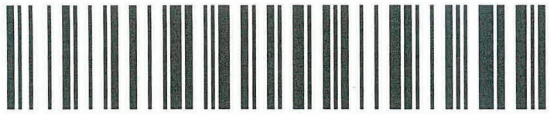


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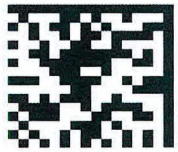
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City of Amsterdam
Amsterdam, NY

Remedial Action Work Plan

for the

Mohasco Mills Complex

ENSR Corporation
March 2004
Document Number 10472-001

ENSR International
3 Marcus Boulevard
Albany, NY 12205-1140
(518) 453-6444
www.ensr.com

March 25, 2004

Mr. Larry Alden
New York State Department of Environmental Conservation
Division of Environmental Remediation
12th Floor
625 Broadway
Albany NY 12233-7013

RECEIVED
MAR 26 2004

RE: Former Mohasco Mills, City of Amsterdam Remedial Action Work Plan
ENSR Project Number 10472-001

Dear Larry

Please find enclosed three copies of the Draft Remedial Action Work Plan for the Former Mohasco Mills Facility located in the City of Amsterdam, New York. This document has been prepared to illustrate the proposed remedial action for the site. The document was prepared following the remedial strategy presented in the Record of Decision (ROD) dated April 2001, and additional discussions held between the City of Amsterdam and the New York State Department of Environmental Conservation following issuance of the ROD.

If you have any questions or comments concerning the enclosed document please fell free to contact me at (518) 453-6444 ext. 104.

Sincerely,

Christopher Gaule
ISC Department Manager - New York

enclosures:

City of Amsterdam
Amsterdam, NY

Remedial Action Work Plan

for the

Mohasco Mills Complex



ENSR Corporation
March 2004
Document Number 10472-001

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Appendix A ENSR Quality Assurance SOPs

EXECUTIVE SUMMARY

The City of Amsterdam (the City) has prepared this Remedial Action Work Plan (RAWP) to address exceedances of risk based criteria caused by residual contamination present within the former Mohasco Mills Complex located in Amsterdam, New York. Prior to the completion of this RAWP, the City completed a comprehensive site investigation and site-specific exposure evaluation. The results of this investigation and exposure assessment indicated that the remedial action is required to contain the polycyclic aromatic hydrocarbon (PAH) contamination identified at the site.

The objective of the remediation activities presented in this RAWP will be to contain the movement of PAHs by placing a soil cover over surfaces where contaminants exceed site background levels. In addition to limiting the movement of the contamination, erosion prevention and direct exposure prevention efforts are included.

Based on the site specific conditions and the desire to address the contamination in a cost effective and timely manner, three alternatives were evaluated in the SI/RAR; "No further action;" "Limited soil removal with off-site disposal;" and "Soil cover with on-site building demolition" were selected for detailed evaluation. For all three alternatives, a deed restriction was proposed to prevent the use of groundwater at the site and require appropriate action (excavation and proper disposal) should intrusive activities disturb contaminated soils. Based on the detailed evaluation, soil cover with on-site building demolition was selected in the Record of Decision (ROD) as the most cost effective and readily implementable remedial option for this site. Implementation of this alternative is expected to require a construction period of approximately six (6) months.

1.0 INTRODUCTION

The former Mohasco Mill complex (the site) is located at the intersection of Forest Avenue and Lyon Street in the City of Amsterdam, Montgomery Country, New York (the City). The site location is shown on Figure 1, Site Location Map. The North Chuctanunda Creek bisects the site from the northeast to the southwest. The remains of large buildings, building foundations, demolition debris, and a parking lot cover most of the central and northern section of the property.

1.1 Summary of the Remediation Goals and Future Use of the Site

The overall remedial goal is to meet all Standards, Criteria and Guidance (SCGs) and be protective of human health and the environment. At a minimum, the remedy selected should eliminate or mitigate all significant threats to the public health and to the environment presented by the hazardous substances disposed of at the site through proper application of scientific and engineering principles. The proposed future use for the Former Mohasco Mill Complex is a park/business office complex. The goals selected for this site are:

- Reduce and control, to the extent practicable, the contamination present within the soils on site.
- Reduce the threat to benthic organisms in the North Chuctanunda Creek by eliminating any future contaminated surface run-off from the contaminated soils on site.
- Eliminate the potential for direct human or animal contact with the contaminated soils on site.
- Reduce the threat from physical hazards that exist on site.

1.2 Summary of Previous Environmental Site Assessments Completed at the Site

Alpha Earth, Inc. conducted an environmental site assessment of the site in 1995. Asbestos containing materials (ACM) in the buildings, lead-based paints, electrical transformers containing PCB oil, and several drums of corrosive chemicals were found on-site. Discharge of spent chemicals into the Chuctanunda Creek was documented from interviews with former Mohasco employees.

1.3 Summary of Site Investigations

A site investigation was implemented to define the nature and extent of the contamination that resulted from the previous activities at the site. The site investigation included soil boring and monitoring well installation for soil and groundwater analysis as well as physical properties of soil and hydrogeologic

conditions. Surficial soil samples were collected and analyzed to determine the extent of contamination. To determine the extent of subsurface contamination, a series of test pits were dug to investigate possible buried transformers. The North Chuctanunda Creek was sampled for water and sediment analysis before merging with the Mohawk River. Finally, asbestos and lead paint surveys were conducted in all remaining buildings located on site.

The analytical data for the samples collected was compared to environmental SCGs. Certain areas and media located on the site were found to require remediation. All contamination levels of concern are based on guidance taken from NYSDEC Ambient Water Quality Standards and Guidance Values, Part V of NYS Sanitary Code, NYSDEC TAGM 4046, and NYSDEC Technical Guidance for Screening Contaminated Sediments guidelines.

2.0 SITE SPECIFIC CONCEPTUAL MODEL

2.1 Site Specific Features

The site is approximately 23.5 acres and is located at the southwest corner of the intersection of Forest Avenue and Lyon Street within the City of Amsterdam, Montgomery Country, New York. The North Chuctanunda Creek bisects the site from the northeast to the southwest. The Mohawk River is located approximately 1.25 miles southwest of the site. The remains of large buildings, building foundations, demolition debris, and a parking lot cover most of the central and northern section of the property. An abandoned railroad and the former steam plant building are on the western and southern portion of the property. See Figures 1 and 2 for more detail.

2.2 Nature and Extent of Contamination

The contaminants detected at this site were semi-volatile organic compounds (SVOCs), metals, polychlorinated biphyenols (PCBs), and pesticides. The PCB contamination at the site are compounds referred to as polycyclic aromatic hydrocarbons (PAHs), and are a byproduct of combustion. The sources of the PAHs include power plants, automobile emissions and industrial processes. The relatively high concentrations of PAHs and certain metals found at this site are likely the result of the fires that occurred at the site, as well as the ash and soot from the former coal burning steam power plant.

PAH compounds and metals were detected in surface soil samples at concentrations above guidance values in the vicinity of the former steam plant, with the highest concentrations detected at the sample collected immediately southeast of the steam plant. This was determined to be the former site of the old railroad trestle.

Concentrations of the PAHs benzo[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, and benzo[a]pyrene, as well as the pesticide dieldrin, exceeded the TAGM cleanup objectives in subsurface soil samples collected from the area south of Building 11. The highest concentration of total SVOCs detected in a sample in this area was approximately 400 ppm. Although the SCG for soil, for total SVOCs is 500 ppm, the concentrations of individual compounds such as benzo[a]anthracene and benzo[a]pyrene exceeded the SCG by more than two orders of magnitude. The concentrations of metals barium, copper, and zinc exceeded the SCG by at least one order of magnitude in the samples collected from this area.

Samples collected from test pits in the drain lines in the floor of Building 7, the former dye house, had high levels of pesticides aldrin and dieldrin in addition to elevated concentrations of metals.

In stream sediment samples collected immediately downstream of the site, concentrations of the PAHs anthracene benzo[a]anthracene, phenanthrene, 2-methylnathalene, pyrene, naphthalene, acenaphthene, fluorine, and fluoranthene exceeded the Technical Guidance for Screening Contaminated Sediments chronic toxicity level. Screening of sediment samples as part of the ecological risk assessment indicates that a risk could exist for aquatic life in the North Chuctanunda Creek from the presence of PAHs, arsenic, lead, and zinc.

Groundwater in the vicinity of the main building complex has not been adversely impacted based on the results of the samples collected. Contaminants were detected at low levels in a few locations, but no plume of groundwater contamination was identified.

The only surface water on site is the North Chuctanunda Creek, which is a rapidly flowing large Class C stream. Any soluble contaminants that may have been discharged to the stream while the mill was operating, or during the fires, have long since washed downstream. Since the groundwater in the vicinity of the main building complex has not been impacted from the site, and contaminants that were detected in soils (PAHs and metals) do not readily dissolve in water, the water in the North Chuctanunda Creek was only sampled for pesticides and PCBs.

PISCES samplers, sampling devices that are used to detect the presence of pesticides and PCBs in flowing water, were placed in the stream for a 21-day period. The results showed non-detect to trace levels of PCBs, with no increase in concentrations downstream of the site area. This data indicates that the site does not adversely impact water quality in the creek.

and no pesticides?

3.0 INTERIM REMEDIAL MEASURES

Interim Remedial Measures (IRMs) are conducted at sites when a source of contamination or exposure pathway can be effectively addressed before completion of a SI/RAR.

During the Site Investigation, NYSDEC staff discovered abandoned electrical transformers leaking PCB oil and a large amount of friable asbestos at the former steam power plant. Upon making this discovery, the NYSDEC requested an emergency remedial response action from the USEPA. The USEPA responded, and from October 1999 through March 2000, an extensive IRM was undertaken in and around the former steam plant portion of the site. The IRM included removal and proper disposal of PCB transformers, asbestos containing materials, coal and fly ash, and approximately 195 tons of PCB contaminated soil.

A second IRM was conducted at the former steam plant in August 2000. This IRM involved the removal and proper disposal of a 100,000 gallon above-ground storage tank containing approximately 6,500 gallons of oil and sludge, and removal and proper disposal of approximately 100 tons of petroleum contaminated soil.

Sampling performed after the completion of these IRMs indicates that they were successful in removing PCB and hydrocarbon contaminants above SCG levels.

4.0 SUMMARY OF REMEDIATION

4.1 Remedial Action

Alternative remedial actions were investigated as part of the Remedial Alternatives Report of this site completed in January 2001. The Remedial Alternatives Report includes a complete discussion of the alternatives considered and the justification for the selection of this remedial action. This report is available to the public through the City and the document repository for this project. The selected remedial action consists of the following tasks:

- A design program to provide the details necessary for the construction, operation and maintenance, and monitoring of the selected remedial alternative. Any uncertainties identified during the SI/RAR will be resolved. The contractor's scope of work under this alternative will include the collection of additional surface soil samples to more accurately identify the lateral extent of PAH surface soil contamination. This information will be used to minimize the amount of soils to be consolidated and covered. Background levels for PAHs at the site will also be further determined through this additional sampling. Areas of the site having PAH levels that do not exceed background will not require protective cover.

- Removal of debris along the stream bank, with consolidation and regrading of contaminated soils.

- Those portions of the site which have PAH levels in excess of the site background levels will be regraded and covered with a protective layer of two feet of clean soil for green spaces (i.e., areas not occupied by buildings, pavement or sidewalk). Beneath the two-foot soil layer, a geotextile fabric will be installed to serve as a demarcation layer and to prevent inadvertent contact with contaminated soils.

  The soil cover material will be sloped as necessary to allow for gradual elevation transition from paved areas on the site to the final grade of the soil cover. Any excavated material not used for regrading purposes will be shipped off site to an approved and permitted landfill.

  Acceptable alternative protective cover possibilities could be: sidewalks, parking lots, building footprints, or other acceptable strategies that provide a barrier to contact with the contaminated subsurface soils.

- A deed restriction will require owners to annually certify to the NYSDEC that the remedy and protective cover have been maintained and that the conditions at the site are fully

protective of public health and the environment in accordance with the ROD for this site. Deed restrictions will also limit the uses of the property to recreational, commercial, or industrial.

- A deed restriction will require that, if development or excavation occurs on site, any subsurface soils below the protective layer that are excavated will either have to be disposed of off site at an approved and permitted landfill in accordance with NYSDEC regulations or redeposited on site, and covered by the filter fabric and a two foot soil cover. In the event that the excavation work involves redepositing soil from below the filter fabric demarcation layer on site, a soil management plan must first be submitted to and approved by the NYSDEC. The soil management plan will include detailed plans for sampling, staging, regrading, and covering the excavated soils.

- Removal and off-site disposal of debris under the Building 31 foundation.

- Removal and off-site disposal of pesticide contaminated sludge or soil in the drain lines in Building 7.

- Demolition of the foundations of Buildings 7, 7A, 11 and 26.

- Asbestos abatement and demolition of Buildings 20A, 36 and the smoke stack at the former steam power plant building.

- Decommissioning of the monitoring wells.

Figure 3, Proposed Conditions, identifies the areas where the different types of work will be completed.

The removal and off-site disposal of sludge or soil in the drain lines in building 7 addresses a local hot spot of potentially hazardous contamination. The demolition of the remaining foundations of Buildings 7, 7A, 11 and 26, and demolition of Buildings 20A and 36, will eliminate a recognized public safety hazard. Similarly, the debris and physical hazards under the Building 31 foundation will be removed, but the foundation will remain. The debris along the stream bank will also be removed, and the soils consolidated and regrading along the stream. The smokestack at the former steam power plant will also be demolished. The demolition and other debris will be deposited and compacted at the location of the former buildings 7, 7A, 11 and 26, and in an area immediately south of the former steam power plant. A layer of cushion soil and a geotextile fabric will be placed over the graded debris, and a two-foot thick soil cover constructed. The soil-covered areas will be seeded and grass established. Deed restrictions would control excavation and restrict the use of groundwater.

Although game fish are not a consideration in the stream with in the vicinity of the site, game fish are an important consideration further downstream and in the Mohawk River. It is necessary to stop the

leaching of contaminants into the creek to protect the ecosystem and benthic life in the stream, and prevent possible future downstream impacts to game fish in the Mohawk River. This will be addressed by removing material with the highest concentrations of PAHs from the banks of the creek, and preventing erosion of surface soils containing PAHs and elevated concentrations of metals.

4.2 Institutional Controls, Engineering Controls

The remedial action utilizes both institutional and engineering controls to achieve protection of human health and the environment from the residual contamination at the site. The soil cap over the buried debris is the engineering control. The soil cover will prevent direct exposure to PAHs and elevated metals in surface soils, as well as prevent the continued erosion of contaminated soils into the North Chuctanunda Creek sediments. This soil cover will be seeded and maintained until the vegetation is adequately established. The long term maintenance of this soil cover will also be a requirement of any new occupants of the Site.

The institutional controls consists of the deed restrictions, which will prevent groundwater use on site, until it can be shown that concentrations of contaminants are at or below SCGs. SCGs for groundwater were only slightly exceeded in a few locations. Since the area is served by a public water supply, groundwater is not used for human consumption. Therefore, a human ingestion or exposure to these low levels of contaminants in the groundwater is not likely. Over time, these low levels of contaminants in the groundwater will naturally attenuate, and concentrations should eventually reach SCG levels. The deed restrictions will also place conditions on future excavation at the site.

4.3 Asbestos and Lead Pre-Demolition Surveys

Prior to the demolition of the remaining buildings, pre-demolition surveys for asbestos containing materials and lead-based paint will be conducted. The results of these surveys will provide the guidance needed to abate the asbestos containing materials and lead-based paint prior to building demolition. These abatement actions, both removal actions and off-site waste disposal, will be conducted in accordance with all applicable state and federal regulations.

5.0 PROJECT ORGANIZATION

5.1 Design Phase

ENSR International will provide engineering design and project management services to the City during the design phase. Christopher Gaule, ENSR's New York Customer Service Center Integrated Site Closure Department manager, will serve as the Project Manager. As such, he will be the primary point of contact between ENSR and the City. Mr. Gaule has approximately six years' experience with the Mohasco Mills site, having worked extensively on the Remedial Investigation.

James P. Sprague, PMP, PE, will lead the engineering design effort. Other ENSR staff will support the design effort as needed. ENSR has the necessary project staff available to fully support the production needs of this project. ENSR also has a diverse group of senior technical resource staff available to provide advice and senior overview to the project staff.

5.2 Construction Phase

ENSR will provide engineering support to the City during the bidding process. This will include coordination of the release of the project for bids, conducting a pre-bid site visit for the bidders, answering Request for Information, tabulating the bids received, and making a selection recommendation to the City. Mr. Gaule, Mr. Sprague, and other support staff, as required, will be involved in this effort.

During the actual construction of the remedial action ENSR will provide a full-time, on-site, owner's representative. Kevin Kogut, of ENSR's Albany, New York, office is scheduled to fill this role. Mr. Kogut will track the remediation contractors activities, documenting the work that occurs, and coordinate the exchange of information between ENSR's design team, the contractor, the New York State Department of Environmental Conservation (NYSDEC), and the City. As an owner's representative, under contract to the owner for only this service, Mr. Kogut will not have authority to provide direction to the remediation contractor. The City's representative will retain the authority, and responsibility, for providing direction to the remediation contractor. We anticipate that Mike Palmer, City Engineer for the City, will be the City's project representative.

6.0 REPORTING

6.1 Certification Report Contents

The formal documentation and reporting of the remedial action will be contained in a final Certification Report. This report will include the following:

- a copy of the original remedial design plans and specifications;
- ENSR's owner's representative's daily logs of the remedial action construction;
- record drawings documenting the final site topography, the limits of the soil caps, and the limits of the buried debris;
- documentation of the proper off-site disposal of waste that is generated by the remedial action;
- photographs of the progress of the construction activities; and
- a copy of the deed restriction that is included in the remedial action.

A copy of the final certification report will be provided to the City both in hard copy and electronic format. One hard copy of the report will also be placed in the local public repository for documents related to this site.

7.0 REMEDIAL SCHEDULE

7.1 Site Closure.

The following project schedule is anticipated for the remediation of the subject site.

Application submitted to the NYSDEC for a Super Fund grant:	10 October 2003
Receipt of approval of Application from NYSDEC	1 February 2004
Design Activities completed and submitted to the City and NYSDEC	
Design approval received from the City	
Design approval received from NYSDEC	16 April 2004
Project released to bidders	3 May 2004
Bids due	17 May 2004
Contractor Selected	31 May 2004
Award made	14 June 2004
On-site Activity Begins	28 June 2004
Anticipated Completion of on-site activity	31 December 2004

Surface restoration work, paving and seeding, may be postponed until the spring of 2005 due to weather considerations.

8.0 PROJECT PLANS

8.1 Minority-Owned Business Enterprise and Women-Owned Business Enterprise Utilization Plan

ENSR will pursue the utilization of Minority-Owned Business Enterprises (MBE) and Women-Owned Business Enterprises (WBE) on this project through the subcontracting opportunities. We anticipate that qualified MBE/WBE firms can be identified to provide the boundary and topographic surveys needed, the duplication of the project plans and specifications for the bidding process, and the heavy equipment and operators needed to complete the remaining subsurface investigation work. ENSR has established a goal of subcontracting 6 percent of the authorized project fee to MBEs and 6 percent to WBEs. This goal applies only to the efforts that ENSR is under contract to provide, it does not apply to the actual construction contract cost.

8.2 Quality Assurance and Quality Control Plan

8.2.1 Design Phase

During the design phase ENSR's standing Quality Assurance practices will be followed. ENSR Standard Operating Procedure (SOP) No. 1003, Senior Review, and SOP No. 1004, Control and Review of Drawings, are applicable to this design effort. Copies of these documents are attached as Appendix A.

8.2.2 Construction Phase

During the construction phase, a project specific Quality Assurance and Quality Control (QA/QC) Planwill be followed. This plan will specify procedures for shop drawing review, material approvals, procedure approval, progress tracking, testing of work-in-place, and final acceptance of the work. This plan will be included in the project manual released at the time of bidding.

ENSR's on-site owner's representative will be the individual primarily responsible for assuring that the construction phase QA/QC Plan is followed. Documentation of the QA/QC activities will be included in the owner's representative's daily logs of the work. Deviations from the QA/QC Plan will be carefully noted and reviewed with the City, with necessary corrective action taken promptly so as to minimize the negative impact of the deviation.

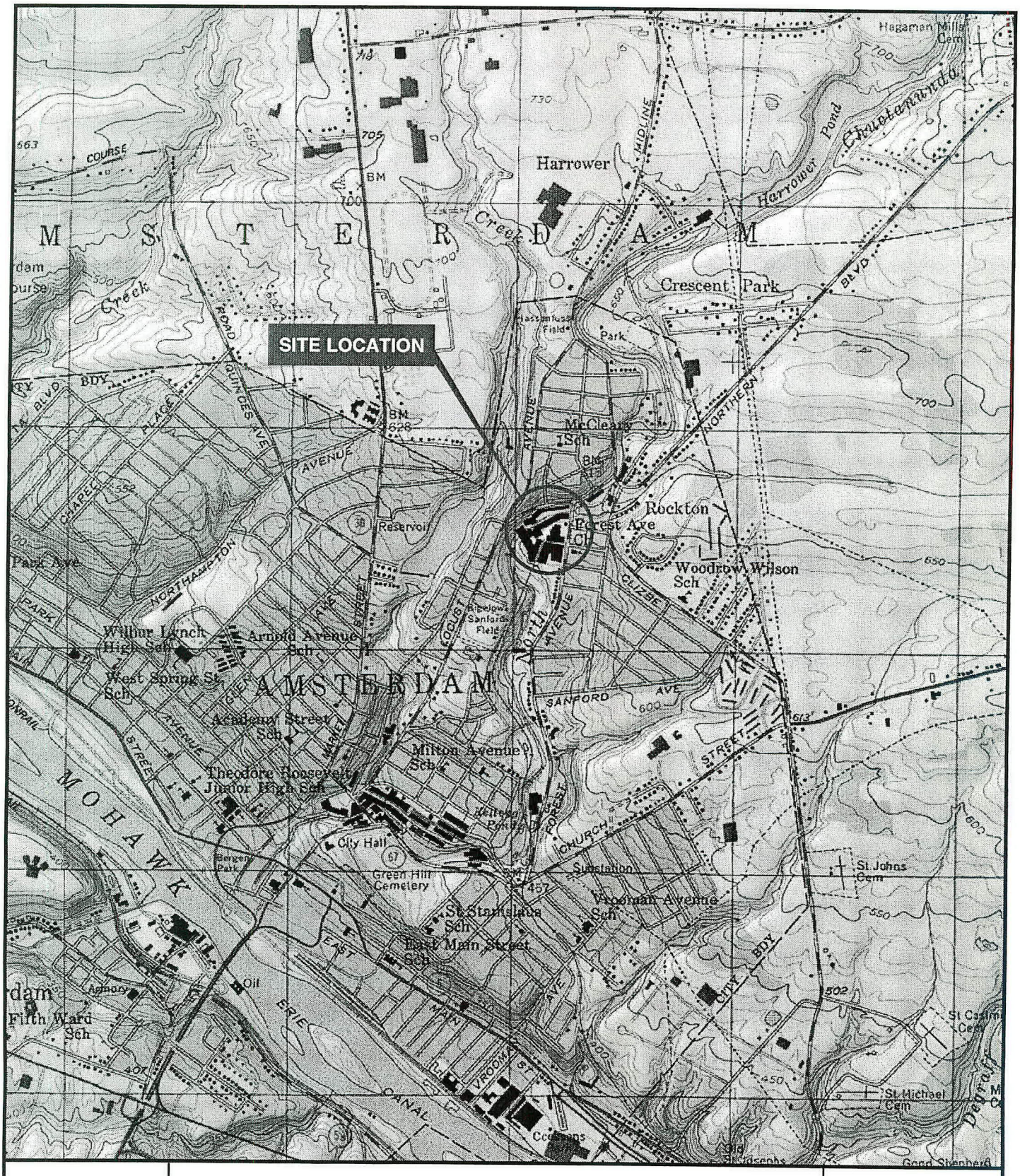
8.3 Health and Safety Plan

A project specific Health and Safety Plan (HASP) will be developed during the design phase and included in the project manual released at the time of bidding. This HASP will cover the basic procedures, emergency information, and personal protective equipment that will be necessary to keep ENSR's on-site owner's representative safe during the implementation of the remedial action. This HASP will not suffice as a HASP for the remedial contractor. The specifics of all of the activities that the contractor will engage in during the implementation of the remedial action are not known to ENSR, nor will they be known prior to a remedial contractor being selected. Therefore, the bidding documents will require that the successful contractor develop, and submit to the City for review, a project specific HASP. The City may, at its discretion, comment on the contractor's HASP, but will not approve the HASP. Responsibility for maintaining a safe work site, for the contractor's employees and all others that visit the site during the project, will remain entirely with the contractor.

9.0 REMEDIAL DESIGN PLANS AND SPECIFICATIONS

The Remedial Design Plans and Specifications will be finalized following the receipt of comments on this RAWP. This RAWP will not be revised in response to the comments. A memo of response to comments will be issued, and the comments provided will be reflected in the final Remedial Design Plans and Specifications, as detailed in the memo of response. The current target date for the issue of the plans and specifications is shown in the proposed project schedule presented in Section 5.0.

FIGURES


SITE LOCATION
AMSTERDAM
MOHAWK
Harrower
Crescent Park
Rockton
Forest Ave
Woodrow Wilson Sch
McClean Sch
Reservoir
Wilbur Lynch High Sch
Arnold Avenue Sch
West Spring St Sch
Academy Street Sch
Milton Avenue Sch
Theodore Roosevelt Junior High Sch
City Hall
Green Hill Cemetery
St Stanislaus Sch
East Main Street Sch
Vrooman Avenue Sch
Fifth Ward Sch
Armory
Oil
Substation
St Johns Cem
St Michael Cem
Hagaman Mills Cem
Harrower Pond
Chuctanunda Creek
Mohawk River
Erie Canal
Legend
N
0 500 1,000 2,000
Feet
ENSR INTERNATIONAL

LYON AVENUE
BROOKSIDE AVENUE
PARCEL 2
WILBUR STREET
STREET
POLE
I.P.F./B.T.
CONC. RETAINING WALL
I.P.F./CONC.
I.P.F./CONC. (2)
BLACKTOP PAVEMENT & PARKING AREA
FIRE HYD.
BOLT/B.T.
(BRIDGE)
Chuctanunda Creek
BLACKTOP PAVEMENT
LAKESIDE AVENUE
I.R.F.
FIRST ST.
FIRST STREET
LOCUST AVENUE
ELIAS
KRULL ST.
CURB
STREET
I.P.F./CONC.
I.P.F.
I.P.F./B.T.
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
MW-12
MW-13
MW-14
MW-15
MW-16
Creek
DAM
Demolish
Foundation
Remove debris
beneath foundation
ROD says keep.
ROD says remove.
Already taken down
BUILDING
Demolish Steel
STEAM PLANT (Approx. Location)
RIGHT OF WAY B.609 P.83
CHAIN LINK FENCE
NAIL IN BRASS PIPE
PRIVATE OWNER
DEED LINE
Chuctanunda
STORM SEWER DISCHARGE
DEBRIS
FORMERLY THE AMSTERDAM CHUCTANUNDA and NORTHERN RAILROAD
APPROX. PROPERTY LINE SCALED FROM TAX MAP
FOREST AVE.
FOREST
SECOND ST.
CURB

100 0 100 200
SCALE IN FEET
1" = 100'

FILENAME: 10472001.DWG

REVISIONS			
NO.	DESCRIPTION:	DATE:	BY:

DESIGNED BY:
DRAWN BY: J.E.B
CHECKED BY: J.P.S
APPROVED BY: J.P.S

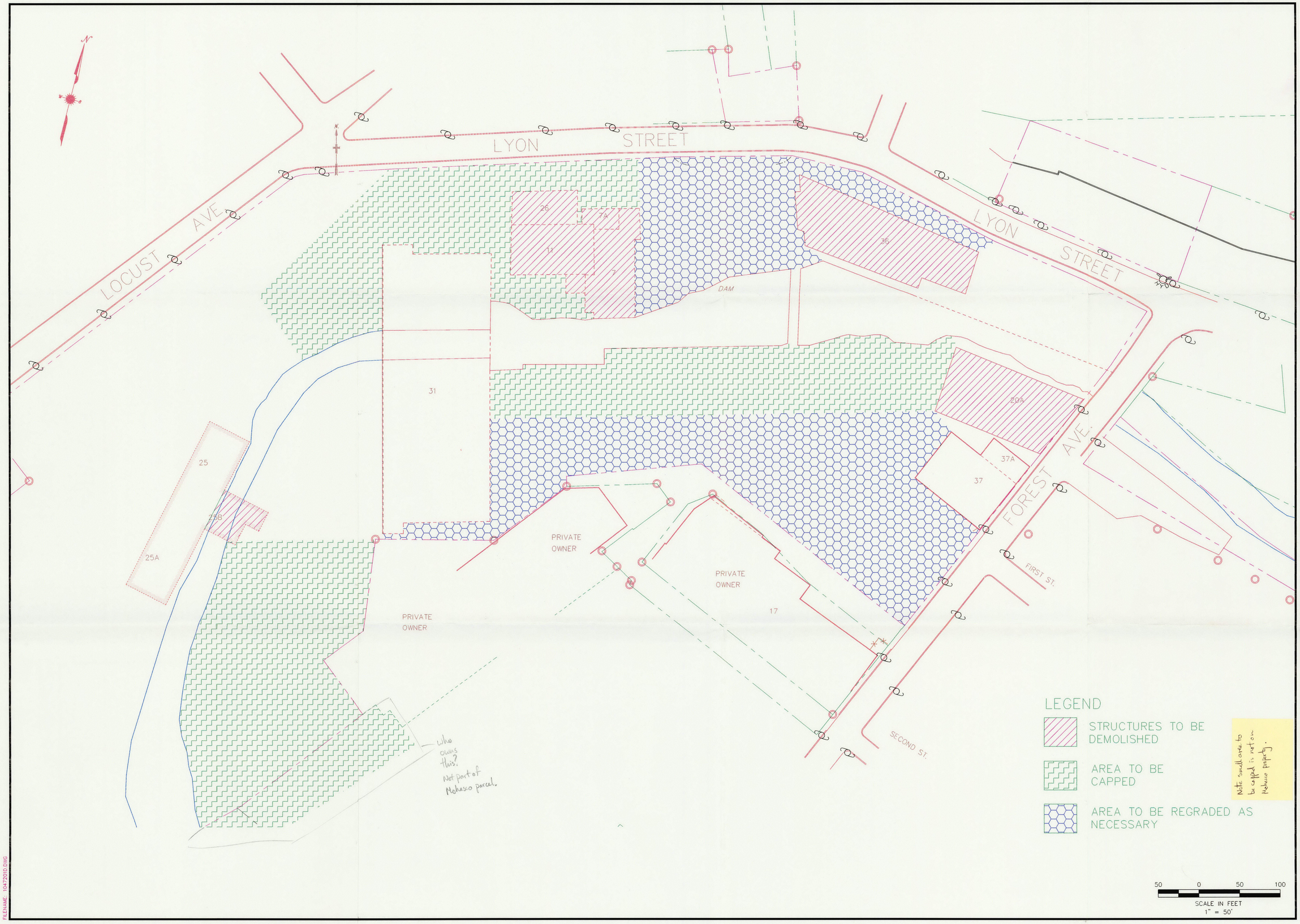
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FAX: (518) 453-0528
WEB: HTTP://WWW.ENSR.COM

EXISTING CONDITIONS
MOHASCO MILLS REMEDIAL ACTION WORK PLAN
AMSTERDAM, NY

SCALE: 1" = 100'
DATE: 10/03
PROJECT NUMBER: 10472-001

FIGURE NUMBER: 2

SHEET NUMBER: 1



REVISIONS			
NO.	DESCRIPTION:	DATE:	BY:

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:
J.P.S.	J.P.S.	J.P.S.	J.P.S.

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PROPOSED CONDITIONS
MOHASCO MILLS REMEDIAL ACTION WORK PLAN
AMSTERDAM, NY

SCALE:	DATE:	PROJECT NUMBER:
1" = 50'	02/26/04	10472-001

FIGURE NUMBER:
3

SHEET NUMBER:
1

FILENAME: 10472010.DWG

APPENDIX A

ENSR QUALITY ASSURANCE SOPS

SOP NUMBER: 1003

Senior Review

Date: October 1999
Revision Number: DRAFT
Author: Scott Whittemore
Discipline: All

1.0 PURPOSE AND APPLICABILITY

This document describes ENSR's procedures for senior review of project deliverables. The purpose of senior review is to ensure that project deliverables are correct, complete, consistent with project objectives, and readily retrievable.

The senior reviewer is an experienced individual with recognized insight about the client and/or the work being performed. The senior reviewer may be an account manager, department manager, senior program manager, or other similarly qualified person.

This procedure applies to all deliverables for ENSR projects larger than $5,000 contract value, and to ENSR proposals greater in value than $10,000. This procedure does not apply to letter proposals and letter reports.

Review and control procedures for engineering drawings are provided in SOP 1004.

2.0 RESPONSIBILITIES

2.1 The project manager is responsible for ensuring that this procedure is followed on his or her projects, and that the project's schedule and budget are sufficient to accommodate the reviews.

2.2 The task manager preparing the project deliverable is responsible for providing the review materials to the assigned reviewer, obtaining a review in accordance with this procedure, incorporating the reviewer's recommendations, and reconciling any disagreements with the reviewer.

2.3 The assigned senior reviewer is responsible for conducting the senior review within the allocated budget and schedule, completing the review documentation (if any), and assisting the project manager, lead author, or task manager in the process of resolving any issues raised.

3.0 REQUIRED MATERIALS

- Materials as specified in project-specific plans.

4.0 METHOD

4.1 Review of Proposals, Plans and Reports

4.1.1 The senior reviewer may attend internal kickoff and other significant progress meetings. At these meetings, the senior reviewer should independently determine whether the client's needs are being met and that proper steps are being taken to produce a quality product. The senior reviewer should be on the communication distribution list for the project/proposal.

4.1.2 The senior reviewer should be provided with drafts of all client-deliverable materials as early as possible.

4.1.3 In the senior review, the reviewer should detect and note any:

- inconsistencies between the project direction or methodologies and the client/project objectives;
- disagreement with interpretations, conclusions, recommendations or procedures;
- obscurity of rationale for interpretations, conclusions or recommendations;
- passages that are unclear, imprecise or misleading;
- material that is poorly organized or difficult to follow;
- inadequate or inappropriate citation of references.

The written findings of the review are returned to the originator in one or both of the following forms:

- a marked-up copy of the draft; and/or
- the completed Senior Review Record (Figure 1), which might be required on some projects.

The final responsibility for product quality rests with the project manager.

4.2 Review of Numerical Analyses

4.2.1 Senior review of numerical analyses shall be performed to ensure that appropriate methods were used and to detect miscalculations, data entry errors, and documentation deficiencies.

4.2.2 All numerical analysis and review is performed and documented in accordance with ENSR SOP 1005. The calculations and review records are filed in the project file.

4.3 Drawings/Illustrations/Images/Animations

4.3.1 Drawings, images or animations that have been created to depict project data, interpretations of project data, remedial construction objectives, etc., shall undergo senior review to ensure that:

- the purpose and intent of each graphic is clear;
- interpretations are valid and defensible;
- graphics do not contradict corresponding text discussions or tabulated data;
- recognized industry standard symbology and terminology are used (e.g., AGI, ANSI, USGS);
- all symbology is explained in a key as part of the graphic;
- visual quality of the graphic (size, resolution, color, etc.) is commensurate with its purpose.

Detailed procedures for engineering drawings are given in ENSR SOP 1004.

5.0 REFERENCES

- ENSR SOP 1005, Numerical Analysis and Peer Review
- ENSR SOP 1006, Qualification and Documentation of Computer Programs
- ENSR SOP 1004, Control and Review of Drawings

Figure 1. Senior Review Record

ENSR.

Senior Review Record

Review
Requested by: _____ For (Client): _____

Reviewer: _____ Date: _____

Title of Document Reviewed: _____

Section(s) Reviewed: _____

ENSR Document Number: _____ Document Type: ☐ Draft/Final Report ☐ Proposal ☐ Other

FINDINGS

- ☐ Reviewer has had advance communication sufficient to understand the Client's needs and properly schedule this review.
- ☐ Document satisfies Client's requirements.
- ☐ Project methodology is consistent with identified objectives and project plans and procedures.
- ☐ Procedures, numerical analyses, conclusions and recommendations are presented clearly and professionally.
- ☐ All data and references forming the basis for conclusions and recommendations are presented or cited.
- ☐ All appropriate quality assurance, including audits, technical reviews and data validation, has been performed and documented.
- ☐ Numerical analyses have been documented, and computer programs have been qualified and documented, in accordance with ENSR procedures.
- ☐ Document conforms to the ENSR Corporate Style templates.

REVIEWER'S COMMENTS

_____
Reviewer's Signature

AUTHOR'S RESPONSE

_____
Author's Signature

DISTRIBUTION:

FINAL RESOLUTION

_____ _____
Author's Signature Date

_____ _____
Reviewer's Signature Date

M990175

SOP NUMBER: 1004

Control and Review of Drawings

Date: September, 1995
Revision Number: 0
Author: Scott Whittemore
Discipline:

1.0 PURPOSE AND APPLICABILITY

This document describes ENSR's procedures for ensuring that all manually drawn or computer generated technical drawings for ENSR projects are correct, comparable with non-ENSR drawings, and consistent with project objectives. The purpose of the documentation is to facilitate review and reconstruction of the information depicted in the drawings.

For the purpose of this SOP, a drawing is any graphical depiction of project technical or schedule data or engineering specifications. Computer-generated drawings include those produced by illustration, desktop publishing, GIS, CADD, Data Visualization, or project management software.

2.0 RESPONSIBILITIES

2.1 The responsibility for implementation of this procedure on each project rests with the individual creating or revising a drawing.

2.2 The project manager is responsible for ensuring that the project files are complete, and that appropriate drawings/revisions and reviews are accommodated in the project's schedule and budget.

2.3 The reviewer is responsible for verifying that the drawing is accurate, traceable to the data it depicts, and consistent with project objectives.

3.0 REQUIRED MATERIALS

None.

4.0 METHOD

4.1 Drawings and drawing revisions will be labeled with:

- A unique name and/or identification number (in the case of computer-generated drawings, this should be the name of the computer file containing the drawing);

- The applicable project number;
- An explanation of the purpose of the drawing and the information it depicts;
- The revision number and date;
- A key that explains the symbology and terminology used (if appropriate).

Slides and photographs will be labeled with a unique identification number that is readily traceable to:

- The electronic file containing the image (if appropriate);
- The applicable project number;
- An explanation of the purpose of the drawing and the information it depicts;
- The revision number and date;
- A key that explains the symbology and terminology used (if appropriate).

4.2 Technical drawings that contain a title block (CADD) will conform to client/project or ENSR style requirements.

4.3 Drawings will use standard symbology and recognized drafting standards, as applicable. Symbology and terminology will be explained in a key on each drawing. The standards used in each drawing should be identified in the key. In the case of computer-generated drawings, the standards used will be identified in the appropriate layer of the drawing file.

4.4 Engineering drawings depicting engineering designs and/or specifications will be signed and dated by the originator and checked, signed, and dated by a reviewer. In addition to this review, some drawings will require the stamp of a registered professional engineer (P.E.).

4.5 Drawings to be included in ENSR work products will be approved for issue by the project manager or designee.

4.6 Review and Revision

4.6.1 Drawings will be reviewed by a qualified individual other than the originator to ensure that:

- Depicted data interpretations are documented adequately to demonstrate that they are valid and defensible;
- Drawings do not contradict corresponding text discussions or tabulated data;
- Recognized industry standard symbology and terminology are used (e.g., ANSI, USGS);

- Symbology and terminology are explained in a key as part of the illustration;
- Engineering drawing title blocks have the necessary approvals (sign-offs) prior to release, and include the latest revision number;

4.6.2 The originator will provide the reviewer with a clean copy (review print) of the illustration, along with related data tabulations and text discussions. The reviewer notes remarks and recommendations in ink on the review print, signs and dates the marked-up review print and returns it to the originator.

4.6.3 If the reviewer recommends revisions, the reviewer and originator will work collaboratively to resolve any disagreements.

4.6.4 After determining that the drawing is acceptable, the reviewer will sign and date a final review print.

4.6.5 Revisions are subject to the same review and approval cycles as initial drawings.

5.0 QUALITY CONTROL

The review and revision portions of the method define the quality control requirements for this procedure.

6.0 DOCUMENTATION

6.1 The master drawing is filed in a central drawing file or in the project file.

6.2 The marked-up, signed and dated review prints should be filed in the project file.

6.3 Drawings will be prepared in, or converted to, file formats that are compatible with client- and/or ENSR-standard software applications to ensure retrievability.

6.4 Electronic files will be stored and backed up on reliable media such as diskettes, tapes, optical media, or other reliable storage media. Primary and back-up files will be maintained on distinctly separate storage media. The data storage structure, showing the relevant directory and subdirectory names, should be documented in the project file.

6.5 Diskettes used for storage of project data and drawings will be labeled clearly and conspicuously with the project name and number, the file names, and the file revision dates. If the diskette label cannot accommodate a complete list of file names and dates, it should contain a clear summary.

7.0 REFERENCES

None.



AL, Florence
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AK, Anchorage
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AK, Fairbanks
(907) 452-5700
CA, Alameda
(510) 748-6700
CA, Camarillo
(805) 388-3775
CA, Glendale
(818) 546-2090
CA, Irvine
(949) 752-0403
CA, Sacramento
(916) 362-7100
CO, Ft. Collins
(970) 493-8878
Ft. Collins Tox Lab
(970) 416-0916
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(860) 429-5323
FL, St. Petersburg
(727) 898-9591
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(850) 385-5006
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(770) 209-7167
GA, Savannah
(912) 898-0015
IL, Chicago
(630) 836-1700
LA, Lafayette
(337) 896-2430
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(207) 773-9501
MD, Columbia
(410) 884-9280
MA, Sagamore Beach
(508) 888-3900
MA, Westford
(978) 589-3000
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(508) 457-7900
MN, Minneapolis
(952) 924-0117
NJ, Piscataway
(732) 457-0500
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(716) 381-2210
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(315) 432-0506
NC, Raleigh
(919) 571-0669
OH, Cincinnati
(513) 985-9186
OR, Portland
(503) 224-7338
PA, Langhorne
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PA, Pittsburgh
(412) 261-2910
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