DECISION DOCUMENT

ExxonMobil Oil Former Buffalo Terminal
Operable Unit Number: 04
Brownfield Cleanup Program
Buffalo, Erie County
Site No. C915201
March 2011

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

DECLARATION STATEMENT - DECISION DOCUMENT

ExxonMobil Oil Former Buffalo Terminal
Operable Unit Number: 04
Brownfield Cleanup Program
Buffalo, Erie County
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Statement of Purpose and Basis

This document presents the remedy for Operable Unit Number: 04 of the ExxonMobil Oil Former Buffalo Terminal site, a brownfield cleanup site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law, Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for Operable Unit Number: 04 of the ExxonMobil Oil Former Buffalo Terminal site and the public's input to the proposed remedy presented by the Department.

Description of Selected Remedy

The elements of the selected remedy are as follows:

The selected remedy meets Track 4 Commercial Use criteria via a low permeability cap, slurry wall/jet grouting groundwater containment and embankment stabilization. A soil-bentonite slurry wall will be constructed around the perimeter of OU-4 to contain the inflow of groundwater and the outflow of potentially contaminated groundwater and petroleum product. A low permeability soil cap will be constructed over the ground surface within the slurry wall to restrict the inflow of storm water. The low permeability cap material (geosynthetic clay liner or geomembrane) will act as a demarcation layer between the contaminated fill and uncontaminated cover soil. Petroleum impacted material between the slurry wall and river will be removed and consolidated on the surface of OU-4 below the cap. The eroding riverbank will be cut back to a maximum 3 to 1 slope, stabilized and vegetated. All fill material placed between the slurry wall and the river will meet the Part 375 Protection of Ecological Resource Soil Cleanup Objectives. A permeable reactive barrier will be placed on the riverbank at the water line as a precaution to mitigate any unknown residual impacts that may remain in the riverbank soil/fill outside the slurry wall. A storm water wetland area will be constructed to treat storm water runoff before discharge to the river.

OU-4 will be dewatered following construction of the slurry wall and cap to facilitate product removal. Product removal will continue until all mobile product is removed.

Since the remedy results in contamination remaining at the site that does not allow for unrestricted use, a Site Management Plan is required.

Declaration

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

03/11/2011

Date

Michael Cruden, Director
Remedial Bureau E

DECISION DOCUMENT

ExxonMobil Oil Former Buffalo Terminal
Buffalo, Erie County
Site No. C915201
March 2011

SECTION 1: SUMMARY AND PURPOSE

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

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

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

SECTION 2: SITE DESCRIPTION AND HISTORY

The remediation of this site is currently being addressed under the Brownfield Cleanup Program(BCP).

Location:

The site is 90.4 acres in size and located on Elk Street in the City of Buffalo, Erie County. The site is bisected by Babcock Street running north-south and Prenatt Street, which is a paper street, running east-west. The site is bordered on the north by a mixture of commercial and residential properties, on the east and west by commercial businesses and on the south by the Buffalo River.

Site Features:

The site is relatively flat with multiple large above ground petroleum storage tanks. Several occupied and vacant buildings exist on-site. An inactive northeasterly-trending railroad right of way separates the eastern tank yard area (OU-4) from the rest of the ExxonMobil former Buffalo Terminal site.

Current Zoning/Use:

The majority of the site is currently zoned industrial. It is located in an urban area, generally surrounded by a mixture of industrial and commercial property. There are a few isolated residential parcels located immediately to the north. A large portion of the site is vacant. The largest active facility on-site is a petroleum distribution terminal. Several smaller commercial businesses operate on the western end of the site.

Historical Use(s):

Since the 1880s, the site has been used for petroleum refining and storage. Refining operations terminated in the 1980s. Former refinery, lube plant and terminal activities have impacted this site.

A Phase I Investigation Report was completed in 1983. Since that time, multiple investigations and interim remedial measures have been completed at the site. On April 3, 2006, the site entered the Brownfield Cleanup Program to address comprehensive remediation of the site.

Operable Units:

The site has been segregated into (5) operable units (OU) based on past use and nature of contamination. An operable unit represents a portion of a remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination.

OU-1 encompasses several former residential parcels north of Elk Street. Remediation of OU-1 to track 2 commercial standards was completed in 2007. The remedy included excavation and off-site disposal of 5,615 tons of soil contaminated with metals and SVOCs.

OU-2 is located south of Elk street and formerly housed refining and petroleum storage facilities. Remediation completed in OU-2 includes the removal of approximately 22 miles of below ground process piping. OU-2 has recently been investigated to determine the nature and extent of soil/fill which is grossly contaminated with petroleum products and/or hazardous based on lead levels. Bench scale and field studies have been completed to assess remedial options to address grossly contaminated soil and hazardous lead soil.

OU-3 is located along the northern shore of the Buffalo River and formerly housed petroleum refining and storage facilities (active petroleum storage presently occurs in this location). A large subsurface plume of free product will be the focus of remedial efforts in OU-3. Currently, ground water and product pumping systems are utilized to capture free product and prevent the migration of free product to the river. Recent investigations in OU-3 include investigation of the Buffalo River dock structure and associated contamination.

OU-4 is located on the north shore of the Buffalo River. This area was filled with municipal waste to realign the Buffalo River in the early 1900s. More recently, ExxonMobil utilized this

area for the disposal of tank bottom sludge and for petroleum storage. Remediation completed in OU-4 includes the operation of a Chem-Ox system (injection of hydrogen peroxide and ozone into the subsurface) to oxidize and mobilize (for extraction) a free product plume. The Chem-Ox injections were terminated in the summer of 2009. Additional remediation is necessary. The RI/AAR for OU-4 was released for public comment in September 2010.

OU-5 includes the river sediment along the north shore of the Buffalo river adjacent to the main site. Limited information is currently available and additional investigation will be necessary.

Site Geology and Hydrogeology:

Three unconsolidated deposits exist throughout the majority of the site including a fill layer (cinders, ash, slag, sand, brick, concrete, etc), underlain by an alluvial deposit layer consisting of silt, sands, gravel and clay and an alluvial deposit layer consisting of glacio-Lacustrine clay which acts as a confining layer. Groundwater is approximately 3 to 20+ feet below ground surface and generally flows southwest toward the Buffalo River.

Operable Unit (OU) Number 04 is the subject of this document.

A Decision Document has yet to be issued for OU 01,02,03,05.

A site location map is attached as Figure 1.

SECTION 3: 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) is/are 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 available in the RI Report.

SECTION 4: ENFORCEMENT STATUS

The Brownfield Cleanup Agreement was signed on April 3, 2006.

SECTION 5: SITE CONTAMINATION

5.1: Summary of the Remedial Investigation

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

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

The RI is intended to identify the nature (or type) of contamination which may be present at a site and the extent of that contamination in the environment on the site, or leaving the site. The RI reports on data gathered to determine if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. Monitoring wells are installed to assess groundwater and soil borings or test pits are installed to sample soil and/or waste(s) identified. If other natural resources are present, such as surface water bodies or wetlands, the water and sediment may be sampled as well. Based on the presence of contaminants in soil and groundwater, soil vapor will also be sampled for the presence of contamination. Data collected in the RI influence the development of remedial alternatives. The RI report is available for review in the site document repository and the results are summarized in section 5.4.

5.1.1: Standards, Criteria, and Guidance (SCGs)

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

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

5.1.2: RI Information

The analytical data collected on this site includes data for:

- groundwater
- soil
- sediment
- soil vapor
- indoor air

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require

evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized below. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified for this Operable Unit at this site is/are:

petroleum products

The contaminant(s) of concern exceed the applicable standards, criteria and guidance for:

- groundwater
- surface water
- soil

5.2: Interim Remedial Measures

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

The following IRM(s) has/have been completed at this site based on conditions observed during the RI.

IRM - Chemical Oxidation

An IRM for chemical oxidation was implemented to assess the treatability of the free product plume in OU-4. ExxonMobil installed and operated a Chem-Ox system (injection of hydrogen peroxide and ozone into the subsurface) to oxidize and mobilize, for extraction, the free product. Although partial oxidation and enhanced mobilization of product was achieved, the IRM failed to achieve complete remediation of the plume. Additional remediation is necessary.

5.3: 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, which limits public access. However, persons who enter the site could contact contaminants in the soil by walking on the site, digging or otherwise disturbing the soil. Soil removal actions have been completed to remove contaminated soil found in off-site residential surface soils. People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in the groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. The potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site redevelopment and occupancy. People using the Buffalo River near the site for recreational purposes such as swimming and boating may come

into direct contact with chemical contaminants. People may come in contact with contaminants present in river sediments while entering or exiting the river during recreational activities.

5.4: Summary of Environmental Assessment

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

Nature and Extent of Contamination:

Based upon investigations conducted to date, the site wide primary contaminants of concern are petroleum product, petroleum related Semi-Volatile Organic Compounds (SVOCs) especially Polycyclic Aromatic Hydrocarbons (PAHs), petroleum related Volatile Organic Compounds (VOCs) and metals. Characteristically hazardous lead soil exists in the central and eastern portion of OU-2. Tetraethyl lead was detected in the river sediments adjacent to OU-4.

Contaminants of concern in groundwater are primarily VOCs, especially in areas where measurable separate phase petroleum product exists on top of the groundwater. Also, considerable quantities of separate phase product have been detected on top of the groundwater, especially near the southern end of the site in OU-3 (north of the Buffalo River) and in OU-4.

Special Resources Impacted/Threatened:

The site occupies approximately 3,100 feet of the north shoreline of the Buffalo River. Historic discharges of petroleum product have adversely impacted the Buffalo River. Currently, small quantities of product continue to discharge to the river (evident by intermittent sheen) especially adjacent to OU-4. The noticeable sheen originates from stained soil on the bank of the river, as well as, the existence of the product plume beneath OU-4. Discharges from other areas of the site are mitigated by operation of a well pumping system that acts to retard groundwater discharge to the river.

SECTION 6: ELEMENTS OF THE SELECTED REMEDY

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

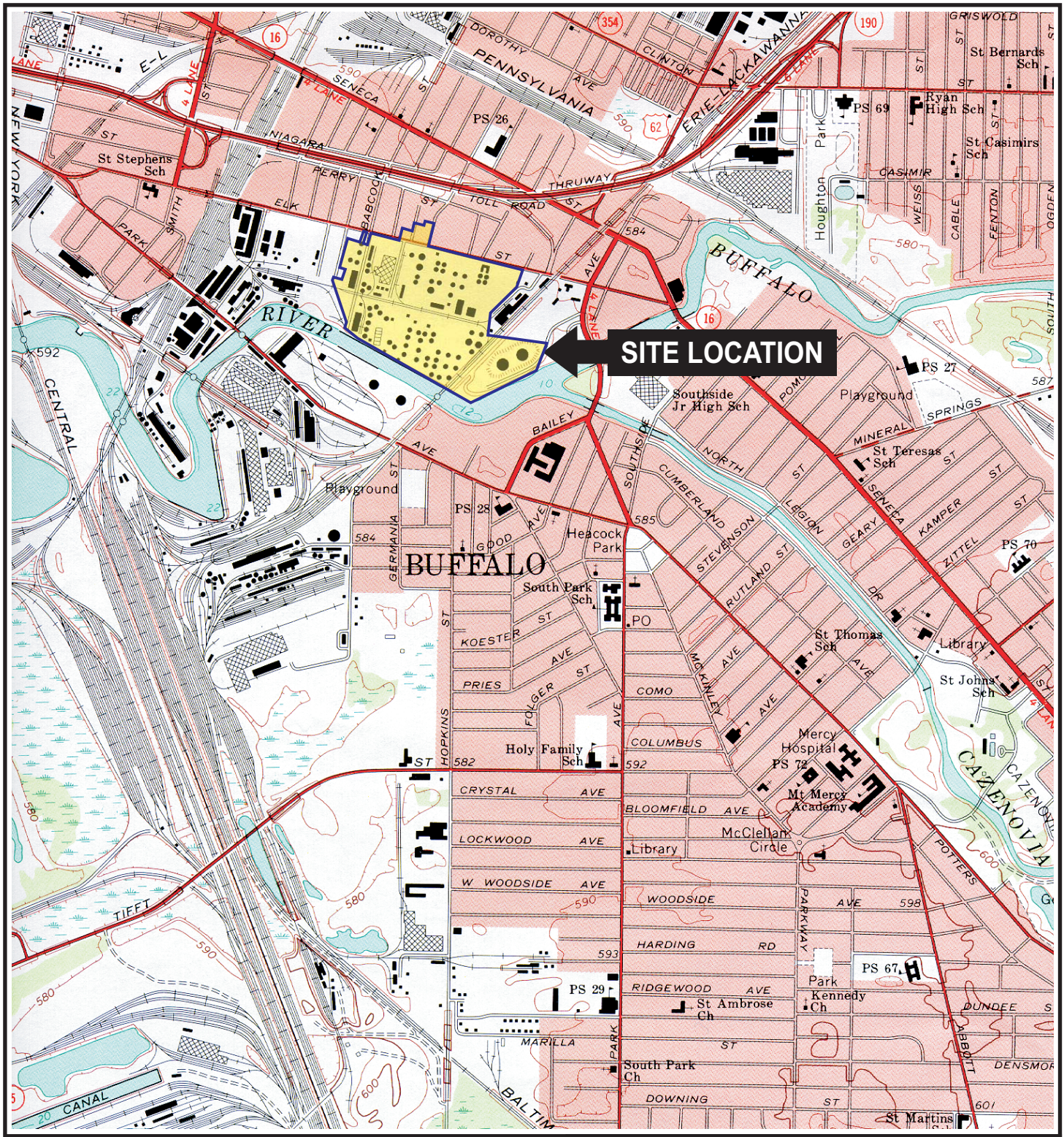
The selected remedy is a Track 4: Restricted use with site-specific soil cleanup objectives remedy.

The elements of the selected remedy, as shown in Figure 2, are as follows:

The selected remedy meets Track 4 Commercial Use criteria via a low permeability cap, slurry wall/jet grouting groundwater containment and embankment stabilization. A soil-bentonite slurry wall will be constructed around the perimeter of OU-4 to contain the inflow of groundwater and the outflow of potentially contaminated groundwater and petroleum product. A low permeability soil cap will be constructed over the ground surface within the slurry wall to restrict the inflow of storm water. The low permeability cap material (geosynthetic clay liner or geomembrane) will act as a demarcation layer between the contaminated fill and uncontaminated cover soil. Petroleum impacted material between the slurry wall and river will be removed and consolidated on the surface of OU-4 below the cap. The eroding riverbank will be cut back to a maximum 3 to 1 slope, stabilized and vegetated. All fill material placed between the slurry wall and the river will meet the Part 375 Protection of Ecological Resource Soil Cleanup Objectives. A permeable reactive barrier will be placed on the riverbank at the water line as a precaution to mitigate any unknown residual impacts that may remain in the riverbank soil/fill outside the slurry wall. A storm water wetland area will be constructed to treat storm water runoff before discharge to the river.

OU-4 will be dewatered following construction of the slurry wall and cap to facilitate product removal. Product removal will continue until all mobile product is removed.

Since the remedy results in contamination remaining at the site that does not allow for unrestricted use, a Site Management Plan is required.



QUADRANGLE LOCATION

SOURCE:
USGS; 1965, Buffalo SE, New York
7.5 Minute Topographic Quadrangle

N

0 2000’

Title:

SITE LOCATION MAP

EXXONMOBIL FORMER BUFFALO TERMINAL, BUFFALO, NEW YORK

Prepared for:

EXXONMOBIL OIL CORPORATION

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: W.K.		Date: 22JUNE09	FIGURE 1
Prepared by: J.A.D.		Scale: AS SHOWN	
Project Mgr.: N.C.		Office: NY	
File No.: MC5238301		Project No.: 17252Y11	

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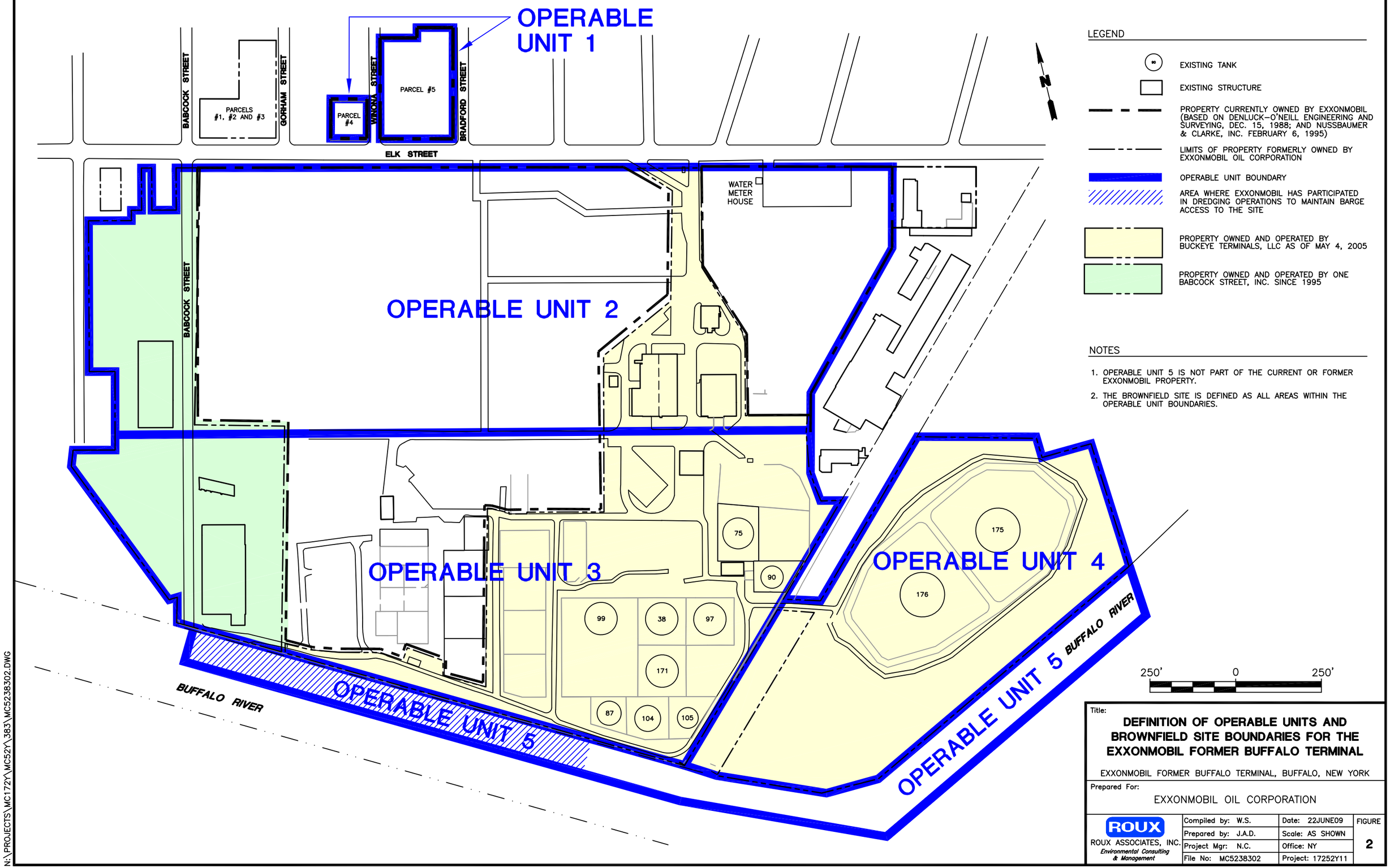

Title:

DEFINITION OF OPERABLE UNITS AND BROWNFIELD SITE BOUNDARIES FOR THE EXXONMOBIL FORMER BUFFALO TERMINAL

EXXONMOBIL FORMER BUFFALO TERMINAL, BUFFALO, NEW YORK

Prepared For:

EXXONMOBIL OIL CORPORATION

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: W.S.	Date: 22JUNE09	FIGURE
Prepared by: J.A.D.	Scale: AS SHOWN	2
Project Mgr: N.C.	Office: NY	
File No: MC5238302	Project: 17252Y11	

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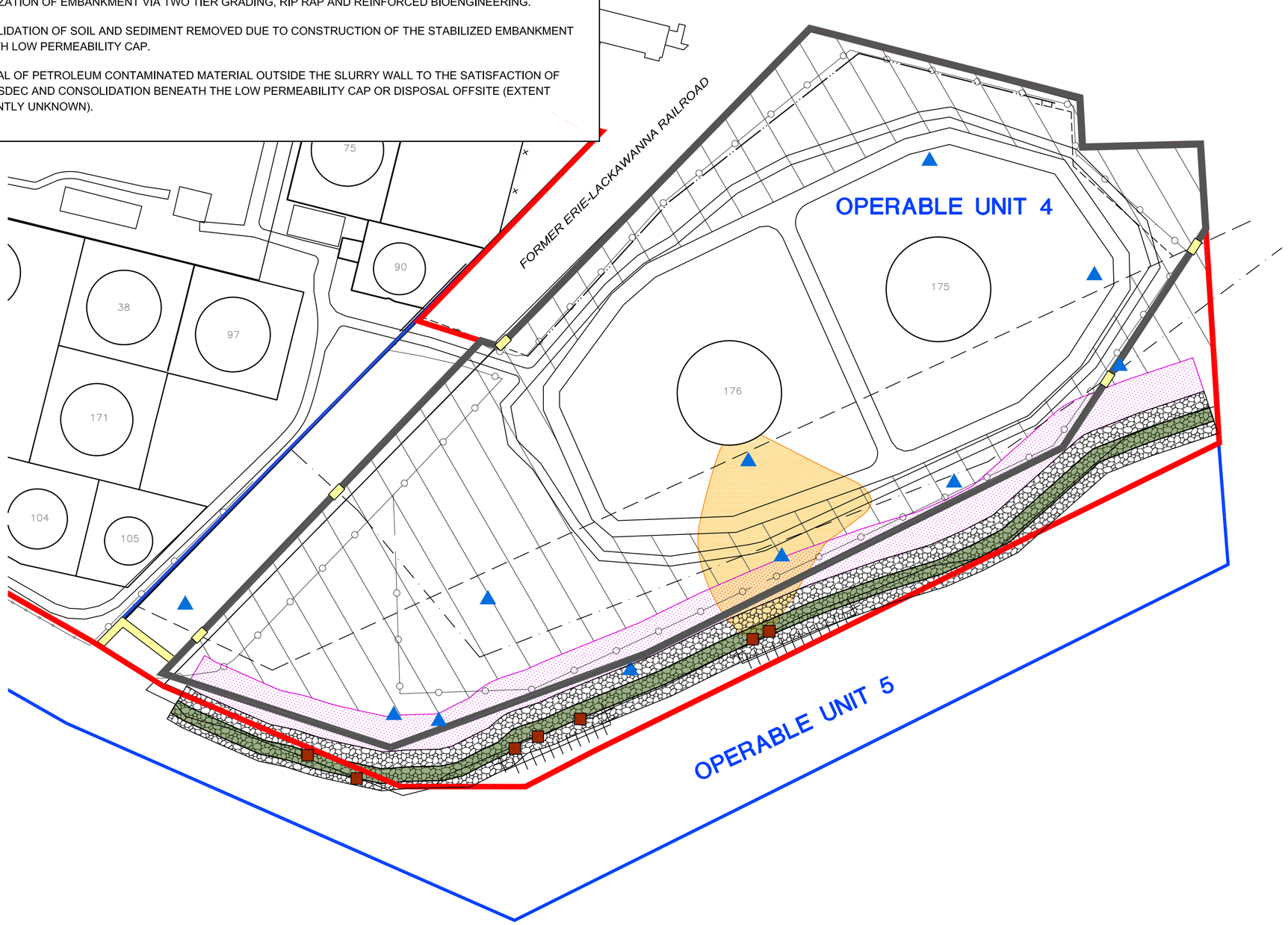
REMEDIAL ALTERNATIVE 3

TRACK 4 TO INDUSTRIAL CRITERIA VIA LOW PERMEABILITY CAP AND SLURRY WALL/JET GROUTING GROUNDWATER CONTAINMENT

DESCRIPTION OF REMEDIAL ALTERNATIVE 3:

ALTERNATIVE 3 INCLUDES:

- LOW PERMEABILITY CAPPING OF ALL AREAS WITHIN THE SLURRY WALL LIMITS WITH ONE FOOT OF SEPARATION BETWEEN SURFACE SOIL EXCEEDING THE INDUSTRIAL CRITERIA.
- LINED ACTIVE TANK BERMS ARE CONSIDERED ADEQUATELY CAPPED.
- REMEDIATION AND CONTAINMENT OF GROUNDWATER VIA SLURRY WALL AND JET GROUTING.
- STABILIZATION OF EMBANKMENT VIA TWO TIER GRADING, RIP RAP AND REINFORCED BIOENGINEERING.
- CONSOLIDATION OF SOIL AND SEDIMENT REMOVED DUE TO CONSTRUCTION OF THE STABILIZED EMBANKMENT BENEATH LOW PERMEABILITY CAP.
- REMOVAL OF PETROLEUM CONTAMINATED MATERIAL OUTSIDE THE SLURRY WALL TO THE SATISFACTION OF THE NYSDEC AND CONSOLIDATION BENEATH THE LOW PERMEABILITY CAP OR DISPOSAL OFFSITE (EXTENT CURRENTLY UNKNOWN).



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LEGEND

- LIMITS OF LOW PERMEABILITY CAP
- LIMITS OF PROPOSED 4–ON–1 VEGETATED EMBANKMENT
- LIMITS OF PROPOSED 3–ON–1 RIP RAP EMBANKMENT
- HISTORICAL AND CURRENT EXTENT OF SEPARATE–PHASE PRODUCT
- SOIL SAMPLE EXCEEDING INDUSTRIAL CRITERIA
- SEDIMENT SAMPLE EXCEEDING BENTHIC AQUATIC LIFE ACUTE TOXICITY FRESH WATER CRITERIA OR SEVERE EFFECT LEVEL
- APPROXIMATE LOCATION OF PROPOSED JET GROUTING
- APPROXIMATE LOCATION OF PROPOSED SLURRY WALL
- PERMEABLE REACTIVE BARRIER
- FENCELINE
- LIMITS OF CONTAINMENT BOOMS
- PORTION OF BUCKEYE'S PRODUCT PIPELINE THAT IS ABANDONED (LINE PURGED AND ABANDONED IN PLACE)
- PORTION OF BUCKEYE'S BURIED PRODUCT PIPELINE THAT IS ACTIVE
- BUCKEYE'S ACTIVE ABOVE GROUND PRODUCT PIPELINE
- ENBRIDGE PIPELINES INC.'S BURIED PRODUCT PIPELINE (LINE REPORTEDLY PURGED AND FILLED WITH NITROGEN IN 1982)
- BCP SITE BOUNDARY
- OPERABLE UNIT BOUNDARY

100' 0 100'

Plot Scale: 1:1 Date: 29JUL10 File Name: N:\PROJECTS\MC1772Y\MC52Y\383R\MC52383R09.DWG

NO.	DATE	REVISION DESCRIPTION	INT.
*	*	*	*

PROJECT ENGINEER: N.C
DESIGNED BY: W.K.
DRAWN BY: J.A.D.
CHECKED BY: N.C.

PROJECT NO. 17252Y13
FILE NO. MC52383R09
SCALE: AS SHOWN
DATE: JULY 2010

REMEDIAL ENGINEERING, P.C.
209 Shafter Street
Islandia, New York 11749 (631) 232–2600

PROJECT NAME: EXXONMOBIL FORMER BUFFALO TERMINAL BUFFALO, NEW YORK
PROJECT FOR: EXXONMOBIL OIL CORPORATION

TITLE: REMEDIAL ALTERNATIVE 3
ALTERNATIVES ANALYSIS REPORT
OPERABLE UNIT 4

PLATE 11

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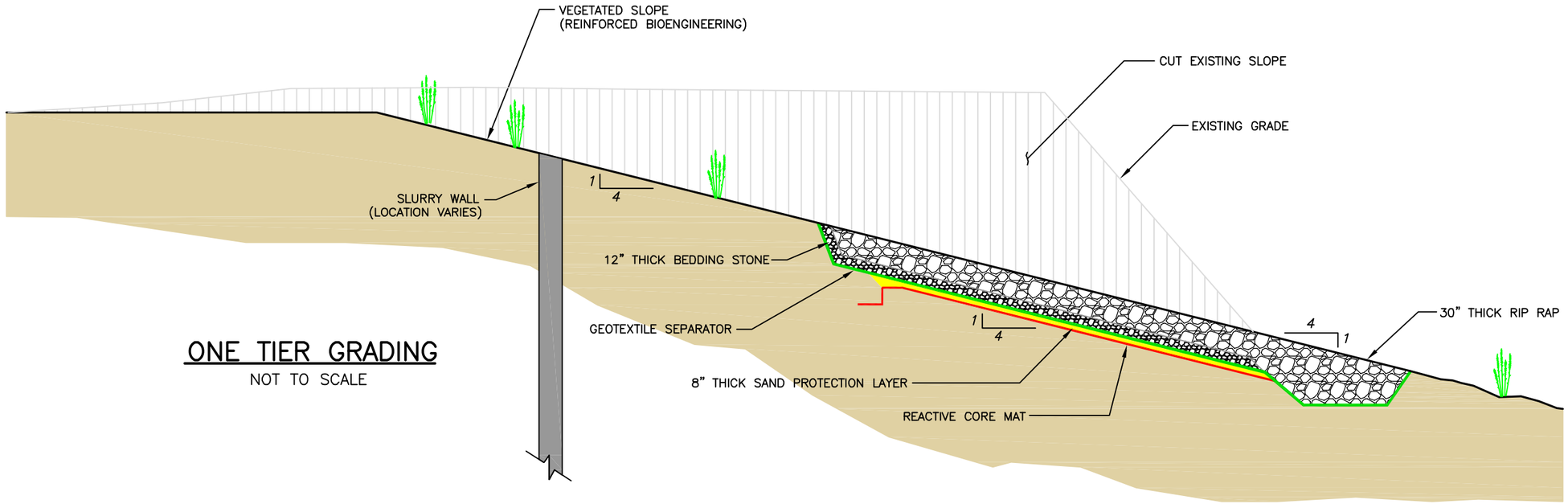
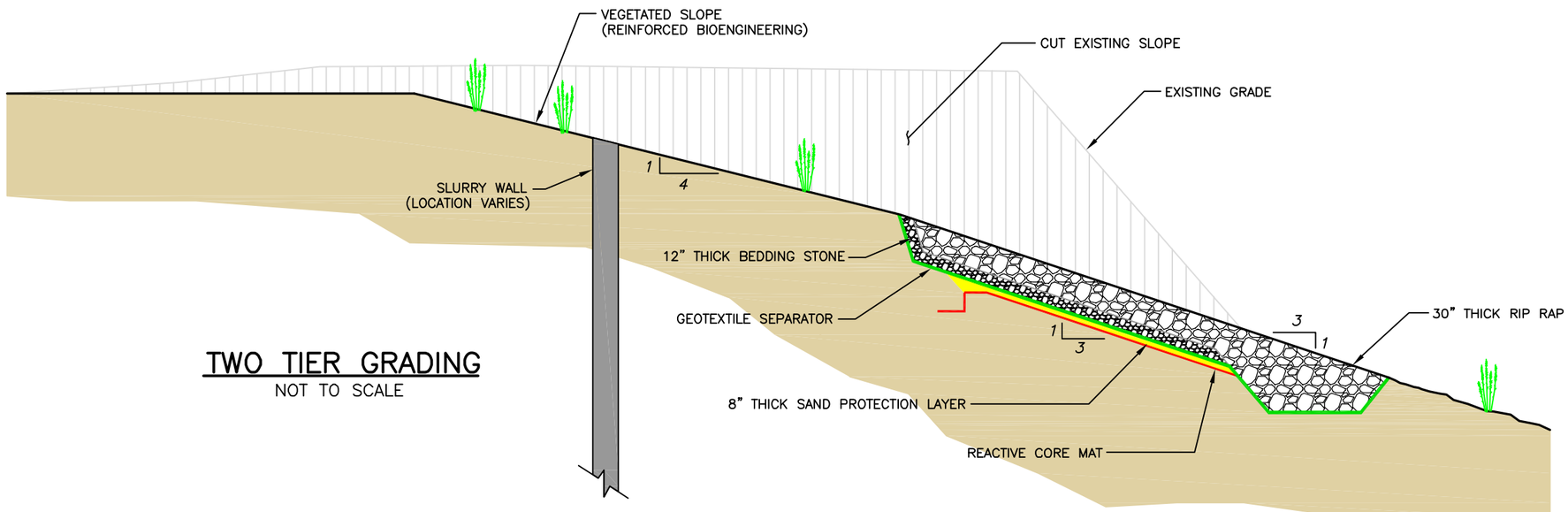


ONE TIER GRADING

NOT TO SCALE



TWO TIER GRADING

NOT TO SCALE

Title:

CONCEPTUAL EMBANKMENT STABILIZATION PROFILES

EXXONMOBIL FORMER BUFFALO TERMINAL
BUFFALO, NEW YORK

Prepared For:

EXXONMOBIL OIL CORPORATION

ROUX ASSOCIATES, INC.
Environmental Consulting and Management

Compiled by: W.K.	Date: 18SEP09	FIGURE
Prepared by: B.H.C.	Scale: AS SHOWN	
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File: MC52383R10.DWG		

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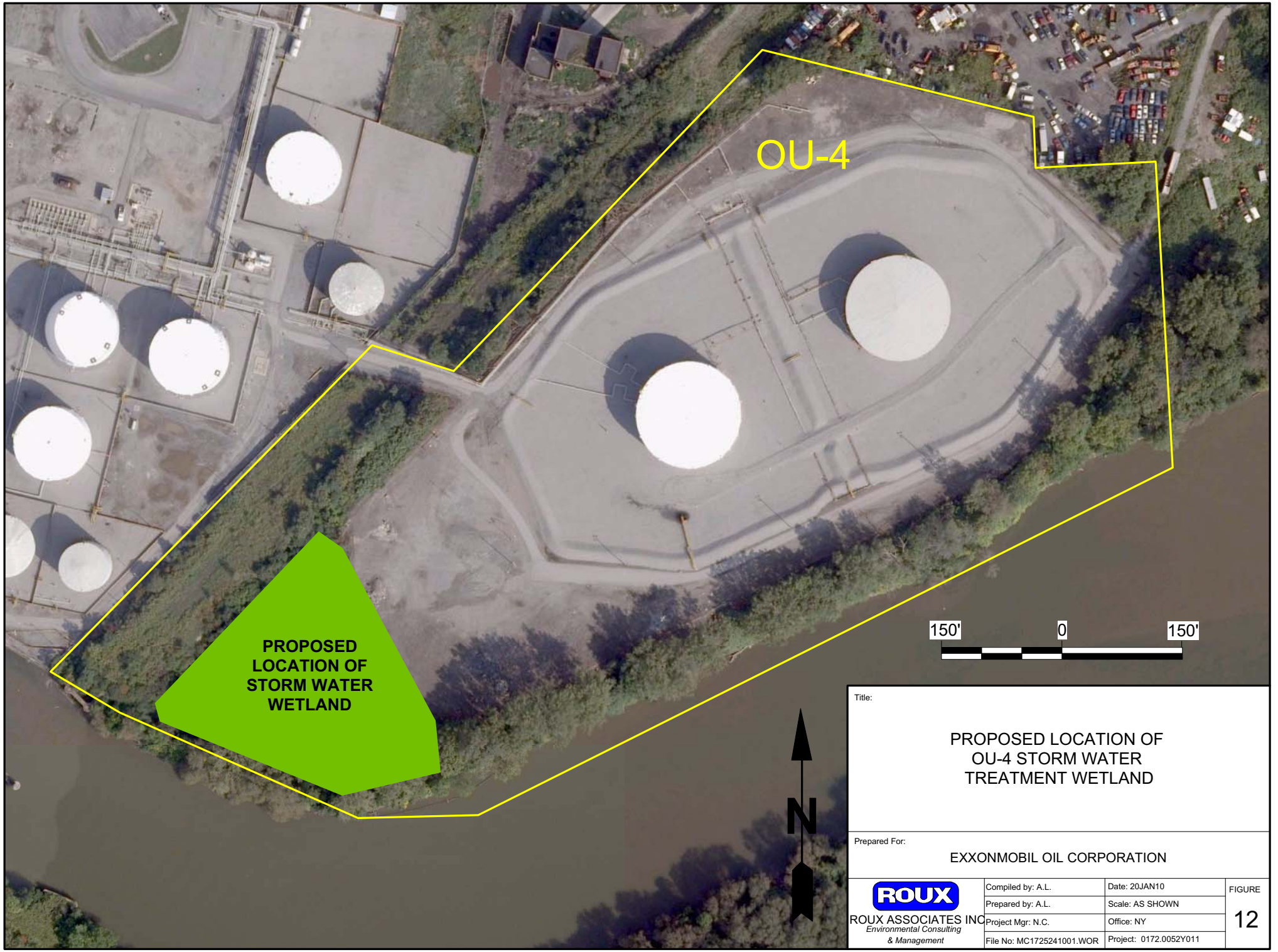

Title:

PROPOSED LOCATION OF OU-4 STORM WATER TREATMENT WETLAND

Prepared For:

EXXONMOBIL OIL CORPORATION

ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: A.L.	Date: 20JAN10	FIGURE
Prepared by: A.L.	Scale: AS SHOWN	12
Project Mgr: N.C.	Office: NY	
File No: MC1725241001.WOR	Project: 0172.0052Y011	