PROPOSED REMEDIAL ACTION PLAN
DEPEW VILLAGE LANDFILL SITE
Operable Unit No. 02
Village of Depew, Erie County, New York
Site No. 915105

October 2009

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 Depew Village Landfill, Operable Unit No. 02. The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this proposed remedy. As more fully described in Sections 3 and 5 of this document, the operation of a former municipal solid waste incinerator and landfill at the site have resulted in the disposal of hazardous wastes, including ash material containing heavy metals. These wastes have contaminated the soils and sediments at the site, and have resulted in:

- a significant threat to human health associated with potential exposure to contaminated soils and sediments.

- a significant environmental threat associated with the current and potential impacts of contaminants to the Cayuga Creek ecosystem.

To eliminate or mitigate these threats, the Department proposes sediment excavation from Cayuga Creek, soil removal from the flood plain and the Zurbrick Road slope, off-site disposal and streambank stabilization.

The proposed remedy, discussed in detail in Section 8, is intended to attain the remediation goals identified for this site in Section 6. The remedy must conform with officially 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.

This Proposed Remedial Action Plan (PRAP) identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for this preference. The Department will select a final remedy for the site only after careful consideration of all comments received during the public comment period.

The Department has issued this PRAP as a component of the Citizen Participation Plan developed pursuant to the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375. This document is a summary of the information that can be found in greater detail in the June 2009, "Remedial Investigation/Feasibility Study (RI/FS) for Operable Unit 2 of the Depew Village Landfill Site", and other relevant documents. The public is encouraged to review the project documents, which are available at the following repositories:

Village of Depew
Municipal Building
85 Manitou Street
Depew, NY 14043
(716) 683-1400
Contact: Elizabeth Melock

NYSDEC Buffalo Office
270 Michigan Avenue
Buffalo, NY 14203
(716) 851-7220
Appointment requested; contact David Locey.

NYSDEC Central Office
625 Broadway, 12th Floor
Albany, NY 12233-7013
(518) 402-9767
Appointment requested; contact Randy Hough, Project Manager.

The Department seeks input from the community on all PRAPs. A public comment period has been set from November 2 through December 1, 2009 to provide an opportunity for public participation in the remedy selection process. A public meeting is scheduled for Tuesday, November 17th, 2009 at the Village of Depew Municipal Building beginning at 7:00 pm.

At the meeting, the results of the RI/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 to Mr. Hough at the above address through December 1, 2009.

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 all of the alternatives identified here.

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.

SECTION 2: SITE LOCATION AND DESCRIPTION

The Depew Village Landfill site is located in the Village of Depew, Town of Cheektowaga, in Erie County (Figure 1). The site's general location is in a suburban setting.

Operable Unit (OU) No. 02, which is the subject of this document, includes a section of the Cayuga Creek environment (surface water, sediments and floodplain soils) and a segment of stream bank located below Zurbrick Road (Figure 2).

An operable unit represents a portion of the site remedy that for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination.

Cayuga Creek is a Class C stream and a major tributary of the Buffalo River, which ultimately empties into Lake Erie. The creek has a drainage area of approximately 112 square miles above the site. The stream at and around the site is characterized by alluvial deposits, a well defined floodplain and floodway, a meandering channel, and a streambed consisting of riffle/pool sequences and point sand bar deposits within the active channel. Bedrock at and around the site consists of fractured and jointed Onondaga limestone, which also forms the bed of Cayuga Creek. Average flowrate in the stream is approximately 110 cubic feet/second. A mixture of public and private lands border the stream at the site area. Property boundaries in the area extend to the stream centerline.

The Zurbrick Road slope area is comprised of two property parcels, one owned by Erie County (1.12 acres) and the other owned the Village of Depew (0.35 acres). Contaminated fill materials appear to have been dumped down the slope in order to help stabilize the area.

The remaining operable unit for this site is: Operable Unit No. 01, which consists of approximately 20 acres of area contained within the banks of the Cayuga Creek on the peninsula south of the Village of Depew DPW facility. OU-01 includes the footprint of the former landfill, excluding the Erie County Overflow Retention Facility (ORF) and associated structures which sit in the middle of the peninsula. The northern boundary of OU-01 (extending west to east) is identified as a combination of the southern perimeter of the DPW parking lot across to the tree-line that abuts the mowed fields in the northeast, continuing to the bank of Cayuga Creek. Zurbrick Road is located to south of the former landfill across Cayuga Creek (Figure 2).

Other sites in the area which are being addressed under the Department's remedial programs include: the Land Reclamation (915070) and the Old Land Reclamation (915129) sites which are located approximately one-half mile downstream and the NL Industries (V00353) site which is located approximately one and one-half miles to the north.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The Depew Village Landfill was operated by the Village of Depew between 1940 and 1961. During operations the landfill received approximately 10,000 tons per year of municipal solid waste and/or other unknown waste streams. Much of the wastes were processed through the incinerator that was once located on-site, with the resulting ash disposed of in the landfill. Site hazardous waste contamination, including heavy metals and in particular lead, was concentrated in the ash fill. Fill materials were placed along the creek shoreline below the bankfull flow elevations (roughly the mean high water level for this stream) making them available for erosion. The former landfill was not lined or properly covered and closed.

3.2: Remedial History

In 1983, the Department first listed the site as a Class 2a site in the Registry of Inactive Hazardous Waste Disposal Sites in New York (the Registry). Class 2a was a temporary classification assigned to a site that had inadequate and/or insufficient data for inclusion in any of the other classifications. Also in 1983, Erie County acquired 14.5 acres of the peninsula area for the ORF project. During ORF construction approximately 60,000 cubic yards of fill was removed from the site and disposed of in the BFI Landfill in Tonawanda, New York. No chemical analysis was performed.

In 1985, the Erie County Department of Environment and Planning prepared a "Hazardous Waste Site Profile Report", which concluded that no hazardous waste was disposed at the site.

In 1988, the Department conducted a Phase I Investigation at the site. This report recommended conducting a Phase II Investigation.

In 1990, the Department de-listed the site from the Registry of Inactive Hazardous Waste Disposal Sites, based upon the fact that no documented evidence of hazardous waste disposal could be found.

In 2001, the Village of Depew entered into a Section 14 (1946 Flood Control Act), Project Cooperation Agreement (PCA) with the U.S. Army Corps of Engineers (USACOE) to perform an Emergency Streambank Protection Project on a section of Cayuga Creek below Zurbrick Road, south of the site. As part of this project, the design called for excavating soils on the peninsula tip, in order to maintain the required stream bed width, and use of these soils on the opposite bank as fill. During the excavation, the USACOE contractor noticed the presence of fill materials and conducted sampling and analysis. The analysis indicated total lead concentrations as high as 86,000 parts per million in the soils and in addition the samples failed the Environmental Protection Agency's (EPA), Toxicity Characteristics Leaching Procedure (TCLP) for lead, making the material hazardous. With the determination of the presence of hazardous waste and in accordance with the PCA, the USACOE ceased operations on the streambank stabilization project.

In 2002, the Village of Depew entered the Department's Voluntary Cleanup Program (VCP) and the site was designated as V00609-9.

In 2003, a Site Investigation was conducted by the Village's consultant which focused on the 1.3 acre area at the tip of the peninsula.

In 2004, the Site Investigation / Remedial Report (SI/RR) was generated. This report confirmed the presence of hazardous wastes and it also indicated that the lead contamination most likely extends to the north, beyond the registry area on the peninsula tip. The Village of Depew opted out of the VCP, the Voluntary Cleanup Agreement was terminated and the Department listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York. A Class 2 site is a site where hazardous waste presents a significant threat to the public health and/or the environment and action is required.

In early 2007, the Department finalized a Site Boundary Modification Package, which increased the site size from 1.3 to 20 acres in the Registry of Inactive Hazardous Waste Disposal Sites. The site boundary modification was based upon the extent of the lead contamination as determined from the RI results. The modified site boundary includes the majority of the footprint of the original landfill. In addition, OU-02 was created based upon the fact that the sediments in the stream around the landfill were determined to be contaminated above Department guidance values, however the downstream extent of the impacts had not been delineated and thus a separate RI/FS was initiated.

The RI/FS for OU-01 was completed in 2006 and the Record of Decision (ROD) was signed in March of 2008. The ROD selected stream bank soil removal, stream bank stabilization, a soil cover, passive landfill gas venting, monitoring and institutional controls as the remedy for this operable unit. Work on the OU-01 remedy has been deferred pending completion of the RI/FS and the selection of a remedy for OU-02.

SECTION 4: 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.

The PRPs for the site, documented to date, include: the Village of Depew and Erie County.

The PRPs declined to implement the RI/FS at the site when requested by the Department. After the remedy is selected, the PRPs will again be contacted to assume responsibility for the remedial program. If an agreement cannot be reached with the PRPs, 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 5: SITE CONTAMINATION

A remedial investigation/feasibility study (RI/FS) has been conducted to evaluate the alternatives for addressing the significant threats to human health and/or the environment.

5.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between September 2007and June 2008. The field activities and findings of the investigation are described in the RI report.

Cayuga Creek surface water, sediments and floodplain soils were investigated over a study area distance of approximately 13,000 feet downstream of the former landfill. In addition, a sampling grid was setup on the slope below Zurbrick Road for soil sample collection in this area.

5.1.1: Standards, Criteria, and Guidance (SCGs)

To determine whether the surface waters, soils, and sediments contain contamination at levels of concern, data from the investigation were compared to the following SCGs:

- Surface water SCGs are based on the Department's "Ambient Water Quality Standards and Guidance Values".

- Soil SCGs are based on the Department's Soil Cleanup Objectives ("6NYCRR Part 375, Environmental Remediation Programs, Subpart 375-6") .

- Sediment criteria are based on the Department's "Technical Guidance for Screening Contaminated Sediments."

- Location specific SCGs must also be considered during remedy selection. Article 15 and Article 16 of the Environmental Conservation Law (ECL) are location specific SCGs applicable to the site. Therefore all work within the streambed and banks must meet the requirements of 6NYCRR Part 608, "Use and Protection of Waters" and all work within the floodplain must meet the requirements of 6NYCRR Part 500, "Floodplain Management Regulations Development Permits".

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized in Section 5.1.2. More complete information can be found in the RI report.

5.1.2: Nature and Extent of Contamination

This section describes the findings of the investigation for all environmental media that were investigated.

As described in the RI report, many soil, surface water and sediment samples were collected to characterize the nature and extent of contamination. As seen in Figures 3 and 4, the main categories of contaminants that exceed their SCGs are inorganics (metals). For comparison purposes, where applicable, SCGs are provided for each medium.

Chemical concentrations are reported in parts per billion (ppb) for water and parts per million (ppm) for soil and sediment.

Figures 3 and 4 summarize the degree of contamination for the contaminants of concern in soils and sediments and compares the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation.

Surface/Subsurface Soil

Soil SCGs include a number of soil cleanup objectives (SCOs) based upon the threat that is to be eliminated or mitigated to protect public health and the environment. Because the soils around the site are being eroded and deposited into the Cayuga Creek ecological resource, the Protection of Ecological Resources Soil Cleanup Objectives are being utilized at this site.

A total of twenty-four soil samples were collected from the slope below Zurbrick Road. Lead concentrations in this area ranged from approximately 20 to 55,000 ppm. It was estimated that the Zurbrick Road slope contains approximately 4,500 cubic yards of contaminated soils and fill materials above the Protection of Ecological Resources Soil Cleanup Objective of 63 ppm for lead. A large part of the volume of this material is at or below the bankfull flow elevation and thus available for erosion into the stream (Figure 3).

A total of 48 soil samples were collected and analyzed from the floodplain/upland areas along the stream. Soil contamination above the Protection of Ecological Resources SCO of 63 ppm was detected in an area extending from the Borden Road bridge downstream approximately 600 feet on the south bank of the stream. The estimated volume of contaminated soils in this area is 8,200 cubic yards.

Surface/subsurface soil contamination identified during the RI/FS will be addressed in the remedy selection process.

Surface Water

Thirteen individual unfiltered surface water samples were collected in the creek proper around and downstream of the landfill and four sets of surface water samples were collected from tributaries entering the stream. Laboratory analysis included methodologies for low level lead. Lead concentrations in the surface water ranged from 0.6 to 2.0 ug/L. The site specific water quality standard for lead is 7.2 ug/L. The stream was generally at or below average flowrate during surface water sample collection.

No site-related surface water contamination of concern was identified during the RI/FS. Therefore, no remedial alternatives need to be evaluated for surface water.

Sediments

The sediment guidance includes two different criteria for screening sediments contaminated with metals. The Lowest Effect Level (LEL), is that level which can be tolerated by the majority of the benthic organisms and the Severe Effect Level (SEL), which is that level at which pronounced disturbance of the sediment dwelling community can be expected. A sediment is considered to be contaminated if either of these criteria is exceeded. If both criteria are exceeded, the sediment is severely impacted. If only the LEL is exceeded, the impact is considered to be moderate. The LEL for lead is 31 ppm and the SEL is 110 ppm.

Sediments were screened for total lead over a stream distance of approximately 13,000 feet around and downstream of the former landfill. Approximately 15 background sediment samples were collected upstream of the landfill with an average lead concentration of 23 ppm, which is close to the LEL of 31 ppm. After the downstream extent of the contamination was determined, sediment sample collection was narrowed to the deposition areas where contamination was found above the lead LEL. A total of 148 sediment samples were collected, with the majority analyzed for total lead only.Lead contamination downstream was found to be as high as 425 times (46,800 ppm) the SEL guidance value. Although lead is the primary contaminant of concern at the site, sediment guidance values were also exceeded for antimony, arsenic, copper, nickel, silver, cadmium, iron, mercury, manganese and zinc. Sediments at eight locations were also collected for particle size distribution. The resulting gravel, medium sands, fine sands and clay/silt fractions from the particle size distribution were analyzed separately for lead. Based upon this analysis, it was determined that most of the lead contamination is contained within the fine sands and clay/silt fractions, which makes up 60% of the sediment volume.

Approximately 8,500 cubic yards of sediments are contaminated above the lead LEL, with approximately 50% above the SEL. Significant sediment contamination above the SEL extends over a distance of 5,800 feet around and downstream of the former landfill (to the transect D16 area). Sporadic levels of lead contaminated sediments slightly above the LEL, but well below the SEL are also found downstream of transect D16, however there are no major sediment deposits in these areas. The majority of this sediment contamination between transects D03 and D16 is contained in the sand bar/riffle deposit areas (Figure 4).

Sediment contamination identified during the RI/FS will be addressed in the remedy selection process.

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 completion of the RI/FS.

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

5.3: Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section 7 of the RI report. An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

The source of contamination is the location where contaminants were released to the environment (any waste disposal area or point of discharge). Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

Currently, the public could be exposed to surficial soil contamination if they venture on to the Zurbrick Road slope. Any excavation in this area would expose the public to lead contaminated fill materials through dermal contact and inhalation of contaminated dust particles.

Recreational users of Cayuga Creek could be exposed to contaminated sediments through direct contact particularly during periods of low flow when contamination is exposed.

There is evidence of trespassing on the Zurbrick Road slope and the stream in the area is used for recreational purposes.

5.4: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts include existing and potential future exposure pathways to fish and wildlife receptors, as well as damage to natural resources such as aquifers and wetlands.

The Fish and Wildlife Impact Analysis, which is included in the RI report, presents a detailed discussion of the existing and potential impacts from the site to fish and wildlife receptors.

The following environmental exposure pathways and ecological risks have been identified:

- Terrestrial wildlife direct contact/ingestion with the contaminants present in the surface and subsurface soils;

- Sediments in Cayuga Creek contain levels of lead up to 425 times the sediment SEL. These levels are known to affect the survival of benthic organisms and to bioaccumulate in fish and other biota. This results in reduced availability of food for forage species and in reproductive effects in fish, terrestrial wildlife and birds.

In addition to the ecological resources of Cayuga Creek, other habitats and cover types in the area include: floodplain forest, emergent wetlands, wetlands, beech-maple forest/successional woods, successional old fields and natural stream cover types.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The remediation goals for this site are to eliminate or reduce to the extent practicable:

- Ingestion/direct contact with contaminated soils and sediments;
- Impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chains;
- Impacts to biota from ingestion/direct contact with sediment causing toxicity or impacts from bioaccumulation through the aquatic food chain;
- The release of contaminants from the site into the surface water and sediments of Cayuga Creek through erosion;

Further, the remediation goals for the site include attaining to the extent practicable:

- The Department's Soil Cleanup Objectives (SCOs) for the Protection of Ecological Resources in the surface, subsurface, and bank soils along Cayuga Creek ("NYSDEC Regulations 6 NYCRR Subpart 375-6, Remedial Program Soil Cleanup Objectives");
- The Department's, "Technical Guidance for Screening Contaminated Sediments", Lowest Effect Level criteria for the contaminated sediments based upon the fact that the LEL concentration generally represents background conditions (upstream) for lead.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected 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. Potential remedial alternatives for the Depew Village Landfill, Operable Unit No. 02 were identified, screened and evaluated in the FS report which is available at the document repositories established for this site.

Based upon site conditions, including the geomorphology of Cayuga Creek, the streams highly energetic and variable flow along with the type of contaminants present (metals which do not naturally degrade), only one remedial technology, dredging/excavation was considered for the sediments in the Detailed Analysis of Alternatives of the FS report. The other sediment remedial technologies including, monitored natural recovery, in-situ capping and in-situ treatment were screened out.

A summary of the remedial alternatives that were considered for this site is discussed below. The present worth 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 and an interest rate of 5% 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.

7.1: Description of Remedial Alternatives

The following potential remedies were considered to address the contaminated soils and sediments at the site.

Alternative 1: No Action with Continued Monitoring

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment. Sediment and aquatic biota monitoring would occur annually.

Present Worth: *$170,000*
Capital Cost: *$0*
Annual Costs:
(Monitoring, Years 1-30): *$11,000*

Alternative 2: Sediment Excavation and Soil Removal, Off-Site Disposal, Streambank Stabilization

Present Worth: *$8,600,000*
Capital Cost: *$8,600,000*

This alternative involves the removal of all contaminated sediments above the Lowest Effect Level from transect D03 to D16 (approximately 50% of which is also above the SEL) based upon the fact that the LEL concentration generally represents background conditions upstream of the site. This alternative would also include the removal of sections of upland soils adjacent to the stream above the Protection of Ecological Resources SCO of 63 ppm. Standard excavation techniques would be utilized to remove the sediments and soils and these would be disposed off-site at a permitted facility.

Figure 5 shows the extent of the contaminated sediments to be removed as well as the location of the bank soils to be excavated downstream of the Borden road bridge and on the slope below Zurbrick Road. It also shows the infrastructure associated with the alternative including access roads, staging areas and possible temporary stream crossings.

The streambank soil contamination will be remediated first, in order to eliminate this source of lead contamination to the stream sediments. In the area downstream of the Borden Road bridge soils up to the bankfull flow elevation will be excavated utilizing conventional equipment. The average depth of excavation would be approximately 1.5 feet from the top of the streambed to the bankfull flow elevation, which would result in a total estimated volume of impacted soil of 8,200 cubic yards to be removed. All excavated material would be replaced with clean fill. Streambank stabilization and restoration measures would be performed in the remediated area to provide for the re-establishment of the riparian habitat. Bank stabilization and restoration would be designed to protect the streambank without reducing flood water conveyance consistent with 6 NYCRR Part 608. Bank stabilization measures would include combinations of non-structural measures (slope grading and re-vegetating), bioengineering (brush matting, tree root wads), bio-technical (erosion control mats, live stakes), and structural (riprap, boulders, weirs) features where applicable.

The contaminated soils on the Zurbrick Road slope will be excavated utilizing conventional equipment. Approximately 4,500 cubic yards of contaminated materials are present here. The specific details of the approach to the excavation on the Zurbrick Road slope, as well as the methodologies to be utilized to control and/or divert the stream flow will be determined during the design stage. All soils would be transported off-site and disposed of in a permitted disposal facility.

Once the contaminated soils are removed from the Zurbrick Road slope then the Village of Depew and the U.S. Army Corps of Engineers would construct structural streambank protection on this slope under their existing Project Cooperation Agreement. Structural streambank protection would be utilized on this slope because of seepage and the erosion forces on the outside bend of the stream. A riprap revetment would be constructed in accordance with "New York Standards and Specifications for Erosion and Sediment

Controls" and the Corps design. The design would include the requirement for backfilling the area with clean fill materials and sloping the area as required. The structural protection would extend approximately 370 feet along the streambank and would extend vertically approximately halfway up the slope. The structure would include a minimum 2 foot toe and be keyed into the bank both up and downstream. The area above the structural protection would be fertilized and seeded. Inspection and maintenance of the revetment would be the responsibility of the Village, the Corps and/or their contractors. Construction of the revetment would change the alignment of the stream which would require the tip of the peninsula on the north shore to be removed in order to maintain flow capacity. Approximately 3,200 cubic yards of contaminated soils would be removed from the stream shoreline and stockpiled upland on the landfill. These soils would be handled during the remedial action at OU-01. Streambank stabilization and restoration measures in this area would be similar to those outlined above for the area downstream of the Borden Road bridge.

Sediment remediation would occur over a stream distance of approximately1mile and include all material on the streambed. The streambed is defined as the physical confine of the average water flow or the area kept clear of terrestrial vegetation. Remedial activities would be conducted during periods of low stream flow. Stream flow will be controlled by channelizing the flow, using a flow-thru temporary dam or by isolating a section of the stream. The details of the specific approach to control stream flow would be determined during remedial design. Controlling the stream flow would allow excavation of the sediments in a dry area which would minimize the need for dewatering of the material. To the extent practical the sediments will be screened utilizing a mobile soil screening machine to isolate the sand, silt and clay fractions which contain the lead contamination. Sediments which are fine gravel size and larger would be returned to the stream. The sand, silt and clay fractions represent 60 % of the total sediment volume of 8,500 cubic yards to be remediated. Thus, after screening the volume of contaminated material would be approximately 5,100 cubic yards. After the sediments are screened, they would be transported off-site and disposed of in a permitted disposal facility. All work within the stream would be in accordance with 6 NYCRR Part 608.

The stabilized and restored streambanks would be periodically inspected for erosion, sloughs, breaks in the drainage pattern and for plant establishment, by the applicable contractor as per the construction contract.

The design and complete implementation of this alternative would take approximately 12 to 36 months from the selection of the remedy.

Alternative 3: Selected Sediment Excavation, Soil Removal, Off-Site Disposal, Bank Stabilization and Continued Monitoring

Present Worth: *$6,500,000*
Capital Cost: *$6,200,000*
Annual Costs:
(Monitoring and Inspections,Years 1-30): *$15,000*

Under Alternative 3 the sediment contamination in the streambed above the LEL located between transects D06 and D09 and at selected depositional areas downstream to transect D16 would be removed, as would sections of creek bank soils above the Protection of Ecological Resources SCO of 63 ppm for lead. Excavation techniques using conventional construction equipment would be utilized to remove the sediments and soils and these would be disposed off-site at a permitted facility.

Figure 6 shows the extent of the contaminated sediments to be removed between the DO6 and D09 transects as well as the downstream selected depositional areas. The location of the bank soils to be excavated downstream of the Borden road bridge and on the slope below Zurbrick Road are the same as Alternative 2. It also shows the infrastructure associated with this alternative including access roads, staging area and possible temporary stream crossings.

The soil removal activities downstream of the Borden Road bridge and at the Zurbrick Road slope as well as the bank stabilization, restoration and structural protection would be consistent with that described in

Alternative 2.

Complete sediment remediation would occur over a continuous stream distance of approximately 1,200 feet and at specific deposition areas that contain point bars. Approximately 25% (2,100 cubic yards) of the contaminated sediment volume would be removed under this alternative. The deposition areas are spread out over a distance of 1 mile downstream. Thus, as with Alternative 2 the necessary infrastructure over this distance would be created to support the removal. As with Alternative 2, remedial activities would be conducted during periods of low stream flow. Stream flow will be controlled by channelizing the flow, using a flow-thru temporary dam or by isolating a section of the stream. The details of the specific approach to control stream flow would be determined during remedial design. Controlling the stream flow would allow excavation of the sediments in a dry area which would minimize the need for dewatering of the material. Consistent with Alternative 2, the sediments will be screened utilizing a mobile soil screening machine to isolate the sand, silt and clay fractions which contain the lead contamination. Sediments which are fine gravel size and larger would be returned to the stream. After the sediments are screened, they would be transported off-site and disposed of in a permitted disposal facility. All work within the stream would be in accordance with 6 NYCRR Part 608.

Sediment and aquatic biota monitoring would occur annually from transects D03 to D16. The stabilized and restored streambanks would be periodically inspected for erosion, sloughs, breaks in the drainage pattern and for plant establishment, by the applicable contractor as per the construction contract.

The design and complete implementation of this alternative would take approximately 12 to 36 months from the selection of the remedy.

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of inactive hazardous waste disposal sites in New York. 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.

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.

The next five “primary balancing criteria” are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term 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.

4. 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.

5. 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.

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.

7. Cost-Effectivness. 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. The costs for each alternative are presented in Table 1.

This final criterion 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.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports 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.

SECTION 8: SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 2, Sediment Excavation and Soil Removal, Off-Site Disposal, and Bank Stabilization as the remedy for this site. The elements of this remedy are described at the end of this section.

The proposed remedy is based on the results of the RI and the evaluation of alternatives presented in the FS.

Alternative 2 is being proposed because, as described below, it satisfies the threshold criteria of protection of human health and the environment as well as meeting and complying with SCGs. In addition it satisfies the primary balancing criteria described in Section 7.2. It would achieve the remediation goals for the site by complete removal of the contaminated sediments above the LEL criteria, based upon the fact that this concentration generally represents background conditions upstream of the site and the complete removal of soils along a section of the streambank and on the Zurbrick Road slope which are above the applicable SCO.

Alternative 1(No Action) does not include actions to contain, remove or treat contaminants that pose a current or potential threat to human health and the environment. Alternative 1 would not be protective of the environment.

Alternative 1would result in the least short-term impacts because minimal action would be taken to disturb the contaminated media. Alternatives 2 and 3 both would involve short-term risks of exposure to on-site construction workers and the community. Short term impacts for the site area and surrounding community would be associated with the construction of the infrastructure including access roads, staging areas, and waterway crossings, along with increased equipment traffic and its associated noise. These short term impacts could be mitigated through the implementation of a health and safety plan, utilization of an erosion and sediment control plan, engineering controls and by prompt site restoration. Based upon the volume of materials to be excavated under Alternative 2, this action would have the greatest short term impacts at the site and the surrounding community.

Short term impacts to the stream environment may be associated with the sediment removal and bank stabilization. Impacts include such things as increased turbidity levels and impacts to the benthic biota during bank relocation, stream diversion and sediment excavation. These short-term impacts can be minimized by protecting all excavated streambanks as soon as practicable, controlling storm water runoff, using turbidity curtains, and excavating the sediment in the dry. All of which would also be part of the erosion and sediment control plan. The short-term impacts associated with both Alternatives 2 and 3 are expected to be controllable and the recovery of the stream environment including re-colonization by aquatic organisms would occur in a reasonable time. Under Alternative 2 the remediation goals for the site would be met upon completion of the remedial action (12 to 36 months).

Long-term effectiveness and permanence at the site would be best achieved with the restoration of the site to meet the LEL criteria for the Cayuga Creek sediments (Alternative 2). Alternative 3 would leave approximately 2,500 pounds of lead in the sediments, with an average concentration of 112 ppm, which is above the SEL, over a stream distance of approximately 4,000 feet. Alternative 2 would provide long-term effectiveness and permanence by removing all the sediment contamination and thus providing a high level of risk reduction. The long-term effectiveness of Alternative 3 is less certain than for Alternative 2 because wildlife and/or human exposure to lead contaminated sediments in the stream would not be completely eliminated. Both Alternatives 2 and 3would excavate the soils on the Zurbrick slope and downstream of the Borden Road bridge and that would increase the long-term effectiveness of the remedy by eliminating contaminant source areas and thus the potential for further migration of lead into Cayuga Creek.

Alternative 2 and 3 would both provide reduction in the volume of contamination and the associated reductions in mobility and toxicity. Alternative 2, would reduce volume, toxicity, and mobility of the contaminants, to a greater extent than Alternative 3 by removing all of the contaminated sediments greater than the LEL. The complete removal of the lead contaminated sediments under Alternative 2 would eliminate impacts to biota including toxicity and bioaccumulation through the aquatic food chain. The removal of the lead contaminated soils would eliminate impacts to biota including toxicity and bioaccumulation through the terrestrial food chain and would also eliminate a source of lead to the stream sediments.

Alternatives 2 and 3 are readily implementable on a technical basis. Excavation methods for both sediments and soils are well established. The stream is generally accessible and the extent of debris is minor. Stream diversion systems are commercially available for purchase or lease. Standards and specifications exist for sediment and erosion control that includes the technical requirements for such items as temporary waterway crossings, structural erosion controls, biotechnical erosion control, live stakes, riprap slope protection and turbidity curtains, for example. Alternatives 2 and 3 both rely on the availability of permitted and operating waste disposal facilities to accept waste from the site. Both hazardous and non-hazardous waste disposal facilities are available in the region. Based upon the location of the sediment hotspots (near the former landfill) and the depositional areas (5,000 feet downstream) the majority of the infrastructure required for Alternative 2 would also have to be constructed for Alternative 3. Thus, from this technical perspective complete contaminated sediment removal would not involve much additional infrastructure construction.

The technical requirement to comply with both 6NYCRR Part 608, “Use and Protection of Waters” and 6NYCRR Part 500 “Floodplain Management Regulations Development Permits” is also essentially the same for both Alternatives 2 and 3. Each alternative includes in-stream work and the bank stabilization, restoration and structural protection which may affect the floodway and floodplain are the same for each Alternative.

The administrative feasibility of both Alternatives 2 and 3 are essentially the same. Both alternatives would require obtaining permits for work in the stream, rights of way and private property access.

The comparative evaluation of the cost of remediation is based on the net present worth of each alternative. Cost estimates are provided in Table 1. Alternative 3 is less expensive than Alternative 2, but Alternative 3 would leave lead contamination in the sediments above the severe effect level and above background

concentrations.

The estimated present worth cost to implement and construct the remedy is $ 8,600,000.

The elements of the proposed remedy are as follows:

1. A remedial design program would be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. This remedial design program would be coupled with the OU-01 remedy design and include a hydrologic and hydraulic study incorporating the bank stabilization, restoration and structural protection of both remedies. The design would include the requirement that all soil excavations for both OU-01 and OU-02 would precede the sediment remediation.

2. Approximately 8,200 cubic yards of contaminated soils would be excavated from a 600 foot section of streambank west of the Borden Road bridge. The depth of the excavation would be approximately 1.5 feet and would be conducted from the baseflow elevation up to the bankfull flow elevation. Bank stabilization and restoration would be designed to protect the streambank without reducing flood water conveyance consistent with 6 NYCRR Part 608. Bank stabilization measures in this area would include combinations of non-structural measures (slope grading and re-vegetating), bioengineering (brush matting, tree root wads), bio-technical (erosion control mats, live stakes) features where applicable.

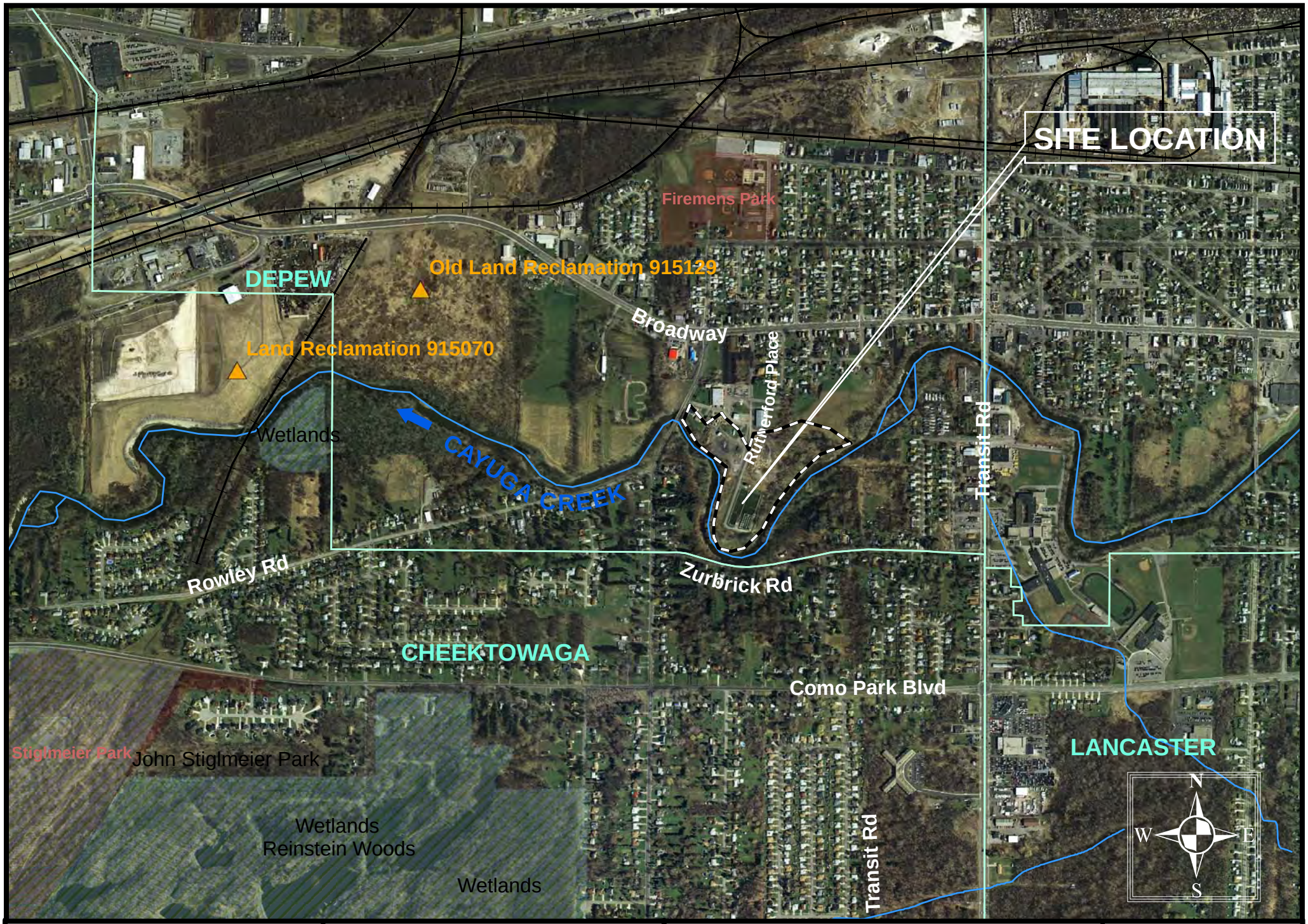
3. Approximately 4,500 cubic yards of contaminated soils on the Zurbrick Road slope will be excavated and disposed off-site. The Village of Depew and the U.S. Army Corps of Engineers under their existing Project Cooperation Agreement would construct structural streambank protection in the form of a riprap revetment to protect this slope that would extend approximately 370 feet along the bank. The revetment would be constructed in accordance with the Corps design. Inspection of the streambank protection for stability, erosion and scour would be the responsibility of the Village, Corps and/or their contractors.

4. Approximately 8,500 cubic yards of contaminated sediments above the Lowest Effect Level sediment criteria would be excavated from a 1 mile section of the stream starting on the east side of the former landfill at transect D03 and extending downstream to transect D16.

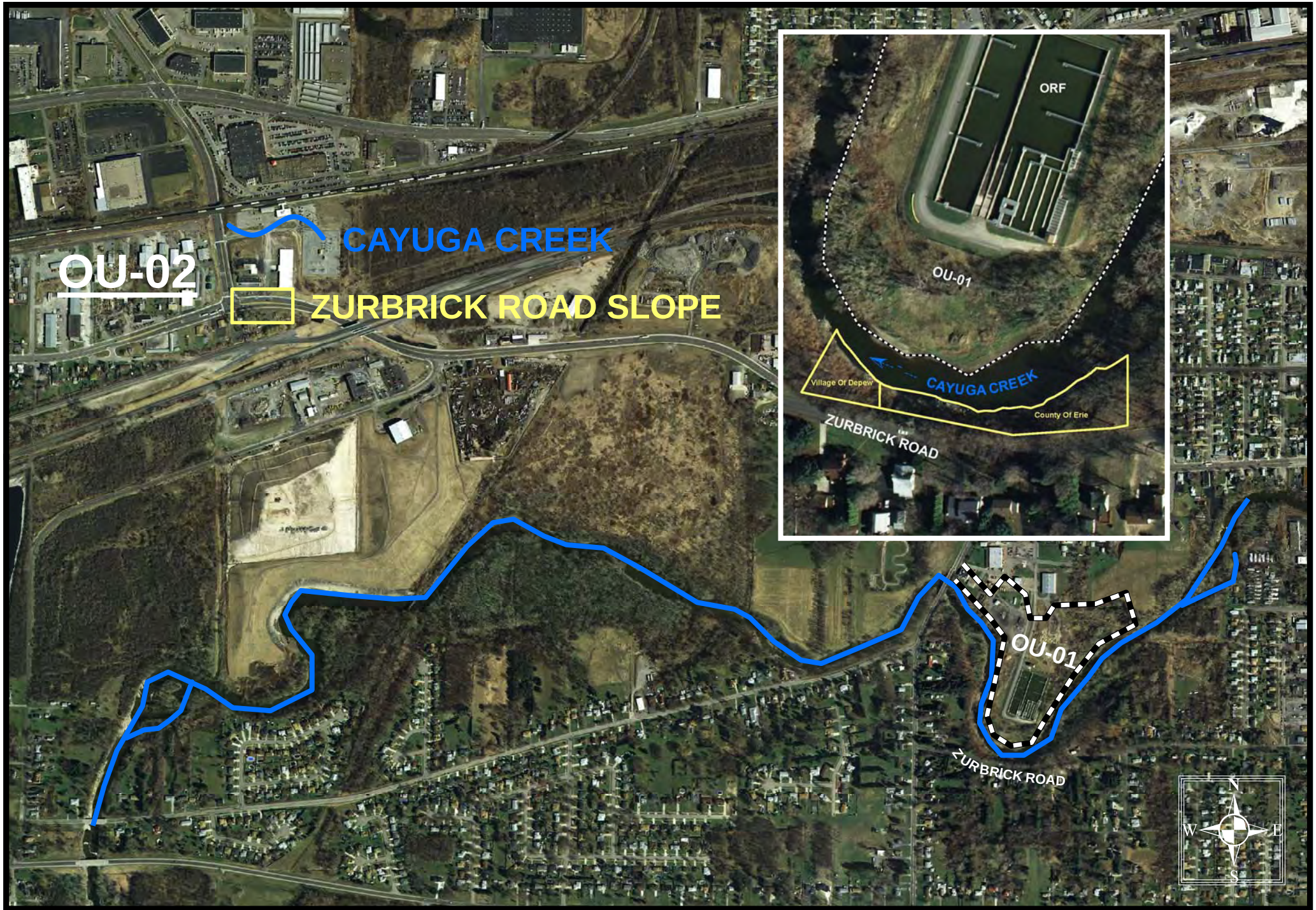
5. To the extent practical the sediments will be excavated in the dry and processed through a screening system to segregate contaminated sand, silt and clay fractions. Sediments which are fine gravel size and larger would be returned to the stream. The contaminated material will be disposed off-site.

Table 1
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual Costs	Total Present Worth
Alternative 1: No Action with Monitoring	$0	$11,000	$170,000
Alternative 2: Sediment Excavation and Soil Removal, Off-Site Disposal, Streambank Stabilization	$8,600,000	$0	$8,600,000
Alternative 3: Sediment Hotspot Excavation, Soil Removal, Off-Site Disposal, Streambank Stabilization and Continued Monitoring	$6,200,000	$15,000	$6,500,000

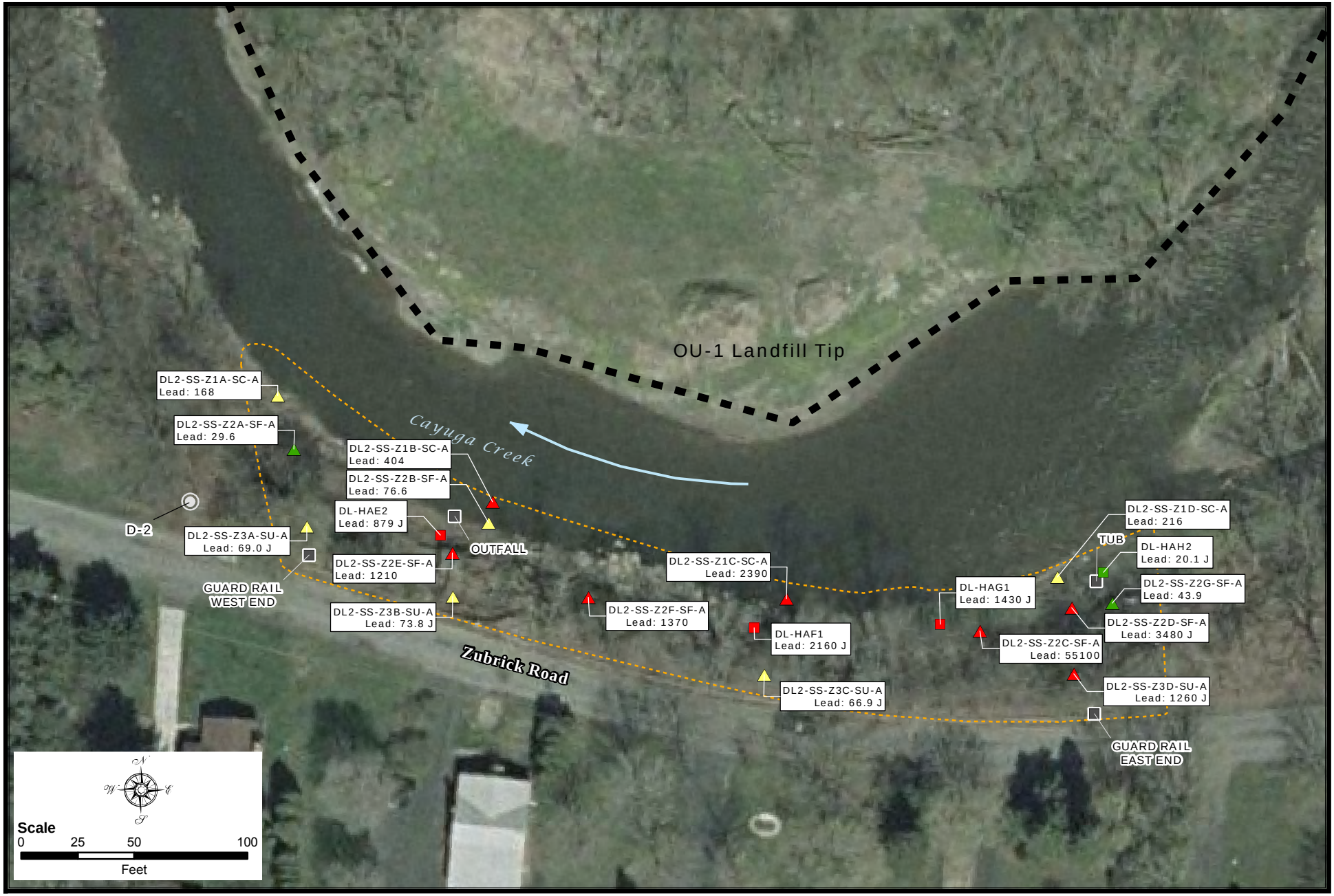


DEPEW VILLAGE LANDFILL SITE #915105	SITE LOCATION MAP	0 375 750 1,500 2,250 3,000 Feet 1 inch equals 1,144 feet	FIGURE 1



DEPEW VILLAGE LANDFILL SITE #915105	OPERABLE UNIT NO. 02 RI STUDY AREA	0 250 500 1,000 1,500 2,000 Feet 1 inch equals 937 feet	FIGURE 2

Source: NYS Office of Cyber Security & Critical Infrastructure Coordination, 2002.



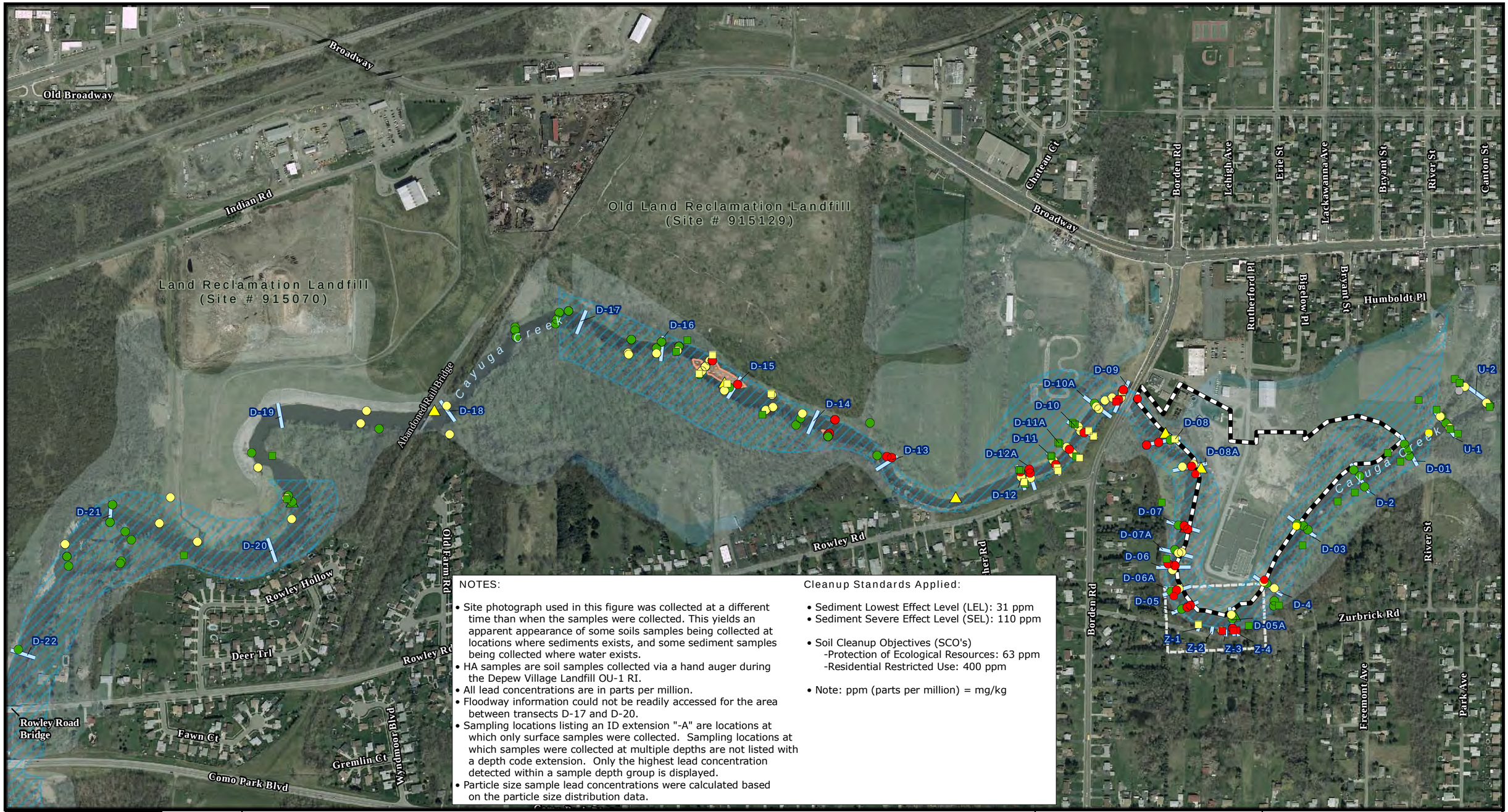
Elevation Bench Mark
Physical Feature
Direction of Creek Flow
OU-1 Site Boundary
Zubrick Road Hillside Area
Approximate Boundary

Hand Auger Soil Sample, by Lead Concentration*
- ND
- ND, ≤ 63 mg/kg
- 63, ≤400 mg/kg
- > 400 mg/kg

*Collected During OU-1 RI

Soil Sample, by Lead Concentration
- ND
- ND, ≤ 63 mg/kg
- 63, ≤400 mg/kg
- > 400 mg/kg

Figure 3
Lead Concentrations in the Zubrick Road Hillside Soils
Depew Village Landfill OU-2
Depew, New York

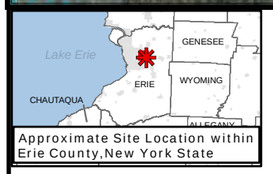


NOTES:

- Site photograph used in this figure was collected at a different time than when the samples were collected. This yields an apparent appearance of some soils samples being collected at locations where sediments exists, and some sediment samples being collected where water exists.
- HA samples are soil samples collected via a hand auger during the Depew Village Landfill OU-1 RI.
- All lead concentrations are in parts per million.
- Floodway information could not be readily accessed for the area between transects D-17 and D-20.
- Sampling locations listing an ID extension "-A" are locations at which only surface samples were collected. Sampling locations at which samples were collected at multiple depths are not listed with a depth code extension. Only the highest lead concentration detected within a sample depth group is displayed.
- Particle size sample lead concentrations were calculated based on the particle size distribution data.

Cleanup Standards Applied:

- Sediment Lowest Effect Level (LEL): 31 ppm
- Sediment Severe Effect Level (SEL): 110 ppm
- Soil Cleanup Objectives (SCO's)
  - -Protection of Ecological Resources: 63 ppm
  - -Residential Restricted Use: 400 ppm
- Note: ppm (parts per million) = mg/kg



Approximate Site Location within Erie County,New York State

N W E S

Scale:
0 250 500 1,000 Feet

Soil Samples, by Lead Concentration
- ND
- ND to 63 mg/kg
- 63 to 400 mg/kg
- Greater than 400 mg/kg

Sediment Samples, by Lead Concentration
- ND
- ND to 31 mg/kg
- 31 to 110 mg/kg
- Greater than 110 mg/kg

Sediment Partical Size Sample Location, by Lead Concentration
- ND to 31 mg/kg
- 31 to 110 mg/kg
- Greater than 110 mg/kg

D-22 Sample Transect
Deposition Area/Channel Bar
OU-1 Site Boundary
Zurbrick Road Hillside General Area
Floodway

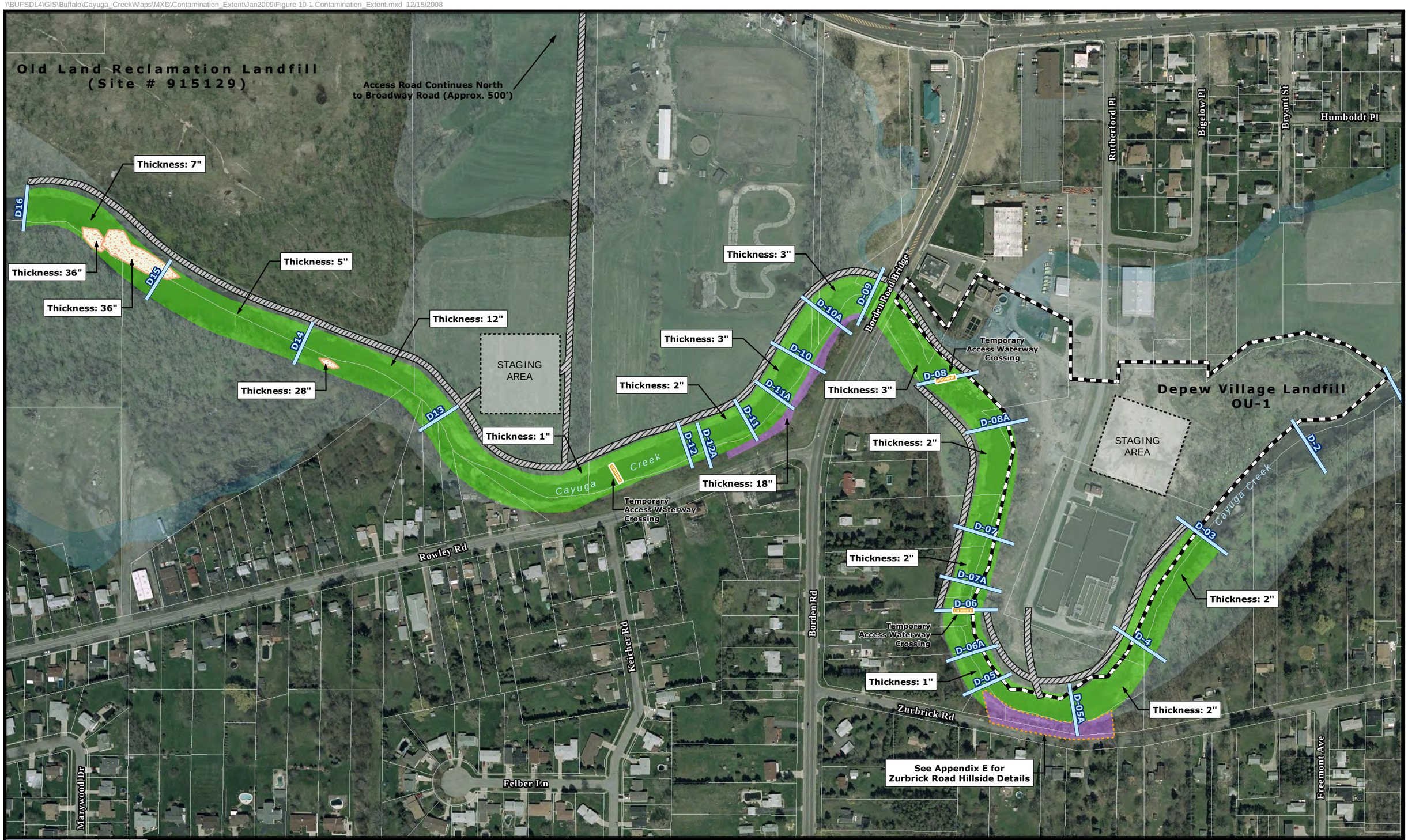
Flood Zone Category
- 100-Year Floodplain
- 500-Year Floodplain

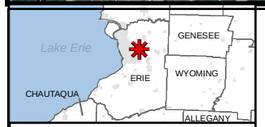
Basemap Imagery Source:
NYS Office of Cyber Security & Critical Infrastructure Coordination, 2002.

Floodplain Data Source:
Federal Emergency Management Agency, 1996.

Figure 4
Lead Concentrations in Creek Sediment and Soils

Depew Village Landfill Site, OU-2
Depew, New York





Approximate Site Location within Erie County,New York State

N W E S

0 125 250 500 Feet

Note: Sediment and depositional area thicknesses shown are approximated based on measurements collected during the OU-2 sampling events.

D12 Sample Transect

Depositional Area

Flood Zone Category

100-Year Floodplain

500-Year Floodplain

Temporary Access Waterway Crossing

Access Road

Staging Area

OU-1 Site Boundary

Zurbrick Road Hillside Area Approximate Boundary

Parcel Boundary

Contaminated Sediment to be Removed

Contaminated Soil to be Removed

Basemap Source:
**Federal Emergency Management Agency, 1996.*
**NYS Office of Cyber Security & Critical Infrastructure Coordination, 2002.*

Figure 5
Alternative 2 - Contaminated Sediment and Soil Removal to Pre-Disposal Conditions
Depew Village Landfill Site, OU-2
Depew, New York

Old Land Reclamation Landfill
(Site # 915129)

Access Road Continues North
to Broadway Road (Approx. 500')

Thickness: 7"
Thickness: 36"
Thickness: 36"
Thickness: 5"
Thickness: 12"
Thickness: 28"
Thickness: 1"
Thickness: 18"
Thickness: 3"
Thickness: 3"
Thickness: 2"
Thickness: 3"
Thickness: 2"
Thickness: 2"
Thickness: 2"
Thickness: 1"
Thickness: 2"
Thickness: 2"

D16 D15 D14 D13 D12 D12A D11 D11A D10 D10A D09 D08 D08A D07 D07A D06 D06A D05 D05A D04 D03 D02

STAGING AREA

Borden Road Bridge

Temporary Access Waterway Crossing

Depew Village Landfill
OU-1

See Appendix E for Zurbrick Road Hillside Details

Cayuga Creek

Rowley Rd
Keicher Rd
Borden Rd
Zurbrick Rd
Marywood Dr
Felber Ln
Rutherford Pl
Bigelow Pl
Bryant St
Humboldt Pl
Freemont Ave

Basemap Source:
**Federal Emergency Management Agency, 1996.*
**NYS Office of Cyber Security & Critical Infrastructure*

Approximate Site Location within Erie County,New York State

N W E S

0 125 250 500 Feet

Note: Sediment and depositional area thicknesses shown are approximated based on measurements collected during the OU-2 sampling events.

- Sample Transect
- **Flood Zone Category**
  - 100-Year Floodplain
  - 500-Year Floodplain
- Temporary Access Waterway Crossing
- Access Road
- Staging Area
- OU-1 Site Boundary
- Parcel Boundary
- Zurbrick Road Hillside Area Approximate Boundary
- Extent of Contaminated Sediment
- Contaminated Sediments to be Removed
- Contaminated Soil to be Removed
- Contaminated Depositional Area to be Removed

Figure 6
Alternative 3 - Hot Spot Sediment Removal and Soil Removal
Depew Village Landfill Site, OU-2
Depew, New York