INTERIM FINAL ENGINEERING REPORT (FER) FOR OPERABLE UNIT 4 (OU-4)
Former Texaco Research Center
Beacon (Glenham), New York

NYSDEC Site ID #314004
EPA ID # 091894899

Prepared For:

Mr. Mark Hendrickson
Chevron Environmental Management Company

Chevron Bellaire Office Building
4800 Fournace Place, Room E-534C
Bellaire, Texas, 77401

Prepared By:

PARSONS

301 Plainfield Road, Suite 350
Syracuse, New York 13212
Phone: (315) 451-9560
Fax: (315) 451-9570

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LIST OF ACRONYMS

bgs	Below Ground Surface
BRC	Beacon Research Center
CAMP	Community Air Monitoring Program
C&D	Construction and Demolition
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	Certificate of Compliance
DER	Division of Environmental Remediation
EC	Engineering Control
ECL	Environmental Conservation Law
EPA	Environmental Protection Agency
EWP	Excavation Work Plan
FLTD	Fuels & Lubricants Technology Department
HASP	Health and Safety Plan
IC	Institutional Control
ICM	Interim Corrective Measure
ISS	Industrial Sewer System
NYCRR	New York Code of Rules and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
O&M	Operations and Maintenance
OU	Operable Unit
PCB	Polychlorinated Biphenyls
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RMR	Rock Mass Rating
SCO	Soil Cleanup Objective
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVI	Soil Vapor Intrusion
SVOCs	Semivolatile Organic Compounds
TAL	Target Analyte List
TCL	Target Compound List

LIST OF ACRONYMS
(CONTINUED)

TOGS	Technical and Operational Guidance Series
TRCB	Texaco Research Center Beacon
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds
WWTP	Wastewater Treatment Plant

CERTIFICATION STATEMENT

I, Craig F. Butler, certify that I am currently a registered professional engineer licensed by the State of New York, I had primary responsibility for implementation of the remedial program activities, and I certify that the Remedial Design was implemented and that all construction activities were completed in accordance with the Department-approved Remedial Design, and that this Interim Final Engineering Report FER) was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

I certify that the data submitted to the Department with this Final Engineering Report demonstrates that the remediation requirements set forth in the Remedial Design and in all applicable statutes and regulations have been or will be achieved in accordance with the time frames, if any, established for the remedy.

I certify that all use restrictions, Institutional Controls, Engineering Controls and/or any operation and maintenance requirements applicable to this site are contained in an environmental easement created and recorded pursuant to ECL 71-3605 and that any affected governments, as defined in ECL 71-3603 , have been notified that such easement has been recorded.

I certify that a Site Management Plan (SMP) has been submitted for the continual and proper operation, maintenance, and monitoring of all Engineering Controls employed at the site, including the proper maintenance of all remaining monitoring wells and that such plan has been approved by DER.

I certify that all documents generated in support of this report have been submitted in accordance with the DER's electronic submission protocols and have been accepted by the Department.

I certify that all date generated in support of this report have been submitted in accordance with the Department's electronic data deliverable and have been accepted by the Department.

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Craig F. Butler, of Parsons, am certifying as Owner's Designated Site Representative for the site.

_____

Craig F. Butler, P.E.
License No. 080807

_____

Date

EXECUTIVE SUMMARY

In 2013, Chevron (Chevron, also historically known as Texaco and ChevronTexaco) entered into a Consent Decree (United States District Court, Northern District of New York, 2013) with the State of New York, to transition the site known historically as the Former Texaco Research Center, Beacon (TRCB) facility, from a Resource Conservation and Recovery Act (RCRA) permitted facility to an Order On Consent for an inactive site, to facilitate additional site investigations and remediation. The consent order identified four operable units (OUs) for the TRCB, and the parcel designated as OU-4, is the subject of this Interim Final Engineering Report (FER). The OU-4 parcel, described as the "Hydroelectric Facility & Dam" in the Consent Order, includes the hydroelectric buildings and the dam itself with access on the north side via an easement to Old Glenham Road, and on the south side via an easement on Washington Avenue.

The purposes of this Interim Final Engineering Report (FER) are to document the OU-4 parcel operating history, summarize the results of environmental investigations completed to date, and describe the conditions under which Chevron will complete the divestiture of this parcel. Chevron has coordinated with the Town of Fishkill to establish the OU-4 parcel as a distinct subdivision of the Former TRCB, for the express purpose of divesting this parcel for continued use by an independent site owner. This Interim FER has been developed to address the unique site redevelopment opportunity associated with divestiture of the OU-4 parcel, and a sitewide FER for the remaining operable units of the Former TRCB will be prepared once the final remedies for those parcels are implemented. The Site Management Plan (SMP) described below is the primary means by which the OU-4 parcel will be operated and maintained to ensure compliance with applicable state and local environmental regulations and code requirements.

Chevron has prepared a Site Management Plan in accordance with the Consent Order requirements, that identifies and implements institutional controls (ICs) and engineering controls (ECs) that allows the OU-4 site to develop final plans to close. The SMP establishes the ongoing monitoring and /or operation of remedial measures pertaining to the OU-4 parcel. The intent of the SMP is to institute the control measures that will lead to a Decision Document for the removal of OU-4 from the identified Consent Order.

Essential elements included in the SMP for the OU-4 parcel are as follows:

- Clear identification of the site boundaries as described in the Consent Order, including the boundaries of the real property subject to the environmental easement;
- A metes and bounds description and survey map that corresponds to the above site boundaries;
- A description of the remedial activities completed at the site;
- A complete description of the ICs/ECs employed at the site;
- Identification of the cleanup levels applied to the remedial actions for each media of concern and area of concern at the site;
- A summary of the implementation of the remedial actions;

- Supporting tables and figures presenting data and information that clearly indicate the nature and extent of any contamination remaining at the site.

SECTION 1

INTRODUCTION

1.1 BACKGROUND AND SITE DESCRIPTION

Chevron U.S.A Inc. (Chevron) entered into an Order on Consent with the New York State Department of Environmental Conservation (NYSDEC) in October 2013 to investigate and remediate its former research center located in the Town of Fishkill, designated as the Former Texaco Research Center, Beacon (TRCB) facility, including the 4.033-acre parcel indentified in the Order on Consent as OU-4. The OU-4 parcel is a portion of the Former TRCB facility, and consists of land on both the north side and south side of Fishkill Creek. The property was remediated to industrial use and will be used for the operation of a hydroelectric generation facility.

The parcel is located in Dutchess County, New York, as shown in Figure 1, and is identified as a portion of Block 16 and Lot 812290 on the Town of Fishkill Tax Map #12406. The site is situated on an approximately 4-acre area bounded by the Consolidated Rail Corporation right-of-way to the south, Washington Avenue to the east, a residential property to the west, south of Fishkill Creek, and the OU-1 parcel of the Former TRCB facility to the north, west, and east on the portion of the parcel located north of Fishkill Creek.

1.1.1 General

In 2013, Chevron (Chevron, also historically known as Texaco and ChevronTexaco) entered into a Consent Decree (United States District Court, Northern District of New York, 2013) with the State of New York, to transition the site from a Resource Conservation and Recovery Act (RCRA) permitted facility to an Order On Consent for an inactive site, to facilitate additional site investigations and remediation. The consent order identifies four OUs for the TRCB, as shown on Figure 2 and described below:

- OU-1 consists of the majority of the Main Texaco Campus (33 acres) (OU-1A) and operating areas which include a former tank farm area (5 acres) (OU-1C), a vacant land parcel consisting of 2.06 acres (OU-1D), and a 93 acre parcel (OU-1E) located across Fishkill Creek from the Main Campus. OU-1 also includes an undeveloped parcel of land known as the "Church Property" (OU-1B) which is located northwest of the Main Research Facility, consisting of 15 acres that once contained a local church that was relocated off the Site.
- OU-2 is a 0.23 acre parcel located along and underneath Washington Avenue that has not been dedicated to the Town of Fishkill. This parcel is located outside of the fence line of the main property and is maintained by the Town of Fishkill.
- OU-3 is a 0.67 acre vacant parcel on Washington Avenue. No TRCB activities were conducted on this property.
- OU-4, the subject of this Interim Final Engineering Report (FER), is described as the "Hydroelectric Facility & Dam" in the Consent Order. The operable unit includes the hydroelectric buildings and the dam itself with access on the north side via an

easement to Old Glenham Road, and on the south side via an easement to Washington Avenue.

The boundaries of the parcel are more fully described in the metes and bounds site description that is part of the Environmental Easement included as Appendix A of the Site Management Plan (SMP), prepared for the OU-4 property. This SMP was prepared to manage remaining contamination at the OU-4 site in accordance with the requirements described in NYSDEC Division of Environmental Remediation (DER) - 10 Technical Guidance for Site Investigation and Remediation, dated May 2010, and the guidelines provided by NYSDEC. The SMP addresses the means for implementing the Institutional Controls (ICs) and Engineering Controls (ECs) that are required by the Environmental Easement for the site until the Environmental Easement is extinguished in accordance with Environmental Conservation Law (ECL) Article 71, Title 36.

1.1.2 Purpose

The purposes of this Interim Final Engineering Report (FER) are to document the OU-4 parcel operating history, summarize the results of environmental investigations completed to date, and describe the conditions under which Chevron will complete the divestiture of this parcel. Chevron has coordinated with the Town of Fishkill to establish the OU-4 parcel as a distinct subdivision of the Former TRCB, for the express purpose of divesting this parcel for continued use by an independent site owner. This Interim FER has been developed to address the unique site redevelopment opportunity associated with divestiture of the OU-4 parcel, and a sitewide FER for the remaining operable units of the Former TRCB will be prepared once the final remedies for those parcels are implemented. The Site Management Plan (SMP) described above is the primary means by which the OU-4 parcel will be operated and maintained to ensure compliance with applicable state and local environmental regulations and code requirements.

An Environmental Easement granted by NYSDEC, and recorded with the Dutchess County Clerk, requires compliance with the SMP and all ECs/ICs placed on the parcel. The ECs define engineering strategies to be employed to and the ICs place restrictions on site use, and mandate operation, maintenance, monitoring and reporting measures for the property. The SMP specifies the methods necessary to ensure compliance with all ECs and ICs required by the Environmental Easement for contamination that remains at the site. Once this plan has been approved by NYSDEC, compliance with this plan will be required by the grantor of the Environmental Easement and the grantor's successors and assigns. The SMP may only be revised with the approval of NYSDEC.

The SMP provides a detailed description of all procedures required to manage remaining contamination at OU-4 after completion of the Decision Document for this property, to be prepared by NYSDEC, including: (1) implementation and management of all Engineering and Institutional Controls; (2) soil cover monitoring; (3) operation and maintenance of the soil cover; and (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports.

To address these needs, the SMP includes two plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; and (2) a Monitoring Plan for implementation of Site Monitoring. This plan also includes a description of Periodic Review

Reports for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the Environmental Easement, which are grounds for revocation of the Certificate of Completion (COC).

Failure to comply with the SMP is also a violation of Environmental Conservation Law, 6 New York Code of Rules and Regulations (NYCRR) Part 375 and the Order on Consent for the site, and thereby subject to applicable penalties.

1.1.3 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC project manager. In accordance with the Environmental Easement for the site, NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.2 SITE BACKGROUND

1.2.1 Site Location and Description

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. It has been called the TRCB, Fuels & Lubricants Technology Department (FLTD) and the Beacon Research Center (BRC). As shown on Figure 2, the subdivision/operable unit (OU-4 parcel) is located on a 4.033 acre parcel that consists of land on both the north and south sides of Fishkill Creek that includes Buildings 3, 4, 5, portions of the former Buildings 2 and 6, the hydroelectric dam facilities, and access to the south side of the dam through an undeveloped area of land on the south side of Fishkill Creek.

1.2.2 Site History

The Main Facility (a.k.a. "Main Campus"), where the northern portion of OU-4 parcel is located, 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. Petroleum, coal products, and solvents have been used at the property in connection with the research functions. The facility formerly included 64 buildings and structures that comprised more than 400,000 square feet.

From 1811 until 1930, the parcel was the location of textile and woolen mills. Historical parcel documents indicated that the mills were powered by water wheels and steam engines. Blacksmith and carpentry shops were also operated in support of the mills.

After undertaking preliminary investigations, it was determined that, in order to complete a Sitewide environmental investigation, demolition of the buildings would better enable access to the subsurface soils for investigation and remediation of any contaminated environmental media at the site. NYSDEC concurred with this determination and the Sitewide Building Demolition Project was coordinated with NYSDEC oversight. Demolition of the buildings to the lowest slab or basement level began in the spring 2011 and was completed by January 2013.

During preparation of the overall site demolition plan, it was learned that certain buildings are interconnected with the Fishkill Creek dam structure. The removal of buildings that were interconnected with the dam would compromise the structural integrity of the dam. In addition, an opportunity was identified to preserve the existing hydroelectric facility. A portion of Building 2, Buildings 3, 4, 5, and a portion of Building 6 were preserved and rehabilitated.

Chevron approached the Town of Fishkill about the subdivision and determined the boundary of the OU-4 parcel at that time. The NYSDEC Bureau of Program Resources and Flood Protection – Dam Safety Section reviewed the proposed subdivision of the dam property and indicated that access to both sides of the dam needed to be obtained for maintenance purposes. Chevron then added the access easement from Washington Avenue as described above in the OU-4 description. The NYSDEC DER then required additional soil and groundwater sampling to determine if any additional contamination was present in the access easement area. All reports associated with the site can be viewed by contacting NYSDEC.

The hydroelectric facility will continue to occupy Buildings 3, 4, 5, and the remaining portion of Building 6. The machinery associated with the facility, including the turbine, are located in Building 5. Building 5 also has attached to it a trash collection rack (to gather debris in the water which is diverted back to the creek) that sits in the water at the inlet to the hydroelectric facility. Building 4, and the remaining portions of Buildings 2 and 6 will be used for the storage of equipment associated with the operation of the hydroelectric facility, such as electric controls, generators and hardware items.

Building 3 is attached to Buildings 2 and 4, but Building 3 will not be used as part of the hydroelectric facility. Building 3 will remain an unoccupied shell until an overall site development plan has been prepared for the balance of the property. The hydroelectric facility is expected to produce 500,000 kWh per year. This amount of power will offset the average power requirements to electrify 275 homes per year.

The proposed subdivision also includes provisions for a future driveway to be constructed off of Washington Avenue to provide access to the south side of the creek and dam structure (Figure 3). There is also a proposed easement from Old Glenham Road to the hydroelectric facility to provide access to the north side of the dam.

1.2.3 Geologic Conditions

The site is located in the Hudson Highlands physiographic province of New York State. Elevations in the area extend from the bottom of the Hudson River (240 meters below mean sea level) to the top of Mount Beacon (405 meters above mean sea level). Detailed descriptions of the OU-4 subsurface geologic conditions, including a summary of groundwater monitoring data, are included in the SMP.

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1.3 SUMMARY OF REMEDIAL INVESTIGATION FINDINGS

As previously discussed, several site investigations were performed to characterize the nature and extent of contamination at the site. Four specific investigations assessed soil contamination, which is hereafter referred to as “remaining soil contamination,” in the OU-4 area; namely the Sitewide RCRA Facility Investigation (Parsons, 2007), Supplemental RCRA

Facility Investigation (Parsons, 2009), Environmental and Geotechnical Investigation Report Former Mill Buildings 2 through 6 (Parsons, 2011), and Undeveloped Property Area Subsurface Investigation (Parsons 2012). Generally, the remedial investigations (RIs) determined that most of the soil located at the OU-4 site contains contaminant concentrations that are below the NYSDEC 6NYCRR Part 375 Industrial Use Soil Criteria. Semi-Volatile Organic Compounds (SVOCs) and metals were detected in samples at four locations within OU-4.

Groundwater samples are generally collected and analyzed annually at a minimum throughout the TRCB to assess if concentrations of Volatile Organic Compounds (VOCs), Semi-Volatiles Organic Compounds (SVOCs) and metals exceed the NYSDEC Technical Operations Guidance Series (TOGS) Class GA Water Standard. Groundwater results are reported to NYSDEC. The most recent round of groundwater sample results (collected in November 2013) indicate that currently there is no groundwater contamination below the OU-4 property.

The results of these investigations as related to the OU-4 portion of the site are summarized below.

Soils

As shown on Figure 4, soil samples were collected from eight locations (MB-1, MB-3, MB-4, MB-5, MB-6, MB-7, SWSL-16, and SWMW-28) adjacent to and underneath Buildings 2 through 6, and submitted for laboratory analyses.

No VOCs were detected in any soil samples collected, while SVOCs were detected in one soil boring (SWSL-16 [0.5 ft – 4.0 ft]) located adjacent to Building 6, at concentrations that exceeded the NYSDEC 6NYCRR Part 375 Industrial Use Soil Criteria. Mercury was also detected in concentrations that exceeded the soil criteria at one soil boring (MB-1 [4.5 ft – 8.5 ft and 10.5 ft –12.5 ft]), located beneath the slab of Building 3. Soil samples were also collected and analyzed from 21 locations along the undeveloped property and access easement leading from the proposed subdivision property from Washington Avenue (Figure 4). Arsenic concentrations exceeded the NYSDEC 6NYCRR Part 375 Industrial Use Soil Criteria at two locations (SWSL-69 [2 ft – 5 ft] and UDPSB-14 [0 ft – 2 ft]), while one location contained benzo (a) pyrene [UDPSB-16 (0.5 ft-1 ft)] at a concentration exceeding the NYSDEC 6NYCRR Part 375 Industrial Use Soil Criteria. Table 1 summarizes soil analytical results and soil exceedences are graphically depicted on Figure 4.

Groundwater

Groundwater samples are generally collected and analyzed annually from both overburden and bedrock wells at the site and reported to the NYSDEC. A review of the historic data collected from the vicinity of the dam buildings indicated exceedences of the Class GA groundwater standards for VOCs, SVOCs, and metals. However, the most recent round of groundwater samples collected (November 2013) indicated concentrations of site contaminants of concern are below the Class GA standards. Figures depicting the groundwater contamination plumes for contaminants of concern at the site in both the overburden and the bedrock are included as Figures 6 through 13. Groundwater will continue to be monitored through the site.

Soil Vapor

A soil vapor investigation was completed for the site in 1999 and is summarized in the Geochemical Investigation of Subsurface Hydrocarbon Gas Constituents report for the TRCB site (Exploration Technologies, Inc., 1999). Data from this report were used to the work scope for the Phase II Environmental Site Assessment (Groundwater Sciences Corp., 2005). The Phase II report concluded that no soil gas hot spots occur underneath the OU-4 buildings or property.

1.4 SUMMARY OF REMEDIAL ACTIONS

One site remedial activity was historically completed in the vicinity of the OU-4 property. The TRCB site industrial sewer system (ISS) adjacent to the OU-4 property was remediated as described in the NYSDEC-approved "Phase II RCRA Facility Assessment – Sampling Visit Interim Remedial Measure: Inactive Line Abandonment" closure report dated October 2006.

ISS remedial activities completed in the vicinity of the OU-4 portion of the site included:

1. Existing industrial sewer lines were cleaned using high pressure water to clean the pipes;
2. Sewer lines integrity was evaluated using remote video camera techniques; and
3. Grouting the industrial sewer lines in place.

1.4.1 Removal of Contaminated Materials From the Site

In addition to the ISS closure, contaminated soil from three locations on the OU-4 parcel that exceeded the NYSDEC 6NYCRR Part 375 Industrial Use Soil Criteria in the top 2 ft bgs will be addressed by Chevron. It is proposed that an Interim Corrective Measure (ICM) will be implemented which will consist of excavation of this material, in three 10 ft by 10 ft impacted areas around locations SWSL-16, UDPSB-14, and UDPSB-16. Excavation at SWSL-16 will extend to a depth of 5 ft to remove soils with arsenic concentrations above NYSDEC 6NYCRR Part 375, as shown on Figure 14.

Industrial Use Soil Criteria.

It is proposed that soils will be removed to a depth of 1 ft at locations UDPSB-16 and UDPSB-14 to address benzo (a) pyrene and arsenic exceedences, respectively. The soils will be direct loaded into lined dump trucks and disposed of at a NYSDEC permitted facility. Excavations will be backfilled with clean imported soils and areas will be restored to pre-existing conditions. A Work Plan providing additional details of this ICM will be developed and submitted by Chevron to NYSDEC for approval.

1.4.2 Site-Related Treatment Systems

No long-term treatment systems will be installed as part of the site remedy.

1.4.3 Remaining Contamination

Upon completion of approved remedial excavations described above in Section 1.4.1, two impacted areas, both with contamination at least 2 ft bgs, pose a minimum exposure risk, and will remain onsite. Soil exceedences of the NYSDEC 6NYCRR Part 375 Industrial Use Soil Criteria remaining at the site are shown on Figure 15 and Table 2 and summarized below:

- Mercury concentrations above NYSDEC Industrial SCOs remain under Building 3 at depths of 4.5 ft – 8.5 ft and 10.5 ft – 12.5 ft bgs (location MB-1). The area is covered by a concrete slab that prevents exposure to contaminated soils. The decision document will require this contamination to be removed if such infrastructure is replaced. Removal of the contaminated soils will follow requirements noted in Section 2.4 and the excavation template included as Appendix B of this report.
- Arsenic concentrations above NYSDEC Industrial SCOs were observed at SWSL-69 at depths from 2 ft – 5 ft bgs. This location has 2 ft of non-impacted soil over top of the impacted soils and, as stated above, poses minimal threat to wildlife or human contact. The Decision Document may require removal of impacted arsenic soil in this area if re-grading or future excavations are completed in this area.

An electronic copy of this FER with all supporting documentation is included as Appendix B.

(Tables included in the Site Management Plan for OU-4)

Table 1	OU-4 Soils Analytical Data Results
Table 2	Remaining OU-4 Soil Exceedences After Remedial Action

SECTION 2

SUMMARY OF SITE REMEDY

2.1 REMEDIAL ACTION OBJECTIVES

2.1.1 General

Based on the results of the Remedial Investigation, the following Remedial Action Objectives (RAOs) were identified for the OU-4 parcel:

2.1.2 Groundwater RAOs

RAOs for Public Health Protection

- Prevent ingestions of groundwater containing contaminant levels exceeding drinking water standards;
- Prevent contact with, or inhalation of, volatiles emanating from contaminated groundwater.

RAOs for Environmental Protection

- Restore groundwater aquifer, to the extent practicable , to pre-disposal/pre-release condition;
- Prevent the discharge of contaminants to surface water;
- Remove the source of ground or surface water contamination.

2.1.3 Soil RAOs

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil;
- Prevent inhalation of , or exposure to, contaminants volatilizing from contaminated soil;

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination;
- Prevent impacts to biota due to ingestion/direct contact with contaminated soil that would cause toxicity or bioaccumulation through the terrestrial food chain.

2.1.4 Surface Water RAOs

RAOs for Public Health Protection

- Prevent ingestion of contaminated water;
- Prevent contact or inhalation of contaminants from impacted water bodies;
- Prevent surface water contamination that may result in fish advisories.

RAOs for Environmental Protection

- Restore surface water to ambient water quality standards for each contaminant of concern;
- Prevent impacts to biota due to ingestion/direct contact with contaminated surface water that would cause toxicity or bioaccumulation through the marine or aquatic food chain.

2.1.5 Sediment RAOs

RAOs for Public Health Protection

- Prevent direct contact with contaminated sediments;
- Prevent surface water contamination that may result in fish advisories.

RAOs for Environmental Protection

- Prevent releases of contaminants from sediments that would result in surface water levels in excess of ambient water quality criteria.
- Prevent impacts to biota due to ingestion/direct contact with contaminated sediments that would cause toxicity or bioaccumulation through the marine or aquatic food chain.

2.2 DESCRIPTION OF SELECTED REMEDY

2.2.1 Engineering Control Systems

Soil Cover

Exposure to remaining contamination in soil/fill at the OU-4 parcel is prevented by the existing cover. This cover system is comprised of a minimum of 24 inches of clean soil or concrete building slabs. The EWP that appears in Appendix A outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection and maintenance of this cover are provided in the Monitoring Plan included in Section 4 of this SMP.

Groundwater

No groundwater remedial systems are being implemented at this site.

Soil Vapor Extraction Systems

No soil vapor remedial systems are being implemented at this site.

2.2.2 Criteria for Completion of Remediation/Termination of Remedial Systems

No remedial systems are being implemented at the OU-4 parcel. Groundwater monitoring activities to assess groundwater contamination and/or natural attenuation will continue from wells on adjacent properties outside of OU-4, as determined by NYSDEC, until residual groundwater concentrations are found to have met NYSDEC standards or have become asymptotic at an acceptable level over an extended period. Monitoring will continue until

permission to discontinue is granted in writing by NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

2.3 INSTITUTIONAL CONTROLS

A series of ICs is required to: (1) implement, maintain and monitor EC systems; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and, (3) limit the use and development of the site to industrial uses only. Adherence to these ICs is required by the OU-4 Environmental Easement and will be implemented under this OU-4 SMP. These ICs are:

- Completion and submission by the remedial party or the property owner to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8(h)(3);
- Use and development of the controlled property by the remedial party or the property owner for industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- Restrictions on the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the New York State Department Of Health (NYSDOH) or County Department Of Health;
- Compliance with the NYSDEC approved SMP;
- Compliance with the Environmental Easement by the Grantor and the Grantor's successors and assigns;
- All ECs must be operated and maintained as specified;
- All ECs on the OU-4 must be inspected at the specified frequency and in the manner defined; and
- Information pertinent to site management of the controlled property must be reported at the specified frequency.

Note: With the approval of the NYSDEC, ICs may be modified, added or deleted from this list as warranted by site-specific conditions.

ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The OU-4 parcel has a series of ICs in the form of site restrictions. Adherence to these ICs is required by the Environmental Easement. Site restrictions that apply to the Controlled Property are:

- The property may not be used for a higher level of use, such as unrestricted residential, restricted residential, or commercial, without approval of the NYSDEC;
- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- Vegetable gardens and farming on the property are prohibited; and
- The property owner or remedial party will submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the

Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow and will be made by an expert that NYSDEC finds acceptable.

2.3.1 Excavation Work Plan (EWP)

Future intrusive work that will encounter or disturb the remaining contamination will be performed in compliance with the EWP template that is attached as Appendix B to the SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with all applicable Federal, State, and local regulations.

The property owner and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe performance of all intrusive work, the structural integrity of excavations, proper disposal of excavation water, control of runoff from open excavations, and for structures that may be affected by excavations (such as building foundations). The property owner will ensure that site development activities will not interfere with, or otherwise impair or compromise, the engineering controls described in this SMP.

2.3.2 Soil Vapor Intrusion Evaluation

All sampling events at OU-4 indicate that there are no known sources of VOCs. Prior to the construction of any additional enclosed structures located over areas that contain remaining contamination, a soil vapor intrusion (SVI) evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the proposed structure. Alternatively, an SVI mitigation system may be installed as an element of the building foundation without first conducting an investigation. This mitigation system will include a vapor barrier and passive sub-slab depressurization system that is capable of being converted to an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to NYSDEC and NYSDOH for approval. This work plan will be developed in accordance with the most recent NYSDOH "Guidance for Evaluating Vapor Intrusion in the State of New York". Measures to be employed to mitigate potential vapor intrusion will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH guidance, and construction details of the proposed structure.

Preliminary (unvalidated) SVI sampling data will be forwarded to NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation. If any indoor air test results exceed NYSDOH guidelines, relevant NYSDOH fact sheets will be provided to all tenants and occupants of the property within 15 days of receipt

of validated data. Any SVI sampling results, evaluations, and follow-up actions will also be summarized in the next Periodic Review Report.

2.4 INSPECTIONS AND NOTIFICATIONS

2.4.1 Inspections

Inspections of the existing soil cover at the OU-4 parcel will be conducted at the frequency specified. A comprehensive annual inspection of the soil cover will be conducted and reported to the NYSDEC, as described in Section 5. The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- If parcel records are complete and up to date; and
- Changes, or needed changes, to the remedial or monitoring system.

Inspections will be conducted in accordance with the procedures set forth in Section 3. The reporting requirements are outlined in the Section 5.

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the site will be conducted within five days of the event to verify the effectiveness of the EC/ICs implemented at the site by a qualified environmental professional as determined by NYSDEC.

2.4.2 Notifications

Notifications will be submitted by the property owner to NYSDEC as needed for the following reasons:

- 60-day advance notice of any proposed changes in parcel use as required under the terms of the Order on Consent.
- Fifteen day advance notice of any proposed ground-intrusive activities pursuant to the EWP.
- Notice within 48-hours of any damage or defect to the foundations structures that reduces or has the potential to reduce the effectiveness of other ECs and likewise any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the site, with written confirmation within seven days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action shall be submitted to the NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the parcel or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser has been provided with a copy of the Order On Consent, and all approved work plans and reports including this SMP.
- Within 15 days after the transfer of all or part of the parcel, the new owner's name, contact representative, and contact information will be confirmed in writing by the new owner.

2.5 CONTINGENCY PLAN

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions. A written contingency plan must be prepared by the property owner to establish specific procedures to be taken whenever these events occur or appear imminent. This contingency plan should include the applicable contact information to be utilized in response to various unplanned or emergency situations, as well as the applicable response timeframes (e.g., environmental spills must be reported within 2 hours), the conditions triggering a response action, and any follow-up actions.

SECTION 3

INTERIM REMEDIAL MEASURES, OPERABLE UNITS AND REMEDIAL CONTRACTS

3.1 INTRODUCTION

The remedy for this site is being performed as a single project that will apply only to the OU-4 parcel. The complete description of the parcel remedy is described in the SMP, and no interim remedial measures were performed.

SECTION 4

DESCRIPTION OF REMEDIAL ACTIONS

4.1 INTRODUCTION

Remedial activities completed at the OU-4 parcel will be conducted in accordance with the NYSDEC-approved SMP.

4.2 GOVERNING DOCUMENTS

The remedial activities described in the SMP for OU-4 will be conducted in accordance with the governing documents listed below

4.2.1 Site Specific Health & Safety Plan (HASP)

The remedial work performed under the SMP will be in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal OSHA. The existing site Health and Safety Plan (HASP) will be amended to address the specific activities in the SMP.

4.2.2 Quality Assurance Project Pl an (QAPP)

A generic Quality Assurance Project Plan (QAPP) has been prepared for the Former TRCB facility for conducting various site investigation and remediation activities. This plan has been reviewed and approved by NYSDEC and will be amended to address the specific activities in the OU-4 SMP. The QAPP describes the specific policies, objectives, organization, functional activities and quality assurance/quality control activities designed to achieve the project data quality objectives.

4.2.3 Construction Quality Assurance Pl an (CQAP)

The Construction Quality Assurance Plan (CQAP) will mange performance of the Remedial Action tasks through designed and documented QA/QC methodologies applied in the field and in the lab. The CQAP provides a detailed description of the observation and testing activities used to monitor construction quality and confirm that remedial construction was in conformance with the remediation objectives and specifications.

4.2.4 Soil/ Materials Management Plan (S/MMP)

The Soil/Materials Management Plan (S/MMP) for the OU-4 site is in accordance with the Excavation Work Plan included in the SMP.

4.2.3 Stormwater Pollution Prevention Pl an (SWPPP)

The erosion and sediment controls for all remedial construction will be performed in conformance with requirements presented in the New York State Guidelines for Urban Erosion and the site-specific Stormwater Pollution Prevention Plan (SWPPP), No. NYR 10U152, dated April 2011.

4.3 ENGINEERING CONTROL SYSTEM PERFORMANCE MONITORING

. The soil cover system includes the portion of the Building 3 slab overlying the localized area of soil impacted with mercury. As such, particular attention of the building slab should be focused on the upper northwest portion of the building slab to ensure that there is no undermining and/or settlement of the building slab in that area, that could potentially lead to soil movement.

4.4 MAINTENANCE AND PERFORMANCE MONITORING REPORTING REQUIREMENTS

There are no engineering control systems in operation at the OU-4 parcel besides the soil cover system described in Section 2.2. Site inspections of the cover will only be required as discussed in Section 5 of the SMP.

4.5 FACILITY DAM MAINTENANCE, MONITORING AND REPORTING

The facility dam and appurtenant structures are registered and regulated by the NYSDEC Dam Safety Division. The facility must be maintained and monitored, in accordance with the regulatory requirements.

4.6 CONTAMINATION REMAINING AT THE PARCEL

The tables and figures in the SMP summarize the results of all soil samples remaining at the parcel after completion of Remedial Action that exceed the Track 1 (unrestricted) SCOs. Since contaminated soil remains beneath the site after completion of the Remedial Action, Institutional and Engineering Controls are required to protect human health and the environment. The Engineering and Institutional Controls (ECs/ICs) are as described in Section 2 of the OU-4 Site Management Plan. Long-term management of these ECs/ICs and residual contamination will be performed under the SMP approved by the NYSDEC.

4.7 SOIL COVER/CAP SYSTEM

Exposure to remaining contamination in soil/fill a the site is prevented by a soil cover system placed at the site. This cover system is comprised of a minimum of 24 inches of clean soil, asphalt pavement, and concrete building slabs or basements. Figure 15 of the SMP shows the location of each cover type built at the site. An Excavation Work Plan, which outlines the procedures required in the event the cover system and/or underlying residual contamination are disturbed, is provided as Appendix B of the SMP.

4.8 OTHER ENGINEERING CONTROLS

The remedy for the site did not require the construction of any other engineering control systems.

Procedures for monitoring, operating, and maintaining the soil cover system are provided in the Operation and Maintenance Plan in Section 4 of the SMP. The monitoring plan also addresses inspection procedures that must occur after any severe weather condition has taken place that may affect on-site ECs.

4.9 INSTITUTIONAL CONTROLS

The parcel remedy requires that an environmental easement be placed on the property to (1) implement, maintain and monitor the Engineering Controls; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and (3) limit the use and development of the site to industrial uses only.

The Environmental Easement for the parcel was executed by the Department on January 26, 2015 and filed with the Dutchess County Clerk on March 27, 2015. The County Recording Identifier number for this filing is # 02 2015 1875. A copy of the easement and proof of filing is provided in Appendix A of the SMP.

FIGURES

(Figures 1 and 2 are included in this document,
the remaining figures can be found in the Site Management Plan for OU-4)

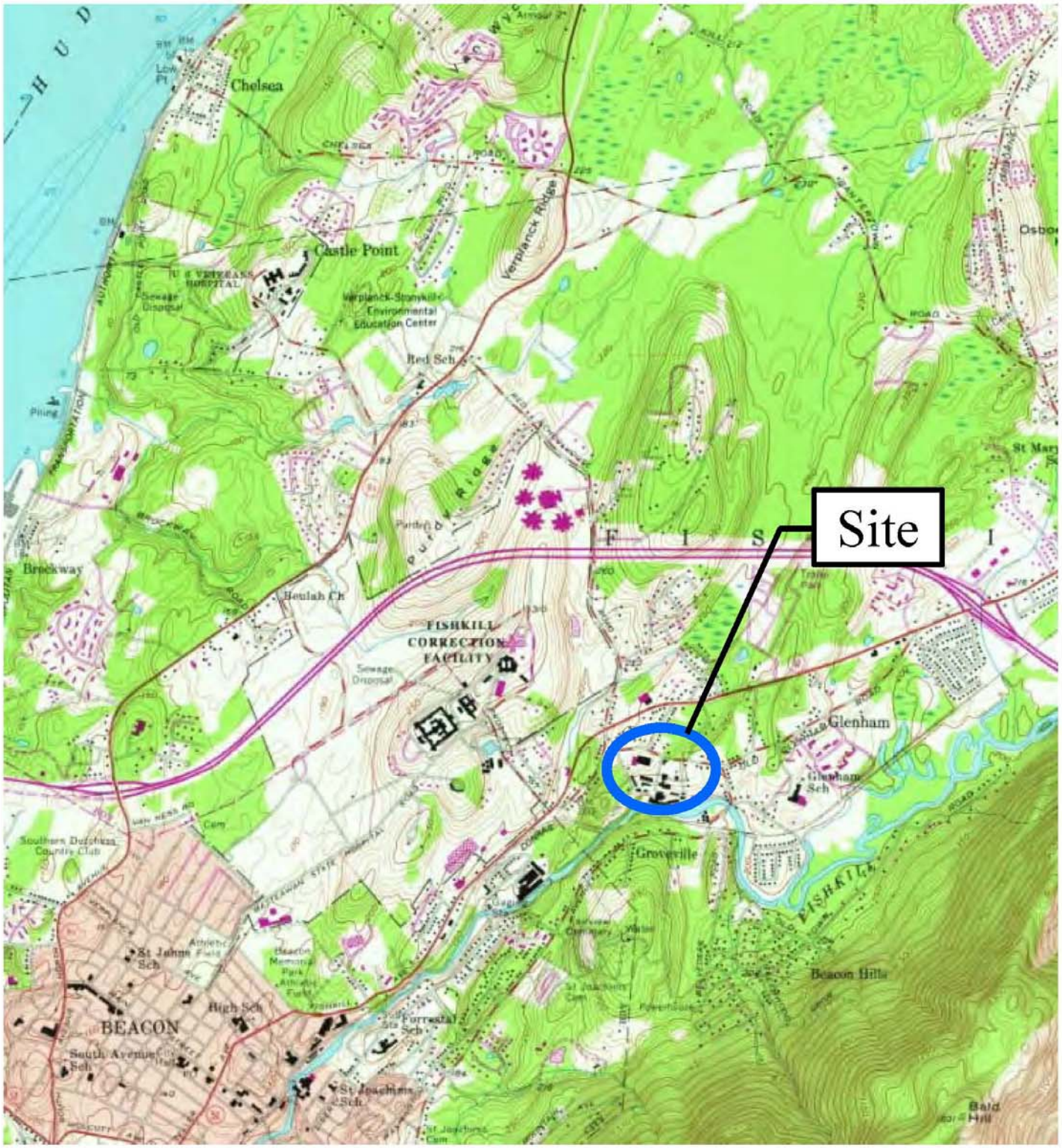


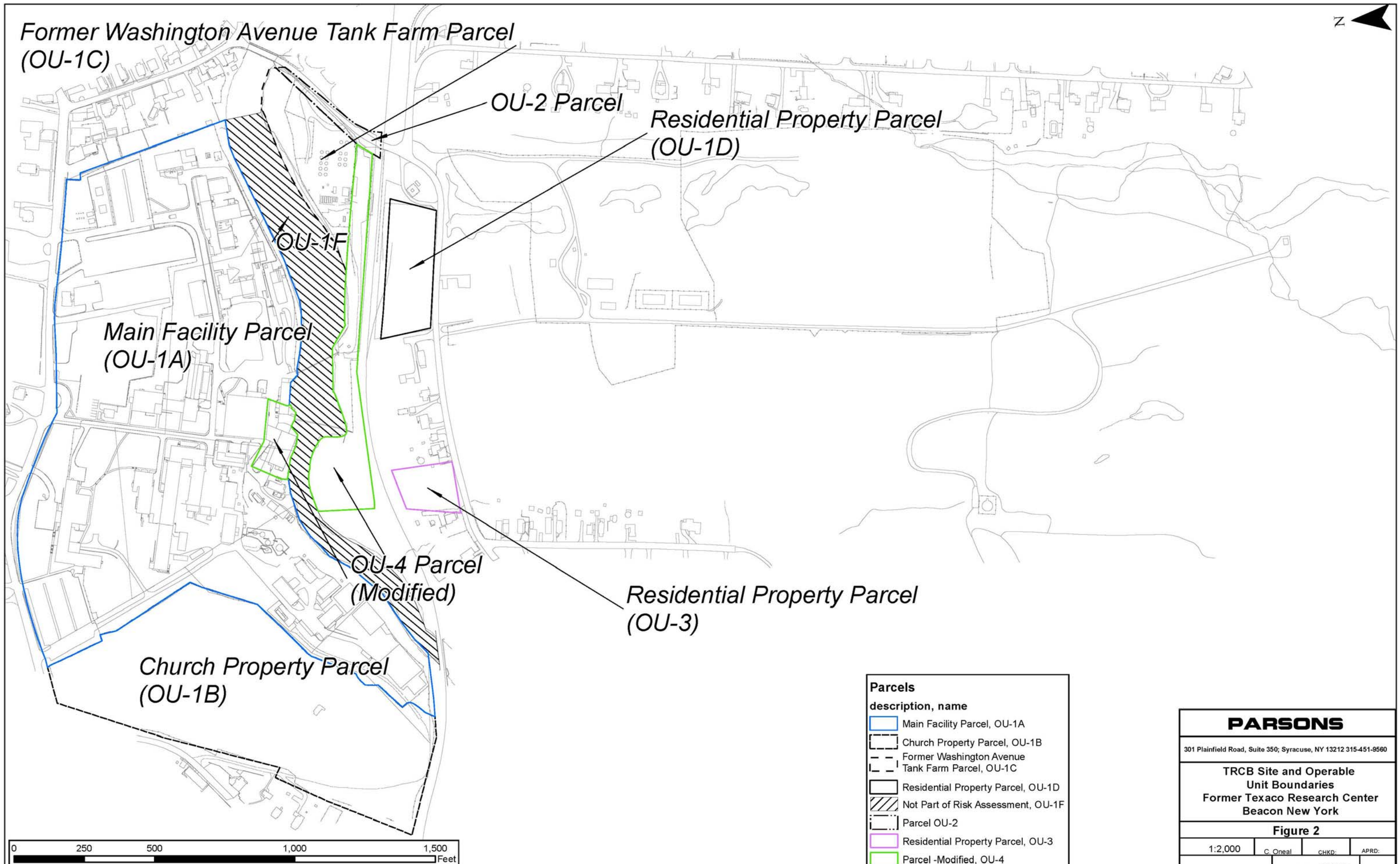
FIGURE 1

SOURCE: U.S.G.S. WAPPINGERS FALLS QUADRANGLE

Chevron Environmental Management Company (EMC)
Former Texaco Research Facility
Beacon, New York

SITE LOCATION MAP

PARSONS
301 PLAINFIELD ROAD * SUITE 350 * SYRACUSE, NY 13212 PHONE: (315) 451-9560



Parcels

description, name

- Main Facility Parcel, OU-1A
- Church Property Parcel, OU-1B
- Former Washington Avenue Tank Farm Parcel, OU-1C
- Residential Property Parcel, OU-1D
- Not Part of Risk Assessment, OU-1F
- Parcel OU-2
- Residential Property Parcel, OU-3
- Parcel -Modified, OU-4

PARSONS

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

TRCB Site and Operable Unit Boundaries
Former Texaco Research Center
Beacon New York

Figure 2

1:2,000	C. Oneal	CHKD:	APRD:
	DATE: 1/20/2014		

Path: G:\GIS\Chevron\MXD\2014\UO_PARCEL.mxd

APPENDICES

APPENDIX A	-	ENVIRONMENTAL EASEMENT
APPENDIX B	-	EXCAVATION WORK PLAN TEMPLATE
APPENDIX C	-	INSPECTION AND MAINTENANCE PLAN, BEACON TECHNOLOGY CENTER DAM
APPENDIX D	-	INSPECTION FORM TEMPLATE

(Included in the Site Management Plan for OU-4)