Locations at OU-4
Former Texaco Research Center
Beacon, New York

Figure 3.8

1:1500	C. Oneal	CHKD:	APRD:
	2/16/2017		

Path: D:\GIS\Chevron\MXD\2017\3.8.mxd



CPGP-16		0 - 0.5	
		11/12/2008	
Aroclor 1016	ug/kg	4.60	U
Aroclor 1221	ug/kg	19.5	U
Aroclor 1232	ug/kg	7.38	U
Aroclor 1242	ug/kg	10.7	U
Aroclor 1248	ug/kg	7.80	U
Aroclor 1254	ug/kg	7.52	U
Aroclor 1260	ug/kg	8.77	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-16		0.5 - 2	
		11/12/2008	
Aroclor 1016	ug/kg	4.18	U
Aroclor 1221	ug/kg	17.7	U
Aroclor 1232	ug/kg	6.71	U
Aroclor 1242	ug/kg	9.75	U
Aroclor 1248	ug/kg	7.09	U
Aroclor 1254	ug/kg	6.84	U
Aroclor 1260	ug/kg	7.97	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-17		0.5 - 2	
		11/12/2008	
Aroclor 1016	ug/kg	4.10	U
Aroclor 1221	ug/kg	17.4	U
Aroclor 1232	ug/kg	6.58	U
Aroclor 1242	ug/kg	9.57	U
Aroclor 1248	ug/kg	6.96	U
Aroclor 1254	ug/kg	6.71	U
Aroclor 1260	ug/kg	7.83	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-15		0 - 0.5	
		11/12/2008	
Aroclor 1016	ug/kg	4.56	U
Aroclor 1221	ug/kg	19.3	U
Aroclor 1232	ug/kg	7.32	U
Aroclor 1242	ug/kg	10.6	U
Aroclor 1248	ug/kg	7.73	U
Aroclor 1254	ug/kg	7.46	U
Aroclor 1260	ug/kg	8.70	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-15		0.5 - 2	
		11/12/2008	
Aroclor 1016	ug/kg	4.05	U
Aroclor 1221	ug/kg	17.2	U
Aroclor 1232	ug/kg	6.51	U
Aroclor 1242	ug/kg	9.46	U
Aroclor 1248	ug/kg	6.88	U
Aroclor 1254	ug/kg	6.63	U
Aroclor 1260	ug/kg	7.74	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-14		0 - 0.5	
		11/12/2008	
Aroclor 1016	ug/kg	4.67	U
Aroclor 1221	ug/kg	19.8	U
Aroclor 1232	ug/kg	7.50	U
Aroclor 1242	ug/kg	10.9	U
Aroclor 1248	ug/kg	7.92	U
Aroclor 1254	ug/kg	7.64	U
Aroclor 1260	ug/kg	37.4	
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-14		0.5 - 2	
		11/12/2008	
Aroclor 1016	ug/kg	4.06	U
Aroclor 1221	ug/kg	17.2	U
Aroclor 1232	ug/kg	6.53	U
Aroclor 1242	ug/kg	9.48	U
Aroclor 1248	ug/kg	6.90	U
Aroclor 1254	ug/kg	6.65	U
Aroclor 1260	ug/kg	7.76	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-13		0 - 0.5	
		11/12/2008	
Aroclor 1016	ug/kg	4.87	U
Aroclor 1221	ug/kg	20.7	U
Aroclor 1232	ug/kg	7.83	U
Aroclor 1242	ug/kg	11.4	U
Aroclor 1248	ug/kg	8.27	U
Aroclor 1254	ug/kg	7.98	U
Aroclor 1260	ug/kg	9.31	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-12		0 - 0.5	
		11/12/2008	
Aroclor 1016	ug/kg	4.40	U
Aroclor 1221	ug/kg	18.7	U
Aroclor 1232	ug/kg	7.07	U
Aroclor 1242	ug/kg	10.3	U
Aroclor 1248	ug/kg	7.47	U
Aroclor 1254	ug/kg	7.20	U
Aroclor 1260	ug/kg	8.40	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-12		0.5 - 2	
		11/12/2008	
Aroclor 1016	ug/kg	3.99	U
Aroclor 1221	ug/kg	16.9	U
Aroclor 1232	ug/kg	6.41	U
Aroclor 1242	ug/kg	9.31	U
Aroclor 1248	ug/kg	6.77	U
Aroclor 1254	ug/kg	6.53	U
Aroclor 1260	ug/kg	7.62	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-11		0 - 0.5	
		11/12/2008	
Aroclor 1016	ug/kg	4.29	U
Aroclor 1221	ug/kg	18.2	U
Aroclor 1232	ug/kg	6.88	U
Aroclor 1242	ug/kg	10.0	U
Aroclor 1248	ug/kg	7.27	U
Aroclor 1254	ug/kg	7.01	U
Aroclor 1260	ug/kg	8.18	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-11 (DUP)		0 - 0.5	
		11/12/2008	
Aroclor 1016	ug/kg	4.38	U
Aroclor 1221	ug/kg	18.6	U
Aroclor 1232	ug/kg	7.04	U
Aroclor 1242	ug/kg	10.2	U
Aroclor 1248	ug/kg	7.44	U
Aroclor 1254	ug/kg	7.17	U
Aroclor 1260	ug/kg	8.37	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-11		0.5 - 1.5	
		11/12/2008	
Aroclor 1016	ug/kg	4.14	U
Aroclor 1221	ug/kg	17.5	U
Aroclor 1232	ug/kg	6.64	U
Aroclor 1242	ug/kg	9.65	U
Aroclor 1248	ug/kg	7.02	U
Aroclor 1254	ug/kg	6.77	U
Aroclor 1260	ug/kg	7.89	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-10		0 - 0.5	
		11/12/2008	
Aroclor 1016	ug/kg	4.24	U
Aroclor 1221	ug/kg	18.0	U
Aroclor 1232	ug/kg	6.81	U
Aroclor 1242	ug/kg	9.90	U
Aroclor 1248	ug/kg	7.20	U
Aroclor 1254	ug/kg	6.94	U
Aroclor 1260	ug/kg	8.10	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-10		0.5 - 2	
		11/12/2008	
Aroclor 1016	ug/kg	3.77	U
Aroclor 1221	ug/kg	16.0	U
Aroclor 1232	ug/kg	6.05	U
Aroclor 1242	ug/kg	8.79	U
Aroclor 1248	ug/kg	6.39	U
Aroclor 1254	ug/kg	6.16	U
Aroclor 1260	ug/kg	7.19	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-9		0 - 0.5	
		11/12/2008	
Aroclor 1016	ug/kg	4.25	U
Aroclor 1221	ug/kg	18.0	U
Aroclor 1232	ug/kg	6.83	U
Aroclor 1242	ug/kg	9.92	U
Aroclor 1248	ug/kg	7.22	U
Aroclor 1254	ug/kg	6.96	U
Aroclor 1260	ug/kg	8.12	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-9		0.5 - 2	
		11/12/2008	
Aroclor 1016	ug/kg	4.02	U
Aroclor 1221	ug/kg	17.1	U
Aroclor 1232	ug/kg	6.46	U
Aroclor 1242	ug/kg	9.38	U
Aroclor 1248	ug/kg	6.82	U
Aroclor 1254	ug/kg	6.58	U
Aroclor 1260	ug/kg	7.67	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

SWSL-37		0.5 - 2	
		10/24/2006	
Aroclor 1016	ug/kg	3.8	U
Aroclor 1221	ug/kg	6.0	U
Aroclor 1232	ug/kg	3.8	U
Aroclor 1242	ug/kg	3.8	U
Aroclor 1248	ug/kg	3.8	U
Aroclor 1254	ug/kg	3.8	U
Aroclor 1260	ug/kg	3.8	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

SWSL-38		0.5 - 2	
		10/24/2006	
Aroclor 1016	ug/kg	3.8	U
Aroclor 1221	ug/kg	6.1	U
Aroclor 1232	ug/kg	3.8	U
Aroclor 1242	ug/kg	3.8	U
Aroclor 1248	ug/kg	3.8	U
Aroclor 1254	ug/kg	3.8	U
Aroclor 1260	ug/kg	3.8	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-7		0 - 0.5	
		11/12/2008	
Aroclor 1016	ug/kg	4.44	U
Aroclor 1221	ug/kg	18.8	U
Aroclor 1232	ug/kg	7.12	U
Aroclor 1242	ug/kg	10.3	U
Aroclor 1248	ug/kg	7.53	U
Aroclor 1254	ug/kg	7.26	U
Aroclor 1260	ug/kg	8.47	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-7		0.5 - 2	
		11/12/2008	
Aroclor 1016	ug/kg	4.08	U
Aroclor 1221	ug/kg	17.3	U
Aroclor 1232	ug/kg	6.55	U
Aroclor 1242	ug/kg	9.52	U
Aroclor 1248	ug/kg	6.92	U
Aroclor 1254	ug/kg	6.67	U
Aroclor 1260	ug/kg	7.79	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-8		0 - 0.5	
		11/12/2008	
Aroclor 1016	ug/kg	4.25	U
Aroclor 1221	ug/kg	18.0	U
Aroclor 1232	ug/kg	6.83	U
Aroclor 1242	ug/kg	9.92	U
Aroclor 1248	ug/kg	7.22	U
Aroclor 1254	ug/kg	6.96	U
Aroclor 1260	ug/kg	34.6	J
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-8		0.5 - 1	
		11/12/2008	
Aroclor 1016	ug/kg	4.34	U
Aroclor 1221	ug/kg	18.4	U
Aroclor 1232	ug/kg	6.97	U
Aroclor 1242	ug/kg	10.1	U
Aroclor 1248	ug/kg	7.37	U
Aroclor 1254	ug/kg	7.11	U
Aroclor 1260	ug/kg	19.4	J
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-6		0 - 0.5	
		11/12/2008	
Aroclor 1016	ug/kg	4.44	U
Aroclor 1221	ug/kg	18.8	U
Aroclor 1232	ug/kg	7.13	U
Aroclor 1242	ug/kg	10.4	U
Aroclor 1248	ug/kg	7.54	U
Aroclor 1254	ug/kg	7.27	U
Aroclor 1260	ug/kg	8.48	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-6		0.5 - 2	
		11/12/2008	
Aroclor 1016	ug/kg	4.07	U
Aroclor 1221	ug/kg	17.3	U
Aroclor 1232	ug/kg	6.54	U
Aroclor 1242	ug/kg	9.49	U
Aroclor 1248	ug/kg	6.91	U
Aroclor 1254	ug/kg	6.66	U
Aroclor 1260	ug/kg	7.77	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-5		0 - 0.5	
		11/12/2008	
Aroclor 1016	ug/kg	4.62	U
Aroclor 1221	ug/kg	19.6	U
Aroclor 1232	ug/kg	7.42	U
Aroclor 1242	ug/kg	10.8	U
Aroclor 1248	ug/kg	7.84	U
Aroclor 1254	ug/kg	7.56	U
Aroclor 1260	ug/kg	14.3	J
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-5		0.5 - 2	
		11/12/2008	
Aroclor 1016	ug/kg	3.98	U
Aroclor 1221	ug/kg	16.9	U
Aroclor 1232	ug/kg	6.39	U
Aroclor 1242	ug/kg	9.29	U
Aroclor 1248	ug/kg	6.76	U
Aroclor 1254	ug/kg	6.51	U
Aroclor 1260	ug/kg	7.60	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-4		0 - 0.5	
		11/12/2008	
Aroclor 1016	ug/kg	4.89	U
Aroclor 1221	ug/kg	20.7	U
Aroclor 1232	ug/kg	7.85	U
Aroclor 1242	ug/kg	11.4	U
Aroclor 1248	ug/kg	8.30	U
Aroclor 1254	ug/kg	8.00	U
Aroclor 1260	ug/kg	40.6	
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-4		0.5 - 2	
		11/12/2008	
Aroclor 1016	ug/kg	4.12	U
Aroclor 1221	ug/kg	17.5	U
Aroclor 1232	ug/kg	6.62	U
Aroclor 1242	ug/kg	9.61	U
Aroclor 1248	ug/kg	6.99	U
Aroclor 1254	ug/kg	6.74	U
Aroclor 1260	ug/kg	7.87	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-3		0 - 0.5	
		11/11/2008	
Aroclor 1016	ug/kg	3.71	U
Aroclor 1221	ug/kg	15.7	U
Aroclor 1232	ug/kg	5.96	U
Aroclor 1242	ug/kg	8.66	U
Aroclor 1248	ug/kg	6.30	U
Aroclor 1254	ug/kg	6.07	U
Aroclor 1260	ug/kg	7.09	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-3		0.5 - 2	
		11/11/2008	
Aroclor 1016	ug/kg	3.74	U
Aroclor 1221	ug/kg	15.9	U
Aroclor 1232	ug/kg	6.01	U
Aroclor 1242	ug/kg	8.73	U
Aroclor 1248	ug/kg	6.35	U
Aroclor 1254	ug/kg	6.12	U
Aroclor 1260	ug/kg	7.14	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-2		0 - 0.5	
		11/11/2008	
Aroclor 1016	ug/kg	3.74	U
Aroclor 1221	ug/kg	15.9	U
Aroclor 1232	ug/kg	6.01	U
Aroclor 1242	ug/kg	8.73	U
Aroclor 1248	ug/kg	6.35	U
Aroclor 1254	ug/kg	6.12	U
Aroclor 1260	ug/kg	7.14	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-2		0.5 - 2	
		11/11/2008	
Aroclor 1016	ug/kg	3.98	U
Aroclor 1221	ug/kg	16.9	U
Aroclor 1232	ug/kg	6.39	U
Aroclor 1242	ug/kg	9.29	U
Aroclor 1248	ug/kg	6.76	U
Aroclor 1254	ug/kg	6.51	U
Aroclor 1260	ug/kg	7.60	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-1		0 - 0.5	
		11/11/2008	
Aroclor 1016	ug/kg	4.15	U
Aroclor 1221	ug/kg	17.6	U
Aroclor 1232	ug/kg	6.67	U
Aroclor 1242	ug/kg	9.69	U
Aroclor 1248	ug/kg	7.04	U
Aroclor 1254	ug/kg	6.79	U
Aroclor 1260	ug/kg	7.92	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

CPGP-1		0.5 - 2	
		11/11/2008	
Aroclor 1016	ug/kg	3.78	U
Aroclor 1221	ug/kg	16.1	U
Aroclor 1232	ug/kg	6.08	U
Aroclor 1242	ug/kg	8.83	U
Aroclor 1248	ug/kg	6.42	U
Aroclor 1254	ug/kg	6.19	U
Aroclor 1260	ug/kg	7.22	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

ITMW-13		0 - 2	
		02/14/2000	
Aroclor 1016	ug/kg	21	U
Aroclor 1221	ug/kg	21	U
Aroclor 1232	ug/kg	21	U
Aroclor 1242	ug/kg	21	U
Aroclor 1248	ug/kg	21	U
Aroclor 1254	ug/kg	21	U
Aroclor 1260	ug/kg	21	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

ITMW-14		0 - 2	
		02/14/2000	
Aroclor 1016	ug/kg	19	U
Aroclor 1221	ug/kg	19	U
Aroclor 1232	ug/kg	19	U
Aroclor 1242	ug/kg	19	U
Aroclor 1248	ug/kg	19	U
Aroclor 1254	ug/kg	19	U
Aroclor 1260	ug/kg	19	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

ITMW-14		5 - 7	
		02/14/2000	
Aroclor 1016	ug/kg	18	U
Aroclor 1221	ug/kg	18	U
Aroclor 1232	ug/kg	18	U
Aroclor 1242	ug/kg	18	U
Aroclor 1248	ug/kg	18	U
Aroclor 1254	ug/kg	18	U
Aroclor 1260	ug/kg	18	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

ITMW-15		0 - 2	
		02/15/2000	
Aroclor 1016	ug/kg	20	U
Aroclor 1221	ug/kg	20	U
Aroclor 1232	ug/kg	20	U
Aroclor 1242	ug/kg	20	U
Aroclor 1248	ug/kg	20	U
Aroclor 1254	ug/kg	20	U
Aroclor 1260	ug/kg	20	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

ITMW-15		5 - 7	
		02/15/2000	
Aroclor 1016	ug/kg	18	U
Aroclor 1221	ug/kg	18	U
Aroclor 1232	ug/kg	18	U
Aroclor 1242	ug/kg	18	U
Aroclor 1248	ug/kg	18	U
Aroclor 1254	ug/kg	18	U
Aroclor 1260	ug/kg	18	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

SWSL-36		0.5 - 2	
		10/24/2006	
Aroclor 1016	ug/kg	3.6	U
Aroclor 1221	ug/kg	5.6	U
Aroclor 1232	ug/kg	3.6	U
Aroclor 1242	ug/kg	3.6	U
Aroclor 1248	ug/kg	3.6	U
Aroclor 1254	ug/kg	3.6	U
Aroclor 1260	ug/kg	3.6	U
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

SWSL-35		0.5 - 2	
		10/24/2006	
Aroclor 1016	ug/kg	3.6	U
Aroclor 1221	ug/kg	5.7	U
Aroclor 1232	ug/kg	3.6	U
Aroclor 1242	ug/kg	3.6	U
Aroclor 1248	ug/kg	3.6	U
Aroclor 1254	ug/kg	3.6	U
Aroclor 1260	ug/kg	9.7	J
Aroclor 1262	ug/kg	NA	NA
Aroclor 1268	ug/kg	NA	NA
Polychlorinated biphenyls	ug/kg	NA	NA

Location ID		
Start Depth - End Depth (ft)		
Date Sampled		6 NYCRR Part 375-6.8(b) Residential
Aroclor 1016	ug/kg	1000.0 ug/kg
Aroclor 1221	ug/kg	1000.0 ug/kg
Aroclor 1232	ug/kg	1000.0 ug/kg
Aroclor 1242	ug/kg	1000.0 ug/kg
Aroclor 1248	ug/kg	1000.0 ug/kg
Aroclor 1254	ug/kg	1000.0 ug/kg
Aroclor 1260	ug/kg	1000.0 ug/kg
Aroclor 1262	ug/kg	NS
Aroclor 1268	ug/kg	NS
Polychlorinated biphenyls	ug/kg	1000.0 ug/kg

Main Facility Parcel, OU-1A
Church Property Parcel, OU-1B
Former Washington Avenue Tank Farm Parcel, OU-1C
Residential Property Parcel, OU-1D
The Back 93 Acres Parcel, OU-1E
Fishkill Creek, OU-1F
Parcel OU-2
Residential Property Parcel, OU-3
Parcel -Modified, OU-4
Soil Boring (Soil Boring Completed to Date)(1)
Proposed Soil Boring

(DUP)=Duplicate

(1) Only Soil boring locations shown on figure where PCBs were sampled for.

ug/Kg=micrograms per kilogram

0 100 200 400 600 Feet

PARSONS

301 Plainfield Road, Suite 350; Syracuse, NY 13212 315-451-9560

Polychlorinated Biphenyls (PCBs) Analytical Data Summary Map (Main Facility) Former Texaco Research Center Beacon New York

Figure 3.9

1:2,000 | C. Oneal | CHK'D | APR'D | DATE: 2/13/2017

Path: D:\GIS\Chevron\MXD\2016\112016\MainCampus_PCB_v3.mxd

		CPGP-15		CPGP-15	
		0 - 0.5		0.5 - 2	
		11/12/2008		11/12/2008	
4,4-DDD	ug/kg	0.46	U	0.41	U
4,4-DDE	ug/kg	18		2.2	
4,4-DDT	ug/kg	8.2		0.93	J
Aldrin	ug/kg	0.46	U	0.41	U
alpha BHC	ug/kg	0.23	U	0.21	U
alpha Chlordane	ug/kg	0.23	U	0.21	U
beta BHC	ug/kg	0.26	U	0.23	U
Chlordane Gamma	ug/kg	NA	NA	NA	NA
delta BHC	ug/kg	0.43	U	0.38	U
DIELDRIN	ug/kg	0.46	U	0.41	U
Endosulfan I	ug/kg	0.30	U	0.27	U
Endosulfan II	ug/kg	0.46	U	0.41	U
ENDOSULFAN SULFATE	ug/kg	0.46	U	0.41	U
ENDRIN	ug/kg	0.46	U	0.41	U
ENDRIN ALDEHYDE	ug/kg	0.46	U	0.41	U
ENDRIN KETONE	ug/kg	0.46	U	0.41	U
gamma BHC (Lindane)	ug/kg	0.23	U	0.21	U
gamma Chlordane	ug/kg	0.23	U	0.21	U
HEPTACHLOR	ug/kg	0.23	U	0.21	U
HEPTACHLOR EPOXIDE	ug/kg	0.23	U	0.21	U
METHOXYCHLOR	ug/kg	2.3	U	2.1	U
TOXAPHENE	ug/kg	15	U	14	U

		CPGP-14		CPGP-14	
		0 - 0.5		0.5 - 2	
		11/12/2008		11/12/2008	
4,4-DDD	ug/kg	0.47	U	0.41	U
4,4-DDE	ug/kg	41		5.3	
4,4-DDT	ug/kg	42		2.6	
Aldrin	ug/kg	0.47	U	0.41	U
alpha BHC	ug/kg	0.24	U	0.21	U
alpha Chlordane	ug/kg	0.60	J	0.21	U
beta BHC	ug/kg	0.27	U	0.23	U
Chlordane Gamma	ug/kg	NA	NA	NA	NA
delta BHC	ug/kg	0.44	U	0.38	U
DIELDRIN	ug/kg	4.1		0.41	U
Endosulfan I	ug/kg	0.31	U	0.27	U
Endosulfan II	ug/kg	0.47	U	0.41	U
ENDOSULFAN SULFATE	ug/kg	1.1	J	0.41	U
ENDRIN	ug/kg	0.47	U	0.41	U
ENDRIN ALDEHYDE	ug/kg	2.1	J	0.41	U
ENDRIN KETONE	ug/kg	0.47	U	0.41	U
gamma BHC (Lindane)	ug/kg	0.24	U	0.21	U
gamma Chlordane	ug/kg	0.24	U	0.21	U
HEPTACHLOR	ug/kg	0.24	U	0.21	U
HEPTACHLOR EPOXIDE	ug/kg	0.24	U	0.21	U
METHOXYCHLOR	ug/kg	2.4	U	2.1	U
TOXAPHENE	ug/kg	16	U	14	U

		CPGP-16		CPGP-16	
		0 - 0.5		0.5 - 2	
		11/12/2008		11/12/2008	
4,4-DDD	ug/kg	0.92	U	0.42	U
4,4-DDE	ug/kg	22		1.6	J
4,4-DDT	ug/kg	48		2.7	
Aldrin	ug/kg	0.92	U	0.42	U
alpha BHC	ug/kg	0.47	U	0.22	U
alpha Chlordane	ug/kg	0.84	J	0.22	U
beta BHC	ug/kg	0.53	U	0.24	U
Chlordane Gamma	ug/kg	NA	NA	NA	NA
delta BHC	ug/kg	0.86	U	0.39	U
DIELDRIN	ug/kg	0.92	U	0.42	U
Endosulfan I	ug/kg	0.61	U	0.28	U
Endosulfan II	ug/kg	0.92	U	0.42	U
ENDOSULFAN SULFATE	ug/kg	0.92	U	0.42	U
ENDRIN	ug/kg	0.92	U	0.42	U
ENDRIN ALDEHYDE	ug/kg	0.92	U	0.42	U
ENDRIN KETONE	ug/kg	0.92	U	0.42	U
gamma BHC (Lindane)	ug/kg	0.47	U	0.22	U
gamma Chlordane	ug/kg	0.47	U	0.22	U
HEPTACHLOR	ug/kg	0.47	U	0.22	U
HEPTACHLOR EPOXIDE	ug/kg	0.47	U	0.22	U
METHOXYCHLOR	ug/kg	4.7	U	2.2	U
TOXAPHENE	ug/kg	31	U	14	U

		CPGP-17	
		0.5 - 2	
		11/12/2008	
4,4-DDD	ug/kg	0.41	U
4,4-DDE	ug/kg	0.51	J
4,4-DDT	ug/kg	1.2	J
Aldrin	ug/kg	0.41	U
alpha BHC	ug/kg	0.21	U
alpha Chlordane	ug/kg	0.21	U
beta BHC	ug/kg	0.24	U
Chlordane Gamma	ug/kg	NA	NA
delta BHC	ug/kg	0.39	U
DIELDRIN	ug/kg	0.41	U
Endosulfan I	ug/kg	0.27	U
Endosulfan II	ug/kg	0.41	U
ENDOSULFAN SULFATE	ug/kg	0.41	U
ENDRIN	ug/kg	0.41	U
ENDRIN ALDEHYDE	ug/kg	0.41	U
ENDRIN KETONE	ug/kg	0.41	U
gamma BHC (Lindane)	ug/kg	0.21	U
gamma Chlordane	ug/kg	0.21	U
HEPTACHLOR	ug/kg	0.21	U
HEPTACHLOR EPOXIDE	ug/kg	0.21	U
METHOXYCHLOR	ug/kg	2.1	U
TOXAPHENE	ug/kg	14	U

		CPGP-13	
		0 - 0.5	
		11/12/2008	
4,4-DDD	ug/kg	0.49	U
4,4-DDE	ug/kg	2.3	J
4,4-DDT	ug/kg	3.7	
Aldrin	ug/kg	0.49	U
alpha BHC	ug/kg	0.25	U
alpha Chlordane	ug/kg	0.25	U
beta BHC	ug/kg	0.28	U
Chlordane Gamma	ug/kg	NA	NA
delta BHC	ug/kg	0.46	U
DIELDRIN	ug/kg	0.49	U
Endosulfan I	ug/kg	0.32	U
Endosulfan II	ug/kg	0.49	U
ENDOSULFAN SULFATE	ug/kg	0.49	U
ENDRIN	ug/kg	0.49	U
ENDRIN ALDEHYDE	ug/kg	0.49	U
ENDRIN KETONE	ug/kg	0.49	U
gamma BHC (Lindane)	ug/kg	0.25	U
gamma Chlordane	ug/kg	0.25	U
HEPTACHLOR	ug/kg	0.25	U
HEPTACHLOR EPOXIDE	ug/kg	0.25	U
METHOXYCHLOR	ug/kg	2.5	U
TOXAPHENE	ug/kg	16	U

		CPGP-12		CPGP-12	
		0 - 0.5		0.5 - 2	
		11/12/2008		11/12/2008	
4,4-DDD	ug/kg	0.44	U	0.40	U
4,4-DDE	ug/kg	4.1		0.95	J
4,4-DDT	ug/kg	6.9		0.99	J
Aldrin	ug/kg	0.44	U	0.40	U
alpha BHC	ug/kg	0.23	U	0.21	U
alpha Chlordane	ug/kg	0.23	U	0.21	U
beta BHC	ug/kg	0.25	U	0.23	U
Chlordane Gamma	ug/kg	NA	NA	NA	NA
delta BHC	ug/kg	0.41	U	0.37	U
DIELDRIN	ug/kg	0.55	J	0.40	U
Endosulfan I	ug/kg	0.29	U	0.27	U
Endosulfan II	ug/kg	0.44	U	0.40	U
ENDOSULFAN SULFATE	ug/kg	0.44	U	0.40	U
ENDRIN	ug/kg	0.44	U	0.40	U
ENDRIN ALDEHYDE	ug/kg	0.44	U	0.40	U
ENDRIN KETONE	ug/kg	0.44	U	0.40	U
gamma BHC (Lindane)	ug/kg	0.23	U	0.21	U
gamma Chlordane	ug/kg	0.23	U	0.21	U
HEPTACHLOR	ug/kg	0.23	U	0.21	U
HEPTACHLOR EPOXIDE	ug/kg	0.23	U	0.21	U
METHOXYCHLOR	ug/kg	2.3	U	2.1	U
TOXAPHENE	ug/kg	15	U	13	U

		CPGP-11		CPGP-11 (DUP)		CPGP-11	
		0 - 0.5		0 - 0.5		0.5 - 1.5	
		11/12/2008		11/12/2008		11/12/2008	
4,4-DDD	ug/kg	0.43	U	0.64	J	0.41	U
4,4-DDE	ug/kg	11		12		4.1	
4,4-DDT	ug/kg	13		15		3.2	
Aldrin	ug/kg	0.43	U	0.44	U	0.41	U
alpha BHC	ug/kg	0.22	U	0.23	U	0.21	U
alpha Chlordane	ug/kg	0.25	J	0.23	U	0.21	U
beta BHC	ug/kg	0.25	U	0.25	U	0.24	U
Chlordane Gamma	ug/kg	NA	NA	NA	NA	NA	NA
delta BHC	ug/kg	0.40	U	0.41	U	0.39	U
DIELDRIN	ug/kg	0.43	U	0.44	U	0.41	U
Endosulfan I	ug/kg	0.29	U	0.29	U	0.28	U
Endosulfan II	ug/kg	0.43	U	0.44	U	0.41	U
ENDOSULFAN SULFATE	ug/kg	0.43	U	0.44	U	0.41	U
ENDRIN	ug/kg	0.43	U	0.44	U	0.41	U
ENDRIN ALDEHYDE	ug/kg	0.43	U	0.44	U	0.41	U
ENDRIN KETONE	ug/kg	0.43	U	0.66	J	0.41	U
gamma BHC (Lindane)	ug/kg	0.22	U	0.23	U	0.21	U
gamma Chlordane	ug/kg	0.22	U	0.23	U	0.21	U
HEPTACHLOR	ug/kg	0.22	U	0.23	U	0.21	U
HEPTACHLOR EPOXIDE	ug/kg	0.22	U	0.23	U	0.21	U
METHOXYCHLOR	ug/kg	2.2	U	2.3	U	2.1	U
TOXAPHENE	ug/kg	14	U	15	U	14	U

		CPGP-10		CPGP-10 (DUP)	
		0 - 0.5		0.5 - 2	
		11/12/2008		11/12/2008	
4,4-DDD	ug/kg	0.42	U	0.38	U
4,4-DDE	ug/kg	7.4		0.94	J
4,4-DDT	ug/kg	6.9		0.93	J
Aldrin	ug/kg	0.42	U	0.38	U
alpha BHC	ug/kg	0.22	U	0.19	U
alpha Chlordane	ug/kg	0.22	U	0.19	U
beta BHC	ug/kg	0.24	U	0.22	U
Chlordane Gamma	ug/kg	NA	NA	NA	NA
delta BHC	ug/kg	0.40	U	0.35	U
DIELDRIN	ug/kg	0.42	U	0.38	U
Endosulfan I	ug/kg	0.28	U	0.25	U
Endosulfan II	ug/kg	0.42	U	0.38	U
ENDOSULFAN SULFATE	ug/kg	0.42	U	0.38	U
ENDRIN	ug/kg	0.42	U	0.38	U
ENDRIN ALDEHYDE	ug/kg	0.42	U	0.38	U
ENDRIN KETONE	ug/kg	0.42	U	0.38	U
gamma BHC (Lindane)	ug/kg	0.22	U	0.19	U
gamma Chlordane	ug/kg	0.22	U	0.19	U
HEPTACHLOR	ug/kg	0.22	U	0.19	U
HEPTACHLOR EPOXIDE	ug/kg	0.22	U	0.19	U
METHOXYCHLOR	ug/kg	2.2	U	1.9	U
TOXAPHENE	ug/kg	14	U	13	U

		CPGP-9		CPGP-9	
		0 - 0.5		0.5 - 2	
		11/12/2008		11/12/2008	
4,4-DDD	ug/kg	0.85	U	0.40	U
4,4-DDE	ug/kg	43		8.1	
4,4-DDT	ug/kg	13		1.9	J
Aldrin	ug/kg	0.85	U	0.40	U
alpha BHC	ug/kg	0.44	U	0.21	U
alpha Chlordane	ug/kg	0.44	U	0.21	U
beta BHC	ug/kg	0.49	U	0.23	U
Chlordane Gamma	ug/kg	NA	NA	NA	NA
delta BHC	ug/kg	0.80	U	0.38	U
DIELDRIN	ug/kg	0.85	U	0.40	U
Endosulfan I	ug/kg	0.57	U	0.27	U
Endosulfan II	ug/kg	0.85	U	0.40	U
ENDOSULFAN SULFATE	ug/kg	0.85	U	0.40	U
ENDRIN	ug/kg	0.85	U	0.40	U
ENDRIN ALDEHYDE	ug/kg	0.85	U	0.40	U
ENDRIN KETONE	ug/kg	0.85	U	0.40	U
gamma BHC (Lindane)	ug/kg	0.44	U	0.21	U
gamma Chlordane	ug/kg	0.44	U	0.21	U
HEPTACHLOR	ug/kg	0.44	U	0.21	U
HEPTACHLOR EPOXIDE	ug/kg	0.44	U	0.21	U
METHOXYCHLOR	ug/kg	4.4	U	2.1	U
TOXAPHENE	ug/kg	28	U	13	U

		CPGP-6		CPGP-6	
		0 - 0.5		0.5 - 2	
		11/12/2008		11/12/2008	
4,4-DDD	ug/kg	0.44	UJ	0.41	U
4,4-DDE	ug/kg	4.9	J	0.41	U
4,4-DDT	ug/kg	4.2	J	0.41	U
Aldrin	ug/kg	0.44	UJ	0.41	U
alpha BHC	ug/kg	0.23	UJ	0.21	U
alpha Chlordane	ug/kg	0.23	UJ	0.21	U
beta BHC	ug/kg	0.26	UJ	0.23	U
Chlordane Gamma	ug/kg	NA	NA	NA	NA
delta BHC	ug/kg	0.42	UJ	0.38	U
DIELDRIN	ug/kg	0.44	UJ	0.41	U
Endosulfan I	ug/kg	0.30	UJ	0.27	U
Endosulfan II	ug/kg	0.44	UJ	0.41	U
ENDOSULFAN SULFATE	ug/kg	0.44	UJ	0.41	U
ENDRIN	ug/kg	0.44	UJ	0.41	U
ENDRIN ALDEHYDE	ug/kg	0.44	UJ	0.41	U
ENDRIN KETONE	ug/kg	0.44	UJ	0.41	U
gamma BHC (Lindane)	ug/kg	0.23	UJ	0.21	U
gamma Chlordane	ug/kg	0.23	UJ	0.21	U
HEPTACHLOR	ug/kg	0.23	UJ	0.21	U
HEPTACHLOR EPOXIDE	ug/kg	0.23	UJ	0.21	U
METHOXYCHLOR	ug/kg	2.3	UJ	2.1	U
TOXAPHENE	ug/kg	15	UJ	14	U

		CPGP-8		CPGP-8	
		0 - 0.5		0.5 - 1	
		11/12/2008		11/12/2008	
4,4-DDD	ug/kg	4.6		6.1	J
4,4-DDE	ug/kg	59		47	J
4,4-DDT	ug/kg	60		73	J
Aldrin	ug/kg	0.85	U	0.43	U
alpha BHC	ug/kg	0.44	U	0.22	U
alpha Chlordane	ug/kg	0.97	J	1.7	J
beta BHC	ug/kg	0.49	U	0.25	U
Chlordane Gamma	ug/kg	NA	NA	NA	NA
delta BHC	ug/kg	0.80	U	0.41	U
DIELDRIN	ug/kg	2.0	J	2.6	
Endosulfan I	ug/kg	0.57	U	0.29	U
Endosulfan II	ug/kg	0.85	U	0.43	U
ENDOSULFAN SULFATE	ug/kg	0.85	U	0.43	U
ENDRIN	ug/kg	0.85	U	0.43	U
ENDRIN ALDEHYDE	ug/kg	0.85	U	0.43	U
ENDRIN KETONE	ug/kg	0.85	U	0.43	U
gamma BHC (Lindane)	ug/kg	0.44	U	0.22	U
gamma Chlordane	ug/kg	1.4	J	2.0	J
HEPTACHLOR	ug/kg	0.44	U	0.22	U
HEPTACHLOR EPOXIDE	ug/kg	0.61	J	0.48	J
METHOXYCHLOR	ug/kg	4.4	U	2.2	U
TOXAPHENE	ug/kg	28	U	14	U

		CPGP-3		CPGP-3	
		0 - 0.5		0.5 - 2	
		11/11/2008		11/11/2008	
4,4-DDD	ug/kg	0.37	U	1.0	J
4,4-DDE	ug/kg	1.4	J	0.37	U
4,4-DDT	ug/kg	2.2		0.37	U
Aldrin	ug/kg	0.37	U	0.37	U
alpha BHC	ug/kg	0.19	U	0.19	U
alpha Chlordane	ug/kg	0.19	U	0.19	U
beta BHC	ug/kg	0.21	U	0.22	U
Chlordane Gamma	ug/kg	NA	NA	NA	NA
delta BHC	ug/kg	0.35	U	0.35	U
DIELDRIN	ug/kg	0.37	U	0.37	U
Endosulfan I	ug/kg	0.25	U	0.25	U
Endosulfan II	ug/kg	0.37	U	0.37	U
ENDOSULFAN SULFATE	ug/kg	0.37	U	0.37	U
ENDRIN	ug/kg	0.37	U	0.72	J
ENDRIN ALDEHYDE	ug/kg	0.37	U	0.37	U
ENDRIN KETONE	ug/kg	0.37	U	0.37	U
gamma BHC (Lindane)	ug/kg	0.19	U	0.19	U
gamma Chlordane	ug/kg	0.19	U	0.19	U
HEPTACHLOR	ug/kg	0.19	U	0.19	U
HEPTACHLOR EPOXIDE	ug/kg	0.19	U	0.19	U
METHOXYCHLOR	ug/kg	1.9	U	1.9	U
TOXAPHENE	ug/kg	12	U	12	U

		CPGP-2		CPGP-2	
		0 - 0.5		0.5 - 2	
		11/11/2008		11/11/2008	
4,4-DDD	ug/kg	0.37	U	0.40	U
4,4-DDE	ug/kg	3.6		0.40	U
4,4-DDT	ug/kg	4.0		0.40	U
Aldrin	ug/kg	0.37	U	0.40	U
alpha BHC	ug/kg	0.19	U	0.21	U
alpha Chlordane	ug/kg	0.19	U	0.21	U
beta BHC	ug/kg	0.22	U	0.23	U
Chlordane Gamma	ug/kg	NA	NA	NA	NA
delta BHC	ug/kg	0.35	U	0.37	U
DIELDRIN	ug/kg	0.37	U	0.40	U
Endosulfan I	ug/kg	0.25	U	0.27	U
Endosulfan II	ug/kg	0.37	U	0.40	U
ENDOSULFAN SULFATE	ug/kg	0.37	U	0.40	U
ENDRIN	ug/kg	0.37	U	0.40	U
ENDRIN ALDEHYDE	ug/kg	0.37	U	0.40	U
ENDRIN KETONE	ug/kg	0.37	U	0.40	U
gamma BHC (Lindane)	ug/kg	0.19	U	0.21	U
gamma Chlordane	ug/kg	0.19	U	0.21	U
HEPTACHLOR	ug/kg	0.19	U	0.21	U
HEPTACHLOR EPOXIDE	ug/kg	0.19	U	0.21	U
METHOXYCHLOR	ug/kg	1.9	U	2.1	U
TOXAPHENE	ug/kg	12	U	13	U

		CPGP-7		CPGP-7	
		0 - 0.5		0.5 - 2	
		11/12/2008		11/12/2008	
4,4-DDD	ug/kg	0.44	U	0.41	U
4,4-DDE	ug/kg	8.3		0.49	J
4,4-DDT	ug/kg	7.0		0.41	U
Aldrin	ug/kg	0.44	U	0.41	U
alpha BHC	ug/kg	0.23	U	0.21	U
alpha Chlordane	ug/kg	0.23	U	0.21	U
beta BHC	ug/kg	0.26	U	0.23	U
Chlordane Gamma	ug/kg	NA	NA	NA	NA
delta BHC	ug/kg	0.42	U	0.38	U
DIELDRIN	ug/kg	0.44	U	0.41	U
Endosulfan I	ug/kg	0.30	U	0.27	U
Endosulfan II	ug/kg	0.44	U	0.41	U
ENDOSULFAN SULFATE	ug/kg	0.44	U	0.41	U
ENDRIN	ug/kg	0.44	U	0.41	U
ENDRIN ALDEHYDE	ug/kg	0.44	U	0.41	U
ENDRIN KETONE	ug/kg	0.44	U	0.41	U
gamma BHC (Lindane)	ug/kg	0.23	U	0.21	U
gamma Chlordane	ug/kg	0.23	U	0.21	U
HEPTACHLOR	ug/kg	0.23	U	0.21	U
HEPTACHLOR EPOXIDE	ug/kg	0.23	U	0.21	U
METHOXYCHLOR	ug/kg	2.3	U	2.1	U
TOXAPHENE	ug/kg	15	U	14	U

		CPGP-1		CPGP-1	
		0 - 0.5		0.5 - 2	
		11/11/2008		11/11/2008	
4,4-DDD	ug/kg	1.0	J	2.4	J
4,4-DDE	ug/kg	28		44	
4,4-DDT	ug/kg	28		26	
Aldrin	ug/kg	0.83	U	0.76	U
alpha BHC	ug/kg	0.43	U	0.39	U
alpha Chlordane	ug/kg	0.43	U	0.39	U
beta BHC	ug/kg	0.48	U	0.44	U
Chlordane Gamma	ug/kg	NA	NA	NA	NA
delta BHC	ug/kg	0.78	U	0.71	U
DIELDRIN	ug/kg	0.83	U	0.76	U
Endosulfan I	ug/kg	0.55	U	0.50	U
Endosulfan II	ug/kg	0.83	U	0.76	U
ENDOSULFAN SULFATE	ug/kg	0.83	U	0.76	U
ENDRIN	ug/kg	0.83	U	0.76	U
ENDRIN ALDEHYDE	ug/kg	0.83	U	1.1	J
ENDRIN KETONE	ug/kg	0.83	U	0.76	U
gamma BHC (Lindane)	ug/kg	0.43	U	0.39	U
gamma Chlordane	ug/kg	0.43	U	0.39	U
HEPTACHLOR	ug/kg	0.43	U	0.39	U
HEPTACHLOR EPOXIDE	ug/kg	0.43	U	0.39	U
METHOXYCHLOR	ug/kg	4.3	U	3.9	U
TOXAPHENE	ug/kg	28	U	25	U

		CPGP-4		CPGP-4	
		0 - 0.5		0.5 - 2	
		11/12/2008		11/12/2008	
4,4-DDD	ug/kg	1.2	J	0.41	U
4,4-DDE	ug/kg	50		0.41	U
4,4-DDT	ug/kg	36		0.41	U
Aldrin	ug/kg	0.98	U	0.41	U
alpha BHC	ug/kg	0.50	U	0.21	U
alpha Chlordane	ug/kg	0.50	U	0.21	U
beta BHC	ug/kg	0.56	U	0.24	U
Chlordane Gamma	ug/kg	NA	NA	NA	NA
delta BHC	ug/kg	0.92	U	0.39	U
DIELDRIN	ug/kg	2.0	J	0.41	U
Endosulfan I	ug/kg	0.65	U	0.27	U
Endosulfan II	ug/kg	0.98	U	0.41	U
ENDOSULFAN SULFATE	ug/kg	0.98	U	0.41	U
ENDRIN	ug/kg	0.98	U	0.41	U
ENDRIN ALDEHYDE	ug/kg	0.98	U	0.41	U
ENDRIN KETONE	ug/kg	0.98	U	0.41	U
gamma BHC (Lindane)	ug/kg	0.50	U	0.21	U
gamma Chlordane	ug/kg	0.50	U	0.21	U
HEPTACHLOR	ug/kg	0.50	U	0.21	U
HEPTACHLOR EPOXIDE	ug/kg	0.50	U	0.21	U
METHOXYCHLOR	ug/kg	5.0	U	2.1	U
TOXAPHENE	ug/kg	33	U	14	U

		CPGP-5		CPGP-5	
		0 - 0.5		0.5 - 2	
		11/12/2008		11/12/2008	
4,4-DDD	ug/kg	0.46	UJ	0.40	U
4,4-DDE	ug/kg	7.6	J	1.0	J
4,4-DDT	ug/kg	9.4	J	0.60	J
Aldrin	ug/kg	0.46	UJ	0.40	U
alpha BHC	ug/kg	0.24	UJ	0.21	U
alpha Chlordane	ug/kg	0.24	UJ	0.21	U
beta BHC	ug/kg	0.41	J	0.23	U
Chlordane Gamma	ug/kg	NA	NA	NA	NA
delta BHC	ug/kg	0.43	UJ	0.37	U
DIELDRIN	ug/kg	0.46	UJ	0.40	U
Endosulfan I	ug/kg	0.31	UJ	0.27	U
Endosulfan II	ug/kg	0.46	UJ	0.40	U
ENDOSULFAN SULFATE	ug/kg	0.46	UJ	0.40	U
ENDRIN	ug/kg	0.46	UJ	0.40	U
ENDRIN ALDEHYDE	ug/kg	0.46	UJ	0.40	U
ENDRIN KETONE	ug/kg	0.46	UJ	0.40	U
gamma BHC (Lindane)	ug/kg	0.24	UJ	0.21	U
gamma Chlordane	ug/kg	0.24	UJ	0.21	U
HEPTACHLOR	ug/kg	0.24	UJ	0.21	U
HEPTACHLOR EPOXIDE	ug/kg	0.24	UJ	0.21	U
METHOXYCHLOR	ug/kg	2.4	UJ	2.1	U
TOXAPHENE	ug/kg	15	UJ	13	U

Location ID		
Start Depth - End Depth (ft)		
Date Sampled		6 NYCRR Part 375-6.8(b) Residential
4,4-DDD	ug/kg	2600.0 ug/kg
4,4-DDE	ug/kg	1800.0 ug/kg
4,4-DDT	ug/kg	1700.0 ug/kg
Aldrin	ug/kg	19.0 ug/kg
alpha BHC	ug/kg	97.0 ug/kg
alpha Chlordane	ug/kg	910.0 ug/kg
beta BHC	ug/kg	72.0 ug/kg
Chlordane Gamma	ug/kg	NS
delta BHC	ug/kg	100000.0 ug/kg
DIELDRIN	ug/kg	39.0 ug/kg
Endosulfan I	ug/kg	4800.0 ug/kg
Endosulfan II	ug/kg	4800.0 ug/kg
ENDOSULFAN SULFATE	ug/kg	4800.0 ug/kg
ENDRIN	ug/kg	2200.0 ug/kg
ENDRIN ALDEHYDE	ug/kg	NS
ENDRIN KETONE	ug/kg	NS
gamma BHC (Lindane)	ug/kg	280.0 ug/kg
gamma Chlordane	ug/kg	NS
HEPTACHLOR	ug/kg	420.0 ug/kg
HEPTACHLOR EPOXIDE	ug/kg	NS
METHOXYCHLOR	ug/kg	NS
TOXAPHENE	ug/kg	NS

Main Facility Parcel, OU-1A
Church Property Parcel, OU-1B
Former Washington Avenue Tank Farm Parcel, OU-1C
Residential Property Parcel, OU-1D
The Back 93 Acres Parcel, OU-1E
Fishkill Creek, OU-1F
Parcel OU-2
Residential Property Parcel, OU-3
Parcel -Modified, OU-4
Soil Boring (Soil Boring Completed to Date)(1)
Proposed Soil Boring

(DUP)=Duplicate

(1)Only soil boring locations shown on figure where pesicides were sampled for.

ug/Kg=micrgram per kilogram

Parameter that exceeded the lowest NYSDEC 6NYCRR Part 375 Soil Cleanup Criteria.

0 100 200 400 600 Feet

Path: D:\GIS\Chevron\MXD\2016\112016\MainCampus_Pest_V3.mxd

PARSONS

301 Plainfield Road, Suite 350; Syracuse, NY 13212 315-451-9560

Pesticides Analytical Data Summary Map
(Main Facility)
Former Texaco Research Center
Beacon New York

Figure 3.10

1:2,000 | C. Oneal | CHKD: | APRD:

DATE: 2/13/2017

		TR11_C
		0 - 0.5
		09/11/2014
Aroclor 1016	ug/kg	4 U
Aroclor 1221	ug/kg	5.1 U
Aroclor 1232	ug/kg	8.9 U
Aroclor 1242	ug/kg	3.7 U
Aroclor 1248	ug/kg	3.7 U
Aroclor 1254	ug/kg	3.7 U
Aroclor 1260	ug/kg	5.4 U
Aroclor 1262	ug/kg	3.7 U
Aroclor 1268	ug/kg	3.7 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR11_C
		0.5 - 1
		09/11/2014
Aroclor 1016	ug/kg	3.9 U
Aroclor 1221	ug/kg	5 U
Aroclor 1232	ug/kg	8.7 U
Aroclor 1242	ug/kg	3.6 U
Aroclor 1248	ug/kg	3.6 U
Aroclor 1254	ug/kg	3.6 U
Aroclor 1260	ug/kg	5.4 U
Aroclor 1262	ug/kg	3.6 U
Aroclor 1268	ug/kg	3.6 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR11_C
		1 - 2
		09/11/2014
Aroclor 1016	ug/kg	4.3 U
Aroclor 1221	ug/kg	5.4 U
Aroclor 1232	ug/kg	9.5 U
Aroclor 1242	ug/kg	3.9 U
Aroclor 1248	ug/kg	3.9 U
Aroclor 1254	ug/kg	3.9 U
Aroclor 1260	ug/kg	5.8 U
Aroclor 1262	ug/kg	3.9 U
Aroclor 1268	ug/kg	3.9 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR10_A
		0 - 0.5
		09/10/2014
Aroclor 1016	ug/kg	4.7 U
Aroclor 1221	ug/kg	6 U
Aroclor 1232	ug/kg	10 U
Aroclor 1242	ug/kg	4.3 U
Aroclor 1248	ug/kg	4.3 U
Aroclor 1254	ug/kg	4.3 U
Aroclor 1260	ug/kg	6.4 U
Aroclor 1262	ug/kg	4.3 U
Aroclor 1268	ug/kg	4.3 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR10_A
		0.5 - 1
		09/10/2014
Aroclor 1016	ug/kg	4.5 U
Aroclor 1221	ug/kg	5.8 U
Aroclor 1232	ug/kg	10 U
Aroclor 1242	ug/kg	4.2 U
Aroclor 1248	ug/kg	4.2 U
Aroclor 1254	ug/kg	4.2 U
Aroclor 1260	ug/kg	6.2 U
Aroclor 1262	ug/kg	4.2 U
Aroclor 1268	ug/kg	4.2 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR10_A
		1 - 2
		09/10/2014
Aroclor 1016	ug/kg	4.5 U
Aroclor 1221	ug/kg	5.7 U
Aroclor 1232	ug/kg	10 U
Aroclor 1242	ug/kg	4.1 U
Aroclor 1248	ug/kg	4.1 U
Aroclor 1254	ug/kg	4.1 U
Aroclor 1260	ug/kg	6.1 U
Aroclor 1262	ug/kg	4.1 U
Aroclor 1268	ug/kg	4.1 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR10_A (DUP)
		1 - 2
		09/10/2014
Aroclor 1016	ug/kg	4.7 U
Aroclor 1221	ug/kg	5.9 U
Aroclor 1232	ug/kg	10 U
Aroclor 1242	ug/kg	4.3 U
Aroclor 1248	ug/kg	4.3 U
Aroclor 1254	ug/kg	4.3 U
Aroclor 1260	ug/kg	6.3 U
Aroclor 1262	ug/kg	4.3 U
Aroclor 1268	ug/kg	4.3 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR07_D
		0 - 0.5
		08/25/2014
Aroclor 1016	ug/kg	5 U
Aroclor 1221	ug/kg	6.4 U
Aroclor 1232	ug/kg	11 U
Aroclor 1242	ug/kg	4.6 U
Aroclor 1248	ug/kg	4.6 U
Aroclor 1254	ug/kg	7.8 J
Aroclor 1260	ug/kg	6.8 U
Aroclor 1262	ug/kg	4.6 U
Aroclor 1268	ug/kg	4.6 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR07_D
		0.5 - 1
		08/25/2014
Aroclor 1016	ug/kg	4.9 U
Aroclor 1221	ug/kg	6.3 U
Aroclor 1232	ug/kg	11 U
Aroclor 1242	ug/kg	4.5 U
Aroclor 1248	ug/kg	4.5 U
Aroclor 1254	ug/kg	4.5 U
Aroclor 1260	ug/kg	6.7 U
Aroclor 1262	ug/kg	4.5 U
Aroclor 1268	ug/kg	4.5 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR07_D
		1 - 2
		08/25/2014
Aroclor 1016	ug/kg	4.5 U
Aroclor 1221	ug/kg	5.8 U
Aroclor 1232	ug/kg	10 U
Aroclor 1242	ug/kg	4.1 U
Aroclor 1248	ug/kg	4.1 U
Aroclor 1254	ug/kg	4.1 U
Aroclor 1260	ug/kg	6.1 U
Aroclor 1262	ug/kg	4.1 U
Aroclor 1268	ug/kg	4.1 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR07_D
		2 - 3
		08/25/2014
Aroclor 1016	ug/kg	4.6 U
Aroclor 1221	ug/kg	5.8 U
Aroclor 1232	ug/kg	10 U
Aroclor 1242	ug/kg	4.2 U
Aroclor 1248	ug/kg	4.2 U
Aroclor 1254	ug/kg	4.2 U
Aroclor 1260	ug/kg	6.2 U
Aroclor 1262	ug/kg	4.2 U
Aroclor 1268	ug/kg	4.2 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR06_D
		0 - 0.5
		08/26/2014
Aroclor 1016	ug/kg	5.6 U
Aroclor 1221	ug/kg	7.2 U
Aroclor 1232	ug/kg	13 U
Aroclor 1242	ug/kg	5.2 U
Aroclor 1248	ug/kg	5.2 U
Aroclor 1254	ug/kg	8.7 J
Aroclor 1260	ug/kg	7.7 U
Aroclor 1262	ug/kg	5.2 U
Aroclor 1268	ug/kg	5.2 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR06_D
		0.5 - 1
		08/26/2014
Aroclor 1016	ug/kg	6.9 U
Aroclor 1221	ug/kg	8.8 U
Aroclor 1232	ug/kg	15 U
Aroclor 1242	ug/kg	6.3 U
Aroclor 1248	ug/kg	6.3 U
Aroclor 1254	ug/kg	6.3 U
Aroclor 1260	ug/kg	9.4 U
Aroclor 1262	ug/kg	6.3 U
Aroclor 1268	ug/kg	6.3 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR06_D
		1 - 2
		08/26/2014
Aroclor 1016	ug/kg	6.9 U
Aroclor 1221	ug/kg	8.9 U
Aroclor 1232	ug/kg	15 U
Aroclor 1242	ug/kg	6.4 U
Aroclor 1248	ug/kg	6.4 U
Aroclor 1254	ug/kg	6.4 U
Aroclor 1260	ug/kg	9.5 U
Aroclor 1262	ug/kg	6.4 U
Aroclor 1268	ug/kg	6.4 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR06_D
		2 - 3
		08/26/2014
Aroclor 1016	ug/kg	6 U
Aroclor 1221	ug/kg	7.6 U
Aroclor 1232	ug/kg	13 U
Aroclor 1242	ug/kg	5.5 U
Aroclor 1248	ug/kg	5.5 U
Aroclor 1254	ug/kg	9.6 J
Aroclor 1260	ug/kg	8.1 U
Aroclor 1262	ug/kg	5.5 U
Aroclor 1268	ug/kg	5.5 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR05_E
		0 - 0.5
		08/26/2014
Aroclor 1016	ug/kg	9.9 U
Aroclor 1221	ug/kg	13 U
Aroclor 1232	ug/kg	22 U
Aroclor 1242	ug/kg	9.1 U
Aroclor 1248	ug/kg	9.1 U
Aroclor 1254	ug/kg	9.1 U
Aroclor 1260	ug/kg	14 U
Aroclor 1262	ug/kg	9.1 U
Aroclor 1268	ug/kg	9.1 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR05_E
		0.5 - 1
		08/26/2014
Aroclor 1016	ug/kg	11 U
Aroclor 1221	ug/kg	15 U
Aroclor 1232	ug/kg	25 U
Aroclor 1242	ug/kg	10 U
Aroclor 1248	ug/kg	10 U
Aroclor 1254	ug/kg	14 J
Aroclor 1260	ug/kg	16 U
Aroclor 1262	ug/kg	10 U
Aroclor 1268	ug/kg	10 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR05_E
		1 - 2
		08/26/2014
Aroclor 1016	ug/kg	4.3 U
Aroclor 1221	ug/kg	5.5 U
Aroclor 1232	ug/kg	9.5 U
Aroclor 1242	ug/kg	3.9 U
Aroclor 1248	ug/kg	3.9 U
Aroclor 1254	ug/kg	3.9 U
Aroclor 1260	ug/kg	5.8 U
Aroclor 1262	ug/kg	3.9 U
Aroclor 1268	ug/kg	3.9 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR05_E
		2 - 3
		08/26/2014
Aroclor 1016	ug/kg	4.1 U
Aroclor 1221	ug/kg	5.3 U
Aroclor 1232	ug/kg	9.2 U
Aroclor 1242	ug/kg	3.8 U
Aroclor 1248	ug/kg	3.8 U
Aroclor 1254	ug/kg	3.8 U
Aroclor 1260	ug/kg	5.6 U
Aroclor 1262	ug/kg	3.8 U
Aroclor 1268	ug/kg	3.8 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR05_E (DUP)
		2 - 3
		08/26/2014
Aroclor 1016	ug/kg	4.1 U
Aroclor 1221	ug/kg	5.2 U
Aroclor 1232	ug/kg	9 U
Aroclor 1242	ug/kg	3.7 U
Aroclor 1248	ug/kg	3.7 U
Aroclor 1254	ug/kg	3.7 U
Aroclor 1260	ug/kg	5.5 U
Aroclor 1262	ug/kg	3.7 U
Aroclor 1268	ug/kg	3.7 U
Polychlorinated biphenyls	ug/kg	NA NA

		TR09_C
		0 - 0.5
		09/10/2014
Aroclor 1016	ug/kg	4.1 U
Aroclor 1221	ug/kg	5.3 U
Aroclor 1232	ug/kg	9.2 U
Aroclor 1242	ug/kg	3.8 U
Aroclor 1248	ug/kg	3.8 U
Aroclor 1254	ug/kg	3.8 U
Aroclor 1260	ug/kg	5.6 U
Aroclor 1262	ug/kg	3.8 U
Aroclor 1268	ug/kg	3.8 U
Polychlorinated biphenyls	ug/kg	NA NA

TR11_C-R1
TR10_A-R1
TR07_D
TR09_C-R1
TR06_D
TR05_E
Parcel
OU-1F (Fishkill Creek)
OU-1C Tank Fa
QU-3
OU-4 Parcel -Modified
OU-1D Parcel -Modified

Main Facility Parcel, OU-1A
Church Property Parcel, OU-1B
Former Washington Avenue Tank Farm Parcel, OU-1C
Residential Property Parcel, OU-1D
The Back 93 Acres Parcel, OU-1E
Fishkill Creek, OU-1F
Parcel OU-2
Residential Property Parcel, OU-3
Parcel -Modified, OU-4
Soil /Sediment Boring (Soil/Sediment Boring Completed to Date)(1)

(DUP)=Duplicate

(1) Only Soil/Sediment boring locations shown on figure where PCBs were sampled for.

ug/Kg=micrgram per kilogram

0 100 200 400 600 Feet

Location ID		
Start Depth - End Depth (ft)		
Date Sampled		6 NYCRR Part 375-6.8(b) Residential
Aroclor 1016	ug/kg	1000.0 ug/kg
Aroclor 1221	ug/kg	1000.0 ug/kg
Aroclor 1232	ug/kg	1000.0 ug/kg
Aroclor 1242	ug/kg	1000.0 ug/kg
Aroclor 1248	ug/kg	1000.0 ug/kg
Aroclor 1254	ug/kg	1000.0 ug/kg
Aroclor 1260	ug/kg	1000.0 ug/kg
Aroclor 1262	ug/kg	NS
Aroclor 1268	ug/kg	NS
Polychlorinated biphenyls	ug/kg	1000.0 ug/kg

PARSONS

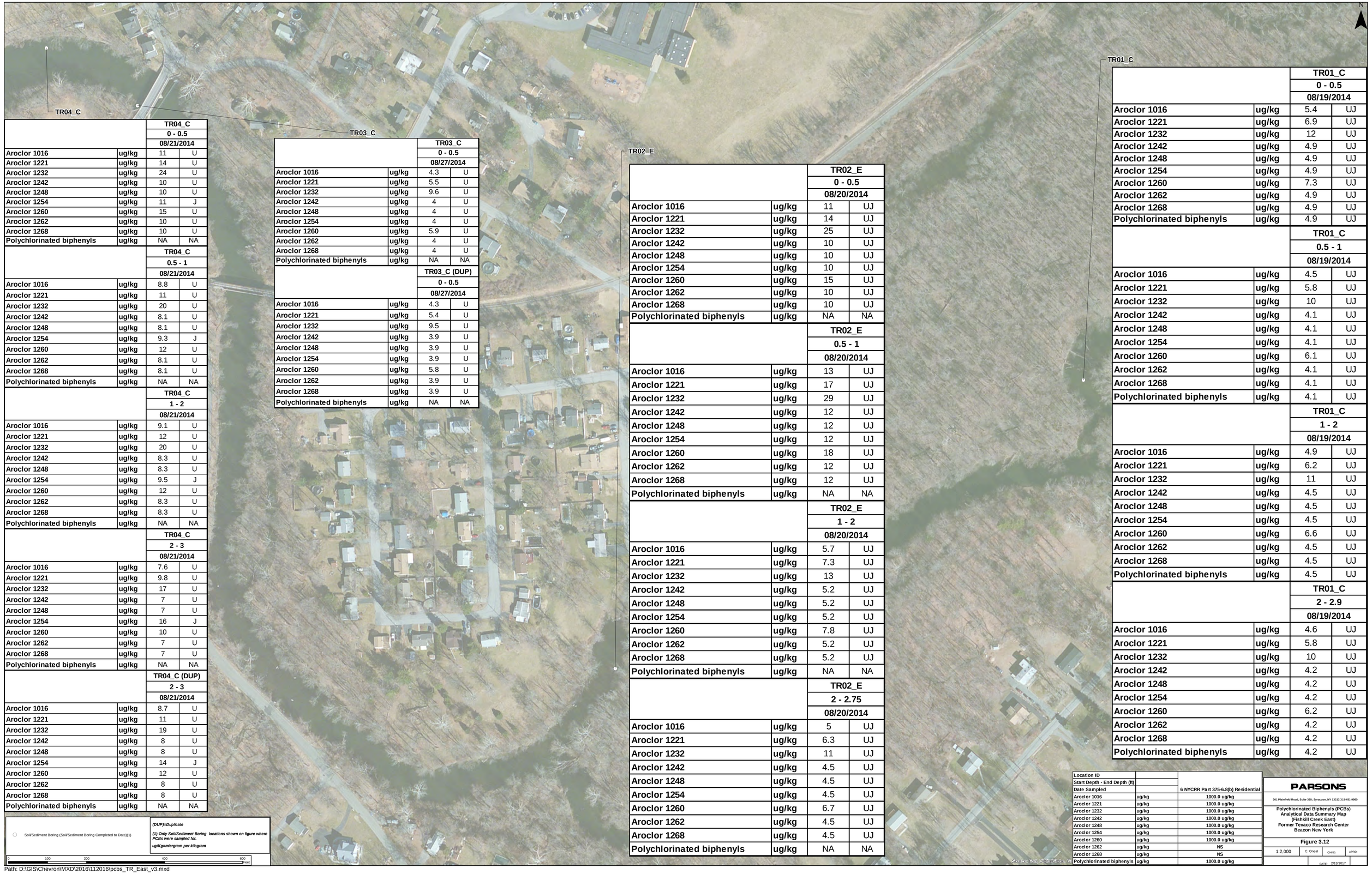
301 Plainfield Road, Suite 350; Syracuse, NY 13212 315-451-9560

Polychlorinated Biphenyls (PCBs) Analytical Data Summary Map (Fishkill Creek West) Former Texaco Research Center Beacon New York

Figure 3.11

1:2,000	C. Oneal	CHKD	APRD
		DATE 2/13/2017	

Path: D:\GIS\Chevron\MXD\2016\112016\pcbs_TR_Site_v3.mxd



		TR04_C	
		0 - 0.5	
		08/21/2014	
Aroclor 1016	ug/kg	11	U
Aroclor 1221	ug/kg	14	U
Aroclor 1232	ug/kg	24	U
Aroclor 1242	ug/kg	10	U
Aroclor 1248	ug/kg	10	U
Aroclor 1254	ug/kg	11	J
Aroclor 1260	ug/kg	15	U
Aroclor 1262	ug/kg	10	U
Aroclor 1268	ug/kg	10	U
Polychlorinated biphenyls	ug/kg	NA	NA

		TR04_C	
		0.5 - 1	
		08/21/2014	
Aroclor 1016	ug/kg	8.8	U
Aroclor 1221	ug/kg	11	U
Aroclor 1232	ug/kg	20	U
Aroclor 1242	ug/kg	8.1	U
Aroclor 1248	ug/kg	8.1	U
Aroclor 1254	ug/kg	9.3	J
Aroclor 1260	ug/kg	12	U
Aroclor 1262	ug/kg	8.1	U
Aroclor 1268	ug/kg	8.1	U
Polychlorinated biphenyls	ug/kg	NA	NA

		TR04_C	
		1 - 2	
		08/21/2014	
Aroclor 1016	ug/kg	9.1	U
Aroclor 1221	ug/kg	12	U
Aroclor 1232	ug/kg	20	U
Aroclor 1242	ug/kg	8.3	U
Aroclor 1248	ug/kg	8.3	U
Aroclor 1254	ug/kg	9.5	J
Aroclor 1260	ug/kg	12	U
Aroclor 1262	ug/kg	8.3	U
Aroclor 1268	ug/kg	8.3	U
Polychlorinated biphenyls	ug/kg	NA	NA

		TR04_C	
		2 - 3	
		08/21/2014	
Aroclor 1016	ug/kg	7.6	U
Aroclor 1221	ug/kg	9.8	U
Aroclor 1232	ug/kg	17	U
Aroclor 1242	ug/kg	7	U
Aroclor 1248	ug/kg	7	U
Aroclor 1254	ug/kg	16	J
Aroclor 1260	ug/kg	10	U
Aroclor 1262	ug/kg	7	U
Aroclor 1268	ug/kg	7	U
Polychlorinated biphenyls	ug/kg	NA	NA

		TR04_C (DUP)	
		2 - 3	
		08/21/2014	
Aroclor 1016	ug/kg	8.7	U
Aroclor 1221	ug/kg	11	U
Aroclor 1232	ug/kg	19	U
Aroclor 1242	ug/kg	8	U
Aroclor 1248	ug/kg	8	U
Aroclor 1254	ug/kg	14	J
Aroclor 1260	ug/kg	12	U
Aroclor 1262	ug/kg	8	U
Aroclor 1268	ug/kg	8	U
Polychlorinated biphenyls	ug/kg	NA	NA

		TR03_C	
		0 - 0.5	
		08/27/2014	
Aroclor 1016	ug/kg	4.3	U
Aroclor 1221	ug/kg	5.5	U
Aroclor 1232	ug/kg	9.6	U
Aroclor 1242	ug/kg	4	U
Aroclor 1248	ug/kg	4	U
Aroclor 1254	ug/kg	4	U
Aroclor 1260	ug/kg	5.9	U
Aroclor 1262	ug/kg	4	U
Aroclor 1268	ug/kg	4	U
Polychlorinated biphenyls	ug/kg	NA	NA

		TR03_C (DUP)	
		0 - 0.5	
		08/27/2014	
Aroclor 1016	ug/kg	4.3	U
Aroclor 1221	ug/kg	5.4	U
Aroclor 1232	ug/kg	9.5	U
Aroclor 1242	ug/kg	3.9	U
Aroclor 1248	ug/kg	3.9	U
Aroclor 1254	ug/kg	3.9	U
Aroclor 1260	ug/kg	5.8	U
Aroclor 1262	ug/kg	3.9	U
Aroclor 1268	ug/kg	3.9	U
Polychlorinated biphenyls	ug/kg	NA	NA

		TR02_E	
		0 - 0.5	
		08/20/2014	
Aroclor 1016	ug/kg	11	UJ
Aroclor 1221	ug/kg	14	UJ
Aroclor 1232	ug/kg	25	UJ
Aroclor 1242	ug/kg	10	UJ
Aroclor 1248	ug/kg	10	UJ
Aroclor 1254	ug/kg	10	UJ
Aroclor 1260	ug/kg	15	UJ
Aroclor 1262	ug/kg	10	UJ
Aroclor 1268	ug/kg	10	UJ
Polychlorinated biphenyls	ug/kg	NA	NA

		TR02_E	
		0.5 - 1	
		08/20/2014	
Aroclor 1016	ug/kg	13	UJ
Aroclor 1221	ug/kg	17	UJ
Aroclor 1232	ug/kg	29	UJ
Aroclor 1242	ug/kg	12	UJ
Aroclor 1248	ug/kg	12	UJ
Aroclor 1254	ug/kg	12	UJ
Aroclor 1260	ug/kg	18	UJ
Aroclor 1262	ug/kg	12	UJ
Aroclor 1268	ug/kg	12	UJ
Polychlorinated biphenyls	ug/kg	NA	NA

		TR02_E	
		1 - 2	
		08/20/2014	
Aroclor 1016	ug/kg	5.7	UJ
Aroclor 1221	ug/kg	7.3	UJ
Aroclor 1232	ug/kg	13	UJ
Aroclor 1242	ug/kg	5.2	UJ
Aroclor 1248	ug/kg	5.2	UJ
Aroclor 1254	ug/kg	5.2	UJ
Aroclor 1260	ug/kg	7.8	UJ
Aroclor 1262	ug/kg	5.2	UJ
Aroclor 1268	ug/kg	5.2	UJ
Polychlorinated biphenyls	ug/kg	NA	NA

		TR02_E	
		2 - 2.75	
		08/20/2014	
Aroclor 1016	ug/kg	5	UJ
Aroclor 1221	ug/kg	6.3	UJ
Aroclor 1232	ug/kg	11	UJ
Aroclor 1242	ug/kg	4.5	UJ
Aroclor 1248	ug/kg	4.5	UJ
Aroclor 1254	ug/kg	4.5	UJ
Aroclor 1260	ug/kg	6.7	UJ
Aroclor 1262	ug/kg	4.5	UJ
Aroclor 1268	ug/kg	4.5	UJ
Polychlorinated biphenyls	ug/kg	NA	NA

		TR01_C	
		0 - 0.5	
		08/19/2014	
Aroclor 1016	ug/kg	5.4	UJ
Aroclor 1221	ug/kg	6.9	UJ
Aroclor 1232	ug/kg	12	UJ
Aroclor 1242	ug/kg	4.9	UJ
Aroclor 1248	ug/kg	4.9	UJ
Aroclor 1254	ug/kg	4.9	UJ
Aroclor 1260	ug/kg	7.3	UJ
Aroclor 1262	ug/kg	4.9	UJ
Aroclor 1268	ug/kg	4.9	UJ
Polychlorinated biphenyls	ug/kg	4.9	UJ

		TR01_C	
		0.5 - 1	
		08/19/2014	
Aroclor 1016	ug/kg	4.5	UJ
Aroclor 1221	ug/kg	5.8	UJ
Aroclor 1232	ug/kg	10	UJ
Aroclor 1242	ug/kg	4.1	UJ
Aroclor 1248	ug/kg	4.1	UJ
Aroclor 1254	ug/kg	4.1	UJ
Aroclor 1260	ug/kg	6.1	UJ
Aroclor 1262	ug/kg	4.1	UJ
Aroclor 1268	ug/kg	4.1	UJ
Polychlorinated biphenyls	ug/kg	4.1	UJ

		TR01_C	
		1 - 2	
		08/19/2014	
Aroclor 1016	ug/kg	4.9	UJ
Aroclor 1221	ug/kg	6.2	UJ
Aroclor 1232	ug/kg	11	UJ
Aroclor 1242	ug/kg	4.5	UJ
Aroclor 1248	ug/kg	4.5	UJ
Aroclor 1254	ug/kg	4.5	UJ
Aroclor 1260	ug/kg	6.6	UJ
Aroclor 1262	ug/kg	4.5	UJ
Aroclor 1268	ug/kg	4.5	UJ
Polychlorinated biphenyls	ug/kg	4.5	UJ

		TR01_C	
		2 - 2.9	
		08/19/2014	
Aroclor 1016	ug/kg	4.6	UJ
Aroclor 1221	ug/kg	5.8	UJ
Aroclor 1232	ug/kg	10	UJ
Aroclor 1242	ug/kg	4.2	UJ
Aroclor 1248	ug/kg	4.2	UJ
Aroclor 1254	ug/kg	4.2	UJ
Aroclor 1260	ug/kg	6.2	UJ
Aroclor 1262	ug/kg	4.2	UJ
Aroclor 1268	ug/kg	4.2	UJ
Polychlorinated biphenyls	ug/kg	4.2	UJ

Soil/Sediment Boring (Soil/Sediment Boring Completed to Date)(1)

(DUP)=Duplicate

(1) Only Soil/Sediment Boring locations shown on figure where PCBs were sampled for.

ug/Kg=micrgram per kilogram

0 100 200 400 600 Feet

Source: Esri, DigitalGlobe, GI

Location ID		
Start Depth - End Depth (ft)		
Date Sampled		6 NYCRR Part 375-6.8(b) Residential
Aroclor 1016	ug/kg	1000.0 ug/kg
Aroclor 1221	ug/kg	1000.0 ug/kg
Aroclor 1232	ug/kg	1000.0 ug/kg
Aroclor 1242	ug/kg	1000.0 ug/kg
Aroclor 1248	ug/kg	1000.0 ug/kg
Aroclor 1254	ug/kg	1000.0 ug/kg
Aroclor 1260	ug/kg	1000.0 ug/kg
Aroclor 1262	ug/kg	NS
Aroclor 1268	ug/kg	NS
Polychlorinated biphenyls	ug/kg	1000.0 ug/kg

PARSONS
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Polychlorinated Biphenyls (PCBs)
Analytical Data Summary Map
(Fishkill Creek East)
Former Texaco Research Center
Beacon New York

Figure 3.12

1:2,000 | C. Oneal | CHKD | APRD | DATE: 2/13/2017

Path: D:\GIS\Chevron\MXD\2016\112016\pcbs_TR_East_v3.mxd

SECTION 4

PROJECT SAFETY, HEALTH, AND ENVIRONMENTAL PLAN

4.1 PROJECT SAFETY, HEALTH, AND ENVIRONMENTAL PLAN (PSHEP)

A PSHEP has been developed in accordance with 29 Code of Federal Regulations (CFR) 1910.120, Parsons Safety, Health, and Risk Program (SHARP) requirements (Parsons, 2004) including Parsons Employee Based Safety (EBS) program and all Chevron safety requirements. The PSHEP will be reviewed and signed by all Parsons' personnel prior to on-site activities. A copy of the PSHEP is included with this draft Work Plan as Appendix E.

Should site conditions change or unexpected hazards be identified, all applicable safety documents will be amended to reflect needed changes in safety procedures to ensure the safety of site workers and the public.

4.2 WORK HOURS AND SITE SECURITY

Work hours are anticipated to begin at 7:30 A.M. and to cease no later than 7:00 P.M during Mondays through Fridays and 8:00 A.M to 5:00 P.M. on Saturdays, if work is required to be performed.

Site security is to remain a priority for the duration of the project and all Parsons' field personnel will make sure that all facility gates are closed and locked when entering areas to conduct field sampling activities. All field personnel will also report any observed damage to security fencing and/or observe non-authorized personnel (e.g., trespassers) on site to the Parsons' field team leader and/or Project Manager immediately.

SECTION 5

SAMPLING AND ANALYSIS PLAN

5.1 OVERVIEW OF SAMPLING AND ANALYSIS PLAN (SAP)

This section provides an overview of the SAP, which is included as Appendix F, and describes the general methodology to be employed during investigation activities at the site. A description of the sampling method to be employed during field activities is described below. The project-specific data quality objectives, analytical protocol, and field and laboratory quality assurance/ quality control procedures are outlined in the QAPP, Appendix D. All laboratory data generated will include a NYSDEC Analytical Services Protocol (ASP) Category B Deliverable Package.

5.2 GENERAL FIELD GUIDELINES

5.2.1 General Site Hazards

Potential on-site surface hazards, such as sharp objects, overhead power lines, energized areas, and on-water hazards, as well as other hazards (i.e., climate, biohazards, etc.) will be identified prior to initiation of fieldwork. Ideally, these hazards will be identified during a site visit prior to the first day of fieldwork.

5.2.2 Field Log Books and Electronic Tablets

All field activities will be carefully documented in field log books and electronic tablets. Entries will be of sufficient detail that a complete daily record of significant events, observations, and measurements is obtained. The field log book and tablet will provide a legal record of the activities conducted at the site. Accordingly:

- Field books will be assigned a unique identification number.
- Field books will be bound with consecutively numbered pages.
- Field books will be controlled by the Field Team Leader while field work is in progress.
- Entries will be written with waterproof ink.
- Entries will be signed and dated at the conclusion of each day of fieldwork.
- Erroneous entries made while fieldwork is in progress will be corrected by the person that made the entries. Corrections will be made by drawing a line through the error, entering the correct information, and initialing the correction.
- Corrections made after departing the field will be made by the person who made the original entries. Corrections will be made by drawing a line through the error, entering the correct information, and initialing and dating the time of the correction.
- At a minimum, daily field book entries will include the following information:
  - Location of field activity;
  - Date and time of entry;
  - Names and titles of field team members;
  - Names and titles of any site visitors and site contacts;
  - Weather information, for example: temperature, cloud coverage, wind speed and direction;

- Purpose of field activity;
- A detailed description of the field work conducted;
- Sample media (soil and/or surface water);
- Sample collection method;
- Number and volume of sample(s) taken;
- Description of sampling point(s);
- Analytical parameters;
- Date and time of collection;
- Sample identification number(s);
- Sample distribution (e.g., laboratory);
- Field observations;
- Any field measurements made, such as soil moisture, color, density, Unified Soil Classification System (USCS) soil designation, etc. (tablet);
- References for all maps and photographs of the sampling site(s);
- Information pertaining to sample documentation such as:
- Bottle lot numbers;
- Dates and method of sample shipments;
- Chain-of-Custody Record numbers; and
- Federal Express Air Bill Number.

Note:

1. When an electric tablet is used instead of a field logbook, all the sample information listed above will be entered into a database spreadsheet that has been pre-loaded into the tablet. The template will also be saved periodically to ensure no information is lost. A field logbook will still be used to document general site activities (e.g. meetings, training, weather, etc.).

5.3 FIELD EQUIPMENT DECONTAMINATION

The following procedures will be used to decontaminate equipment used during the field activities.

Suggested Materials:

- Potable water
- Phosphate-free detergent (e.g., Alconox)
- Reagent-grade methanol or isopropanol
- Distilled water
- Aluminum foil
- Plastic/polyethylene sheeting
- Plastic buckets and brushes
- Personal protective equipment in accordance with the PSHEP

Procedures:

- Prior to sampling, all non-dedicated sampling equipment (bowls, spoons, etc.) will be washed with potable water and a phosphate-free detergent (such as Alconox). Decontamination may take place at the sampling location as long as all liquids are contained in pails, buckets, etc.
- Sampling equipment will be rinsed with potable water followed by a deionized water rinse.
- Between rinses, equipment will be placed on polyethylene sheets or aluminum foil if necessary. At no time will washed equipment be placed directly on the ground.
- Equipment will be wrapped in polyethylene plastic or aluminum foil for storage or transportation from the designated decontamination area to the sampling location.

The following procedures apply for drilling equipment and associated tools and well material (i.e., PVC/Stainless Steel well screen and casing):

- All drilling equipment including the drilling rig, augers, bits, rods, tools, split-spoon samplers, tremie pipe, and if required well materials will be cleaned with a high-pressure steam cleaning unit before beginning work.
- Tools, drill rods, and augers will be placed on sawhorses or polyethylene plastic sheets following cleaning. Direct contact with the ground will be avoided.
- All augers, rods, and tools will be decontaminated between each drilling location according to the above procedures.
- The back of the drill rig and all tools, augers, rods, and tires of drill rig will be decontaminated at the completion of the work and prior to leaving the site.

5.4 FIELD INSTRUMENTS AND CALIBRATION

All field analytical equipment will be calibrated immediately prior to each day's use and more frequently if required. The calibration procedures will conform to manufacturer's standard instructions. This calibration will ensure that the equipment is functioning within the allowable tolerances established by the manufacturer and required by the project. All instrument calibrations will be documented in the project field book and in an instrument calibration log. Records of all instrument calibration will be maintained by the Field Team Leader and will be subject to audit by the Quality Assurance Officer (QAO). Copies of all of the instrument manuals will be maintained on-site by the Field Team Leader.

A portable photoionization analyzer will be used during the field activities. The photoionization analyzer will be a Photovac (or equivalent), equipped with an 11.7 eV lamp. The Photovac is capable of ionizing and detecting compounds with an ionization potential of less than 11.7 eV, which accounts for up to 73% of the volatile organic compounds on the TCL. Calibration must be performed at the beginning and end of each day of use with a standard calibration gas having an approximate concentration of 100 parts per million of isobutylene. If the unit experiences abnormal or erratic readings, additional calibration will be required. All calibration data must be recorded in field notebooks and on calibration log sheets to be maintained on-site. A battery check must be completed at the beginning and end of each working day.

5.5 FIELD SAMPLE IDENTIFICATION AND CUSTODY

5.5.1 Sample Identification

Each sample will be given a unique alphanumeric identifier in accordance with the following classification system. The classification system follows all NYSDEC EQUIS and Chevron EMC sample/ data reporting requirements:

SAMPLE IDENTIFICATION

General Field Sample ID Nomenclature: MW-23-SD-12.55-010801

MW-23 = Field Point Name
S = Matrix
D = Repeat Sample
12.55 = Top Depth of Soil Sample
010801 = Year/Month/Day Sample Collected

Sample Type:	S – Soil W – Water
Repeat Sample:	D- Duplicate T1, T2, etc. – Trip Blank F1, F2, etc. – Field Blank (Equipment Blank)
Sample Number:	Number referenced to a sample location map.

Note: ***Only letters, numbers, or dashes are allowed in sample identification.***

Field duplicates and corresponding original samples will be distinguished by field duplicate samples having the repeat sample letter "D" added to the sample identification (i.e., MW-23-S-12.55-010801 (original sample) equals MW-23-SD-12.55-010801 (field duplicate sample)). Additionally, each sample container will be labeled prior to packing for shipment. The sample identifier, site name, date and time of sampling, and analytical parameters will be written on the label in waterproof ink and recorded in the field book.

5.5.2 Chain of Custody

- A chain of custody (COC) record will accompany the sample containers during selection and preparation at the laboratory, during shipment to the field, and during return shipment to the laboratory.
- The COC will identify each sample container and the analytical parameters for each, and will list the field personnel that collected the samples, the project name and number, the name of the analytical laboratory that will receive the samples, and the method of sample shipment.
- If samples are split and sent to different laboratories, a copy of the COC record will be sent with each sample shipment.

- The COC will be completed by field personnel as samples are collected and packed for shipment.
- Erroneous markings will be crossed out with a single line and initialed by the author.
- The REMARKS space will be used to indicate if the sample is a matrix spike, matrix spike duplicate, or matrix duplicate.
- Trip and field blanks will be listed on separate rows.
- After the samples have been collected and sample information has been listed on the COC form, the method of shipment, the shipping cooler identification number(s), and the shipper airbill number will be entered on the COC.
- Finally, a member of the sampling team will write his/her signature, the date, and time on the first RELINQUISHED BY space. Duplicate copies of each COC must be completed.
- One copy of the COC will be retained by sampling personnel. The other copy and the original will be sealed in a plastic bag and taped inside the lid of the shipping cooler.
- Sample shipments will be refrigerated at 4^{o}C, typically by packing with ice, to preserve the samples during shipment.
- After the shipping cooler is closed, custody seals provided by the laboratory will be affixed to the latch and across the front and back of the cooler lid, and signed by the person relinquishing the samples to the shipper.
- The seal will be covered with clear tape, and the cooler lid will be secured by wrapping with packing tape.
- The cooler will be relinquished to the shipper, typically an overnight carrier.
- The COC seal must be broken to open the container. Breakage of the seals before receipt at the laboratory may indicate tampering. If tampering is apparent, the laboratory will contact the Project Manager, and the samples will not be analyzed.

The samples must be delivered to the laboratory within 48 hours of collection.

SECTION 6

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APPENDIX A

DATA QUALITY OBJECTIVES

REVISED JANUARY 2017

Data Quality Objectives Table – OU-1A Main Facility Parcel

Problem Statement	Goal of the Study	Information Inputs	Study Boundaries	Analytical Approach	Performance/Acceptance Criteria	Data Collection Plan
Future use of this OU is mixed use commercial/residential multi-family housing. • Extensive soil data exist for this parcel, as reviewed in the HHEA (Parsons, 2015); the data gap identified in the HHEA is establishment of site-specific background soil concentrations. • Screening of surface soil concentrations against NYSDEC **restricted residential (mixed use commercial/residential)** soil cleanup objectives indicated exceedances for the following (Parsons, 2015, Table A.1-2): o Metals (29 of 103 samples) o PAHs (17 of 117 samples) o 1,3,5-Trimethylbenzene (1 of 18 samples) • Exceedances are primarily located along the northern and southwestern boundaries of the parcel. • In the absence of site-specific background concentrations, the observed concentrations may not represent contamination. • Screening of the 2013 site-wide groundwater concentrations against EPA residential Vapor Intrusion Screening Levels (VISL) indicated exceedances of five volatile compounds (1,4-dichlorobenzene, benzene, chloroform, ethylbenzene, and TCE) in the overburden wells (see Parsons, 2015; Table C.1-5). Therefore, groundwater concentrations could pose a future residential vapor intrusion threat, which will be managed by engineering/institutional controls safeguarding future buildings. • More current (2015) groundwater data will be evaluated to identify whether the HHEA (Parsons, 2015) screening captured all data gaps. This evaluation will consider trends in groundwater concentrations and specifying a possible (if necessary) field effort to collect samples to fill vapor intrusion data gaps at OU-1A to inform engineering/institutional control design. • No significant habitat available for ecological resources.	The goal of the study is to address data gaps in the nature and extent of potential contamination and to support the assessment of potential exposure of humans to site-related contaminants. **Principal Study Questions** • What are site-specific background levels of OU-1A COPCs? • Are soil constituent concentrations greater than site-specific background? • Which institutional or engineering controls are appropriate to mitigate vapor intrusion risk based on current VOC GW data? **Decision Statement:** • Surface soil (0-2' bgs) exceedances of both site-specific background concentrations and restricted residential SCOs will trigger further evaluation. • Groundwater exceedances of vapor intrusion screening levels for VOCs will trigger further vapor intrusion evaluation, as appropriate based on the results of the comparison to VISLs, and/or engineering controls to address future on-site soil vapor intrusion in the future residential areas.	• Background soil types • OU-1A soil types • Background soil concentrations (metals, PAHs) • Surface soil data • Groundwater data (2015 data) • NYSDEC restricted residential SCOs • Screening levels for VI, such as EPA VISLs version 3.4.6 (incorporating EPA toxicity values through November 2015, released January 2016), or equivalent, for appropriate future land use and media • Human health toxicity and exposure assumptions used to calculate site-specific NYSDEC soil cleanup objectives • Other parameters include organic carbon and pH. Soil classification/logs will be maintained.	Non-applicable, because surface soil sampling is not planned at this time. Overburden groundwater **Constraints** o Weather o Refusal due to bedrock, cobbles	• If maximum concentrations are below background or NYSDEC restricted residential SCOs or VISLs (as appropriate), no further evaluation is necessary. • If maximum concentrations are above background and NYSDEC residential SCOs or VISLs (as appropriate), then further data evaluation may be necessary, including calculation of 95% Upper Confidence Limits and/or statistical evaluation of the data to determine if site concentrations are significantly different than background.	• Detection limits below NYSDEC screening levels • Laboratory and field QA/QC	**Background Areas:** In order to determine if observed concentrations are within the range of naturally occurring or anthropogenic background concentrations, the sampling plan is designed to collect a sufficient number of samples to calculate site-specific background concentrations for metals and PAHs.

Data Quality Objectives Table – OU-1B Church Property Parcel

Problem Statement	Goal of the Study	Information Inputs	Study Boundaries	Analytical Approach	Performance/Acceptance Criteria	Data Collection Plan
Future uses of this OU will be restricted residential (condos, townhomes, multi-family or senior housing). Based on the known history of this parcel and review of historical images, it is expected that this area has not been used for industrial activities and constituent concentrations will reflect natural and anthropogenic background conditions. To verify this, site-specific background soil concentrations are required. Screening of existing surface soil (0-2 ft. bgs) against NYSDEC restricted residential soil cleanup objectives (SCOs) in the HHEA (Parsons, 2015) Table A.1-6 indicated exceedances for the following: • Metals (4 of 33 samples) • PAHs (4 of 33 samples) • Existing soil data (and exceedances) are obtained from sample locations along periphery of property. No soil data are available for the center of the property. The absence of samples may be a result of shallow bedrock and steep slopes. • There are no groundwater wells in OU-1B and it is anticipated that groundwater is deeper than 15 feet bgs. Based on review of 2013 groundwater data for OU-1A that borders this parcel (Parsons, 2015), there were no exceedances of EPA Residential Vapor Intrusion Screening Levels and groundwater flow is away from this parcel. Therefore, there is no complete pathway for vapor intrusion. Screening of surface soil data (0-2 ft. bgs) for ecological receptors identified the following COPECs: • Inorganic compounds: arsenic, chromium, copper, lead, manganese, mercury, nickel, selenium, silver and zinc. • Pesticides: 4,4'-DDD; 4,4'-DDE; and 4,4'-DDT which could be within the range of anthropogenic background concentrations.	The goal of the study is to address data gaps in the nature and extent of potential contamination on site and to inform the assessment of potential exposure of humans and ecological receptors to site-related contaminants. **Principal Study Questions** • What are site-specific background levels of metals, PAHs, and pesticides? • Are soil constituent concentrations greater than site-specific background? • Is there evidence of a release of contaminants to soil at the site? **Decision Statements:** Surface soil (0-2 ft. bgs) exceedances of both site-specific background concentrations and restricted residential or ecological SCOs will trigger further evaluation.	• Background soil types • OU-1B soil types • Background soil concentrations (metals, PAHs, pesticides including DDT and its metabolites) • Surface soil data: SVOCs, metals, VOCs (20% of samples), PCBs (10% of samples, targeted toward the interior of the site), pesticides (10% of samples, targeted toward the interior of the site). • NYSDEC restricted residential SCOs • Ecological and human health toxicity and exposure assumptions used to calculate site-specific NYSDEC SCOs • Other parameters include organic carbon, pH, total sulphur and grain size analysis. Soil classification/logs will be maintained.	• Surface soil: 0-2 in, 2-6 in, 6-12 in, and 12-24 in bgs • Targeted sampling in the middle areas of the property if feasible given terrain and depth to refusal • Total Hg and Hg speciation samples will be collected from 0 - 6 in, 6 -12 in, and 12 -24 in bgs **Constraints** • Weather • Refusal due to bedrock, cobbles • Steep slopes may limit sampling in some areas • Vegetation may limit access	**Human Health Assessment:** • If maximum concentrations are less than background or NYSDEC restricted residential SCOs, no further evaluation is necessary. • If maximum concentrations are above background and NYSDEC residential SCOs, then further data evaluation may be necessary, including calculation of 95% Upper Confidence Limits and/or statistical evaluation of the data to determine if site concentrations are significantly different than background. • Data reduction will be based on homogeneity of the data. **Ecological Risk Assessment:** • If the maximum surface soil concentrations are less than background or NYSDEC ecological SCOs, no further evaluation is necessary. • If the maximum surface soil concentrations are greater than background and NYSDEC ecological SCOs, 95% UCLs will be calculated. • If the 95% UCL of surface soil concentrations is greater than background and NYSDEC ecological SCOs, then further evaluation may be necessary. • Data reduction will be based on homogeneity of the data.	• Detection limits below NYSDEC screening levels • Laboratory and field QA/QC	There are no samples on the interior of the parcel to determine the absence or presence of contamination above risk-based levels. The absence of samples may be a result of inaccessibility to the central portion of the parcel, or the absence of soil to sample. The following activities are suggested to fill the data gap: • Evaluate accessibility of the interior of OU-1B. If inaccessible or soil not present due to rock outcropping, document site conditions and recommend no additional sampling. • If the central area is accessible and soil is present, collect additional samples at a density to be determined to characterize absence of contamination above risk-based levels in the unremarkable areas. Samples will be evenly distributed geographically and vertically. In accordance with the December 2015 Draft Grid Sampling to Screen Soil Cover TechCheck Number 3 (NYSDEC, 2015). **Background Areas:** In order to determine if observed concentrations are within the range of naturally occurring or anthropogenic background concentrations, the sampling plan is designed to collect a sufficient number of samples to calculate site-specific background concentrations for metals, PAHs, and pesticides.

Data Quality Objectives Table – OU-1C Tank Farm

Problem Statement	Goal of the Study	Information Inputs	Study Boundaries	Analytical Approach	Performance/Acceptance Criteria	Data Collection Plan
Future uses of this OU will be industrial use. • No surface soil data (0-1 ft. bgs) so screening against NYSDEC industrial use soil cleanup objectives (SCOs) has not been completed. • Contact with groundwater is not anticipated within 0-1 ft. bgs. • No significant exposure from onsite soil to ecological receptors. • Property is bounded by Fishkill Creek to the north and lies entirely within the Dutchess County property records floodplain boundary. • As shown in Table C.1-6 of the HHEA (Parsons, 2015), screening of the OU-1C 2013 groundwater concentrations against EPA Vapor Intrusion Screening Levels (VISLs) indicated exceedances of two volatile compounds (benzene and naphthalene) in the overburden wells. Therefore, groundwater concentrations could pose a future industrial vapor intrusion threat. However, the floodplain location of this OU and remaining subsurface piping and other infrastructure precludes redevelopment for building construction. The soil management plan for any subsurface disturbance is a further institutional and engineering control against future exposures to subsurface soil and groundwater.	The goal of the study is to address data gaps in the nature and extent of potential contamination on site and to inform the assessment of potential exposure of humans and ecological receptors to site-related contaminants. **Principal Study Questions** • What are site-specific background levels of SVOCs and metals? • Are soil constituent concentrations greater than site-specific background? • Are site surface soil concentrations greater than industrial use SCOs? **Decision Statement:** Surface soil (0-1 ft. bgs) exceedances of both site-specific background concentrations and industrial SCOs will trigger further evaluation. Unacceptable risks will trigger a remedial planning document.	• Background soil types • OU-1C soil types • Background soil concentrations (metals, PAHs) • Surface soil data • NYSDEC SCOs • Human health toxicity and exposure assumptions used to calculate site-specific NYSDEC SCOs • Other parameters: organic carbon, pH, VOCs, SVOCs, pesticides (at 10 percent of locations), PCBs (at 10 percent of locations), and metals (Soil classification/logs will be maintained.	• Surface soil: 0-2 in, 2-6 in, 6-12 in, and 12-24 in bgs **Constraints** • Weather • Refusal due to bedrock, cobbles	**Human Health Assessment:** • If maximum concentrations are below background or industrial SCOs or VISLs (as appropriate), no further evaluation is necessary. If maximum concentrations are above background and industrial SCOs or VISLs (as appropriate), then further data evaluation may be necessary, including calculation of 95% Upper Confidence Limits and/or statistical evaluation of the data to determine if site concentrations are significantly different than background.	• Detection limits below NYSDEC screening levels • Laboratory and field QA/QC	There are no surface soil sample data. To fill the data gap, surface soil samples will be collected at a density to be determined to characterize absence of contamination above risk-based levels. Samples will be evenly distributed geographically and vertically, in accordance with the December 2015 Draft Grid Sampling to Screen Soil Cover TechCheck Number 3 (NYSDEC, 2015), to determine if the existing soil meets the standards as a soil cover. **Background Areas:** In order to determine if observed concentrations are within background, the sampling plan is designed to collect a sufficient number of samples to calculate site-specific background concentrations for metals and SVOCs.

Data Quality Objectives Table – OU-1D Residential Property Parcel

Problem Statement	Goal of the Study	Information Inputs	Study Boundaries	Analytical Approach	Performance/Acceptance Criteria	Data Collection Plan
Future use of this OU is residential single family housing. • No data are available for soil and groundwater. Surface soil sampling is required to characterize OU-1D and confirm absence of contamination. • Based on the recorded history of these parcels and review of historical images, it is expected that the majority of the parcel is undisturbed and constituent concentrations will reflect natural and anthropogenic background conditions. In order to verify this, site-specific background soil concentrations are required. • A rail siding is located along the northern border of OU-1D that extends slightly into the parcel boundary. Historically, liquid petroleum products were offloaded and piped from the rail siding area to the tank farm (OU-1C). • No petroleum hydrocarbons were detected in the groundwater at locations between the rail siding area and the tank farm. • Samples collected from soil borings collected in the vicinity of the rail siding were analyzed for petroleum hydrocarbon constituents. No VOC compounds were detected at concentrations greater than the Residential Soil Cleanup Objectives (SCO). The supplemental RFI concluded that sampling was adequate to characterize the rail siding area. Contact with groundwater is not anticipated within 0-2 ft. bgs, and one of the planned and allowable residential institutional controls is a prohibition against the use of groundwater on site. No significant exposure from onsite soil to ecological receptors.	The goal of the study is to confirm the absence of contamination above risk based levels. **Principal Study Questions** • What are site-specific background levels of metals and SVOCs? • Are soil constituent concentrations greater than site-specific background? • Are soil constituent concentrations greater than residential SCOs? **Decision Statement:** Exceedances of both site-specific background concentrations and residential SCOs will trigger further evaluation. Unacceptable risks will trigger a remedial planning document.	• Background soil types • OU-1D soil types • Background soil concentrations (metals, SVOCs) • Surface soil data • NYSDEC SCOs • Human health toxicity and exposure assumptions • Analytes: o Soil: metals, VOCs (in 20 percent of locations), SVOCs, pesticides (10 percent of locations), and PCBs (10 percent of locations). • Other parameters: organic carbon and pH. Soil classification/logs will be maintained.	• Surface soil: 0-2 in, 2-6 in, 6-12 in, and 12-24 in bgs **Constraints** o Weather o Refusal due to bedrock o Access/vegetation **Decision units** o Each parcel is considered its own decision unit	**Human Health Assessment:** • If maximum concentrations are below background or NYSDEC residential SCOs, no further evaluation is necessary. • If maximum concentrations are above background and NYSDEC residential, then further data evaluation may be necessary, including calculation of 95% Upper Confidence Limits and/or statistical evaluation of the data to determine if site concentrations are significantly different than background. • Data reduction will be based on homogeneity of the data	• Detection limits below NYSDEC screening levels • Laboratory and field QA/QC	Focus on confirming the absence of contamination greater than risk-based levels and site-specific background. Unbiased grid sampling based on the following: • Collect additional samples at a density to be determined to characterize absence of contamination above risk-based levels. Samples will be evenly distributed geographically and vertically. **Background Areas:** In order to determine if observed concentrations are within background, the sampling plan is designed to collect a sufficient number of samples to calculate site-specific background concentrations for metals and PAHs.

Data Quality Objectives Table – OU-1E Back 93 Acre Parcel

Problem Statement	Goal of the Study	Information Inputs	Study Boundaries	Analytical Approach	Performance/ Acceptance Criteria	Data Collection Plan
Based on historical activities conducted at this site, the parcel can likely be divided into **three land uses**: 1. Areas conducive to residential redevelopment (non-disposal, unremarkable areas) 2. Stream and Non-jurisdictional wetlands areas 3. Areas to be considered for recreation, potentially including a sports complex (former disposal areas), which fall under "Restricted Residential" SCOs if active (generally unpaved) or "Commercial" SCOs if passive (generally covered surfaces, such as swimming pools). **Future Residential Areas:** • Limited data are available for soil and groundwater constituent concentrations. Soil sampling is required to characterize this portion of OU-1E and assess any potential risks to human and ecological receptors. • Based on the known history of the parcel and review of historical images, it is expected that the non-disposal areas and wetlands are undisturbed and constituent concentrations will reflect natural and anthropogenic background conditions. In order to verify this, site-specific background soil concentrations are required. • Former disposal area groundwater wells with VOC detections may be an indicator of GW concentrations that could pose a future residential vapor intrusion (VI) threat. However, the land would only be redeveloped with an appropriate engineering control to prevent VI. **Stream and Nonjurisdictional OU-1E Wetland areas:** • No data are available for surface water and soil constituent concentrations. • These are limited in size and may be ephemeral in nature thus these areas are unlikely to provide sufficient habitat to sustain aquatic populations and primarily serve as habitat for terrestrial wildlife. Therefore, these areas will not be evaluated as separate habitat for ecological receptors (i.e., will be combined with soil data from future residential or future recreational areas based on location)*. • If present, Surface water data are required to characterize this portion of OU-1E and assess any potential risks to human and ecological receptors. **Future Recreational Areas (0-2 ft bgs focus):** • Assumed to be active recreational (i.e., designated picnic area, playground, unpaved playing fields). Per NYSDEC DER-10, active recreation is evaluated as restricted residential. Evaluating for active recreation is protective of passive recreation (i.e., artificial surface fields, outdoor tennis or basketball courts, other paved recreational facilities, outdoor pools, indoor sports/recreational facilities, golf courses, paved bike/pedestrian paths). • Current and future access by wildlife is anticipated. Screening of surface soil data (0-2 feet bgs) for ecological receptors identified that benzo(a)pyrene (2,600 mg/kg) exceeded screening levels in 1 of 21 surface soil samples. • Existing soil data (Parsons, 2015) is from former/suspected disposal areas. Screening of surface soil (0-2 feet bgs) against NYSDEC human health restricted residential SCOs showed exceedances of PAHs in 2 of 21 surface soil samples along the eastern boundary of the property. • Existing GW wells are within the former disposal areas that will remain unused. Screening of 2013 groundwater against EPA and NYSDEC drinking water standards (Parsons, 2015) showed exceedances for metals and VOCs/PAHs along the eastern edge of the property and off-site. However, restrictions on GW use are reasonable for future land use. • Based on existing subsurface post-removal confirmation data, additional surface (0-2 ft bgs) soil data surrounding previous excavations is desirable.	The goal of the study is to address data gaps and submit data to regulatory agencies. In the future residential areas, the goal of the study is to confirm the absence of contamination above risk based levels. **Principal Study Questions** • What are site-specific background levels of metals and PAHs? • Are soil constituent concentrations greater than site-specific background? • Are COPCs present in the potable well sample? • Are COPCs present in surface water? • Do any VOCs extend from the former disposal area wells (where the land surface is intended for non-residential recreational use only, and where groundwater use will be prohibited) to any future residential areas? **Decision Statements:** Surface soil (0-2 ft bgs) exceedances of both site-specific background concentrations and residential (future residential areas), restricted residential (future active recreational areas), or ecological SCOs will trigger further evaluation.	• Background soil types • OU-1E soil types • Background soil concentrations (metals, PAHs) • Surface soil data in future active (or passive) recreational areas • Surface soil data in the future residential areas • Soil and surface water (if present to at least one foot depth) data in the wetland areas and streams • Ecological and human health toxicity and exposure assumptions used to calculate NYSDEC soil cleanup objectives • NYSDEC SCOs • NYSDEC screening levels for groundwater, MCLs, and EPA RSLs for Tapwater • Analytes: o **Future Recreational Area: Disposal areas**: • Soil - Metals, SVOCs, VOCs, pesticides, and PCBs o **Future Residential Areas**: • Soil - Metals, SVOCs, VOCs (20% of sample locations), pesticides (10% of sample locations), and PCBs (10% of sample locations) • GW – VOCs, SVOCs including PAHs, metals • Other parameters include organic carbon and pH. Soil classification/logs will be maintained.	**Decision units** Human Health Assessment: • Future Active (or Passive) Recreational Area • Streams and non-jurisdictional wetland areas • Future Residential Area Ecological Risk Assessment: • Wetland Areas • Upland soils (includes future recreational and residential areas) **Future Active Recreational Areas:** • Surface soil: 0-2 in, 2-6 in, 6-12 in, and 12-24 in bgs • Targeted sampling around borders of excavation of historical waste disposal areas **Future Residential Areas:** • Surface soil: 0-2 in, 2-6 in, 6-12 in, and 12-24 in bgs • Unbiased grid sampling **Stream and Nonjurisdictional Wetland Areas** • Soil (assumes presence of intermittent surface water, essentially same as soil for human pathways): 0-2 in, 2-6 in, 6-12 in, and 12-24 in bgs • Surface water (if present to at least one foot depth) • Unbiased grid sampling **Constraints** • Weather • Refusal due to bedrock, cobbles • Steep slopes may limit sampling in some areas • Vegetation may limit access • Lack of surface water in wetland areas during sampling event	**Human Health Assessment:** • If maximum concentrations are below background or NYSDEC residential or restricted residential SCOs (as appropriate), no further evaluation is necessary. • If maximum concentrations are above background and NYSDEC residential or restricted residential SCOs (as appropriate), then further data evaluation may be necessary, including calculation of 95% Upper Confidence Limits and/or statistical evaluation of the data to determine if site concentrations are significantly different than background. • Data reduction will be based on homogeneity of the data. **Ecological Risk Assessment:** • <u>Upland soils: If the maximum surface soil concentrations are less than background or NYSDEC ecological SCOs, no further evaluation is necessary</u> • <u>Upland Soils: If the maximum surface soil concentrations are greater than background and NYSDEC ecological SCOs, 95% UCLs will be calculated.</u> • <u>Upland soils</u>: If the 95% UCL of surface soil concentrations is below background or NYSDEC ecological SCOs, no further evaluation is necessary. • <u>Upland soils</u>: If the 95% UCL of surface soil concentrations is above background and NYSDEC ecological SCOs, then further	• Detection limits below NYSDEC screening levels • Laboratory and field QA/QC	**Future Residential Areas**: Focus on confirming the absence of contamination above risk-based levels and site-specific background. Unbiased grid sampling based on the following: • Collect additional samples at a density to be determined to characterize absence of contamination above risk-based levels in the unremarkable areas. Samples will be evenly distributed geographically and vertically. In accordance with the December 2015 NYSDEC Draft Grid Sampling to Screen Soil Cover TechCheck, Number 3 (NYSDEC, 2015). **Future Active Recreational Area**: Focus on determining if observed concentrations are within background and obtaining appropriate surface soil confirmation sampling of previously excavated historical waste disposal areas. Targeted sampling will be based on existing surface and sub-surface soil confirmation data and documented excavation areas where clean fill is present to a depth of 2 ft or greater. **Stream and Nonjurisdictional Wetland Areas**: Focus on confirming absence of contamination. Due to the limited size and undisturbed nature of the streams and wetland areas, sampling to calculate a 95% UCL may be challenging and unnecessary. An unbiased sample design will be applied to surface waters within the perennial stream and any surface water greater than 1 foot depth within wetland areas greater than 0.5 acre in size. **Background Areas:** In order to determine if observed concentrations are within background, the sampling plan is designed to collect a sufficient number of samples to calculate site-specific background concentrations for metals and PAHs.

				evaluation may be necessary. • Wetlands: If maximum soil concentrations are below soil background and NYSDEC ecological screening levels, no further evaluation is necessary. • If maximum surface water concentrations are below NYSDEC water quality standards, no further evaluation is necessary. • Wetlands: If maximum soil concentrations are above soil background and NYSDEC ecological screening levels, further evaluation may be necessary. • If maximum surface water concentrations are above NYSDEC water quality standards, further evaluation may be necessary.		

Note: * = If a field determination (during soil sampling of OU-1E) of wetland conditions indicates that the area is submerged by at least one foot of water and is greater than 0.5 acres in size, then this suggests that the area may not be ephemeral and should be further assessed to determine if the area sustains aquatic populations (e.g., fish and aquatic invertebrates).

Data Quality Objectives Table – OU-3 Residential Property Parcel

Problem Statement	Goal of the Study	Information Inputs	Study Boundaries	Analytical Approach	Performance/Acceptance Criteria	Data Collection Plan
Future use of this OU is residential single family housing. • No data are available for soil and groundwater. Surface soil sampling is required to characterize OU-3 and confirm absence of contamination. • Based on the recorded history of these parcels and review of historical images, it is expected that the majority of the parcel is undisturbed and constituent concentrations will reflect natural and anthropogenic background conditions. In order to verify this, site-specific background soil concentrations are required. Contact with groundwater is not anticipated within 0-2 ft. bgs, and one of the planned and allowable residential institutional controls is a prohibition against the use of groundwater on site. No significant exposure from onsite soil to ecological receptors.	The goal of the study is to confirm the absence of contamination above risk based levels. **Principal Study Questions** • What are site-specific background levels of metals and SVOCs? • Are soil constituent concentrations greater than site-specific background? • Are soil constituent concentrations greater than residential SCOs? **Decision Statement:** Exceedances of both site-specific background concentrations and residential SCOs will trigger further evaluation. Unacceptable risks will trigger a remedial planning document.	• Background soil types • OU-3 soil types • Background soil concentrations (metals, SVOCs) • Surface and subsurface soils data • NYSDEC SCOs • Human health toxicity and exposure assumptions • Analytes: o Soil: metals, VOCs (at 20 percent of locations), and SVOCs, pesticides (at 10 percent of locations), and PCBs (at 10 percent of locations). • Other parameters: organic carbon and pH. Soil classification/logs will be maintained.	• Surface soil: -2 in, 2-6 in, 6-12 in, and 12-24 in bgs • Constraints o Weather o Refusal due to bedrock o Access/vegetation • Decision units o Each parcel is considered its own decision unit	**Human Health Assessment:** • If maximum concentrations are below background and NYSDEC residential SCOs, no further evaluation is necessary. • If maximum concentrations are above background and NYSDEC residential SCOs, then further data evaluation may be necessary, including calculation of 95% Upper Confidence Limits and/or statistical evaluation of the data to determine if site concentrations are significantly different than background. • Data reduction will be based on homogeneity of the data.	• Detection limits below NYSDEC screening levels • Laboratory and field QA/QC	Focus on confirming the absence of contamination greater than risk-based levels and site-specific background. Unbiased sampling based on the following: • Collect additional samples at a density to be determined to characterize absence of contamination above risk-based levels. Samples will be evenly distributed geographically and vertically. **Background Areas:** In order to determine if observed concentrations are within background, the sampling plan is designed to collect a sufficient number of samples to calculate site-specific background concentrations for metals and SVOCs.

Data Quality Objectives Table – OU-4 Dam Property

Problem Statement	Goal of the Study	Information Inputs	Study Boundaries	Analytical Approach	Performance/Acceptance Criteria	Data Collection Plan
Future uses of this OU will be industrial use. This parcels consists of two areas: • Areas to the south of Fishkill Creek (approximately 3.41 acres) which are unremarkable and not associated with industrial activities • Hydroelectric Dam and associated facilities to the north of Fishkill Creek (4.96 acres) immediately adjacent to OU-1A. Screening of surface soil (0-1 ft. bgs) against NYSDEC industrial use soil cleanup objectives (SCOs) indicated exceedances of: • Arsenic (1 of 60 samples) • Benzo(a)pyrene (2 of 60 samples) • Exceedances are minor (within a factor of two of the SCO). Screening of 95% UCL surface soil (0-2 ft. bgs) concentrations against NYSDEC ecological SCOs indicated exceedances of metals including chromium, copper, lead, mercury, and zinc in up to 10 of 59 samples. In the absence of site-specific background concentrations, the observed concentrations may not represent contamination. A soil vapor assessment completed in 1999 found elevated concentrations of chlorinated solvents and petroleum hydrocarbons in the vicinity of Buildings 2, 3, 4, and 5. Although the report concluded the concentrations of the various chlorinated and petroleum hydrocarbon vapors detected are not excessively high, and significant impact from soil and/or groundwater is not anticipated, the data are approximately 17 years old and there are some exceedances of current EPA Vapor Intrusion Screening Levels (VISL). Therefore, current soil gas data are needed to assess the potential for current/future vapor intrusion risk. These data were collected under a separate work plan and are being evaluated separately. The results of that evaluation will be appended to the Data Gap Risk Assessment.	The goal of the study is to address data gaps in the nature and extent of potential contamination on site and to inform the assessment of potential exposure of humans and ecological receptors to site-related contaminants. **Principal Study Questions** • What are site-specific background levels of metals and benzo(a)pyrene? • Are soil constituent concentrations greater than site-specific background? **Decision Statement:** Surface soil (0-2 ft. bgs) exceedances of both site-specific background concentrations and industrial or ecological SCOs will trigger further evaluation.	• Background soil types • OU-4 soil types • Background soil concentrations (metals, PAHs) • Surface soil data from OU-4 for mercury speciation. • NYSDEC SCOs • Ecological and human health toxicity and exposure assumptions used to calculate site-specific NYSDEC SCOs • Other parameters include Hg Speciation, organic carbon, pH, total sulphur and grain size analysis. Soil classification/logs will be maintained.	• Surface soil: 0-2 in, 2-6 in, 6-12 in, and 12-24 in bgs • Total Hg and Hg speciation samples will be collected from 0 - 6 in, 6 -12 in, and 12 -24 in bgs **Constraints** • Weather • Refusal due to bedrock, cobbles	**Human Health Assessment:** • If maximum concentrations are less than background and NYSDEC industrial SCOs, no further evaluation is necessary. • If maximum concentrations are greater than background and NYSDEC industrial SCOs, then further data evaluation may be necessary, including calculation of 95% Upper Confidence Limits and/or statistical evaluation of the data to determine if site concentrations are significantly different than background. • Data reduction will be based on homogeneity of the data. **Ecological Risk Assessment:** • If the maximum surface soil concentrations are less than background or NYSDEC ecological SCOs, no further evaluation is necessary. • If the maximum surface soil concentrations are greater than background and NYSDEC ecological SCOs, 95% UCLs will be calculated. • If the 95% UCL of surface soil concentrations is greater than background and NYSDEC ecological SCOs, then further evaluation may be necessary. • Data reduction will be based on homogeneity of the data.	• Detection limits below NYSDEC screening levels • Laboratory and field QA/QC	To assess whether soils exceed ecological levels, background soil data will be collected in 2016. **Background Areas:** In order to determine if observed concentrations reflect background conditions, the sampling plan is designed to collect a sufficient number of samples to calculate site-specific background concentrations for metals and PAHs.

APPENDIX B

PRE-DRILLING / SUBSURFACE CHECKLIST FOR INTRUSIVE FIELD WORK

PREDRILLING/SUBSURFACE CHECKLIST FOR INTRUSIVE FIELDWORK

Site Name: _____ **Job Number:** _____
Site Phone Number: _____
Site Address: _____ **County:** _____
Client Proj. Mgr.: _____ **Phone:** _____
Site Manager Contacted Date: _____ **By:** _____
Site Drawings (yes / no / NA) _____ (please attach) **Historical Drawings (yes / no / NA)** _____
Third Party Construction/Redevelopment Plans (Yes/No/NA)

*****ATTACH SITE FIGURE WITH PROPOSED BORING LOCATIONS**

Subcontractor's (drillers, concrete, etc…) **Company** _____
Subcontractor's Contact Person _____ **Phone** _____
Meeting / Start Date _____ **Time** _____

1) Health and Safety Signoff Form Completed? (Yes/No) **Date** _____

2) Utility Protection Services (Minimum 48 Hrs. Advance Notice, State Specific Notification Period Supercedes)
Called: Date _____ **Time** _____ **Initials** _____
Reference # _____
Proposed Drilling Locations Premarked for Locating Service. **Y / N**

3) Private or In-House Utility Locating Service Performed? **Y / N** _____
Called: Date _____ **Time** _____ **Initials** _____
Name of Locating Service: _____
Telephone #/ contact: _____
Name of Supplier Locating Technician: _____
Type of sensing equipment used: _____
Proposed Drilling Locations Premarked **Y / N**

4) Other Potential Underground Structures
Name of City Engineer/Utility Representative: _____
Telephone #: _____
Date Notified _____ **Maps:** **Y / N**
Cleared: **Y / N**

5) COMPLETED SITE WALKOVER W/ SITE MANAGER/DESIGNEE OR OWNER/TENANT REP. **Y / N**
Name of Site Manager: _____
Name of Property Owner/Tenant Representative:_____
Cleared: **Yes / No**
Building Utility Service Line Connections Identified: **Y / N**
(Hand sketch on site map w/proposed boring locations and most likely utility trench locations)

6) Utility Inventory: **Y / N**

Utility	Name	Depth (ft) (If Available)	Phone	Notified - Date	Marked
Above Ground Services					
Electric		NA		Y / N	Y / N
Telephone		NA		Y / N	Y / N
Cable		NA		Y / N	Y / N
Overhead Supports		NA		Y / N	Y / N
Traffic light cables		NA		Y / N	Y / N

PREDRILLING/SUBSURFACE CHECKLIST FOR INTRUSIVE FIELDWORK

6) Utility Inventory Continued:

Below Ground Services:

Electric				Y / N		Y / N
Telephone				Y / N		Y / N
Cable				Y / N		Y / N
Gas				Y / N		Y / N
Water				Y / N		Y / N
UST System				Y / N		Y / N
Storm				Y / N		Y / N
Sanitary				Y / N		Y / N
Steam				Y / N		Y / N
Pipeline Companies				Y / N		Y / N

Other:

				Y / N		Y / N
				Y / N		Y / N
				Y / N		Y / N

7) **Site-Specific Emergency Contingency Plan Incorporated in Health & Safety Plan** **Y / N**

8) **Drilling Locations Approved by Client Project Manager Named Above?** **Y / N**

9) **Signature of Parsons' Project Mgr. (required to begin fieldwork):**

Name of Project Manager	**Signature of Project Manager**
Name of Parsons Field Personnel	**Signature of Field Personnel**

(This document to be included with the site H&S Plan and should be available upon request.)

ADDITIONAL COMMENTS / NOTES:

APPENDIX C

GROUND DISTURBANCE, EXCAVATION, AND WELL ABANDONMENT PROTOCOLS

Chevron Environmental Management Company (CEMC)
GROUND DISTURBANCE REVIEW CHECKLIST

(Note: This checklist does not apply to Upstream Business Unit (UBU) project site work conducted within OPCO SBU controlled areas. Nor does it apply to oil and gas well plug and abandonment (P&A) activities. UBU will follow the Opco SBU requirements to ensure work is safe to proceed.)

CEMC Site Name/Number: _____ CEMC Representative: _____

Location(s) Reviewed: _____ Date: _____

Clearance Inspected by: _____ Business Partner Review by: _____

Questions 1 - 20 must be answered prior to any intrusive subsurface work (e.g. soil borings, excavation, well installation, piezometer, vapor probe, etc.). **DO NOT DISTURB GROUND if you answered NO or Not Applicable (N/A) to any of the questions.** The Business Partner Project Manager (PM) shall contact the CEMC PM to discuss mitigation measures required. The CEMC PM shall provide written or verbal (when remote) acceptance to continue work through the use of the general work permit, or determine that a high risk permit is required. The supplier must document written and/or verbal CEMC acceptance on applicable work permits prior to starting work. Refer to CEMC's Permit to Work Standard for high hazard work permit information.

Note: If subcontractors are used to perform geophysical survey (step #7), the primary supplier must provide field oversight.

Yes	No	N/A	
☐	☐	☐	1. Is a scaled site plan showing the proposed subsurface locations and utility conduits attached to this form?
☐	☐	☐	2. Are all of the proposed subsurface locations at least 5 feet from any subsurface utilities (including fuel product lines) as shown on the building plans? (if answered No, a "high risk" permit is required)
☐	☐	☐	3. Are all of the proposed subsurface locations at least 7 feet from the pad surrounding the underground storage tanks (USTs) shown on the service station's building plans? (if answered No, a "high risk" permit is required)
☐	☐	☐	4. Are all of the proposed subsurface locations at least 5 feet from any subsurface utilities shown on public right-of-way street improvement plans? (*Work with respective utility company to determine if they require a representative present during drilling / excavation activities*) (if answered No, a "high risk" permit is required)
☐	☐	☐	5. Was the station manager / property owner contacted to see if he/she has any knowledge of any subsurface utilities and/or roof drains within 5 feet of the proposed subsurface / intrusive locations? (*Review locations with the manager / owner*)
☐	☐	☐	6. Were all circuits on during subsurface checks if the checks were for identifying energized lines? (e.g., circuits on timers or light sensing switches)
☐	☐	☐	7. Are all of the proposed subsurface locations at least 5 feet from any subsurface utilities identified during a geophysical survey performed using ground penetrating radar (GPR) in conjunction with other technologies? (if answered No, a "high risk" permit is required)
☐	☐	☐	8. Have all state "One Call" providers marked out their facilities in the vicinity of the proposed subsurface locations or otherwise notified EMC's Business Partner that they do not have any facilities near the proposed subsurface / intrusive locations? ***(Utility locators shall be escorted when on site)***
☐	☐	☐	9. Was there visual verification that each of the proposed subsurface locations do not lay on a line connecting two similar looking manhole covers (e.g. sanitary sewer or storm drains)? (*Consider having the line snaked to confirm their locations*)
☐	☐	☐	10. Was there visual verification that each of the proposed subsurface locations do not lie on a line with any water, gas, electrical meters, utility clean-outs, or other utility boxes in the surrounding areas?
☐	☐	☐	11. Was there visual verification that the pavement in the vicinity of each of the proposed subsurface locations has not subsided or give the appearance it may be covering a former trench? (e.g., linear cracks or sagging curbs)
☐	☐	☐	12. Was there visual verification that each of the proposed subsurface locations has adequate overhead clearance for the rig? (e.g., minimum of 15 feet from overhead utility line and/or reasonable distance from canopies to prevent damage) (if answered No, a "high risk" permit is required)
☐	☐	☐	13. Was there visual verification that no changes have been made to the grout collar and the surface around the existing wells? (e.g. comparing current site conditions to photographs taken when the existing borings / wells were installed to identify different colors/textures of concrete in or saw cuts through the area of the well bore)
☐	☐	☐	14. Was a review of the original boring logs for the existing borings / wells completed? (*Please document any discrepancies and/or changes*)
☐	☐	☐	15. Are all of the proposed subsurface locations at least 5 feet from active remediation system lines shown on the as-built drawings? (if answered No, a "high risk" permit is required)
☐	☐	☐	16. Are copies of the completed ground disturbance review checklist(s) and the findings from items 1 through 15 documented in a report? (*Please upload final report to STRATA*)
☐	☐	☐	17. Have all appropriate permits been obtained?
☐	☐	☐	**18. Have you carefully cleared the borehole (using an air knife, hand auger, or other mechanical methods) to a minimum depth of 8 feet below grade before using a drill rig or day-lighted utilities as appropriate for other locations (e.g., excavations, trenches, etc..)?**
☐	☐	☐	19. When drilling, is the diameter of the hand cleared hole at a minimum 2 inches greater than the outer diameter of the drilling tools you will be using? (e.g., hollow stem augur, direct push rod, sonic / rotary drill bit, etc…)
☐	☐	☐	20. Was the soil encountered in the cleared subsurface location free of clean gravel, clean sand, aggregate base (gravelly sand with ~10% fines), or non-native looking material?

Chevron Environmental Management Company (CEMC)
GROUND DISTURBANCE REVIEW CHECKLIST

(Note: This checklist does not apply to Upstream Business Unit (UBU) project site work conducted within OPCO SBU controlled areas. Nor does it apply to oil and gas well plug and abandonment (P&A) activities. UBU will follow the Opco SBU requirements to ensure work is safe to proceed.)

	Additional notes or comments
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PARSONS

-UTILITY CLEARANCE VARIANCE REQUEST **REVISION**

To:	Rich Molta, Pratima Poplai Choose an item.	This Variance Document includes the following Boring Locations:
From:		
Cc	Task Manager: Choose an item. Safety: Choose an item.	
Client Company Name:	CEMC	
Site/Project Name:	Former Chevron P.A. Facility SWMU/AOC	
Date of Request:	Click here to enter a date.	
Work Start Date:	Click here to enter a date.	

The purpose of this document is to request a variance from one or more of the PE&I Mandatory Subsurface Soil Disturbance Protocol requirements. The purpose of the mandatory protocol is to prevent potential injury and/or loss of life; and damage to subsurface utilities and structures during any soil disturbance. Any waiver of these requirements should be carefully evaluated.

Variance from the Subsurface Soil Disturbance Protocol is allowed only with the written approval of the appropriate Parsons' Program/Sector/Operations Manager. GBU/Divisional/Program safety resources should be consulted as needed. Failure to obtain a variance in writing is grounds for disciplinary action.

Brief Project Description

Drilling Equipment Used	Choose an item.	
Previous Drilling Locations in Area		
Geophysical Survey Details		
List of Figures		
Site Walk for Hand Clearance	Site walk Conducted on: CEMC on Site: Parsons Representative:	Click here to enter a date. Choose an item.

	Observations:	
Site Walk for Utility Variance	Site walk Conducted on: CEMC on Site: Parsons Representative: Observations:	Click here to enter a date. Choose an item.

Utility Clearance Requirements

Step No.	Requirement	Step Completed[1]
Prep-1	Obtain as-built drawings and/or existing site plans if available and review for on-site utilities.	Choose an item.
Prep-2	Utility mark-out requested through the nationwide utility locating one-call system (www.call811.com) for the work site.	Choose an item. One-Call Ticket # Exp. Date: Click here to enter a date.
Prep-3	Review the Subsurface Soil Disturbance protocol with all PE&I technical staff that will potentially be involved in projects that include subsurface investigation.	Choose an item.
Pre Mob-1	Notify affected parties at least 48-hours (longer if possible) in advance of planned intrusive fieldwork.	Choose an item.
Pre Mob-2	Prepare a Project Safety, Health and Environmental Plan (PSHEP) that includes a copy of the Subsurface Soil Disturbance protocol.	Choose an item.

[1]Any "No" response must include the rationale for not completing the step at the end of the Variance Request form.

Step No.	Requirement	Step Completed[1]
Pre Mob-3	Select a competent Parsons' on-site representative to oversee all surface removal, hand augering/digging, drilling, and test pitting.	Choose an item.
Site Visit-1	Perform a site visit and identify indications of underground utilities. Indications could include[2]: ➢ Area lights ➢ Phones ➢ Drain lines ➢ Overhead lines ➢ Fire hydrants ➢ Fiber optic cable signage ➢ Catch basins ➢ Manholes ➢ Junction boxes ➢ Natural gas ➢ Observe paving scars such as areas of new pavement or saw cuts	Choose an item.
Site Visit-2	Prepare a vicinity map of the proposed work area to include significant features and utilities. The site visit should be scheduled concurrent with, or soon after the utility mark-out.	Choose an item.
Site Visit-3	Interview someone having historical site knowledge to gain information about the site (locations of former tanks, lines, etc.).	Choose an item.
Site Visit-4	Establish pre-drilling critical zones appropriate to the project site.	Choose an item.
Site Visit-5	Review Selected Locations with the Client.	Choose an item.
Field Work-1	Review site utility maps against each proposed work activity. Check for legibility, accuracy, and scale while walking areas of concern. Evaluate the work area for any items in Site Visit-1 that may have been missed.	Choose an item.

[2] Note that list is not all inclusive.

Step No.	Requirement	Step Completed[1]
Field Work-2	Obtain all necessary permits and utility from the facility.	Choose an item.
Field Work-3	Remove any surface paving or surface cover allow clear visibility of the subsurface conditions during hand augering/digging and allow excavation with hand tools.	Choose an item.
Field Work-4	**Non-Invasive Clearing**: Clear a minimum of a five foot radius for each proposed intrusive activity. Locations will be cleared using results of historical data research and with geophysical methods. Multiple appropriate instruments (ground penetrating radar, electromagnetic detector, magnetometer, metal detector) can be used for this work.	Choose an item. Choose an item.
Field Work-5	**Invasive Clearing**: Delineate the subsurface at the borehole location by probing or digging. Dimensions of the intrusive method must exceed the diameter of the largest tool (hand auger, drill auger, sampling tube, etc.) to be advanced and sufficiently large to allow for visual inspection of any obstructions encountered. Approved methods could include the following: ➢ Vacuum Extraction (Air Knifing, SoftDig®) ➢ Probing ➢ Hand Digging ➢ Hand Augering ➢ Post Hole Digging	Choose an item. Choose an item.

Rationale

Below, identify the step or steps the variance is being requested for and an explanation of why the waiver is necessary and/or justified.

Step No.	Rationale for Variance Request
☐	
☐	
☐	
☐	
☐	

Approvals

	Name	Date
Client (Chevron) Project Manager		
Parsons Project Manager/Chevron Operations Manager		

APPENDIX D

QUALITY ASSURANCE PROJECT PLAN
REVISED FEBRUARY 2017

APPENDIX D: QUALITY ASSURANCE PROJECT PLAN
2017 DATA GAP INVESTIGATION
Former Chevron Research Center
Beacon, New York

SITE ID# 314004
EPA ID # 091894899

Submitted to:

Chevron

Mr. Mark Hendrickson
Chevron Environmental Management Company
Mining and Specialty Portfolio Business Unit
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Syracuse, NY 13212

REVIEWED AND APPROVED BY:

Project Manager: _____ 03/10/17
Date

Technical Manager: _____ 03/10/17
Date

APRIL 2016
REVISED JULY 2016 AND FEBRUARY 2017

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LIST OF ACRONYMS

ASP	Analytical Services Protocol
CAR	Corrective Action Request
COC	Chain of Custody
DUSR	Data Usability Summary Report
EIM	Locus Focus EIM™
ELAP	Environmental Laboratory Approval Program
FGS	Frontier Global Sciences
ICM	Interim Corrective Measure
ISS	Industrial Sewer System
LLI	Eurofins-Lancaster Laboratories, Inc.
LCS	Laboratory Control Samples
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NIST	National Institute of Standards and Technology
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PARCCS	Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity
PCBs	Polychlorinated Biphenyls
PE	Performance Evaluation, also Professional Engineer
PSHEP	Project Safety, Health, and Environmental Plan
PQL	Practical Quantitation Limit
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RL	Reporting Limit

LIST OF ACRONYMS
(Continued)

RPD	Relative Percent Difference
SAP	Sampling and Analysis Plan
SDG	Sample Deliver Group
SVOCs	Semi-volatile Organic Compounds
TAL	Target Analyte List
TCL	Target Compound List
TOC	Total Organic Carbon
TRCB	Texaco Research Center Beacon
TSS	Total Suspended Solids
USEPA	U.S. Environmental Protection Agency
VOCs	Volatile Organic Compounds
VTSR	Validated Time of Sample Receipt
WATF	Washington Avenue Tank Farm

SECTION 1

PROJECT DESCRIPTION

This Quality Assurance Project Plan (QAPP) specifies analytical methods to be used to ensure that data collected from the 2017 Data Gap Investigation program to be conducted at the former Texaco Research Center Beacon (TRCB) in Beacon, New York are precise, accurate, representative, comparable, and complete.

1.1 INTRODUCTION

Chevron Corporation (Chevron, also historically known as Texaco and ChevronTexaco) operated a Research Center in Glenham, New York from 1931 until its closure in 2003. The Site has also been called the Texaco Research Center and the Beacon Research Center. The property is located on approximately 153 acres of land and includes four main areas. The Recreation Area is an undeveloped property located south of Washington Avenue. The Main Facility includes all of the developed areas located north of Fishkill Creek. The Washington Avenue Tank Farm (WATF) is located south of Fishkill Creek and north of Washington Avenue. The Former Church Property is an undeveloped parcel located to the northwest of the Main Facility.

The Main Facility has been used as an on-shore, non-production, non-transportation laboratory complex engaged in research, development, and technical services related to petroleum products and energy. Petroleum, coal products, and solvents have been used at the Property in connection with the research functions. From 1811 until 1930, the Site was the location of textile and woolen mills. The mills were powered by water wheels and steam engines. Blacksmith and carpentry shops operated in support of the mills.

Previous investigations have included follow-on investigations to specific activities such as tank removals and spill investigations. A Phase III Resource Conservation and Recovery Act (RCRA) Facility Investigation was completed by Texaco in March 2001 (IT, 2001a). In 2006, Chevron completed the closure of the Industrial Sewer System (ISS) and the completion of the Recreation Area interim corrective measure (ICM). In 2005, a Phase II Environmental Site Assessment (GSC, 2005) was completed by Groundwater Sciences Corporation on behalf of a party interested in acquiring the Site. In the fall of 2006, a Sitewide RCRA Facility Investigation (RFI) was conducted by Parsons (Parsons, 2007) for Chevron and in the fall of 2007 a Supplemental RFI was conducted by Parsons (Parsons, 2009). In 2010, various subsurface investigations were conducted to determine soil and groundwater quality (e.g., Sitewide Soil and Groundwater Sampling Events, Mill Building Investigation and neighboring property [Westage Property] investigation). In 2012, three subsurface investigations were conducted (Concrete Foundation Drilling Investigation, Undeveloped Property Investigation [property located south of Main Facility], and Sitewide Groundwater Sampling Event) to also determine soil and groundwater quality, while in 2013 two subsurface investigations (Additional Well Installations and Sitewide Groundwater Sampling Event) were performed to determine subsurface conditions.

Property Location and Description

The property is located on approximately 153 acres of land in the Town of Fishkill, New York. Petroleum, coal products, and solvents were used at the Property in connection with research

functions. The Property is located in Dutchess County, Town of Fishkill immediately east of the City of Beacon. The Property occupies land both north (50+ acres) and south (90+ acres) of Fishkill Creek on land zoned "Planned Industrial" by the Town of Fishkill. The area located south of Fishkill Creek is known as the Recreation Area. The area of the Property located north of Fishkill Creek consists of the Main Research Center.

SECTION 2

PROJECT ORGANIZATION

This QAPP was completed for Chevron by Parsons. Parsons will provide an onsite Field Team Leader to provide project oversight. Parsons will also oversee all data analysis and reporting tasks related to the project. Analytical services will be performed by Eurofins-Lancaster Laboratories, Inc. (LLI) (Lancaster, Pennsylvania) and Eurofins-Frontier Global Sciences (FGS) (Bothell, Washington), both a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)/New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocol (ASP) certified environmental analytical testing laboratory.

Key contacts for project are as follows:

Chevron Project Manager:	Mr. Mark Hendrickson Telephone: 713-432-2634 Email: mhendrickson@chevron.com
Parsons Project Manager:	Mr. Craig Butler, P.E. Telephone: (315) 263-6053 Email: Craig.Butler@parsons.com
Eurofins-Lancaster Representative:	Megan Moeller Telephone: 717-656-2300, ext. 1246 Fax: 717-656-2681 Email: meganmoeller@eurofinsUS.com
Eurofins- Bothell Representative:	Robert Brunette Telephone: 425-686-3560 Fax: 425-686-3096 Email: robertbrunette@eurofinsUS.com

SECTION 3

QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) OBJECTIVES FOR MEASUREMENT OF DATA

3.1 INTRODUCTION

The purpose of this QAPP is to provide a standard for control and review of measurement data to ensure they are scientifically sound, representative, comparable, defensible, and of known quality. The data will be used to evaluate the physical and chemical attributes of collected samples. The project objective for analytical testing is to characterize the physical characteristics and chemical constituents and to provide data to support the decision-making process.

The quality assurance and quality control objectives for all measurement data include precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS). These objectives are defined in following subsections. They are formulated to meet the requirements of the USEPA SW-846 and NYSDEC ASP.

3.2 PRECISION

Precision is an expression of the reproducibility of measurements of the same parameter under a given set of conditions. Specifically, it is a quantitative measurement of the variability of a group of measurements compared to their average value (USEPA, 1987). Precision is usually stated in terms of standard deviation, but other estimates such as the coefficient of variation (relative standard deviation), range (maximum value minus minimum value), relative range, and relative percent difference (RPD) are common.

The objectives for precision for each chemical are based on the capabilities of the approved EPA analytical method with respect to laboratory performance. Tables 3.1 and 3.2 present the quantitative objectives for precision for the various parameter groups for laboratory performance and evaluation of sample measurement bias.

For this project, field sampling precision will be determined by analyzing coded duplicate samples (labeled so that the laboratory does not recognize them as duplicates) for the same parameters, and then, during data validation (Section 7), calculating the RPD for duplicate sample results.

Analytical precision will be determined by the laboratory by calculating the RPD for the results of the analysis of internal QC duplicates and matrix spike duplicates. The formula for calculating RPD is as follows:

$$RPD = \frac{|V1 - V2|}{(V1 + V2)/2} \times 100$$

where:

RPD	=	Relative Percent Difference.
V1, V2	=	The two values to be compared.
|V1 - V2|	=	The absolute value of the difference between the two values.
(V1 + V2)/2	=	The average of the two values.

The data quality objectives for analytical precision, calculated as the RPD between duplicate analyses, are presented in Tables 3-1 and 3-2 for water and soil samples, respectively.

3.3 ACCURACY

Accuracy is a measure of the degree of agreement of a measured value with the true or expected value of the quantity of concern (Taylor, 1987), or the difference between a measured value and the true or accepted reference value. The accuracy of an analytical procedure is best determined by the analysis of a sample containing a known quantity of material, and is expressed as the percent of the known quantity which is recovered or measured. The recovery of a given analyte is dependent upon the sample matrix, method of analysis, and the specific compound or element being determined. The concentration of the analyte relative to the detection limit of the analytical method is also a major factor in determining the accuracy of the measurement. Concentrations of analytes which are close to the detection limits are less accurate because they are more affected by such factors as instrument "noise". Higher concentrations will not be as affected by instrument noise or other variables and thus will be more accurate.

The objectives for accuracy for each chemical are based on the capabilities of the approved USEPA analytical method with respect to laboratory performance. Tables 3.1 and 3.2 present the quantitative objectives for accuracy for the various parameter groups for laboratory performance and evaluation of sample measurement bias.

Sampling accuracy may be determined through the assessment of the analytical results of field blanks and trip blanks for each sample set. Analytical accuracy is typically assessed by examining the percent recoveries of surrogate compounds that are added to each sample (organic analyses only), the percent recoveries of matrix spike compounds added to selected samples, and the percent recoveries of spike compounds added to laboratory control samples (LCS). An LCS will be analyzed to provide additional information on analytical accuracy. Additionally, initial and continuing calibrations must be performed and accomplished within the established method control limits to define the instrument accuracy before analytical accuracy can be determined for any sample set.

Accuracy is normally measured as the percent recovery (%R) of a known amount of analyte, called a spike, added to a sample (matrix spike or laboratory control). The %R is calculated as follows:

$$\%R = \frac{SSR - SR}{SA} \times 100$$

where:

- %R = Percent recovery.
- SSR = Spike sample result: concentration of analyte obtained by analyzing the sample with the spike added.
- SR = Sample result: the background value, i.e., the concentration of the analyte obtained by analyzing the sample.
- SA = Spiked analyte: concentration of the analyte spike added to the sample.

The acceptance limits for accuracy for each parameter are included in Tables 3-1 and 3-2.

3.4 REPRESENTATIVENESS

Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter which is most concerned with the proper design of the sampling program (USEPA, 1987). Samples must be representative of the environmental media being sampled. Selection of sample locations and sampling procedures will incorporate consideration of obtaining the most representative sample possible.

Field and laboratory procedures will be performed in such a manner as to ensure, to the degree that is technically possible, that the data derived represents the in-place quality of the material sampled. Every effort will be made to ensure chemical compounds will not be introduced into the sample via sample containers, handling, and analysis. Decontamination of sampling devices and digging equipment will be performed between samples as outlined in the Field Sampling Plan. Analysis of field blanks, trip blanks, and method blanks will also be performed to monitor for potential sample contamination from field and laboratory procedures.

The assessment of representativeness also must consider the degree of heterogeneity in the material from which the samples are collected. Sampling heterogeneity will be evaluated during data validation through the analysis of coded field duplicate samples. The analytical laboratory will also follow acceptable procedures to assure the samples are adequately homogenized prior to taking aliquots for analysis, so the reported results are representative of the sample received.

Chain-of-Custody (COC) procedures will be followed to document that contamination of samples has not occurred during container preparation, shipment, and sampling. Details of blank, duplicate and COC procedures are presented in Sections 4 and 5.

3.5 COMPLETENESS

Completeness is defined as the percentage of measurements made which are judged to be valid (USEPA, 1987). Completeness is calculated for each method (or analyte) and sample matrix for an assigned group of samples. Completeness for a data set represents the results usable for data interpretation and decision making. The completeness objective for this project for the analytical and field data is 90%. Completeness is defined as follows for all sample measurements:

$$\%C = \frac{V}{T} \times 100$$

where:

%C = Percent completeness.

V = Number of measurements judged valid.

T = Total number of measurements.

3.6 COMPARABILITY

Comparability expresses the degree of confidence with which one data set can be compared to another (USEPA, 1987). The comparability of all data collected for this project will be ensured by:

- Using identified standard methods for both sampling and analysis phases of this project;
- Requiring traceability of all analytical standards and/or source materials to the U.S. Environmental Protection Agency (USEPA) or National Institute of Standards and Technology (NIST);
- Requiring that all calibrations be verified with an independently prepared standard from a source other than that used for calibration (if applicable);
- Using standard reporting units and reporting formats including the reporting of QC data;
- Performing a complete data validation on a representative fraction of the analytical results, including the use of data qualifiers in all cases where appropriate; and
- Requiring that all validation qualifiers be used any time an analytical result is used for any purpose.

These steps will ensure all future users of either the data or the conclusions drawn from them will be able to judge the comparability of these data and conclusions.

3.7 SENSITIVITY

When selecting an analytical method during the data quality objective process, the achievable method detection limit (MDL) and reporting limit (RL) must be evaluated to verify that the method will meet the project quantitation limits necessary to support project decision making requirements. This process ensures that the analytical method sensitivity has been considered and that the methods used can produce data that satisfy users' needs while making the most effective use of resources. The concentration of any one target compound that can be detected and/or quantified is a measure of sensitivity for that compound. Sensitivity is instrument-, compound-, method-, and matrix-specific and achieving the required practical quantitation limit (PQL) and/or method detection limit (MDL) objectives depends on instrument sensitivity and potential matrix effects. With regard to instrument sensitivity, it is important to monitor the instrument performance to ensure consistent instrument performance at the low end of the calibration range. Instrument sensitivity will be monitored through the analysis of method/prep blanks, calibration check samples, and low standard evaluations.

Laboratories generally establish limits that are reported with the analytical results; these results may be called reporting limits, detection limits, quantitation limits, or other terms. These laboratory-specific limits, apply undiluted analyses and must be less than or equal to the project RLs. The RL, also known as the practical quantitation limit (PQL), represents the concentration of an analyte that can be routinely measured in the sampled matrix within stated limits and with confidence in both identification and quantitation. Throughout various documents RL and PQL may be interchanged, but they effectively have the same meaning. The RLs are established based on specific knowledge about the analyte, sample matrix, project specific requirements, and regulatory requirements. The RL is typically established by the laboratory at the level of the lowest calibration standard and is generally in the range of two to ten times the MDL.

The MDL is defined as "the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero" (40 CFR 136 Appendix B). The MDL is the lowest concentration at which a specific analyte in a matrix can be measured and reported with 99% confidence that the analyte concentration is greater than zero. MDLs are experimentally determined and verified for each target analyte of the methods in the sampling program. The laboratory will determine MDLs for each analyte and matrix type prior to

analysis of project samples. In addition, when multiple instruments are employed for the analysis of the same method, each individual instrument will maintain a current MDL study. MDLs are based on the results of seven matrix spikes at the estimated MDL, and are statistically calculated in accordance with the Title 40, Code of Federal Regulations Part 136 (40 CFR 136) Appendix B. The standard deviation of the seven replicates is determined and multiplied by 3.14 (i.e., the 99% confidence interval from the one-sided student t-test). If risk-based project objectives are developed, then where practicable, MDLs must be lower than the risk-based criteria determined for the project.

The MDLs to be used are intended to allow that both nondetected and detected target compound results will be usable to the fullest extent possible for the project. An MDL check sample an (interference-free MS with all method target compounds) must be analyzed following the MDL study to determine if reasonable MDL concentrations have been achieved. The MDL check sample should be at a concentration in the range of two to four times the MDL. If any target compound is not recovered, the MDL study must be repeated. In this case, the repeated MDL should be performed with a higher concentration, based on the analyst's judgment, of the target compounds that failed in the MDL check sample. MDLs must be determined annually at a minimum, and verified by analyzing an MDL check sample on each instrument used for the applicable method.

Organic analyses will generally be reported to the RL for nondetected results and metals and cyanide will be reported to the MDL for nondetected results. Analytical results below the MDL will be flagged with a *U* to indicate the data are nondetect. However, the laboratory will flag analytes detected at a level less than the RL but greater than the MDL (or the laboratory's determined minimum reportable concentration) with a *J* to denote an estimated concentration.

When results are corrected for dry weight, the reporting limits are then elevated accordingly. To compensate for the low solids, modifications are made either to increase the initial volume extracted/digested or to reduce the final volume of extract/digestate.

For samples that do not meet the project-specified RLs, (taking into consideration elevated RLs due to percent solids or percent moisture and aliquots used for the designated analysis), the laboratory must make available compelling documentation (e.g., screening data) and a justifiable explanation for its inability to meet the specified limits using the project protocols. It must also provide an appropriate, justifiable explanation of the issues and resolution in the analytical report/data package (dilution factor, interference, etc.). Excessive, unnecessary dilutions on any sample for a project are unacceptable. The laboratory will analyze all samples initially undiluted, unless for GC/MS analyses, a preliminary GC-screen is performed and indicates that GC/MS instrument damage or compromise may occur if the sample is not analyzed initially at dilution. In this instance, the sample will be analyzed at the lowest possible dilution factor. If multiple extractions/ analyses are performed (such as undiluted and diluted analyses), resulting in several data sets for the same sample, the laboratory will report all data and results from each of the multiple analyses in the data package.

TABLE 3-1

QUALITY CONTROL LIMITS FOR WATER SAMPLES

		Laboratory Accuracy and Precision					
Analytical Parameters	**Analytical Method (a)**	**Matrix Spike (MS) Compounds**	**MS/MSD (b) % Recovery**	**MS/MSD RPD (c)**	**LCS (d) % Recovery**	**Surrogate Compounds**	**Surrogate % Recovery**
VOCs (e)	8260C	All target VOCs	Lab QC limits	Lab QC limits	Lab QC limits	Toluene-d8 Bromofluorobenzene 1,2-Dichloroethane-d4	88-110 86-115 76-114
SVOCs (f)	8270D/8270D SIM	All target SVOCs	Lab QC limits	Lab QC limits	Lab QC limits	Nitrobenzene-d5 2-Fluorobiphenyl Terphenyl-d14 Phenol-d5 2-Fluorophenol 2,4,6-Tribromophenol 2-Chlorophenol-d4 1,2-Dichlorobenzene-d4	35-114 43-116 33-141 10-110 21-110 10-123 33-110 (g) 16-110 (g)
Pesticides/PCBs (h)	8081B/8082	All target pesticides/PCB-1016/PCB-1260	Lab QC limits	Lab QC limits	Lab QC limits	Tetrachloro-m-xylene Decachlorobiphenyl	60-150 (g) 60-150 (g)
Inorganics (i)	6010C/6020A/7470A/9012	Inorganic Analyte	75-125 (j)	20 (k)	85-115	NA	NA
Hardness	SM 2340 C-1997	Hardness	Lab QC limits	Lab QC limits	Lab QC limits	NA	NA
TSS	SM 2540 D-1997	TSS	Lab QC limits	Lab QC limits	Lab QC limits	NA	NA
pH	SM 4500-H+ B-200	pH	Lab QC limits	Lab QC limits	Lab QC limits	NA	NA

(a) Analytical Methods: USEPA SW-846, 3rd edition, Revision 1, November 1990; any subsequent revisions shall supersede this information
(b) Matrix Spike/Matrix Spike Duplicate
(c) Relative Percent Difference
(d) Laboratory Control Sample
(e) Target Compound List Volatile Organic Compounds
(f) Target Compound List Semivolatile Organic Compounds
(g) Limits are advisory only
(h) Polychlorinated Biphenyls
(i) Target Analyte List Inorganics (metals and cyanide)
(j) Matrix spike only
(k) Laboratory duplicate RPD
(l) Total Suspended Solids
NA - Not Applicable

TABLE 3-2
QUALITY CONTROL LIMITS FOR SOIL SAMPLES

Laboratory Accuracy and Precision

Analytical Parameter	Analytical Method (a)	Matrix Spike (MS) Compounds	MS/MSD (b) % Recovery	MS/MSD RPD (c)	LCS (d) % Recovery	Surrogate Compounds	Surrogate % Recovery
VOCs (e)	8260C/5035	All target VOCs	Lab QC limits	Lab QC limits	Lab QC limits	Toluene-d8 Bromofluorobenzene 1,2-Dichloroethane-d4	84-138 59-113 70-121
SVOCs (f)	8270D/8270D SIM	All target SVOCs	Lab QC limits	Lab QC limits	Lab QC limits	Nitrobenzene-d5 2-Fluorobiphenyl Terphenyl-d14 Phenol-d5 2-Fluorophenol 2,4,6-Tribromophenol 2-Chlorophenol-d4 1,2-Dichlorobenzene-d4	23-120 30-115 18-137 24-113 25-121 19-122 20-130 (g) 20-130 (g)
Pesticides/PCBs (h)	8081B/8082	All target pesticides/PCB-1016/PCB-1260	Lab QC limits	Lab QC limits	Lab QC limits	Tetrachloro-m-xylene Decachlorobiphenyl	60-150 (g) 60-150 (g)
Inorganics (i)	6010C/6020A/7471	Inorganic Analyte	75-125 (j)	20 (k)	85-115	NA	NA
Total Organic Carbon (TOC)	Lloyd Kahn	TOC	Lab QC limits	Lab QC limits	Lab QC limits	NA	NA
Mercury Speciation Fractions	1630 and 1631	NIST Traceable Spiking Material on Each Fraction and Selective Reference Materials	65%-130% and 71%-125%/	24% and 35%	0%-125% and 80%-120%	NA	NA

(a) Analytical Methods: USEPA SW-846, 3rd edition, Revision 1, November 1990, any subsequent revisions shall supersede this information
(b) Matrix Spike/Matrix Spike Duplicate
(c) Relative Percent Difference
(d) Laboratory Control Sample
(e) Target Compound List Volatile Organic Compounds
(f) Target Compound List Semivolatile Organic Compounds
(g) Limits are advisory only
(h) Polychlorinated Biphenyls
(i) Target Analyte List Inorganics (metals and cyanide)
(j) Matrix spike only
(k) Laboratory duplicate RPD
NA - Not Applicable

SECTION 4

SAMPLING PROGRAM

4.1 INTRODUCTION

This section presents sample container preparation procedures, sample preservation procedures, sample holding times, and field QC sample requirements. A summary of the required samples and analyses that will be collected from the project is shown in Table 4-1. The sampling procedures are presented in the Sampling and Analysis Plan (SAP) provided in Appendix F of the Parsons document entitled, "2017 Data Gap Investigation Work Plan (Soil and Surface Water), Former Chevron Research Center, Beacon, New York", dated April 2016, Revised June 2016 and February 2017.

4.2 SAMPLE CONTAINER PREPARATION AND SAMPLE PRESERVATION

Sample containers will be properly washed and decontaminated prior to their use by either the analytical laboratory or the container vendor to the specifications required by the USEPA. Copies of the sample container QC analyses will be provided by the laboratory for each container lot used to obtain samples. The containers will be tagged; the appropriate preservatives will be added. The types of containers are shown in Tables 4-2 and 4-3.

Samples shall be preserved according to the preservation techniques listed in Tables 4-2 and 4-3. Preservatives will be added to the sample bottles by the laboratory prior to their shipment in sufficient quantities to ensure that proper sample pH is met. Following sample collection, the sample bottles should be placed on ice in the shipping cooler, cooled to 4^{o}C with ice, and delivered to the laboratory within 24-48 hours of collection. COC procedures are described in Section 5.

In addition, water samples and soil samples that are to be analyzed for volatile organic compounds (VOCs) will be shipped to the laboratory in separate coolers, so that the potential for cross contamination will be eliminated.

4.3 SAMPLE HOLDING TIMES

The sample holding times for organic and inorganic parameters are listed in Tables 4-2 and 4-3 and must be in accordance with the NYSDEC ASP requirements. The NYSDEC ASP holding times must be strictly adhered to by the laboratory. Any holding time exceedances must be reported to the Chevron Project Manager.

4.4 FIELD QC SAMPLES

To assess field sampling and decontamination performance, two types of "blanks" will be collected and submitted to the laboratory for analyses. In addition, the precision of field sampling procedures will be assessed by collecting coded field duplicates and matrix spike/ matrix spike duplicates (MS/MSDs). The blanks will include:

a. Trip Blanks - A Trip Blank will be prepared before the sample containers are sent by the laboratory. The trip blank will consist of a 40-ml VOA vial containing distilled, deionized water, which accompanies the other water sample bottles into the field and back to the laboratory. A trip blank will be included with each shipment of water samples for target compound list (TCL) volatiles analysis. The Trip Blank will be

analyzed for TCL volatile organic compounds to assess any contamination from sampling and transport, and internal laboratory procedures.

b. Field Blanks - Field Blanks will be taken at a minimum frequency of one per 20 field samples per sample matrix. Field blanks are used to determine the effectiveness of the decontamination procedures for sampling equipment. It is a sample of deionized, distilled water provided by the laboratory that has passed through a decontaminated bailer or other sampling apparatus. It is usually collected as a last step in the decontamination procedure, prior to taking an environmental sample. The field blank may be analyzed for all or some of the parameters of interest.
   - No field blank will be required if sampling equipment is either dedicated and/or disposal.

The duplicates will consist of:

- Coded Field Duplicate - To determine the representativeness of the sampling methods, coded field duplicates will be collected at a frequency of one per 20 field samples. The samples are termed "coded" because they will be labeled in such a manner that the laboratory will not be able to determine that they are a duplicate sample. This will eliminate any possible bias that could arise.
  - Field duplicates and corresponding original samples will be distinguished by field duplicate samples having the repeat sample letter “D” added to the sample identification (i.e., MW-23-S-12.55-010801 (original sample) equals MW-23-SD-12.55-010801 (field duplicate sample)). Additionally, each sample container will be labeled prior to packing for shipment. The sample identifier, site name, date and time of sampling, and analytical parameters will be written on the label in waterproof ink and recorded in the field book.
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) - MS/MSD samples (MS/MSD for organics; MS and laboratory duplicate for inorganics) will be taken at a frequency of one pair per 20 field samples. These samples are used to assess the effect of the sample matrix on the recovery of target compounds or target analytes. The percent recoveries and RPDs are given in Tables 3-1 and 3-2.

TABLE 4-1
SUMMARY OF SAMPLES AND ANALYSES

Matrix	Parameter	Analytical Method	Field Samples[1]				QC Blanks[1]		Total
			Field Samples	Field Duplicate	MS/MSD[a] (Total)	Sub-Total	Trip Blank	Rinse Blank	
Soil Samples – TRCB Operable Units	SVOCs	EPA SW 8270D	508	28	56	592	NA	28	620
	VOCs	EPA SW 5035/8260B	120	12	18	150	TBD	10	160
	TAL Metals	EPA SW 6010C/6020A/7471B	508	28	56	592	NA	28	620
	Pesticides	EPA SW 8081B	64	9	12	85	NA	7	92
	PCBs	EPA SW 8082A	64	9	12	85	NA	7	92
	TOC	Lloyd Kahn	528	29	58	615	NA	29	644
	pH	EPA SW SM 4500 H+200	528	29	58	615	NA	29	644
	Mercury Speciation	Hg Selective Sequential Extraction Method (Includes EPA Methods 1630 and 1631)	26	2	4	32	NA	2	34
	Grain size analysis	ASTM Method D422	26	2	NA	28	NA	NA	28
Soil Samples – Background Parcels	SVOCs	EPA 8270D	150	6	18	174	NA	8	182
	TAL Metals	EPA SW 6010C/6020A/7471B	150	6	18	174	NA	8	182
	Pesticides	EPA SW 8081B	40	2	42	46	NA	2	48
	TOC	Lloyd Kahn	150	6	18	174	NA	8	182
	pH	EPA SW SM 4500 H+200	150	6	18	174	NA	8	182
	Grain size analysis	ASTM Method D422	30	2	NA	32	NA	NA	32
	Mercury Speciation	Hg Selective Sequential Extraction Method (Includes EPA Method 1631)	45	3	6	54	NA	3	57
Stream Water Samples – Back 93 Acres (OU-1E)	VOCs	EPA SW 8260C	2	1	2	5	2	1	8
	SVOCs	EPA SW 8270D/8270DSIM	2	1	2	5	NA	1	7
	TAL Metals (Dissolved/Total)	EPA SW 6010C/6020A/C7470A	2	1	2	5	NA	1	7
	Hardness	EPA SW 2340 C 1997	2	1	2	5	NA	1	7
	TSS	EPA SW SM 2540 D 1997	2	1	2	5	NA	1	7
	pH	EPA SW SM 4500 H+200	2	1	2	5	NA	1	7

VOCs – Volatile Organic Compounds
SVOCs – Semi-volatile Organic Compounds
TAL – Target Analyte List
TOC – Total Organic Carbon
TSS – Total Suspended Solids
PCBs – Polychlorinated Biphenyls
EPA – Environmental Protection Agency
QC – Quality Control
NA – Non-Applicable
(a) Matrix spike / matrix spike duplicate

(1) Refer to Tables 1.1 and 1.2 of the Sampling and Analysis Plan, dated February 2017 (Appendix F of the 2017 Data Gap Investigation Work Plan, February 2017) for total number of samples required.

TABLE 4-2

WATER SAMPLE CONTAINERIZATION, PRESERVATION, AND HOLDING TIMES

Analysis	Bottle Type	Preservation [a]	Holding Time [b]
Volatile Organic Compounds (VOCs)	3-40 mL glass vial w/Teflon Septum	Cool to 4°C	7 days
Semivolatile Organic Compounds (SVOCs)	1000 mL glass w/Teflon lined cap	Cool to 4°C	5 days (extraction); 40 days (analysis)
Nitrate/Sulfate/Chloride	2-40 mL vials w/Teflon septum	Cool to 4°C	48 hours (Nitrate)/28 days (Sulfate/Chloride)
Metals[d]	1000 mL polyurethane bottle	Cool to 4°C [c]	6 months, except mercury (28 days)
Alkalinity	250 mL polyurethane	Cool to 4°C	14 days
Hardness	1-250 mL polyurethane w/ nitric acid	Cool to 4°C	6 months
TSS	1- 500 mL and 1000 mL polyurethane	Cool to 4°C	7 days
pH	250 mL polyurethane	Cool to 4°C	Immediate

(a) All samples to be preserved on ice during collection and transport.

(b) Days from validated time of sample receipt (VTSR).

(c) Laboratory must preserved sample containers upon arrival at laboratory with nitric acid (Nitric acid to pH<2).

(d) Two 250 mL plastic bottles will be provided if dissolved metals are being analyzed.

TABLE 4.3
SOIL SAMPLE CONTAINERIZATION AND HOLDING TIMES

Analysis	Bottle Type	Preservation [a]	Holding Time [b]
Semivolatile Organic Compounds (SVOCs)	Wide-mouth glass w/ teflon lined cap	Cool to 4°C	14 days (extraction) 40 days (analysis)
Volatile Organic Compounds (VOCs)	Three (3) Encore samplers	Cool to 4°C	48 hours (extraction) 14 days (analysis)
Metals[d]	Wide-mouth plastic or glass	Cool to 4°C [c]	6 months, except mercury (28 days)
Total Organic Carbon	Wide-mouth glass w/Teflon lined cap	Cool to 4 °C	14 days (extraction and analysis)
Pesticides	Wide-mouth plastic or glass	Cool to 4 °C	14 days (extraction) 40 days (analysis
Polychlorinated Biphenyls (PCBs)	Wide-mouth glass w/ teflon lined cap		14 days (extraction) 40 days (analysis)
pH	Wide-mouth plastic or glass	Cool to 4 °C	No hold time
Mercury Speciation	Poly wide mouth jar. No headspace allowed. Double zip lock bag and freeze.	Frozen, kept less than or equal to minus 11°C. If freezing is not possible, then chill at less than or equal to 4° C.	5 days (extraction)-Ship immediately to laboratory 6 months (analysis)
Grain size analysis	Glass wide mouth jar (500 mL) or gallon size Ziploc	Non-applicable	Non-applicable

(a) All samples to be preserved on ice during collection and transport.
(b) Days from validated time of sample receipt (VTSR).

SECTION 5

SAMPLE TRACKING AND CUSTODY

5.1 INTRODUCTION

This section presents sample custody procedures for both the field and laboratory. Implementation of proper custody procedures for samples generated in the field is the responsibility of field personnel. Both laboratory and field personnel involved in the COC and transfer of samples will be trained as to the purpose and procedures prior to implementation.

Evidence of sample traceability and integrity is provided by COC procedures. These procedures document the sample traceability from the selection and preparation of the sample containers by the laboratory, to sample collection, to sample shipment, to laboratory receipt and analysis. The sample custody flowchart is shown in Figure 5-1. A sample is considered to be in a person's custody if the sample is:

- In a person's possession;
- Maintained in view after possession is accepted and documented;
- Locked and tagged with Custody Seals so that no one can tamper with it after having been in physical custody; or
- In a secured area which is restricted to authorized personnel.

5.2 FIELD SAMPLE CUSTODY

A COC record (Figure 5-2 or similar) accompanies the sample containers from selection and preparation at the laboratory, during shipment to the field for sample containment and preservation, and during return to the laboratory. Triplicate copies of the COC must be completed for each sample set collected.

The COC lists the field personnel responsible for taking samples, the project name and number, the name of the analytical laboratory to which the samples are sent, and the method of sample shipment. The COC also lists a unique description of every sample bottle in the set. If samples are split and sent to different laboratories, a copy of the COC record will be sent with each sample.

The REMARKS space on the COC is used to indicate if the sample is a matrix spike, matrix spike duplicate, or any other sample information for the laboratory. Since they are not specific to any one sample point, trip and field blanks are indicated on separate rows. Once all bottles are properly accounted for on the form, a sampler will write his or her signature and the date and time on the first RELINQUISHED BY space. The sampler will also write the method of shipment, the shipping cooler identification number, and the shipper airbill number on the top of the COC. Mistakes will be crossed out with a single line in ink and initialed by the author.

One copy of the COC is retained by sampling personnel and the other two copies are put into a sealable plastic bag and taped inside the lid of the shipping cooler. The cooler lid is closed, custody seals provided by the laboratory are affixed to the latch and across the back and front lids of the cooler, and the person relinquishing the samples signs their name across the seal. The seal

is taped, and the cooler is wrapped tightly with clear packing tape. It is then relinquished by field personnel to personnel responsible for shipment, typically an overnight carrier. The COC seal must be broken to open the container. Breakage of the seals before receipt at the laboratory may indicate tampering. If tampering is apparent, the laboratory will contact the Project Manager, and the sample will not be analyzed.

Note:

If COCs are generated using a database or electronic tablet. The same general guidelines for COC generation/usage described above will be followed.

5.3 LABORATORY SAMPLE CUSTODY

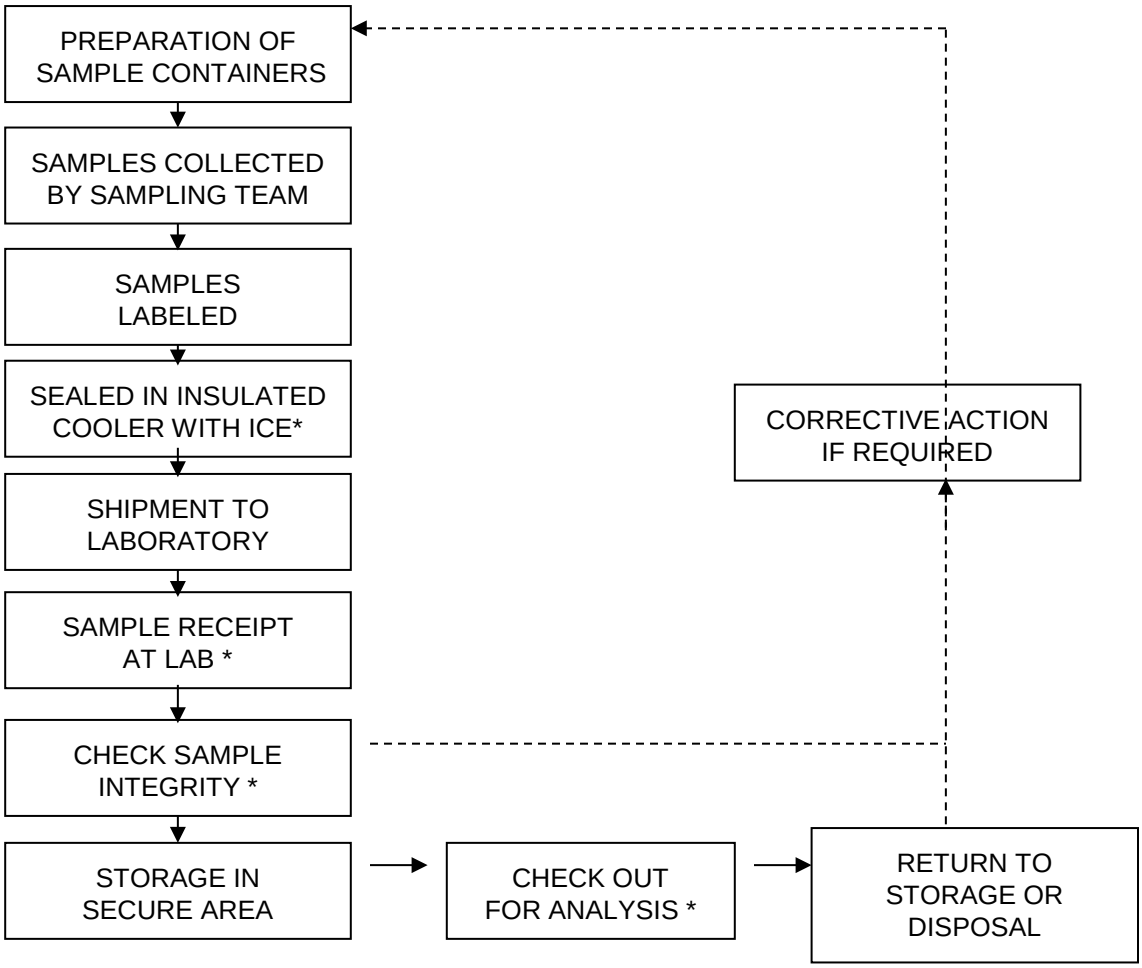
The Project Manager or Field Team Leader will notify the laboratory of upcoming field sampling activities, and the subsequent shipment of samples to the laboratory. This notification will include information concerning the number and type of samples to be shipped as well as the anticipated date of arrival.

The following laboratory sample custody procedures will be used:

- The laboratory will designate a sample custodian who will be responsible for maintaining custody of the samples, and for maintaining all associated records documenting that custody.
- Upon receipt of the samples, the custodian will check cooler temperature, and check the original COC documents and compare them with the labeled contents of each sample container for correctness and traceability. The sample custodian will sign the COC record and record the date and time received.
- Care will be exercised to annotate any labeling or descriptive errors. In the event of discrepant documentation, the laboratory will immediately contact the Project Manager or Field Team Leader as part of the corrective action process. A qualitative assessment of each sample container will be performed to note any anomalies, such as broken or leaking bottles. This assessment will be recorded as part of the incoming COC procedure.
- The samples will be stored in a secured area at a temperature of approximately 4 degrees Celsius until analyses commence.
- A laboratory tracking record will accompany the sample or sample fraction through final analysis for control.
- A copy of the tracking record will accompany the laboratory report and will become a permanent part of the project records.

FIGURE 5-1

SAMPLE CUSTODY



* REQUIRES SIGN-OFF ON CHAIN-OF-CUSTODY FORM

Figure 5.2

Chain of Custody

COC #:

Lab Use Only

Lab Proj #

Lab ID LANCASTER

Job No 449837

Client Contact:

PARSONS
301 PLAINFIELD ROAD-SUITE 350
SYRACUSE, NY 13212

Privileged and Confidential

EDD To:

Sampler:

Program:

Site Name:

Site Location:

Analysis Turnaround Time:
Standard -
Rush Charges Authorized for -
2 weeks -
1 week -
Next Day -

Hardcopy Report To:

Invoice To:

Ship to:

Preservative:

Sample Identification											MS/MSD	Composite (y/n)												Lab Sample Numbers
Location ID	Start Depth (ft)	End Depth (ft)	Field Sample ID	Sample Date	Sample Time	Sample Type	Sample Matrix	Sample Purpose	# of Cont.															

Special Instructions: (1) VOCs - analyze only for Benzene, Chlorobenzene, Trichloroethene, Vinyl chloride, and cis-Dichloroethylene.

Relinquished by:	Company	Received by:	Company	Condition	Custody Seals Int
	Date/Time		Date/Time	Cooler Temp.	
Relinquished by:	Company	Received by:	Company	Condition	Custody Seals Int
	Date/Time		Date/Time	Cooler Temp.	

Preservatives: 0 = None; [1 = HCL]; [2 = HNO3]; [3 = H2SO4]; [4 = NaOH]; [5 = Zn Acetate]; [6 = MeOH]; [7 = NaHSO4]; 8 = Other (specify):

SECTION 6

CALIBRATION PROCEDURES

6.1 FIELD INSTRUMENTS

All field analytical equipment will be calibrated immediately prior to each day's use. The calibration procedures will conform to manufacturer's standard instructions and are described in the SAP (Appendix F of the Work Plan, dated April 2016 and revised July 2016 and February 2017). This calibration will ensure that the equipment is functioning within the allowable tolerances established by the manufacturer and required by the project. Records of all instrument calibration will be maintained by the Field Team Leader. Copies of all the instrument manuals will be maintained onsite by the Field Team Leader.

Calibration procedures for instruments used for monitoring health and safety hazards (e.g., photoionization detector) are provided in the Project Safety, Health, and Environmental Plan (PSHEP) (Appendix E of the Data Gap Work Plan, dated April 2016, revised June 2016 and February 2017).

6.2 LABORATORY INSTRUMENTS

All laboratory equipment will be calibrated according to the requirements of the respective NYSDEC ASP method for each analysis and/or in accordance with the manufacturer’s specifications.

SECTION 7

DATA REDUCTION, VALIDATION, AND REPORTING

7.1 INTRODUCTION

The laboratory is required to meet all applicable documentation, data reduction, and reporting protocols as specified in the 2005 NYSDEC ASP deliverable format. Calculations of sample concentrations will be performed using the appropriate regression analysis program, response factors, and dilution factors, where applicable. The laboratory, through its assigned Quality Assurance Officer (QAO), will conduct its own internal review of the analytical data generated for a specific project prior to sending the data to Parsons. Deficiencies discovered during the laboratory internal data validation, as well as the corrective actions used to correct the deficiency, will be documented in the laboratory Case Narrative submitted with each data package.

The laboratory will report the data in tabular form by method and sample. The laboratory is required to submit analytical results that are supported by a complete NYSDEC ASP Category B data package to enable the quality of the data to be determined. The completed copies of the COC records (both external and internal) accompanying each sample from time of initial bottle preparation to completion of analysis shall be attached to the analytical reports.

Chevron has selected Locus Technologies' LocusFocus EIM™ (EIM) as its preferred environmental data management system.

EIM will be use to manage the following data types:

- Chain-of-custody data
- Laboratory analytical data for various media such as soil, water, soil vapor, sediment, and sludge
- Field measurement data such as pH, dissolved oxygen, turbidity, and water levels
- Geotechnical data such as surface or subsurface soil, or geologic characterizations and lithology
- Survey data including geographic or location data.

Additional data types may be added to EIM as appropriate.

7.2 DATA REDUCTION, VALIDATION, AND REPORTING

In addition to the laboratory's in-house review of the data, the Parsons Project Chemist will review the analytical data prior to its inclusion into a final report. The Project Chemist will conduct a systematic review of the data with respect to the data quality criteria, the laboratory quality assurance plan and quality control programs, and the analytical methods.

The laboratory will send Parsons the required analytical data package deliverables, consisting of CD-ROM and hardcopy versions and the EIM formatted EDD, following completion of the laboratory's validation process. Parsons will perform data validation in accordance with the USEPA Region 2 RCRA and CERCLA Data Validation SOPs for organic and inorganic data

review. In addition, Parsons will refer to this QAPP to verify that project quality objectives were met. If problems are identified during data validation, corrective actions will be requested.

Parsons will validate laboratory analytical data using project-specific data validation procedures to confirm that data meet the applicable data quality objectives. Depending on the type of data and the intended data uses, the data validation process for a given sample delivery group (SDG) (or a specific percentage of sample analyses) or analytical method may be performed following an EPA Level IV protocol (full validation), or an EPA Level III protocol (sample plus QC summary data only, no raw data review). The project-specific Level III data validation protocol will provide a level of review resulting in the generation of a data usability summary report (DUSR), as defined by NYSDEC. Level III validation will be performed on all laboratory data. Ten percent (10%) of the data for each analytical method will undergo a Level IV validation.

A data validation report will be issued and reviewed by the project chemist before finalization. The data validation report will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain-of-custody procedures, and a summary assessment of PARCC criteria for each analytical method. The validation criteria are objective and are not sample dependent, except for consideration of sample matrix effects. The criteria specify performance requirements that should be under the control of the field-sampling contractor or analytical laboratory. This QAPP will be the primary reference for evaluating the data.

Based on the results of data validation, the validated analytical results reported will be assigned a usability flag (see chart below).

USABILITY FLAGS FOR VALIDATED RESULTS	
U	Not detected at given value
UJ	Analyte not detected; associated quantitation limit is an approximate (estimated) values.
J	Estimated value
N	Presumptive evidence at the value given
NJ	Analysis indicates presence of analyte tentatively identified; the associated numerical value is its approximate concentration
R	Result not useable and
No flag	Result accepted without qualification

After data validation, the data will be evaluated for consistency with site conditions and developed conceptual models. Parsons data validation personnel will prepare a project DUSR that summarizes the implications of the use of any data out of criteria. In addition, the data usability report will include the percentage of sample completeness for critical and non-critical samples and a discussion of any issues in representativeness of the data that may develop as a result of validation. The data usability report will address overall data quality and achievement of PARCC criteria and assess issues associated with the overall data and data quality for all validated Level III and Level IV data.

SECTION 8

INTERNAL QUALITY CONTROL CHECKS AND FREQUENCY

8.1 QUALITY ASSURANCE BATCHING

Each set of samples will be analyzed concurrently with calibration standards, method blanks, matrix spikes (MS), matrix spike duplicates (MSD) or laboratory duplicates, and QC check samples (if required by the protocol). The MS/MSD samples will be designated by the field personnel. If no MS/MSD samples have been designated, the laboratory will contact the Parsons Project Manager for corrective action.

8.2 CALIBRATION STANDARDS AND SURROGATES

All organic standard and surrogate compounds are checked by the method of mass spectrometry for correct identification and gas chromatography for degree of purity and concentration. All standards are traceable to a source of known quality certified by the USEPA or NIST, or other similar program. When the compounds pass the identity and purity tests, they are certified for use in standard and surrogate solutions. Concentrations of the solutions are checked for accuracy before release for laboratory use. Standard solutions are replaced monthly or more frequently, based upon data indicating deterioration.

8.3 ORGANIC BLANKS AND MATRIX SPIKE

Analysis of blank samples verifies that the analytical method does not introduce contaminants or detect "false positives". The blank water can be generated by reverse osmosis and Super-Q filtration systems, or distillation of water containing $KMnO_4$. The matrix spike is generated by addition of surrogate standard to each sample.

8.4 TRIP AND FIELD BLANKS

Trip blanks and field blanks will be utilized in accordance with the specifications in Section 4. These blanks will be analyzed to provide a check on sample bottle preparation and to evaluate the possibility of atmospheric or cross contamination of the samples.

SECTION 9

QUALITY ASSURANCE PERFORMANCE AUDITS AND SYSTEM AUDITS

9.1 INTRODUCTION

Quality assurance audits may be performed by the project quality assurance group under the direction and approval of the project Quality Assurance Officer (QAO). These audits will be implemented to evaluate the capability and performance of project and subcontractor personnel, items, activities, and documentation of the measurement system(s). Functioning as an independent body and reporting directly to corporate quality assurance management, the QAO may plan, schedule, and approve system and performance audits based upon procedures customized to the project requirements. At times, the QAO may request additional personnel with specific expertise from company and/or project groups to assist in conducting performance audits. However, these personnel will not have responsibility for the project work associated with the performance audit.

9.2 SYSTEM AUDITS

System audits may be performed by the QAO or designated auditors, and encompass a qualitative evaluation of measurement system components to ascertain their appropriate selection and application. In addition, field and laboratory quality control procedures and associated documentation may be system audited. These audits may be performed once during the performance of the project. If conditions adverse to quality are detected, or upon request by the Project Manager, additional audits may be conducted.

9.3 PERFORMANCE AUDITS

The laboratory may be required to conduct an analysis of Performance Evaluation (PE) samples or provide proof that PE samples submitted by USEPA or a state agency have been analyzed within the past twelve months.

9.4 FORMAL AUDITS

Formal audits refer to any system or performance audit that is documented and implemented by the QA group. These audits encompass documented activities performed by qualified lead auditors to a written procedure or checklists to objectively verify that quality assurance requirements have been developed, documented, and instituted in accordance with contractual and project criteria. Formal audits may be performed on project and subcontractor work at various locations.

Audit reports will be written by auditors who have performed the site audit after gathering and evaluating all data. Items, activities, and documents determined by lead auditors to be in noncompliance shall be identified at exit interviews conducted with the involved management. Noncompliances will be logged, and documented through audit findings which are attached to and are a part of the integral audit report. These audit finding forms are directed to management to satisfactorily resolve the noncompliance in a specified and timely manner.

The Project Manager has overall responsibility to ensure that all corrective actions necessary to resolve audit findings are acted upon promptly and satisfactorily. Audit reports must be submitted to the Project Manager within fifteen days of completion of the audit. Serious deficiencies will be reported to the Project Manager within 24 hours. All audit checklists, audit reports, audit findings, and acceptable resolutions are approved by the QAO prior to issue. Verification of acceptable resolutions may be determined by re-audit or documented surveillance of the item or activity. Upon verification acceptance, the QAO will close out the audit report and findings.

SECTION 10

PREVENTIVE MAINTENANCE PROCEDURES AND SCHEDULES

10.1 PREVENTIVE MAINTENANCE PROCEDURES

Equipment, instruments, tools, gauges, and other items requiring preventive maintenance will be serviced in accordance with the manufacturer's specified recommendations and written procedure developed by the operators.

A list of critical spare parts will be established by the operator. These spare parts will be available for use in order to reduce the downtime. A service contract for rapid instrument repair or backup instruments may be substituted for the spare part inventory.

10.2 SCHEDULES

Written procedures will establish the schedule for servicing critical items in order to minimize the downtime of the measurement system. The laboratory will adhere to the maintenance schedule, and arrange any necessary and prompt service. Required service will be performed by qualified personnel.

10.3 RECORDS

Logs shall be established to record and control maintenance and service procedures and schedules. All maintenance records will be documented and traceable to the specific equipment, instruments, tools, and gauges. Records produced shall be reviewed, maintained, and filed by the operators at the laboratories. The QAO may audit these records to verify complete adherence to these procedures.

SECTION 11

CORRECTIVE ACTION

11.1 INTRODUCTION

The following procedures have been established to ensure that conditions adverse to quality, such as malfunctions, deficiencies, deviations, and errors, are promptly investigated, documented, evaluated, and corrected.

11.2 PROCEDURE DESCRIPTION

When a significant condition adverse to quality is noted at site, laboratory, or subcontractor location, the cause of the condition will be determined and corrective action will be taken to preclude repetition. Condition identification, cause, reference documents, and corrective action planned to be taken will be documented and reported to the QAO, Project Manager, Field Team Leader and involved contractor management, at a minimum. Implementation of corrective action is verified by documented follow-up action.

All project personnel have the responsibility, as part of the normal work duties, to promptly identify, solicit approved correction, and report conditions adverse to quality. Corrective actions will be initiated as follows:

- When predetermined acceptance standards are not attained;
- When procedure or data compiled are determined to be deficient;
- When equipment or instrumentation is found to be faulty;
- When samples and analytical test results are not clearly traceable;
- When quality assurance requirements have been violated;
- When designated approvals have been circumvented;
- As a result of system and performance audits;
- As a result of a management assessment;
- As a result of laboratory/field comparison studies; and
- As required by USEPA SW-846, and subsequent updates, or by the NYSDEC ASP.

Project management and staff, such as field investigation teams, remedial response planning personnel, and laboratory groups, monitor on-going work performance in the normal course of daily responsibilities. Work may be audited at the sites, laboratories, or contractor locations. Activities, or documents ascertained to be noncompliant with quality assurance requirements will be documented. Corrective actions will be mandated through audit finding sheets attached to the audit report. Audit findings are logged, maintained, and controlled by the Task Manager.

Personnel assigned to quality assurance functions will have the responsibility to issue and control Corrective Action Request (CAR) Forms (Figure 11-1 or similar). The CAR identifies the out-of-compliance condition, reference document(s), and recommended corrective action(s) to be administered. The CAR is issued to the personnel responsible for the affected item or activity. A copy is also submitted to the Project Manager. The individual to whom the CAR is addressed

returns the requested response promptly to the QA personnel, affixing his/her signature and date to the corrective action block, after stating the cause of the conditions and corrective action to be taken. The QA personnel maintain the log for status of CARs, confirms the adequacy of the intended corrective action, and verifies its implementation. CARs will be retained in the project file for the records.

Any project personnel may identify noncompliance issues; however, the designated QA personnel are responsible for documenting, numbering, logging, and verifying the close out action. The Project Manager will be responsible for ensuring that all recommended corrective actions are implemented, documented, and approved.

FIGURE 11-1

CORRECTIVE ACTION REQUEST

Number: _____ Date: _____

TO: _____

You are hereby requested to take corrective actions indicated below and as otherwise determined by you to (a) resolve the noted condition and (b) to prevent it from recurring. Your written response is to be returned to the project quality assurance manager by _____

CONDITION:

REFERENCE DOCUMENTS:

RECOMMENDED CORRECTIVE ACTIONS:

_____ _____ _____ _____ _____ _____

Originator Date Approval Date Approval Date

RESPONSE

CAUSE OF CONDITION

CORRECTIVE ACTION

(A) RESOLUTION

(B) PREVENTION

(C) AFFECTED DOCUMENTS

C.A. FOLLOWUP:

CORRECTIVE ACTION VERIFIED BY: _____ DATE:_____

SECTION 12

REFERENCES

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APPENDIX E

PROJECT SAFETY, HEALTH, AND ENVIRONMENTAL PLAN REVISED JULY 2016

Groundwater Sampling, Soil Vapor Sampling, Potable Well Pump Removal, and Hand Auger Sampling Program

Former Texaco Research Center, Beacon, New York

Project Safety, Health, and Environmental Plan

May 2016
Revised July 12, 2016

All incidents/near misses:	***Enter into IndustrySafe within 4 hours***
Worker injury or illness:	***Richard Molta (315) 447-0679***
Environmental spill/release:	***Enter into IndustrySafe within 4 hours***
Medical (non-emergencies):	***WorkCare (888-449-7787)***
Site security (if applicable):	***Craig F. Butler: Cell Phone: 315-263-6053***

Project Key Personnel

Company Executive responsible for Project	Contact Information
Ed Andrechak	Direct Line: 302-468-5567 Cell Phone: 302-438-5743 Email: Ed.Andrechak@parsons.com
Project Manager	Contact Information.
Craig F. Butler	Direct Line: 315-552-9680 Cell Phone: 315-263-6053 Email: craig.butler@parsons.com
Field Team Leader	Contact Information.
Ed Ashton	Direct Line: 315-552-9673 Cell Phone: 314-679-1170 Email: Edward,J.Ashton@parsons.com
Project SH&E Representative	Contact Information
Ed Ashton	Direct Line: 315-552-9673 Cell Phone: 314-679-1170 Email: Edward,J.Ashton@parsons.com
Client Project Management POC	Contact Information
Mark Hendrickson	Direct Line: 713-432-2634 Cell Phone: 832-851-9532 Email: MHendrickson@chevron.com

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SECTION 1 – INTRODUCTION

1.1 PARSONS SAFETY, HEALTH & ENVIRONMENT POLICY

Exhibit P-1 – Parsons Corporate SH&E Policy

PARSONS

Corporate Safety, Health & Environment Policy Statement

As an industry-leading engineering, construction, and technical services firm, Parsons is firmly committed to maintaining a safe, healthy, and environmentally compliant workplace at all its offices and project facilities, guided by the following tenets:

- Safety, Health and Environment (SH&E) is a core value.
- Executive management will lead the SH&E process.
- SH&E will be a responsibility shared by all.
- SH&E performance will be a key business performance indicator.
- SH&E performance will be communicated openly.
- Employees will be given the knowledge and skills necessary to perform their jobs in a high-performance SH&E manner.
- We will extend our SH&E efforts beyond the workplace to include travel, homes, and communities.
- We will continually strive to improve our SH&E processes.

To meet our SH&E objectives, all employees are expected to be actively engaged with regard to SH&E issues. This requires the combined efforts of a concerned management, responsible and knowledgeable supervision, and conscientious, well-trained employees.

Executive Management shall lead and monitor and improve the performance of the organization's Safety, Health and Environmental Management System, at regular intervals, to ensure its continuing suitability, adequacy, and effectiveness.

Parsons will meet or exceed the applicable SH&E legal and other requirements and will continuously monitor and improve operations, procedures, technologies, and programs that are conducive to maintaining a safe, healthy, and environmentally compliant workplace.

Charles L. Harrington

Chairman and Chief Executive Officer

January 2012

1.2 THE PROJECT SAFETY, HEALTH, AND ENVIRONMENTAL PLAN (PSHEP)

Parsons goal is zero incidents using control measures designed to minimize or eliminate hazards to personnel, processes, equipment, the general public and the environment. This PSHEP outlines safety, health, and environment (SH&E) requirements and guidelines developed by Parsons for client-specific work. When implemented, these requirements will help protect site personnel, visitors, the public, and the environment from incidents caused due to SH&E hazards. Parsons

employees should never perform a task that may endanger their own safety and health, the safety and health of coworkers or the public, or damage the environment.

This plan should be updated as conditions change or situations change, usually by addenda to the PSHEP. All Parsons and subcontractor personnel must understand and implement the PSHEP and any addenda. Parsons documents this process by having employees sign an acknowledgement form stating that they understand the PSHEP and its requirements.

1.3 SUBCONTRACTOR SAFETY, HEALTH, AND ENVIRONMENTAL PLANS (SSHEPS)

Subcontractors must establish their own safety program for their work and employees. Contract specifications require all subcontractors to accept the Parsons' PSHEP and prepare their own subcontractor safety, health, and environment plan (SSHEP) for work activities the subcontractor has responsibility for performing. The subcontractor will present the SSHEP to the Parsons' Project Manager at least 10 days before site mobilization. At a minimum, subcontractor plans must meet the requirements of this PSHEP and provide SH&E equipment and safeguards suitable for the hazards involved. This PSHEP may not cover all potential hazards on every project, and subcontractors must ensure that appropriate SH&E information is available for all of the subcontractor's project tasks.

All PSHEP requirements for Parsons' personnel (e.g., training, substance abuse screening, incident reporting, etc.) also apply to subcontractor personnel, and do not need to be repeated in the SSHEP. Since the SSHEP is part of the PSHEP, subcontractor personnel will be required to receive an Orientation that covers information from both documents, and sign off accepting the PSHEP.

For this project, there will be subcontractors directly hired by Parsons.

1.4 MANAGEMENT OF CHANGE (MOC)

Modifications may be made to this PSHEP document after discussion and approval by the Parsons GBU/Division SH&E Manager. Insert a description of the changes in the table below (insert additional rows as necessary).

PSHEP Section	SH&E Initials	Date	Description/Comments
All	NS	May 2011	Original Document
All	EA	Feb 2012	Annual update
9.2, 10	GHB	2/5/13	Added information on Environmental Hazards and Attachments/Forms
All	EA	May 2016	Updated to reflect 2014 SOW
All	RKM	3/17/16	Updated

SECTION 2 – SCOPE OF WORK

2.1 SCOPE OF WORK

If contractors will be used, then designate which activities will be conducted by Parsons and which activities will be provided by each subcontractor.

Parsons, in their contracted role with Chevron Environmental Management Company (CEMC) is providing environmental remediation services for the work as specified in the Contract No. IMA145. Work performed includes field activities associated with RCRA Corrective Action, Closure and Redevelopment for CEMC and other environmental investigation/remediation projects that may arise. This work is performed at the Former Texaco Research Center, Beacon, New York.

Specific Parsons Projects that fall under the scope of this PSHEP include:

2.1.1 2016 RCRA Permit Groundwater Sampling Project:

Collect and analyze groundwater samples from ten well locations (DC-1, DC-2, TF-5, TF-23, DB-8A, DB-17, OS-2, OR-2, OS-3, and OR-3) at the Beacon site as part of the RCRA permit groundwater monitoring program. The samples will be submitted to Lancaster Laboratories, Inc. located in Lancaster, Pennsylvania and analyzed for volatile organic compounds (VOCs) by EPA Method 8260, semi volatile organic compounds (SVOCs) by EPA Method 8270, and lead by EPA Method 6010B. Two rounds of sampling will take place (June and November 2016. Location Former Texaco Research Center, 45 Old Glenham Road, Beacon, NY.

Well OR-3 will also have a camera placed in well to see what the obstruction in well is. Location Former Texaco Research Center, 45 Old Glenham Road, Beacon, NY.

2.1.2 2016 Groundwater Sampling Project:

Collect and analyze groundwater samples from forty-three well locations at the Beacon site on a quarterly schedule and five well annually from a neighboring property. The samples will be submitted to Lancaster Laboratories, Inc. located in Lancaster, Pennsylvania and analyzed for specific volatile organic compounds (VOCs) by EPA Method 8260, semivolatile organic compounds (SVOCs) by EPA Method 8270, Target Analyte List (TAL) metals EPA Methods 6010B and 7970A, and natural attenuation parameters (e.g. alkalinity, nitrate, manganese, iron (III), sulfate, chloride, methane, ethane, ethene, carbon dioxide, and sulfide). Five wells in the Building 51 Area will also be sampled for Compound Specific Isotope Analysis (CSIA) for trichloroethene (TCE), while eight wells will be sampled for bacterial analysis. Two rounds of sampling of the forty-three well locations will be performed (June and November 2016). Location Former Texaco Research Center, 45 Old Glenham Road, Beacon, NY.

2.1.3 Hand Augering

1. PRE-FIELD ACTIVITIES

TRCB Operable Unit Soil Boring Locations

Before subsurface field work begins, the facility superintendent will be contacted to identify potentially buried utility locations. Based on those discussions, and a review of the available Site utility maps, a Parsons geologist will locate proposed boring locations to avoid any underground or aboveground utilities. A private utility locator will also be utilized to confirm the location of underground utilities in working areas, if required. In areas where there is a concern that underground services may exist, hand clearing to 2.5 feet bgs will be completed prior to beginning drilling work. Hand clearing will be performed using a hand auger. All excavated material will be containerized in accordance with the procedures discussed below for investigation derived waste. Dig Safely New York (telephone number: * 811) will be contacted to provide clearance of outside underground utilities that are potentially located near the work areas.

Background Parcel Soil Boring Locations

The same procedures outlined for drilling at the TRCB Operable Unit locations will be followed for field activities to be performed at the Background Parcel soil boring locations, with the exception that owners of parcels will be contacted by Chevron EMC prior to field activities and access agreements between Chevron EMC and the parcel owners will be executed.

The project manager, Mr. Craig Butler, will ensure that the Parsons Pre-Drilling / Subsurface Checklist for Intrusive Field Work (Appendix D) and Chevron EMC's Ground Disturbance, Excavation, and Well Abandonment protocols (Appendix E) will be completed and all appropriate approvals obtained. A complete description of both protocols are provided in Appendix D and E, respectively and should be reviewed prior to field activities.

2. SURFACE SOIL SAMPLING AT TRCB FACILITY OPERABLE UNITS

One hundred seventy one (171) soil borings will be hand augered at the TRCB OU locations shown on Figures 3.1A, 3.1B, 3.1C, 3.1D, 3.1E, and 3.1F. These soil borings will be used to address data gaps that exist at the Former TRCB facility and will be used to complete RA evaluations. Operable Units that soil borings will be sampled at and the rationale for completing borings at each designated OU are provided in Table 3.1. Actual sampling locations will be based on information collected during field activities and utility constraints/access, and NYSDEC will review proposed locations for approval.

Prior to initiation of field activities, all pre-field procedures as described in Section 3.2 will be followed. All sampling equipment that comes into contact with

the subsurface will be thoroughly decontaminated by utilizing an Alconox and distilled water wash and rinse. Each boring will be advanced using a stainless steel hand auger or similar sampling device to a depth of 2 feet bgs. All soil samples will be logged in the field by a Parsons geologist. All soil samples retrieved from the borings will be visually inspected for signs of staining and for the presence of hydrocarbon odors and the evolution of organic vapors with a photoionization detector (PID). Soil samples will be collected from the sample soil type located within the borehole (e.g.-Ud, CtC, HoD, etc.) from intervals of 0 to 2-inches; with the 0 - inch mark starting just below any vegetation layer; 2 to 12 inches, and 12 to 24 inches. If a different soil type is encountered within the same borehole, then a separate sample of that different soil type will be collected for analytical testing. The different soil type will be noted on the corresponding boring log. Soil samples will be analyzed based on which OU location the samples were collected from. Table 3.1 provides the parameters that each soil sample will be analyzed for based on OU location. All analytical work will be performed in accordance with the Quality Assurance Project Plan (QAPP) dated August 2007, revised April 2016.

Following the completion of sampling activities at each soil boring location, any excess soil cuttings from the soil boring will be placed backed into the borehole and bentonite pellets will then be placed into the borehole to within 3-inches of the top of the surface. The remaining void space will then be backfilled with topsoil and grass seed to match the surrounding surface. The soil boring location will then be marked with a pin flag and global positioning system (GPS) coordinates will be completed to denote location for future surveying activities by a New York State licensed surveyor. Once the surveying activities have been completed, the pin flag will be removed.

In addition, if any sediment samples are collected (Back 93 Acre Parcel (OU-1E) wetlands) then the same protocols will be followed, with the exception that the entire borehole will be backfilled to the surface and no grass seed will be placed on top of the borehole surface.

Soil Borings Within Residential/Wetland Zone (Non-Disposal Area)

Seventy (70) soil borings are designated to be completed within the Residential/Wetland Zone (Non-Disposal Area) located at the Back 93 Acre parcel (OU-1E). Boring locations are shown on Figure 3.1D. All field activities will be performed following the same protocols as previously aforementioned. These soil borings will be completed and sampled to obtain data to meet the objectives mentioned above, as well as to evaluate surface soil (0 to 2 ft. bgs) analytical concentrations in areas where no disposal activities took place during past TRCB facility operations.

Soil Borings within No Build Zone (Disposal Area)

Twelve (12) soil borings are designated to be completed within the No Build Zone (Disposal Area) located at the Back 93 Acre parcel (OU-1E). Boring locations are shown on Figure 3.1E. Field activities will be performed following the same protocols as previously described. These soil borings will be completed and sampled to obtain data to meet the objectives mentioned above, as well as to evaluate surface soil (0 to 2 ft. bgs) analytical concentrations in three former disposal areas (New Sludge Lagoon, Trash Pile "C", and Chemical Burial Site No. 3) where disposal activities took place from past TRCB facility operations and to confirm that all impacted soils were removed from the three disposal areas during previous remedial activities (excavations). No surface soil sampling is required at the remaining disposal areas located at the OU-1E parcel since letters of "No Further Action" were granted for the disposal areas by the NYSDEC and/or any remaining impacted soil observed on the outer boundary limits of the remediated area was not the result of past TRCB facility observations. Specifically, Chemical Burial Site No. 1 has a confirmation soil boring located northeast of the former disposal area (ITSB-51) that indicated PAH concentrations that exceeded the NYSDEC Soil Cleanup criteria. The location of sample ITSB-51 is subject to recreational vehicle usage (e.g.-motor bikes, all-terrain vehicles, etc.) by trespassers who bypass perimeter security fencing and use the property as a riding trail. With such activities taking place, chemicals (e.g.-motor oil, hydraulic fluid, etc.) not related to past facility operations can be deposited on the ground and potentially be detected during soil sampling events. Therefore, PAHs detected in this area are potentially the result of recreational vehicle activities, rather than site-related activities. Evidence of such activities taking place will be documented during field sampling activities (Summer 2016) by taking photographs of bypassed security fencing and surface vegetation worn away by recreational vehicle usage.

3. SURFACE SOIL SAMPLING AT BACKGROUND PARCELS

Fifty (50) soil borings (ten (10) borings at each Background Parcel location that contains the same or similar soil type that exist on the Former TRCB facility OUs) will be completed at the five (5) Background Parcels shown on Figures 3.2, 3.3, 3.4, 3.5, and 3.6. Ten (10) borings will be completed for soil type CtC at the Glenham Fire District parcel, ten (10) borings will be completed for soil type PwB at the Jean Van Pelt Park parcel, ten (10) borings will be completed soil type Ud at the Mahopac Park Terrace Apartments parcel, ten (10) borings will be completed for soil type BeC at the Fairview Cemetery Association parcel, and ten (10) borings will be completed for soil type HoF at the Hillside parcel. These soil borings will be used to achieve the following: 1.) determine the local soil background conditions, 2.) determine if PAHs and metal concentrations observed at the TRCB facility are indicative of background soil conditions, and 3.) establish revised cleanup levels for

soils located at the TRCB facility by negotiating with the NYSDEC and NYSDOH. These data will also be used to complete HHRA and BERA evaluations. Background Parcels where soil borings will be completed and the rationale for boring locations at designated parcels are provided in Table 3.2. Actual soil boring locations will be based on information collected during field activities and utility constraints/ access.

Field activities associated with surface soil sampling at the Background Parcels will follow the same procedures as outlined in Section 3.3 (Surface Soil Sampling at TRCB Operable Units), with the exception that soil samples will be analyzed for the parameters shown in Table 3.2.

4. SURFACE WATER SAMPLING IN BACK 93-ACRE PARCEL (OU-1E)

Any soil borings located in a designated wetland area in the Back 93 Acre Parcel (OU-1E) will have the following observations made and the following field sampling activities performed by Parsons personnel:

Observations

1. Field personnel will note if any standing surface water exists within the wetland and if any surface water flow exists.
2. Observations on what general biological habitat exist within wetlands (e.g.-are birds present and nesting, are there phragmites present, are there various insects gathering in wetland, etc.) will be noted.
3. The topographic setting of wetland (e.g. - is wetland located on a hillside, is bedrock out crops located in the vicinity of wetland, wetland located in an extremely saturated soil area, etc.) will be noted.
4. Photographs of wetland will also be taken to document wetland conditions.

Field Sampling Activities

1. If surface water is present in the wetland and meets the characteristics of what denotes a wetland as described in the BERA work plan (See Appendix C), then a surface water sample will be collected following the protocols outlined in the SAP (Appendix I)and analyzed for volatile organic compounds (VOCs) by SW-846-EPA Method 8260C, semi-volatile organic compounds (SVOCs) (PAHs will only be reported) by SW-846-EPA Method 8270D/8270DSIM, TAL metals (dissolved and total) by SW-846-EPA Methods 6010C/6020A/C7470A, hardness by SW-846-EPA Method 2340 C-1997, TSS by SW-846-EPA Method SM 2540 D 1997, and pH by SW-846-EPA Method SM 4500-H+200. (See Table 3.3).
2. If a surface water sample is collected, then a co-located sediment sample will also be collected. The sediment sample will be collected following the same protocol described in Section 3.3 and will be analyzed for VOCs by SW-846-EPA Method 5035/8260C, SVOCs by SW-846-EPA Method 8270D/8270DSIM, TAL metals by SW-846-EPA

Method 6010C/6020A/7471B, Total Organic Carbon (TOC) by Lloyd Kahn method, and acid volatile sulfides and simultaneously extracted metals (SEM) analysis. (See Table 3.4)

3. If no standing water is observed in the wetland and/or the wetland does not meet the characteristics of a wetland as set forth in the BERA, then only a soil sample will be collected and analyzed for the same parameters as listed in Table 3.1 for the corresponding OU.

5. SURVEYING OF SOIL BORING LOCATIONS

Each newly hand augered soil boring will be surveyed and tied to a common, permanent reference datum. Coordinates will be measured in the New York State Plane Coordinate System, East Zone (NAD-1983) system for the horizontal datum, while the vertical datum will use the site vertical datum established by Texaco in 1957. This datum is 1.07 feet below NAVD 1988 coordinate system. All survey work will be completed by a New York State licensed surveyor.

6. INVESTIGATION DERIVED WASTE

All investigation derived waste (IDW), involving decontamination and potable well purge water will be staged in a polyurethane tank or some other holding device and transported to the onsite industrial wastewater treatment system for disposal.

2.1.4 Soil Vapor/Air Sampling

1. INVESTIGATION OBJECTIVE

The objective of this investigation is to determine the absence or presence of a complete vapor intrusion pathway at Buildings 2 through 5 by collecting soil vapor and indoor air samples based on an evaluation of previously collected soil vapor and groundwater data. To facilitate the pending property transfer samples will be collected during the summer of 2016.

2. RATIONALE AND METHODOLOGY TO BE USED FOR SAMPLE COLLECTION

Following New York State Department of Health (NYSDOH) (2006) guidance, co-located sub-slab soil vapor and indoor air samples are recommended at Buildings 2, 4, and 5, while co-located crawl space air and indoor air samples are recommended at Building 3. One sub-slab soil vapor and one indoor air sample will be collected from each slab and foundation type in each building. Based on current knowledge of Buildings 2, 4, and 5, one sub-slab vapor and indoor sample will be collected at each building. Two outdoor air samples will be collected upwind and from the vicinity of Buildings 2 through 5. Outdoor air samples will be collected concurrently to characterize the background air concentrations.

The sub-slab soil vapor probe installation and sample collection procedures that will be followed are described in Section 4 of the Chevron Soil Vapor & Indoor Air

Sampling Technical Toolkit. The crawl space, indoor, and outdoor air sample procedures that will be followed are described in Section 5 of the Chevron Soil Vapor & Indoor Air Sampling Technical Toolkit. All sub-slab soil vapor probes will be installed as permanent probes.

3. ANALYTICAL PARAMETERS

All sub-slab soil vapor and indoor air samples (Buildings 2, 3, 4, and 5) will be analyzed for chlorinated solvents using Method TO-15. TO-15 samples will be collected in individually certified Summa canisters to provide data of acceptable quality for human health risk assessments.

Trap apparatus to provide data of acceptable quality for human health risk assessments. Building 3 was previously used as a laboratory where mercury may have been used. Because mercury was detected in the soil at concentrations exceeding soil screening criteria, and the mercury in soil was not speciated, sub-slab soil vapor and indoor air samples collected in Building 3 will also be analyzed for mercury via United States Environmental Protection Agency (USEPA) Method Modified 30B. As there is no potential source of mercury at Buildings 2, 4, and 5, sub-slab soil vapor and indoor air samples from those buildings will not be analyzed for mercury. Mercury samples will be collected using a certified Sorbent trap.

2.1.5 Potable Well Pump System Removal (Back 93 Acres Parcel)

1. WORK PLAN PREPARATION AND REMOVAL OF POTABLE WELL PUMP SYSTEM FIELD ACTIVITIES

A work plan will be prepared for the proposed scope of work. The work plan will include a detailed scope of work, site project safety plan, and a lift plan prepared by the pump system removal contractor. The draft work plan will be submitted to Chevron Environmental Management Company (EMC) for comment and then finalized.

Following preparation of the work plan, Parsons will hire a contractor and supervise the removal of a potable well pump system located in a Pump House located at the Back 93 Acre Parcel. Once the pump system has been removed, the well will be capped with a locking mechanism for security and all pump materials will be recycled as scrap metal.

2.2 PROJECT SAFETY, HEALTH, AND ENVIRONMENTAL PLAN APPLICATION

This PSHEP and its referenced documents apply to all locations, facilities, operations, and projects associated with contract work performed by Parsons and its subcontractors. Locations/sites covered

under this contract include the Former Texaco Research Center, Beacon, New York and surrounding property.

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SECTION 3 – PROJECT SH&E MANAGEMENT RESPONSIBILITIES AND AUTHORITY

3.1 SH&E RESPONSIBILITY MATRIX

Exhibit 3-1 summarizes the responsibilities of selected roles related to the primary SH&E activities identified in the PSHEP.

Project Managers

Responsibilities include overall coordination of all site activities under his or her project. The Project Manager (PM) has overall accountability and responsibility for the safety of operations and the health and safety of all personnel on their project. The PM is responsible for ensuring that the project is audited to verify compliance with the project health and safety program. In addition, the PM must ensure that the Parsons ESHARP management program is implemented throughout the life of the project.

Project Managers shall:

- Provide leadership by demonstrating a personal commitment to safety at all times.
- Work with the Chevron PM to complete the pre-meeting checklist so that the information needs for preparation for pre-job meeting and PSHEP development are met.
- Attend the pre-project planning meeting that is required to establish the overall Health, Environmental, and Safety (HES) plan for the site or work.
- Verify that a communication plan is prepared to ensure consistent and coordinated HES planning and communication if multiple Contractors are working at the site.
- Verify that the Parsons and Contractor(s) SSHEPs have been accepted by CEMC prior to the start of work.
- Ensure that for each Short Service Employee (SSE) on the project, a completed CEMC SSE form is submitted to the Company for approval 24-hours before the SSE is to enter the worksite.
- Provide adequate staffing and budget to provide a safe workplace and implement the requirements of the Parsons Employee Based Safety (EBS) Program.
- Verify that the Employee Based Observations (EBOs) are performed. Verify that EBOs are performed in a planned fashion and on a recurring basis and are documented in Industry Safe.
- Work with the Field Team Leader and the Site Safety Officer to determine that the Injury Illness/Near Loss Incidents (IILNI) process is implemented for all injuries, incidents, and near loss incidents that occur. Verifying that root causes and corrective actions are

adequately identified and that report is generated in Industry Safe and Chevron's IMPACT reporting system.
- Provide adequate resources for the implementation of corrective actions.
- Ensure that an Activity Hazard Analysis (AHA) is performed for all major project tasks.
- Provide hands-on participation in the development, review, and implementation of the PSHEP.
- Allocate sufficient budget and resources to implement the PSHEP.
- Allocate sufficient budget and resources for EBOs.
- Develop incentive/rewards programs to recognize safety achievements for projects.
- Reinforce the Stop Work Authority (SWA) concept with project teams.
- Reinforce that all incidents are preventable with project teams.
- Verify that all Parsons Contractors and Subcontractors have been evaluated in accordance with Parsons Contractor Safety Evaluation (CSE) process.

Program Safety Manager

The Program Safety Manager is a resource for HE&S and will be consulted on all related health and safety issues that arise in the field, including any changes in the scope of work. The health and safety manager will make all final decisions regarding questions on the content of PSHEPs.

The Program Safety Manager shall:

- Provide leadership by demonstrating a personal commitment to safety at all times.
- Provide oversight, technical guidance, training, and support to Program and Project Safety Managers.
- Oversee the Medical Monitoring Program as required by the Occupational Safety and Health Administration.
- Notify employees when periodic training is required.
- Provide leadership by demonstrating a personal commitment to safety at all times.
- Track safety metrics as necessary to support safety incentives.
- Perform trending analysis of key project metrics for reporting to Parsons on a monthly basis and Chevron on a quarterly basis. Recommend corrective measures to the Program Manager and Project Managers/Task Managers as appropriate.
- Support incentive/rewards programs to recognize program safety achievements.
- Assist in the Project Managers in the development of PSHEPs.
- Perform EBOs as requested by the Project Manager/Task Manager.
- Assist in the development of AHAs with project teams.
- Reviewing and approving PSHEPs for Chevron projects prior to submittal to Chevron for approval.

- Assist the Field Team Leader and the Site Safety Officer to determine that the IILNI process is implemented for all injuries, incidents, and near loss incidents that occur.
- Assist in the incident investigation and verifying that root causes and corrective actions are adequately identified and that report is generated in Industry Safe.
- Perform periodic assessments to determine that EBS has been implemented on the project site at the request of the manager.
- Serve as the administrator for Industry Safe.

Field Team Leader

Under the direction of the PM, the Field Team Leader is responsible for field-related activities and for maintaining field operations in accordance with project requirements. They are responsible for enforcing daily implementation of the PSHEP and resolving health and safety issues with the SSO. They also will assist in conducting daily site briefings and document having done so. They will substitute for the SSO as required by project activities.

Field Team leaders shall:

- Verify that the Preventing Serious Injuries and Fatalities Guide is implemented on job sites. Periodically ask site workers regarding their usage of the tool. (The Parsons Take 5 Card tool is used on an as needed basis.)
- Implement EBS in conjunction with the contractors(s). Verify that EBOs are performed in a planned fashion and on a recurring basis and are documented Industry Safe.
- Verify that the root causes for at risk behaviors are identified and that corrective actions are implemented.
- Ensure that an appropriate mentor is assigned to each Parsons SSE on site.
- Drive the investigation process for all IILNIs that occur. Verifying that root causes and corrective actions are adequately identified and that report is generated in Industry Safe.
- Verify that all corrective actions are implemented and that these actions are adequate to prevent reoccurrence.

Site Safety Officer

The Site Safety Officer (SSO) is responsible for the daily implementation and enforcement of the PSHEP, as well as daily operations oversight, administration of the respiratory protection program, and safety coordination with subcontractors.

SSOs shall:

- Verify that a pre-entry briefing on the content of the PSHEP is completed for all site personnel before they begin work or tour the site. Note: the level of briefing detail may be scaled to fit the specific needs of the worker or visitor.
- Verify that all site workers and visitors pass a site-specific written test demonstrating understanding of site-specific risk and mitigation steps as described in the Site PSHEP.
- Ensure that personnel are aware of the provisions of this PSHEP and are instructed in work practices, safety, waste management, communication, and emergency procedures.
- Verify that the Permit to Work Process, AHA process, Hazard ID, SWA and Preventing Serious Injuries and Fatalities Guide (as well as Take 5 tool) is implemented as required at the site.
- Assist the project team in the implementation of the EBO process.
- Work with the project team to verify that the root causes for at risk behaviors are identified and that corrective actions are implemented.
- Steward the EBS program at the site level to ensure that the Parsons and EMC required metrics for EBS are met.
- Perform EBOs to verify and validate work tasks are performed in accordance with AHAs.
- Report all injury, illness, loss or near loss events to the occurrences and/or unsafe conditions to the Field Team Leader and the Parsons Safety Manager and assist in the investigation process.
- Follow up to determine that corrective actions are implemented and that these actions are adequate to prevent reoccurrence.
- Coordinate hazard hunts and promote participation by field staff.

Project Personnel

Project personnel involved in field activities shall:

- Actively participate in required site safety processes as required by this PSHEP.
- Actively participate in the EBS Program.
- Take all reasonable precautions to prevent injury to themselves and to fellow employees.
- Conduct only those tasks that they are competent in and they can do safely.
- Report all injury, illness, loss or near loss events to the occurrences and/or unsafe conditions to the SSO.

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Exhibit 3-1 – Project Responsibility Matrix

Project Responsibility Matrix		Project												GBU							Corporate					
Phases	Work Elements	Project Manager	Safety & Health	Environmental	Construction/Site	Engineering	First Line Supervision	Facilities and Maintenance	Training	Contracts/Procurement	Security	Sustainability	Quality	President	Operations/Risk Management	Division Management	Sector Management	Safety, Health & Environment	Quality	Business Development	CEO	Operations/Risk Management	Safety, Health & Environment	Security	Workers' Compensation	Insurance
Introduction to ESHARP for Project	1. ESHARP Project Management	R	D	D	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
Business Development	2. Business Development	R	P	P	P	P				P				P	P	A	P	P	P	D	P	P	P	P		P
Startup	3. Initial Hazard Analysis and Planning	A	R	D	P	P					D							P					P	P		
	4. Project Safety Health, and Environmental Plan (PSHEP)	A	D	D	P										P	P	P	R					P	P		
	5. Stakeholder PSHEP Alignment Meeting	A	D	D	P													R								
Construction and/or Field	6. Preconstruction Safety, Health & Environment Activities	A	D	D	P		P						P				P	R	P					P		
	7. Project/Site Orientation, Training, and Recurring Field SH&E Meetings	A	D	D	P		P	P	P									R						P		
	8. SH&E Committee	A	D	D	P		P	P			P							R						P		
	9. Meet Building Trades, Safety, Health, Environmental Regulatory Agencies, & Others	A	D	D	P													R						P	P	
	10. Review Contractor/Subcontractor SH&E Programs	A	D	D	P					P								R						P		
	11. Subcontractor Premobilization Meeting	A	D	D	P	P				P	P							R						P		
	12. Risk Mitigation Planning (2-week look ahead)	A	D	D	R													D						P		
	13. Activity Hazards Analysis	A	D	D	P	P	P	P										R						P		
	14. Project Management Site Safety, Health, & Environmental Inspections	A	D	D	P											P	P	R	P					P		
	15. Audits, Inspections, and Recordkeeping	A	D	D	P		P						P			P	P	R	P					P		
	16. Incident Management Process	A	D	D	P		P						P		P	P	P	R	P					P		P
Testing, Commissioning, Operations, and Decommissioning	17. Management Systems and Transition	A	R	R	D	P	P	P	P		P	P	P	P	P	P	P	P	P		P	P	P	P		P
	18. Equipment and Systems Integrity	A	P	P	R	P	P	D	P				P					P	P				P			
	19. Operations Training and Education	A	D	D	P	P	P	P	P		P		P					R					P			
	20. Assessments and Corrective Action	A	D	D	P	P	P	P	P		P		P					R					P			
	21. Operations Emergency Management	A	P	P	P	P	P	P	P	P	D		P					R					P	P		
	22. Safe and Environmentally Compliant Work Practices	A	D	D	P	R	R	P	P									P					P			
Closeout	23. Lessons Learned and Final SH&E Report	A	D	D	P											P	P	R	P				P			
	24. Records Retention	A	P	P					P		D		P					R	P				P			

R – Responsible and accountable for ensuring the project develops and implements the work element.
D – Develops the plan, tool, training, document, or other item needed for the work element.
P – Participates by providing advice, assisting in the implementation or development, reviewing and providing comments, or otherwise supporting the development or implementation effort.
A – Approval at the management level with responsibility for the project; establishes requirements for the project or serves as sponsor for the item.

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SECTION 4 – ADMINISTRATIVE PHASE

4.1 PROJECT SAFETY, HEALTH & ENVIRONMENT (SH&E) COMMITTEE

If a project has less than five (5) Parsons employees or a total of 25 Parsons and subcontractor employees, then the project staff will utilize information from the Parsons' office responsible for the project as a resource for SH&E committee information. The Project SH&E Representative will be responsible for obtaining and communicating information from the Parsons' Office SH&E Committee meeting minutes, with the project personnel on a monthly basis.

For this project, there will not be a Project SH&E Committee.

4.2 EMPLOYEE ORIENTATION

All new employees on a project, including new hires and transfers, must attend the site orientation program on their first day and sign an acknowledgment form indicating they attended and understood the orientation. Any employee who is unsure of any information presented in the orientation must request clarification. Employees who do not participate in the orientation or refuse to sign the acknowledgment cannot work on site. Site-specific safety procedures and training requirements are covered in Section 7.

4.3 AWARENESS CAMPAIGN

If a project is less than 3 months in duration or has less than five (5) Parsons employees, then the project will fall under the Parsons' office responsible for the project as a resource for SH&E awareness. The Project Manager may also provide training, presentations, or informational materials as part of the awareness campaign. For this project, the duration is more than 3 months in duration, and has less than five (5) Parsons employees.

SH&E bulletin boards maintained by the Project Manager are primary information points for the project awareness campaign. Bulletin boards are located at the field trailer.

4.4 STAKEHOLDER PSHEP ALIGNMENT MEETING

A stakeholder alignment meeting should be held before beginning any field work. The following representatives should attend the meeting:

1. Client – Mark Hendrickson, CEMC Project Manager
2. Parsons – Craig Butler, Project Manager
3. Parsons – Ed Ashton, Site Safety Officer
4. Subcontractor – Ron Rabasco, StoneLedge Enterprises, Inc., (To-Be-Determined)
5. Add others as needed – Cheryl Huey, Bill Simons, Evan Green, Dan Douglass, and Dale Dolph, Parsons field crew (Others To-Be-Determined)
6. Client contractor – Mike Lawler, CBRES Site Contact

Parsons should present the PSHEP and obtain stakeholders concurrence with the approach outlined in this document. The meeting should include a review of stakeholder roles and responsibilities and elements of control appropriate to project risks.

Participants should gain a clear understanding of roles and responsibilities. Meeting participants represent the Parsons project team, subcontractors, and the client.

4.5 TRAINING

The project has a comprehensive SH&E training program tailored to the client requirements and scope of work. All office-based employees or field employees who spend a significant portion of their time in an office or trailer must receive specialized office training consisting of proper lifting techniques, ergonomics, housekeeping, common office hazards, waste management and office emergencies. All projects should be associated with a Parsons office, and the Office SHE Plan should be reviewed for additional information.

All personnel shall be listed in the PSHEP Training-Medical Records spreadsheet (see Appendix), which will identify the training requirements and expiration dates for applicable certifications. Safety training for project personnel will be based primarily on their work activities and corresponding exposure to hazardous substances and health hazards. The Parsons Corporate Safety and Health Manual (CSHM) and applicable sections will be used as a reference for determining the minimum training requirements based on the project scope of work.

Applicable	Corporate Safety and Health Manual Section/Topic
Yes	CSHM-1 Medical Qualification and Surveillance
Yes	CSHM-2 First Aid - list all site personnel in the PSHEP Training-Medical spreadsheet that will be a first responder due to the insufficient response time of EMS personnel. See Section 6.9 of the PSHEP for additional information on first responders.
Yes	CSHM-3 Ergonomics
No	CSHM-4 Concrete and Masonry Construction
Yes	CSHM-5 Field and Office Facilities
Yes	CSHM-6 Personal Protective Equipment
No	CSHM-7 Hearing Conservation – list all site personnel in the PSHEP Training-Medical spreadsheet that will be exposed to noise at levels greater than 85 decibels over an 8 hour time period, which require annual training and audiograms. Include the work activities generating the noise in Section 4.11.6 of this PSHEP.
No	CSHM-8 Respiratory Protection – list all site personnel in the PSHEP Training-Medical spreadsheet that will have a theoretical potential exposure to contaminants above a permissible exposure limit (PEL) based on known soil or water analysis results, or when there is known contamination with no exposure data. Personnel are required to have annual training, medical clearance and a fit test in order to wear a respirator.

Yes	CSHM-9 Air Monitoring – complete Exhibit 6-1 that identifies chemicals of concern, air monitoring equipment, action levels (based on OSHA PELs) and corresponding PPE/Action Taken.
Yes	CSHM-10 Hazard Communication
Yes	CSHM-11 Emergency Procedures
Yes	CSHM-12 Fire Protection
Yes	CSHM-13 Hazardous Waste Operations – list all site personnel in the PSHEP Training-Medical spreadsheet that will be engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards (such as entering an exclusion zone), which are required to receive appropriate training as required by 29 CFR 1910.120, including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher training.
No	CSHM-14 Process Safety Management
No	CSHM-15 Confined Space - list all site personnel in the PSHEP Training-Medical spreadsheet that will be involved with confined spaces, which will require proof of training.
Yes	CSHM-16 Signs, Barricades and Traffic Control
No	CSHM-17 Hazardous Materials Handling, Transportation, Storage and Disposal – list all site personnel in the PSHEP Training-Medical spreadsheet that will be involved with handling or preparing (i.e. package, label, sign shipping papers, etc.) or packaging (i.e. soil and water samples, compressed gases or chemicals) materials listed in the DOT Hazardous Materials Table (49 CFR 172.101), which are required to receive DOT training every three years in accordance with HM126F, or annual RCRA training in accordance with 40 CFR 265.16 (small or large quantity generators of hazardous waste). **NOTE:** Samples being sent for analysis to determine whether they are hazardous are considered non-hazardous, but classified as "Other Regulated Material" in the Hazardous Materials Table.
No	CSHM-19 Ladders
No	CSHM-20 Scaffolds - list all site personnel in the PSHEP Training-Medical spreadsheet that will be involved with erecting, moving, dismantling, or altering scaffolds, which are required to show a scaffold competent person certification.
No	CSHM-21 Aerial Lifts - list all site personnel in the PSHEP Training-Medical spreadsheet that will be involved with operating an aerial lift, which will require proof of training and competency.
No	CSHM-22 Fall Protection - list all site personnel in the PSHEP Training-Medical spreadsheet that will be involved with activities at heights greater than six feet, which will require proof of training.
No	CSHM-23 Lockout/Tagout (LOTO) - list all site personnel in the PSHEP Training-Medical spreadsheet that will be involved with operating or

	performing maintenance on equipment that has stored, pneumatic, hydraulic or electrical energy, which will require proof of training and competency.
No	CSHM-24 Electrical
Yes	CSHM-25 Motor Vehicles and Equipment – list all Parsons site personnel in the PSHEP Training-Medical spreadsheet that will operate a Parsons company vehicle, which are required to complete the online ParsonsU "Hazard Perception" module and review the Fleet Driver policy.
Yes	CSHM-26 Cranes, Hoists, and Lifts, when applicable based on project
No	CSHM-27 Pressure Vessels
Yes	CSHM-28 Welding, Cutting and Brazing, when applicable based on project
Yes	CSHM-29 Tools
Yes	CSHM-30 Underground Construction
No	CSHM-31 Blasting
Yes	CSHM-32 Demolition, when applicable based on project
Yes	CSHM-33 Excavations - list all site personnel in the PSHEP Training-Medical spreadsheet that will be involved daily inspections of excavations greater than 4 feet in depth, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions.
No	CSHM-34 Steel Erection
No	CSHM-35 Asbestos and Lead - list all site personnel in the PSHEP Training-Medical spreadsheet that will be involved
Yes	CSHM-36 Temperature Extremes – see Section 9.2 for mandatory information on all projects in California that must be reviewed prior to starting work
Yes	CSHM-37 Ventilation, when applicable based on project
Yes	CSHM-38 Substance Abuse
Yes	CSHM-39 Bloodborne Pathogens - see Section 6.9 for additional information
Yes	CSHM-40 Recordkeeping

Field-based employees and office employees who spend a significant portion of their time in the field also receive field training as described in Section 7 of this PSHEP.

For this project, the client does require specific training for site personnel. All employees and contractors will receive client-specific training on the following policies and procedures:

- Behavior Based Safety
- Managing Safe Work
- Hot Work
- Isolation of Hazardous Energy (IHE)
- Confined Space Entry
- Portable Gas Detection
- Excavation
- Working at Heights

- Lifting and Rigging
- Permit to Work System
- Hazard Analysis
- Personal Protective Equipment
- Motor Vehicle Safety
- Preventing Serious Injuries & Fatalities
- Simultaneous Operations
- Electrical Safe Work

4.6 AUDITS AND INSPECTIONS

The Project Manager must implement an audit and inspection program in conjunction with the GBU and Corporate SH&E and Quality Assurance Departments. The Project Manager conducts weekly site inspections. If the Project Manager is not on—site, the most senior person onsite person will conduct the inspection. A weekly inspection report will be complete and saved in the project files. Office work areas (including field trailers) are audited according to the corporate office audit checklist posted on IndustrySafe.

For this project, there will be a field trailer.

Additional information on audits and inspections is provided in Section 6.5 of this PSHEP.

4.7 SH&E MEETINGS

All project meetings that include five or more people must begin with a SH&E moment. The meeting chairperson may present the SH&E topic or ask for a volunteer to open the discussion. In general, these "SH&E moments" are brief, perhaps a minute or two, and should be directly relevant to the work of the day or applicable to most employees (e.g., nonwork-related injuries, waste management procedures, effects of stormwater discharges, home exposure to hazardous materials).

During weekly progress meetings, all Parsons Field Team Leaders/Supervisors or subcontractors submit written summaries of upcoming work tasks and associated risks and control measures to the Project Manager. Progress meetings discuss the risks of the upcoming work tasks and the planned mitigation measures. The weekly summaries identify upcoming mobilization or demobilization tasks, audits and inspections, competent person changes, and training requirements. Subcontractors add activities to these summaries at least two weeks in advance of the work. The Risk Mitigation Two-Week Look-Ahead Form in the Appendix should be used to plan mitigation strategies at weekly progress meetings.

4.8 REWARDS AND RECOGNITION

4.8.1 Rewards and Recognition Program

Each project with a duration of at least 6 months must follow the Rewards and Recognition Procedure for developing a "Rewards and Recognition" program to foster continuous improvement in SH&E performance. If a project is less than 6 months in duration, then the project can choose to fall under the "Rewards and Recognition" Program for the Parsons' office responsible for the project. The "Rewards and Recognition" program for this project will be office based.

4.8.1.1 Rewards and Recognition Corporate Policy Procedure

Parsons Corporate Safety Rewards and Recognition Policy recognizes Parsons employees and project teams who make a performance contribution to Parsons SH&E. This policy recognizes achievements or accomplishments that contribute to the overall SH&E objectives of the company.

This policy outlines acceptable methods of rewards and recognition and provides sample plans that focus on leading indicators rather than lagging indicators. Projects and programs are encouraged to reward their teams and individual employees with items from the Parsons Online Safety Products Store and are encouraged to base incentives on leading SH&E indicators.

4.8.1.2 Examples of Leading Indicators

Examples of leading indicators or actions to reward and recognize are as follows:

- Participating in or leading a safety meeting.
- Providing suggestions for improving workplace SH&E.
- Serving on a SH&E committee.
- Creating or revising an activity hazard analysis (AHA) worksheet.
- Use of Stop Work Authority or Hazard ID.
- Employee Based Safety Observations

Celebrations of achievements at a project or office level are still important. Project luncheons at milestone achievements are encouraged and are the appropriate place to recognize the collective achievements of working without incident.

4.9 WORK-RELATED INJURIES, MEASUREMENT AND REPORTING

4.9.1 Work-related Injury Procedures

4.9.1.1 Emergencies

Call 911.

4.9.1.2 Non-Emergencies

For work-related injuries or illnesses that may require physician direction on appropriate treatment, Parsons employees should then promptly contact WorkCare, ideally before seeking medical care, as this will provide the greatest opportunity for appropriate intervention.

WorkCare's Incident Intervention is available 24 hours a day, 7 days a week (24/7), and 365 days per year. The contact number is 1-888-449-7787.

If an injured employee requires medical care for a work related injury/illness, the Order for Treatment of Work-Related Injury/Illness Form MUST be sent with the injured worker and/or faxed to the occupational medicine clinic at the time of the initial evaluation.

For U.S. facilities, here is the link to the document on ParShare: Order for Treatment of Work-Related Injury or Illness. NOTE: The Workers Compensation carrier and Policy number for each State may be different.

When contacting WorkCare, be prepared to provide the following:

- Injured employee's name and Parsons ID number
- Injured employee's contact number
- Injured employee's location (at a minimum include the city and state)
- Employee's GBU and client/project name
- Functional manager's name

If the WorkCare physician or nurse determines that an employee should be evaluated by a local physician, then an occupational clinic will be used whenever possible (i.e. during normal business hours). A secondary facility must be able to provide treatment during all hours of operations (i.e. hospital). The facilities are listed below:

- *Primary – Facility Name and Location TBD by Workers Compensation Analyst (Donna Miller). Contact the facility to determine hours of operation.*
- *Secondary – Saint Luke's Cornwall Hospital, 70 Dubois Street, Newburgh, New York, 12550, 845-561-4400.*

  NOTE: Transportation of an injured worker to a medical facility for non-emergency treatment must be done by at least two (2) individuals (i.e. driver and observer). If a driver is not available, then a cab service is acceptable as long as an observer is present.

4.9.2 Measurement and Compliance

To accurately measure performance and comply with corporate and regulatory requirements, Parsons and its subcontractors have an emergency communications system to contact the following onsite offices for the events listed below:

All incidents/near misses	Enter into IndustrySafe within 4 hours
Worker injury or illness	Richard Molta (315) 447-0679
Fires/Explosions	911
Environmental spill/release	Enter into IndustrySafe within 4 hours
Medical (Emergency)	911

Medical (non-emergencies)	WorkCare (888-449-7787)
Site security (if applicable)	Craig Butler (315) 263-6053

The Project Manager establishes a measurement system to provide indicators of SH&E performance, including the following metrics:

- Hours worked since the last recordable injury and previous record
- Consecutive days without a recordable incident and previous record
- Consecutive days without a days-away-from-work incident and previous record
- Recordable incident rate
- Days-away-from-work incident rate

4.9.3 Incident Reporting

Employees involved in or witnessing an injury, worker exposure, environmental incident, or near miss must immediately report it to the responsible supervisor or foreman, who in turn immediately relays the report to Parsons Project Manager, Craig Butler (315) 263-6053, or Project SH&E Representative, Ed Ashton (315) 679-1170. No supervisor may decline to accept or relay a report of SH&E incident or significant near miss from a subordinate.

Each Project Manager must ensure that all SH&E incidents are reported to the GBU SH&E Director and other management personnel (as required) within four hours using the IndustrySafe Online SH&E Reporting System. The online SH&E reporting system includes an Incident Investigation Form, which can only be viewed by system administrators, designated managers, and the assigned investigator. The GBU SH&E Director serves as the default investigator and may assign that role on a case-by-case basis.

Incident investigation link folder on ParShare is as follows: Incident Investigation.

Procedures for investigating workplace accidents and hazardous exposures include the following:

- Emergency Response Team responds to the accident scene as soon as possible.
- Report all injuries to the Parsons Workers' Compensation Claims Analyst.
- Report on PWeb using the online IndustrySafe Reporting System.
- Report to appropriate client point of contact in accordance with contractual requirements.
- Interview injured workers and witnesses.
- Have employee complete the Employee Accident Report and the Individual Statement Report within 24 hours. If the employee is unable to complete the statement, the functional manager must complete the form. (Note: The Individual Statement Report is also known as the Narrative Statement form.)
- Report to the Program Safety Manager (or Parsons Project Manager) immediately.

- Examine the workplace for factors associated with the accident/exposure.
- Determine the cause of the accident/exposure.
- Take corrective action to prevent the accident/exposure from recurring.
- Record the findings and corrective actions taken.

The Division SH&E Manager must notify the local OSHA office and/or regional, municipal and/or local regulations office in writing within 8 hours if an accident involves the death of an employee or hospitalization of *three or more* workers. In addition, spills/releases of reportable quantities and other reporting required by environmental regulation are the responsibility of the Project Manager.

Subcontractors must submit a monthly report of exposure hours (hours worked on the project, paid or unpaid) to the Parsons Project Manager within four (4) days after the end of each month, or as specified by the contract. The Project Manager compiles the figures and submits them via the online safety reporting system. If necessary, estimated figures are acceptable, but the reports must be filed.

4.10 INCIDENT INVESTIGATIONS

All accidents, worker over exposures, environmental incidents and significant near misses are investigated by an individual or team with training in incident investigation and root cause analysis. Subcontractors must investigate incidents involving their employees or activities and submit an investigation report to the Parsons Project Manager within 48 hours of an incident.

In Parsons, the GBU SH&E Director investigates or assigns an investigator to each significant incident. The investigator submits a final investigation report using the online safety reporting system within 72 hours of the incident. Each Project Manager maintains the investigation file.

4.11 RESPONSIBILITY/IDENTIFICATION OF KEY LINE PERSONNEL

For project responsibility and identification of key personnel

Project Key Personnel

Company Executive responsible for Project	Contact Information
Ed Andrechak	Direct Line: 302-468-5567 Cell Phone: 302-438-5743 Email: Ed.Andrechak@parsons.com
Project Manager	Contact Information.
Craig F. Butler	Direct Line: 315-552-9680 Cell Phone: 315-263-6053 Email: craig.butler@parsons.com
Field Team Leader	Contact Information.
Ed Ashton	Direct Line: 315-552-9673 Cell Phone: 314-679-1170 Email: Edward,J.Ashton@parsons.com
Project SH&E Representative	Contact Information
Ed Ashton	Direct Line: 315-552-9673 Cell Phone: 314-679-1170 Email: Edward,J.Ashton@parsons.com
Client Project Management POC	Contact Information
Mark Hendrickson	Direct Line: 713-432-2634 Cell Phone: 832-851-9532 Email: MHendrickson@chevron.com

The personnel listed above have the authority and responsibility for implementing the provisions of this PSHEP.

4.12 MEDICAL REQUIREMENTS AND WORKERS' COMPENSATION

In accordance with corporate requirements the Program Safety has established and implemented the following medical requirements for the project:

4.12.1 Functional Capacity Evaluations (FCEs)

FCEs are not applicable for Parsons personnel working on this project.

4.12.2 Substance Abuse Tests

The Talent Management Department administers required substance abuse tests. For this project, the client requires the following types of drug and/or alcohol testing:

- Pre-work [include acceptable time period since last test (i.e. within one month)]
- Post-incident – applicable for incidents involving medical treatment or reasonable suspicion
- Reasonable suspicion – NOTE: Supervisor must have training in Controlled Substance

and/or Alcohol Awareness Training, and a Reasonable Suspicion form must be completed.

4.12.3 Workers Compensation Program

Parsons workers' compensation assistance is offered for the injury management process, including but not limited to selecting medical providers, filing the claim with the insurance carrier, monitoring the employee's medical care, and assisting with the Parsons Return-to-Work Program. The Parsons Workers' Compensation Claims Analyst, Donna Miller, can answer your specific questions and concerns. Donna can be reached at (661) 904-0978 or by email at donna.miller@parsons.com.

When a work-related incident, accident, or illness occurs, the employee's supervisor must complete IndustrySafe incident report within 4 hours of his/her knowledge of the incident. Additionally, the employee's supervisor must coordinate the employee's, supervisor's and witnesses' completion of the Workers' Compensation Accident Reports and fax them to Donna within 24 hours of the incident, accident, or illness. Donna's fax number is (866) 293-0114.

4.12.4 Medical Monitoring

All personnel engaged in activities that results in the exposure to chemicals at or above the OSHA Permissible Exposure Limit (PEL) or wear a respirator for more than 30 days in a year, must comply with 29 CFR 1910.120(f) – Medical Surveillance. All personnel who wear a respirator must be medically qualified by a physician, trained and fit-tested on an annual basis, even if they are not required to participate in a medical surveillance program under 29 CFR 1910.120(f).

Based on the scope of work listed in Section 2.1, there are currently no hazards or activities are associated with this project, which may result in an exposure that requires an employee to participate in a medical surveillance program.

Should a medical surveillance program be required, it will be administered by the Division or Program SH&E Manager administers the medical surveillance program.

SECTION 5 – PRE-FIELD WORK

This phase applies to projects with a remediation investigation, action or field component. Activities described in this phase typically occur before actual investigation or remedial phases begin.

5.1 RISK ANALYSIS AND SAFETY SPECIFICATION DEVELOPMENT

The Beacon Project has been ongoing since 2001. All projects at the Beacon Site that have a field component must have a risk analysis performed before the remediation investigation, action or field component begins. For a majority of the projects (groundwater sampling, hand augering), the risks are typically well known and can be effectively planned for by the PM during the pre-field work phase of the project. However, for more complex projects, the PM is advised to consult with a Parsons Safety Manager during the administration phase so that the necessary safety components can be well understood and properly resourced.

The information obtained during the risk assessment can be used as a reference when developing the site specific AHAs.

5.2 SUBCONTRACTOR PREQUALIFICATION REVIEW

For this project, there will be subcontractors directly hired by Parsons.

The subcontractors directly hired by Parsons that will be working on the project are included in Exhibit 5-1.

Exhibit 5-1 – Hired Subcontractors

SUBCONTRACTOR	WORK ACTIVITIES	DATE OF EVALUATION
Stoneledge Enterprises, Inc.	**SWPPP maintenance**	**March 2, 2016**

NOTE: Each Parsons contractor (and lower tier subcontractors) performing any field work must have completed the Parsons online Contractor Safety Evaluation Program in the current calendar year before being eligible to work. The names of contractors, a Summary E-mail that identifies potential risks, and feedback from Parsons personnel that have used the contractor is available at the online Contractor Safety Evaluation web site.

5.3 PRE-FIELD WORK MEETING

A copy of the Pre-Field Work SH&E Meeting and Site-Specific SH&E Review Checklist is part of the Appendix and will be reviewed by all project personnel before work begins. The meeting

includes the Parsons Project Manager and subcontractor representatives, including safety.

5.4 COMPETENT PERSON SUBMISSION REVIEW

Copies of signed Competent Person forms for subcontractor personnel is part of the Appendix. Exhibit 9-1 represents regional, municipal, provincial, local, and/or OSHA regulations, owner, and Parsons corporate regulations and requirements applicable to the project.)

5.5 SUBCONTRACTOR SAFETY PLAN SUBMISSION REVIEW

The subcontractor SH&E plan (SSHEP) has been posted on ParShare (PE&I Safety > Project Safety Plans > Environmental Division > *insert Client Name* > *insert Project Name and hyperlink to the Project folder)*. The Parsons Project Manager has reviewed the SSHEP for adequacy in accordance with the Subcontractor SHE Plan Review form posted on ParShare.

5.6 MOBILIZATION/KICKOFF SH&E MEETING

Project Managers conduct the Mobilization/Kickoff SH&E Meeting on or before the first day of subcontractor mobilization in the field at each work site. The meeting includes a review of the prebid site/area risk analysis and a walk through of the work area to locate items on the prebid risk analysis checklist.

SECTION 6 – CONSTRUCTION PHASE

6.1 SITE RISK ANALYSIS

Below is a list of potential hazards on the project:

- Biological – viruses associated with tick and mosquito bites (Lyme disease, West Nile Virus,)
- Chemical exposures – if soil and/or water analysis data, or historical air monitoring data indicates the need for Level C respiratory protection, then action levels (based on OSHA PELs) and corrective action(s) must be provided. Use the Action Level Table in the Appendix for entering Action Levels and PPE/Action Taken in Table 6-1. NOTE: A respirator cartridge change out schedule must be developed and included - use the Wood Math Model Table based on the anticipated levels of chemical exposure.
- Confined spaces – limited or restricted means for entry or exit, and is not designed for continuous occupancy (vaults, tanks, manholes, pipelines, excavations > 4 ft. deep)
- Crane movement - rigging
- Environmental – cold/heat related illnesses, animals, insects, poisonous plants/vegetation. See Section 9.2 for information related to Environmental hazards.
- Falls – working at heights greater than six feet
- Fires – reference CSHM-12
- Hazardous material handling – reference CSHM-17
- Lightning - personnel shall follow the 30/30 rule - stop field activities and seek shelter when the time between seeing the lightning and hearing the thunder is less than 30 seconds. When the lightning has subsided for 30 minutes, work activities can resume.
- Marine safety/work around water
- Noise – reference CSHM-7
- Overhead utility lines or obstructions
- Underground utilities or obstructions - if subsurface soil disturbance more than 6" below grade surface will occur, then the Parsons Subsurface Soil Disturbance Protocol must be followed (included in the Appendix).
- Traffic

Table 6-1 – Chemicals of Concern

Chemical of Concern	***Soil (mg/kg) or ground water (g/ml) concentrations***	***Monitoring Equipment***	***Action Levels***	***PPE/Action Taken***
VOCs, SVOCs, and TAL Metals	Varies. Concentrations exist within soils that exceed NYSDEC 6NYCRR Part 375-Residential and NYSDEC TOGS Class GA in groundwater.	Photoionization Detector (PID)	See Appendix A-Action Levels for Volatiles.	Non- Asbestos Containing Material abatement personnel will not be allowed in abatement area.

6.2 CONTROL MEASURES

Site hazards and hazards resulting from work activities will be controlled using one or more of the control measures listed below. The order of precedence is as follows:

1. Engineer/design to eliminate or minimize hazards. A major component of the design phase is to select appropriate safety features to eliminate a hazard and render it fail-safe or provide redundancy using backup components. Guard the hazard. Hazards that cannot be eliminated by design must be reduced to an acceptable risk level by safety guards or isolation devices that render them inactive.
2. Provide warnings. Hazards that cannot be totally eliminated by design or guarding are controlled through using a warning or alarm device.
3. Provide special procedures or training. When design, guarding, or warnings cannot eliminate hazards, subcontractors must develop procedures, training, and audits to ensure safe completion of work. Training cannot be a substitute for hazard elimination when life-threatening hazards are present.
4. Provide personal protective equipment. To protect workers from injury, the last method in the order of precedence is the use of personal protective equipment, such as hard hats, gloves, eye protection, life jackets, and other protective equipment with the understanding that bulky, cumbersome, and heavy personal protective equipment is often discarded or not used, rendering this method ineffective without proper controls.

6.3 ACTIVITY HAZARDS ANALYSIS

On Chevron projects, the JSA or JLA is the primary tool that is used to study and record each step of a job or task, identify existing or potential hazards, and determine the best procedures to follow in order to perform the job safely. A JSA should be developed and reviewed with employees for every work process which has the potential or has historically accounted for losses to the organization and for every task performed on-site. They should also be developed and reviewed with employees before operating any newly installed equipment or before implementing new process procedures on existing equipment. Persons developing and performing the JSA reviews with employees must be familiar with the process and understand the basic hazard control measures presented above. The JSA will be used as a "task training" aid to ensure that workers are properly trained on the task they are about to perform. A copy of the JSA form is included in Appendix B. JSAs must be:

- Continuously updated and improved. They are expected to be working documents and marked up accordingly. If the procedure is found deficient or unworkable for some reason, they should be revised or edited rather than disregarded.
- Specific. Do not use vague statements such as "Be Careful" or "Practice Awareness". State what the expected behavior or mitigation measure is to be.
- Communicated to employees and contractors. They can be used as tailgate topics, training tools, a basis for EBSOs, etc. Key elements of the JSA will be reviewed daily.
- Easily accessible: The JSAs must be kept on site in an orderly fashion, and all site workers must be familiar with their location.

- Understood and followed. All site works performing work under a JSA must understand what is expected of him and follow the procedure.
- AHAs for the hazards identified in Section 6.1 can be found on the Chevron Beacon ParShare Site.

6.4 SAFETY SYSTEMS AUDIT PROTOCOL

GBU SH&E Directors use the Safety Systems Audit Protocol for field staff and subcontractors whose work on a project site will be more than six (6) months.

This project *(insert "will" or "will not")* be more than six (6) months in duration.

6.5 SITE INSPECTION

Each Inspection Category below will be assigned the following employees

Inspection Category [a]	Parsons Corporate Safety & Health Manual	Title of Assigned Employee	Minimum Frequency
Focused		Site SSO	Weekly
Fire Extinguishers	12	Site SSO	Weekly
Motor Vehicles and Equipment	25	Employees/Field Crews	Daily
Cranes and Hoisting Equipment	26	As Needed, when equipment is used on project	Daily

[a] Additional inspections may be required by local, state, and federal regulatory agencies based upon the project scope of work.

6.6 WEEKLY SH&E SITE INSPECTIONS

The Project Manager or most senior onsite person conducts a weekly site walk to identify problem areas using the Weekly SH&E Inspection Checklist (see Appendix). Items found to be out of compliance must be assigned corrective action and tracked to completion.

6.7 SH&E ENFORCEMENT

Parsons and its subcontractors enforce all applicable SH&E requirements of regional, federal, municipal, state, local, and all other regulations; and where applicable OSHA 1910 and 1926 and Engineering Manual (EM) 385.1, where applicable. Subcontractors must also comply with and enforce Parsons site requirements.

Parsons and its subcontractors must have written progressive disciplinary systems available for review in their Human Resources departments.

6.8 NOTICE OF VIOLATION OF SAFETY AND HEALTH REGULATIONS

A Notice of Subcontractor Violation of SH&E Regulations form (see Appendix) will be used document immediately dangerous to life and health (IDLH) situation, respiratory airborne hazards (RDLH), and/or when the subcontractor repeatedly fails to comply with SH&E requirements.

The Notice of Subcontractors Noncompliance to SH&E Regulations form (see Appendix) documents poor performance and requires a response from subcontractor senior management. The notice contains five distinct levels of discipline, from submission of a recovery plan to contract termination.

6.9 COMPETENT FIRST AID PERSON

The response time for Emergency Medical Services (EMS) when dialing 911 has been determined to be less than 15 minutes. Based on the activities provided in the Scope of Work (Section 2.1) and the list of Activity Hazard Analysis (AHA) included in Section 6.3, the project does not expect to have an accident involving suffocation, severe bleeding, or other life threatening or permanently disabling injury or illness.

The employee(s) and contractors listed in the Training-Medical Records spreadsheet are assigned to the project and will have a valid certificate in AED, CPR, first aid and bloodborne pathogens.

SECTION 7 – SAFETY TRAINING

7.1 PROJECT SAFETY ORIENTATION

The Parsons Project Manager, Field Engineer, or Project SH&E Representative will conduct an orientation for all new Parsons staff and subcontractor management personnel using the completed PSHEP Orientation.

All visitors must receive a brief orientation on emergency procedures, and be escorted by the Project Manager, Project Engineer, Project SH&E Representative or a designee familiar with the potential hazards on the project, and who has received a full safety orientation.

7.2 PARSONSU MODULES AND START TRAINING – ZERO INCIDENT TECHNIQUES

The following functional managers can be consulted with to determine if project personnel are current in the completion of safety modules on ParsonsU.

- Eric Mysona
- Mark Arrigo

The following Managers and Supervisors have completed START training:

- Craig Butler
- Ed Ashton
- Rich Molta

7.3 DAILY HUDDLE

Daily Planners such as Daily SH&E Planner or the Take 5 Card enable supervisors and employees to formally document SH&E huddle participation as well as the day's activities, associated risks, and relevant control measures. The daily safety huddle must be documented using either one of these forms, or an alternate means of documentation to be determined by the Project Manager.

At the project site, the Take 5 Card is typically utilized when an unplanned task is required to be performed as a way to document that risks and relevant control measures have been discussed and the team is prepared to carry out work in a safe and controlled manner.

At the project site, Field supervisors and/or Site Safety Officers will conduct daily toolbox meetings with site workers. Daily toolbox safety meetings are held with all personnel at the beginning of each shift to review current site conditions, incidents or injuries from the previous shift activities, safe or at-risk observations from the previous shift, activities planned for the

current shift, anticipated hazards, engineering controls-work practices-PPE to protect against

7.4 WEEKLY TOOLBOX SH&E MEETINGS

The Field Team Leader documents toolbox SH&E meetings and attendance and retains all records. Subcontractors shall lead the portion of the meeting that involves their scope of work. Meetings shall be documented and signed by all individuals accessing the site using a Toolbox Safety Meeting form (Safety Meeting Sign-In Sheet).

7.5 ACTIVITY HAZARDS ANALYSIS TRAINING

When the Activity Hazards Analysis (AHA) is complete, the Parsons supervisor or subcontractor conducts a training session with all individuals involved with the task. Individuals should be given an opportunity to provide input regarding task steps, hazards identified, and appropriate control measures.

7.6 REGULATORY TRAINING PROGRAMS

Regional, municipal, provincial, local, and OSHA regulations require specific training in certain circumstances. Based on the scope of work and meetings with regulatory officials, the following training topics are provided on the project:

Yes	Hazard Communication – as per 29 CFR 1910.1200
Yes	HAZWOPER – all workers engaged in activities which are potentially exposed to hazardous substances and health hazards must be trained to meet 1910.120(e)(1). Annual 8-hour refresher training as per 29 CFR 1910.120(e)(3) is required for workers and supervisors must be trained to meet 29 CFR 1910.120(e)(4).
Yes	AED/CPR/First aid/Blood borne Pathogens – provided to personnel based on project activities identified in the Scope of Work (i.e. life threatening) and EMS response time (i.e. less than 15 minutes). See Section 6.9.
No	Emergency response – only applicable to workers engaged in emergency response as per 29 CFR 1910.120(q).
No	Respiratory protection – as per 29 CFR 1910.134. Medical qualification by a physician is required to wear a respirator. Annual fit testing and training is also required.
No	Signaling
No	Process safety management – as per 29 CFR 1910.119.
No	Power-operated hand tools
No	Gas welding and cutting
No	Confined space entry – Supervisor must be trained to meet 29 CFR 1926.651(j).
Yes	Lockout/tagout – as per 29 CFR 1910.147.
No	Asbestos abatement – as per 29 CFR 1926.1101.
No	Scaffold use – as per 29 CFR 1926.451.
No	Excavation/Trenching – as per 29 CFR 1926.651.

7.7 OUTREACH PROGRAMS

The project will use qualified instructors and online courses to conduct regional, municipal, provincial and local training, as well as OSHA 10-/30-hour construction safety training.

7.8 SPECIALIZED TRAINING AND ORIENTATIONS

Personnel receive specialized training on client rules and requirements as well as the unique tools, equipment, and procedures used to perform the work. The Program budget includes funding for the following training as referenced in the Site Orientation Table included in Section 10.1. A refresher training syllabus will be developed on an annual basis.

7.8.1 Short Service Employee

Employees with less than 6 months of experience in the same job type or with their present employer are considered short-service employees (SSE) by CEMC. Personnel who quit and return to the company within one year are exempt from this policy given a variance form is filled out by the contractor and signed by the CEMC Business Unit Manager.

An SSE cannot be the only member of a field crew. Field teams of less than five (5) people may not have more than one SSE. For crews of five (5) or more, no more than 20% of the field team can be comprised of SSE. Field teams with more than 20% SSE, may potentially do so with a completed variance form approved by the Chevron Business Unit Manager.

The SSE must be identified while on site with the use of a hi-vis orange dot on the front of their hard hat, as appropriate, at all times. An SSE is to be under the watch of a Mentor at all times. The Mentor should be someone familiar with the project work and its hazards. The Mentor is to ensure the roles, procedures, and regulations are clear during each task, while on site.

Subcontractors will not be allowed to utilize SSEs at the Facility.

7.8.3 Stop Work Authority

All employees working on any Parsons project has the responsibility and the authority to stop work if the work to be performed cannot be performed safely. Work can and must be stopped and there will be no repercussions to the individual who stopped the work. No job is so important or so critical that it cannot be completed safely.

SECTION 8 – RECORDKEEPING AND POSTING

Parsons and its subcontractors must comply with the recordkeeping requirements of the regional, municipal, local, and/or OSHA regulations, Owner, Parsons Corporation, and this PSHEP, including:

- OSHA 300 and/or applicable regional, municipal, and local regulation logs
- Medical treatment and follow up
- Cranes
- Heavy equipment inspection logs
- Fall protection
- Training
- Inspections
- Audits
- Others, as required

Parsons Talent Management and the Division or Program SH&E Manager are the official recordkeepers for files relating to Parsons employees. Each subcontractor maintains its own files.

For this project, safety bulletin boards used for displaying regional, municipal, provincial, local and/or OSHA posters in conspicuous places will be located in the Parsons field trailer.

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SECTION 9 – SAFETY AND HEALTH REQUIREMENTS

9.1 COMPETENT PERSON AND ACTIVITY HAZARDS ANALYSIS

Parsons and its subcontractors are individually responsible for training their respective employees and for complying with all project requirements. Failure to comply could lead to disciplinary actions against Parsons employees and subcontractors or their employees. Further guidance is available in the Parsons Corporate Safety and Health Manual; ParShare link is as follows: Corporate Safety and Health Manual.

Competent Person forms will be submitted for subcontractor personnel for applicable Safety and Health Requirements in Exhibit 9-1.

Exhibit 9-1 – Competent Person and Activity Hazards Analysis Requirements

Safety and Health Requirement	Parsons Safety, Health, and Environmental Manual	OSHA Regulation	EM 385-1-1 Regulation	Competent/ Qualified Person	Training Required	Written Plan and AHA Required
General Safety and Health		1926.20	01.A	*Yes*	*Yes*	*Yes*
Safety Training		1926.21	01.B.01	*Yes*	*Yes*	*Yes*
Confined Spaces	15	1926.21, 1910.147	06.01	*Yes*	*Yes*	*Yes*
Confined Space Permit System	15	See above	06.01	*Yes*	*Yes*	*Yes*
First Aid and Medical	2	1926.23, 50	03.A	*Yes*	*Yes*	*Yes*
Fire Protection and Prevention	12	1926.24, 150-155, 352	09.A	*Yes*	*Yes*	*Yes*
Housekeeping	4	1926.25	14.C	*N/A*	*N/A*	*N/A*
Illumination	4	1926.26, 56	07.A	*Recommended*	*N/A*	*N/A*
Sanitation	4	1926.27, 51	02.A	*N/A*	*N/A*	*N/A*
Personal Protective Equipment	6	1926.28, 95-98, 100-107	05.A	*Yes*	*Yes*	*Yes*
Acceptable Certifications		1926.29		*Yes*	*Yes*	*Yes*
Incorporation by Reference		1926.31	Preamble	*N/A*	*N/A*	*N/A*
Emergency Employee Action Plans	11	1926.35	01.E	*Recommended*	*Yes*	*Yes*
Noise Exposure	7	1926.52	05.C	*Yes*	*Yes*	*Yes*
Radiation Protection	9	1926.53, 54	06. E&F; 28.A.02	*Yes*	*Yes*	*Yes*
Gases, Vapors, Dusts and Mists	9	1926.1926.55		*Yes*	*Yes*	*Yes*

Safety and Health Requirement	Parsons Safety, Health, and Environmental Manual	OSHA Regulation	EM 385-1-1 Regulation	Competent/ Qualified Person	Training Required	Written Plan and AHA Required
Ventilation	37	1926.57, 353		*Recommended*	*Yes*	*Yes*
Hazard Communication	10	1926.59	1.B.06	*Yes*	*Yes*	*Yes*
Hazardous Waste Operations and Emergency Response	13	1926.65 1910.120	28.A	*Yes*	*Yes*	*Yes*
Waste Disposal		1926.252	14.D	*Yes*	*Yes*	*Yes*
Tools	29	1926.300-307	13.A	*N/A*	*N/A*	*Yes*
Gas Welding and Cutting	28	1926.350	10.A	*Recommended*	*Yes*	*Yes*
Lockout Tagout	23	1926.417, 1910.147	12.A	*Yes*	*Yes*	*Yes*
Lockout Tagout Permit System	23	See above	12.A	*Yes*	*Yes*	*Yes*
Fall Protection	22	1926.500-503	21.A	*Yes*	*Yes*	*Yes*
Cranes, Derricks, Hoists, Elevators and Conveyors	26	1926.550	16.A	*Yes*	*Yes*	*Yes*
Motor Vehicles, Mechanized Equipment	25	1926.600-603	18.A	*Yes*	*Yes*	*Yes*
Excavation Permit	33	N/A	N/A	*Yes*	*Yes*	*Yes*

9.2 ENVIRONMENTAL HAZARDS

9.2.1 Heat Related Illness

Project activities may take place during time periods where exposure to temperature extremes could occur. In order to minimize exposure to temperature extremes, project personnel shall be familiar with the health effects of exposure to temperature extremes and the control measures that can minimize exposure. Personnel wearing impermeable protective clothing when ambient temperatures exceed 70F will be subject to a heat stress monitoring program (see Appendix).

For this project, personnel will not be required to wear impermeable protective clothing or respirators when ambient temperatures exceed 70F.

Training shall be provided to all employees to recognize heat illness hazards before starting to work outdoors.

Any employee experiencing or witnessing signs and/or symptoms of a heat related illness shall report the findings to their supervisor immediately.

Supervisors shall understand the procedures to follow when an employee exhibits symptoms consistent with heat illness, including emergency response.

Definitions

Acclimatization - a temporary adaption of the body to work in the heat that occurs gradually when a person is exposed to it. Acclimatization peaks in most people within 4-14 days of regular work for at least 2 hours per day in the heat.

Environmental Risk Factors - working conditions that create the possibility that heat illness could occur, including air temperature, relative humidity, radiant heat from the sun and other sources, conductive heat sources such as the ground, air movement, workload severity and duration, protective clothing and personal protective equipment worn by employees.

Heat Illness - a serious medical condition resulting from the body's inability to cope with a particular heat load, and includes heat cramps, heat exhaustion, heat syncope and heat stroke.

Heat Wave - a sudden and temporary rise of temperature above the seasonal average for a particular region, which lasts for a prolonged period of time. A heat wave can greatly increase the risk of heat related illnesses.

Personal Risk Factors - an individual's age, degree of acclimatization, health, water consumption, alcohol consumption, caffeine consumption, and use of prescription medications that affect the body's water retention or other physiological responses to heat.

Preventive Recovery Period - a period of time to recover from the heat in order to prevent heat illness.

Shade - blockage of direct sunlight. Canopies, umbrellas and other temporary structures or devices may be used to provide shade. One indicator that blockage is sufficient is when objects do not cast a shadow in the area of blocked sunlight. Shade is not adequate when heat in the area of shade defeats the purpose of shade, which is to allow the body to cool. For example, a car sitting in the sun does not provide acceptable shade to a person inside it, unless the car is running with air conditioning.

Signs and Symptoms of Heat Illnesses

Heat Rash – or prickly heat, occurs in hot and humid environments where sweat is not removed from the skin. Usually disappears when worker returns to cool environment.

Heat Cramps – muscle contractions from the loss of fluids /electrolytes due to sweating. Occurs when workers perform hard physical labor in a hot environment. Most common in the arms and legs. Cramping can occur after work has stopped.

Heat Exhaustion – inadequate blood circulation from stress due to constant heat. The whole body, especially the circulatory system, is extremely stressed. Possible symptoms include: pale, flushed face and neck; clammy skin; heavy sweating; fatigue; shortness of breath; headache; dizziness or fainting; nausea and vomiting; and rapid heartbeat and breathing.

Heat Stroke – body's failure to regulate its' temperature. The most serious stage of heat illness. Symptoms include: dizziness and confusion, red, hot, dry skin; nausea and vomiting; very little sweating; rapid pulse; high body temperature, 105° F or higher; convulsions, and fainting.

Heat Illness Prevention

Prevention of heat related illness in extreme temperature project personnel shall consider implement a Physiological monitoring program, include monitoring with a WBGT and implementing work rest regiments. The field team shall be encouraged to drink plenty of liquids to replenish electrolytes. The field team shall also, construct a shaded rest area for workers to take breaks.

Prevention of heat related illness may call for establishing work teams to rotate to minimize heat related illnesses.

Heat Illness Treatment

Heat Cramps - take water every 15 to 20 minutes. Drinking an electrolyte replacement (like Gatorade) may help.

Heat exhaustion - Get medical help. Don't leave the person alone. While waiting, remove worker to cool place to rest; remove as much clothing as possible; give water and electrolytes; and don't allow person to get chilled.

Heat Stroke – Call 911 immediately. While awaiting medical help, get victim into cool area, fan vigorously, apply cool water to clothing or skin, and apply ice packs under arms and to the groin area.

Heat Waves

Heat illness prevention during heat waves means taking extra measures.

More vigilance - supervisors/employees watch others very closely and provide more frequent feedback during work activities. Site workers shall avoid working alone and utilize the "Buddy System", watch each other and closely monitor/report an employees' condition. Personnel shall be accounted for their whereabouts throughout the work shift and at the end of the day.

More water - employees should drink small quantities of water more frequently before, during and after work. There should be extra supplies of water for replenishment, encourage employees to consult with their doctor on salt/mineral replacement.

More cooling - use other cooling measures in addition to shade, spraying body with water/wiping with wet towels and taking additional/longer breaks in the shade.

Change schedule - work activities may be started earlier on later in the evening, split-up work shifts and avoid working during the hotter parts of the day. Work shifts can be cut short or stop work.

Change meals - encourage employees to eat smaller/or more frequent meals (less body heat during digestion than with big meals), choose foods with higher water content (for example, fruits, vegetables and salads).

Acclimatization warning - personnel should allow the body time to adjust to sudden, abnormally high temperatures or other extreme conditions. Even employees previously fully acclimatized are at risk for heat illness.

Environmental and Physiological Factors

- Average ambient air temperature 96ºF (75-116ºF)
- Average humidity 29% (12% - 55%)
- Average wind speed 7 mph
- Average core body temperature 104ºF (98 -108ºF)

Provision of Water

Sufficient amounts of cool water shall be available and replenished at all times w/at least one quart per employee per hour for the entire shift.

Easy access to clean and cool water shall be available to encourage frequent drinking.

Access to Shade

A Preventative Recovery Period (PRP) is necessary if an employee is suffering from heat illness or believes that a rest break is needed to recover from the heat.

Access to shade shall be permitted at all times. Employees shall have access to an area with shade that is either open to the air or provided with ventilation or cooling for a period of no less than 5 minutes.

Measurement

Portable heat stress meters or monitors are used to measure heat conditions. These instruments can calculate both the indoor and outdoor WBGT Index according to established ACGIH Threshold Limit Value equations. With this information and information on the type of work being performed, heat stress meters can determine how long a person can safely work or remain in a particular hot environment.

Additional Guidance

Cal/OSHA - http://www.dir.ca.gov/DOSH/HeatIllnessInfo.html

NIOSH - http://www.cdc.gov/niosh/topics/heatstress

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SECTION 10 – APPENDIX

10.1 ATTACHMENTS/FORMS

10.1.1 PSP Training-Medical Record

10.1.2 Pre-Field Work Safety Meeting

10.1.3 Employee/Contractor Training Acknowledgement

10.1.4 Risk Mitigation Two-Week Look-Ahead Form

10.1.5 Notice of Noncompliance with Safety and Health Regulations

10.1.6 Notice of Subcontractor Violation of Safety and Health Regulations

10.1.7 Remediation Safety and Health Inspection Checklist

10.1.8 Activity Hazard Analysis Training Record

10.1.9 Mobilization/Kickoff Safety Meeting

10.1.10 Subcontractor Competent Person Form

10.1.11 Safety Performance Evaluation Form

10.1.12 Project Manager Safety Expectations Form

10.1.13 Safety Meeting Sign-in Sheet

10.1.14 Competent Person and Activity Hazard Analysis Requirements

10.1.15 Heat Stress and Heat Stress Monitoring

All these forms can be found on the ParShare Website

10.2 SUBCONTRACTOR SAFETY PLANS (SSPS)

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APPENDIX F

SAMPLING AND ANALYSIS PLAN
REVISED FEBRUARY 2017

APPENDIX F: 2017 SOIL AND SURFACE WATER DATA GAP INVESTIGATION SAMPLING AND ANALYSIS PLAN
Former Chevron Texaco Research Center
Beacon, New York

SITE ID# 314004
EPA ID # 091894899

Submitted to:

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APRIL 2016
REVISED JULY 2016 AND FEBRUARY 2017

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LIST OF ACRONYMS

AHA	Activity Hazard Analysis
ASP	Analytical Services Protocol
BGS	Below Ground Surface
CAR	Corrective Action Request
COC	Chain of Custody
DOT	Department of Transportation
DT	Data Tracker
DQO	Data Quality Objective
Ft.	Feet
FST	Field Sampling Team
Hg	Mercury
SSE	Selective Sequential Extractions
MS	Matrix Spike
mg/l	Milligrams Per Liter
MSD	Matrix Spike Duplicate
NA	Non Applicable
NYSDEC	New York State Department of Environmental Conservation
OU	Operable Unit
PCBs	Polychlorinated Biphenyls
PFD	Personal Flotation Devices
PID	Photoionization Detector
PPE	Personal Protective Equipment
PSHEP	Project Safety, Health, and Environmental Plan
QA	Quality Assurance
QC	Quality Control
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
SAP	Sampling and Analysis Plan
SDG	Sample Delivery Group
SVOCs	Semivolatile Organic Compounds

LIST OF ACRONYMS
(Continued)

TAL	Target Analyte List
TOC	Total Organic Carbon
TRCB	Texaco Research Center Beacon
TSS	Total Suspended Solids
UFPO	Underground Facilities Protective Organization
um	Micron
USCS	Unified Soil Classification System
USEPA	US Environmental Protection Agency
VOCs	Volatile Organic Compounds
WWTP	Wastewater Treatment Plant

SECTION 1

2017 SOIL AND SURFACE WATER DATA GAP SAMPLING AND ANALYSIS PLAN

1.1 INTRODUCTION

This Sampling and Analysis Plan (SAP) describes the sampling and data gathering methods and procedures for use in execution of field activities included in the Data Gap Investigation. A detailed description of the site, the site history and background, and a description of the site-related impacts are provided in Section 1 of the Human Health Exposure Assessment (Parsons 2015a) and Fish and Wildlife Resources Impact Analysis Part 1 (Parsons 2015b). This SAP should be used in conjunction with the Quality Assurance Project Plan (QAPP) (Appendix D of this *Data Gap Investigation Work Plan*) to guide all field and laboratory sampling and measurement performed during investigative projects at the site. Tables 1.1 and 1.2 is a summary of samples and analyses for soils and surface water to be collected during field activities.

1.2 SAMPLING OBJECTIVES

The main objective of the field sampling activities is to collect data necessary to address data gaps that exist at the TRCB facility.

This SAP covers one 2017 data collection effort:

- 2017 Data Gap (Soil and Surface Water) Sampling

To guide the rationale for the SAP sample number and locations for the early 2017 effort, data quality objectives (DQO) were established for each of the OUs at the TRCB. The DQOs are presented in Appendix A of the Data Gap Investigation Work Plan to state the rationale for the proposed 2017 sample locations, analyses of the samples, and describe how the data are planned for use.

TABLE 1.1
SUMMARY OF SOIL SAMPLES AND ANALYSES FOR DATA GAP INVESTIGATION

Location [1]	***TCL Volatile Organic Compounds (VOCs)***	***TCL Semi-Volatile Organic Compounds (SVOCs)***	***Target Analyte List (TAL) Metals*** [8]	***Pesticides***	***Grain Size Analysis***	***Polychlorinated Biphenyls (PCBs)***	***Total Organic Carbon (TOC)***	***pH***	***Mercury Speciation*** [6]
	USEPA SW-846-5035/8260C	**USEPA SW-846-8270D**	**USEPA SW-846-6010C/6020A/ 7471B**	**USEPA SW-846-8081B**	**ASTM Standard D422**	**SW-846-8082A**	**Lloyd Kahn**	**USEPA SW-846-SM 4500-H+200**	**Hg SSE Method** [7]
	Number of Samples [2]	Number of Samples [2]	Number of Samples [2]	Number of Samples [2]	Number of Samples [2]	Number of Samples [2]	Number of Samples [2]	Number of Samples [2]	Number of Samples [2]
TRCB Operable Units									
OU-1B [5]	9	52	52	8	12	8	52	52	12
OU-1C [5]	48	64	64	8	NA	8	64	64	NA
OU-1D [5]	9	44	44	8	NA	8	44	44	NA
OU-1E (Future Residential/Wetlands Areas) [5]	42	280	280	28	NA	28	280	280	NA
OU-1E (Around Former Excavations) [5]	9	48	48	8	NA	8	48	48	NA
OU-3[5]	3	20	20	4	NA	4	20	20	NA
OU-4[6]	NA	NA	NA	NA	14	NA	20	20	14
Total No. of Samples	120	508	508	64	26	64	528	528	26
No. of QA/QC Samples [3]	30/10	84/28	84/28	21/7	2/0	21/7	87/29	87/29	6/2

TABLE 1.1 (Continued)
SUMMARY OF SOIL SAMPLES AND ANALYSES FOR RISK ASSESSMENT DATA GAP INVESTIGATION

Location [1]	***TCL Semi-Volatile Organic Compounds (SVOCs)***	***Target Analyte List (TAL) Metals)*** [8]	***Pesticides***	***Grain Size Analysis***	***Total Organic Carbon (TOC)***	***pH***	***Mercury Speciation*** [6]
	USEPA SW-846-8270D	**USEPA SW-846-6010C/6020A/7471B**	**USEPA SW-846-8081B**	**ASTM Standard D422**	**Lloyd Kahn**	**USEPA SW-846-SM 4500-H+200**	**Hg SSE Method** [7]
	Number of Samples [2]	Number of Samples [2]	Number of Samples [2]	Number of Samples [2]	Number of Samples [2]	Number of Samples [2]	Number of Samples [2]
Background Parcels [4]							
Residential Parcel No. 1	30	30	8	6	30	30	9
Mahopac Park Terrace Apartments (Parcel No. 2)	30	30	8	6	30	30	9
New York State Office of Parks, Recreation & Historic Preservation (Parcel No. 3)	30	30	8	6	30	30	9
New York State Office of Parks, Recreation & Historic Preservation (Parcel 4)	30	30	8	6	30	30	9
New York State Office of Parks, Recreation & Historic Preservation (Parcel 5)	30	30	8	6	30	30	9
Total No. of Samples	150	150	40	30	150	150	45
No. of QA/QC Samples [3]	24/8	24/8	6/2	2/0	24/8	24/8	9/3

TABLE 1.1 (Continued)
SUMMARY OF SOIL SAMPLES AND ANALYSES FOR RISK ASSESSMENT DATA GAP INVESTIGATION

Notes:

(1) SVOCS – Semi-Volatile Organic Compounds
TAL – Target Analyte List
PCBs – Polychlorinated Biphenyls
VOCs – Volatile Organic Compounds
USEPA – U.S. Environmental Protection Agency
NA – Non Applicable
QA/QC – Quality Assurance/Quality Control
Hg SSE Method – Mercury Selective Sequential Extraction Method. Depth of samples will be from 0 to 2 feet (ft.) below ground surface (bgs.) at all locations, with the exception Hg speciation sampling (see note (6) below). This depth interval was chosen to give Chevron the required data that they would need if future land use changed from current classification.

(2) Number of samples reflect sampling efforts for the 2017 Data Gap Investigation. Samples will be collected from selected Operable Units located at the former TRCB facility and from five adjacent parcels located in the vicinity of the facility.

(3) #/# represents the number of soil QA/QC samples required and number of equipment blanks required. One set of QA/QC samples per twenty (20) grab samples are designated for project. QA/QC samples include one duplicate sample, one equipment blank, and one matrix spike/matric spike duplicate (MS/MSD) sample. Trip blanks will accompany any VOC samples shipped to laboratory. Not included in sample count.

(4) Sampling of the Background Parcels is contingent upon Chevron EMC obtaining an access agreement with parcel owners. If no access agreement is obtained, then alternate Background Parcels will be chosen for sampling activities and the table will be revised to reflect changes.

(5) Soil samples will be collected from intervals of 0 to 2 inches bgs., 2 to 6 inches bgs., 6 to 12 inches bgs., and 12 to 24 inches bgs.

(6) Samples will collected from 0 to 12 inches bgs. and 12 to 24 inches bgs.

(7) Hg SSE Method includes USEPA Methods 1630 and 1631 and obtains the following mercury fractions elemental mercury (vapor phase), methyl mercury, water soluble mercury, acid soluble mercury, soil humic substance associated mercury, elemental mercury (surface bound), and mercury sulfide.

(8) Total Sulphur analysis will be obtained from EPA Method 6010C.

TABLES 1.2
SUMMARY OF STREAM SAMPLES AND ANALYSES FOR DATA GAP INVESTIGATION

Location	***VOCs***	***TCL SVOCs*** (1)	***TCL SVOCs*** (1)	***TAL Metals*** (2) **(Dissolved and Total)**	***Hardness***	***TSS***	***pH***
	USEPA SW-846-8260C	**USEPA SW-846-8270D**	**USEPA W-846-8270D SIM**	**USEPA SW-846-6010C/6020A/C7470A**	**USEPA SW-846-2340 C-1997**	**USEPA SW-846-SM 2540 D-1997**	**USEPA SW-846-SM 4500-H + -200**
	Number of Samples (3)	Number of Samples (3)	Number of Samples (3)	Number of Samples (3)	Number of Samples (3)	Number of Samples (3)	Number of Samples (3)
Stream							
Location No. 1	1	1	1	1	1	1	1
Location No. 2	1	1	1	1	1	1	1
Total No. of Samples	2	2	2	2	2	2	2
No. of QA/QC Samples (4)	4	4	4	4	4	4	4

Notes:

VOCs – Volatile Organic Compounds

TSS –Total Suspended Solids

(1) SW Method 8270 will be used first to analyze SVOCs and then 8270 SIM will be used to analyze SVOCs that require lower detection limits.

(2) Metals will be analyzed primarily by EPA SW Method 6020A, then by 6010C for metals that are not analyzed satisfactorily by 6020A. Samples will be filtered in the field.

(3) Number of samples reflect sampling efforts for the 2017 Data Gap Investigation. Samples will be collected from a perennial stream located in the Back 93 Acres Parcel (OU-1E).

(4) The number QA/QC samples required. One set of QA/QC samples per twenty (20) grab samples are designated for project. QA/QC samples include one duplicate sample, one equipment blank, and one MS/MSD sample. Trips blanks will accompany any VOC samples shipped to laboratory. Not included in sample count.

SECTION 2

GENERAL GUIDELINES FOR FIELD WORK

2.1 SURFACE HAZARDS

Potential on-site surface hazards, such as sharp objects, overhead power lines, and building hazards, will be identified prior to initiation of field work. Generally, such hazards will be identified during a site reconnaissance visit that proceeds the first day of fieldwork.

2.2 UNDERGROUND UTILITIES

All underground utilities, including electric lines, gas lines, and communication lines, will be identified prior to initiation of drilling and other subsurface work. This will be accomplished by contacting the Underground Facilities Protective Organization (UFPO) (Dig Safely New York): (*811). A UFPO representative will mark all buried utility lines in the work area. New York State law requires that UFPO be notified at least two working days, and not more than ten working days, before subsurface work is conducted. In addition, site representatives will be contacted to identify any other facility utilities, sewer lines, or other obstructions that may pose a risk to health and safety.

In addition, all Parsons and Chevron Environmental Management Company protocols for performing subsurface intrusive work will be followed. Refer to corresponding project work plans for details.

2.3 FIELD LOG BOOKS AND ELECTRONIC TABLETS

All field activities will be carefully documented in field log books and electronic tablets. Entries will be of sufficient detail that a complete daily record of significant events, observations, and measurements is obtained. The field log book and tablet will provide a legal record of the activities conducted at the site. Accordingly:

- Field books will be assigned a unique identification number.
- Field books will be bound with consecutively numbered pages.
- Field books will be controlled by the Field Team Leader while field work is in progress.
- Entries will be written with waterproof ink.
- Entries will be signed and dated at the conclusion of each day of fieldwork.
- Erroneous entries made while fieldwork is in progress will be corrected by the person that made the entries. Corrections will be made by drawing a line through the error, entering the correct information, and initialing the correction.
- Corrections made after departing the field will be made by the person who made the original entries. Corrections will be made by drawing a line through the error, entering the correct information, and initialing and dating the time of the correction.
- At a minimum, daily field book entries will include the following information:
  - Location of field activity;

- Date and time of entry;
- Names and titles of field team members;
- Names and titles of any site visitors and site contacts;
- Weather information, for example: temperature, cloud coverage, wind speed and direction;
- Purpose of field activity;
- A detailed description of the field work conducted;
- Sample media (surface water or soil);
- Sample collection method;
- Number and volume of sample(s) taken;
- Description of sampling point(s);
- Volume of groundwater removed before sampling;
- Preservatives used;
- Analytical parameters;
- Date and time of collection;
- Sample identification number(s);
- Sample distribution (e.g., laboratory);
- Field observations;
- Any field measurements made, such as pH, temperature, conductivity, water level, etc. (tablet);
- References for all maps and photographs of the sampling site(s);
- Information pertaining to sample documentation such as:
- Bottle lot numbers;
- Dates and method of sample shipments;
- Chain-of-Custody Record numbers; and
- Federal Express Air Bill Number.

Note:

1. When an electric tablet is used instead of a field logbook, all the sample information listed above will be entered into a groundwater sampling template that has been loaded into the tablet. The template will also be saved periodically to ensure no information is lost. A field logbook will still be used to document general site activities (e.g. meetings, training, weather, etc.).

SECTION 3

SAMPLING EQUIPMENT AND PROCEDURES FOR FIELD EQUIPMENT DECONTAMINATION, WASTE MANAGEMENT, AND EQUIPMENT CALIBRATION

3.1 FIELD EQUIPMENT CHECKLIST

A general list of equipment necessary for field measurement and sample collection includes:

- Appropriate sample containers (see QAPP);
- Chain-of-Custody seals and record forms;
- Field sample record forms;
- Log book and indelible ink markers;
- Phosphate-free decontamination soaps (such as Alconox), reagent-grade solvents, and deionized water to be used for decontaminating equipment between sampling stations;
- Buckets, plastic wash basins, plastic drop cloths, and scrub brushes to be used for decontaminating equipment;
- Camera and film for use in documenting sampling procedures and sample locations;
- Stakes to identify sampling locations;
- Shipping labels and forms;
- Retractable Knife;
- Bubble wrap or other packing/shipping material for sample bottles;
- Strapping tape;
- Clear plastic tape;
- Coolers;
- Duct tape;
- Rope;
- Resealable plastic bags;
- Portable field instruments (photoionization detector, metal detector, combustible gas indicator, conductivity meter, pH/temperature/conductivity meter, dissolved oxygen meter, redox probe, electronic water level indicator, Jerome® Mercury Vapor Analyzer, etc.);
- Waders
- Personal Flotation Devices (PFDs)
- Health and safety equipment, and
- Electronic tablet.

3.2 EQUIPMENT DECONTAMINATION

3.2.1 Sampling Equipment Decontamination

Sample equipment decontamination will be conducted in a decontamination pad when one is readily available; otherwise decontamination will be conducted in buckets on plastic sheeting. Prior to sampling, all bowls, spoons, augers, bailers, and filtering equipment will be washed in potable water and phosphate-free detergent (e.g. Alconox). The sampling equipment will then be rinsed with potable water followed by a distilled water rinse. Between rinses, equipment will be placed on polyethylene sheets or aluminum foil if necessary. Sample equipment may also be steam cleaned, if appropriate. Sampling equipment will be wrapped in aluminum foil for storage or transportation from the designated decontamination area to the sample locations. Decontaminated equipment will not be placed directly on the ground surface. In order to minimize the time spent in the field and reduce the opportunity for cross contamination, the sampling team will have sufficient clean equipment available to complete a sampling round without excessive delays.

3.3 MANAGEMENT OF INVESTIGATION DERIVED WASTE

3.3.1 Decontamination Fluids

All decontamination fluids will be collected in 55-gallon drums or a plastic temporary holding tank and transferred to the on-site Wastewater Treatment Plant (WWTP) for disposal.

3.3.2 Personal Protective Equipment

All personal protective equipment (PPE) will be placed in Department of Transportation (DOT), 55-gallon, 17-H type drums and staged on-site for proper disposal.

3.3.3 Excess Soil Cuttings

Excess soil cuttings from the soil boring will be placed backed into the borehole and bentonite pellets will then be placed into the borehole to within 3-inches of the top of the surface. The remaining void space will then be backfilled with topsoil and grass seed to match the surrounding surface.

3.4 FIELD INSTRUMENT CALIBRATION

All field screening and sampling instruments (e.g., temperature-conductivity-pH probes) that require calibration prior to operation will be calibrated daily in accordance with the manufacturer's instructions. All instrument calibrations will be documented in the project field book. Instrument operating manuals will be maintained on-site by the field team.

3.5 MAINTENANCE PROCEDURES

3.5.1 Non-Routine Maintenance Procedures

Field equipment will be inspected prior to initiation of fieldwork to determine whether or not it is operational. If it is not operational, it will be serviced or replaced. Batteries will be fully charged or fresh, as applicable.

3.5.2 Routine Maintenance Procedures and Schedules

Field equipment requiring preventive maintenance will be serviced in accordance with written procedures based on the manufacturer's instructions or recommendations. Maintenance will be performed in accordance with the schedule specified by the manufacturer, in order to minimize the downtime of the measurement system. Maintenance work will be performed by qualified personnel.

3.5.3 Spare Parts

A list of critical spare parts will be developed prior to the initiation of fieldwork. Field personnel will have ready access to critical spare parts in order to minimize downtime while fieldwork is in progress. In lieu of maintaining an inventory of spare parts, access to critical spare parts may be provided by firms capable of rapid repair or replacement. These firms must be identified prior to initiation of fieldwork.

3.5.4 Maintenance Records

Equipment maintenance logs will be maintained to document maintenance activities and schedules. All maintenance logs will be traceable to a specific piece of equipment. These records may be audited by the QAO to verify compliance.

SECTION 4

SAMPLING EQUIPMENT AND PROCEDURES FOR FIELD MEASUREMENTS AND MONITORING

4.1 AIR MONITORING

Air monitoring will be conducted during all field activities with a Photovac MicroTip HL-2000 (or equivalent) photoionization detector (PID) equipped with a 11.7 eV lamp. The Photovac MicroTip is capable of ionizing and detecting compounds with an ionization potential of less than 11.7 eV. This accounts for roughly 54 percent to 73 percent of the volatile organic compounds (VOCs) on the New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocol (ASP) Target Compound List and for most of the VOCs detected on-site. The compounds with ionization potentials above 11.7 eV have correspondingly high allowable limits, for example 100 ppm for 1,1-DCA and 350 ppm for 1,1,1-TCA. The PID will be used to monitor for VOCs in the breathing zone at well heads.

Method

- The PID will be calibrated at the beginning and end of each day of use with a standard calibration gas of a concentration within the expected range of use. The calibration gas, which is most often used, has an approximate concentration of 100 ppm of isobutylene.
- If abnormal or erratic readings are observed, additional calibration will be required.
- All calibration data will be recorded in field notebooks and on calibration log sheets to be maintained on-site.
- The PID will be used to monitor the breathing zone at well heads. Action levels are specified in the Project Safety, Health, and Environmental Plan (PSHEP).
- PID readings will be recorded in the field book during sampling activities.
- A battery check will be completed at the beginning and end of each working day, and the battery will be checked for proper voltage.
- Detailed procedures for operation of the PID are included in the PSHEP.

SECTION 5

SAMPLING EQUIPMENT AND PROCEDURES FOR INSTALLATION OF SOIL BORINGS BY HAND AUGERING

5.1 INTRODUCTION

The procedures and specifications for hand augering soil borings are described in this section. Sampling procedures are described in Section 6.

5.2 SOIL BORINGS

The following procedures will be used for conducting soil borings at the site:

Drilling Method Using a Hand Auger or Similar Tool

- The hand auger or similar tool will be inspected to make sure equipment is not damaged.
- The Activity Hazard Analysis (AHA) sheet will be reviewed prior to use.
- Training on how to use tool(s) will be performed by an experienced field person who has used such tool(s) before with field crew(s).
- After collecting each hand auger sample, the borehole will be augered to a depth equal to the top of the next sampling interval unless the geologist authorizes otherwise.

    1. Soil samples collected in an Operable Unit on the TRCB facility that are being collected to complete data gaps for both Human Health and Ecological Risk Assessment purposes will have soil samples collected from the following intervals:

        a. 0 to 2 inches bgs., 2 to 6 inches bgs., 6 to 12 inches bgs., and 12 to 24 inches bgs.

    2. Soil samples collected in an Operable Unit on the TRCB facility that are being collected to complete data gaps for only Human Health Risk Assessment purposes will have soil samples collected from the following intervals:

        a. 0 to 2 inches bgs, 2 to 12 inches bgs., and 12 to 24 inches bgs.

- Soil samples retrieved from the borehole will be visually described for: 1) percent recovery, 2) soil type, 3) color, 4) moisture content, 5) texture, 6) grain size and shape, 7) consistency, 8) visible evidence of staining, and 9) any other observations. The descriptions will be in accordance with the Unified Soil Classification System (USCS).
- Soil samples will be immediately screened for the evolution of organic vapors with a PID. If the initial screening indicates the presence of VOCs, a head space measurement will be made from the sample container as described below. After a minimum of 10 minutes, the lid will be unscrewed and the tip of the PID will be inserted under the cap to measure the headspace for volatile organic vapors.
- Excess soil will be disposed of in accordance with methods specified in Section 2.

- All drilling equipment will be decontaminated between each boring in accordance with methods specified in Section 3.
- The designated field geologist will log borehole geology and PID measurements in the field book. The information logged in the field book will include all of the data required to complete the Drilling Record shown in Figure 5.1.

FIGURE 5.1

Contractor: _____
Driller: _____
Inspector: _____
Rig Type: _____

PARSONS
DRILLING RECORD

BORING/ WELL NO. Sheet of

PROJECT NAME: _____
PROJECT NUMBER: _____

Location Description:

Location Plan

Weather: _____

Date/Time Start: _____

Date/Time Finish: _____

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Sample Depth	Sample I.D.	SPT	% Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0							
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							

SAMPLING METHOD
SS = SPLIT SPOON
A = AUGER CUTTINGS
GP = GEOPROBE - DIRECT PUSH

COMMENTS:

SECTION 6

SAMPLING EQUIPMENT AND PROCEDURES FOR FIELD SAMPLE COLLECTION

6.1 INTRODUCTION

Procedures for obtaining samples of various environmental media are described in this section. Sample handling and procedures are described in Section 7.

6.2 SURFACE WATER SAMPLES

The following procedure will be used to collect surface water samples at the perennial stream located in OU-1E (The Back 93 Acres Parcel) only.

Sampling Method

6.2.1 Water Quality Sampling

- Before collecting any data, calibrate water quality meters according to manufacturers' instructions.
- Place sample probe into the water at each sample location and record readings in the field notebook.
- Record water depth at each sample location to the nearest inch.

6.2.2 Sample Collection in Water Less Than 2 ft. in Depth (Two Methods Described- Best and Most Practical Will be Used at the Time of Sampling)

Method No. 1

- All sampling activities will follow USEPA's "clean hands/dirty hands" protocols (EPA Method 1669). See Section 6.2.4.
- Open and slowly submerge an unpreserved laboratory provided sample bottles, into the water.
- Hold the sample bottle at the water surface until the sample bottle is filled.
- Use water from the unpreserved sample bottle to fill preserved sample bottles, except the bottle for low level mercury analyses. Low level mercury sample procedures are described in Section 6.2.4.
- For collection of dissolved metals, run water in unpreserved sample bottle through a 0.45 micron (um) filter utilizing dedicated polyurethane tubing and a peristaltic pump into a preserved sample bottle.
- Repeat the above procedures until all sample bottles are filled.
- Seal and label and then place sample bottle into a cooler with ice.

Method No. 2

- All sampling activities will follow USEPA's "clean hands/dirty hands" protocols (EPA Method 1669). See Section 6.2.4.

- Slowly submerge dedicated polyurethane tubing into water surface and pump water through tubing into preserved laboratory provided sample bottles utilizing a peristaltic pump. Follow this method until all sample bottles have been filled with the exception of low level mercury and dissolved metals. Low level mercury sample procedures are described in Section 6.2.4, while dissolved metals sample procedures are described below
- For collection of dissolved metals, run water through a 0.45 micron (um) filter utilizing dedicated polyurethane tubing and a peristaltic pump into a preserved sample bottle.
- Repeat the above procedures until all sample bottles are filled.
- Seal and label and then place sample bottle into a cooler with ice.

6.2.3 Surface Water Sample Collection in Water Greater Than 2 ft. in Depth

Note: This procedure will be followed if site conditions warrant it. Water column thickness unknown at perennial stream.

- All sampling activities will follow USEPA's "clean hands/dirty hands" protocols (EPA Method 1669). See Section 6.2.4.
- Water samples will be collected through the length of the water column at locations where water depth is greater than 2 ft. using the procedures outlined under Method No. 2 above.
- Water samples will be collected by slowly lowering clean disposable polyurethane tubing through the water column, carefully avoiding the creek bottom and the water surface and pumping water into sample bottles provided by the laboratory.
- Follow these procedures until appropriate bottles are filled for all parameters except for mercury and dissolved metals. Low level mercury sample procedures are described in Section 6.2.4 and dissolved metal sampling procedures are described above under Methods No. 2.

6.2.4 Mercury Sample Procedures

- One member of the two-person sampling team will be designated to perform duties that may result in contact with potential contaminants, and will not perform any tasks that result in direct contact with samples ("dirty hands"). The second member will perform all activities that may result in contact with the sample containers or transfer of the sample ("clean hands"). Sampling personnel are required to wear clean gloves at all times when handling sampling equipment and containers.
- Sample handling procedures will follow USEPA's "clean hands/dirty hands" protocols (EPA Method 1669) whenever handling materials that may come in contact with the sample. One person of the two person sampling crew will be designated to perform the "clean hands" duties, while the other will perform the "dirty hands" duties.
- Both sampling personnel will put on two pairs of disposable gloves. The outer pair of gloves will be changed any time there is potential for the outer gloves coming in contact with potential contaminants.

- Pre-cleaned sample containers will be pre-labeled and double bagged using resealable food storage bags, and placed in a clean, dedicated cooler. Sample containers will be labeled in accordance with the QAPP.
- "Dirty hands" will open the cooler and the outer plastic bag containing the appropriate sample container.[both should change gloves after handling the sampler and prior to opening the outer and inner bags] "Clean hands" will then open the inner plastic bag.
- At locations where water depth is less than 2 feet (ft.), "Clean hands" will immerse the sample container into the water without disturbing the sediment. The sample will be collected from the top 12 inches of the water column.
- At locations where water depth is greater than 2 ft., "dirty hands" will obtain the water sample using the dedicated polyurethane tubing and peristaltic pump. "Clean hands" will hold the sample container as the water is transferred from the tubing into the sample container. Tubing must not be allowed to touch sample bottle what so ever.
- "Clean hands" will then place the cap back on the container, and place it inside the inner bag, and then place the inner bag inside the outer bag, held by "Dirty hands". "Dirty hands" will then close the outer bag, and place the double bagged container back in the cooler. This process will be repeated at each location.

6.2.5 Equipment Blank Samples

- Prepare for "clean hands/dirty hands" procedures (put on new disposable gloves).
- "Clean hands" will pour the dilute acid solution out into a carboy container designated for waste storage.
- "Clean hands" will then slowly pour laboratory supplied reagent water into a clean sample container while "dirty hands" hold the container stable.
- After collection, handle equipment blank samples in a manner that is consistent with all other environmental samples.

SECTION 7

SAMPLE HANDLING AND ANALYSIS

7.1 SAMPLE DESIGNATION

Each sample will be given a unique alphanumeric identifier in accordance with the classification system shown in Table 7.1. Duplicate samples will be assigned identifiers that do not allow the laboratory to distinguish them as duplicates. Each sample container will be labeled prior to packing for shipment. The sample identifier, site name, date and time of sampling, and analytical parameters will be written on the label in waterproof ink and recorded in the field book.

7.2 SAMPLE CONTAINERIZATION, PRESERVATION AND ANALYSIS

Sample containerization, holding time requirements, and preservation requirements are listed in Section 4 of the QAPP. Field handling and storage of samples and sample containers is described in Section 5 of the QAPP. Analytical methods for sample analyses are listed in Section 7 of the QAPP.

7.3 CHAIN OF CUSTODY

A Chain-of-Custody (COC) record (Figure 7.1) will accompany the sample containers during selection and preparation at the laboratory, during shipment to the field, and during return shipment to the laboratory. The COC will identify each sample container and the analytical parameters for each, and will list the field personnel that collected the samples, the project name and number, the name of the analytical laboratory that will receive the samples, and the method of sample shipment. If samples are split and sent to different laboratories, a copy of the COC record will be sent with each sample shipment.

Method

- The COC will be completed by field personnel as samples are collected and packed for shipment.
- Erroneous markings will be crossed-out with a single line and initialed by the author.
- The REMARKS space will be used to indicate if the sample is a matrix spike, matrix spike duplicate, or matrix duplicate.
- Trip and field blanks will be listed on separate rows.
- After the samples have been collected and sample information has been listed on the COC form, the method of shipment, the shipping cooler identification number(s), and the shipper air bill number will be entered on the COC.
- Finally, a member of the sampling team will write his/her signature, the date, and time on the first RELINQUISHED BY space. Duplicate copies of each COC must be completed.
- One copy of the COC will be retained by sampling personnel. The other copy and the original will be sealed in a plastic bag and taped inside the lid of the shipping cooler.
- Sample shipments going to chemical analytical laboratories will be refrigerated at 4^{o}C, typically by packing with ice, to preserve the samples during shipment. Samples going to geotechnical labs for geotechnical analyses will not require refrigeration.

- After the shipping cooler is closed, custody seals provided by the laboratory will be affixed to the latch and across the front and back of the cooler lid, and signed by the person relinquishing the samples to the shipper.
- The seal will be covered with clear tape, and the cooler lid will be secured by wrapping with packing tape.
- Then the cooler will be relinquished to the shipper, typically an overnight carrier.
- The COC seal must be broken to open the container. Breakage of the seals before receipt at the laboratory may indicate tampering. If tampering is apparent, the laboratory will contact the Parsons Project Manager, and the samples will not be analyzed.
- The chemical analytical samples must be delivered to the laboratory within 48 hours of collection.

Note:

If COCs are generated using a database or electronic tablet, the same general guidelines for COC generation/usage described above will be followed.

7.4 SAMPLE DOCUMENTATION

The field team leader will retain a copy of the COC, and, in addition, the field team leader will ensure that the following information about each sample is recorded in the field book:

- Sample identifier;
- Identification of sampled media (e.g., soil, sediment, groundwater);
- Sample location with respect to known reference point;
- Physical description of sample location;
- Field measurements, (e.g., pH, temperature, conductivity, water levels, soil descriptions, etc.);
- Date and time of collection;
- Sample collection method;
- Volume of groundwater purged before sampling;
- Number of sample containers;
- Analytical parameters;
- Preservatives used; and
- Shipping information:
  - Dates and method of sample shipments,
  - Chain-of-Custody Record numbers,
  - FedEx Air Bill numbers, and
  - Sample recipient (e.g., laboratory name).

7.5 SAMPLE TRACKING

Parsons will use an in-house tracking system to monitor sampling schedules, and the progress of laboratory analytical work and reporting, and to assist in performing contract compliance screening and data validation. The system tracks the following information for each sample: sample

identifier, sample medium, sampling date, analytical parameters, sample delivery group (SDG) designations for samples, and laboratory report due date.

The sample tracking system consists of the following procedures:

1. A Data Tracker (DT) will be assigned to each sampling event. The DT will provide sequentially numbered COC forms to the field sampling team (FST), and maintain a COC log. The FST will sign-out the COC forms prior to sampling.
2. The FST will ship the white (original) and yellow copy of the completed COCs to the laboratory with the field samples. The serial numbers of all the COCs that were either sent to the laboratory or voided will be recorded in the field book.
3. The FST will return: (1) pink copies of the COC forms that were sent to the lab; (2) voided COCs; and (3) any unused COCs to the DT. The DT will maintain a file of the completed COCs for each project, and will keep an inventory of all the numbered COCs.
4. The DT will enter the following information into the COC log: (1) all COC numbers (including voided or unused numbers); (2) names of FST members; (3) site name; (4) project number; (5) sampling date; (6) shipping date; (7) number of samples per matrix; (8) analytical parameters requested; and (9) the laboratory name, address, and phone number.
5. The DT will call the laboratory on the work day following receipt of the COCs to confirm the time, date, and condition of the samples shipped; to determine laboratory SDG identifiers; and to confirm the contract-required due-date for receipt of analytical results.
6. The DT will use an electronic spreadsheet and database program to generate a Sample Tracking Report monthly, or more frequently if necessary. The database allows sampling data to be sorted by site name, project number, sampling dates, project number, laboratory, and laboratory name.
7. The Project Manager or a designated representative will maintain day-to-day contact with the laboratory to monitor the progress of analytical work.
8. The DT will contact the Parsons Project Manager every Friday to determine the status of analytical work, and to confirm the dates for contract compliance screening and data validation.
9. The Project Manager will deliver sample analytical results received from the laboratory to the DT for contract compliance screening, and to the data validator for validation as specified elsewhere in this document. The Project Manager will retain the shipping receipt to document the date of receipt, and forward the shipping receipt to the data validator with the analytical package.

TABLE 7.1

SAMPLE DESIGNATION

General Field Sample ID Nomenclature: MW-23-SD-12.55-010801

MW-23 = Field Point Name
S = Matrix
D = Repeat Sample
12.55 = Top Depth of Soil Sample or Top of Well Screen
010801 = Year/Month/Day Sample Collected

Sample Type: S – Soil
W – Water
SW – Surface Water

Repeat Sample: D- Duplicate
T1, T2, etc. – Trip Blank
F1, F2, etc. – Field Blank (Equipment Blank)

Sample Number: Number referenced to a sample location map.

Note: Only letters, numbers, or dashes are allowed in sample identification.

Figure 7.1

Chain of Custody

COC #:

Lab Use Only

Lab Proj #

Lab ID LANCASTER

Job No 449837

Client Contact:

PARSONS
301 PLAINFIELD ROAD-SUITE 350
SYRACUSE, NY 13212

Privileged and Confidential

EDD To:

Sampler:

Program:

Analysis Turnaround Time:
Standard -
Rush Charges Authorized for -
2 weeks -
1 week -
Next Day -

Site Name:

Site Location:

Hardcopy Report To:

Invoice To:

Ship to:

Preservative:

Sample Identification										MS/MSD	Composite (y/n)												Lab Sample Numbers
Location ID	Start Depth (ft)	End Depth (ft)	Field Sample ID	Sample Date	Sample Time	Sample Type	Sample Matrix	Sample Purpose	# of Cont.														

Special Instructions: (1) VOCs - analyze only for Benzene, Chlorobenzene, Trichloroethene, Vinyl chloride, and cis-Dichloroethylene.

Relinquished by:	Company	Received by:	Company	Condition	Custody Seals Int
	Date/Time		Date/Time	Cooler Temp.	
Relinquished by:	Company	Received by:	Company	Condition	Custody Seals Int
	Date/Time		Date/Time	Cooler Temp.	

Preservatives: 0 = None; [1 = HCL]; [2 = HNO3]; [3 = H2SO4]; [4 = NaOH]; [5 = Zn Acetate]; [6 = MeOH]; [7 = NaHSO4]; 8 = Other (specify):

SECTION 8

SAMPLING QA AUDITS

8.1 SAMPLING QA AUDITS

Sampling quality assurance (QA) audits may be conducted to verify that fieldwork is conducted in accordance with the procedures specified in this document. The QA audits will be performed by the approved quality assurance officer (QAO) or a qualified designee under the direction of the QAO. The designee will not have responsibility for the project work associated with the audit.

Sampling QA audits will include, but will not be limited by, review of the following items:

- Decontamination procedures;
- Sampling procedures;
- Sampling container cleanliness, size, and material;
- Sample identification (labels and COC);
- Sample handling, preservation, and shipping;
- Sample tracking;
- Maintenance and calibration of sampling equipment; and
- Corrective action.

An audit report must be submitted to the Parsons Project Manager within 15 days of completion of the audit. Serious deficiencies will be reported to the Project Manager within 24 hours. This may be accomplished by issuing a Corrective Action Request (CAR) (Figure 8.1). The CAR identifies the out-of-compliance condition, reference documents, and recommended corrective action. The CAR will be issued to the individual(s) responsible for the noncompliance and to the Project Manager. The individual to whom the CAR is addressed will respond by writing a brief description of the cause and corrective action required in the appropriate area on the CAR, sign and date the response, and return the CAR to the QAO.

The Project Manager will be responsible for ensuring that all required corrective actions identified during an audit are acted upon promptly and satisfactorily. The QAO or a qualified designee will verify and document that satisfactory corrective action has been taken. All audit checklists, audit reports, audit findings, and acceptable resolutions will be approved by the QAO. Then the QAO will close the audit. The QAO will maintain a status log for CARs, and the CARs will be retained in the project file.

8.2 RECORD MAINTENANCE

A project file will be established to retain the documents and records generated during the project. Field records will be stored in the project file when not in use. At the conclusion of the work assignment, the project file will be archived.

Field records that must be retained in the project files include:

- Field books,
- Chain-of-Custody forms,

- Site photographs, and
- QA audit reports.

Equipment calibration and maintenance records will be retained by a designated Parsons' equipment manager for at least as long as the project files are retained.

FIGURE 8.1

CORRECTIVE ACTION REQUEST

Number _____ **Date:**_____

TO: _____

You are hereby requested to take corrective actions indicated below and as otherwise determined by you (a) to resolve the noted conditions and (b) to prevent it from recurring. Your written response is to be returned to the Project quality assurance manager by _____.

Condition:

Reference Documents:

_____	_____	_____	_____	_____	_____
Originator	Date	Approval	Date	Approval	Date

Response

Cause of Condition:

Corrective Action

(A) Resolution:

(B) Prevention

(B2) Affected Documents

Signature_____ Date_____

CA Followup

Corrective Action verified by:_____ Date _____

SECTION 9

REFERENCES

Parsons. 2015a. Qualitative Human Health Exposure Assessment, Former Texaco Research Center, Beacon (Glenham), New York, Parsons June 2015.

Parsons. 2015. Fish and Wildlife Resources Impact Analysis Part 1 – Fish and Wildlife Resources Characterization, Former Texaco Research Center, Beacon (Glenham), New York, Parsons April 2015.

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