DECISION DOCUMENT

Oregon Road Site
Brownfield Cleanup Program
Olean, Cattaraugus County
Site No. C905045
June 2020

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

DECLARATION STATEMENT - DECISION DOCUMENT

Oregon Road Site
Brownfield Cleanup Program
Olean, Cattaraugus County
Site No. C905045
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Statement of Purpose and Basis

This document presents the remedy for the Oregon Road Site site, a brownfield cleanup site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the Oregon Road Site site and the public's input to the proposed remedy presented by the Department.

Description of Selected Remedy

The elements of the selected remedy are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a

minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

2. Excavation

Excavation and off-site disposal of contaminant source areas, including:

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- non-aqueous phase liquids;
- soil with non-aqueous phase liquid;
- soil containing total SVOCs exceeding 500 ppm; and
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

Approximately 20,560 cubic yards of contaminated soil meeting the above criteria will be removed from the site. Excavation and removal of any underground piping or other structures associated with a source of contamination will also be completed. An estimated 3,000 linear feet of piping will be removed from the site.

3. Backfill

On-site soil which does not exceed the above excavation criteria may be used below the cover system described in remedy element 2 to backfill the excavation to the extent that a sufficient volume of on-site soil is available and to establish the designed grades at the site. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades at the site. The site will be re-graded to accommodate installation of a cover system as described in remedial element 5.

4. In-Situ Stabilization with Activated Carbon

In-situ stabilization (ISS) will be implemented in surficial soils proximate to the on-site driveway that are the source of PFAS groundwater contamination. ISS is a process that amends the soil matrix to increase its capacity to absorb contamination and minimize migration. The contaminated soil will be mixed in place with activated carbon or another proprietary additive using an excavator or augers. The stabilized soil will then be covered with a cover system as described in element 5 to prevent direct exposure. This treatment increases the sorption capacity of the soil to reduce or eliminate the matrix as a source of groundwater contamination.

Prior to the full implementation of this technology, laboratory pilot scale studies will be conducted to more clearly define design parameters and confirm that the treatment effectively reduces the leachability of PFAS (as determined by SPLP results). A predesign investigation will be required to delineate the extent of source soil requiring treatment.

Monitoring will be required up-gradient and down-gradient of the treatment area for total PFAS, PFOA, and PFOS. Excavation and off-site disposal of the surficial soils may be required if the treatment is not effective at reducing SPLP results.

5. Cover System

A site cover will be required to allow for commercial use of the site in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs), except in

areas proximate to Two Mile Creek where cover material must meet the protection of ecological resources SCOs. Where a soil cover is to be used it will be a minimum of one foot of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

6. In-Situ Groundwater Treatment Wall

Activated carbon will be added to the subsurface to capture and prevent the migration of PFAS compounds in groundwater. Liquid activated carbon or other proprietary treatment additives will be added to the subsurface to form a permeable barrier along the downgradient boundary of the site near MW-10, MW-12, and MW-13 where groundwater concentrations exceed 500 ppt for total PFAS or 10 ppt for either PFOA or PFOS. An additional treatment area may be needed based on the results of the pre-design investigation discussed in remedial element 4. The method and depth of barrier installation will be determined during the remedial design.

Monitoring will be required up-gradient and down-gradient of the treatment area for total PFAS, PFOA, and PFOS. Additional source removal may be required if the treatment wall is not effective at preventing off-site migration.

7. Environmental Easement

The remedy will achieve a Track 4 commercial cleanup at a minimum and will include an environmental easement, and site management plan as described below.

Institutional Control:

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for commercial use or industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and
- require compliance with the Department approved Site Management Plan.

8. Site Management Plan

A Site Management Plan is required, which includes the following:

a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in remedial element 7 above.
Engineering Controls: The soil cover discussed in remedial element 5 and groundwater treatment barrier discussed in remedial element 6 above.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- a provision should redevelopment occur to ensure no soil exceeding protection of groundwater concentrations will remain below storm water retention basin or infiltration structures.
- a provision for removal or treatment of the any PFAS source area located under the existing access driveway if and when it is removed;
- descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- a provision that should existing pavement be removed in the future, a cover system consistent with that described in remedial element 5 above will be placed in any areas where the upper one foot of exposed surface soil exceeds the applicable soil cleanup objectives (SCOs);
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of groundwater to assess the performance and effectiveness of the remedy; and
- a schedule of monitoring and frequency of submittals to the Department.

Declaration

The remedy conforms with promulgated standards and criteria that are directly applicable, or that are relevant and appropriate and takes into consideration Department guidance, as appropriate. The remedy is protective of public health and the environment.

6/11/2020
Date

Michael Cruden
Michael Cruden, Director
Remedial Bureau E

DECISION DOCUMENT

Oregon Road Site
Olean, Cattaraugus County
Site No. C905045
June 2020

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced site. The disposal of contaminants at the site has resulted in threats to public health and the environment that would be addressed by the remedy. The disposal or release of contaminants at this site, as more fully described in this document, has contaminated various environmental media. Contaminants include hazardous waste and/or petroleum.

The New York State Brownfield Cleanup Program (BCP) is a voluntary program. The goal of the BCP is to enhance private-sector cleanups of brownfields and to reduce development pressure on "greenfields." A brownfield site is real property, the redevelopment or reuse of which may be complicated by the presence or potential presence of a contaminant.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and 6 NYCRR Part 375. This document is a summary of the information that can be found in the site-related reports and documents.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all remedies. A public comment period was held, during which the public was encouraged to submit comment on the proposed remedy. All comments on the remedy received during the comment period were considered by the Department in selecting a remedy for the site. Site-related reports and documents were made available for review by the public at the following document repository:

DECInfo Locator - Web Application
https://gisservices.dec.ny.gov/gis/dil/index.html?rs=C905045

Olean Public Library
134 N 2nd Street
Olean, NY 14760
Phone: (716) 372-0200

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: The Oregon Road Site is a 24.57-acre site located in a mixed use industrial/commercial/residential area on Homer Street, Town of Olean, Cattaraugus County. The site is bounded by undeveloped parcels to the north; Oregon Road and residential properties to the northeast; Homer Street and commercial properties, including one undeveloped parcel, to the southeast; and a commercial property to the southwest.

Site Features: The site is currently vacant and does not contain any structures. An asphalt access driveway connects the site to Homer Street. The surface cover at the site is generally grass vegetation. Two Mile Creek, a tributary to Allegheny River, bisects the southeastern portion of the site.

Zoning and Land Use: The site is currently vacant and is zoned for industrial and commercial purposes. Properties surrounding the site primarily include commercial properties and residential properties.

Past Use of the Site: The site is located at the northern limit 125-acre ExxonMobil Legacy Site (EMLS). The EMLS operated as an oil refinery under several different names from approximately 1880 to the 1950s. Initially, two separate refineries operated on the EMLS from 1882 until 1902. The two refineries merged to become Vacuum Oil, which then merged with the Standard Oil Company in 1934. These companies were predecessors of the ExxonMobil Oil Corporation. The site was historically occupied by an oil tank farm, including one large tank, a portion of another tank, and a former containment berm area within the site limits, apparently used for oil storage. The tank and berm areas were removed by the 1960s.

The site has remained vacant since the removal of the tanks and has been owned by the following entities: Swan Finch Oil Corporation; Felmont Oil Corporation; Cattaraugus County Industrial Development Agency; Benson Construction & Development, LLC; and Homer Street Properties, LLC.

Site Geology and Hydrogeology: The overburden geology over the majority of the site is generally described as fill material in the upper approximate 4 feet below ground surface (fbgs) overlying sandy lean clay with various amounts of gravel to depths of 10 to 12 fbgs. Natural groundwater flow in the upper aquifer flows south to southwest, generally following surface topography. Deeper groundwater flow may be impacted by the three residential groundwater supply wells located along Oregon Road. Groundwater was encountered at depths ranging from 4 to 10 fbgs.

A site location map is attached as Figures 1 and 2.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to commercial use (which allows for industrial use) as described in Part 375-1.8(g) were/was evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the Remedial Investigation (RI) to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is available in the RI Report.

SECTION 5: ENFORCEMENT STATUS

The Applicant(s) under the Brownfield Cleanup Agreement is a/are Volunteer(s). The Applicant(s) does/do not have an obligation to address off-site contamination. However, the Department has determined that this site does not pose a significant threat to public health or the environment; accordingly, no enforcement actions are necessary.

The Applicant(s) under the Brownfield Cleanup Agreement is a/are Volunteer(s). The Applicant(s) does/do not have an obligation to address off-site contamination. However, the Department has determined that this site does not pose a significant threat to public health or the environment; accordingly, no enforcement actions are necessary.

Any off-site contamination related to the former refinery operations will be addressed under the Department's Petroleum Spill Response program.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A remedial investigation (RI) serves as the mechanism for collecting data to:

- characterize site conditions;
- determine the nature of the contamination; and
- assess risk to human health and the environment.

The RI is intended to identify the nature (or type) of contamination which may be present at a site and the extent of that contamination in the environment on the site, or leaving the site. The RI reports on data gathered to determine if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. Monitoring wells are installed to assess groundwater and soil borings or test pits are installed to sample soil and/or waste(s) identified. If other natural resources are present, such as surface water bodies or wetlands, the water and sediment may be

sampled as well. Based on the presence of contaminants in soil and groundwater, soil vapor will also be sampled for the presence of contamination. Data collected in the RI influence the development of remedial alternatives. The RI report is available for review in the site document repository and the results are summarized in section 6.3.

The analytical data collected on this site includes data for:

- groundwater
- surface water
- soil
- sediment
- soil vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Results

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized below. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

perfluorooctane sulfonate
arsenic
polycyclic aromatic hydrocarbons (PAHS), total
petroleum products
perfluorooctanoic acid

The contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- soil

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Decision Document.

There were no IRMs performed at this site during the RI.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water. The RI report presents a detailed discussion of any existing and potential impacts from the site to fish and wildlife receptors.

The Remedial Investigation sampled surface and subsurface soils, groundwater, surface water, sediment, and soil vapor. The primary contaminants of concern in on-site soil are semi-volatile organic compounds (SVOCs), arsenic, perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and petroleum. The primary contaminants of concern in on-site groundwater are perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and tentatively identified volatile organic compounds/semi-volatile organic compounds (TICs) related to petroleum.

Surface Soil: Samples were collected from 0 to 2 inches below vegetative cover across the entire site and analyzed for SVOCs, pesticides, herbicides, polychlorinated biphenyls (PCBs), and metals. The SVOC benzo(a)pyrene (up to 9.55 parts per million (ppm); (commercial soil cleanup objective (CSCO) 1 ppm) and the metal arsenic (up to 46.6 ppm, CSCO 16 ppm) were detected at concentrations exceeding their commercial use SCOs. The locations with arsenic in excess of its commercial use SCO are predominately on the western portion of the site. Several pesticides were detected in at least one sample, but none exceed their commercial use SCOs. PCBs and herbicides were not detected in any samples above laboratory quantitation limits, which were below commercial use SCOs.

Additional surface soil samples were collected from the area of MW-10, MW-12, and MW-13 and analyzed for per- and polyfluoroalkyl substances (PFAS). Multiple PFAS compounds were detected in each surface soil sample, with PFOA (up to 1.12 parts per billion (ppb)) and PFOS (up to 82.7 ppb) detected in every sample. Total PFAS concentrations ranged from 2.6 to 100 ppb. Currently there are no SCOs for PFAS.

Subsurface Soil: Samples were collected from multiple intervals including 1 to 2 feet below ground surface (fbgs), 2 to 3 fbgs, 3 to 4 fbgs, and between 3 and 14 fbgs. A majority of subsurface soil samples were collected from approximately 6 to 8 fbgs. Samples were analyzed for volatile organic compounds (VOCs), SVOCs, pesticides, herbicides, PCBs, and metals. Arsenic (up to 73 ppm, CSCO 16 ppm) was the only contaminant detected at concentrations exceeding its commercial use SCO. The locations with arsenic in excess of its commercial use SCO are predominately on the western portion of the site and were not detected at depths greater than 4 fbgs. At one location total SVOCs were detected at 1095 ppm but did not exceed any individual commercial use SCOs.

Grossly contaminated soil (GCS) was identified at 16 subsurface locations, typically from 3 to 6 fbgs. The GCS at the site is indicative of petroleum contamination and was identified by the presence of mobile light non-aqueous phase liquid (LNAPL), elevated field instrument readings, and petroleum odors. GCS is primarily located in the central portion of the site west of Two Mile Creek and is estimated to be present in 20,000 cubic yards of soil. Weathered petroleum impacts, identified by elevated field instrument readings, petroleum odors, or staining, were also identified at many subsurface locations at similar depths as the GCS. It is estimated that 33,600 cubic yards of soil exhibit weathered petroleum impacts (outside of the GCS area). GCS and/or weathered petroleum products may be present off-site due to the former refinery operations throughout the area and pipelines that extend off-site.

Additional subsurface soil samples were collected from the area of MW-10, MW-12, and MW-13 and analyzed for PFAS. Sample depths were targeted immediately below the on-site driveway and at the groundwater interface. Multiple PFAS compounds were detected in a majority of the subsurface soil samples, with PFOA (up to an estimated 0.372 ppb) and PFOS (up to 12.8 ppb) detected in every sample except three. Total PFAS concentrations ranged from 0.37 to 23 ppb. Currently there are no SCOs for PFAS.

Four soil samples were collected from the area of MW-10, MW-12, and MW-13 and tested using the Synthetic Precipitation Leaching Procedure (SPLP) and analyzed for PFAS. At least one PFAS compound was detected in each leachate sample, with PFOA (up to 22.7 parts per trillion (ppt)) and PFOS (up to 733 ppt) being detected in every leachate sample. Total PFAS concentrations ranged from 61 to 1,128 ppt.

Groundwater: Samples were collected from 12 monitoring wells and analyzed for VOCs, SVOCs, pesticides, herbicides, PCBs, and metals. There were no VOCs, pesticides, herbicides, or PCBs detected above groundwater quality standards (GWQS). The SVOC benzo(a)pyrene (0.26 ppb, GWQS non-detect) was detected in a temporary well during the Phase II Investigation. The metals arsenic (up to 330 ppb, GWQS 25 ppb), barium (up to 1,900 ppb, GWQS 1,000 ppb), beryllium (up to 4.5 ppb, GWQS 3 ppb), chromium (up to 130 ppb, GWQS 50 ppb), copper (up to 230 ppb, GWQS 200 ppb), iron (up to 283,000 ppb; GWQS 300 ppb), lead (up to 210 ppb, GWQS 25 ppb), manganese (up to 17,900 ppb, GWQS 300 ppb), and sodium (up to 44,700 ppb, GWQS 20,000 ppb) were detected exceeding their GWQS. Filtered groundwater samples were analyzed from 5 of the 12 wells and did not exceed GWQS for any metals. The lack of filtered samples exceeding the GWQS indicate that the detections in unfiltered samples are most likely the result of turbid water samples and not indicative of actual groundwater contamination. 1,4-dioxane was analyzed for (using EPA Method 8270 SIM) at 7 monitoring wells and was detected in three wells at 2.5 ppb.

Groundwater samples were collected from 14 monitoring wells and analyzed for PFAS, with at least one PFAS compound detected in 8 of the wells. PFOA (up to 100 ppt) and PFOS (up to 1,020 ppt) both exceeded the screening level of 10 ppt. Total PFAS concentrations ranged from non-detect to 4,408 ppt. Detections of PFOA or PFOS above the 10 ppt screening level are limited to MW-10, MW-11, MW-12, and MW-13. Detections of total PFAS above 500 ppt are limited to

MW-10, MW-12, and MW-13. Given the location of these monitoring wells and the direction of groundwater flow it is expected that off-site migration of contaminated groundwater is occurring.

Surface Water: Four surface water sample were collected from Two Mile Creek and analyzed for VOCs, SVOCs, pesticides, herbicides, PCBs, and metals. Pesticides, herbicides, and PCBs were not detected above detection limits in any samples. Acetone (up to 3.6 ppb), VOC tentatively identified compounds (TICs) (up to 89 ppb), and SVOC TICs (up to 209 ppb) were detected in at least one sample. There are no surface water quality standards (SWQS) for these contaminants in Class C surface waters. Iron (up to 523 ppb, Class C SWQS 300 ppb) was the only metal detected above its Class C SWQS.

Sediments: Four sediment samples were collected from Two Mile Creek and analyzed for VOCs plus TICs, SVOCs plus TICs, pesticides, herbicides, PCBs, and metals. Herbicides and PCBs were not detected above detection limits in any samples. Several VOCs, SVOCs, and pesticides were detected in at least one sample but were below their respective Class A sediment guidance values (SGVs). The metals arsenic (up to 20.3 ppm, Class A SGV 10 ppm) and nickel (up to 25 ppm, Class A SGV 23 ppm) were detected exceeding the Class A SGV in at least one location. Additional samples from the locations with the metal exceedances were collected and sent for toxicity testing. The results of the toxicity testing indicate that the levels observed are not toxic to aquatic life.

Soil Vapor: Four soil vapor samples and one ambient outdoor air sample were collected from the eastern portion of the site and analyzed for VOCs. Low levels of several compounds related to petroleum were detected in most samples, such as benzene (up to 10.7 micrograms per cubic meter (ug/m^3)), n-hexane (up to 12.8 ug/m^3), toluene (up to 17.3 ug/m^3), and total xylenes (up to 8.02 ug/m^3). There are not currently standards for these compounds in soil vapor. Soil vapor samples were collected from the adjacent off-site residential properties under a separate program and did not indicate that there are significant off-site impacts in soil vapor.

6.4: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure.*

Access to the site is not restricted and people can come into contact with site-related soil and groundwater contamination if they disturb the surface materials. Sampling of the nearby residential drinking water wells indicated no detection of compounds above drinking water quality guidelines. Volatile organic compounds in contaminated groundwater or contaminated soils may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. As the site is vacant, soil vapor intrusion is not a current concern. Sampling at the off-site adjacent residential properties indicated that soil vapor intrusion is not a concern.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

SECTION 7: ELEMENTS OF THE SELECTED REMEDY

The alternatives developed for the site and the evaluation of the remedial criteria are presented in the Alternative Analysis. The remedy is selected pursuant to the remedy selection criteria set forth in DER-10, Technical Guidance for Site Investigation and Remediation and 6 NYCRR Part 375.

The selected remedy is a Track 4: Restricted use with site-specific soil cleanup objectives remedy.

The selected remedy is referred to as the Excavation with Passive Groundwater Treatment remedy.

The elements of the selected remedy, as shown in Figures 3A and 3B, are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

2. Excavation

Excavation and off-site disposal of contaminant source areas, including:

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- non-aqueous phase liquids;
- soil with non-aqueous phase liquid;
- soil containing total SVOCs exceeding 500 ppm; and
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

Approximately 20,560 cubic yards of contaminated soil meeting the above criteria will be removed from the site. Excavation and removal of any underground piping or other structures associated with a source of contamination will also be completed. An estimated 3,000 linear feet of piping will be removed from the site.

3. Backfill

On-site soil which does not exceed the above excavation criteria may be used below the cover system described in remedy element 2 to backfill the excavation to the extent that a sufficient volume of on-site soil is available and to establish the designed grades at the site. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades at the site. The site will be re-graded to accommodate installation of a cover system as described in remedial element 5.

4. In-Situ Stabilization with Activated Carbon

In-situ stabilization (ISS) will be implemented in surficial soils proximate to the on-site driveway that are the source of PFAS groundwater contamination. ISS is a process that amends the soil matrix to increase its capacity to absorb contamination and minimize migration. The contaminated soil will be mixed in place with activated carbon or another proprietary additive using an excavator or augers. The stabilized soil will then be covered with a cover system as described in element 5 to prevent direct exposure. This treatment increases the sorption capacity of the soil to reduce or eliminate the matrix as a source of groundwater contamination.

Prior to the full implementation of this technology, laboratory pilot scale studies will be conducted to more clearly define design parameters and confirm that the treatment effectively reduces the leachability of PFAS (as determined by SPLP results). A predesign investigation will be required to delineate the extent of source soil requiring treatment.

Monitoring will be required up-gradient and down-gradient of the treatment area for total PFAS, PFOA, and PFOS. Excavation and off-site disposal of the surficial soils may be required if the treatment is not effective at reducing SPLP results.

5. Cover System

A site cover will be required to allow for commercial use of the site in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs), except in areas proximate to Two Mile Creek where cover material must meet the protection of ecological resources SCOs. Where a soil cover is to be used it will be a minimum of one foot of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

6. In-Situ Groundwater Treatment Wall

Activated carbon will be added to the subsurface to capture and prevent the migration of PFAS compounds in groundwater. Liquid activated carbon or other proprietary treatment additives will be added to the subsurface to form a permeable barrier along the downgradient boundary of the site near MW-10, MW-12, and MW-13 where groundwater concentrations exceed 500 ppt for total PFAS or 10 ppt for either PFOA or PFOS. An additional treatment area may be needed based on the results of the pre-design investigation discussed in remedial element 4. The method and depth of barrier installation will be determined during the remedial design.

Monitoring will be required up-gradient and down-gradient of the treatment area for total PFAS, PFOA, and PFOS. Additional source removal may be required if the treatment wall is not effective at preventing off-site migration.

6/11/2020

7. Environmental Easement

The remedy will achieve a Track 4 commercial cleanup at a minimum and will include an environmental easement, and site management plan as described below.

Institutional Control:
Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for commercial use or industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and
- require compliance with the Department approved Site Management Plan.

8. Site Management Plan

A Site Management Plan is required, which includes the following:

a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in remedial element 7 above.
Engineering Controls: The soil cover discussed in remedial element 5 and groundwater treatment barrier discussed in remedial element 6 above.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- a provision should redevelopment occur to ensure no soil exceeding protection of groundwater concentrations will remain below storm water retention basin or infiltration structures.
- a provision for removal or treatment of the any PFAS source area located under the existing access driveway if and when it is removed;
- descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- a provision that should existing pavement be removed in the future, a cover system consistent with that described in remedial element 5 above will be placed in any areas where the upper one foot of exposed surface soil exceeds the applicable soil cleanup objectives (SCOs);
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and

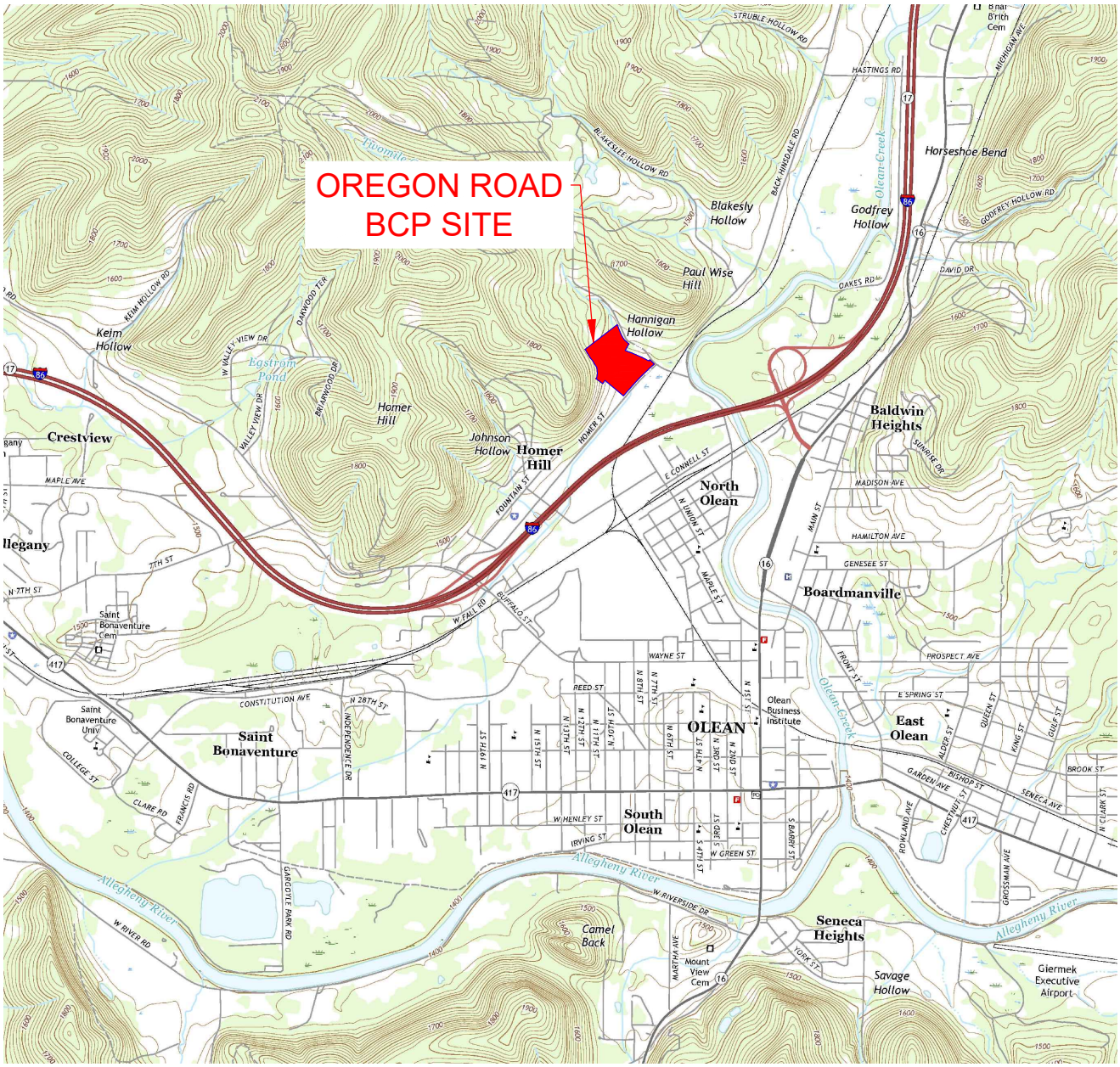
• the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

• monitoring of groundwater to assess the performance and effectiveness of the remedy; and
• a schedule of monitoring and frequency of submittals to the Department.

F:\CAD\TurnKey\Homer Street Properties, LLC\Oregon Road\RI Report\Figure 1; Site Location and Vicinity Map.dwg, 11/8/2019 3:21:51 PM

FIGURE 1



3,500' 0' 3,500' 7,000'

SCALE: 1 INCH = 3,500 FEET
SCALE IN FEET
(approximate)

QUADRANGLE LOCATION

NOTE: BASE MAP USGS OLEAN, NY QUADRANGLE 2016

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
IN ASSOCIATION WITH
TURNKEY ENVIRONMENTAL RESTORATION, LLC

2558 HAMBURG TURNPIKE, SUITE 300, BUFFALO, NY 14218, (716) 856-0599

PROJECT NO.: 0323-017-001

DATE: NOVEMBER 2018

DRAFTED BY: RFL

SITE LOCATION & VICINITY MAP

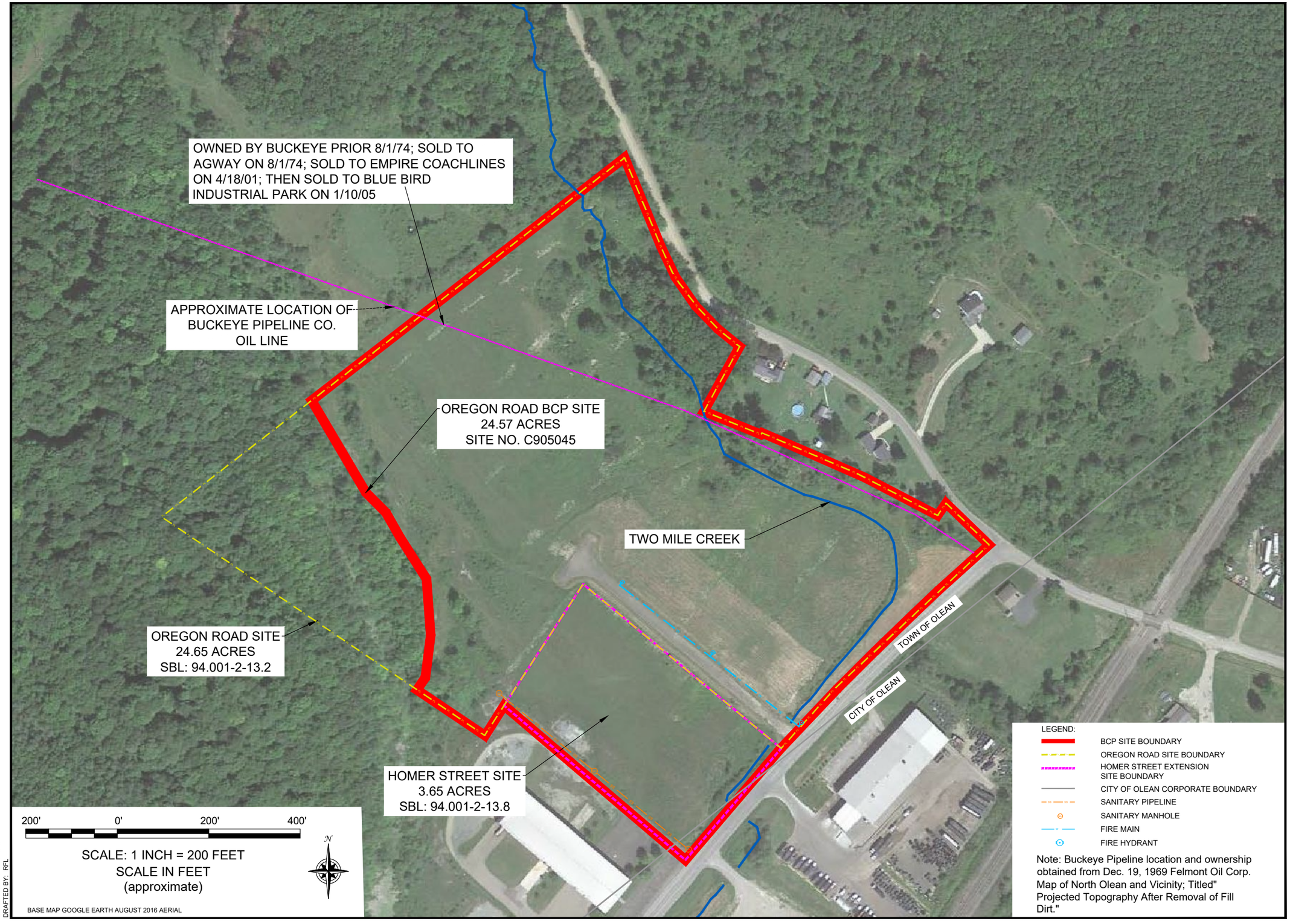
RI/AA REPORT

OREGON ROAD SITE
BCP SITE NO. C905045
OLEAN, NEW YORK

PREPARED FOR

HOMER STREET PROPERTIES, LLC

F:\CAD\TurnKey\Homer Street Properties, LLC\Oregon Road\RI Report\Figure 2A; Site Plan (Aerial).dwg, 11/8/2019 3:23:18 PM



DATE: NOVEMBER 2018
DRAFTED BY: RFL

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SITE PLAN (AERIAL)

RI/AA REPORT
OREGON ROAD SITE
OLEAN, NEW YORK
PREPARED FOR
HOMER STREET PROPERTIES, LLC

FIGURE 2

LEGEND:

Symbol	Description
	BCP BOUNDARY
TP-2	TEST PIT
TT-15	TEST TRENCH
MW-2	1" MONITORING WELL (SEE NOTE 1)
MW-5	MONITORING WELL
SW/SED	SURFACE WATER & SEDIMENT SAMPLE
SB-2	SOIL BORING LOCATION
SS NS 26	SURFACE AND NEAR-SURFACE SAMPLE
	EXTENT OF MOBILE LNAPL (GCS) - LIMITS OF EXCAVATION
	ARSENIC CSCO EXCEEDANCE IN SOIL
	SVOC CVOC EXCEEDANCE IN SOIL
	MOBILE LNAPL (GCS) IN SOIL (DASHED WHERE INFERRED)
	WEATHERED PETROLEUM PRESENT IN SOIL (SHEEN, STAINING, ODORS AND ELEVATED PID), (DASHED WHERE INFERRED)
	EXTENT OF WEATHERED PETROLEUM IMPACTS
	SVOC EXCAVATION AREA
PL	EXISTING ABANDONED PETROLEUM LINE
	PLUME STOP BARRIER INJECTION DEPTH (7-11')
W	WATER LINE AND FIRE HYDRANT
	PRIVATE WATER SUPPLY WELL
[ ]	SECTION OF TWO MILE CREEK TO BE DISTURBED WITH GCS REMOVAL

NOTES:
1. WELLS MW-1 AND MW-3 ARE ONE-INCH DIAMETER WELLS INSTALLED AS PART OF A PHASE II SITE ASSESSMENT. WELL MW-2 (ALSO A 1" WELL) WAS REPLACED WITH WELL MW-2R (2" WELL).
2. SAMPLES OFF OF THE BCP SITE ARE EXCLUDED FROM THIS ANALYSES
3. BASE MAP FROM GOOGLE EARTH 2016 AERIAL IMAGE.

N

100' 0' 100' 200'

SCALE: 1 INCH = 100 FEET
SCALE IN FEET
(approximate)

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JOB NO.: 0323-017-001

REVISIONS

NO.	BY	DATE	REMARKS

SEAL

DRAWN BY:	RFL
DATE:	DECEMBER 2018
CHECKED BY:	
APPROVED BY:	MAL

ALTERNATIVE 4: COMMERCIAL TRACK 4 CLEANUP EXCAVATION AND OFF-SITE DISPOSAL

RI/AA REPORT
OREGON ROAD SITE
BCP SITE NO. C905045
OLEAN, NEW YORK
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HOMER STREET PROPERTIES, LLC

Figure 3A

F:\CAD\TurnKey\Homer Street Properties, LLC\Oregon Road\RI Report\Figure 6B Commercial Track 4 Cleanup and AOCs R1.dwg, 1/10/2020 12:49:23 PM, DWG To PDF.pc3

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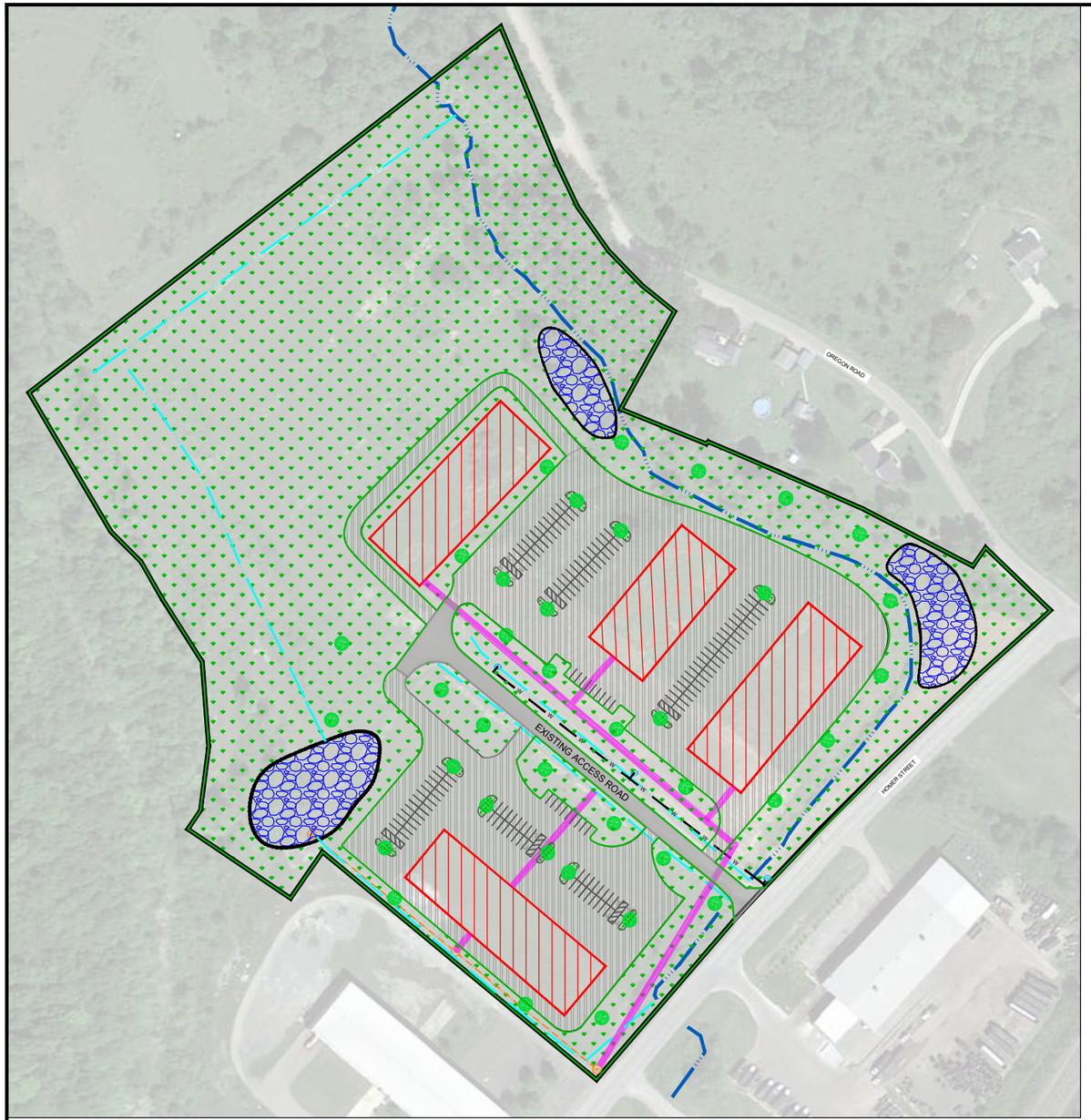


LEGEND:

- BCP SITE BOUNDARY
- PROPOSED DRAINAGE DITCH
- PLANNED BUILDING LOCATION (PRELIMINARY)
- EXISTING SANITARY SEWER AND MANHOLE
- EXISTING WATER LINE AND FIRE HYDRANT
- UTILITY CORRIDOR
- PLANNED RETENTION POND
- TREE (PRELIMINARY)
- PLANNED PARKING/ROADWAY (PRELIMINARY)
- PLANNED VEGETATED COVER SYSTEM (PRELIMINARY)

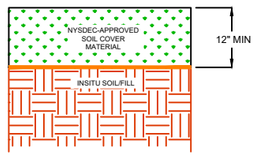
N

200' 0' 200' 400'

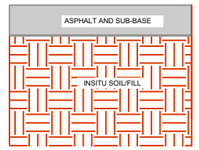
SCALE: 1 INCH = 200 FEET
SCALE IN FEET
(approximate)

DATE: FEBRUARY 2020
DRAFTED BY: RFL

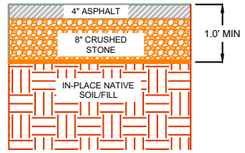
VEGETATED SOIL COVER SYSTEM DETAIL
NTS

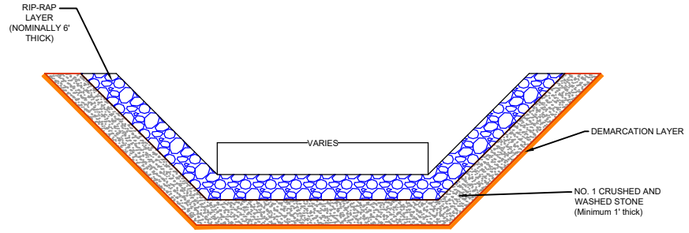


EXISTING ASPHALT COVER SYSTEM DETAIL
NTS



PARKING/ROADWAY
NTS





DETENTION POND & DRAINAGE DITCH COVER DETAIL
NTS

PRELIMINARY CONCEPTUAL REDEVELOPMENT PLAN AND COVER SYSTEM DETAILS

RI/AA REPORT

OREGON ROAD SITE

OLEAN, NEW YORK

PREPARED FOR

HOMER STREET PROPERTIES, LLC

Figure 3B

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