Operation, Maintenance, and Monitoring Manual

Ley Creek PCB Dredgings Site
Syracuse, New York

Remediation and Liability Management Company, Inc.

September 2001



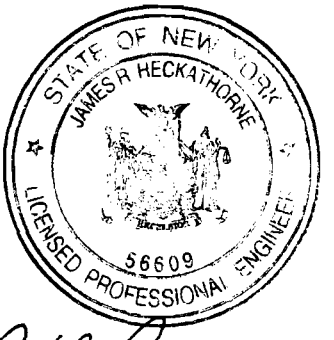
O'BRIEN & GERE
ENGINEERS, INC.

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Vice President

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1. Introduction

This document provides guidelines and procedures for conducting operation, maintenance, and monitoring (OM&M) activities at the Ley Creek PCB Dredgings Site (Site) located in the Town of Salina, Onondaga County, New York, during the post-Remedial Construction period. This OM&M Manual has been prepared on behalf of Remediation and Liability Management Company, Inc. (REALM) in accordance with the Consent Order (Index #D-7-0008-97-06) executed between REALM and the New York State Department of Environmental Conservation (NYSDEC), which became effective upon the signature of NYSDEC on July 15, 1999. This document supplements information contained in the following documents:

- Remedial Design [as listed in the March 30, 1999 letter to Wayne Mizerak (NYSDEC) from Maureen S. Markert (O'Brien & Gere)]
- Remedial Action Engineering Report (O'Brien & Gere, 2001a)
- Management Plan for County Maintenance Work (Appendix A)
- Record Drawings (Appendix B)
- As-builts (Exhibit A)
- Consent Order-Index #D-7-0008-97-06 (NYSDEC, 1999).

A three-ring binder format is provided so that updates to the OM&M Manual may be made as conditions warrant during continuing operations.

1.1. Project description

The Ley Creek PCB Dredgings Site is a Class 2 site in the New York State Registry of Inactive Hazardous Waste Disposal Sites. The Site is located in the Town of Salina, Onondaga County, New York, and is bounded by Factory Avenue on the south and Ley Creek to the north. The eastern limit of the Site is Townline Road and the western limit is approximately 4,300 ft downstream. A Site location map is presented as Figure 1-1 and a Site plan is presented as Figure 1-2. A property legal description for the Site is presented in Exhibit B. The Site is approximately 19 acres in size.

1.2. Site history

Operation background. Prior to the early 1970's, the combination of poor channel conditions and large areas of low permeability in the Ley Creek watershed caused extensive flooding, some of the worst of which was near the General Motors Corporation (GM) former Inland Fisher Guide (IFG) facility in 1969 (Calocerinos and Spina, 1969). The formation of the Ley Creek Drainage District and clearing and dredging of the channel occurred after the 1969 flooding event. The Onondaga County Department of Drainage and Sanitation performed the dredging of Ley Creek. In 1970, the section of the creek between Seventh North Street and Route 11 was dredged. Portions of the creek between Seventh North Street and Onondaga Lake were dredged in 1971. Ley Creek was dredged from Townline Road to Onondaga Lake in 1975. In 1983, the section of the creek between Townline Road and Route 11 was dredged. Dredged material generated during these activities was placed along the south bank of the creek or used for land restoration projects (EDI, 1985b).

Regulatory background. A hydrogeologic investigation performed by EDI Engineering and Science (EDI) on behalf of GM pursuant to a SPDES Consent Order (NYSDEC, 1985) indicated the presence of polychlorinated biphenyls (PCBs) in the dredged material at the Site. Material previously used in hydraulic equipment for die casting operations at the GM facility (EDI, 1985a) is believed to be one of the sources of the detected PCBs.

Subsequent to the completion of the EDI hydrogeologic investigation, NYSDEC requested that GM perform a more detailed study of the area between Factory Avenue and Ley Creek. Pursuant to an Order on Consent dated August 12, 1985 between NYSDEC and GM, GM completed an investigation of dredged material/soil and ground water in the area between Factory Avenue and Ley Creek. Ground water flow was determined to be generally north towards Ley Creek. PCBs were detected in dredged material/soil and ground water samples (O'Brien & Gere, 1987).

As a result of the 1987 investigation, NYSDEC required a more comprehensive evaluation of the Ley Creek dredged material/soil to define the extent of PCBs along the north and south banks of Ley Creek and evaluate the impacts to public health and the environment. O'Brien & Gere, on behalf of GM, completed a field investigation of the Site in 1989, which included the sampling and analysis of ground water, dredged material/soil, sediment, and surface water (O'Brien & Gere, 1989). Ground water samples collected from the Site during two sampling events exhibited concentrations of PCBs in excess of the NYS Class GA ground water standard of 0.1 µg/L. The maximum concentration of PCBs detected during the two sampling events was 21 µg/L in MW-9. PCBs were detected in the dredged material/soil samples ranging in concentrations from non-detect to 180 mg/kg. Sediment samples collected from locations in Ley Creek, north of the Site,

exhibited PCB concentrations from 1.9 mg/kg to 8.9 mg/kg. The surface water sample results ranged in PCB concentrations from non-detect to 1.4µg/L.

Analysis of the exposure conditions at the Site indicated that none of the contaminant transport and exposure routes (air, soil/sediment, surface water, or ground water) were functional for humans under the site conditions at the time of the investigation. It was concluded that the exposure to PCBs experienced by humans at the Site did not represent an unacceptable risk. The Field Investigation Report was submitted to NYSDEC in July 1989.

In its comments on the Field Investigation Report, NYSDEC requested that additional investigatory work be performed at the Site to complete the characterization of the areal and vertical extent of contamination and to conduct a habitat based assessment (Kelly, 1989). GM and NYSDEC signed an Administrative Order on Consent for performance of a Remedial Investigation/Feasibility Study (RI/FS) at the Site, effective May 23, 1991 (NYSDEC, 1991). Based on NYSDEC's Field Investigation Report comments and on several meetings between GM and NYSDEC, a Work Plan was developed for an RI/FS for the Site (O'Brien & Gere, 1992) and approved by NYSDEC on June 3, 1992 (Schick, 1992).

Investigatory activities conducted during the RI included installation of two deep monitoring wells and ground water sampling of new and existing wells, surface and subsurface soil sampling, sediment sampling, fish sampling, and storm event sampling of the Outfall 003 discharge water and sediment. A risk assessment and fish and wildlife impact analysis were also completed as part of the RI. RI sampling activities commenced in July 1992, and the RI was completed in accordance with the RI/FS Work Plan.

The initial RI Report was submitted to the NYSDEC in February 1993. In September 1993, the revised RI Report (O'Brien & Gere, 1993) was submitted to NYSDEC which incorporated revisions approved by NYSDEC on August 25, 1993 (Schick, 1993) to the February 1993 initial RI Report.

An FS Report was submitted to NYSDEC on November 24, 1993. NYSDEC provided comments on the FS Report in letters dated January 14, 1994 (Schick, 1994a) and April 21, 1994 (Schick, 1994b). Responses were prepared and provided in an Addendum to the FS report and submitted to NYSDEC as the revised FS Report on May 20, 1994 (Kochem, 1994, and O'Brien & Gere, 1994). Based on further NYSDEC comments (Little, 1994) and Onondaga County concerns as a property owner (Pirro, 1994), a revised FS Report was submitted to NYSDEC on October 9, 1996. NYSDEC approved the FS Report (O'Brien & Gere, 1996) in a letter dated January 23, 1997 (Davies, 1997).

In March 1997, following a period of public comment, NYSDEC issued its Record of Decision (ROD) for the Site (NYSDEC, 1997). The

USEPA concurred in the selection of NYSDEC's remedial alternative in the ROD by its letter dated February 9, 1998 to NYSDEC Commissioner John Cahill (Fox, 1998). Since that time, NYSDEC and USEPA designated the Site as a subsite of the Onondaga Lake National Priorities List (NPL) site. A description of the selected remedial alternative follows in Section 1.3.

A Remedial Design Report was submitted for review to NYSDEC and USEPA on June 19, 1998. On February 19, 1999 (O'Brien & Gere, 1999a), the final Remedial Design Report (O'Brien & Gere, 1999b), Contract Drawings (O'Brien & Gere, 1999c), Technical Specifications and Special Provisions (O'Brien & Gere, 1999d), and Hydraulic Analysis and Floodplain Assessment Report (O'Brien & Gere, 1999e) were resubmitted to incorporate comments from NYSDEC's and USEPA's letters dated July 20, 1998 (Mizerak, 1998a), July 29, 1998 (Mizerak 1998b), July 30, 1998 (Hess, 1998a), and October 27, 1998 (Hess, 1998b).

Revised pages to the Remedial Design Report, Technical Specifications, and Special Provisions were submitted to NYSDEC on March 22, 1999 (O'Brien & Gere, 1999f) to incorporate comments from NYSDEC's and USEPA's letters dated March 10, 1999 (Mizerak, 1999) and March 5, 1999 (Nunes, 1999), as well as verbal comments received on February 23, 1999 and March 16, 1999.

The Remedial Design, consisting of the documents specified in the March 30, 1999 (O'Brien & Gere, 1999g) letter to NYSDEC, was approved by NYSDEC subject to the requirements listed in the June 30, 1999 approval letter (Schick, 1999).

The Remedial Design/Remedial Action Order on Consent (RD/RA Order) (Index # D-7-0008-97-06) (NYSDEC, 1999) between REALM and NYSDEC became effective upon the signature of NYSDEC on July 15, 1999.

Property acquisition. At the time of the ROD issuance, property at the Site was owned by four parties: Onondaga County (County), The Pfaltzgraff Co. (Pfaltzgraff), Niagara Mohawk Power Corporation (NMPC), and the New York State Thruway Authority. REALM has either acquired, or is in the process of acquiring, property within the boundaries of the Site from these parties.

On March 16, 1999, the County conveyed its parcel of land located within the Site to REALM via a quit claim deed. REALM conveyed to the County an easement so that the County could access the 4-foot diameter sanitary sewer that runs in an east-west direction along the southern portion of the Site. The sewer continues to be owned by the County. REALM recorded a Declaration of Covenants and Restrictions for the property acquired from the County on August 9, 1999.

A quit claim deed was recorded on November 23, 1999 for the Pfaltzgraff land parcel located within the limits of the Site. REALM

recorded a Declaration of Covenants and Restrictions for the property acquired from Pfaltzgraff on December 29, 1999.

Two quit claim deeds were recorded on August 2, 2001 for the NMPC land parcels located within the limits of the Site. REALM continues to work with the New York State Thruway Authority to acquire the remaining property at the Site.

Following conveyance of the New York State Thruway Authority property, a deed restriction will be recorded for the Site as a whole.

Remedial Design. The Site Remedial Design developed by O'Brien & Gere and constructed by Royal Environmental, Inc. during 1999 and 2000 consisted of the following major components:

- Excavation and transportation of dredged material/soil containing PCBs ≥ 50 mg/kg for disposal off-site
- Relocation of dredged material/soil within the limits of the vegetative cover
- Installation of 12 inch vegetative cover over designated areas of the Site
- Vertical extension of ground water monitoring wells located within the limits of the vegetative cover
- Vertical extension of sanitary manholes located within the limits of the vegetative cover
- Construction of access pathways to the sanitary manholes
- Installation of vegetative cover with an erosion control and revegetation matrix between Ley Creek and the access road
- Installation of drainage culverts and catch basins
- Installation of overflow spillways
- Installation of chain link fence around the vegetative cover area to limit access
- Installation of non-woven geotextile visual indicator between the southern edge of Ley Creek and the access road

Geotextile visual indicator between the southern edge of Ley Creek and a few feet south of the start of the slope increase south of the access road

- Installation of gravel access road along Ley Creek
- Seeding of vegetative cover.

1.3. Summary of OM&M activities

1.3.1. OM&M components

This OM&M Manual is applicable to the following components of the Site remedy:

- Vegetative cover
- Access road
- Surface water drainage
- Ground water monitoring wells
- Sanitary sewer manhole access paths
- Wetlands
- Physical security.

1.3.2. OM&M activities

As required by the ROD, operation and maintenance activities for the Site include:

- Routine inspection and maintenance of the constructed features, including the vegetative soil cover, access road, surface water drainage, ground water monitoring wells, sanitary sewer manhole access paths, wetlands, and physical security
- Further evaluation of the ground water beneath the Site, as well as surface water and sediments in Ley Creek will be included in the scope of work for the Supplemental Remedial Investigation/Feasibility Study (SRI/FS) for the Former IFG Facility and Ley Creek Deferred Media Site
- Evaluation of operation, maintenance, and monitoring activities and identification of proposed changes to the OM&M Manual or Site procedures/policies which would provide a safer and /or more cost effective operation
- Recordkeeping and reporting.

1.3.3. Health and safety

Prior to commencement of the OM&M activities at the Ley Creek PCB Dredgings Site, REALM or the OM&M Contractor retained by REALM will prepare and implement a site-specific Health and Safety Plan (HASP) for persons working at the Site in accordance with the Federal Regulations found under 29 CFR 1910.120 for Hazardous Waste Operations and Emergency Response, 29 CFR 1926 "Safety and Health Regulations for Construction," and the citations adopted by reference. The personnel assigned must implement the OM&M Manual and maintain compliance with applicable medical surveillance and personnel training requirements. The OM&M Contractor may either accept and implement the applicable portions of the HASP provided as part of the County Management Plan or modify the HASP as needed.

The Management Plan for County Maintenance Work (O'Brien & Gere, 2001a) was developed to describe in detail the health and safety procedures to be followed by the Onondaga County Sanitation and Drainage Department (OCDDS), the Onondaga County Department of Transportation (OCDOT), and their respective workers in conducting the County of Onondaga's (County's) sewer, drainage district and storm water culvert or pipe maintenance and repair activities at the Site. See Appendix A for a copy of the above mentioned plan. The attached plan is the same draft as the one dated July 1998 and referenced in the RD/RA Consent Order (see paragraph III.C.2 of the Order) as modified to reflect revised lists of contact names and the fact that the Remedial Construction activities have been completed.

1.3.4. Site security

REALM will maintain site security and restrict access to the Site. A 5-ft high chain link fence and warning signs will be maintained to protect the integrity of the vegetative cover area. There are two double swing security gates at both entrance/exit points along Factory Avenue, and they are double locked as to provide access to both REALM and the County.

1.4. Requirements for updating the OM&M Manual

This OM&M Manual may require modifications or enhancements as a result of data generated, changing site conditions, or when more cost effective or better procedures are identified or developed by operations personnel who apply this OM&M Manual. As stated in Section 1, the three-ring binder format is provided in order that changes to this OM&M Manual may be facilitated as conditions warrant.

Potential changes to this OM&M Manual identified by operations personnel shall first be described or discussed in detail with REALM. If appropriate, the recommended change will be identified by REALM to NYSDEC for approval. Once approved by the NYSDEC, copies of revisions to the OM&M Manual will be forwarded to the holders of the

OM&M Manual for insertion into their respective copies. NYSDEC-approved changes/revisions shall then become operational requirements. Distribution of revisions to the OM&M Manual will be coordinated by the following contact:

- Mr. James F. Hartnett
  Remediation and Liability Management Company, Inc.
  c/o GM Remediation Project Office
  1 General Motors Drive
  Syracuse, New York 13206
  Cell phone - (313) 510-5134

The approved changes to the OM&M Manual must also be inserted in the OM&M Manual maintained at the document repositories for the Ley Creek PCB Dredgings Site. The document repositories for the Ley Creek PCB Dredgings Site are as follows:

- Onondaga County Public Libraries
  Paine Branch
  113 Nichols Avenue
  Syracuse, New York 13206
  (315) 434-9135

- Region 7 Office
  NYS Department of Environmental Conservation
  Division of Environmental Remediation
  615 Erie Boulevard, West
  Syracuse, New York 13204

- NYS Department of Environmental Conservation
  Division of Environmental Remediation
  625 Broadway 12th Floor
  Albany, New York 12233-7013

2. Post Remedial Construction site monitoring and maintenance activities

Site monitoring and maintenance will be performed on the following site features:

- Vegetative cover
- Access road
- Surface water drainage
- Ground water monitoring wells
- Sanitary sewer manhole access paths
- Wetlands
- Physical security

The inspection and monitoring of the site features will be performed in May, July, and September for the first year. The first year will begin after the final inspection is completed and NYSDEC has approved the Remedial Action Engineering Report. The monitoring frequency will be reduced to semi-annually (early summer and late summer) after the first year. After completion of the fifth year, the monitoring frequency will be evaluated for continuing monitoring efforts. The monitoring frequency will not be modified without concurrence of the NYSDEC.

The maintenance and repair of significant problems noted during the routine inspections of the site features will be performed within one month of observation assuming weather conditions warrant the work. The materials to be used for maintenance and repair will be equal or better than the materials specified in the February 1999 Technical Specifications (O'Brien & Gere, 1999d).

Additional post-flooding site inspections will be conducted when storm events exceed the 25 year, 24-hour design storm that has a rainfall total of 4.5 inches or greater. The inspection checklist, provided as Table 2-1, will be used to document these inspections.

2.1. Vegetative cover system

2.1.1. Description

A vegetative cover system was installed at the Ley Creek PCB Dredgings Site. Details of the vegetative cover are shown on Record Drawing G-8 of Appendix B.

2.1.2. Purpose

The vegetative cover system was installed over the consolidated dredged materials/soils to minimize the threat to surface waters and sediments by minimizing future contaminated surface run-off from the Site; to prevent, to the extent possible, migration of contaminants into ground water; and to minimize the potential for direct human or animal contact with the consolidated dredged materials/soils.

2.1.3. Inspection and maintenance requirement

In order to establish vegetation at the site, the following program will be implemented for the first three years following completion of Remedial Construction (starting in the fall of 2001).

First Year 2001: The OM&M Contractor shall mow vegetation to a height of 6 to 8 inches in early fall, weather dependent. Fertilizer 6-44-12 shall be applied at a rate of 300 lbs per acre and FINN HST soil conditioner shall be applied at a rate of 2.5 gallons per acre. Overseeding of the Site shall be performed by the application of Timothy, Trefoil, and Clover seed mixture at a rate of 25 lbs per acre. The fertilizer, soil conditioner, and seed mixture will be applied by hydroseeding methods.

Second Year 2002: The OM&M Contractor shall mow vegetation to a height of 6 to 8 inches, three times a year. Fertilizer 6-44-12 shall be applied at a rate of 300 lbs per acre and FINN HST soil conditioner shall be applied at a rate of 2.5 gallons per acre. Both the fertilizer and soil conditioner shall be applied one time per year.

Third Year 2003: The OM&M Contractor shall mow vegetation to a height of 6 to 8 inches, three times a year. Fertilizer 6-44-12 shall be applied at a rate of 300 lbs per acre and FINN HST soil conditioner shall be applied at a rate of 2.5 gallons per acre. Both the fertilizer and soil conditioner shall be applied one time per year.

After the third year, the need for continued application of seed, fertilizer, and soil conditioner will be evaluated. If it is determined that a new program will be needed, the NYSDEC will be notified of the program for concurrence.

Routine inspection of the Site will be performed in May, July, and September for the first year (2001) and semi-annually thereafter until the fifth year (2005). After completion of the fifth year, the monitoring frequency will be evaluated for continuing monitoring efforts. NYSDEC will be informed of the inspections at least one week in advance to enable its participation in the inspections. The inspector will observe the condition of the vegetative cover for areas of settlement, erosion, slope instability, thinning vegetation or other signs of vegetative stress, burrowing animals, or other damage to the cover.

Deep rooting shrubs, brush, or trees will not be allowed to establish on the cover. Mowing will be performed semi-annually (early summer and late summer) or as required to prevent the establishment of woody plants (trees) that may penetrate the cover. Areas that appear to be thinning out over time will require overseeding to keep the vegetative cover uniform.

If burrowing animals or signs of the presence of burrowing animals are observed within the limits of the Site, live traps will be utilized. The captured animals are to be relocated off the Site, and holes produced by the animals are to be filled with like materials.

2.2. Access road

2.2.1. Description

A gravel access road with a turn-around was constructed at the Site, as shown on the Record Drawings G-2 through G-6 (see Appendix B). The gravel access road was constructed using 12 inches of crusher run (NYSDOT 203.2, 4 inch minus) underlain by woven geotextile stabilization fabric. An approximate 1220 ft section of the road between CB-3 and CB-4 received an additional 12 inches of crusher run (NYSDOT 203.2, 4 inch minus) underlain with woven geotextile stabilization fabric between May and July 2001, due to soft soil conditions encountered during construction. Locations of the modified access road are depicted Record Drawings G-4 through G-6.

An approximate 100 ft section of the stone access road between CB-3 and CB-4 received approximately 24 inches of fine rip-rap and gabion baskets filled with fine rip-rap. Both the rip-rap and gabion baskets were underlain with geogrid. This section of the access road was modified to allow water to drain through the access road. The locations of these modifications to the access road are depicted on Sheet G-5 of the Record Drawings.

2.2.2. Purpose

The access road was constructed at the Site to provide the OM&M Contractor a means to access the Site and to provide Onondaga County a means to access Ley Creek for maintenance.

2.2.3. Inspection and maintenance requirements

The access road will be inspected as the same frequency as the vegetative cover. During routine inspections, the inspector will walk along the access road and look for excessive rutting, potholes, or settlement. Should any of these conditions be observed, they will be corrected by filling with appropriate material.

2.3. Surface water drainage

2.3.1. Description

Surface water drainage at the Site was accomplished by the following:

- Installation of five new catch basins and five new culverts to convey storm water to Ley Creek
- Construction of overflow spillways adjacent to the culverts to provide a controlled path for storm water to flow to Ley Creek in the event that the flow to the catch basins is restricted by debris
- Installation of twelve new culverts within the drainage ditch between Factory Avenue and the Site fence to convey storm water runoff beneath the access road at the eastern and western entrance/exit locations and the sanitary sewer truck access paths
- Grading of the drainage ditch between Factory Avenue and the Site fence to promote storm water runoff drainage to the catch basins
- Grading of the Site to promote drainage in a northerly direction to Ley Creek or a southerly direction to the drainage ditch between Factory Avenue and the Site fence

Locations and invert elevations of the catch basins and the culvert pipes are shown on Record Drawings G-2 through G-6 (see Appendix B). Details of the catch basin, culvert pipe bedding, and culvert pipe end sections are shown on Record Drawing G-8 (see Appendix B).

2.3.2. Purpose

The surface water drainage system was implemented to minimize the potential threat of eroding the covered dredged material/soil; and to the extent possible, minimize the migration of contaminants into the ground water through surface water control.

2.3.3. Inspection and maintenance requirement

Surface water drainage facilities will be inspected at the same frequency as the vegetative cover and access road. Surface water drainage facilities will be inspected for accumulation of debris or soils that may inhibit flow. Should excessive debris or soil accumulation be noted, it will be promptly removed to maintain flow capacity. Necessary repairs to the culverts, catch basins, and pipes will also be performed, if needed, to maintain their integrity.

2.4. Ground water monitoring system

2.4.1. Description

The ground water monitoring system at the Site includes ground water monitoring wells. Following the completion of Remedial Construction, six wells remain at the Site. The locations of those wells are shown on Record Drawing G-2 though G-6 of Appendix B. The need for replacement of the wells removed during Remedial Construction is being evaluated as part of the Supplemental Feasibility Study process being conducted under the Former IFG Facility and Ley Creek Deferred Media SRI/FS Order.

During May and July 2001, three new monitoring wells (OBG-19D, OBG-20D and OBG 21D) were installed at the Site as part of the SRI/FS for the Former IFG Facility and Ley Creek Deferred Media SRI/FS Order. The locations of these wells are shown on Record Drawings G-5 and G-6.

2.4.2. Purpose

The ground water monitoring wells serve as locations to monitor elevation of the ground water table and ground water quality. Long-term ground water monitoring is discussed in Section 4.

2.4.3. Inspection and maintenance requirement

During each sampling event and routine inspections, the ground water monitoring wells will be inspected for damage. If damage is detected, or if routine sampling indicates a problem with one or more of the ground water monitoring wells, proposed corrective actions will be discussed with NYSDEC.

2.5. Sanitary sewer manhole access paths

2.5.1. Description

Eleven sanitary sewer manholes on the Site (see Record Drawings G-2 through G-6 for locations) were extended to the final grade, and access paths from Factory Avenue to each manhole were constructed of asphalt (see detail on Record Drawing G-8).

2.5.2. Purpose

Access to each sanitary sewer manhole from Factory Avenue is provided for County maintenance of the 4-foot diameter sanitary sewer that runs in an east-west direction along the southern portion of the Site.

2.5.3. Inspection and maintenance requirement

The eleven sanitary sewer manholes and access paths will be inspected at the same frequency as the routine Site inspection. Severe cracks in the access path asphalt or manhole concrete will be repaired. The manhole covers will be checked for vandalism. Necessary repairs to the asphalt will be made. The County will be notified of needed repairs to the manhole covers to be performed by the County.

2.6. Wetlands

2.6.1. Description

Approximately 1.5 acres of wetlands have been constructed on the southern side of the access road, as depicted on Record Drawings G-2 through G-6. In addition to direct precipitation, the constructed wetlands receive storm water runoff from the vegetative cover and during high water conditions, from Ley Creek.

2.6.2. Purpose

The wetlands were constructed to replace those wetlands eliminated due to the implementation of the Remedial Action.

2.6.3. Inspection and maintenance requirement

During the first full growing season (2001), inspections will be performed to assess the initial success of the seeding with *Phalaris arundinacea* (Reed Canary Grass) and to identify deficiencies, if any, such as bare spots, failed seed germination, and eroded areas. If deficiencies are noted, recommendations will be developed. Recommendations may include reseeding, fertilization, additional erosion control, replacing and regrading soils, provisions for hydraulic control, and removal of debris that may have been deposited in the restored areas.

Following the first full growing season (2001) and each year for four years following the first growing season (2002 through 2005), a minimum of three vegetative sample plots (9 sq ft in size) in the restored areas will be evaluated in late summer (August-September) by a qualified wetland scientist for vegetation variety and density. The locations of these plots will be chosen randomly. Percent ground cover and species present in restored areas will be visually evaluated within the sample plots. Photographs will be taken from consistent locations to document the observed restored wetland conditions at the time of data collection. Summary reports will be prepared and submitted to the NYSDEC and USEPA following data collections to document the progress of the restored areas and to evaluate whether target restoration goals are being met. The target restoration goal for the restored wetlands will be 90% ground cover within the sample plots of seeded and wetland-dependent species.

Upon completion of the five year monitoring effort, an assessment will be prepared identifying the need for continued monitoring efforts. If the stated goals are met (90% ground cover of seeded and wetland-dependent species), monitoring will be concluded.

If the target vegetation density is not achieved, or is not anticipated to be met within three years, additional seeding with Reed Canary Grass, or an appropriate substitute species as identified by a qualified wetland scientist, will be initiated to meet the target density. In the event such corrective action is necessary, a new trigger date will be selected for meeting the stated goals and concluding the monitoring requirement. The new trigger date will need to be approved by NYSDEC and USEPA.

2.7. Physical site security

2.7.1. Description

Access to the Ley Creek PCB Dredgings Site is controlled by a 5-ft chain link fence around the eastern and western limits of the soil cover system and off-set from Factory Avenue on the southern side (see Record

Drawings G-2 through G-6 for location and G-8 for details) and two double swing security gates at both entrance/exit points along Factory Avenue (see Record Drawings G-2 and G-6 for locations). Perimeter warning signs were placed at 250 ft intervals on the fence and on the access gates to discourage potential trespassers. The perimeter warning signs on the access gates list the number for local police. Informational signs were also placed at the access gates to inform personnel entering the Site of the procedures needed to be taken to perform work on-site.

2.7.2. Inspection and maintenance requirement

The integrity of the 5-ft high chain link fence surrounding the Site will be inspected at the same frequency as the routine Site inspection. The structural integrity of the fencing system will be verified, and breaches or weaknesses shall be repaired. To maintain the security of the Site the access gates will be doubled locked while the Site is unattended.

2.8. Recordkeeping and reporting requirements

OM&M activities will be performed for an estimated period of 30 years following the commencement of the OM&M (Post-Remedial Construction) period unless reviews indicate that a different OM&M period is warranted. Recordkeeping requirements for the Ley Creek PCB Dredgings Site consist of filling out an inspection checklist, provided in Table 2-1, during routine inspections. Copies of records, reports, or other information relative to maintenance and monitoring activities at the Site will be provided to NYSDEC by REALM in annual

reports that will be submitted on or before January 31 for the prior calendar year.

3. County maintenance and work activities

A Management Plan for County Maintenance Work was developed to describe in detail the health and safety procedures to be followed by the OCDDS, the OCDOT, and their respective workers in conducting the County's sewer, drainage district and storm water culvert or pipe maintenance and repair activities at the Site. The Management Plan for County Maintenance Work is separately bound and incorporated into this OM&M Manual as Appendix A.

4. Long term ground water monitoring plan

Ground water beneath the Ley Creek PCB Dredgings Site is being evaluated as part of the Supplemental Remedial Investigation/Feasibility Study (SRI/FS) for the Former IFG Facility and Ley Creek Deferred Media Site. Therefore, ground water monitoring is not included as a part of OM&M activities for this Site. Following completion of the SRI/FS, a long term ground water monitoring program will be established for the Former IFG Facility and Ley Creek Deferred Media ground water as part of the Record of Decision for that Site (Registry Site #734057).

The remedial alternative being implemented under the RD/RA Order for the Ley Creek PCB Dredgings Site addressed only the piles of dredged material/soil located on the banks of Ley Creek. Site ground water was one of the media deferred by NYSDEC for evaluation and any required remediation under the Former IFG Facility Registry Site (NYSDEC, 1997).

5. Contingency plan

The contingency plan presented in this section is applicable to the OM&M period following completion of the Remedial Construction. The contingency plan will be implemented in the event that a component of the Remedial Design fails to operate in accordance with the intent of the Remedial Design.

5.1. Freezing conditions

The Remedial Design considered freeze/thaw conditions, but in the event of unusual freeze/thaw activity, the heaved area of the vegetative cover will be scarified, recompacted, and the area reseeded. Freeze/thaw activity could also cause excessive rutting or pothole formation in the Site access road. If this occurs, the damaged portion of the road will be filled with a suitable material.

5.2. Heavy rains

Repeated heavy rainfall could cause erosion of the vegetative cover. If this occurs, the eroded area will be scarified and additional vegetative cover material added, if necessary, and recompacted, and reseeded. Areas of persistent erosion may require utilization of an erosion control fabric or ditching and rip rap.

5.3. Surface water drainage facilities

Should flow in the surface water drainage facilities become inhibited by the accumulation of excessive debris or soils from the erosion of the adjacent embankment, appropriate measures will be taken to repair or clean the culverts to maintain flow capacities.

5.4. Health and safety

Health and safety measures to be implemented during the OM&M period include restricting site access and appropriate personal protective equipment and decontamination during ground water monitoring. These measures are meant to minimize damage to site-related construction materials and protect the sampling crew during ground water monitoring activities.

In the event that routine maintenance and monitoring activities indicate problems with the remedial components, activities outlined in this contingency plan will be implemented. The type of health and safety requirements to be implemented in the event of failure of the remedial components would depend on the type of failure and field activities conducted in implementing this contingency plan. It is likely that health and safety requirements utilized in the event of implementation of this contingency plan will be similar to those implemented during Remedial Construction. The OM&M Contractor may either accept and implement the applicable portions of the HASP provided as part of the County Management Plan or modify the HASP as needed. However, it may be necessary to develop specific health and safety requirements and procedures to address the specific conditions encountered.

5.5. Emergency contacts

In the event of an emergency at the Site, REALM should be contacted as appropriate. The current addresses and phone numbers are as follows:

Mr. James F. Hartnett
Remediation and Liability Management Company, Inc.
c/o GM Remediation Project Office
1 General Motors Drive
Syracuse, New York 13206
Cell Phone - (313) 510-5134

The NYSDEC, USEPA, and NYSDOH may also be contacted as necessary. The current addresses and phone numbers are as follows:

Mr. Gerald Rider, P.E.
Chief
Operation & Maintenance Section
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany, New York 12233-7014
(518) 402-9640

Mr. Reginald Parker, P.E.
Regional Hazardous Waste Engineer
NYSDEC Region 7 Office
615 Erie Boulevard West
Syracuse, New York 13204
(315) 426-7551

Robert Nunes
Onondaga Lake Project Manager
U.S. Environmental Protection Agency, Region II
290 Broadway, 20th Floor
New York, New York 10007-1866
212-637-4254

Mr. Ronald Heerkens
NYSDOH
Syracuse Regional Office
217 South Salina Street
Syracuse, New York 13202
(315) 426-7613

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Table 2-1. *Inspection checklist*

Date Performed:				Weather:
Site Name: **Ley Creek PCB Dredgings site**				Inspector Name:
Site Location: **Syracuse, New York**				Inspector Signature:
Item	**Task**	**Response**		**Comments**
		Yes	**No**	
Vegetative Cover				
	1. Areas of settlement?			
	2. Areas of erosion?			
	3. Areas where geotextile visible due to erosion?			
	4. Areas of slope instability?			
	5. Lack or thinning vegetation?			
	6. Presence of burrowing animals?			
	7. Areas of damage?			
	8. Drainage problems?			
	9. Mowing required?			
Access Road				
	1. Areas of settlement?			

Table 2-1. *Inspection checklist*

Date Performed:				Weather:
Site Name: **Ley Creek PCB Dredgings site**				Inspector Name:
Site Location: **Syracuse, New York**				Inspector Signature:
Access Road	2. Areas of erosion?			
	3. Areas rutted or potholes present?			
	4. Areas of damage?			
Surface Water Drainage				
	1. Accumulation of debris?			
	2. Excessive scouring?			
	3. Areas of damage?			
Ground Water Wells				
	1. Casings secure and locked?			
	2. Areas of damage?			
Sanitary sewer access paths				
	1. Cracks in asphalt?			
	2. Manhole covers in place?			

Table 2-1. *Inspection checklist*

Date Performed:				Weather:
Site Name: **Ley Creek PCB Dredgings site**				Inspector Name:
Site Location: **Syracuse, New York**				Inspector Signature:
Sanitary sewer access paths	3. Debris accumulating in access paths?			
Physical Site Security				
	1. Signs intact?			
	2. Fence breached?			
	3. Access gates locked?			
	4. Areas of damage?			
Notes/any additional comments:				

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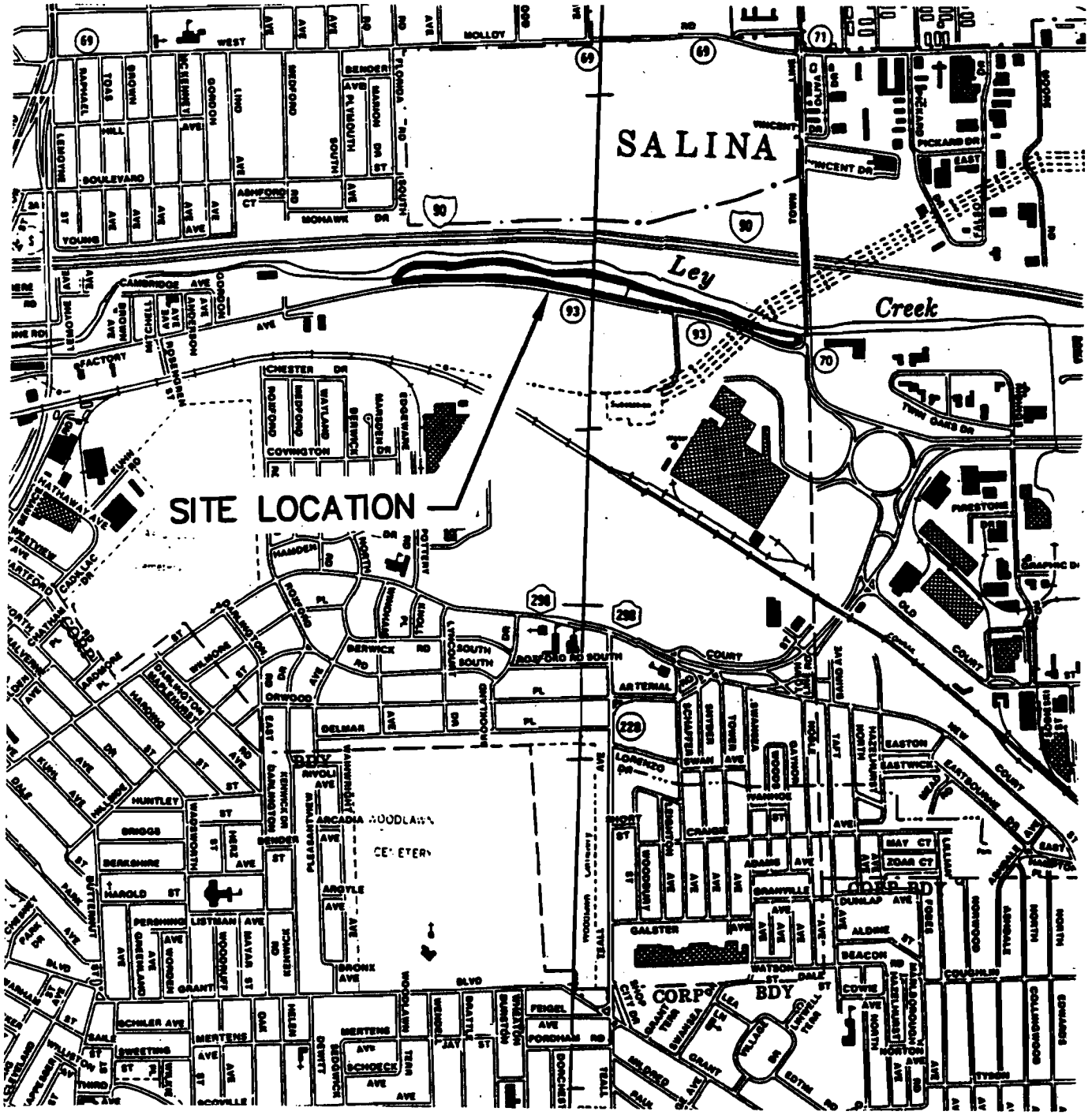
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FIGURE 1-1





STATE LOCATION MAP

LEY CREEK PCB DREDGINGS SITE
SYRACUSE, NEW YORK
REMEDIATION AND LIABILITY
MANAGEMENT COMPANY, INC.

SITE LOCATION PLAN

NOT TO SCALE

FILE NO. 4966.24346.022
DATE: FEBRUARY 2001

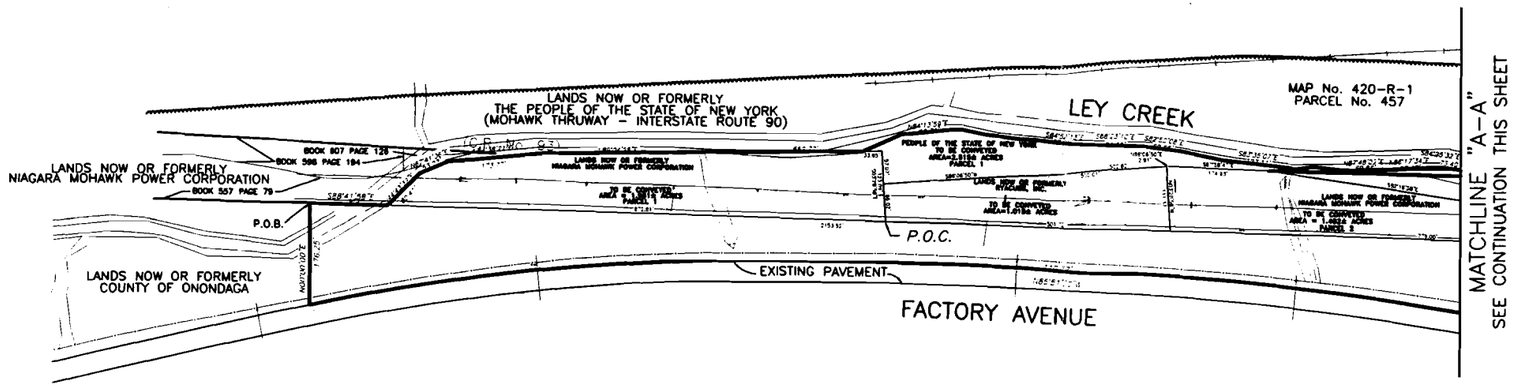
O'BRIEN & GERE ENGINEERS INC.

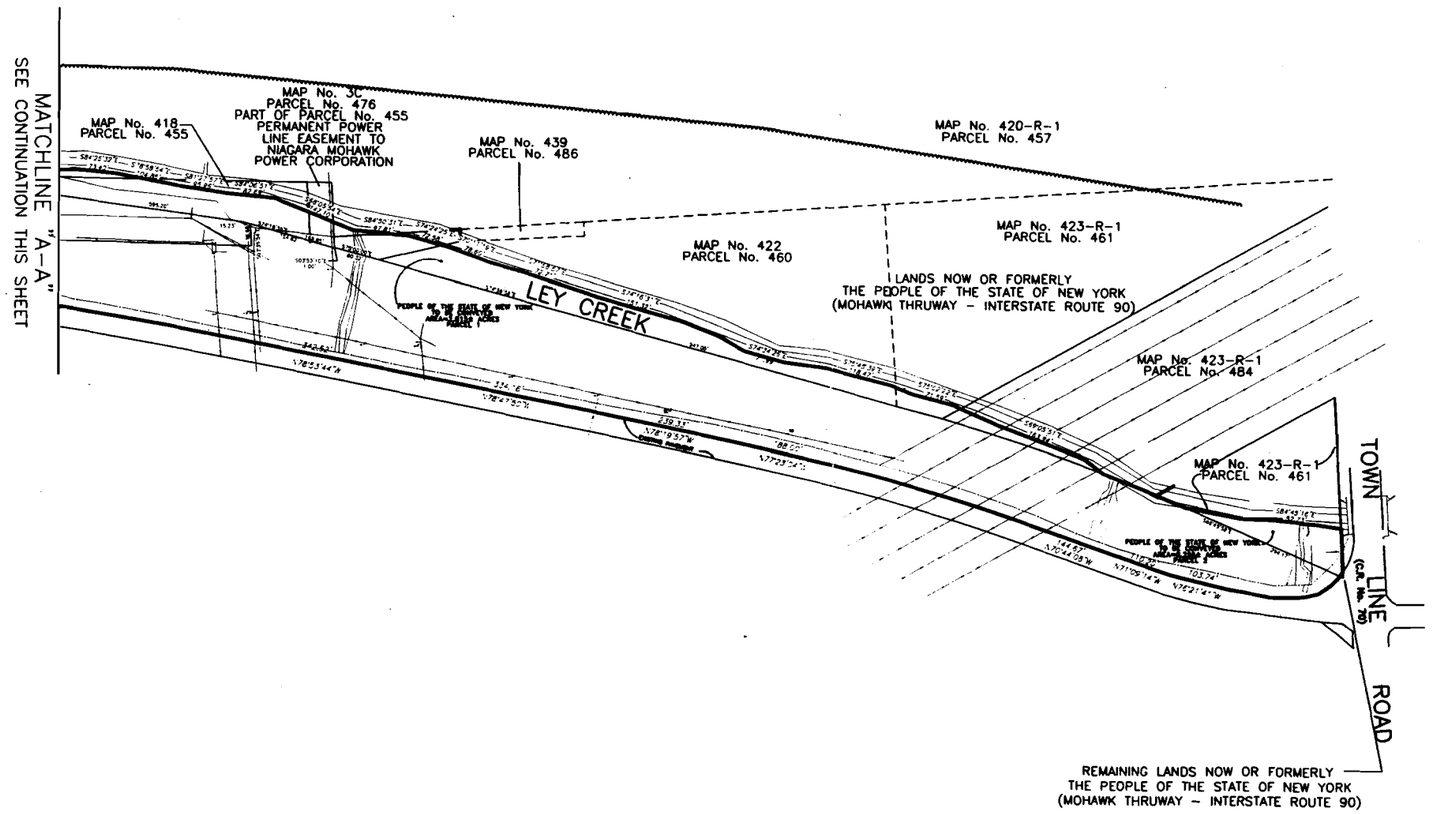
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PLOT DATE: 02/ MTW

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FIGURE 1-2





LEGEND

- OVERHEAD WIRES
- CHAINLINK FENCE
- PROPERTY LINE
- EDGE OF WOODS
- TOP OF BANK
- UTILITY POLE
- GUY WIRE
- SANITARY MANHOLE
- GATE IN FENCE
- P.O.B. POINT OF BEGINNING
- LINE EASEMENT

LEY CREEK PCB DREDGINGS SITE
TOWN OF SALINA, NEW YORK

SITE PLAN

1"=400' 400 0 400

DATE: SEPTEMBER 2001

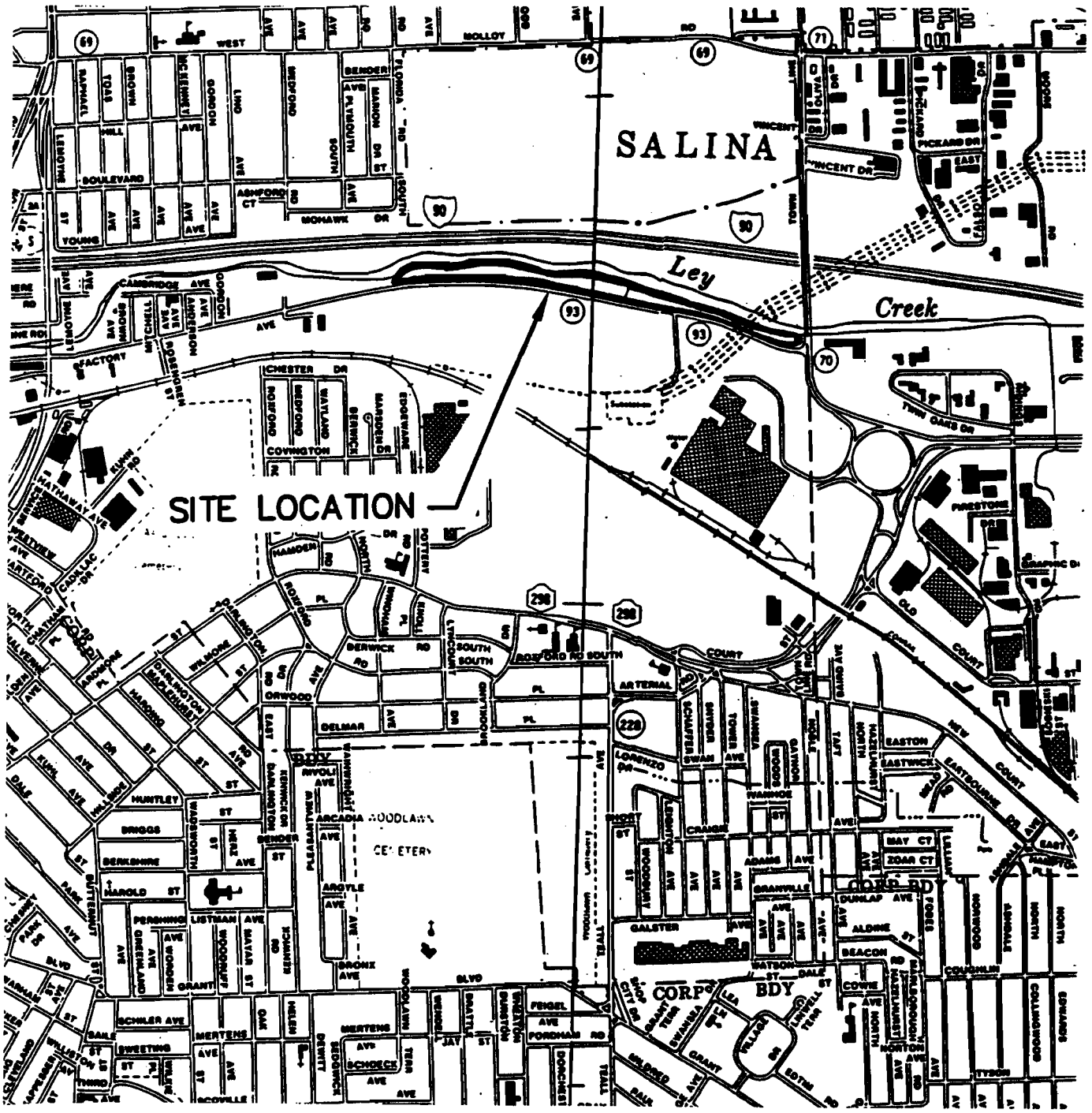
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O'BRIEN & GERE ENGINEERS INC.

REV DATE: 9/26/01

PLOT DATE: 9/27/01 NMJ

FIGURE 1-1





STATE LOCATION MAP

LEY CREEK PCB DREDGINGS SITE
SYRACUSE, NEW YORK
REMEDIATION AND LIABILITY
MANAGEMENT COMPANY, INC.

SITE LOCATION PLAN

NOT TO SCALE

FILE NO. 4966.24346.022
DATE: FEBRUARY 2001

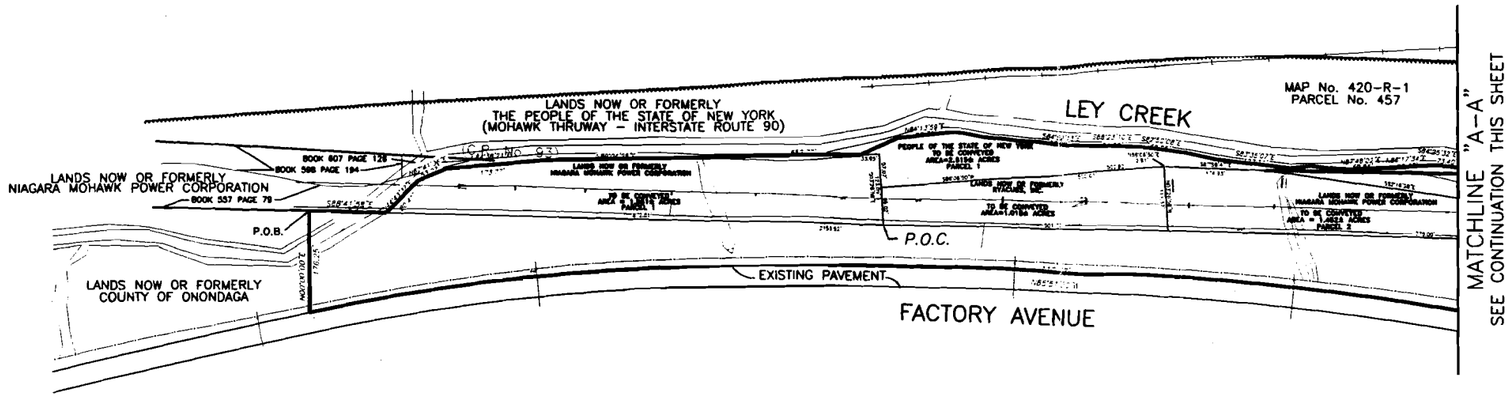
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ENGINEERS INC.

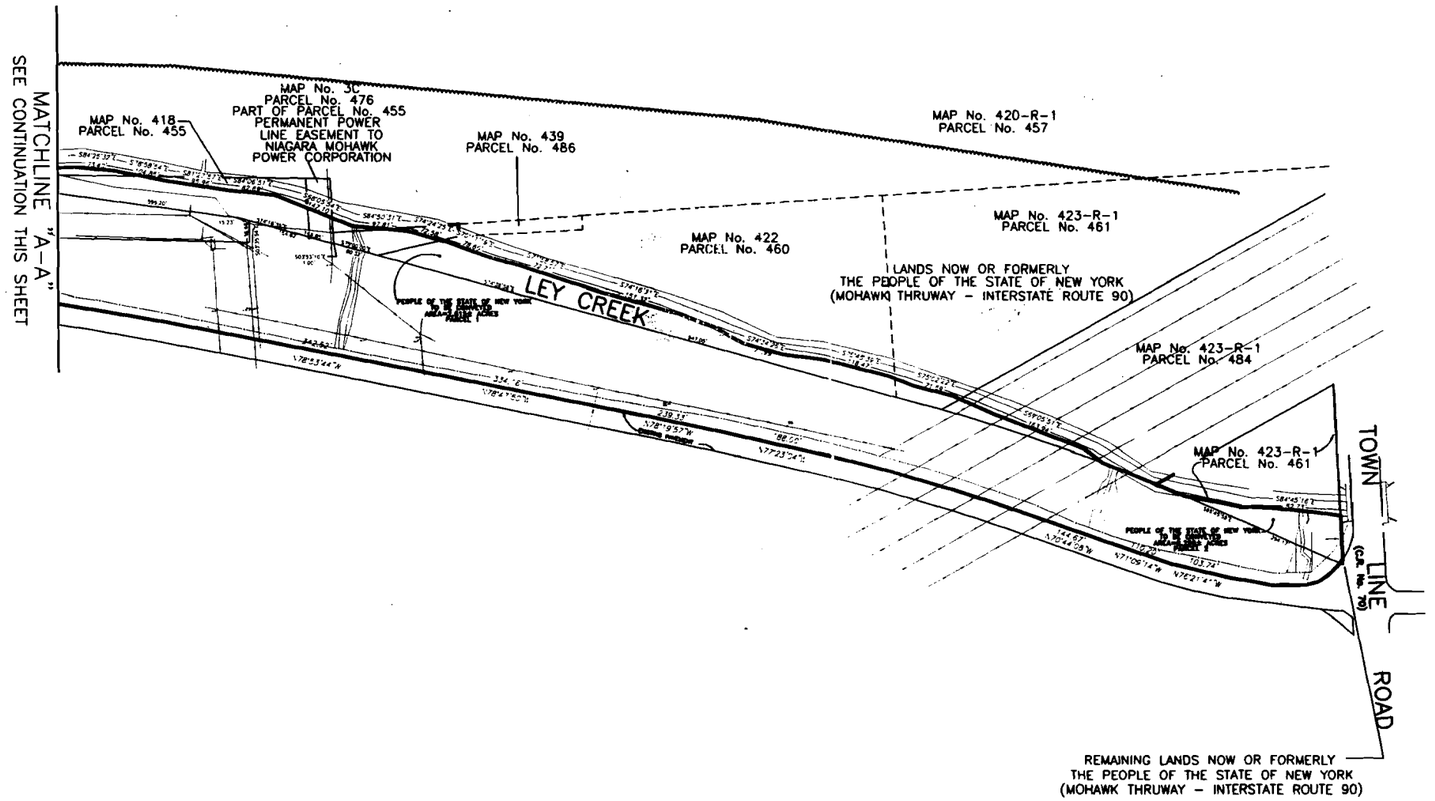
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PLOT DATE: 02/ MTW

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FIGURE 1-2





LEGEND

-OHG-	OVERHEAD WIRES
-C-	CHAINLINK FENCE
	PROPERTY LINE
	EDGE OF WOODS
	TOP OF BANK
	UTILITY POLE
	GUY WIRE
SMH	SANITARY MANHOLE
-o-o-	GATE IN FENCE
P.O.B.	POINT OF BEGINNING
	LINE EASEMENT

LEY CREEK PCB
DREDGINGS SITE
TOWN OF SALINA, NEW YORK

SITE PLAN

1"=400' 400 0 400

DATE: SEPTEMBER 2001
FILE NO. 4966.24346.014

O'BRIEN & GERE
ENGINEERS INC.

REV DATE: 9/26/01

PLOT DATE: 9/27/01 NMJ

Appendix A

Management Plan for County Maintenance Work

WORK PLAN

Management Plan for County Maintenance Work

General Motors Corporation/Remediation and Liability Management Company, Inc.
Syracuse, New York

Revised September 2001
February 2001
July 1998

4966/24346

Work Plan

Management Plan for County Maintenance Work

General Motors Corporation/Remediation and Liability Management Company, Inc.
Syracuse, New York



James R. Heckathrone, P.E.
Vice President

Revised September 2001
February 2001
July 1998

O'BRIEN & GERE ENGINEERS, INC.

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1. Introduction

1.1. Background

The Ley Creek PCB Dredgings Site (site), identified as site #7-34-044 on the New York State Department of Environmental Conservation (NYSDEC) Registry of Inactive Hazardous Waste sites, is located along the south bank of Ley Creek in the Town of Salina, Onondaga County, New York. The site is approximately 19 acres in size and is bounded by Factory Avenue to the south, Ley Creek to the north, and Townline Road to the east; the western site boundary is approximately 4300 feet west of Townline Road. A sanitary sewer line, owned and maintained by the Onondaga County Department of Drainage and Sanitation (OCDDS) is located along the southern boundary of the site. A site plan is attached as Figure 1. The 48-inch sanitary sewer line was reportedly installed in the 1930's and is a U-shaped monolithic concrete pipe with a concrete cap. Eleven manholes exist along the portion of the sanitary line at the site.

Dredgings from Ley Creek were generated during channel improvements performed by OCDDS and were staged on the site. Polychlorinated biphenyls (PCBs) were detected in the dredgings.

A Remedial Investigation/Feasibility Study (RI/FS) was conducted by O'Brien & Gere Engineers, Inc. (O'Brien & Gere) on behalf of General Motors Corporation (GM), in accordance with an Administrative Order on Consent (#A7-0239-90-07) between GM and NYSDEC and the RI/FS Work Plan (O'Brien & Gere, 1992), which was approved by NYSDEC on June 3, 1992. The results of the RI were documented in the September 1993 Revised RI Report (O'Brien & Gere, 1993) and the FS Report was prepared by O'Brien & Gere in October 1996 (O'Brien & Gere, 1996) based on the results of the RI. The FS Report evaluated several remedial alternatives and detailed the proposed remedial action for the site.

Based on the results of the RI/FS, NYSDEC prepared a Proposed Remedial Action Plan (PRAP) for the site in February 1997. Following public comment, the site remedy was documented in the March 1997 Record of Decision (ROD). The United States Environmental Protection Agency (USEPA) concurred with the ROD-selected remedy in its letter dated February 9, 1998 to the NYSDEC Commissioner John Cahill.

The Remedial Design/Remedial Action Order on Consent (RD/RA Order), (Index # D-7-0008-97-06) between REALM and NYSDEC became effective upon the signature of NYSDEC on July 15, 1999. The RD/RA implementation commenced in October 1999. Construction proceeded through 1999 with substantial completion of the project on November 8, 2000 after the Substantial Project Completion Inspection attended by O'Brien & Gere, Royal, and NYSDEC. The Final Completion Inspection was conducted on August 30, 2001 with representatives of REALM, O'Brien & Gere, Royal, and NYSDEC present.

1.2. Purpose of plan

The purpose of this plan is to detail the health and safety procedures to be followed by OCDDS, the Onondaga County Department of Transportation (OCDOT) and their respective contractors in conducting the County of Onondaga's (County's) sewer, drainage district and storm water culvert or pipe maintenance and repair activities ("maintenance work") at the site following GM/REALM's (Remediation and Liability Management Company, Inc.) implementation of the ROD-selected remedial alternative. Maintenance work shall include, but not be limited to: cleaning; repair; replacement; inspection; and/or installation of sewer, drainage district and storm water facilities; and all other related activities which the County deems necessary and appropriate. The portion of the site previously owned by the County was conveyed to GM/REALM via a quit claim deed on March 16, 1999. GM/REALM granted the County access to the site so that OCDDS and OCDOT can perform their respective maintenance work. (Term "maintenance work" includes repairs and the term was referred to in the County-GM/REALM transfer agreement).

The plan is attached as an Addendum to the Operation, Maintenance and Monitoring (OM&M) Plan prepared as part of the Remedial Design/Remedial Action (RD/RA) work under the Order on Consent between NYSDEC and GM/REALM (NYSDEC, 1999).

The procedures described in this plan are limited to the protection of workers and off-site receptors from exposure to PCB-contaminated materials during the conduct of maintenance work by the County, and are not intended to cover any other conditions which may be encountered in the course of the maintenance work. Further, it will be the responsibility of the County and its contractors to initiate, maintain, and supervise all safety programs for their respective employees in accordance with all applicable laws, ordinances, rules, regulations, and orders of public bodies.

2. Summary of the remedial action

2.1. Description

Eight remedial alternatives were developed in the FS, and based on a detailed evaluation of the alternatives, the following remedial action was chosen in the ROD and implemented during remedial construction:

- removal and off-site disposal of dredged material/soil containing greater than 50 mg/kg PCBs,
- regrading and placement of a low permeability cover on those portions of the site in the floodway,
- placement of a vegetative soil cover over the remaining portions of the site which exceed the remedial criteria,
- ground water monitoring, and
- fencing and maintenance access provisions.

This remedial action is discussed in greater detail below.

2.2. Removal of dredged material/soil and cover installation

Dredged material/soil containing greater than 50 mg/kg PCBs was excavated and disposed off-site. The remaining material with concentrations greater than 1 mg/kg PCBs (surface) and 10 mg/kg PCBs (subsurface) was handled as follows:

- PCB-contaminated dredged material/soil was regraded out of the floodway south of Ley Creek to appropriate elevations. The area was then covered with a geotextile overlain by a 12-inch vegetative soil cover.

- Material relocated from the floodway was consolidated south of the floodway and north of a buffer zone which runs 25 feet north of the sewer line.

- Remaining areas within the site with PCB concentrations exceeding the 1mg/kg PCB (surface) and 10 mg/kg PCB (subsurface) criteria were covered with a 12-inch vegetative soil cover.

2.3. Ground water monitoring, fencing, and access provisions

In addition to dredged material/soil removal and cover placement, the ground water monitoring, and fencing and access provisions of the remedy were implemented. Ground water monitoring will be conducted to document PCB concentrations in shallow ground water.

Fencing was installed to control access to the site, and chains or cables were installed near manholes for access during maintenance activities. To assist in the conduct of maintenance activities, the following actions were taken: 1) storm water culverts were piped and access will be provided; 2) sanitary sewer manholes were modified to match final grade; asphalt work pads were installed around each manhole; and fencing was modified to allow for direct access to the manholes without entering into fenced areas; and 3) an access road was constructed on the south bank of Ley Creek. Figure 1 shows the design and layout of the site following implementation of the remedial action.

3. Site maintenance procedures

3.1. Summary of expected maintenance work

GM/REALM understands that OCDDS, OCDOT, or their contractors will be performing periodic inspection and maintenance of the storm water culverts or pipes, sanitary sewer, and creek channel/drainage district. The expected non-intrusive and intrusive maintenance activities to be performed on-site are described below. Potential exposure to PCB-containing materials is anticipated only for intrusive activities. For intrusive activities, it will be the responsibility of the County and its contractors to develop, adopt, and enforce a project-specific health and safety plan (HASP) for their respective employees, in accordance with 29 CFR Section 1910. The site-specific HASP included in Appendix A has been developed by O'Brien & Gere as an example of the minimum health and safety procedures.

3.1.1. Unrestricted site activities

Unrestricted site activities are those activities which when performed should not involve access to fenced areas of the site or exposure to PCB-contaminated materials. The following inspection and maintenance activities may be performed at the site by OCDDS, OCDOT, or their contractors following the implementation of the remedial action:

- Storm Water Culverts or Pipe Inspection/Flushing - Storm water culverts or pipes may be visually inspected periodically by OCDOT personnel in the Factory Avenue right-of-way for the presence of sediment or debris. If sediment or debris is impeding flow, flushing of the storm water culverts or pipes may be performed. Storm water culverts or pipes may be accessed from Factory Avenue outside of the fenced area.

- Sewer Inspection/Flushing - Sewers will be visually inspected periodically by OCDDS personnel, using manholes for access. Sewer flushing and cleaning may be performed, as necessary. Site fencing shall extend around sanitary sewer manholes and access paths, such that manholes may be directly accessed from Factory Avenue without access to the fenced area.

It will not be necessary for personnel performing unrestricted site activities to read this document or to notify GM/REALM of the activities.

3.1.2. Restricted non-intrusive site activities

Restricted non-intrusive site activities are those that require access to fenced areas of the site, but which should not involve exposure to PCB-contaminated materials. The following restricted non-intrusive maintenance activities may be performed at the site by OCDDS or their contractors following implementation of the remedial action:

- Creek Channel/Drainage District Inspection - The creek channel/ drainage district may be visually inspected periodically by OCDDS personnel. Obstructions may be removed to prevent blockage of flow.

All persons performing non-intrusive activities shall have read and understood this document and acknowledged this in writing. A copy of the acknowledgment form is attached as Figure 2. Copies of these signed forms shall be forwarded to GM/REALM's project manager before commencing these activities. Access to the access road along Ley Creek shall be limited to locked access gates, for which OCDDS will be given keys. OCDDS project managers shall limit personnel and equipment activity in the area of the soil cover by utilizing access roads, as appropriate. In the unlikely event that damage to the soil cover occurs, the affected area shall be delineated with temporary fencing by the County and GM/REALM's project manager shall be contacted. Final repair/replacement of the cover shall be GM/REALM's responsibility.

Upon completion of non-intrusive maintenance activities, a record of non-intrusive maintenance activities form must be completed and signed. A copy of this form is attached as Figure 3.

3.1.3. Restricted intrusive on-site activities

Intrusive activities are those activities which when performed have the potential for exposure to PCB-contaminated material. The following intrusive maintenance activities may be performed at the site by OCDDS or their contractors following the implementation of the remedial action:

- Subsurface Inspection or Testing of Sanitary Sewer Piping or Manholes - Sewer piping or manholes may be inspected by OCDDS personnel by removing surface and subsurface soil to access the area for inspection. Dewatering of excavations may be required.

- Subsurface Repair of Sanitary Sewer Piping - Repair of sewer piping may be performed by OCDDS personnel by removing surface and subsurface soil to access the area in need of repair. Dewatering of excavations may be required.

Prior to performing intrusive maintenance activities, OCDDS or its contractors shall inform the project managers as listed in Section 4. All persons performing intrusive activities shall have at a minimum 40-hour hazardous waste training in accordance with Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response (HAZWOPER). All persons performing intrusive maintenance activities shall have read and understood this document and acknowledged this in writing. A copy of the acknowledgment form is attached as Figure 2. Copies of these signed forms shall be forwarded to GM/REALM's project manager before commencing these activities. Access to the vegetated cover portions of the site shall be limited to locked access gates, for which OCDDS will be given keys. OCDDS project managers shall limit personnel and equipment activity in the area of the soil cover by utilizing access roads, as appropriate.

Area control. During intrusive activities, the potential for encountering soils with detectable concentrations of PCBs is anticipated. Work areas at the site shall be delineated in three specific zones: a "Work Zone," a "Decontamination Zone" and a "Clean Zone." Entrance into work and decontamination zones shall be limited to personnel which have received HAZWOPER training. These zones shall be delineated using means such as temporary fencing or stakes and surveyors' tape. The operation of each zone and other area control measures are discussed in the HASP.

Dredged material /soil excavation. The first foot of disturbed clean soil cover material shall be staged separately from excavated dredged material/soil for reuse in soil cover restoration as feasible. In order to mitigate contact with the clean soil cover, excavated dredged material/soil, which is potentially PCB-contaminated, shall be placed on polyethylene sheeting or its equivalent and covered or placed in watertight containers as close as is reasonable to the excavation, in a manner which will minimize erosion of the staged pile. Staged dredged material/soil shall be used as backfill upon completion of construction activities, and the soil cover shall be restored by the County to the extent possible with original cover material. In the event that all of the excavated dredged material/soil can not be used as backfill, the remaining dredged material/soil shall be staged in DOT-approved 55-gallon drums or other suitable container(s) for future characterization and disposal by GM/REALM. OCDDS or its contractors shall minimize the amount of dredged material/soil generated during construction. OCDDS or its contractor shall contact GM/REALM's project manager to inform him as to the amount and type of material staged on-site. The area of vegetative soil cover damage shall be delineated with temporary fencing. Final repair/replacement of the cover shall be GM/REALM's responsibility, upon notification of completion of County activities by OCDDS or its contractor.

Dredged material/soil which gets into the sanitary sewer pipe in the event of a sewer failure shall be removed from the sewer pipe using a vacuum truck. Removed material shall be characterized for disposal and disposed of in accordance with applicable regulations by the County.

Dewatering. During dredged material/soil excavation the potential exists for PCB-containing ground water or water from the sanitary system (in the event of a leak or break in the line) to enter the excavation. Dewatering of the excavation shall be performed, as needed, by pumping the standing water from the excavation to suitable on-site containment vessels (drums, tanks, etc.). Provisions to prevent freezing of water shall be employed during cold-weather activities. The type of container utilized shall depend on the amount of water encountered. Care shall be taken during pumping to limit the amount of solids present in the discharge stream. GM/REALM's project manager shall be contacted and informed of the amount of water held on-site and the type of containment vessel used. The characterization and proper disposal of these waters shall be GM/REALM's responsibility.

During emergency situations, in which dewatering is necessary and a suitable containment vessel is not available, NYSDEC's Regional Water Engineer shall be contacted immediately by the County or its Contractor to develop as viable a plan as possible to mitigate environmental impacts. The County and its Contractor shall take prudent steps to minimize health and environmental impacts during the interim period between the emergency occurrence and the development of such plan with the NYSDEC Regional Water Engineer. In the event that pumping of water from the excavation to Ley Creek is necessary in this interim period, care shall be taken during pumping to minimize the discharge and to limit the amount of solids present in the discharge stream. GM/REALMS's and NYSDEC's project manager shall be contacted and informed of the approximate amount of water discharged to Ley Creek.

Migration Control. During intrusive maintenance activities in which dredged material/soil, sediment, or ground water potentially containing PCBs is disturbed, engineering controls shall be employed to minimize the potential migration of PCBs through dust, runon/runoff, and personnel/equipment. Use of water sprays and polyethylene sheeting to cover disturbed soil are examples of dust control methods. Measures to control runon/runoff may include physical measures such as berms around excavation areas or other devices to prevent clean water from contacting PCB-contaminated material, and temporary covers (e.g., polyethylene sheeting over the excavation and/or excavated materials). Work scheduling efforts, such as minimizing the areas of excavation that are open at any one time, may also be employed to control runon/runoff.

Decontamination. Equipment in contact with potentially PCB-containing material shall be decontaminated in the Decontamination Zone prior to entering the Clean Zone. Decontamination procedures shall be performed in accordance with the HASP. Dry decontamination may be performed when the intrusive maintenance activities do not involve exposure to saturated subsurface soil or water which are potentially PCB-contaminated. Upon completion of dry decontamination procedures, visual inspection of equipment shall be conducted. If during visual inspection, residual dredged material/soil or staining is still observed on the equipment, wet decontamination shall be performed.

Wet decontamination shall be performed by OCDDS or its contractors on a concrete decontamination pad and collection sump. OCDDS or its contractors shall bring clean water on-site or utilize Ley Creek water for wet decontamination. Decontamination fluids which are directed to the collection sump (max capacity 55-gallons) shall be collected and stored in suitable on-site containment vessels (drums, tanks, etc.). The type of container utilized shall depend on the amount of decontamination water generated. GM/REALM's project manager shall be contacted and informed of the amount of water held on-site and the type of containment vessel used. GM/REALM will be responsible for characterization and proper disposal of decontamination water, upon notification of completion of County activities by OCDDS or its contractor.

During dry and wet decontamination procedures, PPE, polyethylene sheeting, and other potentially PCB-contaminated material must be containerized in DOT approved 55-gallon drums or other suitable containers. GM/REALM's project manager shall be contacted regarding the amount of PCB-contaminated material (e.g., contaminated soil, water, and wastewater) stored on-site. The characterization and disposal of potentially PCB-contaminated material shall be GM/REALM's responsibility.

Documentation. Upon completion of intrusive maintenance activities, a record of intrusive maintenance activities form must be completed and signed. A copy of this form is attached as Figure 4.

3.2. Management of potential PCB-containing materials

OCDDS, OCDOT or their contractors shall be responsible for the following management activities for potential PCB-containing materials left on-site: proper handling of the PPE as specified in the HASP, proper staging of PCB-contaminated material, and proper notification of GM/REALM's project manager. GM/REALM will be responsible for characterization and disposal of PCB-contaminated material.

The staging area for drums or other containers shall be delineated using temporary fencing or stakes and surveyor's tape. The staging area shall be treated as a Work Zone as discussed in Section 3.1.3 and the HASP. The containers shall be staged on polyethylene sheeting in a flat area of the site, at least 50 feet from the fence line. The containers shall be free of holes or other defects and have a limited potential for tipping or spillage. Prior to leaving the site, OCDDS, OCDOT or their contractors shall document the amount of material staged on the site for off-site disposal in accordance with the activity forms attached as Figures 3 and 4. The forms shall be submitted to GM/REALM's project manager.

3.3. PCB-related expenses

During the conduct of non-intrusive and intrusive maintenance activities by OCDDS, OCDOT, or their respective contractors, costs in addition to those for typical maintenance work may be incurred to conform with the requirements of this plan due to the potential presence of PCB-contaminated material. These additional expenses will be GM/REALM's responsibility under the terms and conditions of the GM/REALM-County of Onondaga agreement that provided for the transfer of County property within the site to GM/REALM.

GM/REALM shall cover the expenses for OCDDS, OCDOT, and their respective contractors' time and equipment associated with the following activities and equipment required due to the presence of PCB-contaminated material at the site:

- HAZWOPER training
- Medical surveillance
- Site awareness training
- Mobilization and demobilization of PCB-related equipment
- Personal protective equipment
- Area control measures
- Air monitoring
- Runoff control
- Decontamination
- Potentially PCB-contaminated material containerization
- Additional site related notification and coordination
- Permitting costs related to PCBs
- Consultant costs related to PCBs
- PCB transportation and disposal costs
- Dredging costs related to PCBs
- Treatment and/or disposal of PCB-contaminated water or soil
- Other PCB-related costs.

4. Project management

A project management team has been identified to oversee the implementation of maintenance work at the site. Non-intrusive maintenance activities shall be communicated by the County verbally or in writing to GM/REALM's project manager at least 1 day prior to the activities. Intrusive maintenance activities shall be communicated verbally or in writing to GM/REALM's project manager and NYSDEC's project manager at least 2 weeks prior to the activities, except in emergencies, when notification shall be provided as soon as practicable. Addresses and phone numbers for these individuals are listed below.

Additionally, the individuals listed below shall be recognized as the general contact for the County, the project manager responsible for OCDDS maintenance activities, and the project manager for OCDOT maintenance activities. During emergency situations, notifications of project managers or regulatory personnel shall be conducted in accordance with the HASP. Any changes to the project managers listed in this plan shall be made in writing to the other project managers.

GM/REALM's Project Manager

- Mr. James F. Hartnett
  Remediation and Liability Management Company, Inc.
  c/o GM Remediation Project Office
  1 General Motors Drive
  Syracuse, NY 13206
  Cell Phone (313) 510-5134

OCDDS's Project Manager

- Mr. Steve Martin
  Onondaga County Dept. of
  Drainage and Sanitation
  650 Hiawatha Blvd West
  Syracuse, NY 13204-1194
  (315) 435-2260

NYSDEC's Project Manager

- Mr. Gerald Rider, Jr.
  NYSDEC
  Chief, Operation and Maintenance Section
  Division of Environmental Remediation
  625 Broadway, 11th Floor
  Albany, NY 12233-7014
  (518) 402-9640

OCDOT's Project Manager

- Mr. Anthony DeStefano
  Onondaga County Dept
  of Transportation
  John H. Mulroy Civic Ctr
  11th Floor
  421 Montgomery Street
  Syracuse, NY 13202
  (315) 435-3176

Onondaga County General Contact

- Mr. David Coburn
  Director, Onondaga County Office of
  the Environment
  John H. Mulroy Civic Center, 14th Floor
  421 Montgomery Street
  Syracuse, NY 13202
  (315) 435-2647

References

Hammond, Rick (NYSDEC). Telephone Communication with Maureen Salanger (O'Brien & Gere), September 22, 1997

NYSDEC. *"Remedial Design/Remedial Action Order on Consent, Index #D-7-0008-97-06."* July 15, 1999.

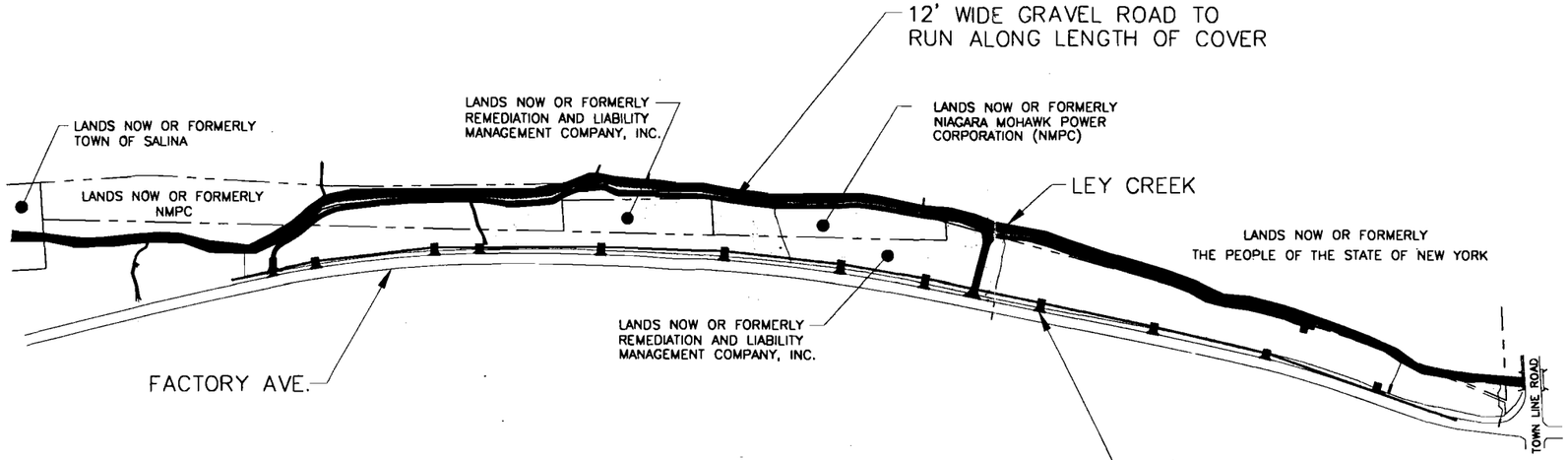
O'Brien & Gere "Work Plan; Remedial Investigation/Feasibility Study; Ley Creek Dredged Material Area." February 1992.

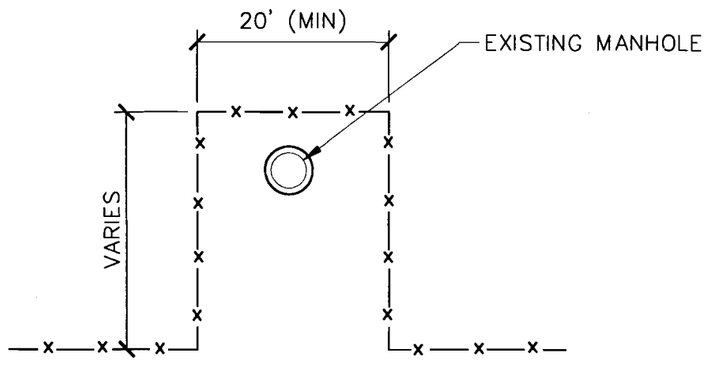
O'Brien & Gere "Remedial Investigation; Ley Creek Dredged Material Area." September 1993.

O'Brien & Gere "Feasibility Study; Ley Creek Dredged Material Area." October 1996.

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FIGURE 1





TYPICAL MANHOLE ACCESS

LEGEND

- GRAVEL ACCESS ROAD
- SAN — SANITARY SEWER
- PROPERTY BOUNDARY
- MANHOLE ACCESS LOCATION
- FENCE
- EXTENT OF SOIL COVER

NOTE:

1. LOCATION OF FENCE AND SANITARY SEWER ARE APPROXIMATE.

REV DATE: 02/12/01

LEY CREEK PCB
DREDGINGS SITE
TOWN OF SALINA, NEW YORK

SITE PLAN

0 500 1000
SCALE IN FEET

DATE: FEBRUARY 2001
FILE NO. 4966.24346.019

O'BRIEN & GERE
ENGINEERS INC.

PLOT DATE: 02/09/01 MTW

Figure 2

Acknowledgment Form

I hereby acknowledge that I have read and understand the Management Plan for County Maintenance Work, prepared on behalf of General Motors Corporation/Remediation and Liability Management Company, Inc. by O'Brien & Gere Engineers, Inc. (July 1998; Revised September 2001) and I will abide by its terms.

Signature	Organization	Date

Figure 3

Record of Restricted, Non-Intrusive Maintenance Activities

Date/Time _____

Personnel On-Site	**Organization**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Activities Performed

_____

_____

_____

_____

_____

_____

Was prior notification of work given?	Y / N
Was remedial cover damaged during work?	Y / N
Were fencing and gates intact?	Y / N
Were gates locked upon exiting?	Y / N

General Notes

_____

_____

_____

_____

_____

_____

_____

Signature of On-site Supervisor _____

Figure 4

Record of Intrusive Maintenance Activities

Date/Time _____

Personnel On-Site	**Organization**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Activities Performed

_____

_____

_____

_____

_____

_____

Area where intrusive maintenance activities were performed _____

_____

Amount of dredged material/soil staged on-site _____

Amount of construction water staged on-site _____

Amount of water sent to sanitary sewer system _____

Was prior notification of work given to GM? Y / N

Were fencing and gates intact? Y / N

Were gates locked upon exiting? Y / N

General Notes

_____

_____

_____

_____

Signature of On-site Supervisor _____

Appendix A

Health and Safety Plan for County Maintenance Work at the Ley Creek PCB Dredgings Site

Health and Safety Plan

Health and Safety Plan for County Maintenance Work at the Ley Creek PCB Dredgings Site

General Motors Corporation/Remediation and Liability Management Company, Inc.
Syracuse, New York

Revised February 2001
July 1998

O'BRIEN & GERE
ENGINEERS, INC.

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A PCB-contaminated particulate inhalation exposure calculation

1. Introduction

1.1. Objectives

This Health and Safety Plan (HASP) has been prepared by O'Brien & Gere Engineers, Inc. (O'Brien & Gere) on behalf of General Motors Corporation/Remediation and Liability Management Company, Inc. (GM/REALM). This HASP describes the recommended on-site health and safety procedures that O'Brien & Gere has identified to be appropriate for intrusive site maintenance and repair activities to be performed by Onondaga County Department of Drainage and Sanitation (OCDDS) or their contractors to limit their potential for exposure to polychlorinated biphenyl (PCB) contaminated material. Maintenance and repair shall include, but not be limited to: cleaning; repair; replacement; inspection; and/or installation of sewer, drainage district, and storm water facilities; and all other related activities which the County deems necessary and appropriate. The HASPs to be prepared by OCDDS and its contractors should reflect these provisions; however, the ultimate responsibility for the HASPs to be used will be the employer for those employees performing work at the site.

This HASP is specifically intended for the conduct of intrusive site activities within the scope of work defined in the Management Plan for County Maintenance Work (Work Plan) (O'Brien & Gere, 2001). This HASP identifies the minimum health and safety requirements for on-site workers with respect to the protection from PCB containing materials. Each contractor is responsible for making its own evaluation of site risks and assessing the need for additional protective measures.

It will be the responsibility of OCDDS to ensure that its employees or contractors perform intrusive site activities in accordance with the procedures described herein and 29 CFR Part 1910. The requirements and guidelines in this HASP are based on a review of available information and an evaluation of potential on-site hazards. This HASP shall be reviewed by OCDDS's and its contractor's Site Safety and Health Coordinator (SSHC) and project

managers for applicability. The SSHCs are responsible for monitoring activities and for enforcing compliance with the provisions of the applicable HASP. Changes in site conditions and/or the implementation of the remedial action at this site may necessitate the modification of the recommended procedures set forth in this HASP before beginning on-site work.

1.2. Designation of responsibilities

The following persons are responsible for the implementation of this HASP:

- OCDDS's Project Manager: Mr. Steven Martin
  Phone: (315) 435-2260

- OCDDS's SSHC: Mr. James Adsitt
  Phone: (315) 435-2260

Although the responsibility for implementing the HASP is shared by the project managers and SSHCs, the primary responsibility for health and safety procedures lies with the individual employee. Each employee must be familiar with the procedures recommended in this HASP and conduct on-site activities in accordance with the HASP applicable to the work (the "final HASP").

The project managers shall recommend policy on health and safety matters which arise on-site and must provide the necessary resources to allow work to be conducted in accordance with the applicable HASP.

The OCDDS's or the contractor's SSHC shall develop, as necessary, health and safety policies and procedures, monitor training and medical surveillance programs, and make final decisions regarding health and safety issues. The SSHC shall also be responsible for:

- Ensuring that a complete copy of this HASP is at the site during field activities, that all employees have access to and are familiar with it, and that field activities by employees and subcontractors are conducted in a manner consistent with it (except as the procedures are modified by the final HASP);

- Ensuring that all appropriate employee records and certifications are available at the site and a copy has been forwarded to GM/REALM's project manager:

  Mr. James F. Hartnett
  Remediation and Liability Management Company, Inc.
  c/o GM Remediation Project Office
  Rt. 37 East, Box 460
  Massena, NY 13662-0460
  Phone: (315)764-2239

- Conducting training/rehearsal sessions for employees, as appropriate, before work starts and whenever conditions change (including on-site control and emergency response procedures);

- Ensuring that employees have, use, and properly maintain specified personal protective, monitoring, decontamination, and other health and safety equipment;

- Maintaining a high level of site safety awareness among employees and communicating pertinent matters to them promptly.

- Informing subcontractors of potential site health and safety hazards that have been identified and of site emergency response procedures;

- Ensuring that specified monitoring is conducted;

- Ensuring proper decontamination of employees and personal protective equipment (PPE);

- Initiating immediate response actions in the event of an emergency or unsafe condition, and coordinating those actions with employees and subcontractors;

- Notifying GM/REALM's project manager promptly of an emergency or unsafe act or condition or exception to the procedures in this HASP;

- Recommending improved health and safety measures; and

- Ensuring that work conducted by its employees or subcontractors complies with applicable safety regulations including, but not limited to, 29 CFR 1910.

1.3. Site background

The site, identified as site #7-34-044 on the New York State Department of Environmental Conservation (NYSDEC) Registry of Inactive Hazardous Waste sites, is located along the south bank of Ley Creek in the Town of Salina, Onondaga County, New York. The site is approximately 19 acres in size and is bounded by Factory Avenue to the south, Ley Creek to the north, and Townline Road to the east; the western site boundary is approximately 4300 feet west of Townline Road. A sanitary sewer line owned and maintained by OCDDS is located along the southern boundary of the site. The 48-inch sanitary sewer line was reportedly installed in the 1930's and is a U-shaped monolithic concrete pipe with a concrete cap. Eleven manholes exist along the portion of the sanitary line at the site. A site plan is attached as Figure 1.

Dredgings from Ley Creek were generated during channel improvements and staged on the site. Polychlorinated biphenyls (PCBs) were detected in the dredgings.

A Remedial Investigation/Feasibility Study (RI/FS) was conducted by O'Brien & Gere on behalf of GM, in accordance with an Administrative Order on Consent (#A7-0239-90-07) between GM and NYSDEC and the RI/FS Work Plan (O'Brien & Gere, 1992), which was approved by NYSDEC on June 3, 1992. The results of the RI were documented in the September 1993 Revised RI Report (O'Brien & Gere, 1993) and the FS Report was prepared by O'Brien & Gere in October 1996 (O'Brien & Gere, 1996) based on the results of the RI. The FS Report evaluated several remedial alternatives and detailed the proposed remedial action for the site.

Based on the results of the RI/FS, NYSDEC prepared a Proposed Remedial Action Plan (PRAP) for the site in February 1997. Following public comment, the site remedy was documented in the March 1997 Record of Decision (ROD). United States Environmental Protection Agency (USEPA) concurred with the ROD-selected remedy in its letter dated February 9, 1998, to NYSDEC Commissioner, John Cahill.

The Remedial Design/Remedial Action Order on Consent (RD/RA Order), (Index # D-7-0008-97-06) was between REALM and NYSDEC became effective upon the signature of NYSDEC on July 15, 1999. The RD/RA implementation commenced in October 1999 and construction proceeded through 1999 with substantial completion of the project on November 8, 2000

after the Substantial Project Completion Inspection attended by O'Brien & Gere, Royal, and NYSDEC. Final completion of the project is expected in the spring of 2001 after NYSDEC conducts its Final Inspection after the required punch list items have been completed.

1.4. Summary of remedial action and site conditions

The following presents a summary of the remedial action as documented in the ROD and as implemeted during remedial construction. Dredged material/soil containing greater than 50 mg/kg PCBs was excavated and disposed off-site. The remaining dredged material/soil with concentrations greater than 1 mg/kg PCBs (surface) and 10 mg/kg PCBs (subsurface) were managed as follows:

- PCB-contaminated dredged material/soil was regraded out of the floodway south of Ley Creek to appropriate elevations. The area was then covered with a geotextile overlain by a 12-inch vegetative soil cover.
- Material relocated from the floodway was consolidated south of the floodway and north of a buffer zone which runs 25 feet north of the sewer.
- Remaining areas within the site with PCB concentrations exceeding the 1 mg/kg PCB (surface) and 10 mg/kg PCB (subsurface) criteria were covered with a 12-inch vegetative soil cover.

In addition to dredged material/soil removal and cover placement, ground water monitoring, fencing, and access provisions were implemented. Ground water monitoring will be conducted by GM/REALM to document PCB concentrations in shallow ground water.

Fencing was installed to control access to the site, and fencing extends around sanitary sewer manholes to allow direct access from Factory Avenue without access to the vegetated soil cover area. In order to assist in the conduct of maintenance activities, the following actions were taken: 1) storm water culverts were piped and access will be provided outside of the fenced area of the site; 2) sanitary sewer manholes were modified to match final grade and asphalt work pads were installed around each manhole; and 3) an access road was constructed on the south bank of Ley Creek.

Figure 1 shows the site plan following implementation of the remedial action.

1.5. Health and safety plan format

This health and safety plan consists of eight sections. Section 1 provides background information on the site and site activities; Section 2 describes on-site maintenance activities; Section 3 details potential site hazards and personal protective equipment; Section 4 describes decontamination procedures to be followed; Section 5 describes area control measures; Section 6 discusses training requirements for site personnel; Section 7 details the medical surveillance program; and Section 8 discusses the procedures to be used to respond to on-site emergencies.

2. Maintenance and repair activities

The maintenance and repair activities covered by this HASP include intrusive maintenance activities to be conducted at the site by OCDDS or its contractors. Intrusive maintenance activities that may occur include subsurface inspection or testing of sanitary sewer piping or manholes and subsurface repair of sanitary sewer piping. These activities are discussed in Section 3 of the Work Plan (O'Brien & Gere, 2001).

3. Area control measures

3.1. Working zones

Intrusive activities at the site will be conducted in three distinct working zones: a "Work Zone" a "Decontamination Zone and Facilities", and a "Support (or Clean) Zone".

The Work Zone shall be utilized for isolation of contaminated materials during the soil removal processes. The Work Zone will be delineated with colored fence barriers. The Work Zone encompasses areas in which contact with potentially PCB-contaminated materials may occur. Thus, the Work Zone will be limited to essential personnel for soil removal and decontamination work.

The Decontamination Zone(s) is to include the materials and facilities necessary for personnel who exit the Work Zone to remove possible contamination from clothing and equipment. This will consist of equipment drop and wash stations, wash and rinse tubs, lined disposal containers and benches or chairs (see Section 5 for decontamination procedures). Personnel who are to enter a Work Zone must don the appropriate PPE in the Decontamination Zone (Decon Zone), and enter through the "Entry and Exit Point", the one opening on the perimeter of the Work Zone.

The Support Zone is located at the end of the Decon Zone opposite the Entry and Exit Point. Adequate supplies of drinking liquids (*e.g.*, Gatorade or equivalent and potable water) and adequate rest and sanitary facilities are to be located in the Support Zone, along with extra equipment and supplies. Eating, drinking and smoking are only permitted in the Support Zone (and <u>not</u> permitted in the Work or Decon Zones).

3.2. Work area access and security

To minimize the number of workers requiring decontamination, only essential, trained (per Section 6) project personnel and decontamination staff are to enter the Work and Decon Zones, and only after donning appropriate protective equipment and clothing. Furthermore, a log-in/log-out sheet will be maintained in the Decon Zone.

3.3. Communication

Verbal communication between Work Zone personnel and Decon Zone personnel are to be maintained whenever possible. Where this is not possible, due to noise inherent in the clean-up activities, hand signals will be used, as follows:

- Thumbs-up - everything is OK. Proceed with work.
- Tap wrist with hand, motion towards Decon Zone - time to rest or exit to Support Zone and decontaminate.
- Hands to throat - not feeling well. Need immediate help.
- "Chop" or "Safe" motions - stop all work immediately. Leave the area.

4. Potential hazards and personal protective equipment

4.1. General discussion of potential hazards

PCBs. PCBs have been detected in dredged material/ soil at the site. Upon completion of the remedial action, dredged material/soil which has less than 50 mg/kg PCB will remain on-site under a vegetative soil cover. Due to the presence of the vegetative soil cover following remediation, exposure to PCB-contaminated materials would not be expected during non intrusive activities. Exposure to PCBs can occur during intrusive activities through ingestion, inhalation, or external contact. Occupational exposures suggest that PCBs might cause liver cancer or reproductive and developmental effects. External (skin) contact to PCBs is known to cause skin irritation and chloracne. Ingestion of PCBs may occur through the consumption of contaminated food or poor hygiene practices. The risk of inhalation exposure to PCBs on the site is through the inhalation of PCB-contaminated airborne particulates. These exposures will be controlled by the use of air monitoring and engineering controls and PPE as discussed in the following subsections.

Heat Stress. Wearing PPE puts a worker at considerable risk of developing heat stress. This can result in health effects ranging from transient heat fatigue to serious illness or death. Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker. Because heat stress is probably one of the most common illnesses at hazardous waste sites, regular monitoring and other preventative precautions are vital.

Some workers have a predisposition towards susceptibility of heat stress. Such factors include lack of physical fitness, lack of acclimatization, age, dehydration, obesity, alcohol and drug use, infection, sunburn, and chronic disease.

Proper monitoring is required to reduce the chance of heat stress. Heart rate, oral temperature, and body water loss should all be monitored periodically. If the heart rate exceeds 110 beats/minute or the oral temperature exceeds 99.6 °F, work cycles should be shortened by one-third.

To prevent heat stress, work schedules should be adjusted to work during cooler times of the day, or to work shorter shifts with more workers. In addition, shelter and drinks should be provided, and cooling devices such as fans or air conditioners are recommended. If possible, workers should be acclimatized to the work conditions over time, that is, to start workers at 50% of the work load and move up to full work load over two to five days. Workers should be encouraged to maintain a suitable level of fitness, and should be trained in how to recognize and treat heat stress.

4.2. Levels of personal protective equipment

During the performance of intrusive maintenance modified Level D PPE shall be worn in the work zone and decontamination zone, described in Section 2. Modified level D protection shall include safety glasses, hard hat, safety boots with outer cover (neoprene or rubber), inner gloves (latex), outer gloves (butyl rubber, neoprene, nitrile, PVC, or viton), duct tape to seal the boots and gloves, and a Tyvek® suit.

If during the performance of intrusive maintenance activities, the action level for potentially PCB-contaminated airborne particulates (5 mg/m^3) is reached, the level of PPE shall be increased to Level C. Level C protection shall include a hard hat, safety glasses, a Tyvek® suit, safety boots with outer cover (neoprene or rubber), inner gloves (latex), outer gloves (butyl rubber, neoprene, nitrile, PVC, or viton), duct tape to seal the boot and glove to the Tyvek® suit, and half face air-purifying respirator with HEPA filters. Level C protection should be used during intrusive maintenance activities (*i.e.*, subsurface work) during which airborne particulate, potentially PCB-contaminated, reaches the action level of 5 mg/m^3. Air monitoring procedures and calculation of the action level is discussed is Section 4.3.

Facial hair which inhibits the correct fit of a respirator is prohibited in Level C protection.

4.3 Air monitoring

When performing intrusive maintenance activities, air monitoring shall be performed for airborne particulate matter, which is potentially PCB-contaminated. Real-time monitoring shall be performed in the work area, to protect site personnel, using equipment such as the MIE RAM-1 or equivalent, which records levels of dust from 1 $\mu g/m^3$ to 200 mg/m^3. If the airborne particulate concentration exceeds the nuisance dust level (respirable fraction) of 5 mg/m^3 in the Work Zone, half-face respirators with HEPA filters must be worn by workers exposed to the particulate matter (Level C protection as discussed in Section 4.2 of this HASP). The calculated airborne PCB-contaminated particulate concentration associated with this action level (see Appendix A) is well below the PEL for PCBs, 0.001 mg/m^3.

Upon switching to Level C protection, monitoring shall be conducted down - wind at the limits of the Work Zone to protect personnel in the Decon and Support Zones. If at the limits of the Work Zone, the action level (5 mg/m^3 particulates) is reached, the Work Zone shall be extended until particulate levels are detected below the action level. If the action level is exceeded down-wind at the fence line, work activities shall be discontinued and engineering controls shall be utilized to reduce the generation of airborne particulates. Once the levels of airborne particulates down-wind at the fence line decreases below the 5 mg/m^3 action level, work may resume.

4.4. Dust minimization/migration control

During intrusive maintenance activities in which dredged material/soil potentially containing PCBs is disturbed, measures shall be taken to control migration of PCBs from the site. Engineering controls shall be employed to minimize the spread of PCBs through dust migration. Use of water sprays and polyethylene sheeting to cover disturbed soil are examples of dust control methods. Work scheduling efforts such as minimizing the areas of excavation that are open at any one time may also be employed to the generation of airborne particulate. OCDDS or its contractors shall utilize engineering controls or other means to minimize the amount of potentially PCB-contaminated material generated during maintenance activities.

5. Decontamination procedures

Equipment in contact with potential PCB-contaminated material shall be decontaminated in the Decontamination Zone prior to entering the Clean Zone. Personnel who wear protective clothing or utilize equipment in the Work Zone must use proper decontamination procedures. Upon exiting the Work Zone, the decontamination stations, listed below for wet and dry decontamination, will be established. Every worker is to pass through each station in the order shown when exiting the Work Zone. Different procedures are defined for wet and dry decontamination; they are discussed below.

Dry decontamination shall be performed, as described below when the intrusive maintenance activities do not involve exposure to saturated subsurface soil or water which are potentially PCB-contaminated.

Dry Decontamination Stations:

Station 1: Equipment Drop
A plastic drop cloth will be positioned onto which equipment used on-site (*e.g.*, hand tools, containers, clipboards, etc.) will be placed.

Station 2: Outer Garments, Boots, Gloves and Equipment
While on polyethylene sheeting, outer garments, boots, gloves and equipment shall be brushed to remove residual dredged material/soil and staining.

Station 3: Equipment and PPE Visual Inspection
Equipment and PPE shall be inspected for cleanliness. If during visual inspection, residual dredged material/soil or staining is still observed, wet decontamination shall be performed beginning at Station 2 described below. If during visual inspection the equipment and PPE is deemed "clean", then dry decontamination will be continued.

Station 4: Outer Boot and Glove Removal
Outer boots and gloves shall be removed and placed in a DOT approved 55-gallon drum or suitable container.

Station 5: Outer Garment Removal
At this station, Tyveks® are removed and deposited in a DOT approved 55-gallon drum or suitable container.

Station 6: Inner Glove Removal
A container with a plastic liner will be positioned so that inner gloves can be removed and disposed of in this area.

Station 7: Final Visual Inspection
Personnel shall perform visual inspection to assure that their hands, face and rest of their person is free of dredged material/soil or staining. If their person is not clean, they shall perform wet decontamination beginning at Station 7. Polyethylene sheeting and other debris utilized during decontamination shall be placed in waste containers and managed in accordance with the Work Plan (O'Brien & Gere, 2001).

Wet decontamination shall be performed by OCDDS or its contractors on a concrete decontamination pad and collection sump. Wet decontamination shall be performed when the intrusive maintenance activities involve exposure to saturated subsurface soil or water which are potentially PCB-contaminated or when dry decontamination is ineffective. Wet decontamination must be performed for cleaning of respirators.

Wet Decontamination Stations:

Station 1: Equipment Drop
A plastic drop cloth will be positioned onto which equipment used on-site (*e.g.*, hand tools, containers, clipboards, etc.) will be placed.

Station 2: Outer Garments, Boots, Gloves Wash and Rinse
Outer boots and gloves are to be washed in an industrial detergent and water mixture in a tub. Move from the tub to a designated area to remove equipment.

Station 3: Outer Boot and Glove Removal
Remove boots and gloves and place in a DOT approved 55-gallon drum or suitable container.

Station 4: Outer Garment Removal
At this station, Tyveks® are removed and deposited in a DOT approved 55-gallon drum or suitable container.

Station 5: Respirator Removal
The respirator is removed while avoiding touching the face with fingers. The respirator is to be cleaned with soap and water. Cartridges are to be changed at least once for each shift.

Station 6: Inner Glove Removal
A container with a plastic liner will be positioned so that inner gloves can be removed and disposed of in this area.

Station 7: Clean-up
Wash hands and face, or shower, as much as facilities and time permit.

Field equipment will be cleaned with a wash solution and a brush if necessary. The wash solution will be a mixture of detergent and water. Decontamination of larger field equipment will be cleaned with a pressure washer and a brush if necessary on the decontamination pad. Decontamination fluids will be contained and managed in accordance with the Work Plan (O'Brien & Gere, 2001).

6. Training program

Personnel engaged in intrusive maintenance and repair activities on this project are required to adhere to the training requirements dictated in 29 CFR 1910.120. This includes successful completion of a 40-hour or 24-hour course on health and safety issues for hazardous waste operations and 24 hours of supervised field experience, depending on the degree of activity and exposure anticipated. Attendance at an annual 8-hour refresher course for training is also required. For personnel engaged in supervisory activities on the project, completion of an additional 8-hour course for supervisors is also required.

Personnel must provide proof of successful completion of the required course(s) and submit proof to the project manager, prior to being allowed to participate in any on-site project activities.

7. Medical surveillance program

Workers engaged in site activities, with potential exposures above permissible exposure limits (PELs) for thirty days or more, must participate in an annual medical surveillance program as mandated by 29 CFR 1910.120. Due to the fact that on-site personnel have a limited potential for exposure to PCBs above the PEL (as supported by the calculation of exposure included as Appendix A), this requirement may not be applicable to the site. OCDDS or its contractors' SSHC shall evaluate their respective employees exposures and assess the applicability of the medical surveillance program.

8. On-site emergency

8.1. Notification

In the event of an emergency at the site, GM/REALM's project manager shall be contacted within 24 hours of identification of the emergency by the OCDDS project manager.

8.2. Directions to hospital

From Factory Avenue turn right onto Townline Road. Get on GM Circle. Go to Route 298 West (Court Street). Continue west on Court Street to the intersection of Court Street and N. Salina Street. Turn left on N. Salina Street and proceed to the intersection of N. Salina Street and Prospect Avenue. Turn left onto Prospect Avenue and proceed to St. Joseph's Hospital at 301 Prospect Street, between Townsend Road and N. State Street. **Emergency number (315) 448-5101.** Directions to the hospital are shown in Figure 2.

8.3. Emergency decontamination

Decontamination during an emergency situation must be performed as closely as possible to specified procedures without interfering with the immediate health and safety concerns of the workers as is deemed necessary at the time of the emergency.

- Equipment may be removed without cleaning
- Clothing may be cut off with or without regard to cleaning

- If a victim is transported out of the work area without removing contaminated protective clothing, the person should be wrapped in a plastic sheet or blanket unless heat stress prevents such.

In all cases, care must always be maintained to minimize the spread of contamination away from the work area.

8.4. Follow-up measures

Following an emergency incident, all personnel and equipment must be reviewed to ensure that all are prepared to re-start work. Work must not be resumed until the SSHC determines that all appropriate parties are appraised of the situation, all equipment has been repaired or replaced, all emergency response equipment has been refilled or replaced, and a review/report of the incident has been completed.

References

O'Brien & Gere *"Work Plan; Remedial Investigation/Feasibility Study; Ley Creek Dredged Material Area."* February 1992.

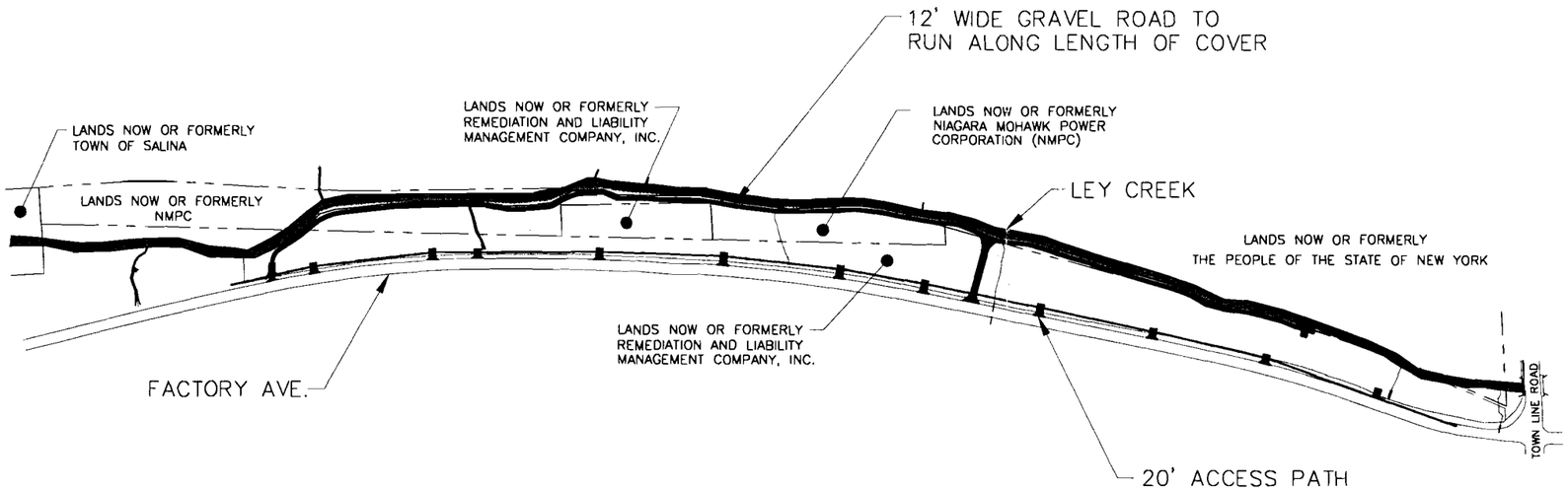
O'Brien & Gere *"Remedial Investigation; Ley Creek Dredged Material Area."* September 1993a.

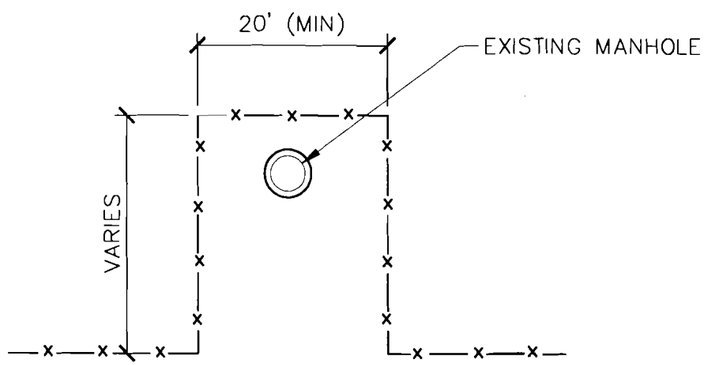
O'Brien & Gere *"Feasibility Study; Ley Creek Dredged Material Area."* October 1996.

O'Brien & Gere *"Management Plan for County Maintenance Work"* revised February 2001.

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FIGURE 1





TYPICAL MANHOLE ACCESS

LEGEND

- GRAVEL ACCESS ROAD
- SAN — SANITARY SEWER
- PROPERTY BOUNDARY
- MANHOLE ACCESS LOCATION
- FENCE
- EXTENT OF SOIL COVER

LEY CREEK PCB
DREDGINGS SITE
TOWN OF SALINA, NEW YORK

SITE PLAN

0 500 1000
SCALE IN FEET

NOTE:

1. LOCATION OF FENCE AND SANITARY SEWER ARE APPROXIMATE.

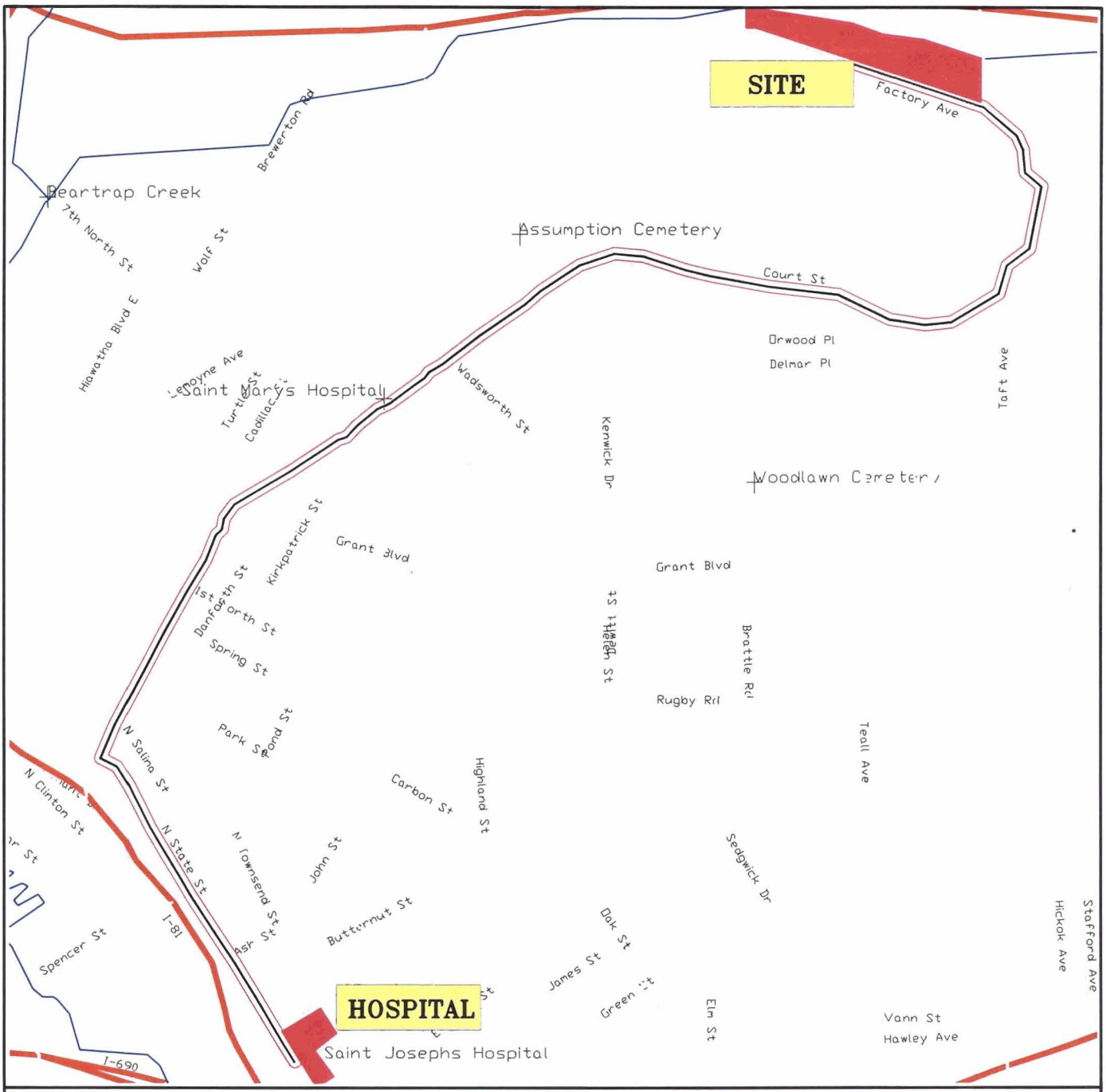
REV DATE: 02/12/01

DATE: FEBRUARY 2001
FILE NO. 4966.24346.019

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FIGURE 2



GENERAL MOTORS CORPORATION/
REMEDIATION AND LIABILITY MANAGMENT COMPANY, INC.
SYRACUSE, NEW YORK

LEY CREEK PCB DREDGINGS SITE

DIRECTIONS TO HOSPITAL



QUADRANGLE LOCATION

0 2000 4000

SCALE IN FEET

SOURCE: SYRACUSE EAST & WEST, U.S.G.S. QUADRANGLE MAPS.

O'BRIEN & GERE ENGINEERS INC.

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Appendix A

PCB-contaminated Particulate Inhalation Exposure Calculation

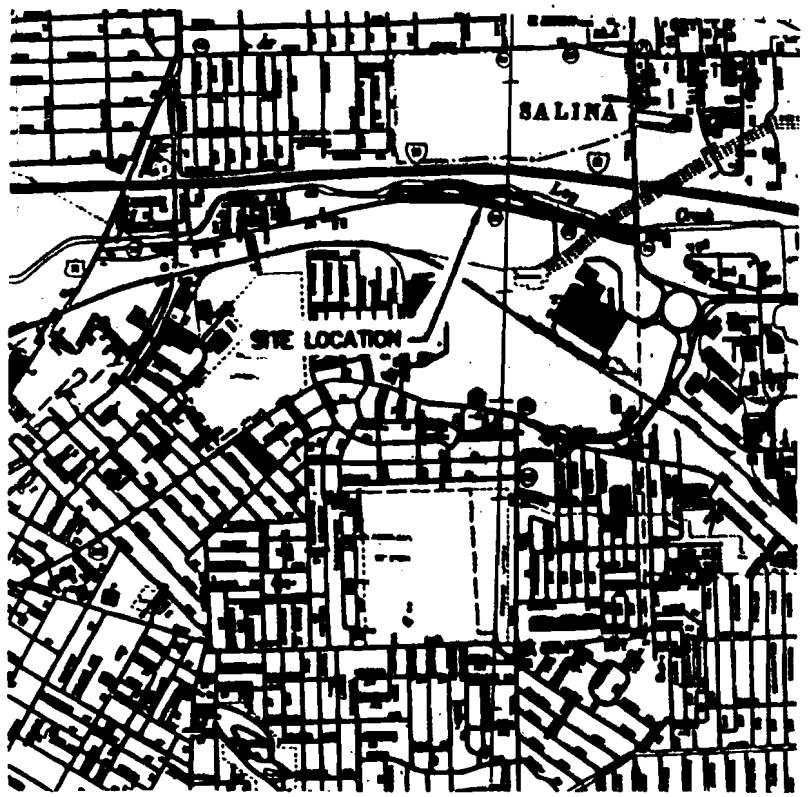
- Maximum PCB concentration in dredged material/soil = mg/kg
- Exposure limit for particulate = 5 mg/kg^3 (respirable factor)

  50 mg/kg x 5 mg/kg^3 x 10^{-6} kg/mg = .00025 mg/m^3
- The PEL for PCBs is 0.001 mg/m^3
- Based on the action level of 5 mg/m^3 (particulate), the PEL for PCBs is not reached.

Appendix B

Record Drawings

DWG PATH: L:\DIV7\PROJECTS\4966\24348\RECORD\11S.DWG SF=1



LOCATION PLAN
NOT TO SCALE

RECORD DRAWINGS

LEY CREEK PCB DREDGINGS SITE SYRACUSE, NEW YORK

SITE REMEDIATION PROJECT

REMEDIATION AND LIABILITY MANAGEMENT COMPANY, INC.
FEBRUARY 2001

O'BRIEN & GERE ENGINEERS INC.

STATE OF NEW YORK
DEPARTMENT OF EDUCATION
LICENSED PROFESSIONAL ENGINEER
24008

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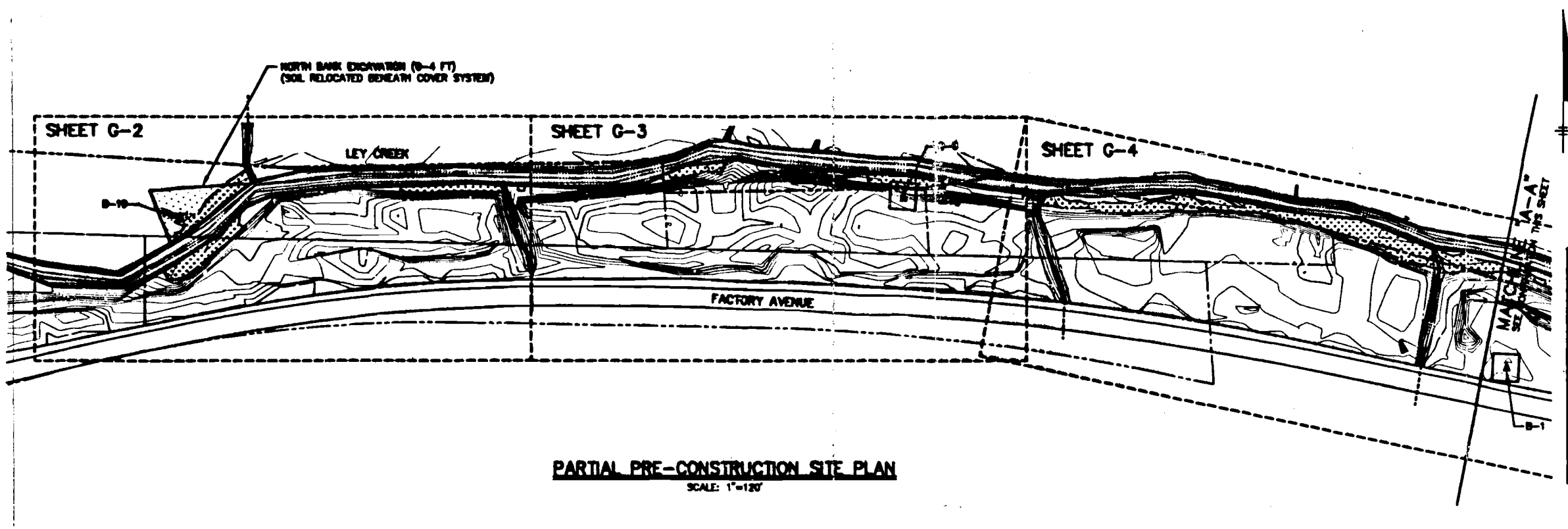
INDEX TO DRAWINGS

TITLE SHEET

G-1	EXISTING SITE PLAN / INDEX TO PARTIAL GRADING PLANS
G-2	PARTIAL GRADING PLAN
G-3	PARTIAL GRADING PLAN
G-4	PARTIAL GRADING PLAN
G-5	PARTIAL GRADING PLAN
G-6	PARTIAL GRADING PLAN
G-7	MISCELLANEOUS DETAILS
G-8	MISCELLANEOUS DETAILS

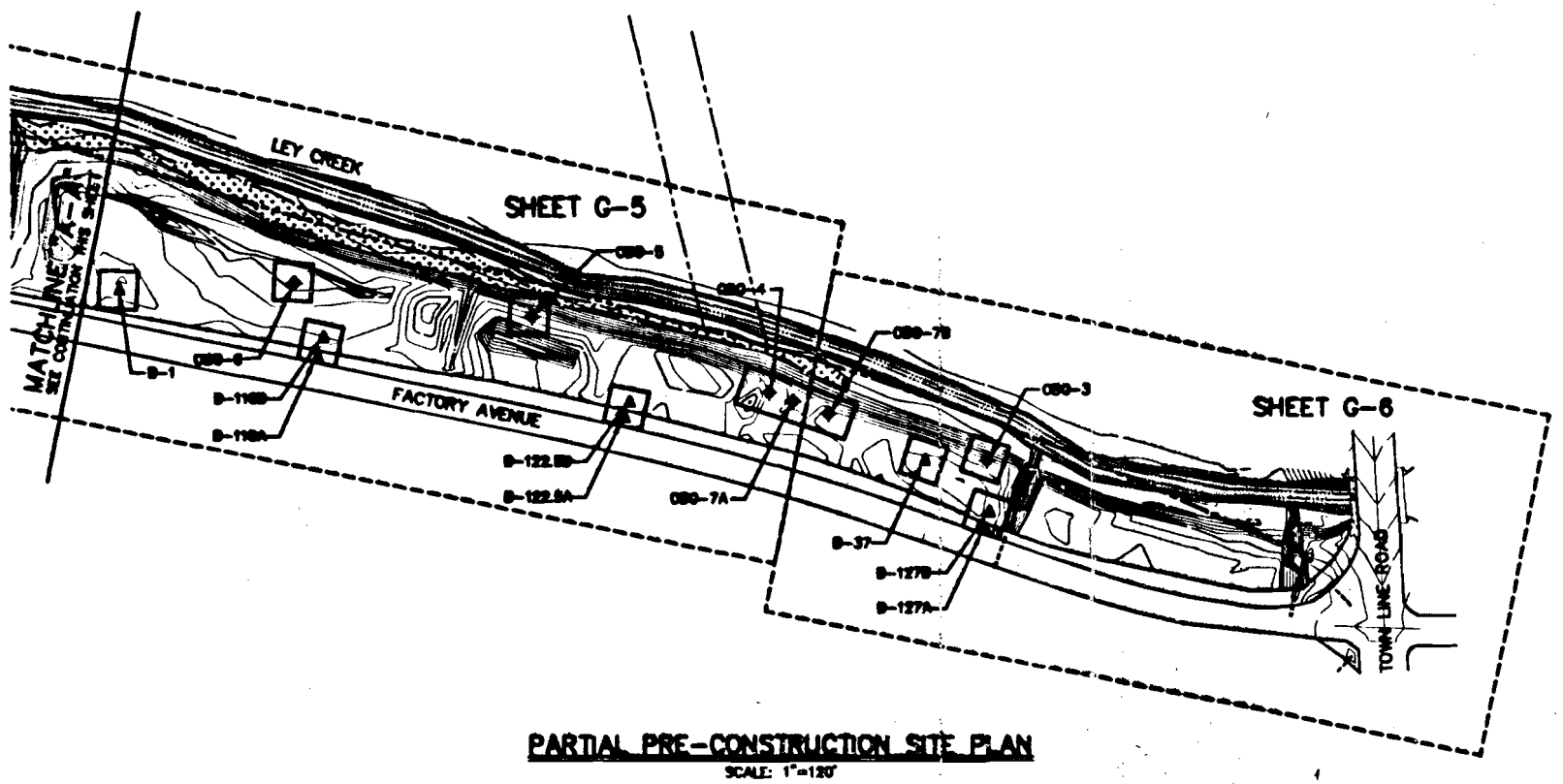
4966.24348.015

PLOT DATE: 02/13/01 MTW



PARTIAL PRE-CONSTRUCTION SITE PLAN

SCALE: 1"=120'



PARTIAL PRE-CONSTRUCTION SITE PLAN

SCALE: 1"=120'

SURVEY NOTES:

1. SURVEY MAPPING ADOPTED FROM TOPOGRAPHIC SURVEY MAP PREPARED BY C.T. MALE ASSOCIATES, P.C., 300 GATEWAY PARK DRIVE, P.O. BOX 3240, SYRACUSE, NY 13220.
2. NORTH ORIENTATION AND COORDINATE DATUM ARE BASED ON THE CENTRAL ZONE OF NEW YORK STATE PLANE COORDINATE SYSTEM AS ESTABLISHED BY DIFFERENTIAL G.P.S. METHODS.
3. VERTICAL DATUM IS BASED ON N.G.V.D. 1929.

DRAWING NOTES:

1. THE LIMITS OF SOIL EXCAVATION FOR OFF-SITE DISPOSAL SHOWN HERE ARE NOT NECESSARILY REPRESENTATIVE OF THE ACTUAL AREA OF EXCAVATION. THE ACTUAL LIMITS WERE DETERMINED DURING CONSTRUCTION BASED ON THE TECHNICAL SPECIFICATIONS AND ARE SHOWN IN THE FOLLOWING SHEETS.
2. OFF-SITE DISPOSAL ZONE DEPTHS ALL LISTED BELOW OR DEPICTED ON THE FOLLOWING SHEETS.

SOIL EXCAVATION & OFF-SITE DISPOSAL TABLE

LOCATION	NORTHING	EASTING	APPROX. REMOVAL/OFF-SITE DISPOSAL ZONE DEPTH
B-6	11127134.72	943075.84	0-6 FT
B-1	11126817.46	943233.53	4-8 FT
OBG-6	11126826.15	943464.29	2-10 FT
OBG-5	11126782.19	943773.62	0-2 FT
OBG-4	11126685.25	944081.91	4-6 FT
OBG-7A	11126673.38	944113.14	2-4 FT
OBG-7B	11126656.77	944156.07	6-8 FT
B-37	11126584.82	944283.37	4-8 FT
OBG-3	11126565.07	944365.99	0-4 FT
B-127A	11126516.03	944356.48	DRAWING NOTE 2
B-127B	11126526.74	944373.53	DRAWING NOTE 2
B-122.5A	11126636.73	943972.76	DRAWING NOTE 2
B-122.5B	11126656.46	943978.68	DRAWING NOTE 2
B-116A	11126736.57	943486.80	0-1 FT
B-116B	11126774.27	943492.60	0-5 FT

LEGEND

- PROPERTY BOUNDARY
- LANDS NOW OR FORMERLY THE PEOPLE OF THE STATE OF NEW YORK
- TOP OF BANK, BOTTOM OF BANK, FLOW LINE
- WETLANDS EXISTING PRIOR TO CONSTRUCTION
- PRE-CONSTRUCTION ELEVATION CONTOUR
- MONITORING WELL
- SOIL BORING
- AREAS OF SOIL DISPOSED OF OFF-SITE (SEE DRAWING NOTE 1)

RECORD DRAWINGS

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O'BRIEN & GERE ENGINEERS, INC.

By: _____

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0	6/15/98	ISSUED FOR NYSDEC REVIEW	

1"=120' 120 0 120 240

O'BRIEN & GERE ENGINEERS INC.

LEY CREEK PCB DREDGINGS SITE
SYRACUSE, NEW YORK
SITE REMEDIATION PROJECT

GENERAL

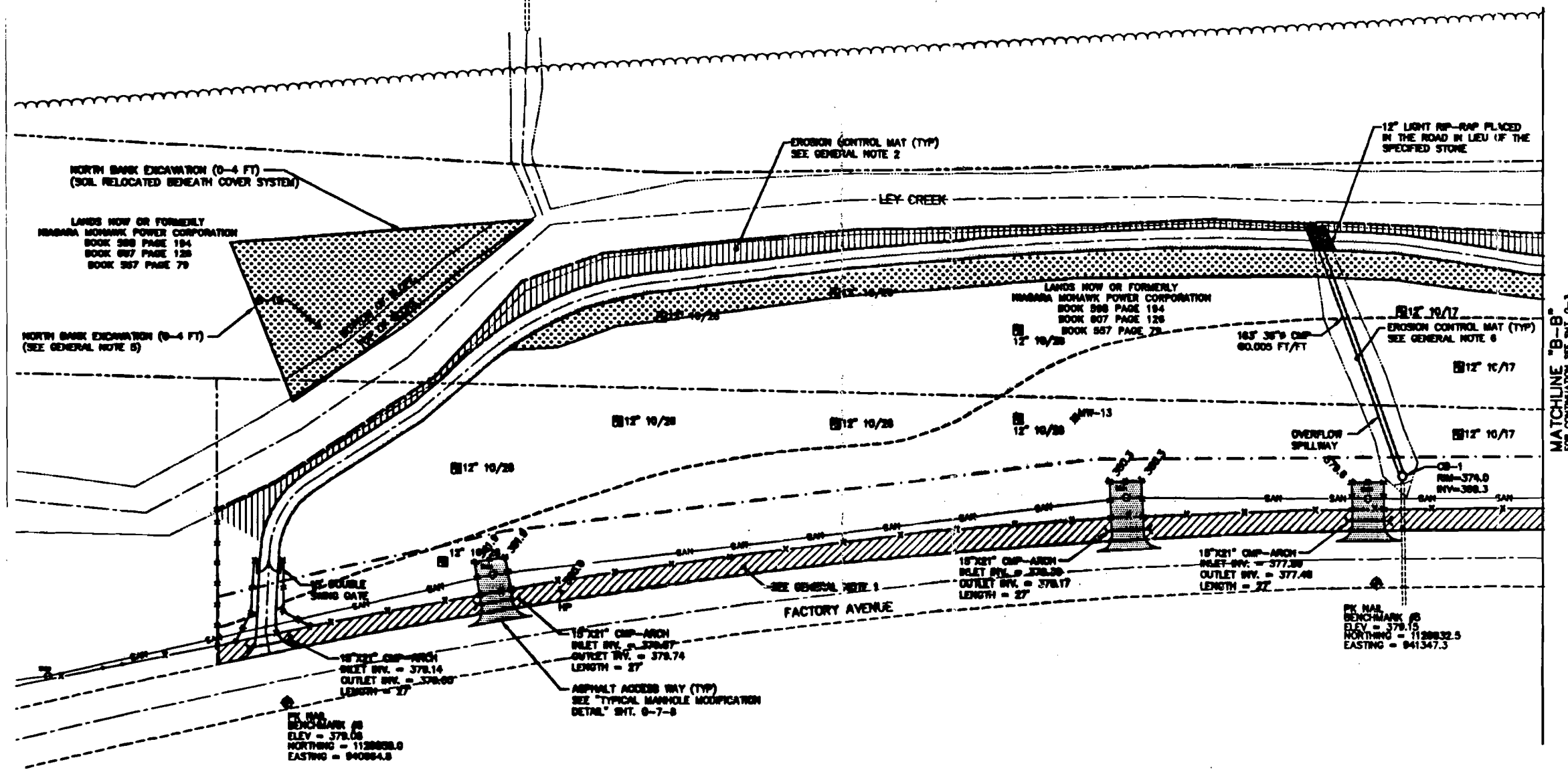
EXISTING SITE PLAN / INDEX TO PARTIAL GRADING PLANS

IN CHARGE OF _____
DESIGNED BY DTF CHECKED BY MJM
DRAWN BY MJM

FILE NO. 4966.24346.014
DATE FEBRUARY 2001

G-1

MAIN (\DM7\PROJECTS\4966\24346\DWG\RECORD\014.DWG SF:1 2/19/98
PLOT DATE: 02/12/01 MTP



LEGEND

- SEEDED WITH CANARY GRASS
- OHW — OVERHEAD WIRES
- PROPERTY BOUNDARY
- EDGE OF WOODS
- TOP OF BANK
- UTILITY POLE
- GUY WIRE
- SAN — SANITARY SEWER
- SANITARY MANHOLE
- CATCH BASIN
- 380 — EXISTING ELEVATION CONTOUR
- 380 — ELEVATION CONTOUR
- x 379.0 — SPOT ELEVATION
- HP — HIGH POINT
- SECURITY FENCE (SEE GENERAL NOTE 4)
- PAVEMENT
- GRAVEL ACCESS ROAD
- LIMITS OF SOIL LOCATED ALONG FACTORY AVENUE RELOCATED BENEATH COVER SYSTEM
- CATCH BASIN
- MW-OBX17C — MODIFIED MONITORING WELL
- MONITORING WELL PRESUMED DESTROYED
- ABANDONED MONITORING WELL
- NEW MONITORING WELL
- LIMITS OF EROSION CONTROL MAT
- LIMITS OF COVER SYSTEM
- 25 FT. SANITARY OFFSET
- LIMITS OF NON-WOVEN GEOTEXTILE (SEE "STONE ACCESS ROAD/ VEGETATIVE SOIL COVER SYSTEM DETAIL" SHT. G-7
- 12" 10/17 — VEGETATIVE COVER THICKNESS TEST PIT

-PLAN HERE SUPERSEDED
-REFER TO ROYAL ENVIRONMENTAL, INC.
"AS-BUILT TOPOGRAPHICAL SURVEY"
PREPARED BY CT MALE ASSOCIATES, P.C.,
SHEETS 1 OF 3, 2 OF 3, AND 3 OF 3.
DATED: 12/22/00
REVISED: 12/29/00 REV. 1
. 02/07/01 REV. 2
. 08/08/01 REV. 3

GENERAL NOTES - ALL DRAWINGS

1. THE CONTRACTOR REMOVED (1) FOOT OF SOIL LOCATED BETWEEN THE EXISTING FENCE AND FACTORY AVENUE AND RELOCATED IT TO WITHIN THE LIMITS OF COVER SYSTEM. SEE "PATCH RESTORATION DETAIL" SHT. G-7
2. EROSION CONTROL MAT WAS INSTALLED BETWEEN THE SOUTHERN LIMITS OF LEY CREEK AND THE NORTHERN LIMITS OF THE STONE ACCESS ROAD. SEE "STONE ACCESS ROAD / VEGETATIVE SOIL COVER SYSTEM DETAIL" SHT. G-7
3. RIP-RAP WAS PLACED AROUND ALL CATCH BASINS AND PIPE OUTLETS. RIP-RAP SIZE AND PLACEMENT WAS IN ACCORDANCE WITH THE SPECIFICATION.
4. ALL EXISTING FENCE WITHIN THE LIMITS OF THE COVER SYSTEM WAS REMOVED AND REPLACED WITH NEW FENCE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
5. THE CONTRACTOR EXCAVATED FROM THE TOP OF BANK AT A (1) VERTICAL TO (3) HORIZONTAL SLOPE TO A DEPTH OF 4 FEET FROM THE BOTTOM OF THE SLOPE. THE CONTRACTOR EXCAVATED TO THE LIMITS SHOWN AT A DEPTH OF 4 FEET.
6. THE CONTRACTOR INSTALLED THE EROSION CONTROL MAT SPECIFIED IN THE CONTRACT DOCUMENTS ALONG THE BOTTOM AND AT LEAST 2 FEET UP THE SIDE SLOPE OF THE OVERFLOW SPILLWAYS. THE EROSION CONTROL MAT WAS INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

RECORD DRAWINGS

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1"=40' 40 0 40 80

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LEY CREEK PCB DREDGINGS SITE
SYRACUSE, NEW YORK
SITE REMEDIATION PROJECT

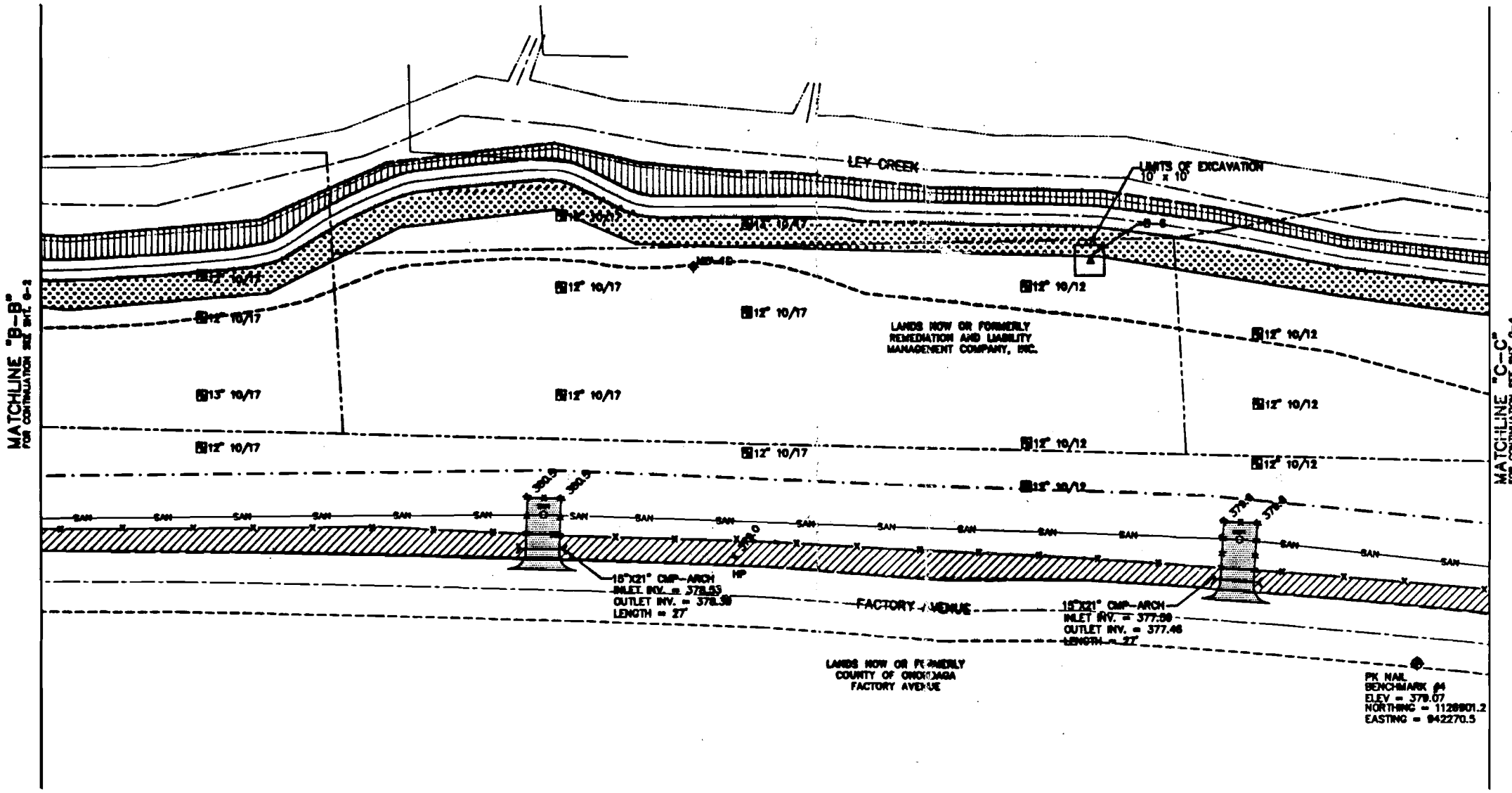
GENERAL

PARTIAL GRADING PLAN

IN CHARGE OF
DESIGNED BY BAK CHECKED BY PFF
DRAWN BY NMJ
FILE NO. 4966.24346.009
DATE FEBRUARY 2001

G-2

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PLOT DATE: 9/24/01 NMJ



LEGEND

- SEEDED WITH CANARY GRASS
- OHW — OVERHEAD WIRES
- PROPERTY BOUNDARY
- EDGE OF WOODS
- TOP OF BANK
- UTILITY POLE
- GUY WIRE
- SAN — SANITARY SEWER
- SANITARY MANHOLE
- CATCH BASIN
- 380 EXISTING ELEVATION CONTOUR
- 380 ELEVATION CONTOUR
- X 378.0 SPOT ELEVATION
- HP HIGH POINT
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- MONITORING WELL PRESUMED DESTROYED
- ABANDONED MONITORING WELL
- NEW MONITORING WELL
- LIMITS OF EROSION CONTROL MAT
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SHEETS 1 OF 3, 2 OF 3, AND 3 OF 3.
DATED: 12/22/00
REVISED: 12/29/00 REV. 1
. 02/07/01 REV. 2
. 06/06/01 REV. 3

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0	6/19/98	ISSUED FOR NYSDEC REVIEW	

1"=40' 40 0 40 80

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LEY CREEK PCB DREDGINGS SITE
SYRACUSE, NEW YORK
SITE REMEDIATION PROJECT

GENERAL

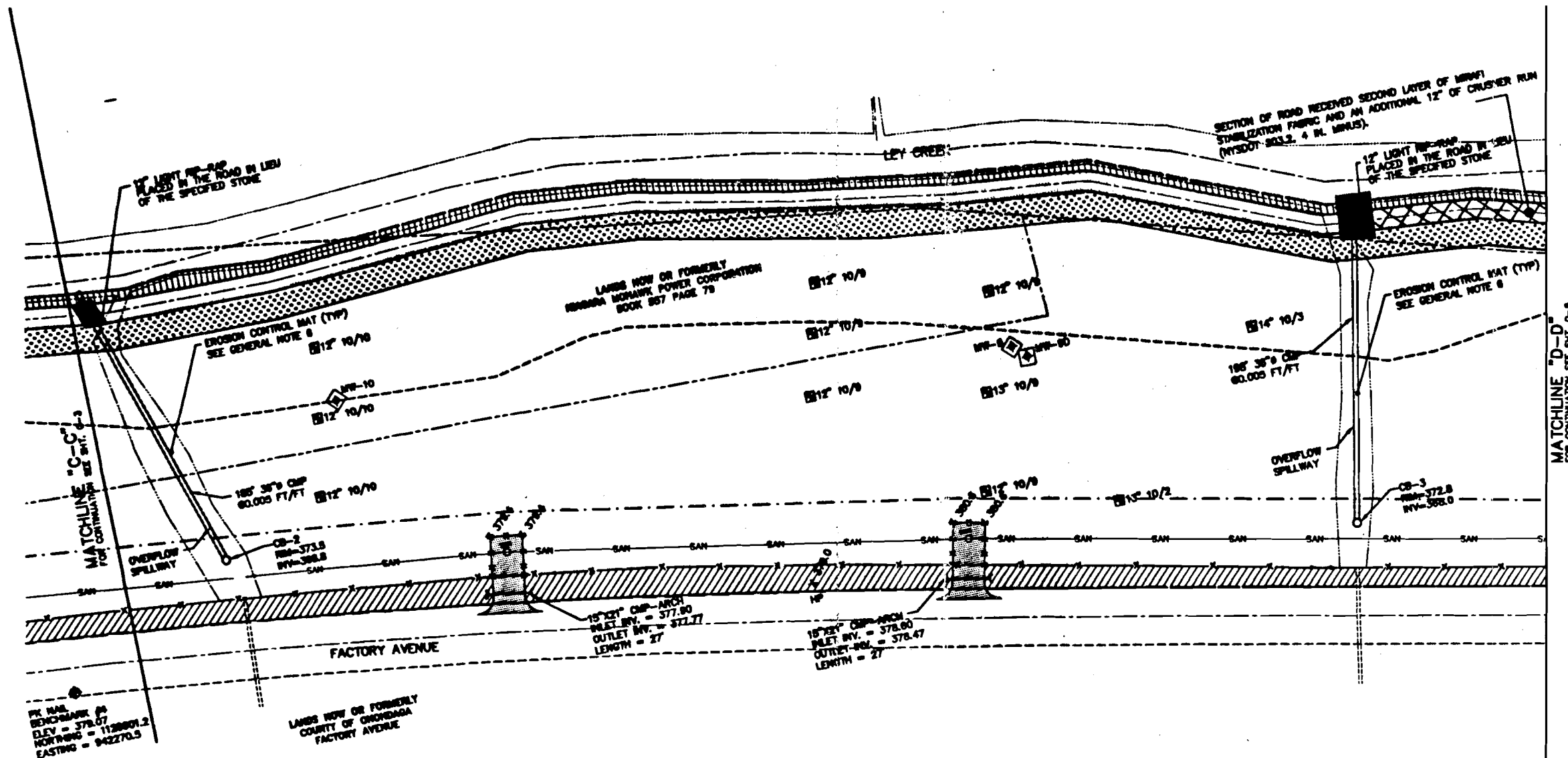
PARTIAL GRADING PLAN

IN CHARGE OF
DESIGNED BY CHECKED BY
DRAWN BY

FILE NO. 4933.24346.010
DATE FEBRUARY 2001

G-3

PLOT DATE: 9/24/01 NMJ



LEGEND

- SEEDED WITH CANARY GRASS
- OHW OVERHEAD WIRES
- PROPERTY BOUNDARY
- EDGE OF WOODS
- TOP OF BANK
- UTILITY POLE
- GUY WIRE
- SAN SANITARY SEWER
- SAN SANITARY MANHOLE
- CATCH BASIN
- 380 EXISTING ELEVATION CONTOUR
- 380 ELEVATION CONTOUR
- X 379.0 SPOT ELEVATION
- HP HIGH POINT
- SECURITY FENCE (SEE GENERAL NOTE 4)
- PAVEMENT
- GRAVEL ACCESS ROAD
- LIMITS OF SOIL LOCATED ALONG FACTORY AVENUE RELOCATED BENEATH COVER SYSTEM
- CATCH BASIN
- MW-08C7C MODIFIED MONITORING WELL
- MONITORING WELL PRESUMED DESTROYED
- ABANDONED MONITORING WELL
- NEW MONITORING WELL
- LIMITS OF EROSION CONTROL MAT
- LIMITS OF COVER SYSTEM
- 25 FT. SANITARY OFFSET
- LIMITS OF NON-WOVEN GEOTEXTILE (SEE "STONE ACCESS ROAD/ VEGETATIVE SOIL COVER SYSTEM DETAIL" SHT. G-7
- 12" 10/17 VEGETATIVE COVER THICKNESS TEST PIT

-PLAN HERE SUPERSEDED
-REFER TO ROYAL ENVIRONMENTAL, INC. "AS-BUILT TOPOGRAPHICAL SURVEY" PREPARED BY CT MALE ASSOCIATES, P.C., SHEETS 1 OF 3, 2 OF 3, AND 3 OF 3.
DATED: 12/22/00
REVISED: 12/28/00 REV. 1
02/07/01 REV. 2
08/08/01 REV. 3

RECORD DRAWINGS

TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

O'BRIEN & GERE ENGINEERS, INC.
By:

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. DISCREPANCIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED BY ANY MEANS. USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.

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STATE OF NEW YORK — JAMES M. CAPPUCCINO — 58609 — LICENSED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	INIT.
5	9/24/01	NYSDEC COMMENTS INCORPORATED	
4	02/13/01	RECORD DRAWINGS	
3	7/06/00	MODIFICATION #2	
2	2/19/99	NYSDEC COMMENTS INCORPORATED	
1	7/17/98	AS-BID	
0	6/19/98	ISSUED FOR NYSDEC REVIEW	

1"=40' 40 0 40 80

O'BRIEN & GERE ENGINEERS INC.

LEY CREEK PCB DREDGINGS SITE
SYRACUSE, NEW YORK
SITE REMEDIATION PROJECT

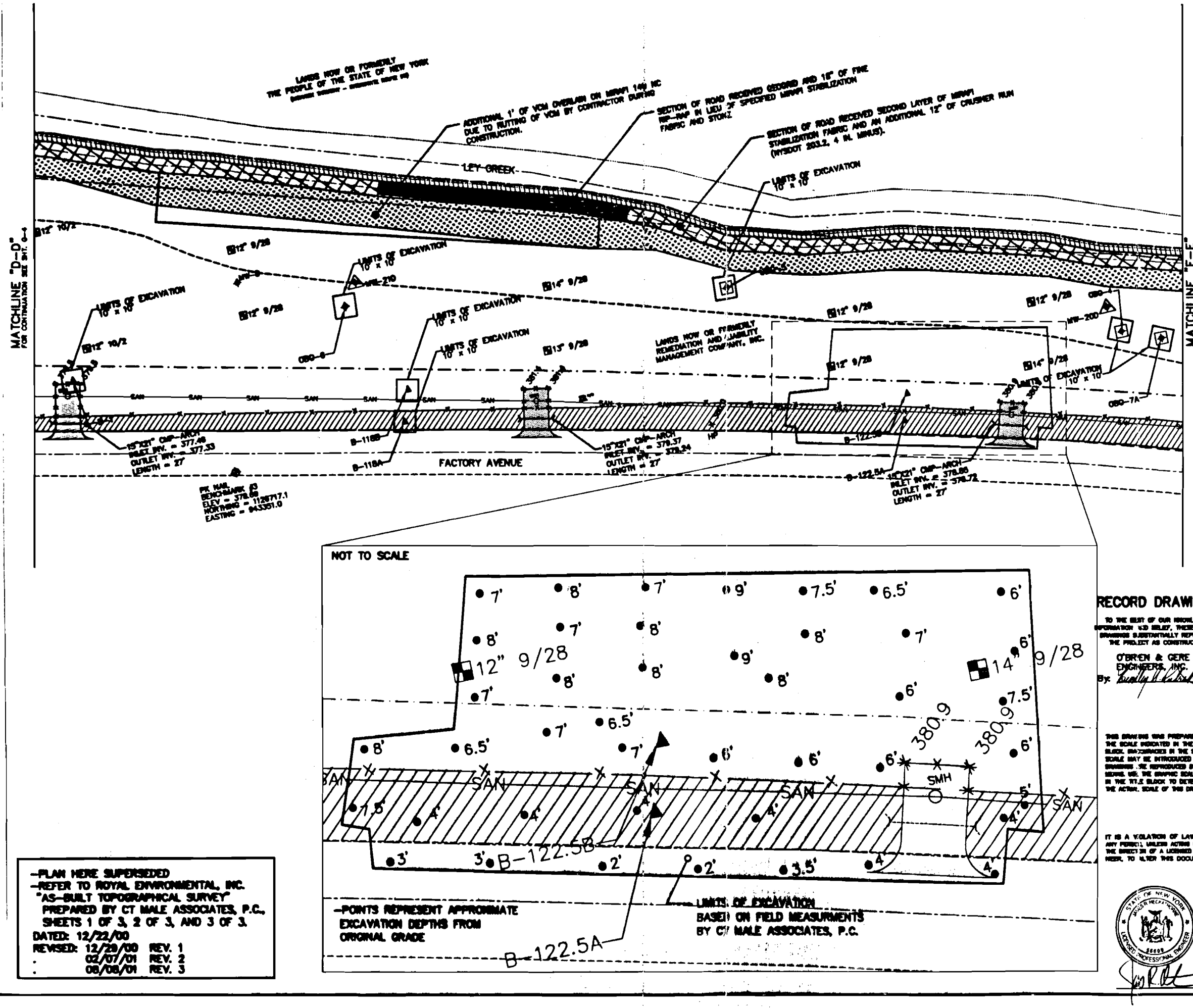
GENERAL

PARTIAL GRADING PLAN

IN CHARGE OF
DESIGNED BY CHECKED BY
DRAWN BY
FILE NO. 4966.24346.011
DATE FEBRUARY 2001

G-4

PLOT DATE: 9/24/01 NMJ
WWW I:\DAV71\PROJECTS\4966\24346\DWG\RECORD\G06.DWG SF:1 (DVIEW 346.SB)



LEGEND

- SEEDED WITH CANARY GRASS
- OHW — OVERHEAD WIRES
- PROPERTY BOUNDARY
- EDGE OF WOODS
- TOP OF BANK
- UTILITY POLE
- GUY WIRE
- SAN — SANITARY SEWER
- SANITARY MANHOLE
- CATCH BASIN
- 380 EXISTING ELEVATION CONTOUR
- 380 ELEVATION CONTOUR
- x 379.0 SPOT ELEVATION
- HP HIGH POINT
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- MONITORING WELL PRESUMED DESTROYED
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- 25 FT. SANITARY OFFSET
- LIMITS OF NON-WOVEN GEOTEXTILE (SEE "STONE ACCESS ROAD/ VEGETATIVE SOIL COVER SYSTEM DETAIL" SHT. G-7
- 12" 10/17 VEGETATIVE COVER THICKNESS TEST PIT

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-REFER TO ROYAL ENVIRONMENTAL, INC. "AS-BUILT TOPOGRAPHICAL SURVEY" PREPARED BY CT MALE ASSOCIATES, P.C., SHEETS 1 OF 3, 2 OF 3, AND 3 OF 3.
DATED: 12/22/00
REVISED: 12/29/00 REV. 1
02/07/01 REV. 2
08/08/01 REV. 3

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O'BRIEN & GERE ENGINEERS, INC.
By:

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STATE OF NEW YORK — JAMES MCCARTHY — 76609 — LICENSED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	INIT.
4	9/24/01	NYSDEC COMMENTS INCORPORATED	
3	02/12/01	RECORD DRAWINGS	
2	2/19/99	NYSDEC COMMENTS INCORPORATED	
1	7/17/98	AS-BID	
0	6/19/98	ISSUED FOR NYSDEC REVIEW	

1"=40' 40 0 40 80

O'BRIEN & GERE ENGINEERS INC.

LEY CREEK PCB DREDGINGS SITE
SYRACUSE, NEW YORK
SITE REMEDIATION PROJECT

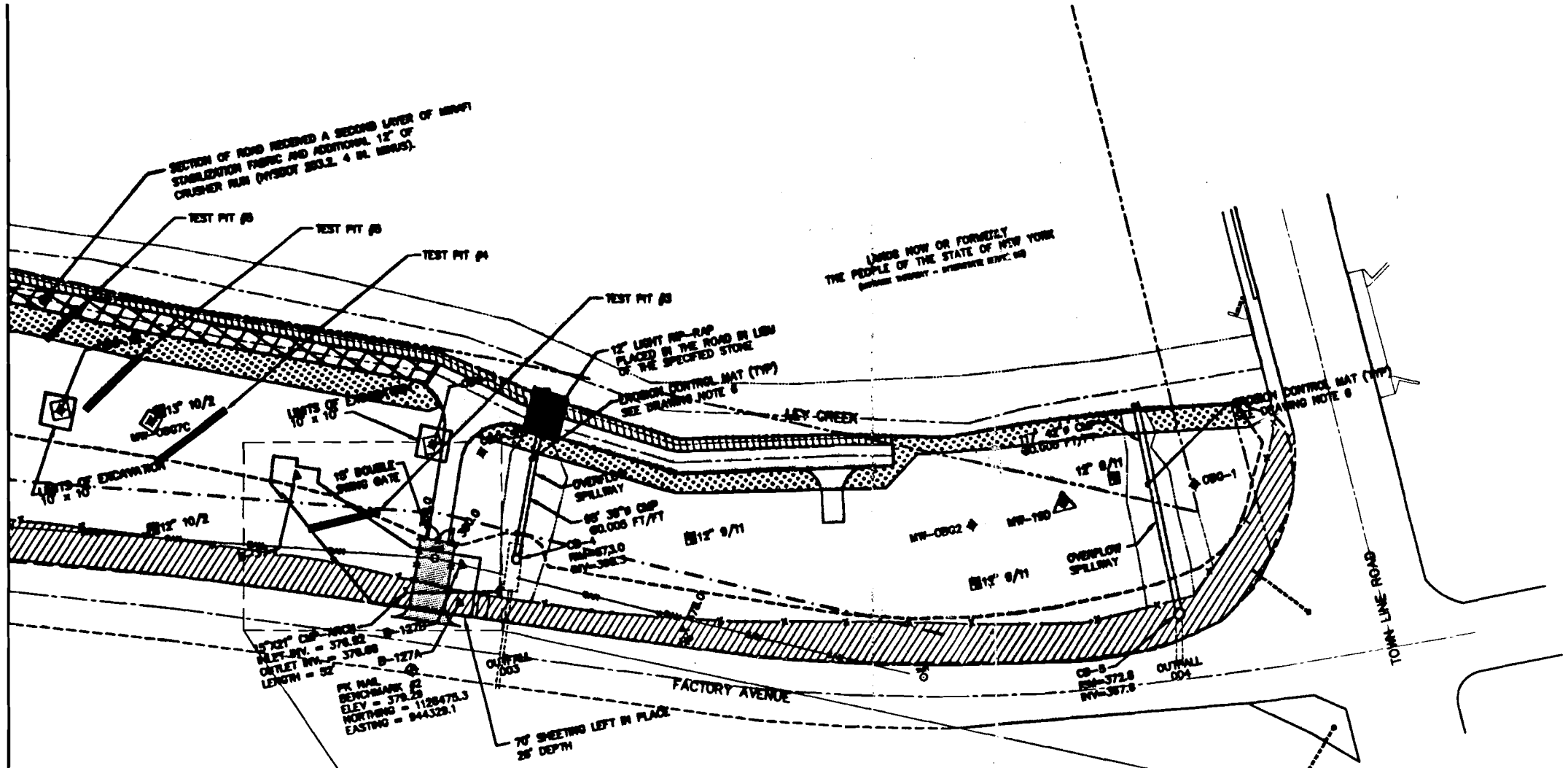
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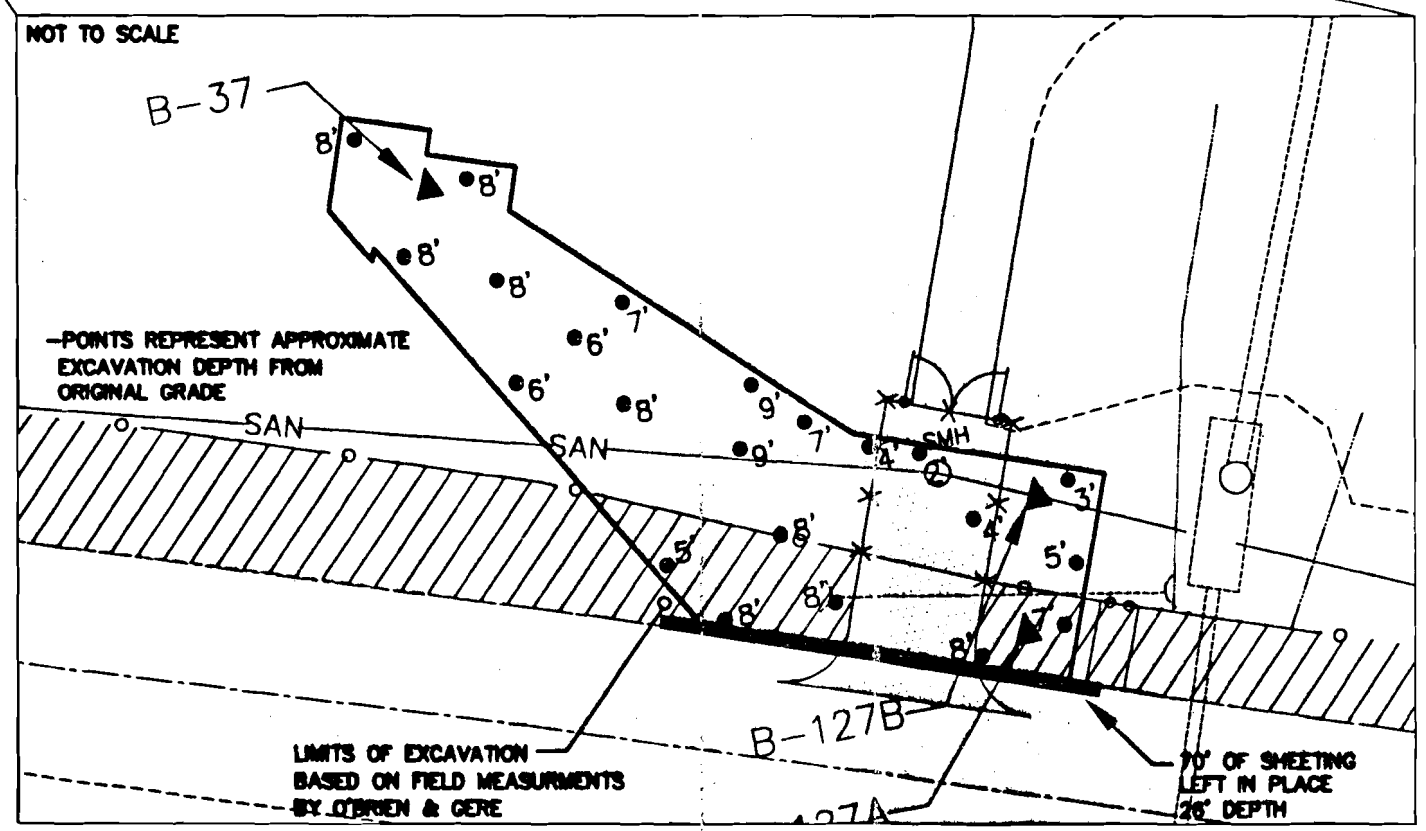
PARTIAL GRADING PLAN

IN CHARGE OF
DESIGNED BY CHECKED BY
DRAWN BY
FILE NO. 4966.24346.012
DATE FEBRUARY 2001

G-5

MWH E:\DV71\PROJECTS\4966\24346\DWG\RECORD\COG.DWG 8P:1 (DVIEW 346.SCR)
PLOT DATE: 9/24/01 NMJ





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DATED: 12/22/00
REVISED: 12/29/00 REV. 1
02/07/01 REV. 2
08/08/01 REV. 3

LEGEND

- SEEDED WITH CANARY GRASS
- OHW — OVERHEAD WIRES
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- UTILITY POLE
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- MONITORING WELL PRESUMED DESTROYED
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STATE OF NEW YORK — MARK H. NECHAMEN — 85909 — LICENSED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	INIT.
6	9/24/01	NYSDEC COMMENTS INCORPORATED	
5	02/12/01	RECORD DRAWINGS	
4	7/06/00	MODIFICATION #2	
3	4/21/00	MODIFICATION #1	
2	2/19/99	NYSDEC COMMENTS INCORPORATED	
1	7/17/98	AS-BID	
0	5/19/98	ISSUED FOR NYSDEC REVIEW	

1"=40' 40 0 40 80

O'BRIEN & GERE ENGINEERS INC.

LEY CREEK PCB DREDGINGS SITE
SYRACUSE, NEW YORK
SITE REMEDIATION PROJECT

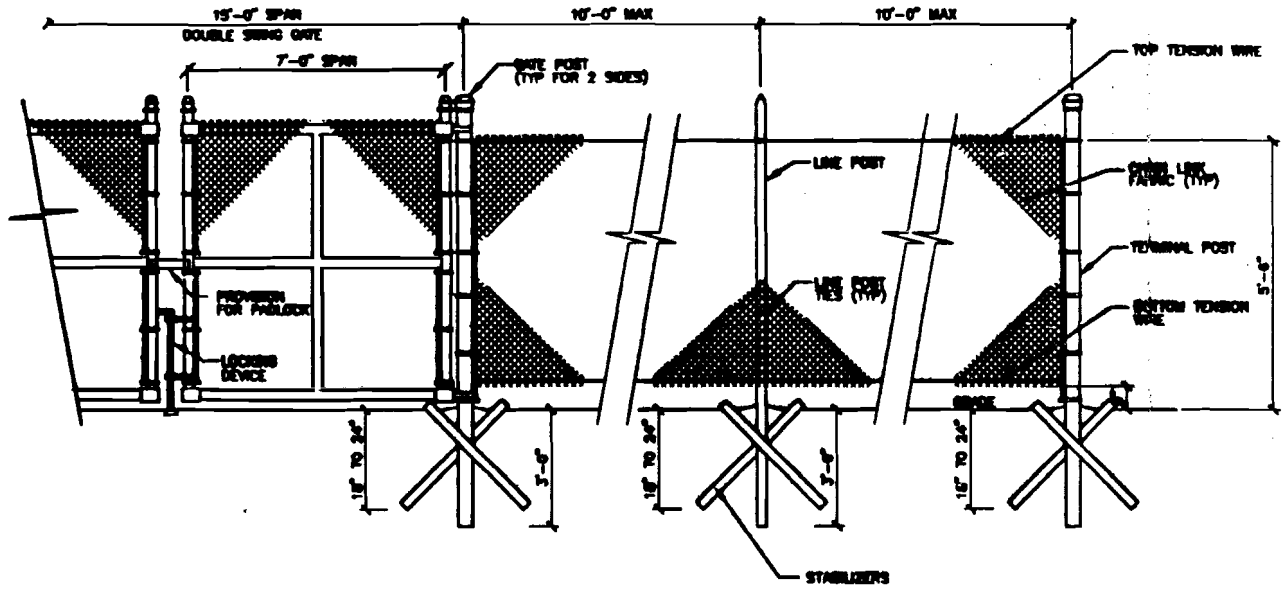
GENERAL

PARTIAL GRADING PLAN

IN CHARGE OF
DESIGNED BY CHECKED BY
DRAWN BY
FILE NO. 4966.24346.013
DATE FEBRUARY 2001

G-6

MMH I:\DM771\PROJECTS\4966\24346\DWG\RECORD\G06.DWG SF:1 (D=ORIGINAL) PLOT DATED: 9/24/01

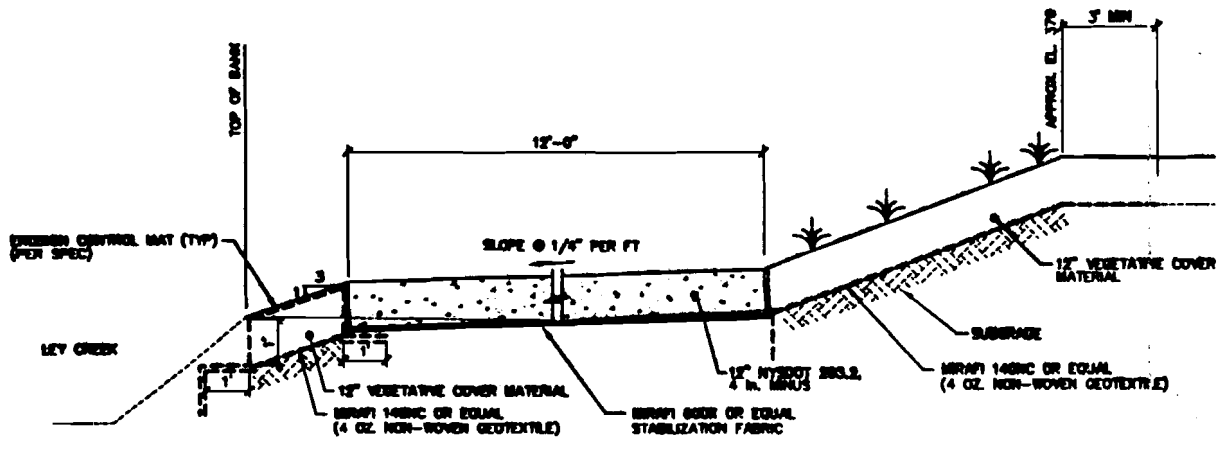


CHAIN LINK FENCE & GATE DETAIL

NOT TO SCALE

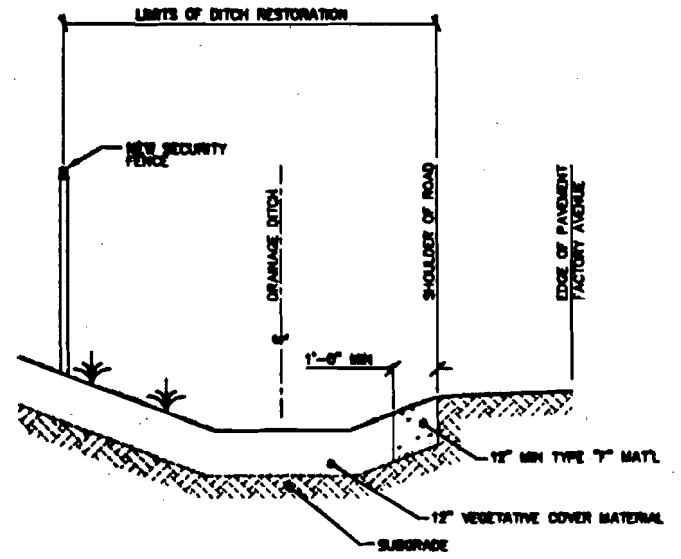
DETAIL NOTES:

1. PROVIDED TERMINAL POST AT EACH TERMINATION AND CHANGE IN HORIZONTAL OR VERTICAL DIRECTION OF LINE. MORE TERMINAL POSTS ARE PLUMB WITH TOPS PROPERLY ALIGNED.
2. ALL GATE SIZES, TYPES, AND LOCATIONS ARE AS SPECIFIED ON SHT. C-2 THROUGH C-4.
3. ALL CHAIN LINK FENCING AND GATES WERE INSTALLED PER THE MANUFACTURERS RECOMMENDATIONS.
4. HARDENED SECURITY PAD LOCKS, MASTER MODEL ESPRA-101018 (ENGINEER STOCK NO.8781S1) WERE PROVIDED. ALL LOCKS ARE KEYED ALIKE AT ALL GATES. TWO (2) EXTRA LOCK SETS, KEYED THE SAME AS THE OTHERS, HAVE BEEN PROVIDED.
5. GATES ARE DOUBLE LOCKED TO PROVIDE BOTH NEXUS AND ONONDAGA COUNTY ACCESS AT ALL TIMES.



STONE ACCESS ROAD / VEGETATIVE SOIL COVER SYSTEM DETAIL

NOT TO SCALE



DITCH RESTORATION DETAIL

NOT TO SCALE

RECORD DRAWINGS

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O'BRIEN & GERE ENGINEERS, INC.
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STATE OF NEW YORK — JAMES M. MCCANN — 66608 — LICENSED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	INT.
4	02/12/01	RECORD DRAWINGS	
3	3/20/99	NYSDEC COMMENTS INCORPORATED	
2	2/19/99	NYSDEC COMMENTS INCORPORATED	
1	7/17/98	AS-BID	
0	6/19/98	ISSUED FOR NYSDEC REVIEW	

NOT TO SCALE

O'BRIEN & GERE ENGINEERS INC.

LEY CREEK PCB DREDGINGS SITE
SYRACUSE, NEW YORK
SITE REMEDIATION PROJECT

GENERAL

MISCELLANEOUS DETAILS

IN CHARGE OF
DESIGNED BY DTF CHECKED BY
DRAWN BY

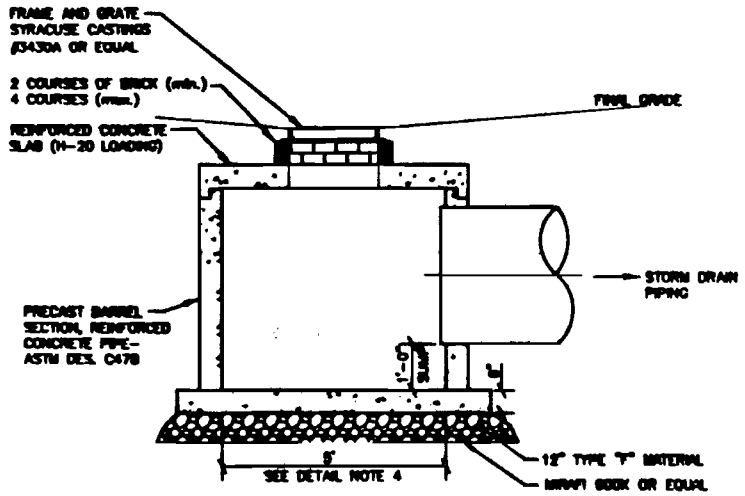
FILE NO. 4966.24346.016
DATE FEBRUARY 2001

G-7

PLOT DATE: 02/12/01 MTW

MAIN: S:\DAV71\PROJECTS\4966\24346\DWG\RECORD\016.DWG 97:24 3/26/99

MAIN I:\DIV71\PROJECTS\4966\24346\DWG\RECORD\G18.DWG 5F:24

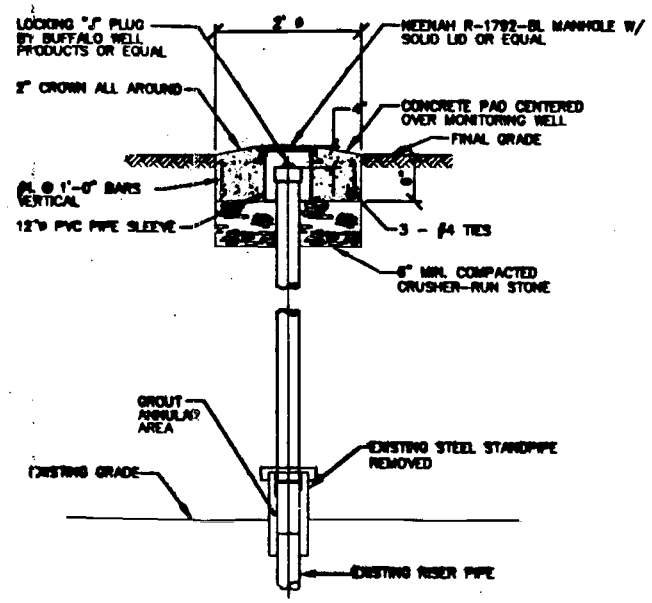


TYPICAL CATCH BASIN DETAIL

NOT TO SCALE

DETAIL NOTES:

1. REFER TO "CT MALE ASSOCIATES AS-BUILTS INFORMATIONAL SURVEY" FOR INVERT ELEVATIONS ASSOCIATED WITH CATCH BASINS.
2. ALL CATCH BASINS DESIGNED FOR H20 LOADING
3. MANHOLE STEPS (NOT SHOWN HERE) PROVIDED AS PER SPEC.
4. 6' DIAMETER CATCH BASIN PROVIDED FOR CB-5

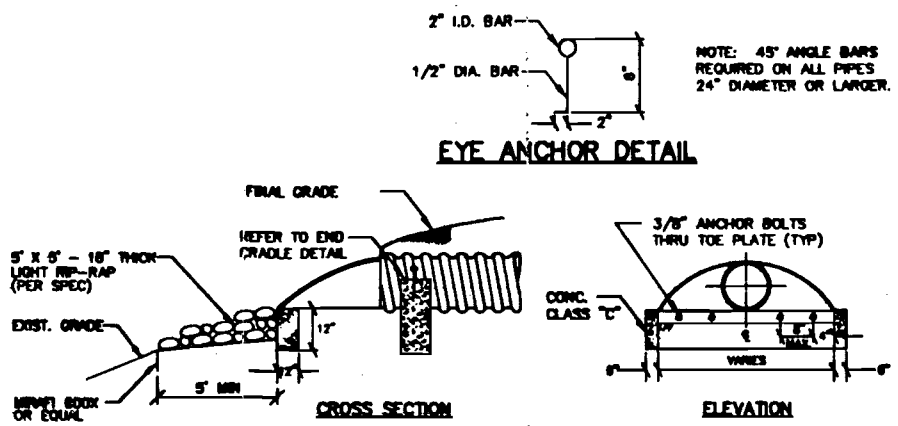


MONITORING WELL MODIFICATION DETAIL

NOT TO SCALE

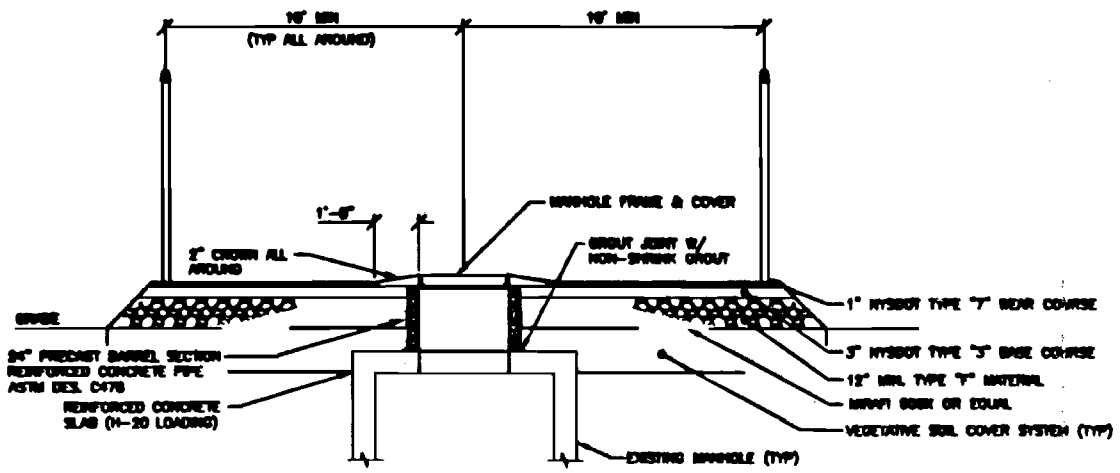
DETAIL NOTES:

1. DETAIL SHOWN HERE DEPICTS MONITORING WELL EXTENSION.
2. EXISTING MONITORING WELLS DESIGNED TO BE CUT HERE INSTALLED AS SHOWN MINUS 1'-6" RISER EXTENSION AND WATERTIGHT COUPLER.
3. MONITORING WELLS OBG-3, OBG-4, OBG-5, OBG-6, OBG-7A, OBG-7B, AND OBG-8D TO BE ABANDONED IN ACCORDANCE WITH THE NYSDEC-APPROVED PROCEDURES.
4. MONITORING WELLS OBG-1, OBG-2, OBG-7B, MW-4, MW-12, AND MW-13 WERE MODIFIED IN ACCORDANCE WITH THE ABOVE MONITORING WELL MODIFICATION DETAIL.
5. MONITORING WELLS OBG-7C, MW-4, AND MW-10 WERE NOT RELOCATED AFTER COMPLETION OF CONSTRUCTION ACTIVITIES.
6. REPLACEMENT OF WELLS IN NOTES 3 AND 5 WILL BE EVALUATED.



FLARED END SECTION & CRADLE DETAIL

NOT TO SCALE



TYPICAL MANHOLE MODIFICATION DETAIL

NOT TO SCALE

DETAIL NOTE:

1. CONTRACTOR EXTENDED EXISTING MANHOLES BY ADDING A PRECAST BARREL SECTION, REINFORCED CONCRETE PIPE ASTM DES. C478.
2. CONTRACTOR FINE ADJUSTED THE PRECAST PIPE RISER HEIGHT BY ADDING COURSES OF BRICK NOT EXCEEDING 4 IN TOTAL HEIGHT.

RECORD DRAWINGS

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O'BRIEN & GERE ENGINEERS, INC.

By:

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NO.	DATE	REVISION	INIT.
4	02/12/01	RECORD DRAWINGS	
3	5/26/00	MODIFICATION #2	
2	2/19/99	NYSDEC COMMENTS INCORPORATED	
1	7/17/98	AS-BID	
0	6/19/98	ISSUED FOR NYSDEC REVIEW	

NOT TO SCALE

O'BRIEN & GERE ENGINEERS INC.

LEY CREEK PCB DREDGINGS SITE
SYRACUSE, NEW YORK
SITE REMEDIATION PROJECT

GENERAL

MISCELLANEOUS DETAILS

IN CHARGE OF
DESIGNED BY TF CHECKED BY
DRAWN BY

FILE NO. 4966.24346.018

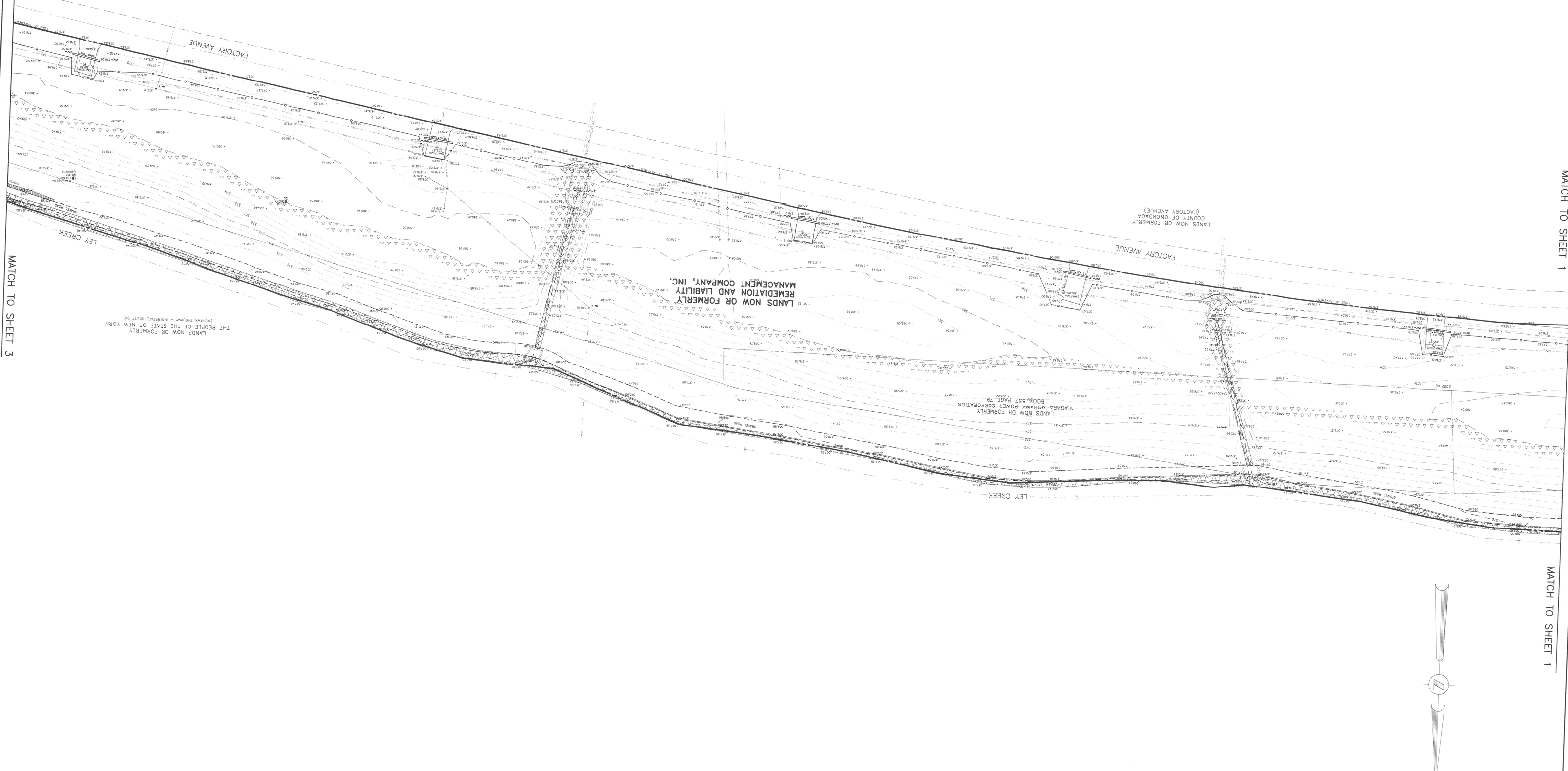
DATE FEBRUARY 2001

G-8

PLOT DATE: 02/13/01 MTW

Exhibit A

As-builts



PROJECT NUMBER: 99.02146

CAD DWG. FILE NAME: 6099ASBLTUPD.DWG

CAD DWG. FILE NAME: 6099ASBLTUPD.DWG

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BAR SCALE
40 0 20 40 80
1 inch = 40 ft.

MAP NOTES

1) NORTH ORIENTATION AND COORDINATE DATUM ARE BASED ON THE CENTRAL ZONE OF NEW YORK STATE PLANE COORDINATE SYSTEM AS ESTABLISHED BY DIFFERENTIAL G.P.S. METHODS.
2) VERTICAL DATUM IS BASED ON N.G.V.D. 1929.
3) TOPOGRAPHIC SURVEY OF EXISTING CONDITIONS BASED ON FIELD WORK CONDUCTED NOVEMBER 2000.

MAP REFERENCE

1) MAP ENTITLED " TOPOGRAPHIC AND BOUNDARY SURVEY, LANDS ALONG FACTORY AVE. AND LEY CREEK " FOR O'BRIEN & GERE ENGINEERS" DATED AUGUST 16, 1995. PREPARED BY C.T. MALE ASSOCIATES, P.C.

- ROAD- MIRAFI 600X FABRIC UNDERNEATH
- SEEDED WETLANDS
- EROSION MAT
- SOUTHERN LIMITS MIRAFI 140 FABRIC
- SANITARY MANHOLE
- CHAIN LINK FENCE
- UTILITY POLE
- MONITOR WELL
- RIP-RAP

AS DELINEATED BY CONTRACTOR

David J. Unmacht
050052
STATE OF NEW YORK
LICENSED LAND SURVEYOR
JOSEPH
AUGUST 2

DATE	REVISIONS /RECORD/DESCRIPTION	DRAFTER	CHECK	APPR.
12/29/00	MISCELLANEOUS REVISIONS	dwd	djv	
2/7/01	MISCELLANEOUS REVISIONS	dwd	djv	
08/08/01	Added gravel road, change topography	dms		

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© 2000 C.T. MALE ASSOCIATES P.C.

AS-BUILT TOPOGRAPHIC SURVEY
LEY CREEK
PREPARED FOR
ROYAL ENVIRONMENTAL

TOWN OF SALINA — ONONDAGA COUNTY, NEW YORK

APPROVED: djv
DRAFTED : djv/vpnous
CHECKED : djv
PROJ. NO: 99.02146
SCALE : 1"=40'
DATE : 12/22/00

C.T. MALE ASSOCIATES, P.C.
ARCHITECTURE & BUILDING SYSTEMS CONSULTING • CIVIL ENGINEERING
ENVIRONMENTAL SERVICES • SURVEY & LAND INFORMATION SERVICES
200 CATHEDRAL PARK DRIVE, P.O. BOX 5240
SYRACUSE, NY 13220-2240
315.458.8490 • FAX 315.458.4427

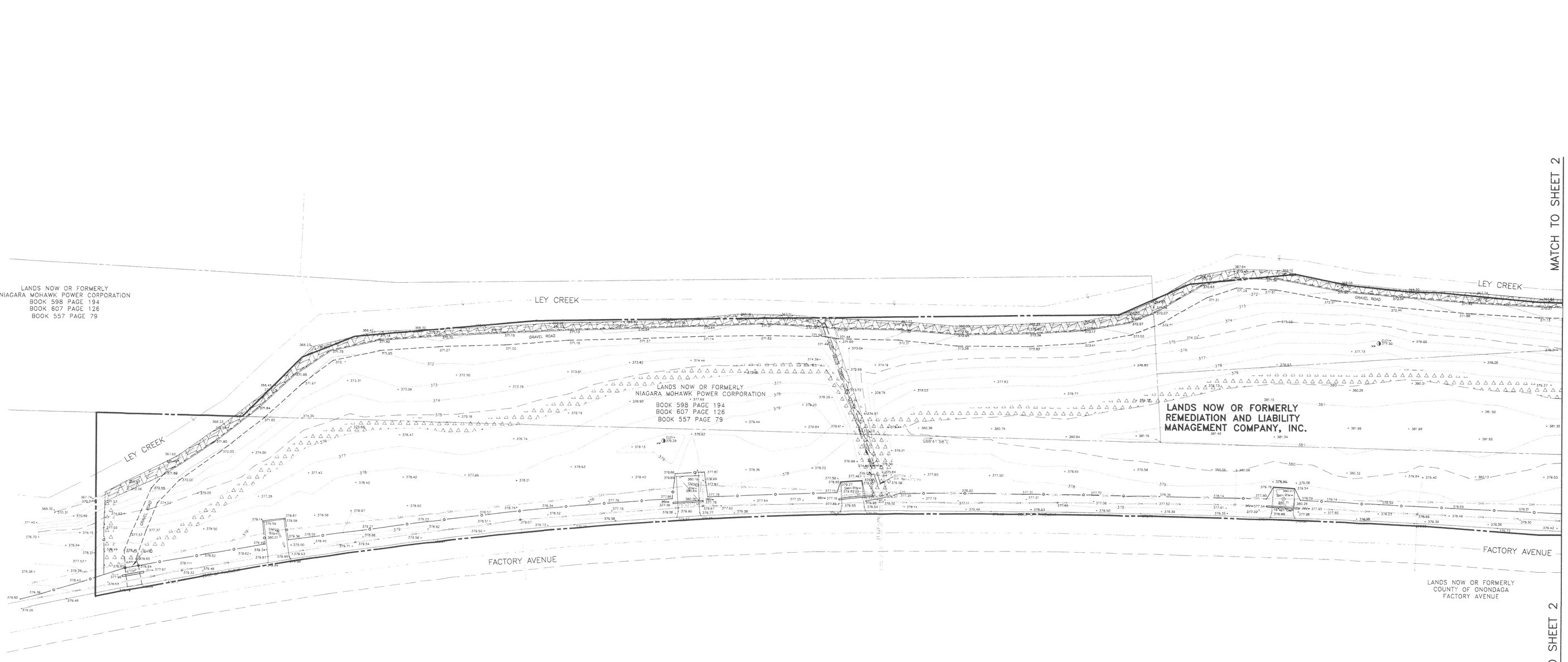
SHEET 2 OF 3
DWG. NO: 99-03920b

RECEIVED
AUG 1 0 2001
O'BRIEN & GERE ENGINEERS, INC
SYRACUSE, NY

NO XREFS

PROJECT NUMBER: 99.02146

CAD DWG. FILE NAME: 0SBASELTUP3.DWG



BAR SCALE
40 0 20 40 80
1 inch = 40 ft.

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ROAD– MIRAFI 600X FABRIC UNDERNEATH
SEEDED WETLANDS
EROSION MAT
SOUTHERN LIMITS MIRAFI 140 FABRIC
AS DELINEATED BY CONTRACTOR
SMH SANITARY MANHOLE
CHAIN LINK FENCE
UTILITY POLE
MONITOR WELL
RIP–RAP

RECEIVED
AUG 1 0 2001
O'BRIEN & GERE ENGINEERS, INC.
SYRACUSE, NY

David J. Uhrinec
050052
STATE OF NEW YORK
LICENSED PROFESSIONAL ENGINEER
OSOUVES
LICENSED LAND SURVEYOR

DATE		REVISIONS RECORD/DESCRIPTION	DRAFTER	CHECK	APPR.
12/29/00	1	MISCELLANEOUS REVISIONS	dwd	dju	
2/7/01	2	MISCELLANEOUS REVISIONS	dwd	dju	
08/08/01	3	Asbuilt gravel road; change topography	dms		
	4				
	5				
	6				
	7				
	8				
	9				

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PROJ. NO : 99.02146
SCALE : 1"=40'
DATE : 12/22/00

AS-BUILT TOPOGRAPHIC SURVEY
LEY CREEK
PREPARED FOR
ROYAL ENVIRONMENTAL

TOWN OF SALINA — ONONDAGA COUNTY, NEW YORK

C.T. MALE ASSOCIATES, P.C.
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ENVIRONMENTAL SERVICES • SURVEY & LAND INFORMATION SERVICES

SHEET 1 OF 3
DWG. NO: 99-0392ab

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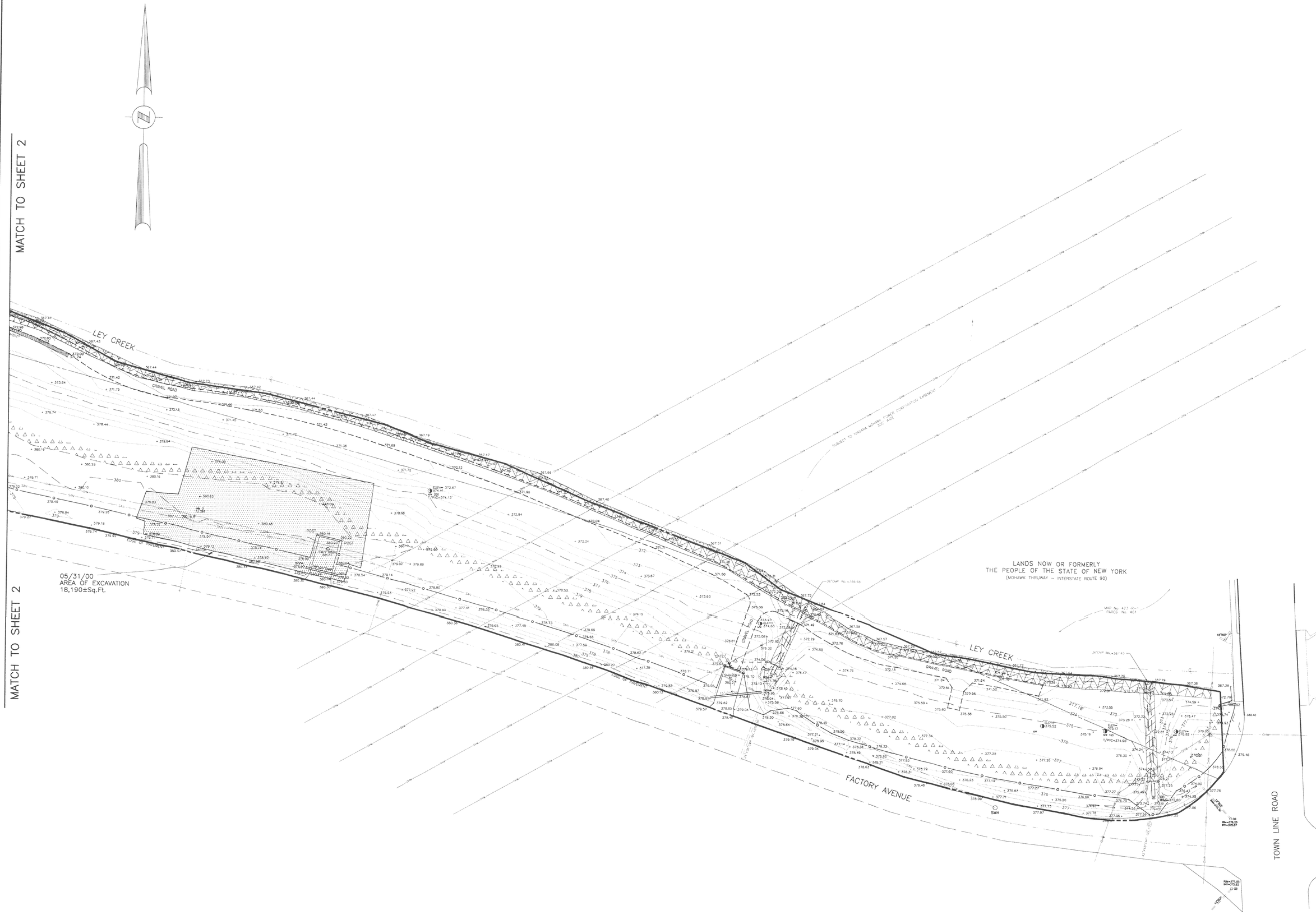
NO. AREA

PROJECT NUMBER: 99.02146

CAD DWG. FILE NAME: 0099SBLTUPD.DWG

MATCH TO SHEET 2

MATCH TO SHEET 2



BAR SCALE
40 0 20 40 80
1 inch = 40 ft.

MAP NOTES

1) NORTH ORIENTATION AND COORDINATE DATUM ARE BASED ON THE CENTRAL ZONE OF NEW YORK STATE PLANE COORDINATE SYSTEM AS ESTABLISHED BY DIFFERENTIAL G.P.S. METHODS.
2) VERTICAL DATUM IS BASED ON N.G.V.D. 1929.
3) TOPOGRAPHIC SURVEY OF EXISTING CONDITIONS BASED ON FIELD WORK CONDUCTED NOVEMBER 2000.

MAP REFERENCE

1) MAP ENTITLED " TOPOGRAPHIC AND BOUNDARY SURVEY, LANDS ALONG FACTORY AVE. AND LEY CREEK, FOR O'BRIEN & GERE ENGINEERS" DATED AUGUST 16, 1995. PREPARED BY C.T. MALE ASSOCIATES, P.C.

ROAD– MIRAFI 600X FABRIC UNDERNEATH
SEEDED WETLANDS
EROSION MAT
SOUTHERN LIMITS MIRAFI 140 FABRIC
AS DELINEATED BY CONTRACTOR
SMH SANITARY MANHOLE
CHAIN LINK FENCE
UTILITY POLE
MONITOR WELL
RIP–RAP

"ONLY COPIES OF THIS MAP SIGNED IN RED INK AND EMBOSSED WITH THE SEAL OF AN OFFICER OF C.T. MALE ASSOCIATES, P.C. OR A DESIGNATED REPRESENTATIVE SHALL BE CONSIDERED TO BE A VALID TRUE COPY"

RECEIVED
AUG 10 2001
O'BRIEN & GERE ENGINEERS, INC
SYRACUSE, NY

David J. Uhrinec
050052
STATE OF NEW YORK
DAVID JOSEPH UHRINEC
050052
LICENSED LAND SURVEYOR

DATE		REVISIONS RECORD/DESCRIPTION	DRAFTER	CHECK	APPR.
12/29/00	1	MISCELLANEOUS REVISIONS	dwd	dju	
2/7/01	2	MISCELLANEOUS REVISIONS	dwd	dju	
08/08/01	3	Asbuilt gravel road; change topography	dms		
	4				
	5				
	6				
	7				
	8				

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SHEET 3 OF 3
DWG. NO: 99–0392ab

Exhibit B

Property Legal Description

REMEDIATION AND LIABILITY MANAGEMENT COMPANY, INC.
LEGAL DESCRIPTION

Ley Creek PCB Dredgings Site
Registry Site # 734044

ALL THAT CERTAIN TRACT OR PARCEL OF LAND, situate in the Town of Salina, County of Onondaga, and State of New York, being a part of Military Lot 19 and being more particularly bounded and described as follows:

Commencing at a point said point being on the division line between the lands now or formerly of Ryacuss, Inc. on the east as described in Book 2461 of Deeds at page 215, the lands now or formerly of Niagara Mohawk Power Corporation on the west as described in Book 557 of Deeds at page 79, and the lands now or formerly of the County of Onondaga on the south, thence North 88 deg. 41 mm. 58 sec. West 1011.74 ft. to the Point of Beginning of the premises herein conveyed; thence South 88 deg. 41 mm. 58 sec. East along said division line between the said lands now or formerly of Niagara Mohawk Power Corporation on the north, and the said lands now or formerly of Ryacuss, Inc., in part by each, on the north and said lands now or formerly of the County of Onondaga on the south, 138.93 ft. to a point; thence through the said lands now or formerly of Niagara Mohawk Power Corporation the following three (3) courses: 1) North 44 deg. 43 mm. 32 sec. East 80.41 ft. to a point; thence 2) North 67 deg. 41 mm. 06 sec. East 53.22 ft. to a point; and 3) North 84 deg. 38 mm. 21 sec. East 173.77 ft. to a point on the division line between the said lands now or formerly of Niagara Mohawk Power Corporation on the south and the lands now or formerly of the People of the State of New York (Mohawk Thruway -Interstate 90) on the north; thence North 89 deg. 04 mm. 25 sec. East along said division line, 552.77 ft. to a point; thence through the said lands now or formerly of the People of the State of New York (Mohawk Thruway -Interstate 90) the following thirty six (36) courses and distances: 1) North 66 deg. 19 mm. 01 sec. East 74.55 ft. to a point; thence 2) North 84 deg. 13 mm. 59 sec. East 99.71 ft. to a point; thence 3) South 78 deg. 31 mm. 42 sec. East 50.48 ft. to a point; thence 4) South 84 deg. 21 mm. 17 sec. East 59.24 ft. to a point; thence 5) South 88 deg. 27 mm. 04 sec. East 29.92 ft. to a point; thence 6) South 84 deg. 52 mm. 13 sec. East 92.90 ft. to a point; thence 7) South 88 deg. 23 mm. 10 sec. East 94.66 ft. to a point; thence 8) South 82 deg. 50 mm. 08 sec. East 69.25 ft. to a point; thence 9) South 78 deg. 57 mm. 30 sec. East 74.32 ft. to a point; thence 10) South 83 deg. 35 mm 07 sec. East 127.11 ft. to a point; thence 11) North 82 deg. 41 mm. 20 sec. East 32.06 ft. to a point; thence 12) South 84 deg. 06 mm. 07 sec. East 56.05 ft. to a point; thence 13) North 87 deg. 48 mm. 02 sec. East 69.86 ft. to a point; thence 14) North 86 deg. 17 mm. 34 sec. East 92.47 ft. to a point; thence 15) South 84 deg. 25 mm. 32 sec. East 73.40 ft. to a point; thence 16) South 78 deg. 58 mm. 54 sec. East 104.85 ft. to a point; thence 17) South 81 deg. 27 mm. 57 sec. East 95.96 ft. to a point; thence 18) South 84 deg. 06 mm. 51 sec. East 82.69 ft. to a point; thence 19) South 68 deg. 05 mm. 54 sec. East 147.10 ft. to a point; thence 20) South 84 deg. 50 mm. 31 sec. East 97.81 ft. to a point; thence 21) South 74 deg. 24 mm. 25 sec. East 72.58 ft. to a point; thence 22) South 70 deg. 11 mm. 19 sec. East 78.60 ft. to a point; thence 23) South 74 deg. 23 mm. 40 sec. East 57.62 ft. to a point; thence 24) South 71 deg. 58 mm. 57 sec. East 72.71 ft. to a point; thence 25) South 71 deg. 47 mm. 47 sec. East 68.66 ft. to a point; thence 26) South 74 deg. 16 mm. 31 sec. East 151.32 ft. to a point; thence 27) South 68 deg. 37 mm. 25 sec. East 68.45 ft. to a point; thence 28) South 60 deg. 33 mm. 44 sec. East 53.98 ft. to a

point; thence 29) South 74 deg. 34 mm. 26 sec. East 71.99 ft. to a point; thence 30) South 82 deg. 20 mm. 49 sec. East 75.63 ft. to a point; thence 31) South 75 deg. 45 mm. 39 sec. East 118.47 ft. to a point; thence 32) South 68 deg. 26 mm. 57 sec. East 44.40 ft. to a point; thence 33) South 75 deg. 02 mm. 22 sec. East 71.59 ft. to a point; thence 34) South 66 deg. 13 mm. 05 sec. East 84.02 ft. to a point; thence 35) South 69 deg. 05 mm. 51 sec. East 163.94 ft. to a point; and 36) South 53 deg. 19 mm. 26 sec. East 41.63 ft. to a point on the division line between the lands now or formerly of the County of Onondaga on the south and the lands now or formerly of the People of The State of New York (Mohawk Thruway-Interstate 90) on the north; thence along the division line between the lands now or formerly of the County of Onondaga on the south and the lands now or formerly of the People of the State of New York (Mohawk Thruway-Interstate 90) on the north the following two (2) courses: 1) along the arc of a non-tangent curve to the right having a radius of 3,368.16 ft., a length of 140.70 ft. and a chord bearing South 68 deg. 00 mm. 32 sec. East 140.69 ft. to a point; and 2) South 66 deg. 45 mm. 59 sec. East 16.75 ft. to the Point of Beginning; thence through the said lands now or formerly of The People of the State of New York (Mohawk Thruway-Interstate 90) the following five (5) courses: 1) South 81 deg. 01 mm. 17 sec. East 35.07 ft. to a point; thence 2) South 79 deg. 02 mm. 20 sec. East 63.22 ft. to a point; thence 3) South 87 deg. 59 mm. 04 sec. East 49.76 ft. to a point; 4) South 84 deg. 45 mm. 16 sec. East 82.73 ft. to a point and 5) South 81 deg. 44 mm. 13 sec. East 43.03 ft. to a point on the westerly margin of Town Line Road; thence South 03 deg. 07 mm. 16 sec. East along said margin, 76.14 ft. to a point on the division line between the lands now or formerly of the County of Onondaga on the south and the lands now or formerly of the People of the State of New York (Mohawk Thruway-Interstate 90) on the north; thence through the said lands now or formerly of the County of Onondaga the following twenty one (21) courses and distances: 1) along the arc of a non tangent curve to the right having a radius of 136.44 ft., an arc length of 58.74 ft., a chord bearing of South 47 deg. 04 mm. 14 sec. West and a chord distance of 58.29 ft. to a point of compound curvature; thence 2) along the arc of a non tangent curve to the right having a radius of 213.90 ft., an arc length of 107.20 ft., a chord bearing of South 88 deg. 50 mm. 00 sec. West, and a chord distance of 106.08 ft. to a point; thence 3) North 80 deg 33 mm. 34 sec. West 53.35 ft. to a point; thence 4) North 76 deg. 21 mm. 41 sec. West 103.74 ft. to a point; thence 5) North 71 deg. 09 mm. 14 sec. West 110.20 ft. to a point; thence 6) North 70 deg. 44 mm. 08 sec. West 144.67 ft. to a point; thence 7) North 71 deg. 16 mm. 26 sec. West 89.71 ft. to a point; thence 8) North 72 deg. 47 mm. 34 sec. West 90.15 ft. to a point; thence 9) North 74 deg. 01 mm. 17 sec. West 90.85 ft. to a point; thence 10) North 75 deg. 58 mm. 23 sec. West 93.53 ft. to a point; thence 11) North 77 deg. 23 mm. 04 sec. West 188.00 ft. to a point; thence 12) North 78 deg. 19 mm. 57 sec. West 239.33 ft. to a point; thence 13) North 78 deg. 47 mm. 50 sec. West 334.16 ft. to a point; thence 14) North 78 deg. 53 mm. 44 sec. West 342.52 ft. to a point of curvature; thence 15) along the arc of a non tangent curve to the left having a radius of 6042.48 ft., an arc length of 453.67 ft., a chord bearing of North 80 deg. 55 mm. 53 sec. West and a chord distance of 453.57 ft. to a point of compound curvature; thence 16) along the arc of a non tangent curve to the left having a radius of 5062.11 ft., an arc length of 340.69 ft., a chord bearing of North 84 deg. 55 mm. 49 sec. West 340.62 ft. to a point; thence 17) South 89 deg. 54 mm. 50 sec. West 79.82 ft. to a point; thence 18) North 85 deg. 51 mm. 50 sec. West 110.37 ft. to a point of curvature; thence 19) along the arc of a non tangent curve to the left having a radius of 9081.78 ft., an arc distance of 558.32 ft., a chord bearing of North 89 deg. 11 mm. 44 sec. West and a chord distance of 558.23 ft. to a point of compound curvature; thence 20) along the arc of a non tangent curve to the left having a radius of 3880.39 ft., an arc distance of 709.26 ft., a chord

bearing of South 83 deg. 16 mm. 27 sec. West and a chord distance of 708.27 ft. to a point; thence 21) North 00 deg. 00 mm. 00 sec. East 176.25 ft. to the point or place of beginning. Containing 19.058 acres of land more or less.