FINAL REPORT
FOR
THE NL INDUSTRIES/DEPEW PLANT SITE

VILLAGE OF DEPEW, ERIE COUNTY, NEW YORK

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NY02-927-01
January 26, 2007

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1.0 INTRODUCTION

This Final Report was prepared by Advanced GeoServices Engineering, P.C. (Advanced GeoServices) on behalf of NL Industries, Inc. (Respondent) to document the activities that were performed between October 2004 and June 2006 at the former NL Industries/Depew Plant Site (Site) located in Depew, New York. These activities were performed pursuant to the requirements of the Administrative Order on Consent (AOC), Index Number CERCLA-02-2004-2024, between the Respondent and the United States Environmental Protection Agency (USEPA) effective October 6, 2004.

1.1 PURPOSE OF REPORT

The purpose of this Final Report is to document that the work performed by the Respondent met the requirements of the AOC. The work performed required delineation sampling to confirm the "Site Boundary", removal of lead-impacted soil from residential properties that had lead levels at or above 400 milligrams per kilogram (mg/kg). The delineation sampling to establish the Site boundary was performed in accordance with the AOC and the requirements of USEPA's "Superfund Lead-Contaminated Residential Sites Handbook" (Residential Handbook).

This Final Report describes the procedures used to complete removal activities. Key features of the work included:

- Obtaining property access agreements, completing delineation sampling, and conducting pre-excavation meetings;
- Excavating soil in the defined areas with total lead concentrations at or above 400 mg/kg on residential properties;
- Characterizing excavated soil and disposing of the soils off-site;

- Conducting confirmation sampling on remediated properties; and

- Backfilling and restoring excavated areas.

The work performed was consistent with the Work Plan for the Removal Action (Work Plan) approved by USEPA May 5, 2005. The Work Plan is provided as an attachment.

1.2 REPORT ORGANIZATION

The remainder of this report is organized as follows:

Section 2.0 – Site Background
Section 3.0 – Delineation Sampling
Section 4.0 – Removal Areas and Activities
Section 5.0 – Backfill, Sod and Restoration
Section 6.0 – Project Costs
Section 7.0 – Reports
Section 8.0 – Summary and Certification Statement

Appendices with supplemental information are also provided following the text.

2.0 SITE BACKGROUND

2.1 SITE DESCRIPTION

NL operated a brass foundry in Depew, New York from 1892 until 1972. In 1974, NL sold the foundry property to Anglo-Recycling Corporation. The property is now used by Metro Waste Paper Recovery, Inc., a division of the Cascades Group, for paper recycling. A Site Location Map, Figure 1, identifies the location of the Site and the former foundry Facility, now operated by Metro Paper Recovery, Inc.

2.1.1 Previous Investigations

Investigations conducted by XCG Consultants, Ltd. (XCG) of Oakville, ON, Canada in 1999 and 2000 indicated that specific areas at the property and adjacent residential areas had soil lead concentrations above the New York State Department of Health (NYSDOH) goal of 400 mg/kg. All investigative sampling conducted by XCG consisted of collecting discrete samples in contrast to the composite sampling conducted for delineation purposes under the AOC as discussed later in this report. Additional offsite surficial soil investigations of 12 residential properties were performed by XCG in 2001 near the Facility. The residential properties are situated on Walden Avenue, West Second Street, West Third Street, and Princeton Avenue, all located north of the former foundry. The sampling results indicated that at least 8 properties contained soil with lead concentrations above 400 mg/kg. Additional residential properties were sampled by XCG in the spring of 2002, in the same vicinity of the previously sampled properties, to delineate the area exceeding 400 mg/kg lead.

2.2 REMOVAL ACTION

For the purposes of this report, the Site refers to the residential properties located in the vicinity of the former NL Industries/Depew Plant Property which were determined to have soil lead concentrations greater than 400 mg/kg due to former foundry operations (Figure 2).

To address these conditions, USEPA and the Respondent executed an AOC on October 6, 2004. The AOC required the Respondent to perform the following activities for all residential properties within the area defined in the AOC in the vicinity of the former NL Industries/Depew Plant Site Property:

- Develop and implement a Health and Safety Plan, including an Air Monitoring Plan and Emergency Contingency Plan;
- Develop and implement a Site Security Plan;
- Perform delineation sampling on residential properties to determine the area of lead impacted soils exceeding the 400 mg/kg performance standard;
- Remove (excavate) and properly dispose of soils containing lead concentrations at or above 400 mg/kg; and
- Restore all excavated properties with clean backfill and topsoil and establish turf as well as replace any landscaping items removed (e.g., trees, bushes).

2.3 KEY CONTRACTORS

Work activities were completed on-site by the Respondent's contractors; Environmental Restoration, Inc. (ERI) of Courtdale, Pennsylvania and Advanced GeoServices. Advanced GeoServices coordinated access efforts, performed delineation sampling and monitored Site activities. ERI and their subcontractors conducted the pre-excavation meetings, excavated the soil with elevated lead concentrations, conducted the required confirmation sampling, and completed the required backfill and restoration activities. Contact information on the key contractors and other project personnel are provided in Table 1.

3.0 DELINEATION SAMPLING

XCG conducted soil sampling activities in the community to delineate the area of lead-impacted soil. One property sampled by XCG adjacent to the Final Site Boundary contained lead levels below the 400 mg/kg performance standard, and no removal was required. As part of the work performed by the Respondent pursuant to the AOC, Advanced GeoServices sampled 22 properties between November 2004 and October 2005, to identify the Final Site Boundary. The additional sampling identified 15 properties that required complete or partial soil removal. Three of these properties, which were previously scheduled for remediation, were sampled to fully delineate the areas for removal. Four properties sampled during this time period contained lead levels below the performance standard, and no soil removal was required.

3.1 PROPERTY ACCESS

A public availability meeting was held November 17, 2004 prior to mobilization to raise community awareness of the project. The meeting was attended by residents of the Site and the surrounding area, and by representatives of the USEPA, New York State Department of Environmental Conservation (NYSDEC), NYSDOH, and Advanced GeoServices. Residents were given an opportunity to discuss project details, have their questions addressed, and review results of previous sampling performed at their property.

Property owners received property access request letters from Advanced GeoServices via certified mail or hand delivery to their residence. Property access was requested for soil sampling and potential soil removal operations. The letters included a consent form for the owner to sign, documenting agreement for access to their property. A sample Access Agreement is provided in Appendix A.

Advanced GeoServices and the Respondent attempted to gain access to a total of 43 properties, including Depew owned Rights-of-Way. Best efforts were made to obtain access to all properties. These efforts included regular and certified mailings, phone calls and repeated visits

to the property and/or the owner's residence. Access to all 43 properties was successfully obtained. In one instance, the property owner gave verbal approval for sampling purposes. Access to Depew owned Rights-of-Way was granted by the Village of Depew.

3.2 SOIL SAMPLING PROCEDURE

The soil delineation sampling methodology used by Advanced GeoServices during sampling activities was outlined in the Quality Assurance Project Plan (QAPP). Specifically, soil composite samples were collected from the 0 to 6 inch and 6 to 12 inch horizons at each property designated for sampling. The general delineation sampling program called for each property to be divided into quadrants and five individual samples (aliquots) were obtained from each quadrant at both the depth intervals identified above. Each aliquot obtained was placed in a resealable plastic bag with the other aliquots from the same depth interval in each quadrant and mixed to create a composite sample. These samples were then homogenized and a representative sample was collected, labeled, and sent to Severn Trent Laboratories Buffalo (STL-Buffalo), a USEPA certified laboratory, for testing. The sampling procedure included the preparation of a sketch of the property that showed the location of all aliquots for each quadrant. Consistent with the QAPP, blind duplicate samples were collected at a rate of 1 per 20 field samples and tested. Additional sample volume was collected for matrix spike/matrix spike duplicates (MS/MSD) at a rate of 1 per 20 field samples.

In instances where lead concentrations from composite samples were above 400 mg/kg, adjacent properties were sampled to determine the extent of lateral contamination.

In one instance, at the request of the property owner and the USEPA, the backyard of one property was re-sampled to confirm that results were consistent with the initial sampling results and that the soil was below the 400 mg/kg performance standard for the project.

Additionally, vegetable gardens and garden beds were sampled separately in accordance with sampling procedures outlined in the QAPP. The sampling was performed at the property owner's request. In instances where property owners specifically requested that a tree not be

removed, sampling was performed beneath the canopy to determine if the tree could remain. Ultimately, all trees within the Site Boundary were removed in accordance with the Work Plan. All trees, for which sampling beneath the canopy was requested, were found to have soil lead concentrations exceeding 400 mg/kg and were removed as per the Work Plan. One garden which was sampled had soil lead concentrations below 400 mg/kg and was left in place. One flower bed was sampled at the request of the property owner and was found to have soil lead concentrations exceeding 400 mg/kg and was removed.

In one instance, soil beneath an above ground pool was sampled to determine if removal of the pool was necessary. The liner was removed to access the soil beneath and a composite sample was collected. Soil lead concentrations beneath the pool were below 400 mg/kg and the pool remained in place. A new liner was provided by the Respondent and installed by ERI subcontracted pool installation professionals.

Each sample submitted to the fixed laboratory was recorded on a Chain-of Custody (COC), placed on ice in a cooler, and personally delivered by site personnel to STL-Buffalo located in Amherst, New York. COC's are provided in Appendix B (Delineation Sampling Information) and G (Confirmation Sampling Information).

4.0 REMOVAL AREAS AND ACTIVITIES

4.1 RESULTS OF THE DELINEATION SAMPLING

The results of the soil delineation sampling described in Section 3.0 indicated that 34 residential properties exceeded the 400 mg/kg action level. Areas within 2 additional properties were also identified as a result of perimeter confirmation sampling of excavated properties. In total, 36 properties within the Site were determined to have soil lead concentrations exceeding 400 mg/kg. The property sampling sketches, sampling results for each property, and laboratory analytical reports are provided in Appendix B.

4.2 SITE PREPARATION ACTIVITIES

Prior to soil excavation activities, Site preparation activities were performed by the Respondent's contractor, ERI, and Advanced GeoServices. These activities are described in the following sections.

4.2.1 Pre-Excavation Meetings

Prior to soil excavation activities on a given property, an ERI representative, along with Advanced GeoServices' Quality Assurance (QA) Official, and in some instances USEPA's OSC and contractor (Weston Solutions), met with each property owner. Each owner was given a description of the soil removal and restoration activities to be performed on the property and provided with an anticipated schedule. At some tenant-occupied properties, the pre-excavation meeting was held with the tenant, and the property owner was contacted by telephone. Any special requests, comments, and concerns expressed by the owner or tenant were documented and addressed. Owners were informed that, in accordance to the Order, all landscaping (e.g. trees, shrubs, plants, and flowers) may be removed prior to excavation. Owners were provided the opportunity to request separate sampling of landscaped areas and trees in an effort to reduce the impact of removal activities at their property. Owners were reminded that removal activities

would proceed free of charge to them and that any costs incurred (e.g. use of water or electric) would be reimbursed by ERI. Owners were also informed that any landscaping disturbed during operations would either be restored to pre-excavation conditions with nursery stock items or compensated for monetarily. All owners and/or tenants were provided with an emergency contact number for ERI and Advanced GeoServices' QA Official.

4.2.2 Surveying

A total of four separate surveys were required to resolve uncertainties and disputes over property line locations within the Site Boundary. A survey of the property line between 23 West Second Street and 3242 Walden Avenue was required to resolve a dispute between the respective owners over possession of a hedgerow. The property line between 3236 Walden Avenue and 0 Walden Avenue was surveyed to resolve a resident dispute for restoration purposes. A survey of 34 Bostwick Place was required to determine property boundaries for excavation purposes. The property line between 5798A Transit Avenue and the adjacent commercial property to the north was also required for sampling and excavation purposes. In all four instances, ERI retained the services of a Surveyor licensed in the State of New York, Greenman-Pederson, Inc. of Buffalo, New York.

4.2.3 Landscape Inventory

In order to properly identify landscaping items and pre-excavation locations of the items, William Snyder, a registered Consulting Arborist, was retained by ERI to perform a landscape inventory of each property. To ensure accuracy, landscape inventories were reviewed by each property owner prior to removal activities. The inventories were also used to establish a value associated with landscape restoration. Each property was evaluated and a lump sum value for restoration was determined. Pricing was determined by the cost of replacement nursery stock items and costs associated with labor and installation. This lump sum value was provided either to ERI's landscape contractor for restoration of the property or to the property owner as

compensation. In some cases, in an effort to better facilitate residents' needs, landscaping was partially restored and compensation for the remaining items was provided to the owner. Landscape inventories for all properties within the Site Boundary are provided in Appendix C.

4.2.4 Photodocumentation

ERI conducted photo-documentation of pre-excavation conditions to document the condition of properties and to serve as a reference for restoration and landscaping. Video and photographs were taken of each property, including driveways, sidewalks, building exteriors, and vegetation. Additional photodocumentation was performed when circumstances arose (e.g., suspected damage to property). Representative photographs showing the various stages of activity on the residential properties are provided in Appendix D.

4.2.5 Tree Removal

All trees within the Site were removed prior to excavation. Although soil below certain trees was sampled by Advanced GeoServices at the request of property owners, soil lead concentrations beneath the canopies exceeded the 400 mg/kg performance standard and the trees were removed with the owner's permission. The property owners were given the option of not having the tree removed but were told by USEPA that the property would be considered "partially remediated" if the tree was left in place. ERI retained a local tree specialist to perform the removal. In an effort to reduce the impact of removal activities, the Site was cleared in three primary stages that corresponded to ERI's excavation schedule. All trees were disposed of by the tree specialist and a stump grinder was used to grind the stumps in place. The ground stumps and all other vegetation (e.g. shrubs, brush, etc.) were removed by ERI during excavation and stockpiled with excavated soil materials for disposal.

4.2.6 Decontamination Facilities

Decontamination facilities were provided in the support zone of each excavation area as well as a wash station and first aid supplies. Dry brush decontamination of equipment was performed before removing the equipment from the excavation area. Any materials that were inadvertently tracked onto sidewalks and streets were immediately removed by ERI. Streets and sidewalks were swept clean and, if necessary, rinsed with water following excavation and backfill operations. The materials which had been tracked onto streets and sidewalks were rinsed back into the excavation or restoration areas. At no time were materials washed into municipal stormwater inlets.

4.2.7 Soil Staging Area

A seventeen-acre vacant lot to the south of the Site, located on Transit Avenue, was used as a support and staging area. Temporary trailer offices for ERI, Advanced GeoServices and USEPA were placed in the center of the lot. Excavated materials and fill materials were staged in separate stockpiles at the western end of the lot, with the excavated stockpile located down gradient of the fill stockpile. All excavated material was stockpiled on plastic sheeting. Silt fencing was installed down gradient of the excavated stockpile to prevent cross contamination and an earthen berm was constructed to retain runoff from the excavated stockpile. A security fence was erected around the perimeter of the staging area and a rock construction entrance was installed at the fence gate in order to allow decontamination of trucks exiting the soil staging area. Decontamination of trucks was deemed unnecessary because the rock construction entrance, which consisted of large diameter stone, acted as natural scrubbers for the truck tires leaving the staging area and ensured that lead contaminated soil was not tracked outside of the staging area. The soil stockpiles were covered with plastic tarps during non-working hours and the gates were locked. As described in additional detail in Section 4.3.1, Personal Air Monitors (PAMs) and Personal Data Random Air Monitors (PDRs) were used to monitor particulate

concentrations near the soil stockpiles during all soil disturbance activities. A water truck was stored in the staging area in the event that particulate concentrations warranted increased dust suppression.

4.3 SOIL REMOVAL ACTIVITIES

All properties within the Site, with the exception of an area within one of the properties, were excavated to a depth necessary to achieve sample results below the 400 mg/kg performance standard. At one property, excavation was performed to a depth of approximately 5 ft. below a deteriorated paved driveway. During excavation activities, ERI encountered the groundwater table at the bottom of the excavation. The Respondent petitioned the USEPA to discontinue excavation, which due to its proximity to the house placed the integrity of the structure at risk. USEPA approved discontinuing excavation and the area was backfilled and repaved with a new asphalt driveway. No confirmation samples were obtained in this area at the approval of the USEPA.

Upon initial excavation to a depth consistent with historic sampling, deposits of a black fill material were encountered in portions of the first properties to be remediated. Field screening of the black material, using an X-Ray Fluorescence (XRF) analyzer, consistently yielded lead concentrations above 400 mg/kg. During the initial excavation, there was a horizon of soil that exhibited lead concentrations below 400 at an excavation depth of approximately 8-12 inches. Black material was only encountered in isolated pockets initially. Excavation of the isolated pockets of black material led to the discovery that lead-impacted black material extended underneath the "clean" horizon of soil throughout the entire area initially excavated. The Respondent petitioned the USEPA so that excavation could be discontinued upon reaching the recommended minimum 12-inch depth as discussed in the Residential Handbook guidelines which will generally prevent direct human contact and exposure to contaminated soil left at depth.

On a conference call on October 7, 2005 between representatives of NL and USEPA, the USEPA required and NL agreed, in order to avoid penalties, that excavations would extend to a depth of about four feet if the confirmation sample data warranted excavation to that depth or where groundwater was encountered. Excavations beyond a depth of four feet would be discussed with USEPA prior to being undertaken. Subsequently, these areas were re-excavated to remove all lead-impacted black material. Excavation to the underlying clay layer, which typically indicated an end to fill materials and lead impacted soils, was required in most areas. Hand tools were used upon primary excavation to remove any small deposits of black material remaining in the clay. The elevation of the clay layer varied within the Site, which subsequently led to excavation at greater depths in properties to the west of West Second Street and those along Walden Avenue. Lead-impacted black material was encountered in varying amounts throughout the Site, and many properties required excavation to depths greater than those originally anticipated in order to meet the USEPA cleanup standard in accordance with the AOC. Removal of the visually identifiable black material and excavation to the underlying clay layer became characteristic of the majority of properties within the Site Boundary.

In order to reduce the impact of removal activities, equipment size was kept to a minimum. Mini-excavators and skid-steers were used to perform excavations. In smaller areas where there was a risk of damage to structures from equipment or where access was limited, the excavations were performed using hand tools (e.g. shovels). Single-axle dump trucks were used to transport excavated material from the Site to the staging area. The use of driveways and sidewalks for access to properties was kept to a minimum. When the use of driveways and sidewalks was necessary, plywood was placed and gravel loading ramps were constructed to reduce impact.

Excavation of each property was performed to a minimum depth of 6 inches. In areas where lead-impacted black material was encountered and visually identifiable, excavation continued beyond the 6 inch minimum until removal of the black material was complete. In areas where there was no clear distinction between soils and fill materials beyond the 6 inch minimum, excavation proceeded in 3 to 6 inch intervals. XRF field screenings were taken continuously throughout removal activities to guide excavation, characterize soils, and determine removal

depth requirements. XRF screening of the underlying clay layer consistently yielded soil lead concentrations well below the 400 mg/kg performance standard. In general, the visually distinct clay layer indicated an end to lead impacted materials. Excavation to the clay layer, XRF screening of darker colored areas within the clay, and, if necessary, hand digging of these areas became standard procedure for most properties.

In areas where groundwater was encountered at depth or where excavations had standing storm water, removal was discontinued until the areas were pumped. All water removed from excavations was pumped through filter bags to control sediment release.

As mentioned above, all properties within the Site, with the exception of an area within one of the properties, were excavated to a depth necessary to achieve sample results below the 400 mg/kg performance standard. At one property, excavation of the deteriorated asphalt driveway revealed large deposits of lead-impacted black material at depths of 4-5 feet. Because of the very poor condition of half of the driveway, the decision was made by the USEPA to treat that half of the driveway as non-paved. Test pits were dug in the driveway which revealed that the black material continued throughout the driveway. A test pit dug on the east side of the driveway revealed that the black material existed in a uniform layer which got steadily deeper from east to west from 5-6 feet to an undetermined depth. The layer of black material was able to be excavated east of the driveway at a depth of 18-24". The house borders the driveway to the west. The groundwater was also encountered at a depth 3-4 ft. With USEPA approval, excavation at depth was discontinued and the portion of the driveway area that had already been excavated was backfilled with clean fill. Excavation then continued along the remainder of the driveway at a depth of 12 inches. The driveway was backfilled with 8 inches of 2A-modified stone and covered with 4 inches of asphalt. At the direction of the interim USEPA On-Scene Coordinator (OSC), no post-excavation samples were taken in the driveway area prior to backfill and placement of asphalt.

4.3.1 Air Monitoring

Air monitoring was performed in accordance with the Site specific HASP developed by Advanced GeoServices and amended by Cocciardi and Associates, Inc., ERI's Health and Safety subcontractor. Air monitoring consisted of perimeter dust monitoring and personal exposure assessments for lead-in-air. PDRs and PAMs were used to measure particulate and lead levels, respectively. Air monitoring was performed from June 2005 through October 2005. With USEPA approval, no air monitoring was required during additional removal activities performed in November 2005. Appropriate dust suppression measures were determined to be adequate considering the minimal intrusive activities that were to be performed during this period. NYS guidance uses "intrusive activities" to define when air monitoring should be performed. Excavations were visually monitored, although dust generation was negligible due to frequent rain events and wet conditions, and no further suppression techniques were necessary.

4.3.1.1 **PDR Air Monitor Results**

Daily on-site dust monitoring was conducted using PDRs which were placed upwind and downwind along the perimeter of the exclusion zone while earth disturbance activities were ongoing within the exclusion zone. An additional PDR was placed at the main entrance to the closest downwind residential structure. PDRs were also located upwind and downwind during all activities within the soil staging area. PDRs were zeroed daily using the MIE Z-bag method. Data was collected and averaged over fifteen-minute intervals for the duration of on-site activities. Daily dust monitoring results were maintained on-site for review by site personnel and are attached as Appendix E. PDR readings were monitored during excavation activities. The results were evaluated to determine the level of dust suppression required. No additional dust suppression techniques, other than those described in Section 4.3.2, were necessary during soil excavation and handling operations.

4.3.1.2 **PAM Results**

PAMs were used to characterize lead-in-air exposure levels during on-site activities. Site activities were initiated in Level C personal protective equipment (PPE) and were downgraded to Level D after a negative exposure assessment was performed. Worker exposure characterizations for lead-in-air were performed for the first seven days of work for all Site activities. Additional exposure characterizations were performed once every month thereafter, for the duration of the project. Air samples were collected in accordance with the National Institute for Occupational Safety and Health (NIOSH) Method 7300 and 7700 (spot test). Specific sample identification and results can be found in Appendix E. Samples were delivered to STL-Buffalo. STL-Buffalo forwarded these samples to Galson Laboratories, an Environmental Lead Laboratory Accreditation Program (ELLAP) certified laboratory. Galson Laboratories performed the analysis.

Lead characterizations consisted of personal monitoring, as identified in the HASP. Criteria for the lead exposure assessment are identified as: less than 30 $\mu g/m^3$ (OSHA Action Level) and less than 50 $\mu g/m^3$ (OSHA Permissible Exposure Limit) as defined in 29CFR 1926.62.

Personal lead-in-air samples were analyzed on-site during the initial assessment in accordance with NIOSH 7700 (Lead-in-Air by Chemical Spot Test) with confirmatory laboratory duplicate samples to downgrade the PPE requirements from Level C to Level D. Specific spot test sample results and locations can be found in Appendix E.

4.3.2 Dust Control

Water was used for dust suppression during soil disturbance activities. All trucks used to transport soil were tarped during on-site and off-site transport. During periods of dry weather and little rainfall, dust suppression was constant throughout the day. Visual dust generation was monitored by an individual who was exclusively responsible for dust suppression. This was especially necessary in areas where excavation was performed beyond the depth where soils

could be presoaked. During periods of frequent rain events, dust suppression was not necessary. Excavations were visually monitored for dust generation and dust suppression was utilized when appropriate. During non-working hours, soil stockpiles were covered with plastic tarps.

4.3.4 Erosion and Sedimentation Control

Filter fabric fence was installed along the perimeter of excavations in areas where runoff was possible. Areas up gradient or that were bounded by sidewalks, driveways, and curbs did not require filter fabric fence. Properties in which excavation depths were sufficient to prevent sediment release required no additional control measures. Backfilled areas were secured with filter fabric fence where necessary, although erosion was minimal throughout the project. To prevent sediment release into city storm water systems, filter bags were used to provide inlet protection.

4.3.5 Confirmation Sampling

Post-excavation confirmation soil sampling was conducted as specified in the NYSDEC Draft Technical Guidance on Site Investigation and Remediation (Section 5. Remedial Design/Remedial Action). Sampling was performed by ERI following excavation of all or part of a property. In addition, Advanced GeoServices performed limited perimeter sampling. Confirmation sampling included the collection of samples from the base of excavation areas and along the perimeter of excavation areas. All samples were screened using the XRF and delivered to STL Buffalo for laboratory confirmation by USEPA SW-846 Method 6010B for total lead. Although the excavations on many properties were contiguous with no sidewall, each property was treated as a separate excavation.

At the base of excavation areas, 900 square foot sampling areas were designated within each property as per the Work Plan. Four grab samples (0 to 6-inches in depth) were collected within each 900 square foot sampling area. Sample locations were evenly dispersed within each

sampling area and biased towards any areas of discoloration as black color was found to be indicative of lead contamination. In situations where sampling areas were less than 900 square feet, sample frequency, as approved by USEPA, was pro-rated to correspond to the appropriate square footage (e.g. for a 450 square foot sampling area, 2 grab samples were collected). In areas where excavation between properties was continuous (e.g. not separated by features such as sidewalks, driveways, etc.), the property line was used to define the boundary of the sampling area. Each grab sample collected within a sampling area was screened with the XRF. The sample with the highest concentration under 400 mg/kg total lead was submitted for fixed laboratory confirmation. If any of the screened samples were above 400 mg/kg, additional localized excavation was performed in those areas until screening produced results below 400 mg/kg.

Additionally, samples were collected along the perimeter of excavation areas at a frequency of one grab sample (0-6 inches of surface soils in depth) per 30 linear feet. Perimeter samples were located immediately outside of excavation areas within the Site Boundary. Samples were taken in areas where excavation terminated in grass; no perimeter samples were taken if the excavation terminated at pavement or any other permanent feature. In several areas, perimeter sample results were greater than the 400 mg/kg performance standard and further excavation was required. If a perimeter sample was greater than 400 mg/kg, additional perimeter samples were taken at five-foot intervals perpendicular to the face of the excavation at a depth of 0-6 inches until a sample result below 400 mg/kg was obtained. The samples were screened with the XRF and the screened sample with the XRF reading below 400 mg/kg was sent to the laboratory for confirmation. The new horizontal limit of excavation was designated as the 15 foot interval on either side of the sample location, parallel to the existing face of the excavation. This area was excavated up to the passing XRF-screened sample. No additional perimeter samples were taken since the horizontal limits of excavation were previously established. The base of the additional excavation was sampled as per the Work Plan. If the perimeter sampling indicated that the excavation extended onto a property that was not scheduled for excavation on the basis of delineation sampling, then that property owner was contacted to gain access for sampling and excavation as necessary.

The perimeter sampling procedure described above was designated as a modification to the Work Plan and documented in an email from Advanced GeoServices to USEPA in response to the presence of lead-impacted black material and perimeter sample results exceeding 400 mg/kg. A copy of this email is provided in Appendix F, along with the Site specific HASP Addendum prepared by Cocciardi and Associates, Inc. upon USEPA request.

During Quality Assurance procedures, it was determined that laboratory data was not available for three confirmation samples (two base of excavation locations and one perimeter location) which affected four properties. Additional sampling was performed on March 17, 2006. The sampling consisted of collecting the missing samples at the final excavation depth following the Work Plan sampling protocols. Quality Assurance samples were also collected to conform to the Quality Assurance Project Plan and included an additional two samples. All samples collected had duplicate samples prepared as well as additional volume for Matrix Spike and Matrix Spike Duplicates testing. The samples were tested for total lead and all concentrations were below the performance standard.

Property sketches illustrating the location of the confirmation samples were prepared by ERI. The sketches depict the property, each area that was addressed, and the location of each sample sent to the laboratory for confirmation. Property sketches, confirmation sampling results, and laboratory data sheets are provided in Appendix G.

4.4 TREATMENT, TRANSPORTATION AND DISPOSAL

Excavated materials were loaded and transported from the Site to the staging area in tarped, 10 cubic yard dump trucks. All excavated materials were then loaded out from the staging area for off-site disposal.

4.4.1 Waste Characterization

Prior to removal activities, ERI performed waste characterization sampling of the Site. Six representative composite samples were obtained from within the Site Boundary and evaluated by STL-Buffalo for Toxicity Characteristic Leaching Procedure (TCLP) parameters (volatiles, BNA extractables, pesticides, herbicides and metals) and PCBs. Two additional composite samples were submitted for laboratory analysis upon the initial increase of anticipated tonnage from 3,000 to 4,000 tons. Results indicated that the additional material was similar to the material previously approved by the NYSDEC and was approved for disposal at the BFI Niagara facility. As determined from laboratory data, none of the excavated material required stabilization treatment prior to disposal. The waste characterization information and TCLP/PCB analysis data are presented in Appendix H.

4.4.2 Amount and Destination of Removed Soil

All excavated material was disposed off-site at the BFI Niagara Recycling Landfill facility in Niagara Falls, New York. A total of 9,877.58 tons of excavated material was disposed of at the facility between the dates of July 1, 2005 and November 15, 2005. NYSDEC approved the original application for the facility's disposal of 3,000 tons of excavated material. As a result of excavation depths beyond what was originally anticipated, two additional applications were resubmitted to account for increased tonnages. The NYSDEC approved all three submittals for the facility's acceptance of up to 3,000 tons, 4,000 tons, and, ultimately, 11,000 tons of excavated material. Applications and approved submittals are provided in Appendix H. Weight tickets and manifests were recorded for each truck sent to the disposal facility and are provided in Appendix I.

5.0 BACKFILL, SOD, AND RESTORATION

Backfill operations on a property proceeded upon laboratory confirmation of sample results below 400 mg/kg. A combination of structural fill and topsoil was used on all properties. Each excavation was backfilled to approximate pre-excavation grades and all backfill was placed to provide positive drainage away from houses. All backfill materials used at the Site were tested and certified to meet the NYSDEC Cleanup Objectives. The quantity of backfill materials used did not exceed 10,000 cubic yards and, therefore, did not require further testing beyond the initial analysis. Results of backfill testing are provided in Appendix J.

5.1 STRUCTURAL FILL

Most of the structural fill used at the Site was obtained from a quarry located in Lancaster, NY, owned and operated by Lafarge. Structural fill was also obtained from Mr. Topsoil located in Depew, NY, although Lafarge was the primary provider for the project. Both sources were tested to ensure that NYSDEC Cleanup Objectives were met. Structural fill was placed to allow 3 inches of topsoil to be applied. Modified gravel was used to backfill driveways and other areas requested by the property owners.

5.2 TOPSOIL

Most of the topsoil was obtained from Mr. Topsoil located in Depew, NY. Topsoil was also obtained from CJ Krantz, Inc. located in Clarence Center, NY, although Mr. Topsoil was the primary provider for the project. For each source, separate stockpiles were set aside at the respective facility and designated for use only at the Site. The stockpiles were tested to ensure that NYSDEC Cleanup Objectives were met. The topsoil from both sources was a natural friable soil with organic content and nutrients sufficient to sustain turf establishment. The maximum particle size allowed was ¾ inch. All properties received a minimum of 3 inches of topsoil.

5.3 SODDING

Sod was used to restore turf on all disturbed residential properties within the Site. At the direction of Depew Village Administration, village owned Rights-of-Way only required seeding for restoration purposes. The Rights-of-Way of the village are the actual width of the roadway owned by the village. These Rights-of-Way varied in width; however, for the purposes of this report, they are described as the area between the sidewalk and the roadway. Although a few of these Rights-of-Way successfully received seeding, most of the village owned areas were restored with sod to reduce maintenance requirements and to provide immediate erosion control.

A professional landscaping service was retained by ERI, Rich's Sports Fields, for placement of the sod. The sod was provided by a local sod farm and delivered in large rolls. These rolls were loaded onto a track machine, which applied the sod in long, continuous strips. In areas where machine access was restricted, sod was applied by hand. A weighted roller was used to provide uniform settling upon placement of sod.

All sod provided by the local sod farm was free of weeds and of good quality. Sod deliveries were randomly screened with the XRF for lead content and all results were below the detection limit of the XRF. Upon placement of sod, all properties were watered as necessary to support root establishment. Once it was determined that sufficient root growth into the topsoil had been achieved, maintenance of the established sod was relinquished to the property owner. At this time, the property owner was notified that sod maintenance was their responsibility and was issued lawn care instructions provided by the local sod farm.

5.4 REPAIR TO DAMAGED PROPERTY

All property damaged during the project was either repaired or monetary compensation was provided according to the documentation of pre-excavation property conditions. All resident concerns, except one, have been addressed by ERI and documented in weekly reports submitted to the USEPA. The remaining concern, re-rolling of sod installed in 2005, will be performed in

the spring of 2007. All fences that were removed for access were either reinstalled or replaced with new fencing. ERI provided compensation to property owners whose driveways and sidewalks were damaged. In instances where unmarked utilities were damaged upon excavation, appropriate safety measures were taken, utility companies were notified, and certified personnel were retained to perform the repairs.

5.5 PROPERTY CLOSEOUT

Following restoration of a property, a meeting was scheduled with the property owner. The owner and an ERI representative inspected the property to determine that restoration was complete, including vegetation, sod and any repairs that may have been needed. If there were restoration issues, the issues were recorded on the property inspection/agreement form provided by ERI. Any items remaining to be addressed were recorded in a punchlist that was frequently updated and distributed to ERI for appropriate response. ERI provided the property owners with a maintenance policy for replacement of unsuccessful vegetation where erosion and settling had occurred. Prior to the Final Site Inspection on May 25, 2006, any settlement and replacement of unsuccessful vegetation was repaired to the satisfaction of all property owners except the concern discussed in section 5.4.

At the completion of the project, final property owner confirmation result letters were issued to each owner. These letters included sketches illustrating areas remediated within the property, confirmation sample locations, confirmation sample results and inspection/agreement forms. Best efforts were made to obtain signed inspection/agreement forms from all property owners prior to issuing the final letters. Unfortunately, the project team was unable to obtain signed forms from two property owners in time to include them in the letter. Subsequently, one property owner signed and returned the agreement however; one property owner (23 W. 2nd) has been unresponsive to all attempts. Final property owner confirmation result letters including inspection/agreement forms are provided in Appendix K.

5.6 FINAL INSPECTION

A preliminary final inspection was held on November 17, 2005 with representatives of the Respondent, Advanced GeoServices, USEPA, and ERI in attendance. A short meeting was held prior to the site walk, at which time the USEPA was informed of the status of the project and those restoration items remaining to be addressed. The entire Site was observed during a site walk that included several stops to observe conditions on properties of concern. A copy of the minutes from the preliminary inspection is attached in Appendix L.

On May 25, 2006, a final inspection was performed. Meeting minutes of the final inspection were documented in the May 2006 Monthly Report submitted to the USEPA. Also, a letter to the USEPA was submitted on July 10, 2006 which documented the requirements of the AOC were satisfactorily met. Correspondence is provided in Appendix L.

6.0 PROJECT COSTS

The estimated cost to prepare the Work Plan, obtain access to the properties, perform delineation sampling, perform soil removal and property restoration activities, prepare the final report, and conduct other tasks associated with the removal activities is approximately $1.8 million. The costs do not include the Respondent's costs associated with work performed by USEPA and their contractors.

7.0 REPORTS

7.1 DAILY FIELD REPORTS

Daily field reports were prepared by Advanced GeoServices. They include daily site activities and communications. These reports were also intended to document that work was performed in accordance with the Work Plan and to note any exceptions. The daily field reports are provided in Appendix M.

7.2 WEEKLY REPORTS

Weekly Reports were completed by ERI and submitted electronically to Advanced GeoServices. The weekly reports included at a minimum: site activities completed for the previous reporting period; site activities planned for the next reporting period; project personnel, equipment, and materials; health and safety items; issues or concerns; planned resolution of issues; and a schedule update. The weekly reports submitted to Advanced GeoServices are provided in Appendix N.

Weekly Reports were also completed by Advanced GeoServices and submitted electronically to the USEPA. The weekly reports included at a minimum: site activities for the previous reporting period; sample data received for the previous reporting period; resident concerns; and a statistical summary of properties accessed, sampled, excavated, backfilled, and sodded. The weekly reports submitted to USEPA are provided in Appendix N.

7.3 MONTHLY REPORTS

Monthly reports were completed and submitted by Advanced GeoServices to the USEPA by the 10th day of each month. Reports were submitted from December 2004 through April 2005. From June 2005 up to and including November 2005, during on-site operations, weekly reports were submitted by Advanced GeoServices in lieu of monthly reports. Advanced GeoServices

discontinued weekly reporting and returned to submitting monthly reports December 2005 through July 2006. Each monthly report contained at a minimum:

- Actions Taken During the Previous Month to Comply with the AOC;
- Summary of Data Received During the Reporting Period;
- Deliverables Submitted During the Reporting Period;
- Activities Planned for the Next Reporting Period;
- Problems Encountered, Anticipated Problems and Planned Resolutions of Past or Anticipated Problems; and
- Modifications to Approved Work Plans or Schedules.

The monthly reports submitted to USEPA are provided in Appendix O.

7.4 FIELD DOCUMENTATION

Field documentation by Advanced GeoServices was kept in the form of field log books for daily activities and sampling. The field book had entries throughout each day to document activities performed as well as conversations with property owners, regulators, representatives of the Respondent, Advanced GeoServices, and ERI. The sampling logbook contains a record of all sampling, delineation and perimeter sampling, performed by Advanced GeoServices and includes sample locations and identification.

8.0 SUMMARY AND CERTIFICATION STATEMENT

This Final Report documents that the activities outlined in the Removal Action Work Plan have been successfully completed and, therefore the requirements for that portion of the Administrative Order on Consent, Index Number CERCLA-02-2004-2024, have been fulfilled. A total of 9,877.58 tons of lead-impacted soils and associated materials have been removed from the residential properties and the removal goals for the project have been achieved.

Under penalty of law, I certify that, to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of this report, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Barbara L. Forslund, P.E.
Advanced GeoServices Engineering, P.C.

1/25/07
Date

ATTACHMENT
WORK PLAN FOR THE REMOVAL ACTION AT NL INDUSTRIES/DEPEW PLANT SITE (PROVIDED ON COMPACT DISC ATTACHED)

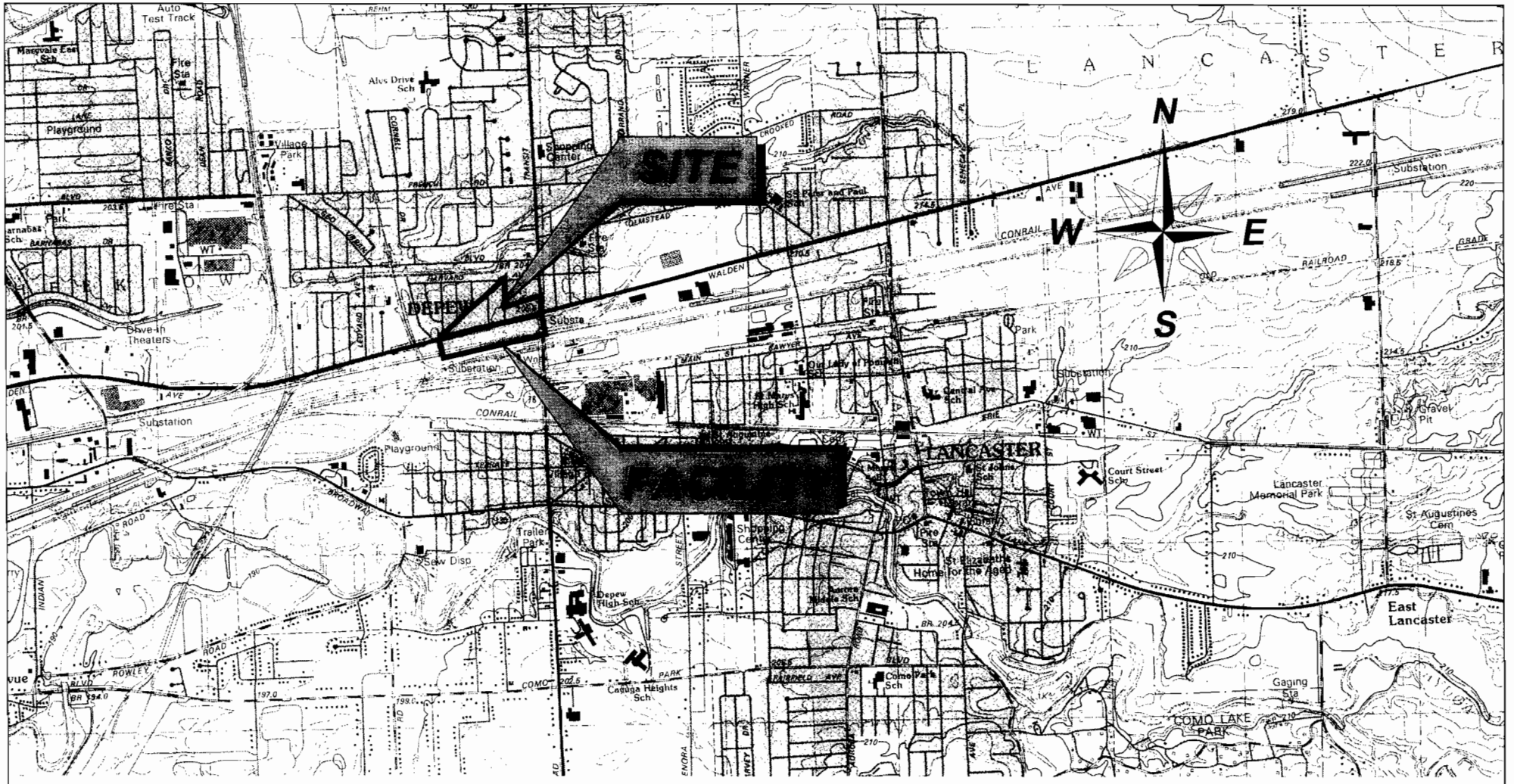
TABLE

TABLE 1
PROJECT PERSONNEL CONTACT INFORMATION

NL Industries/Depew Plant Site
Depew, New York

Advanced GeoServices Corp. *NL's On-site Quality Assurance Representative* Primary Contact: Barbara L. Forslund, P.E.	1055 Andrew Drive, Suite A West Chester, PA 19380-4293 610-840-9100
Environmental Restoration, Inc. (ERI) *NL's Removal Contractor* Primary Contact: Michael P. Domenick	191 Courtdale Avenue Courtdale, PA 18704 570-331-8191
Cocciardi and Associates, Inc. *ERI's Health and Safety Subcontractor* Primary Contact: Troy Clark, Justin Heffner	4 Kasey Court Mechanicsburg, PA 17055-5596 717-766-4500
Rich's Sports Fields *ERI's Restoration/Landscaping Subcontractor* Primary Contact: Rich Roncone	110 Pavement Road Lancaster, NY 14086 716-681-5951
Professional Tree Care, Inc. *ERI's Tree Removal Subcontractor* Primary Contact: Justin Ibowicz	PO Box 344 Lancaster, NY 14086 716-681-9663
William A. Snyder, Registered Consulting Arborist *ERI's Landscape Inventory Subcontractor* Primary Contact: William A. Snyder	188 Bennington Road Amherst, NY 14226 716-839-0096
Greenman - Pedersen, Inc. *ERI's Surveying Subcontractor*	4950 Genesee Street, Suite 165 Buffalo, NY 14225 716-633-4844

FIGURES



Basemap source:
U.S.G.S. 7.5 minute quadrangle maps of Lancaster New York, dated 1982

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NL INDUSTRIES/DEPEW PLANT

DEPEW, NEW YORK

Scale: N.T.S.	SITE LOCATION MAP
Originated By: K.O	
Drawn By: P.S.G.	
Checked By: K.O	
Project Mgr: B.L.F	
Dwg No: NY02-927-11	
JAN 26 2007	
Project No: NY02-927	FIGURE: 1

Advanced GeoServices Engineering P.C.
1055 Andrew Drive Suite A
West Chester, Pennsylvania 19380
(610) 840-9100
FAX: (610) 840-9199

LEGEND

- SOILS EXCEEDING 400 ppm
- SOILS BELOW 400 ppm
- COMMERCIAL PROPERTY BOUNDARY
- LIMIT OF REMOVAL
- EXTENDED EXCAVATION (Based on Perimeter Sampling)

3232 WALDEN (Block 7 Lot 7) - STREET ADDRESS - BLOCK AND LOT

JAR6 - RIGHT-OF-WAY EXCAVATION (AREA APPROXIMATE)

NL INDUSTRIES/DEPEW PLANT SITE

DEPEW, NEW YORK

DEPEW PLANT SUPERFUND SITE AS DEFINED IN PARAGRAPH 6q. OF THE ADMINISTRATIVE ORDER ON CONSENT FOR A REMOVAL ACTION INDEX NUMBER CERCLA 02-2004-2024 VILLAGE OF DEPEW, ERIE COUNTY, NEW YORK

120 0 120 240

SCALE IN FEET

NOTES:
1. BASED ON HISTORICAL DATA; FOR DISCUSSION PURPOSES ONLY.
2. PERIMETER AREAS SHOWN ARE APPROXIMATE.
3. PROPERTY LOT LINES TAKEN FROM ERIE COUNTY TAX MAPPING SERVICE.

Scale: 1"=100'
Designed By: K.O.
Drawn By: P.S.G.
Checked By: P.D.
Project Mgr: C.T.R.
Dwg No. NY02-927-02A
JAN 26 2007
Project No. NY02-927
FIGURE: 2

FINAL SITE BOUNDARY PLAN

Advanced GeoServices Engineering P.C.
1055 Andrew Drive Suite A
West Chester, Pennsylvania 19380
(610) 840-9100
FAX: (610) 840-9199

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APPENDICES

(PROVIDED ON COMPACT DISC ATTACHED)