PROPOSED REMEDIAL ACTION PLAN

Old Upper Mountain Road Site
Operable Unit Number 01: Landfill - Old Upper Mountain Road Parcel
Operable Unit Number 02: Gulf Creek
State Superfund Project
Lockport, Niagara County
Site No. 932112
February 2013

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

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that would be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. The proposed remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred remedy.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this document in accordance with the requirements of 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 document is a summary of the information that can be found in the site-related reports and documents in the document repositories identified below.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all PRAPs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repositories:

Lockport Public Library
23 East Avenue
Lockport, NY 14094
Phone: (716) 433-5935

NYSDEC Region 9 Office
Attn: Glenn M. May
270 Michigan Avenue
Buffalo, NY 14203
Phone: (716) 851-7220

A public comment period has been set from:

2/27/2013 to 3/28/2013

A public meeting is scheduled for the following date:

3/14/2013 at 6:30 PM

Public meeting location:

Lockport City Hall

At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP.

Written comments may also be sent through 3/28/2013 to:

Glenn May
NYS Department of Environmental Conservation
Division of Environmental Remediation
270 Michigan Ave
Buffalo, NY 14203-2915
gmmay@gw.dec.state.ny.us

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

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, Voluntary 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 Old Upper Mountain Road Site is located near the intersection of NY State Routes 31 and 93 in both the City and Town of Lockport, Niagara County, New York in a mixed residential, commercial and industrial neighborhood. The site is bounded on the west by Old Upper Mountain Road, on the south by the active CSX and Somerset railroads, on the east by the active Somerset Railroad and an abandoned rail spur, and on the north by residential property and a steep ravine known as The Gulf.

Site Features:

The Old Upper Mountain Road Site is approximately 7 acres in size and located on a relatively flat-lying plateau separated by the Somerset Railroad, which is approximately 10 feet higher than the surrounding topography. The topography slopes steeply to the north into The Gulf; there is an approximate 80-foot difference in elevation between the site and the base of the ravine. A portion of this ravine underlies the site and has been filled in with waste material. A narrow stream, Gulf Creek, emerges from a storm sewer culvert at the west side of the site and flows along the bottom of the ravine, eventually discharging into Eighteenmile Creek approximately one mile to the northeast.

Current Zoning/Use:

The Old Upper Mountain Road Site consists of fifteen parcels owned by eight individuals, municipalities and corporations. Different parcels of the site are zoned for residential, commercial, industrial and public utility use. Eight parcels contain active rail lines, one parcel contains a single family dwelling, and six parcels are vacant.

Operable Units:

The Old Upper Mountain Road Site has been subdivided into three Operable Units (OUs) defined as follows: OU 01: Landfill - Old Upper Mountain Road Parcel, OU 02: Gulf Creek (including the associated riparian area), and OU 03: Landfill - Otto Park Place Parcel. OUs 01 and 03 are the former landfill that is divided into two operable units by the Somerset Railroad. OU 01 is located north of the Somerset Railroad, and is approximately 6 acres in size. OU 03 is located between the active Somerset and CSX railroads, and the abandoned rail spur. This operable unit is approximately 1 acre in size. OU 02 consists of approximately 4,400 linear feet of contaminated Gulf Creek sediment between the site and Niagara Street to the north.

Past Use of the Site:

The Old Upper Mountain Road Site was reportedly operated as a municipal landfill by the City

of Lockport from 1921 through the 1950's. Access to the landfill was from a viaduct under the CSX Railroad just north of Old Upper Mountain Road (now known as Otto Park Place). In later years, a gate was placed at the viaduct in an attempt to control unauthorized dumping. This gate is no longer present. Incinerator ash from garbage and other wastes was apparently dumped at the landfill and then pushed into the ravine. It has also been reported that local companies dumped their wastes directly into the landfill.

Site History:

In November 1997 the NYSDEC collected thirteen soil/waste samples from OU 01. All samples contained elevated concentrations of semivolatile organic compounds (SVOCs) and metals.

In October 1998 the NYSDOH collected five surface soil samples from OU 01. These samples contained elevated concentrations of metals.

In 2007 the NYSDEC conducted a Site Characterization at OUs 01 and 03.

In August 2008, based upon the results from the Site Characterization, the Old Upper Mountain Road Site was listed as a Class 2 Site in the Registry of Inactive Hazardous Waste Disposal Sites in New York State.

Site Geology and Hydrogeology:

Native soils underlying the site include a thin glaciolacustrine deposit consisting primarily of tan to brown silty clays and clayey silts containing rock fragments, and light brown very fine sand with a trace of silt. Native soils directly overly weathered bedrock.

The uppermost bedrock unit underlying the site is the Guelph Dolostone Formation of the Lockport Group. Depth to bedrock ranges from 2 feet at OU 03 to greater than 78 feet in the former ravine at OU 01.

Groundwater underlying the Old Upper Mountain Road Site occurs primarily in the upper fractured bedrock, and flows in a radial pattern toward the former ravine. Groundwater ultimately discharges into Gulf Creek at seeps emanating from the ash waste that fills the former ravine.

Operable Unit (OU) Numbers 01 and 02 are the subject of this document.

A Record of Decision was issued previously for OU 03.

A site location map is attached as Figure 1, with the operable units shown on Figure 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) are/is being evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the investigation to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

No PRPs have been documented to date.

After the remedy is selected, the Department will again attempt to identify PRPs to assume responsibility for the remedial program. If an agreement cannot be reached with the PRPs, or none are identified, the Department will evaluate the site for further action under the State Superfund. The PRPs are subject to legal actions by the state for recovery of all response costs the state has incurred.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

The analytical data collected on this site includes data for:

- groundwater

- surface water
- soil
- sediment

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. The tables found in Exhibit A list the applicable SCGs in the footnotes. 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 hazardous waste 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 in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

For OU: 01

BENZO(A)PYRENE
ARSENIC
BARIUM
CADMIUM
CHROMIUM
LEAD
MERCURY
NICKEL
ZINC
COPPER
BENZ(A)ANTHRACENE
BENZO(B)FLUORANTHENE
BENZO[K]FLUORANTHENE
CHRYSENE
DIBENZ[A,H]ANTHRACENE
INDENO(1,2,3-CD)PYRENE

For OU: 02

BENZ(A)ANTHRACENE
ANTIMONY
ARSENIC
CADMIUM
CHROMIUM
COPPER
LEAD
MERCURY
NICKEL
ZINC
BENZO(A)PYRENE
BENZO(B)FLUORANTHENE
BENZO[K]FLUORANTHENE
INDENO(1,2,3-CD)PYRENE
PHENANTHRENE

As illustrated in Exhibit A, the contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- surface water
- soil
- sediment

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 Record of Decision.

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 Fish and Wildlife Resources Impact Analysis (FWRIA) for OUs 01 and 02, which is/are included in the RI report(s), present(s) a detailed discussion of the existing and potential impacts from the site to fish and wildlife receptors.

The FWRIA identified the following environmental exposure pathways and ecological risks at OU 01 and OU 02 from metals, and to a lesser extent, semivolatile organic compounds: (1) dermal contact of contaminated soil, waste and sediment by terrestrial and aquatic organisms; (2) inhalation of contaminated particulates by terrestrial organisms; and (3) ingestion of contaminated soil, waste and sediment by terrestrial and aquatic organisms.

Waste consisting primarily of white to gray ash containing metal, glass, rock, ceramic, coal, brick and concrete fragments with occasional layers of black foundry sand is exposed at the surface throughout the site. This waste ranges in thickness from 0.5 to 78 feet. The thickest fill was encountered at OU 01 where the former ravine was filled with ash. The estimated volume of waste material at the site is approximately 210,000 cubic yards; 10,000 cubic yards of the total volume is found at OU 03. Incinerator ash was found throughout the site, with thirteen samples of this ash failing the Toxicity Characteristic Leaching Procedure (TCLP) Regulatory Limit for lead, indicating that characteristic hazardous waste (D008) was present at the site. This ash also contains elevated concentrations of SVOCs and other metals.

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*.

The site is partially fenced and persons who enter the site could contact contaminants in the soil by walking on the soil, digging or otherwise disturbing the soil. People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Although access is difficult, people may come in contact with contaminated creek water and shallow creek sediments when entering or exiting the creek.

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:

For OU 01:

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.
- Prevent the discharge of contaminants to surface water.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

RAOs for Environmental Protection

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

For OU 02:

Surface Water

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Restore surface water to ambient water quality criteria for the contaminant of

concern.

- Prevent impacts to biota from ingestion/direct contact with surface water causing toxicity and impacts from bioaccumulation through the marine or aquatic food chain.

Sediment

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Prevent releases of contaminant(s) from sediments that would result in surface water levels in excess of ambient water quality criteria.
- Prevent impacts to biota from ingestion/direct contact with sediments causing toxicity or impacts from bioaccumulation through the marine or aquatic food chain.
- Restore sediments to pre-release/background conditions to the extent feasible.

SECTION 7: SUMMARY OF THE PROPOSED REMEDY

To be selected, the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5. Potential remedial alternatives for the Site were identified, screened and evaluated in the FS report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit B. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit C.

The basis for the Department's proposed remedy is set forth at Exhibit D.

For OU 01: Landfill - Old Upper Mountain Road Parcel, the proposed remedy is referred to as the Landfill Capping with a Part 360 Cap - Extended Landfill Footprint remedy.

The estimated present worth cost to implement the remedy is $6,143,000. The cost to construct the remedy is estimated to be $5,862,000 and the estimated average annual cost is $9,500.

The elements of the proposed remedy are as follows:

1. A remedial design program to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program, including the re-routing of a sewer line that crosses the landfill and improvement of access roads into the ravine. Some modification to the Part 360 requirements may be contemplated during the design. 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 gas 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; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. To prepare for the construction of a multi-layer cap (Part 360 cap or a modified Part 360 Cap; item 4 below) over ash waste that exceeds the unrestricted soil cleanup objectives, relocation and contouring of the ash waste will be necessary to achieve the 3:1 slopes required for cap stability. This material will be placed into the open ravine at the base of OU 01 to extend the current footprint of the landfill farther into the ravine. To accomplish this an approximate 800 foot long section of Gulf Creek (approximately 1.75 acres) will be culverted to allow for the relocation of ash to the ravine. Mitigation to offset the loss of the stream and any associated wetland areas from the filling will be required elsewhere in Gulf Creek or the Eighteenmile Creek watershed. This mitigation will be detailed in a mitigation plan which, at a minimum, will replace the area of lost stream/wetland at a 1:1 ratio and be consistent with the requirements of 6 NYCRR Part 608.

3. Prior to extending the landfill into the open ravine, a groundwater drainage and diversion system will be installed to convey groundwater that naturally flows down the filled portion of the ravine to Gulf Creek at a fixed point(s) along the toe of the extended landfill. Groundwater drainage and diversion is necessary to keep it from building up under the cap and eventually causing cap failure. Construction of the diversion system will require the use of filter fabrics or other means to filter the groundwater entering this system to achieve surface water quality discharge limits for site-related contaminants, before discharge. The flow from the extended culvert will flow down an armored diversion swale constructed across the top of the extended landfill.

4. The site cap will be constructed to allow for commercial use of the site. The cap will consist of either the structures, such as buildings, pavement and sidewalks comprising site development, or a multi-layer cap (Part 360 cap or a modified Part 360 Cap) in areas where the upper one foot

of exposed surface soil exceeds the applicable soil cleanup objectives (SCOs). Any fill material brought to the site will meet the requirements for the commercial use SCOs on the upland areas and the protection of ecological resources SCOs in the ravine area, as set forth in 6 NYCRR Part 375-6.7(d).

5. Imposition of an institutional control in the form of an Environmental Easement for the controlled property that:

- Requires 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);
- Allows the use and development of the controlled property for commercial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- Restricts 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;
- Prohibits agriculture or vegetable gardens on the controlled property; and
- Requires compliance with the Department approved Site Management Plan.

6. A Site Management Plan that includes the following:

- 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:

(a) Institutional Controls: The Environmental Easement discussed in Paragraph 5 above; and
(b) Engineering Controls: The cap discussed in Paragraph 4 above.

This plan includes, but may not be limited to:
(1) An Excavation Plan that details the provisions for management of future excavations in areas of remaining contamination;
(2) Descriptions of the provisions of the environmental easement including any land use and groundwater restrictions;
(3) Provisions for the management and inspection of the identified engineering controls;
(4) Maintaining site access controls and Department notification; and
(5) The steps necessary for periodic reviews and certification of the institutional and engineering controls.

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

(a) Monitoring of sediment, surface water, biota, groundwater and the creek restoration actions to assess the performance and effectiveness of the remedy;
(b) Monitoring of the discharge from the diversion system to ensure that surface water quality discharge standards for site-related contaminants are achieved; and
(c) A schedule of monitoring and frequency of submittals to the Department.

For OU 02: Gulf Creek, the proposed remedy is referred to as the Complete Removal with Disposal remedy.
The estimated present worth cost to implement the remedy is $4,340,000. The cost to construct the remedy is estimated to be $4,340,000 and the estimated average annual cost is $0.

The elements of the proposed remedy are as follows:

1. A remedial design program to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program, including the full delineation of sediment requiring removal, the re-routing of a sewer line that underlies the creek, improvement of access roads into the ravine, and diversion of creek flow during remedial action. A floodplain and hydraulic study will be completed to help with a design for a creek restoration plan that optimizes aquatic and riparian habitat. 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 the same as described for OU 01 above.

2. The complete excavation of all contaminated sediment in Gulf Creek between the site and Niagara Street that exceeds the sediment SCGs (approximately 18,100 cubic yards). All excavated sediment will be dewatered at a facility constructed at the site before being placed in OU 01 prior to the construction of the multi-layer cap (Part 360 cap or a modified Part 360 Cap) proposed for OU 01 (Landfill Capping with a Part 360 Cap - Extended Landfill Footprint).

3. Following removal of all contaminated sediments, the excavation area will be restored to its original grade. To the extent possible, restoration will be with material similar to the existing substrate. A restoration plan will be developed during design and will meet the substantive requirements of Article 15 and 6 NYCRR Part 608.

4. Monitoring of sediment, surface water, biota, groundwater and the creek restoration actions as described for the proposed remedy of OU 01.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation (RI) and Supplemental RI for all environmental media that were evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into three groups: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and inorganics (metals and cyanide). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 6.1.1 are also presented.

Waste/Source Areas

As described in the RI report, waste/source areas were identified at the site and are impacting groundwater, surface water and sediment.

Wastes are defined in 6 NYCRR Part 375-1.2 (aw) and include solid, industrial and/or hazardous wastes. Source Areas are defined in 6 NYCRR Part 375(au). Source areas are areas of concern at a site where substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium. Wastes and source areas that were identified at the site include the ash waste of OU 01. This waste consists primarily of white to gray ash containing metal, glass, rock, ceramic, coal, brick and concrete fragments with occasional layers of black foundry sand. The primary contaminants of concern in the ash include metals, and to a much lesser degree SVOCs (Table 1). The SVOCs detected consisted primarily of polycyclic aromatic hydrocarbons (PAHs). Of these compounds, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene were detected at concentrations that exceeded the NYSDEC Part 375 unrestricted soil cleanup objectives (Table 1; Figure 4). Samples exceeding the NYSDEC Part 375 commercial soil cleanup objectives for SVOCs are shown on Figure 5 and in Table 1. PAHs are a group of over 100 different chemicals that are common in the environment. Sources of PAHs include incomplete combustion of coal, oil, gasoline, garbage, wood, automobiles and incinerators.

Metals were the predominant contaminants detected in the ash waste at OU 01. Of these compounds, arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver and zinc were detected at concentrations that exceeded the NYSDEC Part 375 unrestricted soil cleanup objectives (Table 1; Figure 4). Samples exceeding the NYSDEC Part 375 commercial soil cleanup objectives for metals are shown on Figure 5 and in Table 1. Sixty-seven waste samples were also analyzed for the characteristics of hazardous waste using the Toxicity Characteristic Leaching Procedure (TCLP). These results reveal that ash throughout OU 01 is a characteristic hazardous waste for lead (D008; Figure 6). The estimated volume of ash waste at OU 01 is 200,000 cubic yards.

The waste/source areas identified will be addressed in the remedy selection process.

Table 1 - Waste (OU 01)

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted SCG[c] (ppm)	Frequency Exceeding Restricted SCG
SVOCs					
Benzo(a)anthracene	ND – 70	1	7 of 17	5.6	2 of 17
Benzo(a)pyrene	ND – 50	1	6 of 17	1	6 of 17
Benzo(b)fluoranthene	0.12 – 160	1	10 of 17	5.6	2 of 17
Benzo(k)fluoranthene	ND – 37	0.8	4 of 17	56	0 of 17
Chrysene	ND – 78	1	8 of 17	56	1 of 17
Dibenzo(a,h)anthracene	ND – 22	0.33	7 of 17	0.56	3 of 17
Indeno(1,2,3-cd)pyrene	ND – 70	0.5	8 of 17	5.6	1 of 17
Metals					
Arsenic	ND – 1,000	13	77 of 99	16	68 of 99
Barium	11 – 6,500	350	66 of 99	400	62 of 99
Cadmium	ND – 130	2.5	61 of 99	9.3	21 of 99
Chromium	7.3 – 1,100	30	58 of 99	1,500	0 of 99
Copper	30 – 25,000	50	45 of 46	270	33 of 46
Lead	28 – 23,000	63	98 of 99	1,000	64 of 99
Mercury	ND – 20	0.18	76 of 99	2.8	14 of 99
Nickel	15 – 590	30	36 of 46	310	3 of 46
Selenium	ND – 10.0	3.9	14 of 46	1,500	0 of 46
Silver	ND – 110	2	19 of 46	1,500	0 of 46
Zinc	270 – 22,000	109	46 of 46	10,000	3 of 46

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Commercial Soil Cleanup Objectives.

Groundwater

Groundwater samples were collected from overburden and bedrock monitoring wells installed at OU 01 (Figure 7) to determine if contaminants in the ash waste at this operable unit were adversely impacting site groundwater. The contaminants of concern in site groundwater include SVOCs and metals (Table 2). VOCs were also detected in site groundwater (Table 2), but as discussed below, are not considered contaminants of concern at the site.

The contaminants of concern in groundwater at OU 01 that are associated with the ash waste are SVOCs and metals. The extent of groundwater contamination by these contaminants is shown on Figure 7. The highest concentrations of these contaminants were detected in well MW-4, which monitors the ash waste in the former ravine where waste thickness is greatest. Twenty-one of twenty-two SVOC exceedances and 51% of the metals exceedances were associated with this well.

To determine if metals were leaching from the ash waste at OU 01 under natural conditions, both filtered and unfiltered groundwater samples were analyzed. Due to the high concentrations and large percentage of exceedances in well MW-4, the results from this well are summarized in Table 3. This table shows numerous exceedances for the unfiltered sample, but only one exceedance (sodium) for the filtered sample. These results suggest that turbidity (sediment) in the sample is the cause of the high contaminant concentrations in this well. The filtered and unfiltered results from well MW-3 show the same relationship.

It is important to note that the VOCs detected in groundwater at OU 01 were not detected in the ash waste at this operable unit. The absence of VOCs in the ash waste, combined with the presence of VOCs in upgradient wells and at known upgradient sites, suggests an off-site source(s) for this contamination. Therefore, the VOCs found in groundwater are not considered site specific contaminants of concern. In addition, iron, magnesium and sodium are naturally occurring, with concentrations of these metals likely representing background concentrations in this area of Lockport.

Since high turbidity in the samples is the apparent cause of the groundwater contamination identified at OU 01 during the RI and Supplemental RI, specific remedial alternatives for groundwater do not need to be evaluated.

Table 2 – Groundwater (OU 01)

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
1,1-Dichloroethane	ND – 5.5	5	1 of 10
Chloroform	ND – 25	7	2 of 10

Cis-1,2-Dichloroethene	ND – 18	5	6 of 10
Toluene	ND – 5.6	5	1 of 10
Trichloroethene	ND – 17	5	4 of 10
Vinyl Chloride	ND – 6.6	2	4 of 10
SVOCs			
Acenaphthene	ND – 22	20	1 of 10
Benzo(a)pyrene	ND – 45	ND	2 of 10
Benzo(b)fluoranthene	ND – 61	0.002	2 of 10
Benzo(k)fluoranthene	ND – 27	0.002	2 of 10
Bis(2-ethylhexyl)phthalate	ND – 28	5	3 of 10
Chrysene	ND – 61	0.002	2 of 10
Fluoranthene	ND – 140	50	2 of 10
Indeno(1,2,3-cd)pyrene	ND – 29	0.002	2 of 10
Naphthalene	ND – 37	10	2 of 10
Phenanthrene	ND – 180	50	2 of 10
Pyrene	ND – 130	50	2 of 10
Metals			
Aluminum	ND – 110,000	100	13 of 14
Antimony	ND – 64	3	3 of 9
Arsenic	ND – 110	25	3 of 14
Barium	ND – 8,100	1,000	3 of 14
Beryllium	ND – 32	3	2 of 14
Cadmium	ND – 200	5	3 of 14
Chromium	ND – 2,900	50	6 of 14
Cobalt	ND – 290	5	3 of 14
Copper	ND – 17,000	200	3 of 14
Iron	380 – 1,200,000	300	14 of 14
Lead	ND – 49,000	25	7 of 14

Magnesium	11,000 – 160,000	35,000	8 of 14
Manganese	ND – 21,000	300	8 of 14
Mercury	ND – 8.9	0.7	4 of 14
Nickel	ND – 1,200	100	3 of 14
Sodium	20,000 – 220,000	20,000	14 of 14
Zinc	ND – 120,000	2,000	3 of 14

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b - SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface Water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

Table 3 – Filtered vs Unfiltered Groundwater Results for MW-04 (Exceedances are Shaded)

Detected Constituents	Unfiltered Concentration (ppb)[a]	Filtered Concentration (ppb)	SCG[b] (ppb)
Metals			
Aluminum	**11,000**	ND	100
Antimony	**27**	ND	3
Arsenic	**45**	ND	25
Barium	**1,700**	440	1,000
Cadmium	**16**	ND	5
Chromium	**320**	ND	50
Cobalt	**18**	ND	5
Copper	**1,700**	ND	200
Iron	**150,000**	ND	300
Lead	**3,100**	5.1	25
Magnesium	**41,000**	32,000	35,000
Manganese	**1,100**	91	300
Mercury	**2.3**	ND	0.7
Nickel	87	ND	100

Sodium	**130,000**	**130,000**	20,000
Zinc	**7,400**	ND	2,000

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b - SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface Water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

Soil

Nine surface soil samples (0-2 inches depth) were collected from OU 01 during the RI to assess direct human exposure to the ash waste, while three subsurface soil samples were collected from the native soil below the ash waste to assess the downward migration of contaminants (Figure 3). The surface soil results are summarized in Table 4, while the subsurface soil results are summarized in Table 5.

The contaminants of concern in surface soil at OU 01 include SVOCs and metals (Table 4). The SVOCs and metals detected consisted primarily of the same SVOCs and metals detected in the ash waste (compare Table 4 with Table 1). Surface soil samples at OU 01 that exceeded the NYSDEC Part 375 unrestricted soil cleanup objectives are shown on Figure 4, while surface soil samples that exceeded the NYSDEC Part 375 commercial soil cleanup objectives are shown on Figure 5.

Seven of the nine surface soil samples at OU 01 were also analyzed for the characteristics of hazardous waste by TCLP. These results reveal that some surface soil at OU 01 is a characteristic hazardous waste for lead (D008; Figure 6).

Table 4 - Surface Soil (OU 01)

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted SCG[c] (ppm)	Frequency Exceeding Restricted SCG
SVOCs					
Benzo(a)anthracene	0.17 – 5.1	1	6 of 9	5.6	0 of 9
Benzo(a)pyrene	0.12 – 5.0	1	6 of 9	1	6 of 9
Benzo(b)fluoranthene	ND – 7.8	1	7 of 9	5.6	1 of 9
Benzo(k)fluoranthene	ND – 2.5	0.8	4 of 9	56	0 of 9
Chrysene	0.14 – 5.5	1	6 of 9	56	0 of 9
Dibenzo(a,h)anthracene	ND – 1.1	0.33	6 of 9	0.56	2 of 9

Indeno(1,2,3-cd)pyrene	ND – 2.9	0.5	6 of 9	5.6	0 of 9
Metals					
Arsenic	6.2 – 35	13	5 of 9	16	4 of 9
Barium	96 – 1,000	350	4 of 9	400	4 of 9
Cadmium	ND – 20	2.5	6 of 9	9.3	2 of 9
Chromium	9.5 – 190	30	6 of 9	1,500	0 of 9
Copper	65 – 3,700	50	9 of 9	270	6 of 9
Lead	170 – 19,000	63	9 of 9	1,000	7 of 9
Mercury	ND – 3.0	0.18	6 of 9	2.8	1 of 9
Nickel	16 – 250	30	8 of 9	310	0 of 9
Silver	ND – 33	2	5 of 9	1,500	0 of 9
Zinc	170 – 33,000	109	9 of 9	10,000	1 of 9

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Commercial Soil Cleanup Objectives.

Three samples of subsurface soil below the ash waste were collected from OU 01 and analyzed for arsenic, barium, cadmium, chromium, lead and mercury. None of these metals were detected at concentrations that exceeded the NYSDEC Part 375 unrestricted or commercial soil cleanup objectives (Table 5). These results indicate that contaminants in the ash waste are not migrating into the underlying native soils.

Table 5 - Subsurface Soil (OU 01)

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted SCG[c] (ppm)	Frequency Exceeding Restricted SCG
Metals					
Arsenic	ND – 7.6	13	0 of 3	16	0 of 3
Barium	ND – 64	350	0 of 3	400	0 of 3
Cadmium	ND	2.5	0 of 3	9.3	0 of 3
Chromium	6 – 8.4	30	0 of 3	1,500	0 of 3

Lead	16 – 42	63	0 of 3	1,000	0 of 3
Mercury	ND	0.18	0 of 3	2.8	0 of 3

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Commercial Soil Cleanup Objectives.

Based on the findings of the RI, the past disposal of hazardous waste has resulted in the contamination of surface soil at OU 01 of the site. The site contaminants identified in surface soil that are considered to be the primary contaminants of concern, to be addressed by the remedy selection process, are SVOCS and metals. Native subsurface soils have not been adversely impacted by the ash waste and will not require remediation.

Surface Water

Thirteen surface water samples were collected from Gulf Creek (OU 02) during the RI and Supplemental RI to determine if contaminants in the ash waste at OU 01 were adversely impacting surface water in the creek (Figure 8). Surface water samples were also collected from sanitary and storm sewers near the site to further evaluate the presence of VOCs in surface water discharging from a storm sewer into Gulf Creek (Figure 8). The surface water results from Gulf Creek are summarized in Table 6, while the surface water results from the sewers are summarized in Table 7. The contaminants of concern in surface water at OU 02 include SVOCs and metals (Table 6). VOCs were also detected in surface water (Tables 6 and 7), but as discussed below, are not considered contaminants of concern at the site. The extent of surface water contamination is shown on Figure 8.

VOCs were detected in surface water from Gulf Creek (Table 6) and in the sanitary and storm sewers near the site (Table 7). The absence of VOCs in the ash waste at OU 01, the presence of VOCs in the storm sewer that discharges to Gulf Creek, and the presence of VOCs in the sanitary sewer upgradient of the site, suggests an off-site source(s) for this contamination. Therefore, the VOCs found in surface water of Gulf Creek are not considered site specific contaminants of concern.

Benzo(b)fluoranthene and bis(2-ethylhexyl)phthalate were the only SVOCs detected in surface water from Gulf Creek that exceeded NYSDEC surface water standards (Table 6). Bis(2-ethylhexyl)phthalate also exceeded NYSDEC surface water standards in the storm and sanitary sewer samples (Table 7). This contaminant, however, was not detected in ash waste samples at concentrations that exceeded NYSDEC soil cleanup objectives. Therefore, bis(2-ethylhexyl)-phthalate in surface water is not considered a site specific contaminant of concern. Benzo(b)fluoranthene was detected in the ash waste at OU 01.

Aluminum, iron, lead, magnesium and manganese were the only metals detected in surface water from Gulf Creek that exceeded NYSDEC surface water standards (Table 6). Aluminum and iron also exceeded NYSDEC surface water standards in the storm and sanitary sewer samples (Table 7). In addition, iron and magnesium are naturally occurring, with concentrations of these metals likely

representing background concentrations in this area of Lockport. Only lead appears to be related to the ash waste at OU 01.

To determine if lead (and other metals) was leaching from the ash waste at OU 01 under natural conditions, both filtered and unfiltered samples of seeps originating from the filled ravine were analyzed. The results from Seep-3, which contained the highest concentrations of metals, are summarized in Table 8. This table shows several exceedances for the unfiltered sample, but only one (sodium) for the filtered sample. These results suggest that turbidity in the sample is the cause of the high contaminant concentrations in this sample. The filtered and unfiltered results from the other seep samples show the same relationship, with only sodium exceeding the NYSDEC surface water standards in all filtered samples.

The absence of arsenic, barium and copper in the surface water samples (Table 6), coupled with the absence of contamination (except for sodium) in the filtered seep samples, suggests that the ash waste of OU 01 is not adversely impacting surface water in Gulf Creek. As a result, specific remedial alternatives for surface water at OU 02 do not need to be evaluated.

Table 6 – Surface Water from Gulf Creek (OU 02)

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
Chloroform	ND – 7.7	7	1 of 5
1,2-Dichloroethene (total)	ND – 8.7	5	1 of 5
Tetrachloroethene	ND – 3.9	0.7	1 of 5
Toluene	ND – 5.7	5	1 of 5
Trichloroethene	ND – 12	5	3 of 5
SVOCs			
Benzo(b)fluoranthene	ND – 2.4	0.002	1 of 4
Bis(2-ethylhexyl)phthalate	ND – 5.7	5	1 of 4
Metals			
Aluminum	ND – 7,500	100	8 of 13
Iron	ND – 9,800	300	8 of 13
Lead	ND – 220	50	5 of 13
Magnesium	12,000 – 39,000	35,000	3 of 13

Manganese	ND – 430	300	2 of 13

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b - SCG: Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1) and 6 NYCRR Part 703, Surface Water and Groundwater Quality Standards.

Table 7 – Surface Water from Storm & Sanitary Sewers

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
Acetone	ND – 74	50	2 of 5
1,2-Dichloroethene (total)	ND – 20	5	2 of 5
Tetrachloroethene	ND – 7.8	0.7	2 of 5
Trichloroethene	ND – 9.1	5	1 of 5
Vinyl Chloride	ND – 5.9	0.3	1 of 5
SVOCs			
Bis(2-ethylhexyl)phthalate	6.6 – 7.3	5	2 of 2
Metals			
Aluminum	5,600 – 6,700	100	2 of 2
Iron	980 – 1,100	300	2 of 2

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b - SCG: Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1) and 6 NYCRR Part 703, Surface Water and Groundwater Quality Standards.

Table 8 – Filtered vs Unfiltered Surface Water Results from Sample Seep-3 (Exceedances are Shaded)

Detected Constituents	Unfiltered Concentration (ppb)[a]	Filtered Concentration (ppb)	SCG[b] (ppb)
Metals			
Aluminum	**5,600**	ND	100
Arsenic	10	ND	25
Barium	110	56	1,000
Cadmium	4.3	ND	5

Cobalt	2	ND	5
Copper	**250**	ND	200
Iron	**6,600**	ND	300
Lead	**220**	4.5	25
Magnesium	**39,000**	34,000	35,000
Manganese	98	ND	300
Sodium	**140,000**	**120,000**	20,000
Zinc	820	260	2,000

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b - SCG: Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1) and 6 NYCRR Part 703, Surface Water and Groundwater Quality Standards.

Sediments

Fifty-eight sediment samples were collected from Gulf Creek (OU 02) during the RI and Supplemental RI to determine if contaminants in the ash waste at OU 01 were adversely impacting creek sediment. These samples were collected from the site to Niagara Street, a distance of approximately 4,400 feet (Figure 9). Samples from Niagara Street to Eighteenmile Creek were collected by the United States Environmental Protection Agency (USEPA) as part of the Eighteenmile Creek NPL Site.

The primary contaminants of concern in Gulf Creek sediment include SVOCs and metals (Table 9). The SVOCs and metals that exceeded sediment SCGs consisted primarily of the same SVOCs and metals detected in the ash waste (compare Table 9 with Table 1). The extent of sediment contamination by these contaminants is shown on Figure 9. The estimated volume of contaminated sediment at OU 02 is approximately 18,100 cubic yards. Concentrations of SVOCs and metals are generally highest near OU 01 and decrease downstream.

Four sediment samples were also analyzed for the characteristics of hazardous waste by TCLP. These results reveal that none of the sediment in OU 02 is a characteristic hazardous waste.

Based on the findings of the RI and Supplemental RI, the past disposal of hazardous waste has resulted in the contamination of sediment at OU 02 of the site. The site contaminants identified in sediment that are considered to be the primary contaminants of concern, to be addressed by the remedy selection process, are SVOCs and metals.

Table 9 – Sediment (OU 02)					
Detected Constituents	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)	Frequency Exceeding SCG	Site Derived Value[c] (ppm)	Frequency Exceeding Site Derived Value
SVOCs					
Benzo(a)anthracene	ND – 3.9	0.122[f]	14 of 17	0.448[e]	10 of 17
Benzo(a)pyrene	ND – 3.5	0.013[d]	14 of 17	0.047[d]	14 of 17
Benzo(b)fluoranthene	ND – 4.9	0.013[d]	16 of 17	0.047[d]	16 of 17
Benzo(k)fluoranthene	ND – 1.8	0.013[d]	11 of 17	0.047[d]	11 of 17
Indeno(1,2,3-cd)pyrene	ND – 2.9	0.013[d]	14 of 17	0.047[d]	14 of 17
Phenanthrene	ND – 4.9	1.2[f]	8 of 17	4.3[e]	1 of 17
Metals					
Antimony	ND – 13	LEL: 2.0	11 of 58		
		SEL: 25.0	0 of 58		
Arsenic	ND – 38	LEL: 6.0	48 of 58		
		SEL: 33.0	2 of 58		
Cadmium	ND – 16	LEL: 0.6	50 of 58		
		SEL: 9.0	11 of 58		
Chromium	ND – 150	LEL: 26.0	48 of 58		
		SEL: 110	2 of 58		
Copper	18 – 8,200	LEL: 16.0	58 of 58		
		SEL: 110	45 of 58		
Iron	7,900 – 120,000	LEL: 20,000	41 of 58		
		SEL: 40,000	10 of 58		
Lead	43 – 2,700	LEL: 31.0	58 of 58		
		SEL: 110	54 of 58		
Manganese	200 – 5,100	LEL: 460	46 of 58		
		SEL: 1,100	11 of 58		
Mercury	ND – 2.9	LEL: 0.15	32 of 58		
		SEL: 1.3	1 of 58		
Nickel	ND – 120	LEL: 16.0	54 of 58		
		SEL: 50.0	38 of 58		

Silver	ND – 8.7	LEL: 1.0	4 of 58		
		SEL: 2.2	4 of 58		
Zinc	100 – 3,700	LEL: 120	57 of 58		
		SEL: 270	54 of 58		

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in sediment;
b - SCG: The Department's "Technical Guidance for Screening Contaminated Sediments."
c – Site Derived Value: values derived using the Department's "Technical Guidance for Screening Contaminated Sediments" with the lower confidence limit (3.58%) of the average TOC concentration.
d – Value is based on Human Health Bioaccumulation
e - Value is based on Benthic Aquatic Life Chronic Toxicity
LEL = Lowest Effects Level and SEL = Severe Effects Level. A sediment is considered contaminated if either of these criteria is exceeded. If the SEL criteria are exceeded, the sediment is severely impacted. If only the LEL is impacted, the impact is considered moderate.

Exhibit B

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Section 6.5) to address the contaminated media identified at the site as described in Exhibit A.

Remedial Alternatives for OU 01

OU 01 Alternative 1A: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

OU 01 Alternative 1B: Site Management

The Site Management Alternative requires only institutional controls for the site. This alternative includes institutional controls, in the form of an environmental easement, a site management plan and fencing, which are necessary to protect public health and the environment from any contamination identified at the site. Long-term costs associated with this alternative include periodic inspections and repairs to the fence when required.

Present Worth:.....*$160,000*
Capital Cost:.....*$99,000*
Annual Costs:.....*$4,000*

OU 01 Alternative 2: Complete Removal with Off-Site Disposal

This alternative achieves all of the SCGs discussed in Section 5.1.1 and soil meets the unrestricted soil clean objectives listed in Part 375-6.8(a). This alternative consists of the excavation of all ash waste at OU 01 that exceeds the unrestricted soil cleanup objectives (approximately 200,000 cubic yards). The area to be excavated is shown on Figure 10. Excavation is a common remedy used to remove contaminated soil or waste from a source area, and is effective at eliminating exposure and preventing transport of contaminants.

Special considerations are required at OU 01 due to the physical setting and steep slopes of the ravine. Modification and maintenance of ravine access is needed to allow for complete waste removal. In addition, a sewer line runs through the existing waste and will need to be re-routed before excavation takes place.

During excavation, the ash waste will be segregated (hazardous versus non-hazardous) based upon chemical analysis, and transported to the appropriate off-site disposal facilities. The collection of verification samples following excavation will confirm that all waste exceeding the unrestricted soil cleanup objectives has been removed from OU 01.

The excavated area of OU 01 will not be restored to pre-existing grade, but will be restored with a sufficient quantity of clean soil backfill and topsoil to support the growth of native grasses and shrubs.

Since all waste exceeding the unrestricted soil cleanup objectives is removed from OU 01 under this alternative, institutional controls and long-term monitoring are not required.

The time required to complete this alternative is estimated to be 40 months.

Present Worth:.....*$43,609,000*
Capital Cost:.....*$43,609,000*
Annual Costs:.....*$0*

OU 01 Alternative 3: Ex-Situ Stabilization with Off-Site Disposal

This alternative consists of all elements of Alternative 2 with the difference being that the excavated material from OU 01 will be staged on-site and stabilized prior to off-site disposal. The area to be excavated is shown on Figure 10. Ex-situ stabilization is a process that uses a stabilizing agent to bind contaminants in place to reduce their solubility and/or mobility. Under this process, the excavated material is mixed in a temporary mixing facility (i.e., pug mill, mixer, etc.) with a stabilizing agent. The stabilization process allows the waste to be disposed as solid waste at appropriate off-site disposal facilities.

Since all waste exceeding the unrestricted soil cleanup objectives is removed from OU 01 under this alternative, institutional controls and long-term monitoring are not required.

The time required to complete this alternative is estimated to be 40 months.

Present Worth:.....*$40,509,000*
Capital Cost:.....*$40,509,000*
Annual Costs:.....*$0*

OU 01 Alternative 4: Landfill Capping with a Part 360 Cap - Existing Landfill Footprint

This alternative consists of the construction of a multi-layer cap (Part 360 cap) over ash waste at OU 01 that exceeds the unrestricted soil cleanup objectives to prevent direct contact exposures and the leaching of contaminants from the waste. The area to be capped is shown on Figure 11. Capping with a Part 360 Cap is a common remedy, and is effective at eliminating exposure, preventing the infiltration of precipitation into contaminated material, and preventing the transport of contaminants. Some modification to the Part 360 requirements (e.g., reduce/eliminate of gas collection) may be contemplated during the design.

Special considerations are required for cap construction at OU 01 due to the physical setting and steep slopes of the ravine. Modification and maintenance of ravine access is needed to allow for

access to the embankment. Existing grades of the waste are steep, and will require considerable earth work to achieve the 3:1 slopes required for cap stability. Due to space constraints, excavated material will be segregated (hazardous versus non-hazardous) and transported to the appropriate off-site disposal facilities. The area to be excavated prior to capping is shown on Figure 11. In addition, a permeable barrier wall will be constructed at the base of the landfill to keep groundwater that naturally flows down the filled portion of the ravine from building up under the cap and eventually causing cap failure. Lastly, a sewer line runs through the existing waste and will need to be re-routed around the site before earth work and capping take place.

Since contaminated waste will remain at OU 01 under this alternative, institutional controls, in the form of an environmental easement, a site management plan and fencing, are necessary to protect public health and the environment from contamination remaining on-site. Long-term monitoring includes the periodic sampling and analysis of groundwater. Long-term costs associated with this alternative include periodic inspections of the cap, repairs when required, and annual mowing.

The time required to complete this alternative is estimated to be 21 months. Long-term monitoring would continue for 30 years.

Present Worth:.....*$26,975,000*
Capital Cost:.....*$26,552,000*
Annual Costs:.....*$14,000*

OU 01 Alternative 5: Landfill Capping with a Part 360 Cap - Extended Landfill Footprint

This alternative consists of the construction of a multi-layer cap (Part 360 cap) over ash waste at OU 01 that exceeds the unrestricted soil cleanup objectives to prevent direct contact exposures and the leaching of contaminants from the waste. The area to be capped is shown on Figure 12. Capping with a Part 360 Cap is a common remedy, and is effective at eliminating exposure, preventing the infiltration of precipitation into contaminated material, and preventing the transport of contaminants. Some modification to the Part 360 requirements (e.g., reduce/eliminate of gas collection) may be contemplated during the design.

Special considerations are required for cap construction at OU 01 due to the physical setting and steep slopes of the ravine. Modification and maintenance of ravine access is needed to allow for access to the embankment. Existing grades of the waste are steep, and will require considerable earth work to achieve the 3:1 slopes required for cap stability. This material will be placed into the open ravine at the base of OU 01 to extend the current footprint of the landfill farther into the ravine (Figure 12). Prior to extending the landfill into the open ravine, a groundwater drainage and diversion system will be installed to convey groundwater that naturally flows down the filled portion of the ravine to Gulf Creek at a fixed point(s) along the toe of the extended landfill (Figure 13). Groundwater drainage and diversion is necessary to keep it from building up under the cap and eventually causing cap failure. In addition, a sewer line runs through the existing waste and will need to be re-routed around the site before earth work and capping take place.

Since contaminated waste will remain at OU 01 under this alternative, institutional controls, in the form of an environmental easement, a site management plan and fencing, are necessary to protect public health and the environment from contamination remaining on-site. Long-term monitoring includes the periodic sampling and analysis of groundwater. Long-term costs associated with this alternative include periodic inspections of the cap, repairs when required, and annual mowing.

The time required to complete this alternative is estimated to be 9 months. Long-term monitoring would continue for 30 years.

Present Worth:.....*$6,143,000*
Capital Cost:.....*$5,862,000*
Annual Costs:.....*$9,500*

OU 01 Alternative 6: Landfill Capping with a Clean Soil Cover – Extended Landfill Footprint

This alternative consists of all elements of Alternative 5 with the difference being that a 2-foot thick clean soil cover with a demarcation layer will be constructed over the ash waste at OU 01 rather than a Part 360 cap. The top 6 inches of the soil cover will consist of topsoil to be planted with native grasses and/or shrubs. The area to be covered is the same as the area to be capped under Alternative 5 (Figure 12). Capping with a clean soil cover is a common remedy that is effective at eliminating exposure and preventing the transport of waste by erosion.

Since contaminated waste will remain at OU 01 under this alternative, institutional controls, in the form of an environmental easement, a site management plan and fencing, are necessary to protect public health and the environment from contamination remaining on-site. Long-term monitoring includes the periodic sampling and analysis of groundwater. Long-term costs associated with this alternative include periodic inspections of the soil cover, repairs when required, and annual mowing.

The time required to complete this alternative is estimated to be 9 months. Long-term monitoring would continue for 30 years.

Present Worth:.....*$4,377,000*
Capital Cost:.....*$4,096,000*
Annual Costs:.....*$9,500*

OU 01 Alternative 7: Partial Removal and Off-Site Disposal with In-Situ Stabilization of Shallow Waste

This alternative consists of the excavation of approximately 152,000 cubic yards of contaminated ash waste from the filled ravine that is too thick to effectively stabilize, with in-situ treatment of the remaining ash at OU 01 with a stabilizing amendment. In-situ stabilization is a process that uses a stabilizing agent to bind contaminants in place to reduce their solubility or mobility. The waste and binding agent are typically mixed in-situ by augers. Excavated material will be segregated (hazardous versus non-hazardous) and transported to appropriate off-site disposal facilities. The

areas to be excavated and stabilized in-situ are shown on Figure 14.

Special considerations are required at OU 01 due to the physical setting and steep slopes of the ravine. Modification and maintenance of ravine access is needed to allow for partial removal of ash waste from the filled ravine. In addition, a sewer line runs through the existing waste and will need to be re-routed before excavation and in-situ stabilization take place.

The stabilized mass at OU 01 will be restored to 3:1 grades to limit erosion, and covered with 6 inches of topsoil to be planted with native grasses and/or shrubs.

Since contaminated waste will remain at OU 01 under this alternative, institutional controls, in the form of an environmental easement, a site management plan and fencing, are necessary to protect public health and the environment from contamination remaining on-site. Long-term monitoring includes the periodic sampling and analysis of groundwater. Long-term costs associated with this alternative include periodic inspections of the soil cover and stabilized mass, and repairs to the cover when required.

The time required to complete this alternative is estimated to be 34 months. Long-term monitoring will continue for 30 years.

Present Worth:.....*$41,721,000*
Capital Cost:.....*$41,500,000*
Annual Costs:.....*$7,500*

OU 01 Alternative 8: Partial Removal, Ex-Situ Stabilization and On-Site Placement with In-Situ Stabilization of Shallow Waste

This alternative consists of all elements of Alternative 7 with the difference being that the excavated ash waste from the filled ravine that is too thick to effectively stabilize in-situ will be stabilized ex-situ and placed into the open ravine at the base of OU 01 to extend the current footprint of the landfill (Figure 15). A groundwater drainage and diversion system will be installed as described in OU 01 Alternative 5.

Special considerations are required at OU 01 due to the physical setting and steep slopes of the ravine. Modification and maintenance of ravine access is needed to allow for partial removal of ash waste from the filled ravine. In addition, a sewer line runs through the existing waste and will need to be re-routed before excavation and in-situ stabilization take place.

The stabilized mass at OU 01 will be restored to 3:1 grades to limit erosion, and covered with 6 inches of topsoil to be planted with native grasses and/or shrubs.

Since contaminated waste will remain at OU 01 under this alternative, institutional controls, in the form of an environmental easement, a site management plan and fencing, are necessary to protect public health and the environment from contamination remaining on-site. Long-term monitoring includes the periodic sampling and analysis of groundwater. Long-term costs associated with this

alternative include periodic inspections of the soil cover and stabilized mass, and repairs to the cover when required.

The time required to complete this alternative is estimated to be 19 months. Long-term monitoring will continue for 30 years.

Present Worth:.....*$22,230,000*
Capital Cost:.....*$22,009,000*
Annual Costs:.....*$7,500*

Remedial Alternatives for OU 02

OU 02 Alternative 1A: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

OU 02 Alternative 1B: Site Management

The Site Management Alternative requires only institutional controls for the site. This alternative includes institutional controls, in the form of an environmental easement, a site management plan and fencing, which are necessary to protect public health and the environment from any contamination identified at the site. Long-term costs associated with this alternative include periodic inspections and repairs to the fence when required.

Present Worth:.....*$87,000*
Capital Cost:.....*$41,000*
Annual Costs:.....*$3,000*

OU 2 Alternative 2: Multi-Media Sub-Aqueous Capping

This alternative consists of the construction of a multi-media sub-aqueous cap (clean sand, soil, cobbles, topsoil, and/or organic matter and demarcation layer) over contaminated sediments in Gulf Creek. The area to be capped is shown on Figure 16, and includes Gulf Creek from the site to Niagara Street. Sub-aqueous capping is a common remedy, and is effective at eliminating exposure, preventing the transport of contaminated sediments, and preventing the uptake of contaminants by aquatic organisms.

Due to the continuous flow of water in Gulf Creek, flows will need to be managed during capping activities. In addition, the existing sewer line will need to be re-aligned outside of OU 02 or in such a way as to limit its impact during remediation, and to accommodate future maintenance activities without jeopardizing the cap.

Following capping, Gulf Creek will be restored, to the extent possible, to its original grade with material similar to the existing substrate. A restoration plan will be developed during design and will meet the substantive requirements of Article 15 and 6 NYCRR Part 608.

Long-term monitoring of sediment, surface water and biota will be conducted to assess the effectiveness of the remediation. Long-term costs associated with this alternative include periodic inspections of the cap and repairs when required.

The time required to complete this alternative is estimated to be 24 months. Long-term monitoring would continue for 30 years.

Present Worth:.....*$2,889,000*
Capital Cost:.....*$2,775,000*
Annual Costs:.....*$6,000*

OU 2 Alternative 3: In-Situ Sediment Amendment

This alternative consists of the in-situ amendment of contaminated sediments with apatite and gypsum. Apatite has been used as a remediation amendment because it binds lead, zinc, and other metals in forms that are not soluble, bioavailable, or toxic, while gypsum has been used for mercury because it produces a form of mercury that is relatively non-toxic and non-bioavailable. The area to be amended in-situ is shown on Figure 16, and includes Gulf Creek from the site to Niagara Street.

Due to the continuous flow of water in Gulf Creek, flows will need to be managed during in-situ amendment activities. In addition, the existing sewer line will need to be re-aligned outside of OU 02 or in such a way as to limit its impact during remediation, and to accommodate future maintenance activities without jeopardizing the remediation.

Following in-situ amendment, Gulf Creek will be restored, to the extent possible, to its original grade with material similar to the existing substrate. A restoration plan will be developed during design and will meet the substantive requirements of Article 15 and 6 NYCRR Part 608.

Long-term monitoring of sediment, surface water and biota will be conducted to assess the effectiveness of the remediation.

The time required to complete this alternative is estimated to be 24 months. Long-term monitoring would continue for 30 years.

Present Worth:.....*$2,334,000*
Capital Cost:.....*$2,295,000*
Annual Costs:.....*$2,000*

OU 2 Alternative 4: Complete Removal with Disposal

This alternative consists of the complete excavation of all sediment in Gulf Creek that exceeds the sediment SCGs (approximately 18,100 cubic yards). The area to be excavated is shown on Figure 16, and includes Gulf Creek from the site to Niagara Street. Excavation is a common remedy used to remove contaminated sediments from shallows creeks, and is effective at eliminating exposure and preventing transport of contaminants.

Due to the continuous flow of water in Gulf Creek, flows will need to be managed during excavation activities. In addition, the existing sewer line will need to be re-aligned outside of OU 02 or in such a way as to limit its impact during remediation.

Verification samples will be collected following sediment removal to confirm that all contaminated sediment has been removed from OU 02. All excavated sediment will be dewatered at a facility constructed at the site before being transported to approved off-site disposal facilities or placed in the landfill created in the open ravine under OU 01 Alternatives 5 (Landfill Capping with a Part 360 Cap - Extended Landfill Footprint), 6 (Landfill Capping with a Clean Soil Cover - Extended Landfill Footprint) or 8 (Partial Removal with Ex-Situ Stabilization and On-Site Disposal, with In-Situ Stabilization).

Following excavation, Gulf Creek will be restored, to the extent possible, to its original grade with material similar to the existing substrate. A restoration plan will be developed during design and will meet the substantive requirements of Article 15 and 6 NYCRR Part 608.

Since all sediment exceeding the sediment SCGs is removed from OU 02 under this alternative, long-term monitoring is not required.

The time required to complete this alternative is estimated to be 24 months.

Present Worth:.....*$4,340,000*
Capital Cost:.....*$4,340,000*
Annual Costs:.....*$0*

OU 2 Alternative 5: Partial Removal with Multi-Media Sub-Aqueous Capping

This alternative consists of the excavation of contaminated sediments from the ponded water area immediately downstream of OU 01 (approximately 17,200 cubic yards) with multi-media sub-aqueous capping over the remaining contaminated sediments. The areas to be excavated and capped are shown on Figure 17. Excavation and capping are common remedies used to remove or contain contaminated sediments, and are effective at eliminating exposure, preventing the transport of contaminated sediments, and preventing the uptake of contaminants by aquatic organisms.
Due to the continuous flow of water in Gulf Creek, flows will need to be managed during excavation and capping activities. In addition, the existing sewer line will need to be re-aligned outside of OU 02 or in such a way as to limit its impact during remediation, and to accommodate future maintenance activities without jeopardizing the cap.

Verification samples will be collected following sediment removal to confirm that all contaminated sediment has been removed from OU 02. All excavated sediment will be dewatered at a facility constructed at the site before being transported to approved off-site disposal facilities or placed in the landfill created in the open ravine under OU 01 Alternatives 5 (Landfill Capping with a Part 360 Cap - Extended Landfill Footprint), 6 (Landfill Capping with a Clean Soil Cover - Extended Landfill Footprint) or 8 (Partial Removal with Ex-Situ Stabilization and On-Site Disposal, with In-Situ Stabilization).

Following excavation and capping, Gulf Creek will be restored, to the extent possible, to its original grade with material similar to the existing substrate. A restoration plan will be developed during design and will meet the substantive requirements of Article 15 and 6 NYCRR Part 608.

Long-term monitoring of sediment, surface water and biota will be conducted to assess the effectiveness of the remediation. Long-term costs associated with this alternative include periodic inspections of the cap and repairs when required.

The time required to complete this alternative is estimated to be 9 months. Long-term monitoring would continue for 30 years.

Present Worth:.....*$3,887,000*
Capital Cost:.....*$3,875,000*
Annual Costs:.....*$760*

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
Operable Unit 01			
Alternative 1A: No Action	0	0	0
Alternative 1B: Site Management	99,000	4,000	160,000
Alternative 2: Complete Removal with Off-Site Disposal	43,609,000	0	43,609,000
Alternative 3: Ex Situ Stabilization with Off-Site Disposal	40,509,000	0	40,509,000
Alternative 4: Landfill Capping with a Part 360 Cap – Existing Landfill Footprint	26,552,000	14,000	26,975,000
Alternative 5: Landfill Capping with a Part 360 Cap – Extended Landfill Footprint	5,862,000	9,500	6,143,000
Alternative 6: Landfill Capping with a Clean Soil Cover - Extended Landfill Footprint	4,096,000	9,500	4,377,000
Alternative 7: Partial Removal and Off-Site Disposal with In-Situ Stabilization of Shallow Waste	41,500,000	7,500	41,721,000
Alternative 8: Partial Removal, Ex-Situ Stabilization and On-Site Placement with In-Situ Stabilization of Shallow Waste	22,009,000	7,500	22,230,000

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
Operable Unit 02			
Alternative 1A: No Action	0	0	0
Alternative 1B: Site Management	41,000	3,000	87,000
Alternative 2: Multi-Media Sub-Aqueous Capping	2,775,000	6,000	2,889,000
Alternative 3: In-Situ Sediment Amendment	2,295,000	2,000	2,334,000
Alternative 4: Complete Removal with Disposal	4,340,000[a] 5,098,000[b]	0	4,340,000[a] 5,098,000[b]
Alternative 5: Partial Removal with Multi-Media Sub-Aqueous Capping	3,875,000[a] 4,289,000[b]	760	3,887,000[a] 4,289,000[b]

a – on-site disposal at OU 01.
b – off-site disposal at appropriate facilities.

Exhibit D

Summary of the Proposed Remedy

The Department is proposing the following alternatives as the remedy for this site. The elements of this remedy are described in Section 7. The proposed remedy is shown in Figures 12 and 15.

- OU 01: Landfill – Old Upper Mountain Road Parcel: Alternative 5: Landfill Capping with a Part 360 Cap – Extended Landfill Footprint; and

- OU 02: Gulf Creek: Alternative 4: Complete Removal with Disposal.

Basis for Selection

The proposed remedy is based on the results of the RI, the Supplemental RI and the evaluation of alternatives. The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

OU 01 and OU 02 Alternatives 1A (No Action) do not satisfy this criterion as ash waste and sediment exceeding SCGs remain on-site and continue to present a significant threat to public health and the environment. Furthermore, the No Action alternatives do not address transport mechanisms, such as erosion and loading from seeps, that allow contaminated ash from OU 01 to remain a potential source of contamination to Gulf Creek, and for contaminated sediment to continue to migrate downstream. The site also remains in its current state under OU 01 and OU 02 Alternative 1B (Site Management), although the presence of access controls (e.g., environmental easement, fencing) provides some long-term protection to public health by restricting access to the contaminated media. Once again, transport mechanisms are not addressed. As OU 01 and OU 02 Alternatives 1A and 1B are not fully protective of public health and the environment they are not considered for implementation at the Old Upper Mountain Road Site.

OU 01 Alternatives 2 (Complete Removal with Off-Site Disposal) and 3 (Ex-Situ Stabilization with Off-Site Disposal) best satisfy this criterion by removing all ash waste that exceeds the unrestricted soil cleanup objectives. The stabilization process of Alternative 3 reduces the solubility or mobility of contaminants, and also reduces disposal costs. OU 01 Alternatives 4 and 5 (Landfill Capping with a Part 360 Cap – Existing or Extended Landfill Footprint), 6 (Landfill Capping with a Clean Soil Cover - Extended Landfill Footprint), 7 (Partial Removal and Off-Site Disposal with In-Situ Stabilization) and 8 (Partial Removal, Ex-Situ Stabilization and On-Site Placement with In-Situ

Stabilization) also satisfy this criterion, although ash waste remains at OU 01 under these alternatives.

OU 02 Alternative 4 (Complete Removal with Disposal) best satisfies this criterion by removing all sediment that exceeds the sediment SCGs. OU 02 Alternatives 2 (Multi-Media Sub-Aqueous Capping), 3 (In-Situ Sediment Amendment) and 5 (Partial Removal with Multi-Media Sub-Aqueous Capping) also satisfy this criterion, although contaminated sediment remains at OU 02 under these alternatives.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

OU 01 Alternatives 2 (Complete Removal with Off-Site Disposal) and 3 (Ex-Situ Stabilization with Off-Site Disposal) best satisfy this criterion by removing all ash waste that exceeds the unrestricted soil cleanup objectives. OU 01 Alternatives 4 and 5 (Landfill Capping with a Part 360 Cap – Existing or Extended Landfill Footprint), 6 (Landfill Capping with a Clean Soil Cover - Extended Landfill Footprint), 7 (Partial Removal and Off-Site Disposal with In-Situ Stabilization) and 8 (Partial Removal, Ex-Situ Stabilization and On-Site Placement with In-Situ Stabilization) also satisfy this criterion, with the waste capped under Alternatives 4, 5 and 6, or stabilized under Alternatives 7 and 8. Because Alternatives 2 through 8 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for OU 01.

OU 02 Alternative 4 (Complete Removal with Disposal) best satisfies this criterion by removing all sediment that exceeds the sediment SCGs. OU 02 Alternatives 2 (Multi-Media Sub-Aqueous Capping), 3 (In-Situ Sediment Amendment) and 5 (Partial Removal with Multi-Media Sub-Aqueous Capping) also satisfy this criterion, with the contaminated sediments capped under Alternatives 2 and 5, partially removed under Alternative 5, or stabilized in place under Alternative 3. Because Alternatives 2 through 5 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for OU 02.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-Term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

OU 01 Alternatives 2 (Complete Removal with Off-Site Disposal) and 3 (Ex-Situ Stabilization with Off-Site Disposal) best satisfy this criterion by removing all ash waste that exceeds the unrestricted soil cleanup objectives. Complete waste removal eliminates the need for property use restrictions and long-term monitoring and maintenance. OU 01 Alternatives 4 and 5 (Landfill Capping with a

Part 360 Cap – Existing or Extended Landfill Footprint), 7 (Partial Removal and Off-Site Disposal with In-Situ Stabilization) and 8 (Partial Removal, Ex-Situ Stabilization and On-Site Placement with In-Situ Stabilization) also satisfy this criterion, although these alternatives require environmental easements, long-term monitoring and maintenance to ensure their long-term effectiveness. The long-term effectiveness of Alternative 6 (Landfill Capping with a Clean Soil Cover - Extended Landfill Footprint) is uncertain as leaching of lead from the ash waste could occur through the infiltration of precipitation and snow melt into the waste. An environmental easement, long-term monitoring and maintenance are also required under Alternative 6.

OU 02 Alternative 4 (Complete Removal with Disposal) best satisfies this criterion by removing all sediment that exceeds the sediment SCGs. Complete sediment removal eliminates the need for long-term monitoring and maintenance. OU 02 Alternatives 2 (Multi-Media Sub-Aqueous Capping) and 5 (Partial Removal with Multi-Media Sub-Aqueous Capping) also satisfy this criterion, although these alternatives require long-term monitoring and maintenance to ensure their long-term effectiveness. The long-term effective of OU 02 Alternative 3 (In-Situ Sediment Amendment) is unknown.

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

OU 01 Alternatives 2 (Complete Removal with Off-Site Disposal) and 3 (Ex-Situ Stabilization with Off-Site Disposal) reduce the toxicity, mobility and volume of contaminants by removing all ash waste that exceeds the unrestricted soil cleanup objectives. The mobility of the on-site waste is reduced under OU 01 Alternatives 4 and 5 (Landfill Capping with a Part 360 Cap – Existing or Extended Landfill Footprint), 7 (Partial Removal and Off-Site Disposal with In-Situ Stabilization) and 8 (Partial Removal, Ex-Situ Stabilization and On-Site Placement with In-Situ Stabilization). The mobility of contaminants from the on-site waste is not significantly reduced under Alternative 6 (Landfill Capping with a Clean Soil Cover - Extended Landfill Footprint) as a clean soil cover would not prevent the infiltration of precipitation and snow melt into the waste.

OU 02 Alternatives 4 (Complete Removal with Disposal) and 5 (Partial Removal with Multi-Media Sub-Aqueous Capping) best satisfy this criterion by removing some (Alternative 5) or all (Alternative 4) sediment that exceeds the sediment SCGs. The mobility of contaminants is reduced under OU 02 Alternatives 2 (Multi-Media Sub-Aqueous Capping), 3 (In-Situ Sediment Amendment) and 5 (Partial Removal with Multi-Media Sub-Aqueous Capping).

5. Short-Term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

OU 01 Alternatives 2 through 8, and OU 02 Alternatives 2 through 5, include the excavation and handling of contaminated ash waste and sediment. As a result, these alternatives all have potential short-term exposure risks to construction workers and the surrounding community (e.g., increased truck traffic, odors, dust, noise, etc.) that could occur during the implementation of these

alternatives. These impacts, however, are easily mitigated through standard construction practices. The time needed to complete the remediation at OU 01 is the shortest for Alternatives 5 and 6 (9 months) and the longest for Alternatives 2 and 3 (40 months). The time needed to complete the remediation at OU 02 is the shortest for Alternative 5 (9 months) and the longest for Alternatives 2, 3 and 4 (24 months).

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

OU 01 Alternatives 2 through 8, and OU 02 Alternatives 2 through 5, are implementable as there is ample availability of remedial contractors and equipment to: (1) complete the excavation activities of OU 01 Alternatives 2 and 3, and OU 02 Alternatives 4 and 5; (2) construct the multi-layer cap system of OU 01 Alternative 4 and 5, and the multi-layer sub-aqueous cap of OU 02 Alternatives 2 and 5; (3) complete the in-situ stabilization of OU 01 Alternatives 7 and 8, and the in-situ amendment of OU 02 Alternative 3; (4) complete the ex-situ stabilization of OU 01 Alternatives 3 and 8; and (5) construct the clean soil cover of OU 01 Alternative 6. In addition, the earthwork and transportation technologies necessary for the implementation of these alternatives are proven and reliable.

It is important to note that site conditions could adversely impact implementability. For example, bedrock outcrops are present along the ravine. The presence of similar outcrops in the filled ravine of OU 01 will make excavation, grading, and stabilization activities more difficult to implement.

For OU 02, the sediment in the ponded water area has low bearing capacity due to the saturated and fine grained nature of the sediment, and would need to be stabilized to support the cap under Alternative 2 (Multi-Media Sub-Aqueous Capping). In addition, a large section of creek north of the ponded water area is extremely rocky and shallow. This area of the creek would be more difficult to amend (Alternative 3) or cap (Alternatives 2 and 5).

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

OU 01 Alternative 6 (Landfill Capping with a Clean Soil Cover - Extended Landfill Footprint) has the lowest cost, followed by Alternative 5 (Landfill Capping with a Part 360 Cap – Extended Landfill Footprint). OU 01 Alternatives 4 (Landfill Capping with a Part 360 Cap – Existing Landfill Footprint) and 8 (Partial Removal, Ex-Situ Stabilization and On-Site Placement with In-Situ Stabilization) have the next lowest costs. These costs, however, are 4 to 5 times higher than the costs for Alternatives 5 and 6. The highest costs are associated with OU 01 Alternatives 2 (Complete Removal with Off-Site Disposal), 3 (Ex-Situ Stabilization with Off-Site Disposal) and 7

(Partial Removal and Off-Site Disposal with In-Situ Stabilization). These costs are significantly higher than the costs for Alternatives 5 and 6.

OU 02 Alternative 3 (In-Situ Sediment Amendment) has the lowest cost for OU 02, followed closely by Alternative 2 (Multi-Media Sub-Aqueous Capping). Both alternatives require long-term monitoring and maintenance to ensure their long-term effectiveness, and have implementability issues that could increase the capital cost of these alternatives. OU 02 Alternative 5 (Partial Removal with Multi-Media Sub-Aqueous Capping) has the next highest cost, and also requires long-term monitoring and maintenance to ensure its effectiveness. OU 02 Alternative 4 (Complete Removal with Disposal) has the highest cost if the excavated sediment is disposed off-site. If the sediment is placed in OU 01 the cost for this alternative is similar to that of Alternative 5.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

OU 01 consists of nine parcels that are zoned for residential, commercial, industrial and public utility use. Eight parcels are vacant, with the ninth parcel containing a single family dwelling (Figure 3). The residential parcel is located on Old Upper Mountain Road, and extends eastward across the ravine and up the far embankment to the east (Figure 3). A large portion of this parcel is unsuitable for development due to the presence of the ravine and by access limitations. The dwelling is not located on waste material and is not part of the Old Upper Mountain Road Site. There are no known anticipated uses for the remaining parcels, and several are tax delinquent.

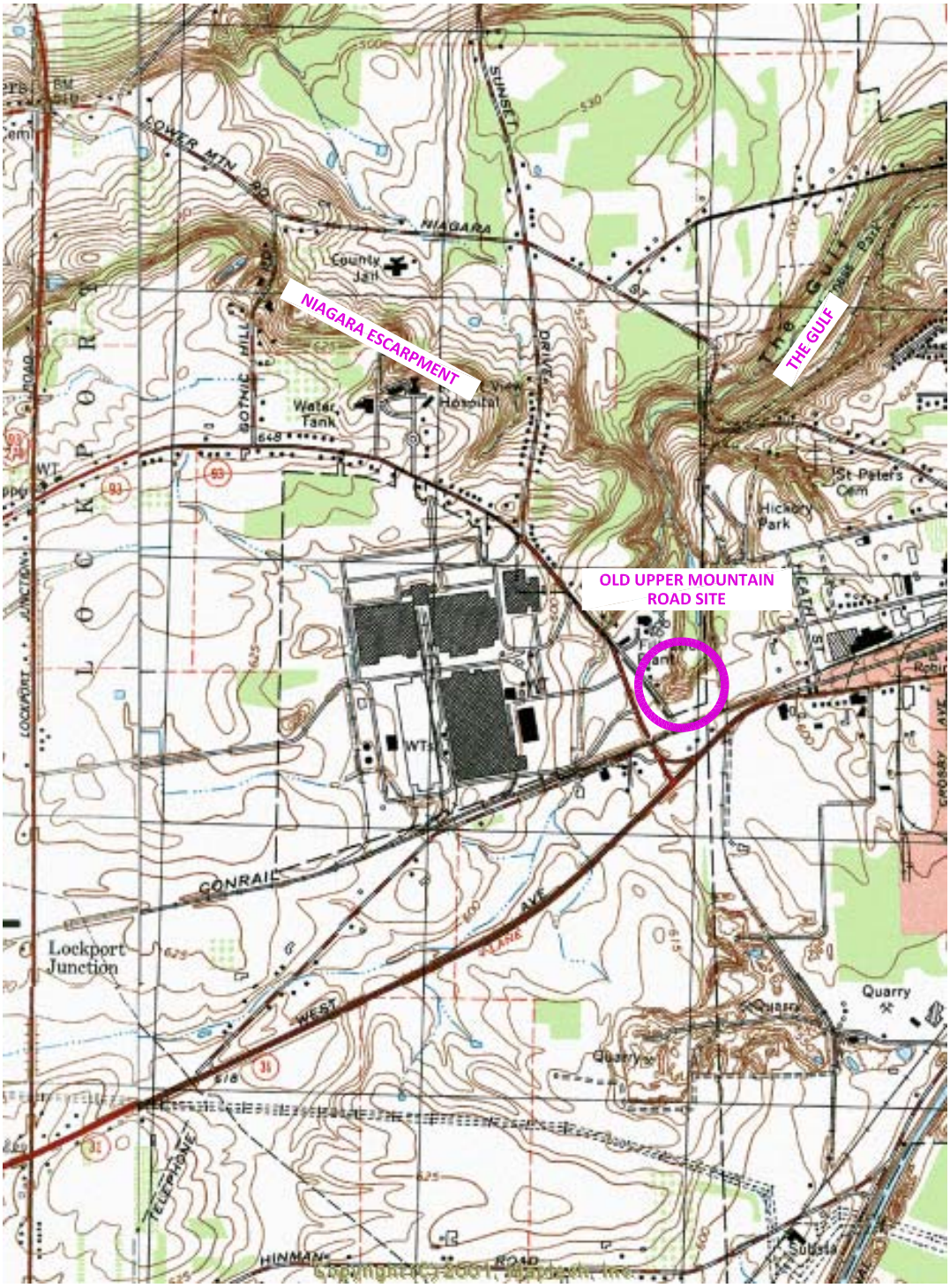
The plateau areas on either side of the ravine could be redeveloped under OU 01 Alternatives 2 (Complete Removal with Off-Site Disposal) and 3 (Ex-Situ Stabilization with Off-Site Disposal) as no waste remains on-site under these alternatives. Future use of this operable unit is limited under OU 01 Alternatives 4 and 5 (Landfill Capping with a Part 360 Cap – Existing or Extended Landfill Footprint), 6 (Landfill Capping with a Clean Soil Cover - Extended Landfill Footprint), 7 (Partial Removal and Off-Site Disposal with In-Situ Stabilization) and 8 (Partial Removal, Ex-Situ Stabilization and On-Site Placement with In-Situ Stabilization) as the plateau areas will contain either a multi-layer cap system (Alternatives 4 and 5), ash waste stabilized in place (Alternatives 7 and 8), or a clean soil cover (Alternative 6).

OU 02 is a creek and not subject to redevelopment.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

Alternative 5 (Landfill Capping with a Part 360 Cap – Extended Footprint Landfill) is being proposed for OU 01, while Alternative 4 (Complete Removal with Disposal) is being proposed for OU 02 because, as described above, they satisfy the threshold criteria and provides the best balance of the balancing criterion.



Cambria & Lockport Quadrangles

Scale Depends on Final Plotted Size

SITE LOCATION MAP

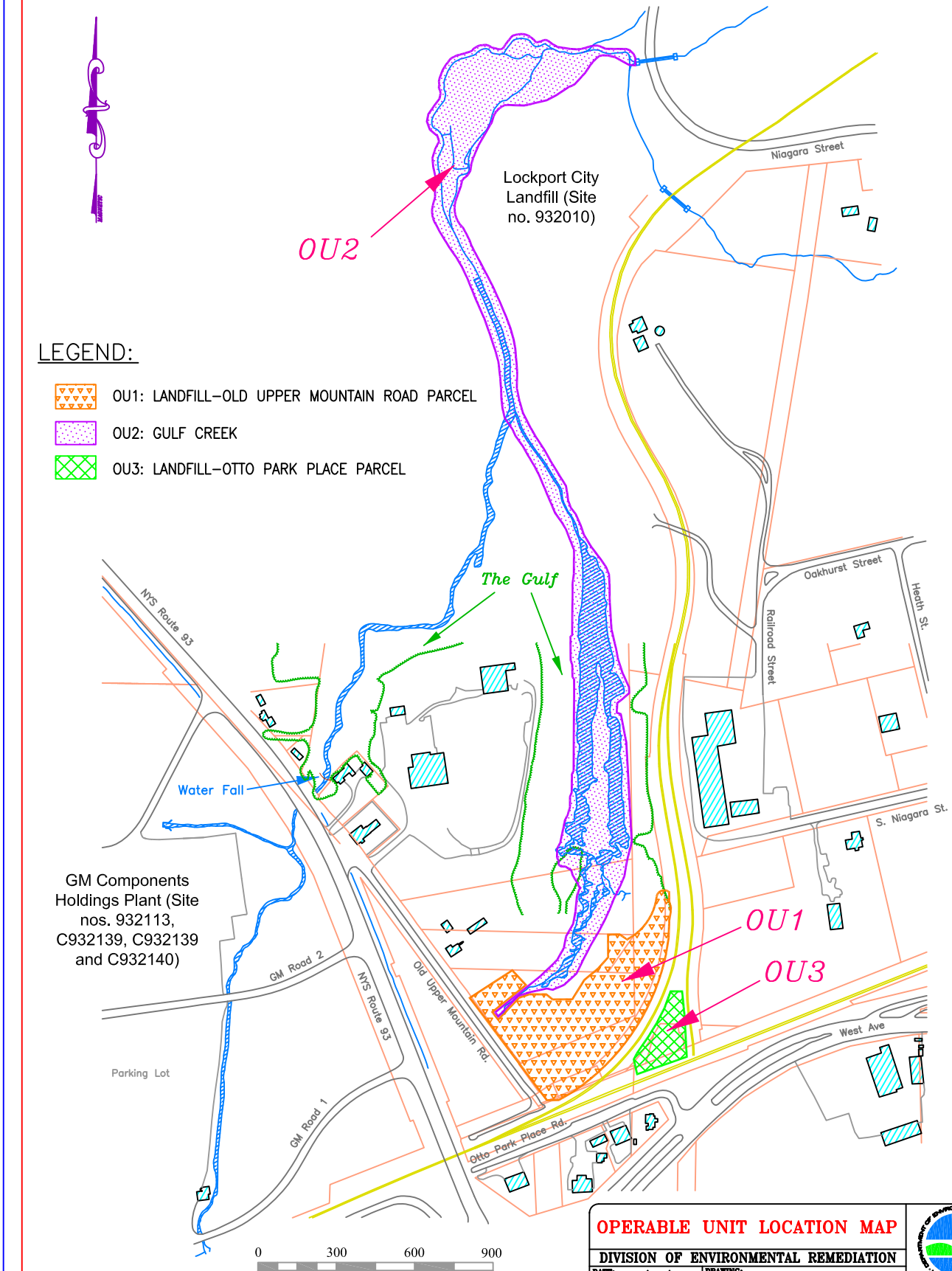
DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 06/21/11

DRAWING: Site Location Map.dwg

SITE: OLD UPPER MOUNTAIN ROAD SITE

FIGURE 1

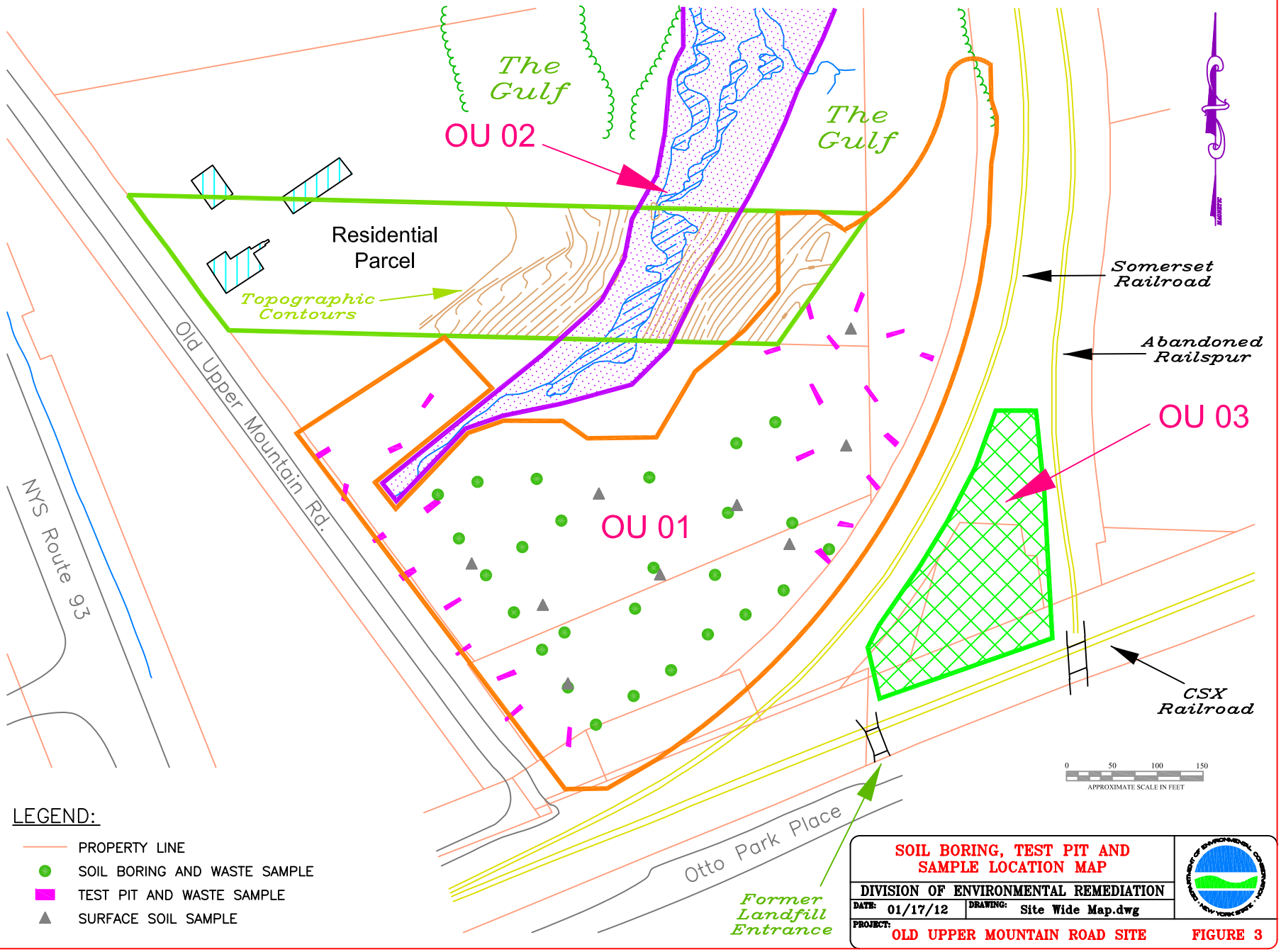


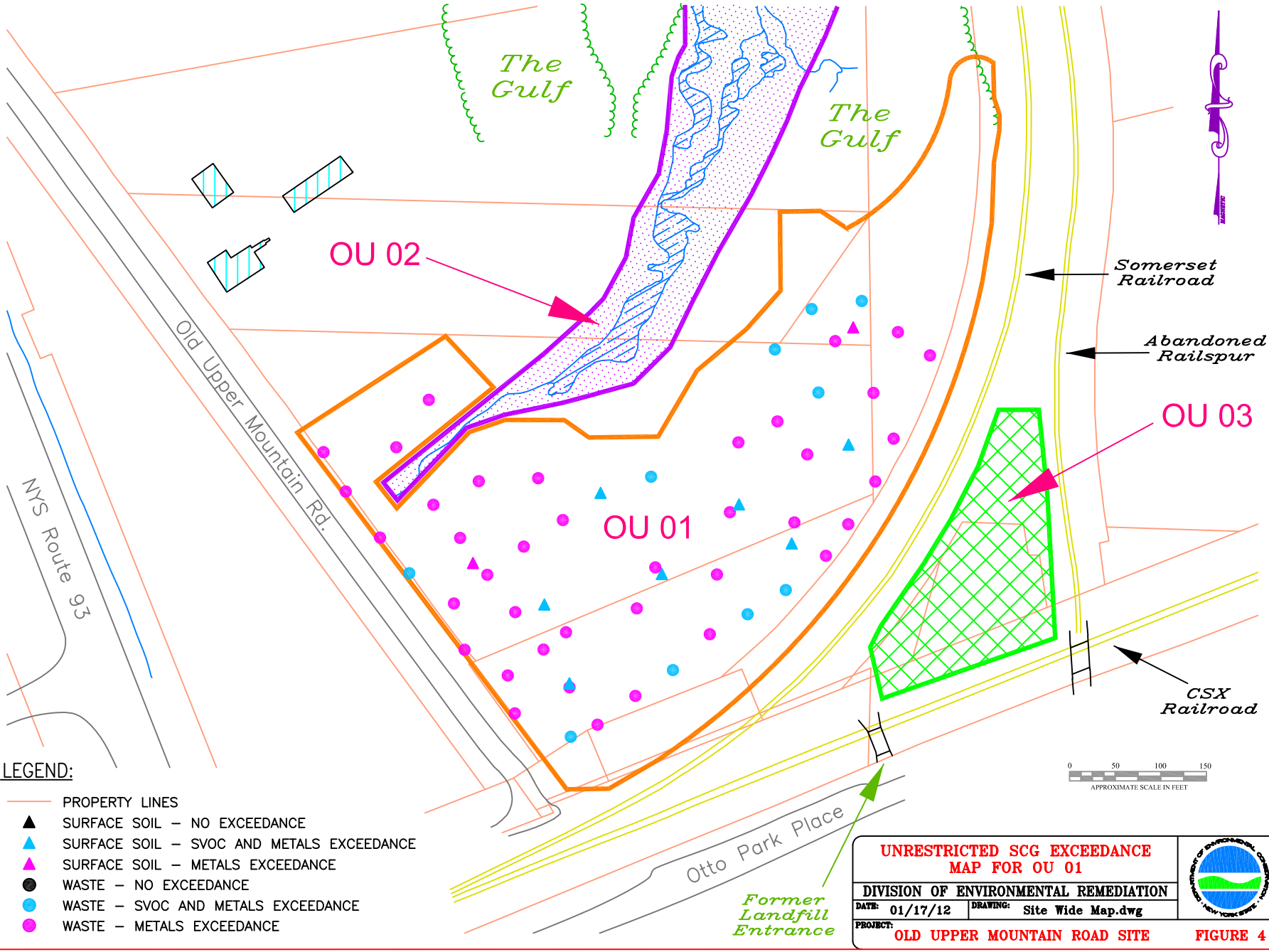
OPERABLE UNIT LOCATION MAP

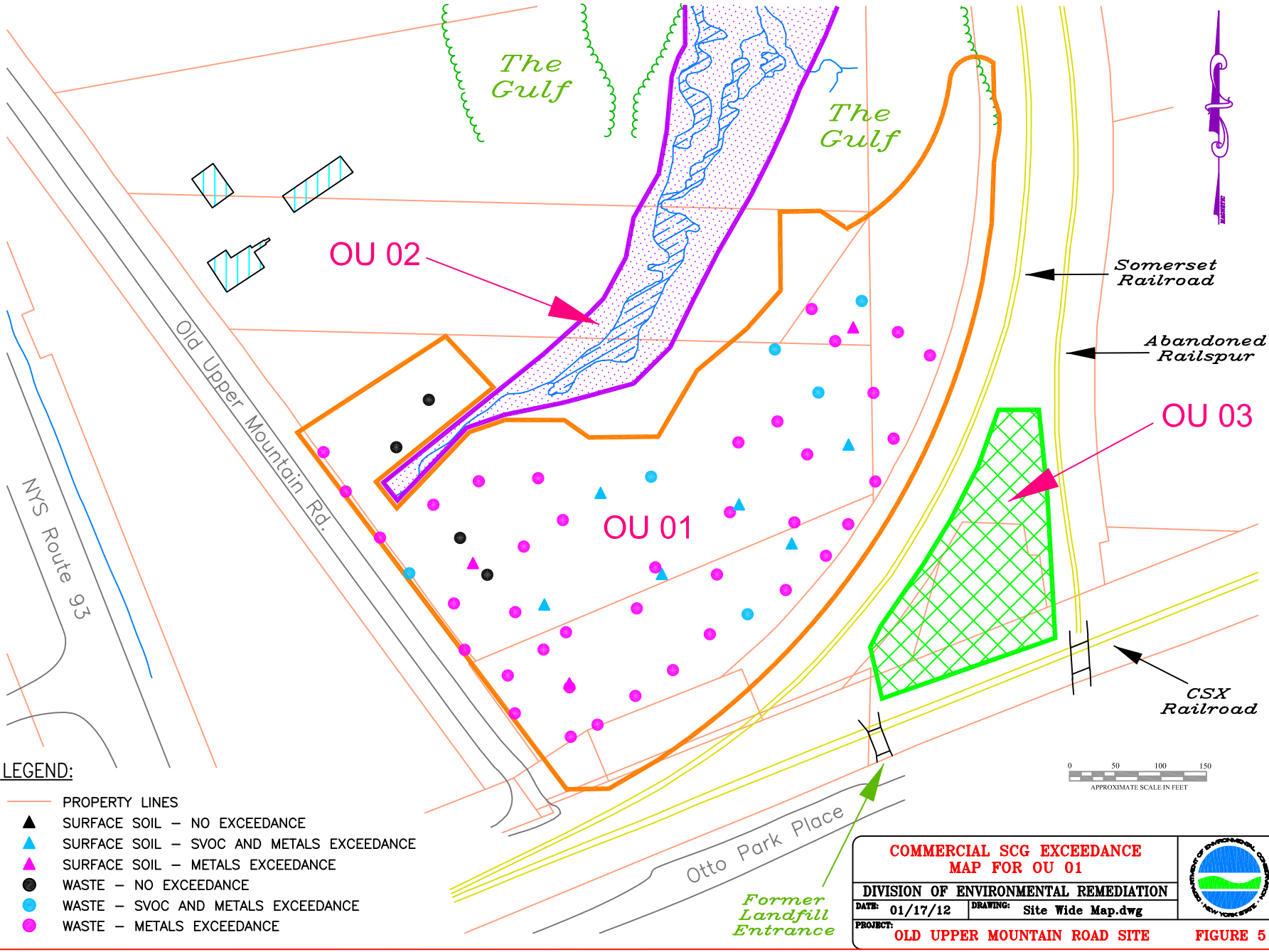
DIVISION OF ENVIRONMENTAL REMEDIATION

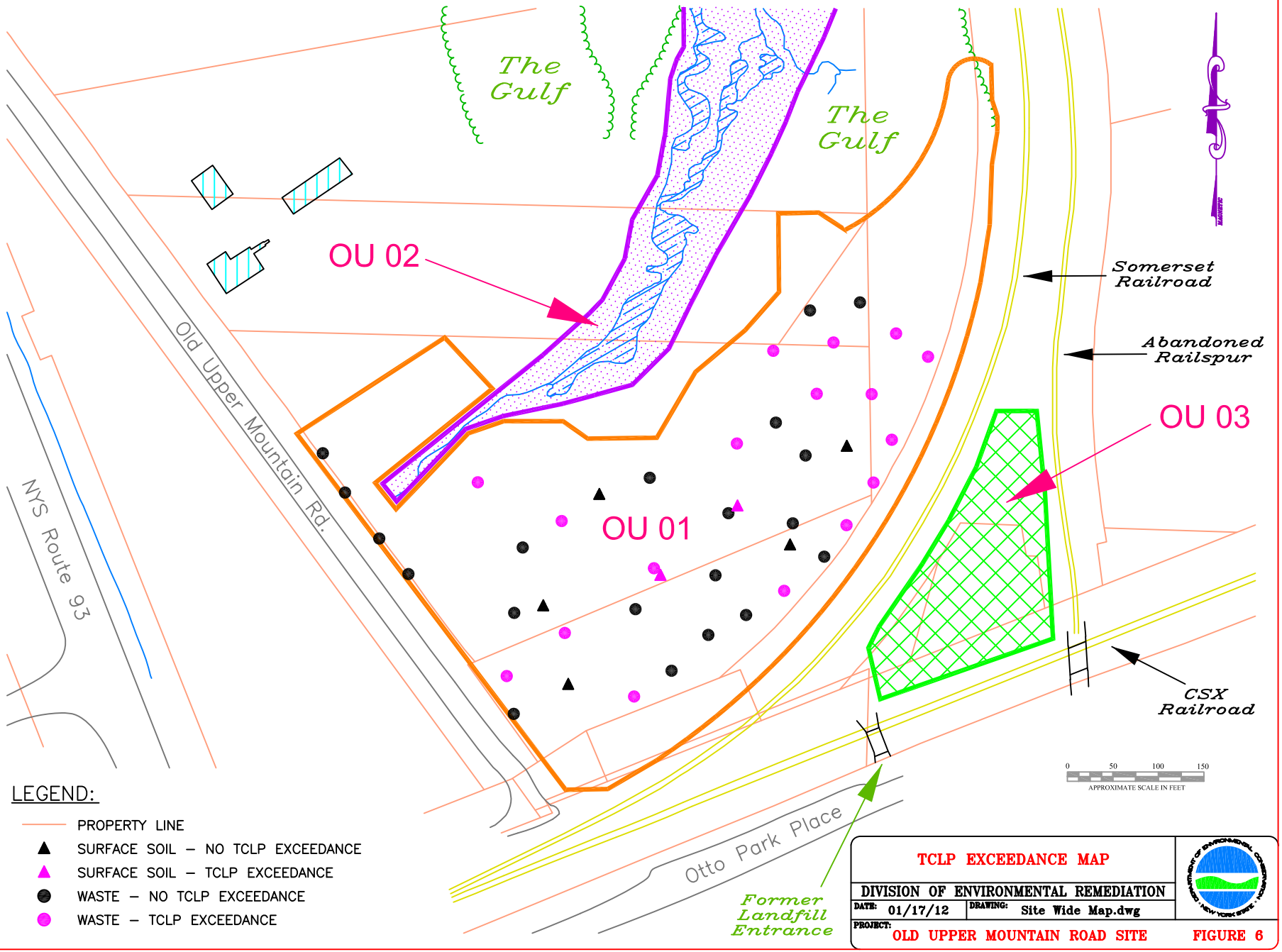
DATE: 01/13/12 DRAWING: OU Designation Map

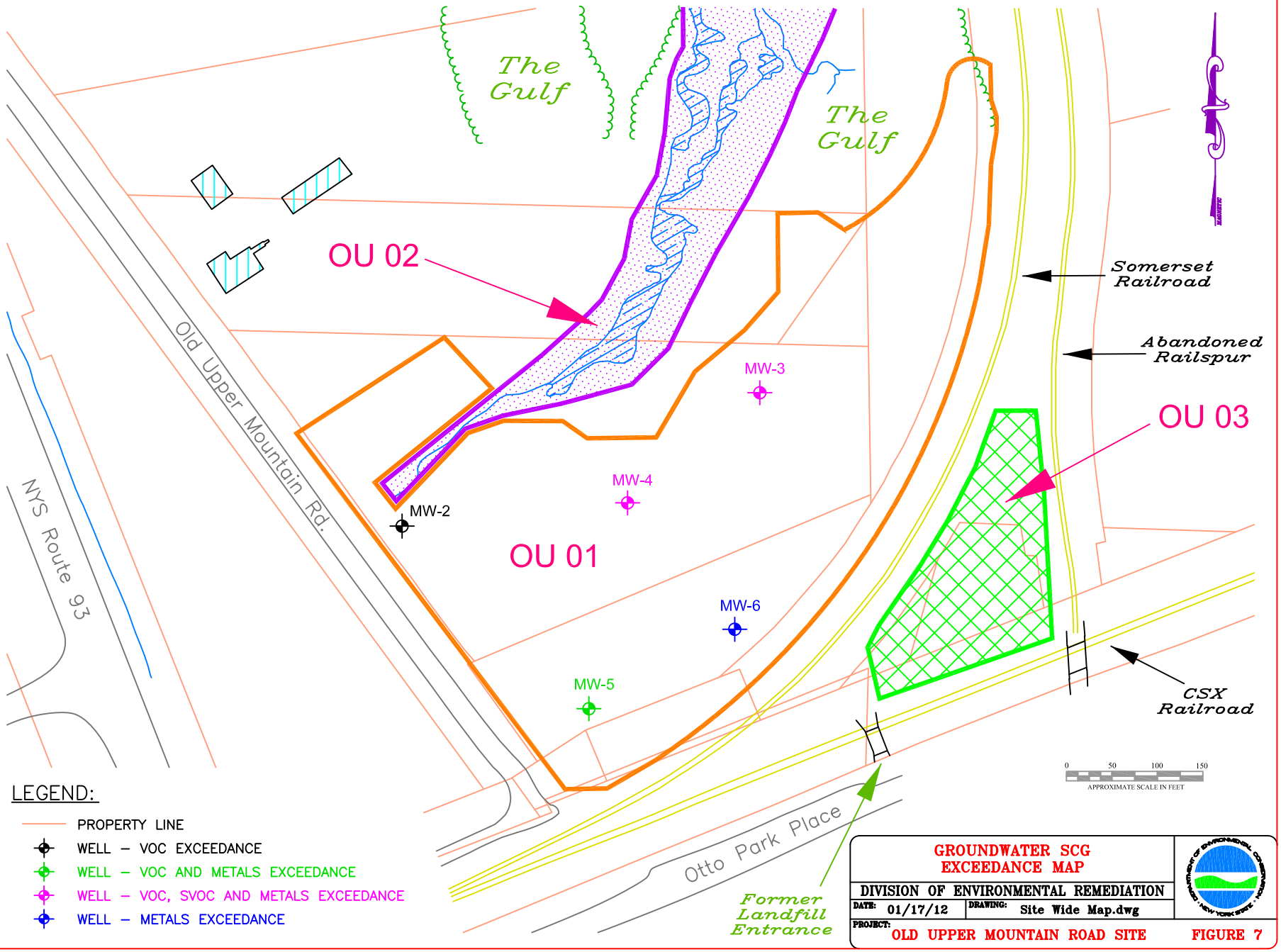
SITE: OLD UPPER MOUNTAIN ROAD SITE FIGURE 2

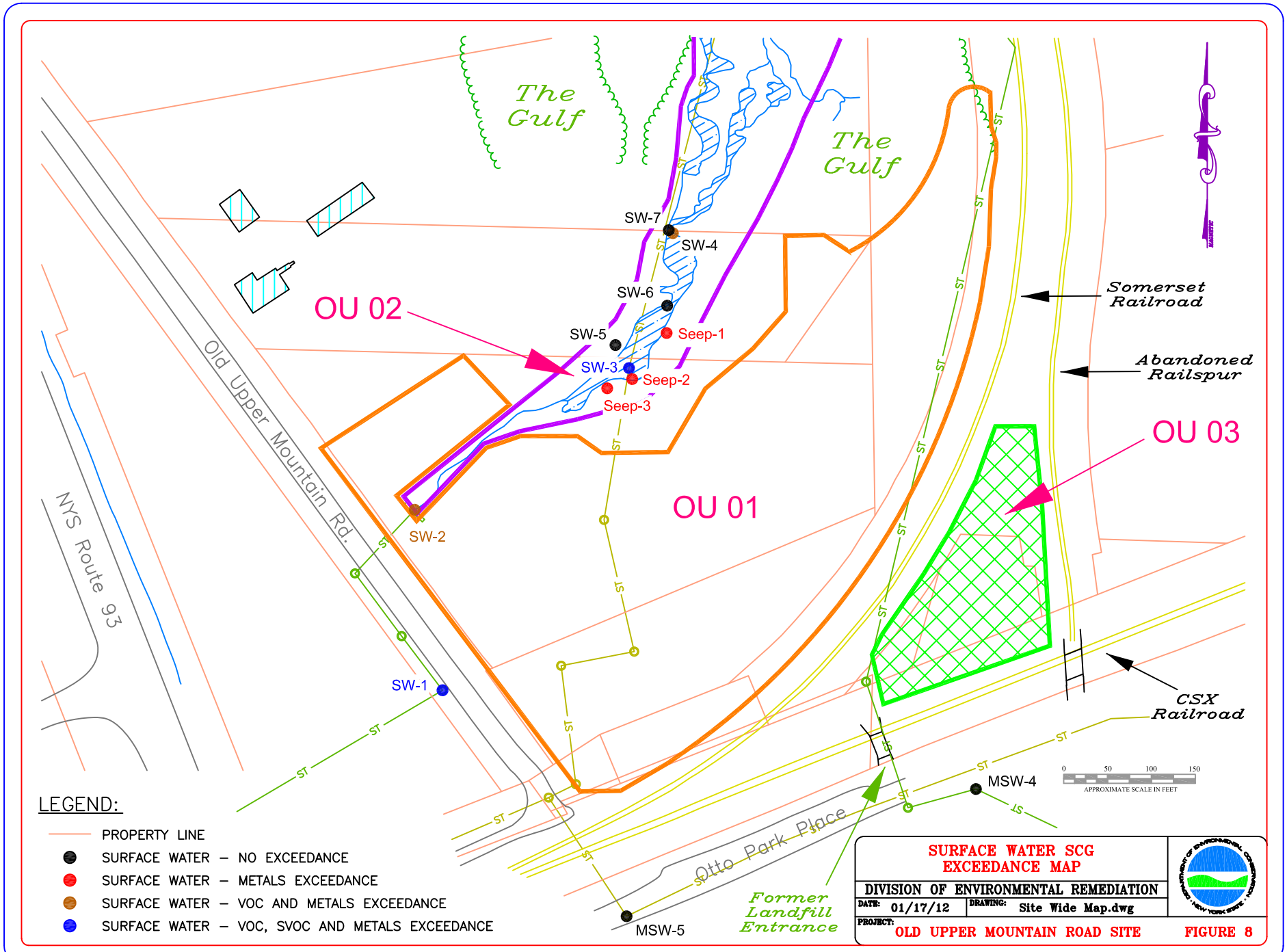

The Gulf
OU 02
The Gulf
Residential Parcel
Topographic Contours
Old Upper Mountain Rd.
NYS Route 93
Somerset Railroad
Abandoned Railspur
OU 03
OU 01
CSX Railroad
0 50 100 150
APPROXIMATE SCALE IN FEET
Otto Park Place
Former Landfill Entrance
LEGEND:
PROPERTY LINE
SOIL BORING AND WASTE SAMPLE
TEST PIT AND WASTE SAMPLE
SURFACE SOIL SAMPLE
SOIL BORING, TEST PIT AND SAMPLE LOCATION MAP
DIVISION OF ENVIRONMENTAL REMEDIATION
DATE: 01/17/12
DRAWING: Site Wide Map.dwg
PROJECT: OLD UPPER MOUNTAIN ROAD SITE
FIGURE 3

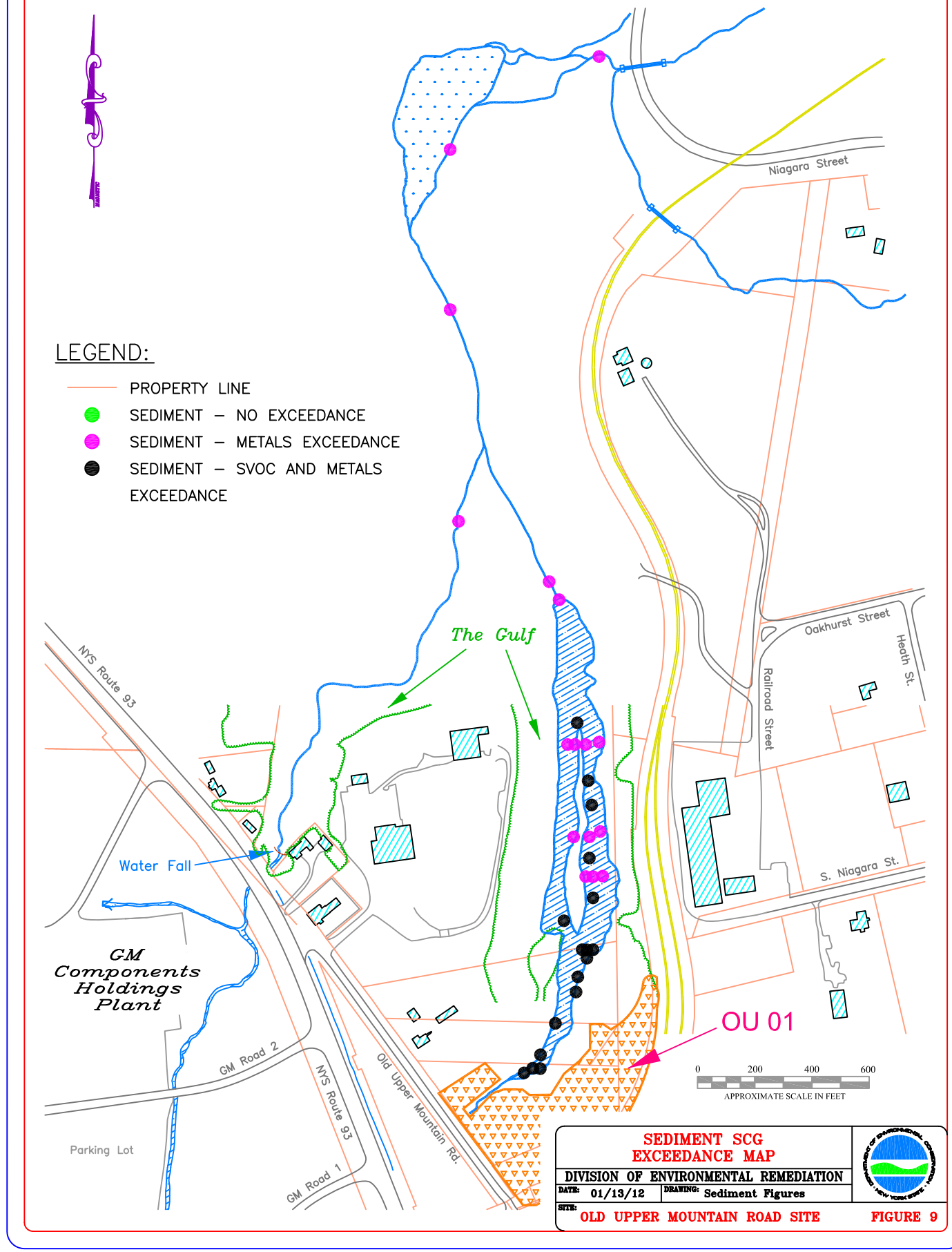

The Gulf
The Gulf
OU 02
OU 01
OU 03
Somerset Railroad
Abandoned Railspur
CSX Railroad
Old Upper Mountain Rd.
NYS Route 93
Otto Park Place
Former Landfill Entrance
LEGEND:
PROPERTY LINES
SURFACE SOIL – NO EXCEEDANCE
SURFACE SOIL – SVOC AND METALS EXCEEDANCE
SURFACE SOIL – METALS EXCEEDANCE
WASTE – NO EXCEEDANCE
WASTE – SVOC AND METALS EXCEEDANCE
WASTE – METALS EXCEEDANCE
0 50 100 150
APPROXIMATE SCALE IN FEET
UNRESTRICTED SCG EXCEEDANCE MAP FOR OU 01
DIVISION OF ENVIRONMENTAL REMEDIATION
DATE: 01/17/12
DRAWING: Site Wide Map.dwg
PROJECT: OLD UPPER MOUNTAIN ROAD SITE
FIGURE 4

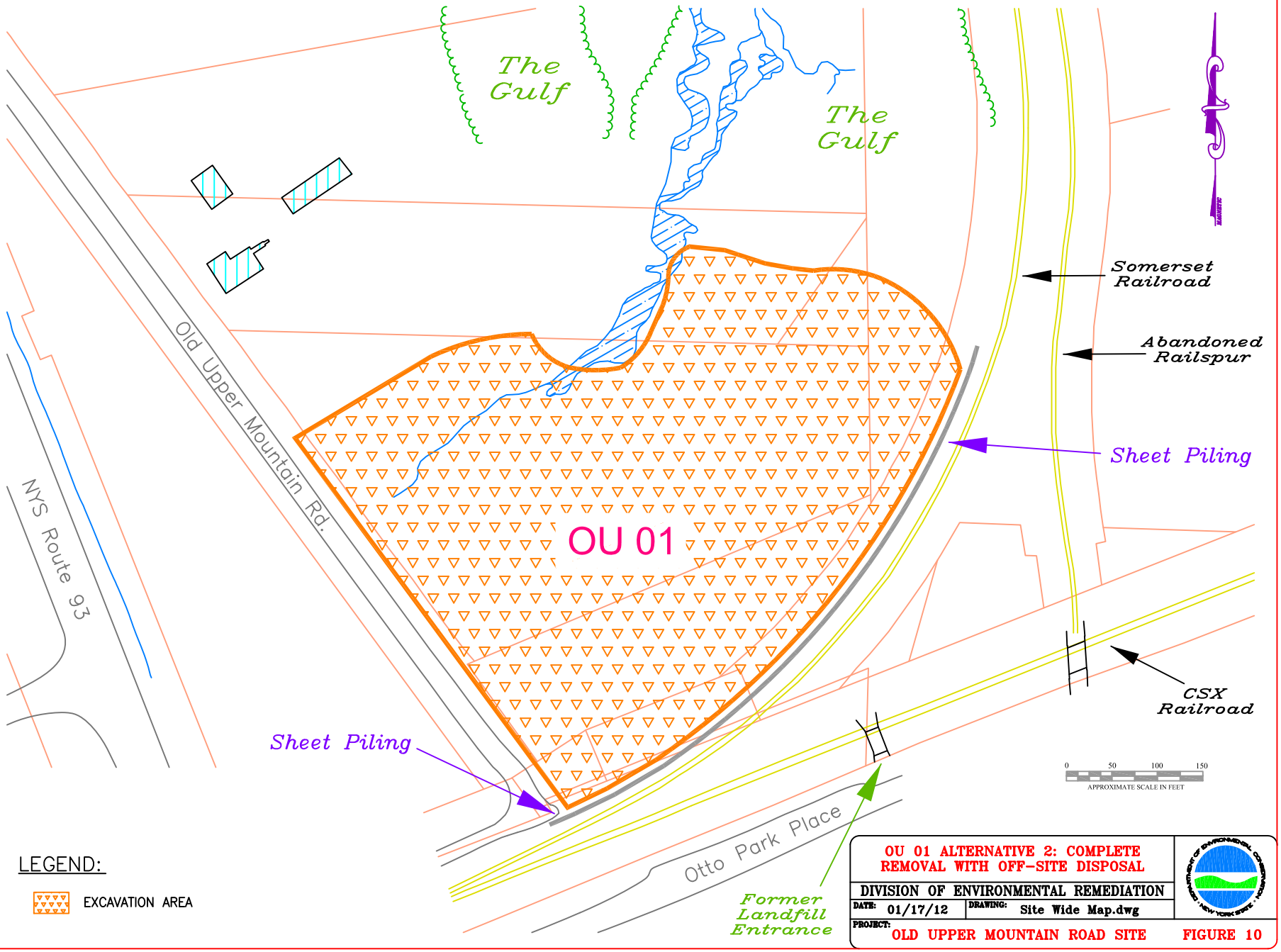

The Gulf
The Gulf
OU 02
OU 01
OU 03
Somerset Railroad
Abandoned Railspur
CSX Railroad
Old Upper Mountain Rd.
NYS Route 93
Otto Park Place
Former Landfill Entrance
LEGEND:
PROPERTY LINES
SURFACE SOIL – NO EXCEEDANCE
SURFACE SOIL – SVOC AND METALS EXCEEDANCE
SURFACE SOIL – METALS EXCEEDANCE
WASTE – NO EXCEEDANCE
WASTE – SVOC AND METALS EXCEEDANCE
WASTE – METALS EXCEEDANCE
0 50 100 150
APPROXIMATE SCALE IN FEET
COMMERCIAL SCG EXCEEDANCE MAP FOR OU 01
DIVISION OF ENVIRONMENTAL REMEDIATION
DATE: 01/17/12
DRAWING: Site Wide Map.dwg
PROJECT: OLD UPPER MOUNTAIN ROAD SITE
FIGURE 5

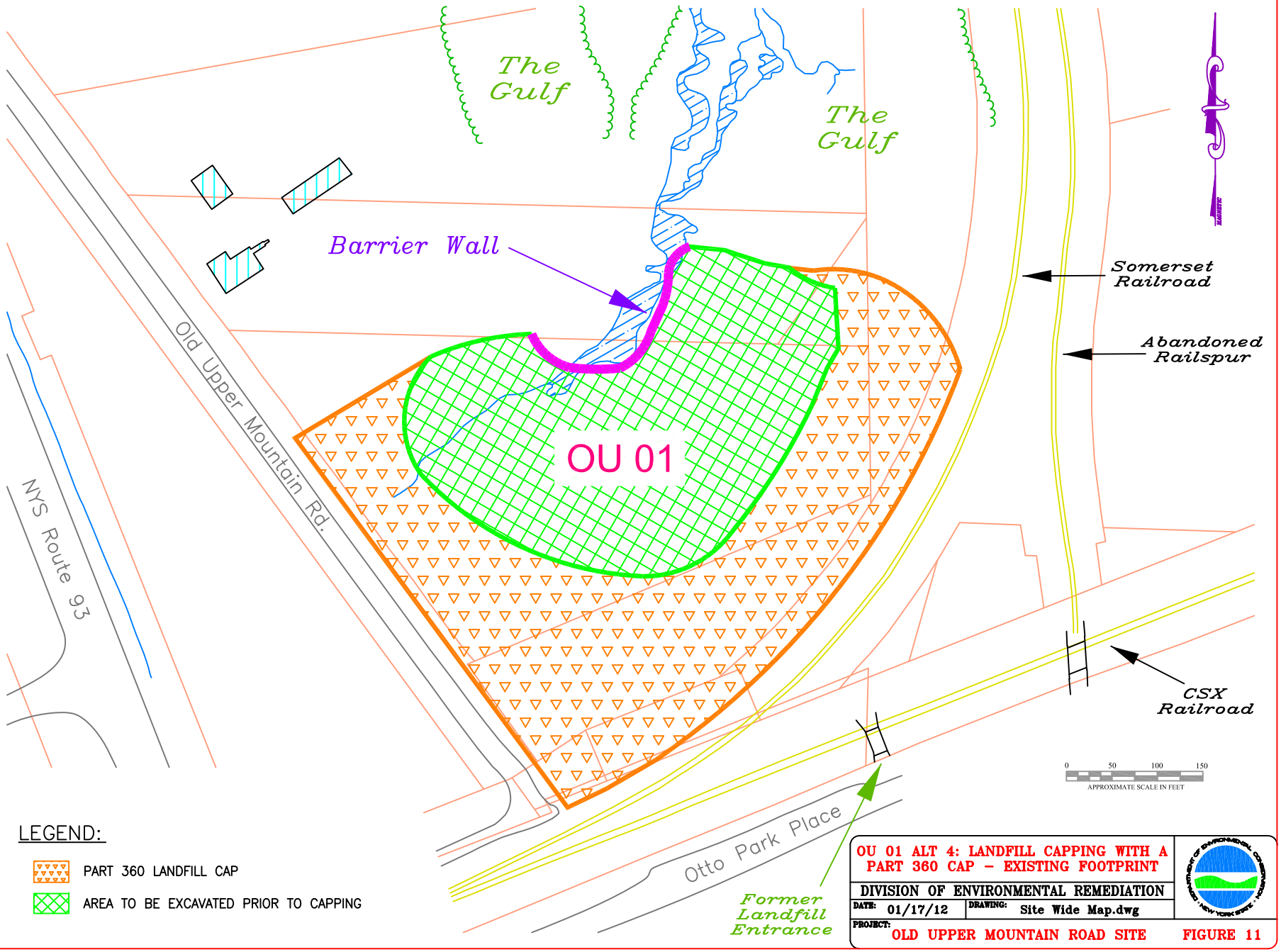

The Gulf
The Gulf
OU 02
OU 01
OU 03
Somerset Railroad
Abandoned Railspur
CSX Railroad
Old Upper Mountain Rd.
NYS Route 93
Otto Park Place
Former Landfill Entrance
0 50 100 150
APPROXIMATE SCALE IN FEET
LEGEND:
PROPERTY LINE
SURFACE SOIL – NO TCLP EXCEEDANCE
SURFACE SOIL – TCLP EXCEEDANCE
WASTE – NO TCLP EXCEEDANCE
WASTE – TCLP EXCEEDANCE
TCLP EXCEEDANCE MAP
DIVISION OF ENVIRONMENTAL REMEDIATION
DATE: 01/17/12
DRAWING: Site Wide Map.dwg
PROJECT: OLD UPPER MOUNTAIN ROAD SITE
FIGURE 6

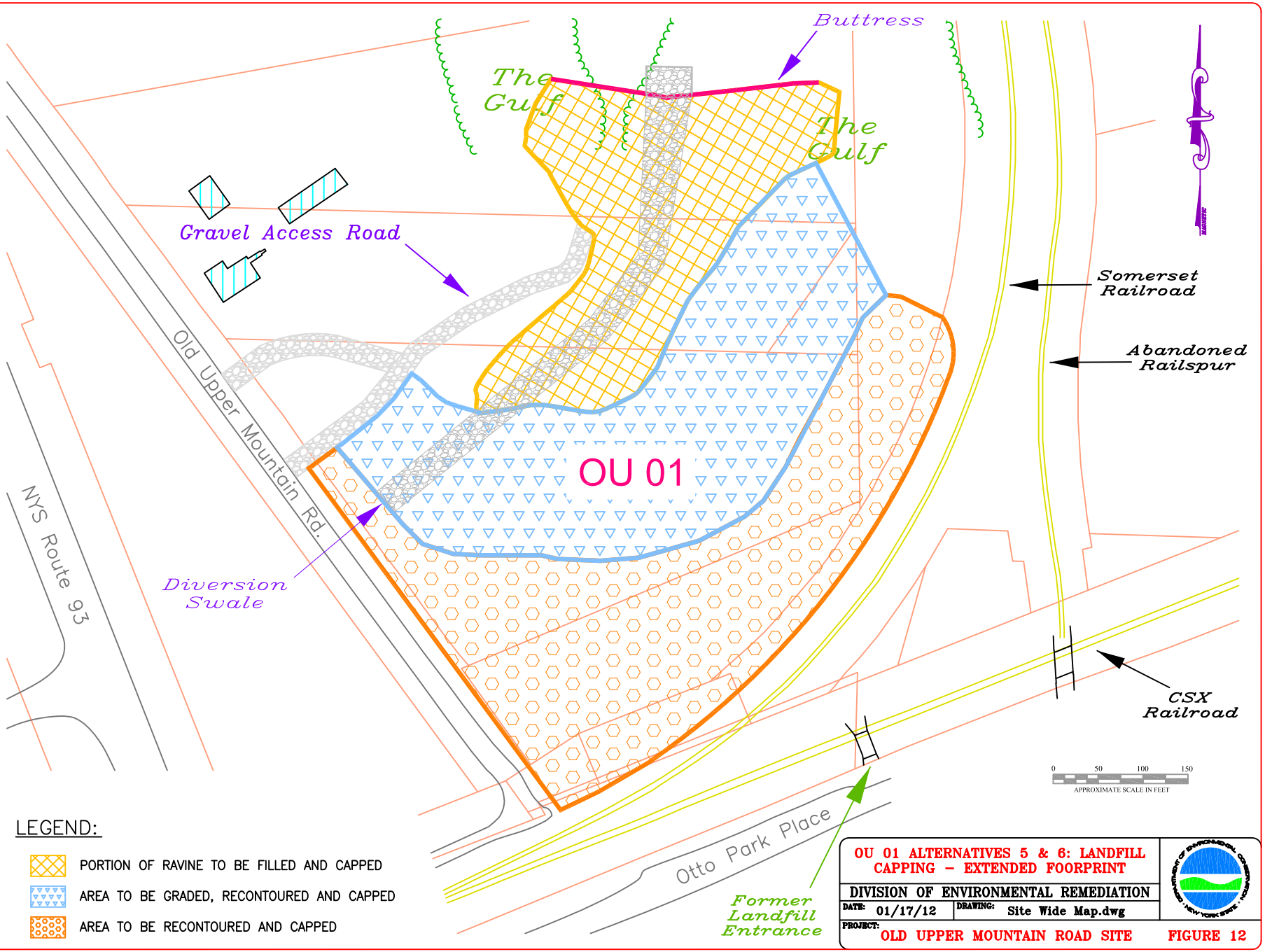

The Gulf
The Gulf
OU 02
OU 01
OU 03
Somerset Railroad
Abandoned Railspur
CSX Railroad
Old Upper Mountain Rd.
NYS Route 93
Otto Park Place
Former Landfill Entrance
MW-2
MW-3
MW-4
MW-5
MW-6
0 50 100 150
APPROXIMATE SCALE IN FEET
LEGEND:
PROPERTY LINE
WELL – VOC EXCEEDANCE
WELL – VOC AND METALS EXCEEDANCE
WELL – VOC, SVOC AND METALS EXCEEDANCE
WELL – METALS EXCEEDANCE
GROUNDWATER SCG EXCEEDANCE MAP
DIVISION OF ENVIRONMENTAL REMEDIATION
DATE: 01/17/12
DRAWING: Site Wide Map.dwg
PROJECT: OLD UPPER MOUNTAIN ROAD SITE
FIGURE 7

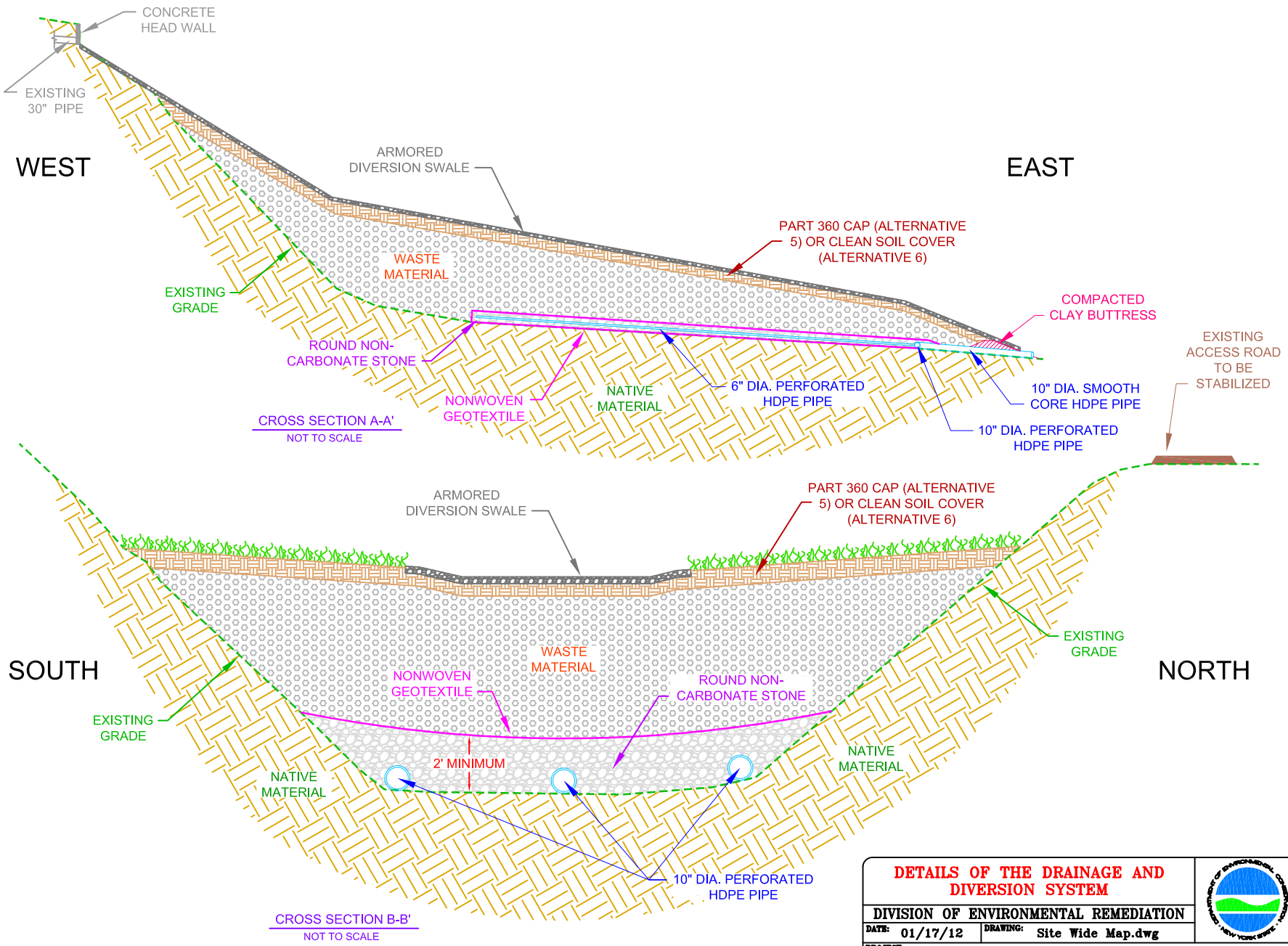

The Gulf
The Gulf
SW-7
SW-4
SW-6
SW-5
Seep-1
SW-3
Seep-2
Seep-3
OU 02
OU 01
OU 03
SW-2
SW-1
Old Upper Mountain Rd.
NYS Route 93
Somerset Railroad
Abandoned Railspur
CSX Railroad
MSW-4
MSW-5
Otto Park Place
Former Landfill Entrance
0 50 100 150
APPROXIMATE SCALE IN FEET
LEGEND:
PROPERTY LINE
SURFACE WATER – NO EXCEEDANCE
SURFACE WATER – METALS EXCEEDANCE
SURFACE WATER – VOC AND METALS EXCEEDANCE
SURFACE WATER – VOC, SVOC AND METALS EXCEEDANCE
SURFACE WATER SCG EXCEEDANCE MAP
DIVISION OF ENVIRONMENTAL REMEDIATION
DATE: 01/17/12
DRAWING: Site Wide Map.dwg
PROJECT: OLD UPPER MOUNTAIN ROAD SITE
FIGURE 8


LEGEND:
PROPERTY LINE
SEDIMENT – NO EXCEEDANCE
SEDIMENT – METALS EXCEEDANCE
SEDIMENT – SVOC AND METALS EXCEEDANCE
Niagara Street
The Gulf
Oakhurst Street
Heath St.
Railroad Street
S. Niagara St.
NYS Route 93
Water Fall
GM Components Holdings Plant
GM Road 2
NYS Route 93
Old Upper Mountain Rd.
GM Road 1
Parking Lot
OU 01
0 200 400 600
APPROXIMATE SCALE IN FEET
SEDIMENT SCG EXCEEDANCE MAP
DIVISION OF ENVIRONMENTAL REMEDIATION
DATE: 01/13/12
DRAWING: Sediment Figures
SITE: OLD UPPER MOUNTAIN ROAD SITE
FIGURE 9


The Gulf
The Gulf
Somerset Railroad
Abandoned Railspur
Sheet Piling
OU 01
Old Upper Mountain Rd.
NYS Route 93
Sheet Piling
CSX Railroad
0 50 100 150
APPROXIMATE SCALE IN FEET
Otto Park Place
Former Landfill Entrance
LEGEND:
EXCAVATION AREA
OU 01 ALTERNATIVE 2: COMPLETE REMOVAL WITH OFF-SITE DISPOSAL
DIVISION OF ENVIRONMENTAL REMEDIATION
DATE: 01/17/12
DRAWING: Site Wide Map.dwg
PROJECT: OLD UPPER MOUNTAIN ROAD SITE
FIGURE 10


The Gulf
The Gulf
Barrier Wall
Somerset Railroad
Abandoned Railspur
OU 01
Old Upper Mountain Rd.
NYS Route 93
CSX Railroad
0 50 100 150
APPROXIMATE SCALE IN FEET
Otto Park Place
Former Landfill Entrance
LEGEND:
PART 360 LANDFILL CAP
AREA TO BE EXCAVATED PRIOR TO CAPPING
OU 01 ALT 4: LANDFILL CAPPING WITH A PART 360 CAP – EXISTING FOOTPRINT
DIVISION OF ENVIRONMENTAL REMEDIATION
DATE: 01/17/12
DRAWING: Site Wide Map.dwg
PROJECT: OLD UPPER MOUNTAIN ROAD SITE
FIGURE 11


Buttress
The Gulf
The Gulf
Gravel Access Road
Somerset Railroad
Abandoned Railspur
Old Upper Mountain Rd.
NYS Route 93
OU 01
Diversion Swale
CSX Railroad
0 50 100 150
APPROXIMATE SCALE IN FEET
Otto Park Place
Former Landfill Entrance
LEGEND:
PORTION OF RAVINE TO BE FILLED AND CAPPED
AREA TO BE GRADED, RECONTOURED AND CAPPED
AREA TO BE RECONTOURED AND CAPPED
OU 01 ALTERNATIVES 5 & 6: LANDFILL CAPPING – EXTENDED FOORPRINT
DIVISION OF ENVIRONMENTAL REMEDIATION
DATE: 01/17/12
DRAWING: Site Wide Map.dwg
PROJECT: OLD UPPER MOUNTAIN ROAD SITE
FIGURE 12

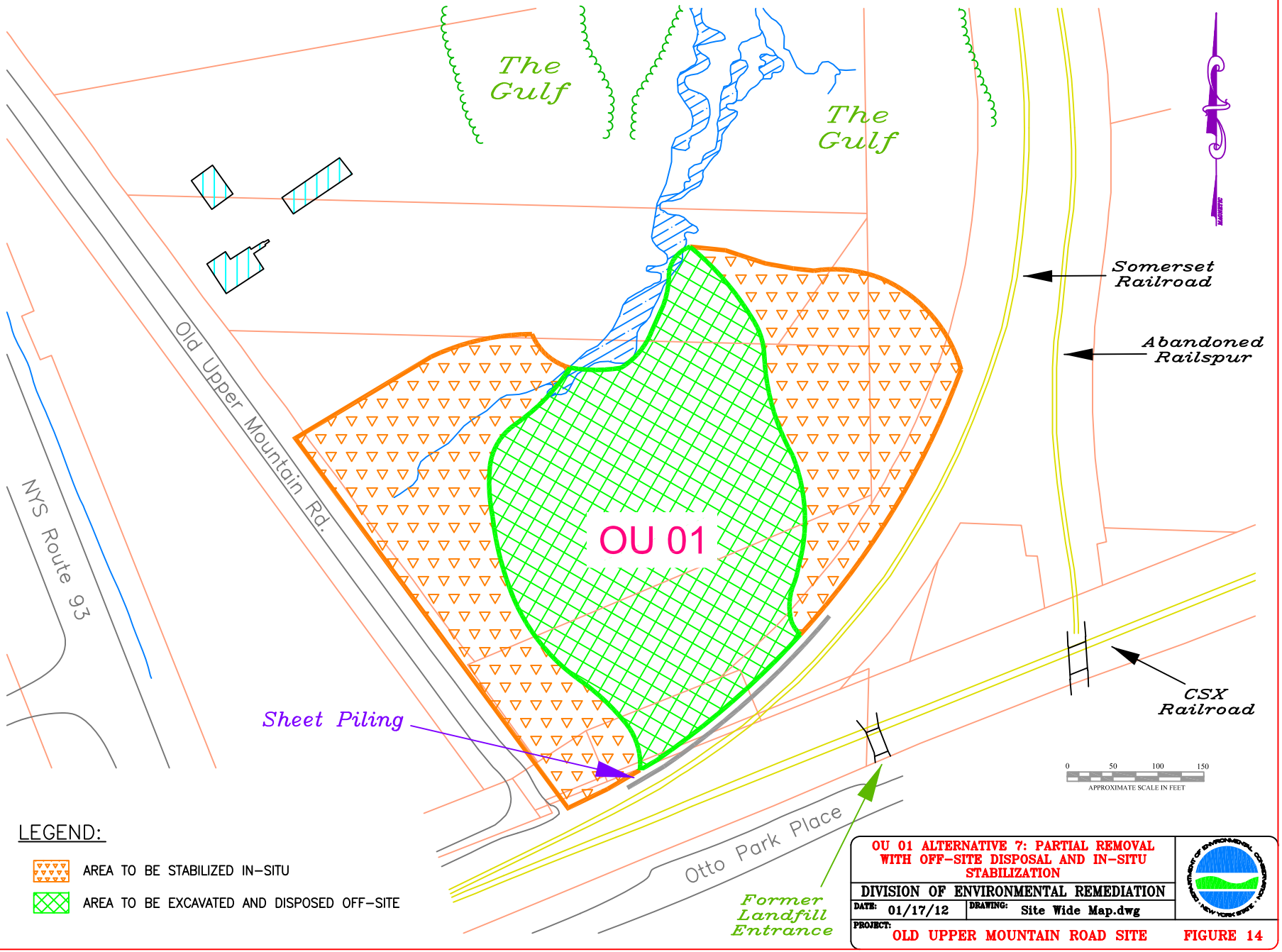


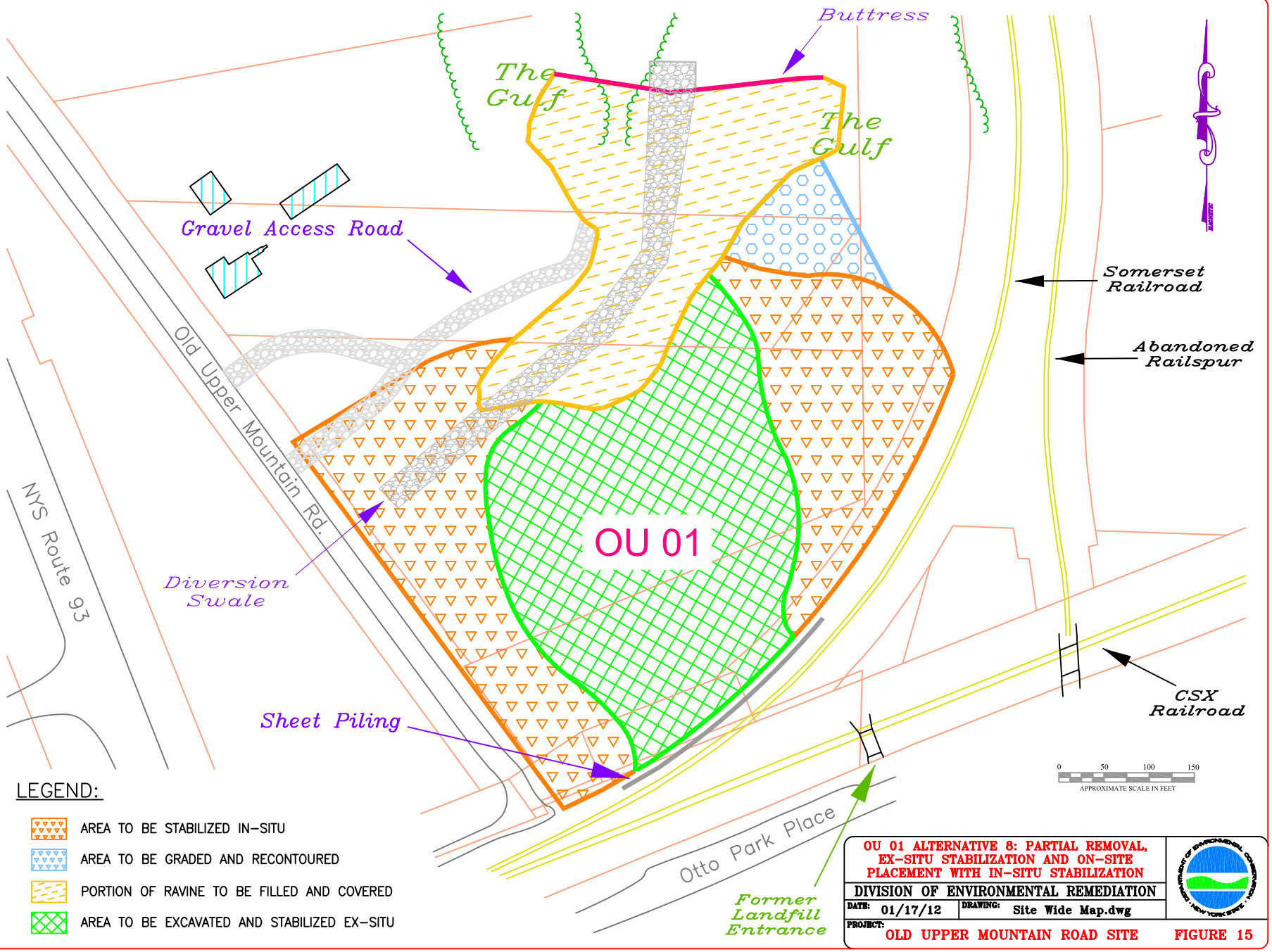
DETAILS OF THE DRAINAGE AND DIVERSION SYSTEM

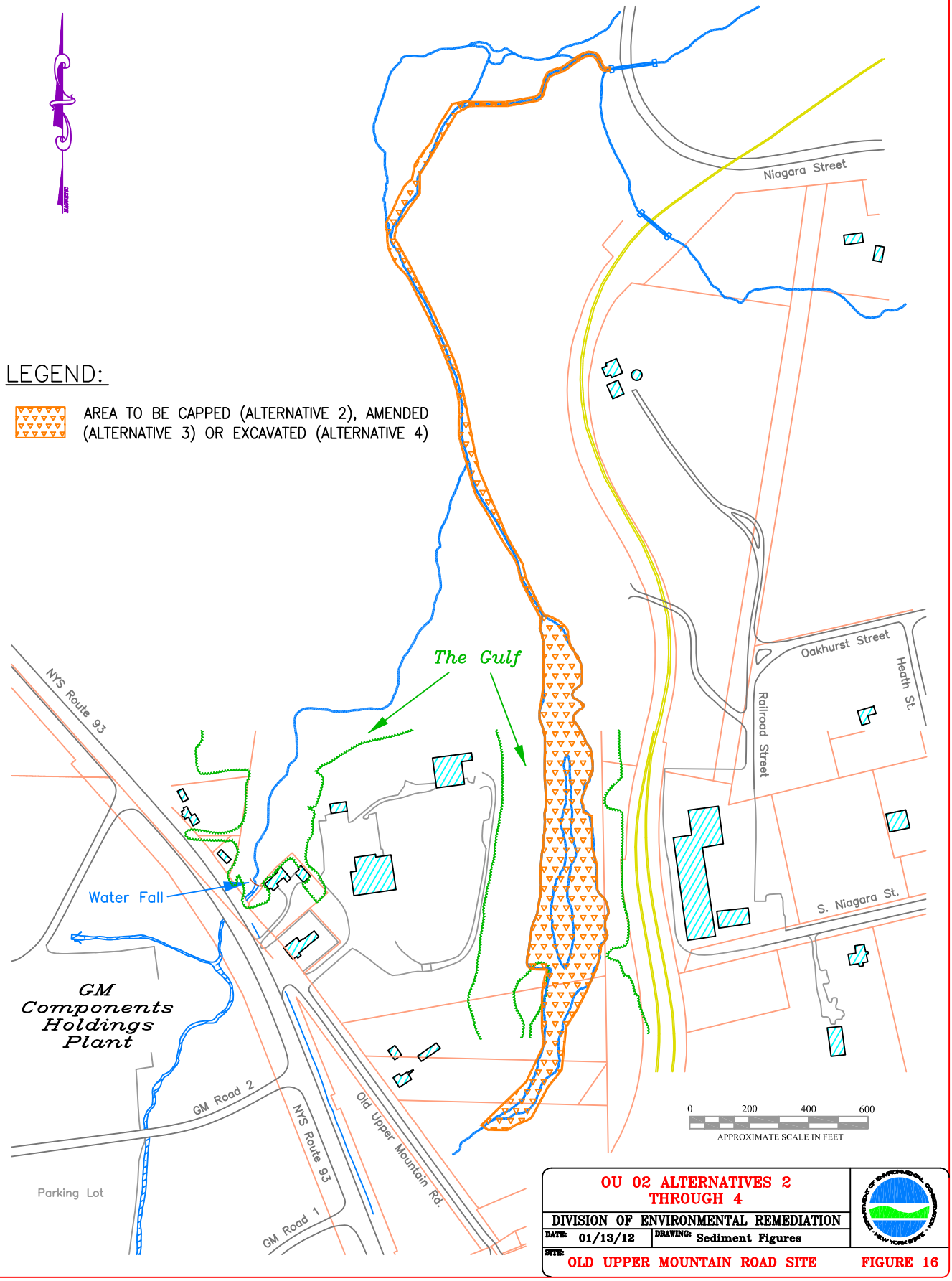
DIVISION OF ENVIRONMENTAL REMEDIATION

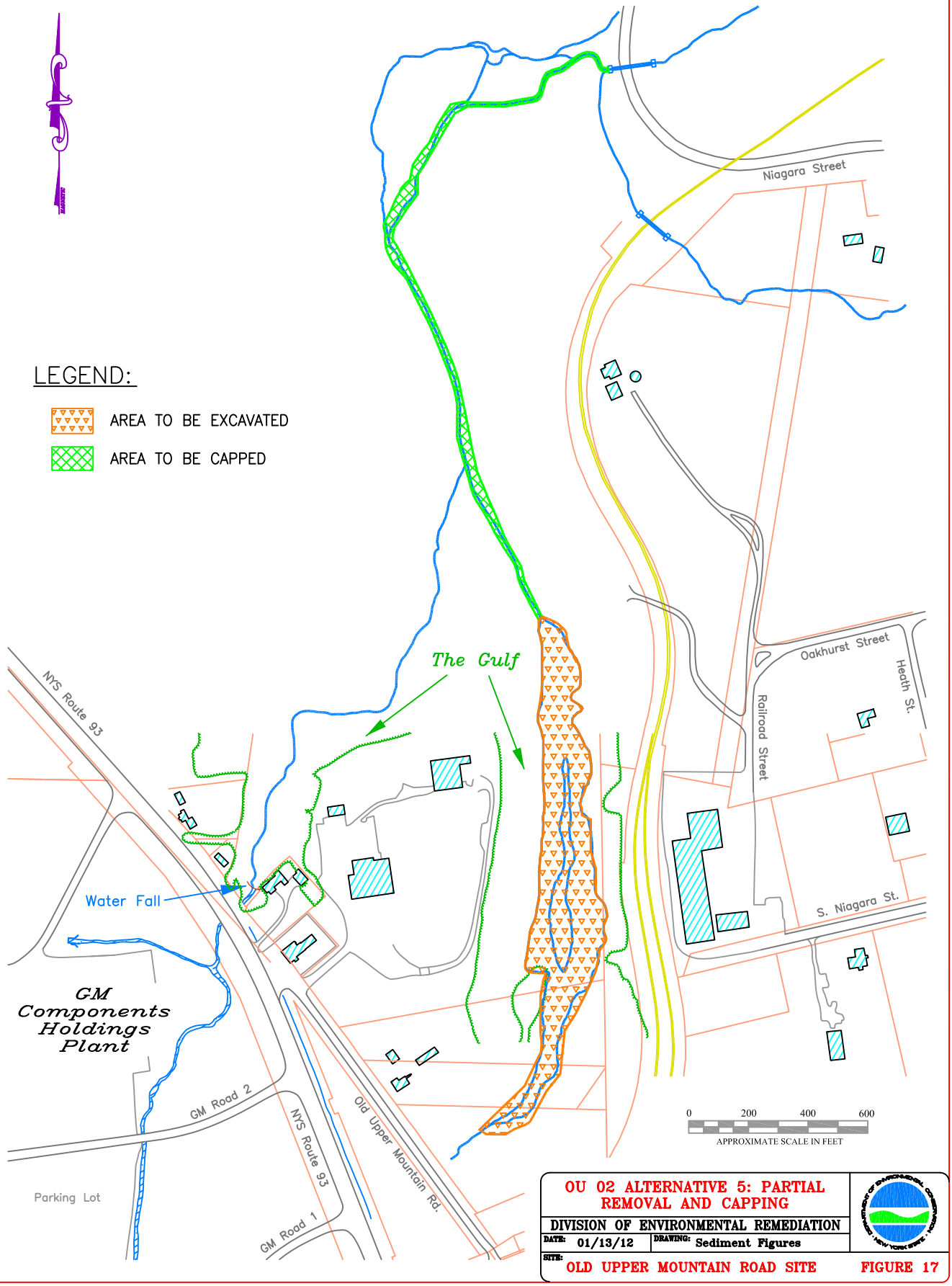
DATE: 01/17/12 DRAWING: Site Wide Map.dwg

PROJECT: OLD UPPER MOUNTAIN ROAD SITE FIGURE 13


The Gulf
The Gulf
Somerset Railroad
Abandoned Railspur
Old Upper Mountain Rd.
NYS Route 93
OU 01
Sheet Piling
CSX Railroad
0 50 100 150
APPROXIMATE SCALE IN FEET
Otto Park Place
Former Landfill Entrance
LEGEND:
AREA TO BE STABILIZED IN-SITU
AREA TO BE EXCAVATED AND DISPOSED OFF-SITE
OU 01 ALTERNATIVE 7: PARTIAL REMOVAL WITH OFF-SITE DISPOSAL AND IN-SITU STABILIZATION
DIVISION OF ENVIRONMENTAL REMEDIATION
DATE: 01/17/12
DRAWING: Site Wide Map.dwg
PROJECT: OLD UPPER MOUNTAIN ROAD SITE
FIGURE 14


Buttress
The Gulf
The Gulf
Gravel Access Road
Somerset Railroad
Abandoned Railspur
Old Upper Mountain Rd.
NYS Route 93
OU 01
Diversion Swale
Sheet Piling
CSX Railroad
Otto Park Place
Former Landfill Entrance
0 50 100 150
APPROXIMATE SCALE IN FEET
LEGEND:
AREA TO BE STABILIZED IN-SITU
AREA TO BE GRADED AND RECONTOURED
PORTION OF RAVINE TO BE FILLED AND COVERED
AREA TO BE EXCAVATED AND STABILIZED EX-SITU
OU 01 ALTERNATIVE 8: PARTIAL REMOVAL, EX-SITU STABILIZATION AND ON-SITE PLACEMENT WITH IN-SITU STABILIZATION
DIVISION OF ENVIRONMENTAL REMEDIATION
DATE: 01/17/12
DRAWING: Site Wide Map.dwg
PROJECT: OLD UPPER MOUNTAIN ROAD SITE
FIGURE 15


LEGEND:
AREA TO BE CAPPED (ALTERNATIVE 2), AMENDED (ALTERNATIVE 3) OR EXCAVATED (ALTERNATIVE 4)
Niagara Street
The Gulf
Oakhurst Street
Heath St.
Railroad Street
S. Niagara St.
NYS Route 93
Water Fall
GM Components Holdings Plant
GM Road 2
NYS Route 93
Old Upper Mountain Rd.
GM Road 1
Parking Lot
0 200 400 600
APPROXIMATE SCALE IN FEET
OU 02 ALTERNATIVES 2 THROUGH 4
DIVISION OF ENVIRONMENTAL REMEDIATION
DATE: 01/13/12
DRAWING: Sediment Figures
SITE: OLD UPPER MOUNTAIN ROAD SITE
FIGURE 16



OU 02 ALTERNATIVE 5: PARTIAL REMOVAL AND CAPPING

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 01/13/12 | DRAWING: Sediment Figures

SITE: OLD UPPER MOUNTAIN ROAD SITE | FIGURE 17