DAC comments 3/25/92

MAR 16 1992

FEASIBILITY STUDY REPORT
DOLLINGER FACILITY
BRIGHTON, NEW YORK

by

H&A of New York
Rochester, New York

for

Dollinger-A Filtrona Company
Richmond, Virginia

File No. 70007-43
March 1992

H & A OF NEW YORK

Geotechnical Engineers &
Environmental Consultants

12 March 1992
File No. 70007-43

Dollinger - A Filtrona Company
3951 Westerre Parkway, Suite 300
Richmond, Virginia 23233

Attention: Mr. Anthony M. Vincent
Mr. Michael L. Burge

Subject: Dollinger Site Feasibility Study Report

Gentlemen:

H&A is pleased to provide this report on the Dollinger Feasibility Study, prepared in accordance with the Work Plan dated 15 February 1991. Copies have been sent to representatives of NYSDEC, NYSDOH, Monroe County Department of Health and the Document Repository.

Thank you for the opportunity to assist you with this project.

Sincerely yours,
H&A OF NEW YORK

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EXECUTIVE SUMMARY

This report describes results of a Feasibility Study that was performed to identify, evaluate and recommend potential alternatives to remediate the Dollinger NYSDEC Inactive Hazardous Waste Registry Site No. 828078. The site is located at the northern end of Brighton-Henrietta Townline Circle in Brighton, New York.

Feasible alternatives for remediation of the Dollinger site have been evaluated in accordance with EPA "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA," dated October 1988, and the NYSDEC 15 May 1990 Technical and Administrative Guidance Memorandum for the Selection of Remedial Actions at Inactive Hazardous Waste Sites.

Remedial alternatives were evaluated to address volatile organic compounds in source soils at a former TCE degreaser area and drum storage area; semi-volatile and volatile compounds in pond sediments; and volatile compounds in site groundwater (below the former drum storage and degreaser areas). Based on performance of a baseline risk assessment performed as part of the Remedial Investigation for this site, no unacceptable health risks were identified as being associated with residual soils, groundwater or sediment concentrations, with one exception. Based on the health risk assessment, remedial action is recommended to reduce potential acute health risks under a theoretical utility or foundation excavation scenario outside the former TCE degreaser area. Due to this potential risk, the no action alternative for soil is not recommended. Remediation of affected soils and pond sediments is based on exceedance of site-specific criteria developed by NYSDEC for these media. Alternatives have been evaluated to meet those criteria.

This Feasibility Study includes preliminary screening of 15 general response actions including 29 remedial technology alternatives, and subsequent detailed screening of 8 general response actions including 9 remedial technology alternatives. Based on this evaluation, the following remedial technology alternatives are recommended for implementation:

- Soil - In-situ high vacuum extraction of vapors from the former drum storage and degreaser areas (within designated areas both inside and beyond the building footprint).

- Sediment - Removal and off-site disposal of sediments from the site pond (assuming the sediments are not determined to be hazardous waste following performance of analysis for specific waste classification).

- Groundwater - The no action alternative and installation of bentonite collars for migration control along the storm sewer line between the former TCE degreaser area and site pond. This recommendation is made assuming this alternative is implemented in conjunction with the soil and sediment alternatives described above.

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The combined estimated capital costs to implement the recommended alternatives range from approximately $250,000 to $442,000, depending primarily on waste classification of the pond sediments for off-site disposal. Annual O&M costs (associated with the high vacuum extraction alternative) total approximately $55,800 per year with net present worth of O&M costs ranging from approximately $241,600 over 5 years to $857,500 over 30 years.

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I. INTRODUCTION

1.1 PURPOSE AND ORGANIZATION OF REPORT

This report presents the results of the Feasibility Study (FS) at the Dollinger Facility site in Brighton, New York. The FS was undertaken on behalf of Dollinger-A Filtrona Company (former site owner) for NYSDEC Registry Site No. 828078, pursuant to an Order on Consent between Dollinger and the New York State Department of Environmental Conservation (NYSDEC), signed on 13 May 1991.

This FS report has been prepared in conformance with the United States Environmental Protection Agency (EPA) document entitled "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" dated October 1988 (EPA RI/FS Guidance), and the NYSDEC's 15 May 1990 Technical and Administrative Guidance Memorandum (TAGM) for the Selection of Remedial Actions at Inactive Hazardous Waste Sites (NYSDEC 15 May 1990 TAGM). The organization of this FS report is described below.

Section 1 contains a summary of the results of the Remedial Investigation (RI) and an overview of the FS.

Section 2 describes the identification and screening of remedial technologies. The identification and screening of technologies, based on the RI data, includes the following activities:

- develop remedial action objectives which specify site compounds and media of interest, and potential exposure pathways. Objectives are based on compound-specific cleanup criteria provided by the State;
- develop general response actions for each medium that may be taken to satisfy the remedial action objectives;
- identify volumes and areas of media to which general response actions might be applied.

Section 3 describes the development and screening of alternatives and includes a preliminary screening of the alternatives relative to effectiveness and implementability. This is performed utilizing scoring methods provided by the NYSDEC 15 May 1990 TAGM.

Section 4 presents a detailed analysis of the alternatives retained from the preliminary screening with respect to the following criteria:

- Overall protection of human health and the environment.

- o Compliance with SCGs (New York Standards, Criteria and Guidelines).
- o Long-term effectiveness and permanence.
- o Reduction of toxicity, mobility, or volume of site compounds.
- o Short-term impacts and effectiveness.
- o Implementability.
- o Cost.

1.2 BACKGROUND INFORMATION: REMEDIAL INVESTIGATION SUMMARY

The site is an 18.5 ± acre property which is roughly rectangular in shape, located in Brighton, New York at 1 Town Line Circle. An approximately 140,000 sq. ft., 1 story, slab on grade building containing manufacturing, warehousing, and office space is centrally located on the site. [redacted] The property is bounded on all sides by other commercial and industrial lots and buildings. Please refer to Figures 1 and 2 for a Project Locus and Site Area Plan.

The site was the location of the manufacture and assembly of industrial filters between 1970 and 1987. Operations at the facility ceased in approximately 1987 and the building was vacated of personnel, equipment and operations prior to its sale in 1989. The building is currently unoccupied.

Previous site investigations identified three areas of concern: a former trichloroethylene (TCE) degreaser area, a former drum storage area and a former dumpster area. Additionally, an on-site storm sewer, drainage pond and waste/fill area were investigated under the RI. These areas of concern are shown on Figures 6, 9 and 10 of the RI report. Following completion of the RI report, and based on comparison of detected concentrations to NYSDEC-supplied SCGs, remaining areas of concern carried into the Feasibility Study are the former drum storage area, the former degreaser area and the site pond.

No waste was identified in the purported waste/fill area. Remedial investigations in the remaining areas of concern consisted of a grid boring program (to obtain soil samples to a maximum depth of 12 feet), installation of monitoring wells and groundwater sampling, and shallow soil, surface water and sediment sampling (including sampling at a site storm sewer).

The nature and extent of site compounds of concern in each of the media investigated are defined as follows:

- Groundwater - Compounds in groundwater are primarily limited to TCE and its breakdown products (1,2-DCE, 1,1-DCE and vinyl chloride) present immediately below the areas of concern (former TCE degreaser area and former drum storage area-see Figure 3). The highest concentration of these compounds was detected in groundwater beneath the former TCE degreaser area. Sampling and analysis of the deepest site well, installed across the overburden bedrock interface below the former TCE degreaser area, did not detect chlorinated volatile organic compounds (VOCs), nor were chlorinated compounds detected in wells located north, south, east or west of the three areas of concern.

- Sediment and Soil - The shallow pond sediment nearest the storm sewer outfall pipe, and shallow soil at each of the areas of concern, contained detectable concentrations of the chlorinated VOCs described above, semi-volatile phthalates and polyaromatic hydrocarbons (PAHs).

Results of site compound fate and transport evaluations indicate that the VOCs, PAHs, and phthalates are confined to on-site areas and do not appear to be migrating off-site.

Results of the human health risk assessment conducted as part of the RI indicate that non-carcinogenic hazard indices for the Typical and Reasonable Maximum Exposures (RME) are less than 1, the USEPA threshold value for this index, for all scenarios evaluated, with one exception. Evaluation of an on-site worker or trespasser entering a construction trench in the area immediately outside the former TCE degreaser room indicates that an acute exposure of the individual to TCE vapors from soil may result, if entering the trench without OSHA-required respiratory and personal protective equipment.

Carcinogenic risks for the Typical case and RME conditions for a child trespass and on-site worker scenario fell within or below the range identified by USEPA as acceptable.

II. IDENTIFICATION AND SCREENING OF TECHNOLOGIES

2.1 INTRODUCTION

The FS process is based on available data and information, as contained in the Dollinger RI report, dated 27 November 1991, and subsequent Addenda, dated 16 January 1992, 23 January 1992, and 24 February 1992.

The Feasibility Study (FS) is performed in three phases: (1) the identification and screening of technologies, during which phase remedial action objectives and general response actions are developed, (2) the preliminary screening of alternatives, and (3) a detailed analysis of the alternatives. This section addresses the first phase, including remedial action objectives, which were established to protect human health and the environment. Remedial action objectives specify site compounds and media of concern, potential exposure pathways, and compound-specific preliminary cleanup criteria provided by the State for each impacted medium at the site, all based on results of the RI and Addenda.

Following the discussion of remedial action objectives, this section describes the development of general response actions for each medium and the volume or area of each medium to which general response actions may be applied.

2.2 REMEDIAL ACTION OBJECTIVES

2.2.1 Site Compounds and Media of Concern

Compounds of concern have been detected at the Dollinger site in groundwater, surface water, sediments, and soil. The overall objectives of remediating this site are to protect human health and the environment. This is done by identifying the compounds exceeding NYSDEC Standards, Criteria and Guidelines (SCGs) in each medium, then evaluating remedial alternatives to address the compounds in the affected media.

Following submittal of the RI report (dated 27 November 1991) and Addenda (dated 16 and 23 January and 24 February 1992) to NYSDEC, preliminary cleanup criteria for specific site compounds in source area sediments and soils were provided based on SCG exceedances. The technical feasibility of reaching these cleanup criteria is evaluated in detail later in this FS report.

The sediments and soils addressed in this FS report are shown on Figure 3, Soil and Sediment Remediation Areas. As shown on this plan, there are three areas of concern on site to be addressed which contain concentrations of compounds above SCGs as documented in the RI and Addenda: (1) shallow sediments in a portion of the pond; (2) soils at the degreaser area (both adjacent to and below the building); and (3) soils at the drum storage area.

Table IV of the RI report shows the impact on soil to be limited to a few VOCs and semi-volatiles. Concentrations of VOCs are also found in groundwater, as shown on Tables VI and VII of the RI report. The impact on sediment consists primarily of semi-volatile organics as shown on Table X of the RI report. TCE at 1.5 ppm in sediments

This FS addresses sediment, soil and groundwater concentrations at the above locations which exceed NYSDEC SCGs (for groundwater) and the site-specific cleanup criteria (for sediment and soil) provided by NYSDEC.

2.2.2 Potential Exposure Pathways

Potential migration and exposure pathways were evaluated in the RI report and it was concluded that the potential for contaminant migration from the sediment and low soil source areas, and the adjacent groundwater, was low, based on soil permeability and groundwater flow velocity. Exposure pathways, as evaluated in the RI Risk Assessment, indicated a hazard index of less than the threshold for every scenario, with one exception. In the case of an on-site worker or trespasser entering a construction trench in the area immediately outside the former TCE degreaser room, the risk assessment conducted for the RI showed a potential for acute exposure to TCE vapors if such worker or trespasser enters the trench without OSHA-required respirators and personal protective equipment. This exposure risk is addressed by the remedial actions provided in this FS.

2.2.3 Cleanup Criteria

Sediment cleanup criteria have been identified for the following compounds: 1,1,1-trichloroethane, toluene, acetone, 2-butanone, methylene chloride, di-n-butylphthalate, bis (2-ethylhexyl) phthalate, butylbenzylphthalate, acenaphthene, anthracene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i) perylene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno (1,2,3-cd)pyrene, phenanthrene and pyrene. These criteria represent "background" concentrations for the pond sediment, as found in sediment sample SS-202s collected from the portion of the pond which does not receive drainage from the site areas of concern. These criteria are presented in Table I.

The NYSDEC has provided recommended soil cleanup criteria for the following compounds: xylenes, trichloroethene, trans-1,2-dichloroethene, vinyl chloride, benzo(a)pyrene and benzo(a)anthracene. These criteria and the variables, calculations and assumptions used to calculate them are presented in Table II.

2.3 GENERAL RESPONSE ACTIONS

The general response actions are actions that may be applicable to each affected site media. Based upon evaluation of RI data, the general response actions considered in this FS for the Dollinger site include:

- Soil-no action; excavation and off-site disposal without treatment; in-situ treatment with on-site or off-site disposal; excavation and ex-situ treatment with on-site or off-site disposal; and on-site containment/disposal without treatment.

- Sediment-no action; removal and off-site disposal without treatment; removal and on-site disposal without treatment; and stabilization with on-site or off-site disposal.

- Groundwater-no action; active containment; passive containment; conventional groundwater recovery; high vacuum extraction of vapors; and in-situ delivery of treatment.

General response actions are presented in Table III. Table III breaks down each response action by media (soil, sediment or groundwater), by general response action, then by remedial technologies that fall under a response action. Applicability and technical feasibility of each response action are also summarized in Table III. Following is an overview of the general response actions considered in this FS:

- No-Action

  To the extent it is both possible and appropriate, the no-action alternative is required by EPA RI/FS guidance to be evaluated as part of the FS. There is no treatment or disposal involved in the no-action response. The no-action alternative does not provide treatment to prevent migration of compounds to continue along identified migration pathways from source areas.

This response evaluates whether there would be any threat to public health, welfare or the environment if no action is taken. It provides the baseline risks against which other responses can be compared. This response may be selected if natural environmental mechanisms will result in degradstion or immobilization of the site compound concentrations within a reasonable amount of time, or if risks shown are acceptable by EPA standards.

Under this alternative, a monitoring program is required to be developed and conducted to monitor changes in groundwater, surface water, soil and sediment quality. The monitoring program for groundwater would include sampling the existing monitoring wells and sampling the site surface waters as well as downstream waters. The soil and sediment monitoring would consist of selected sampling from specified locations at the previously identified source area.

The NYSDEC/EPA definition of the no-action alternative provides for a 30-year monitoring period consisting of annual sampling of selected media and a review of site conditions at 5-year intervals. This would apply unless the approach were modified based on site-specific factors, which would appear to be justified for this site.

Under natural conditions at the Dollinger site, the VOC concentrations in the groundwater are expected to diminish over time due to degradation and attenuation, and to a lesser degree dilution and dispersion. Due to low site soil permeability, in place degradation appears to be acting on the compounds in groundwater more than migration or dispersion. The no-action response would consist primarily of environmental monitoring of contaminant migration. For the Dollinger site, the no action alternative would provide for monitoring of: the migration of soil compounds into groundwater; groundwater migration; groundwater migration along the storm sewer bedding into the site pond water and sediment; and the migration of sediment compounds into site surface water.

No action justification for GW.

- <u>Excavation and Off-site Disposal. Without Treatment</u>

This alternative would involve removing soils (by excavation) and sediment (by excavation, dredging or vacuuming) from the four identified areas and disposing of the materials at an off-site facility designed to handle such wastes. It is possible, depending on the compound concentrations in soil and sediment, that the materials would be subject to EPA's Land Disposal Restrictions (LDRs) and treatment would be necessary prior to disposal. Backfilling and revegetating the excavations would occur once removal was completed.

- <u>In-situ Treatment with On-site or Off-site Disposal</u>

In-situ soil/sediment treatment is performed either by adding materials to the soil or removing materials from the soil to effect contaminant reduction, destruction or immobilization. In-situ treatment, as the name implies, involves treatment of the media as it remains in place. Byproducts may be produced by some of the in-situ treatment technologies. Depending on the amount and types of residuals after treatment, on-site or off-site disposal could be considered.

Some examples of in-situ treatment involving the addition of materials to the soil include: bioremediation in which organisms and/or nutrients are added to the soil; soil flushing using surfactants to enhance contaminant solubility; vitrification using heat to melt soil to an inert state; and stabilization of soil using silicates or cement stabilizing compounds. In-situ soil remediation techniques include: steam distillation used to drive VOCs from the soil where the vapor is then condensed and decanted; vacuum extraction which uses high and low pressure to extract contaminants which are then passed through a vapor/liquid separator and the gasses are adsorbed on carbon; or a combination of steam injection and vacuum extraction of vapors.

Please note that, based on discussions of preliminary screening with NYSDEC, the in-situ sediment treatment alternative was eliminated from consideration beyond the preliminary screening due to concerns over potential habitat impacts associated with the treatment. ✓

Under certain conditions, high groundwater levels result in production of groundwater incidental to high vacuum extraction of soil vapor, and provisions must be made for handling such groundwater produced. Dual-phase groundwater extraction, a similar but distinct method of recovering groundwater, was considered in the preliminary screening as a potential groundwater recovery alternative and was rejected from further consideration due to low site permeabilities.

So the preferred alternative is VE, but they won't use a combined system hod
How deep are they going to install the VE headers? → 16'

- Excavation and Ex-situ Treatment With On-site or Off-site Disposal

  Both soils and sediment can be removed from their current location, treated, and replaced or disposed of off site. Ex-situ soil treatment would generally involve the following: excavate the soil, stockpile the soil on site for treatment or disposal, conduct treatment or remove for disposal, backfill, regrade and revegetate. Some examples of ex-situ soil treatment include: circulating fluidized bed combustor (soil plus limestone are placed in a chamber, heated and contaminated gasses are neutralized); bioremediation; vacuum extraction of vapors; stabilization; soil tilling (involves mechanical agitation of soils to release volatilized organics); low temperature thermal desorption (a soil dryer drives off water and organic contaminants); or oxygen burners (used to burn wastes).

- On-site Containment/Disposal Without Treatment

  On-site containment/disposal of soil without treatment includes two specific actions: excavation of soils and/or sediment and disposal on-site in an engineered fill; or covering soils in-place with an impermeable cover to prevent/retard water infiltration, the escape of fugitive dust and human contact with the soil.

- Ex-situ Sediment Stabilization With On-site or Off-site Disposal

  The ex-situ stabilization of sediment involves removing sediment and mixing the sediment with silicate or cement compounds that render the sediment relatively inert and the contaminant constituents immobile. Ex-situ stabilization would be followed by returning the sediment to the excavation area, leaving it in place elsewhere on-site, or removing it from the site.

- Active/Passive Groundwater Containment

  Under this response action, groundwater flow velocity and direction are controlled by active hydraulic barriers such as injection and/or extraction wells, or by passive means such as surface caps and/or subsurface vertical or horizontal barriers.

ʘ Conventional Groundwater Recovery

Using this alterative, groundwater is pumped from the subsurface and treated using chemical, physical (including thermal destruction and freezing separation), or biological means. Well and pump installations and treatment systems are utilized.

ʘ In-situ Delivery of Groundwater Treatment

Chemical, physical or biological treatments are used to remediate groundwater. Delivery of these treatments is through existing or newly-installed wells.

2.4 GENERAL RESPONSE ACTION AREAS AND VOLUMES

The distribution of selected compounds in soil, sediment and groundwater is presented in the RI report. The volume of total affected soil and sediment is estimated, based on the RI data summary and as discussed below.

Sediment: Compounds found in the sediment sample points SS-201s and SS-204s exceeded the NYSDEC recommended sediment cleanup criteria presented in Table I. These samples were collected from approximately six inches below the surface of the sediment. At each location a deep sample, in which no exceedances were detected, was collected from two feet below the sediment surface. Based on the lack of exceedances at the deep samples at these locations, an excavation depth of an average of 0.75 feet was determined to be sufficient to estimate the volume of sediment compounds exceeding the criteria. As shown on Figure 3 of this report, the pond area that requires remediation measures approximately:

No mention of confirmatory samples

(150 ft. x 40 ft. x 0.75 ft. avg. depth) =
4500 CF =
167 CY.

Soil: Exceedances of the soil cleanup criteria presented in Table II occur, at the B201 boring in the soil samples from 8 to 10 and 12 to 14 feet below ground surface and at grid sample location GS-A8 from the 2 to 4 foot below ground surface interval.

Sear-Brown soil data, collected prior to the RI and presented on Table I of H&A's October 1988 Report, included three locations at which the NYSDEC site-specific criteria for volatiles in soil was exceeded. These locations are: "drum storage" sample; "composite from 6 in. DS-1, 2, 3" sample; and "TA-1 6 in. core" sample.

For semi-volatiles, Sear-Brown results showed exceedances of the criteria (Table II, H&A October 1988 report) at the: "drum storage" sample location; "comp. 6 in. DS-1, 2, 3" sample; "TA-1 6 in. core" sample; "TA-8 6 in. core" sample; and "TA-15 6 in. core" sample.

These samples, in conjunction with the grid samples collected during the RI, identify the former drum storage and TCE degreaser areas as those where soil concentrations exceed the NYSDEC site-specific criteria.

The Sear-Brown samples from the drum storage area are composites, and therefore it is possible that exceedances did not occur at all locations used to make up the composite sample. Since the H&A grid screening conducted during the RI delineates an area where concentrations at depth are less than the cleanup objectives for volatiles (GS-B4 and GS-B5), it was determined to use those points as the center for estimating areal extent of soil remediation in the drum storage area. To calculate a depth to which remediation should occur, the following sample depths were considered:

- Sear-Brown's "drum sample" composites to 6-inches and from 2.5 to 3.5 feet deep;
- Sear-Brown's 6 inch deep composite from DS-1, 2, 3;
- H&A's grid sample GS-B4 from 10 to 12 feet;
- H&A's grid sample GS-B5 from 4 to 6 feet.

DRUM STORAGE

Since the Sear-Brown samples exceeded the cleanup objectives and the deeper H&A samples did not, a depth of 3.5 feet was selected as the maximum depth for soils to be considered for remediation.

Using the area shown on Figure 1, soil volume estimated for remediation in the drum storage area is approximately:

50 ft. X 100 ft. x 3.5 ft. =
17,500 CF or 648 CY.

In the degreaser area, samples obtained by both H&A and Sear-Brown contained concentrations above the cleanup criteria. The Sear-Brown TA samples 1, 8 and 15 are located along the outside of the degreaser area west wall. This is also where H&A grid sample GS-A8 is located. Additionally, soil from the H&A B201 borings, just inside the building at the deyreaser area, exceeded the cleanup criteria at samples from 8 to 10 and 12 to 14 feet below ground surface. Assuming a remediation depth of 14 feet, and an area of 80 by 80 feet, a volume of soil to be considered for remediation in the degreaser area is approximately:

DEGREASER AREA

80 ft. X 80 ft. x 14 ft. =
89,600 CF or 3319 CY.

NO!

Groundwater: For groundwater, the two primary areas on-site where groundwater exceeds the New York State Drinking Water Quality Standards or Guidance Values are the TCE degreaser area and the drum storage area. The low permeability of site soils, the relatively flat gradient and the retardation of site compounds (along with their apparent in-place degradation and reduction) combine to result in an estimated site groundwater velocity of approximately 0.01 feet per year and an estimated velocity of site VOCs in groundwater of 0.004 feet per year. Furthermore, based on two rounds of sampling results discussed in the RI report, there are several indications that the total VOC concentrations are decreasing and that the compounds are degrading in place. For example, at OW-103s, OW-104s and OW-104d the concentration of TCE decreased between analyses conducted in July 1988 and September 1391. At each of these locations the concentration of 1,2-DCE (a TCE breakdown product) increased over the same period while the total TCE + 1,2-DCE decreased.

The estimated volume of affected groundwater is approximately 7.3 MG of water. This estimate assumes no significant net migration with time based on the above conditions. The calculated volume assumes the area surrounding well ciusters 103, 104, and 201 are affected to approximately half the distance to the nearest adjacent clean well. Similarly, groundwater is assumed to be affected to a depth of approximately half the distance between well screen OW-104d and the deepest site well screen B205-OW. Assuming an average porosity of 42% for the site soils, this allows up to 972,468 CF or approximately 7.3 MG of water (at 7.5 gal/CF) that may contain site compounds in excess of drinking water standards or guidance values.

III. DEVELOPMENT AND SCREENING OF ALTERNATIVES

The range of potentially applicable technology types and process options, as presented in Table III and Section II, were identified for the affected groundwater, soil, and sediment at the Dollinger site. As presented below, the technologies and process options were then preliminarily screened on the basis of technical implementability and effectiveness given site contaminant distribution and local hydrologic, geologic and hydrogeologic conditions.

3.1 EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS

The technology types and process options were evaluated to determine their ability to meet two criteria. These criteria are defined by the EPA RI/FS Guidance and the NYSDEC 15 May 1990 TAGM as follows:

- Effectiveness - this criterion focuses on the degree to which an alternative reduces toxicity, mobility or volume through treatment, minimizes residual risks and affords long term protection (referring to the period after the remedial action is in place and effective), and complies with SCGs. It also considers short-term impacts (during the construction and implementation period) and how quickly the action achieves protection. Alternatives providing significantly less effectiveness than other more promising alternatives may be eliminated. Alternatives that do not provide adequate protection of human health and the environment are eliminated from further consideration under the FS detailed analysis.

- Implementability - this criterion focuses on the technical and administrative feasibility of implementing the alternative. Technical feasibility refers to the ability to construct, operate, maintain, replace and monitor into the future necessary process units as well as the availability of necessary equipment and technical specialists. Administrative feasibility includes compliance with applicable rules, regulations and statutes; the ability to obtain approvals from other offices and agencies; and the availability of treatment, storage and disposal services. Alternatives that are technically or administratively infeasible or that would require equipment, specialists, or facilities that are not available within a reasonable period of time may be eliminated from further consideration.

3.2 RESULTS OF PRELIMINARY SCREENING

A preliminary screening of remedial alternatives for the cleanup of site sediment, soil and groundwater was conducted in accordance with the NYSDEC 15 May 1990 TAGM. Table IV presents a summary of each remedial alternative score and the preliminary screening scoring sheets are provided in Appendix A.

As described in the NYSDEC TAGM, the objective of the screening at this stage of the FS process is to narrow the list of potential alternatives that will be evaluated in detail. Detailed analysis (Section IV of this report) is performed on those alternatives that pass the preliminary screening.

The criteria for which the remedial alternatives are screened and scored numerically in this preliminary phase are their short-term and long-term effectiveness, and their implementability, as defined above.

For effectiveness, the maximum score attainable (representing an alternative providing very effective remediation) is 25. The scoring is subdivided into the following analysis factors:

- Protection of community during remedial actions
- environmental impacts
- time to implement the remedy
- on-site or off-site treatment or land disposal
- permanence of the remedial alternative
- lifetime of remedial actions
- quantity and nature of remaining waste or residue after remediation
- adequacy and reliability of controls

If the total score of any remedial alternative is less than 10, that remedial alternative may be rejected from further consideration.

The maximum score attainable for implementability is 15. The scoring is subdivided into the following analysis factors:

Technical Feasibility:

- ability to construct technology
- reliability of technology
- schedule of delays due to technical problems
- need of additional remedial actions

Administrative Feasibility:

- coordination with other agencies

Availability of Services and Materials:

- availability of technologies
- availability of necessary equipment and specialists

If the total score of any remedial alternative is less than 8, that remedial alternative may be rejected from further consideration.

If the alternative fails either the effectiveness or implementability scoring, it is eliminated from further consideration.

Table IV lists the response actions and technologies that have been eliminated from further, detailed evaluation based on scores below the acceptance threshold(s).

Based on the preliminary screening the following specific remedial technologies, from the general response actions considered, were retained for further consideration at the site (please note that this includes the no action alternative for each media, as EPA RI/FS Guidance requires that it be evaluated under the detailed screening):

A. Media: Soil

(1) General Response Action: No Action

(2) General Response Action: Excavation and Off-site Disposal Without Treatment

(3) General Response Action: In-situ Treatment With On-site or Off-site Disposal
Remedial Technology: In-situ High Vacuum Extraction of Soil Vapor From In-place Soil

(4) General Response Action: Ex-situ Treatment With On-site or Off-site Disposal
Remedial Technology: Ex-situ High Vacuum Extraction of Soil Vapor from Areas Not Under the Building

B. Media: Sediment

(1) General Response Action: No Action

(2) General Response Action: Remove and Dispose Without Treatment Off-site

(3) General Response Action: Ex-situ Stabilization

C. Media: Groundwater

(1) General Response Action: No Action

Preliminary screening scores for the above general response actions are summarized on Table IV. In some cases, specific technologies under response actions have been carried through for detailed analysis, beyond the preliminary screening, based on evaluation of feasibility, as noted on Table III.

IV. DETAILED EVALUATION OF REMEDIAL ALTERNATIVES

In this section of the feasibility study, remedial alternatives are developed which (1) meet the remedial action objectives outlined in Section II and (2) were retained after the preliminary screening described in Section III.

The purpose of this phase is to perform a detailed analysis of each of the remedial technologies carried through the preliminary screening. Anticipated scale, implementation requirements, sequence costs, and administrative requirements of each technology are developed on a conceptual basis. The alternatives are then compared individually, and in combination as appropriate, to meet the remedial objectives of the site. The alternatives and combinations, if appropriate, are ranked based on a scoring mechanism provided by the NYSDEC 15 May 1990 TAGM. The alternatives or combinations recommended for the site are then summarized.

The purpose of the detailed analysis is to provide sufficient information to compare the alternatives, identify an appropriate remedy or remedies for the site, and provide a basis for remedial alternative selection through the NYSDEC Record of Decision (ROD) proceedings.

EPA and NYSDEC feasibility study guidance requires that nine evaluation criteria be used to rank the remedial alternatives. Ranking is based on a weighted scoring system which allots 10 to 20 points per criterion, totalling 100 points. Specific consideration of seven of the alternatives is included in this FS report (and the remaining two, NYSDEC Acceptance and Community Acceptance, are part of the Record of Decision proceedings). The seven criteria consist of the following:

- <u>Compliance with ARARs</u> - This criterion is used to determine whether a remedial alternative conforms to Applicable or Relevant and Appropriate Requirements (ARARs). ARARs used in this feasibility study have been derived from the "New York State List of Applicable or Relevant and Appropriate Requirements", which is considered to be equivalent to the New York Standards, Criteria and Guidelines (SCGs). The NYSDEC 15 May 1990 TAGM allots a maximum of 10 points for scoring based on this criterion.

- <u>Protection of Human Health and the Environment</u> - Under this criterion a remedial alternative is evaluated to determine whether it provides adequate protection of human health and the environment. The NYSDEC 15 May 1990 TAGM gives this criterion a weight of 20 points.

- Short-term Effectiveness - This criterion evaluates possible effects of each remedial alternative during the construction and implementation phase, addressing factors such as protection of the community and workers, mitigative measures, and time frame to achieve response objectives. The NYSDEC 15 May 1990 TAGM allows a maximum of 10 points for this criterion.

- Lons-term Effectiveness and Permanence - This criterion evaluates the potential risk remaining at the site after response objectives have been met. It is based on comparison of residual risks to the calculated baseline risk contained in the site RI. The NYSDEC 15 May 1990 TAGM allots 15 points for scoring this criterion.

- Reduction of Toxicity, Mobility or Volume - This criterion evaluates the ability of a remedial alternative to permanently and significantly reduce toxicity, mobility, or volume of the hazardous substances present. Alternatives which achieve reduction by one or more of these measures are favored over those which do not. The NYSDEC 15 May 1990 TAGM allows a maximum of 15 points in weighting this criterion.

- Implementability - This criterion evaluates the technical and administrative feasibility of implementing the alternative. The NYSDEC 15 May 1990 TAGM allows up to 15 points as a weighting factor for this criterion.

- Cost - The cost criterion allows a comparison of each alternative's estimated costs of implementation and maintenance, if necessary, over time. EPA RI/FS Guidance indicates that estimated accuracy of cost estimates is expected to range from +50% to -30%, and the estimates should be prepared using data available from the RI. These estimated costs do not represent quotes to be used for construction bid purposes or costs to complete the project. Estimated costs are formatted as follows:

  Capital Costs - potential direct (such as construction) and indirect (non-construction and overhead) costs associated with implementation of a remedial alternative.

  Annual Operation and Maintenance (O&M) Costs - post-construction costs typically associated with monitoring, maintaining, or confirming progress of a particular alternative.

Net Present Worth - analysis is used to develop a single cost figure, including capital and O&M as appropriate, so that different remedial alternatives may be compared on a similar cost basis over the remedial alternatives planned life.

o NYSDEC Acceptance and Communitv Acceptance - These are the remaining two criteria by which a remedial alternative is selected. Although these criteria are not analyzed as part of this FS document, they are based on the information contained in this FS Report. These criterion are evaluated during a public comment period conducted by NYSDEC after acceptance of the feasibility study. The criteria are considered in developing the NYSDEC Record of Decision (ROD).

Descriptions of each of the remedial technologies considered under general response actions are provided below, organized by environmental media (soil, sediment, and groundwater). Evaluation and scoring of each of the technologies against the above-listed criteria is also summarized.

4.1 SOIL ALTERNATIVES

Four primary response technologies, including the no action alternative, were identified and evaluated for soil remediation. A set of three worksheets for each alternative is included in Appendix C. The first worksheet of each set provides a summary description of tasks necessary to implement and maintain the remedial alternative. The second worksheet provides a breakdown of estimated costs. The third worksheet provides a summary of ARARs that may be associated with the specific alternative.

A. No Action

Under this alternative, no treatment of residual concentration in soil source areas would occur. The RI baseline risk assessment has identified no unacceptable health risks associated with site soil, with the exception of a theoretical future use scenario involving exposure to soil vapors by an on-site worker or trespasser entering an excavated construction trench in the area immediately adjacent to the former TCE degreaser area. Eased on this scenario, application of the no action alternative to TCE degreaser area soils is not recommended.

The no action alternative, as indicated by EPA RI/FS Guidance, recommends that periodic, limited monitoring of soils be performed, and results of the monitoring be reviewed at 5-year intervals until further activities are considered unnecessary. Assumptions used in evaluating routine monitoring at the site include annual sampling of source soils in the former drum storage and former TCE degreaser areas. Samples would be obtained from the affected soil depth interval in the drum storage area (0-3.5 ft.), and in two depth intervals in the former degreaser area (0-7 ft. and 7-14 ft.). Samples would be analyzed for volatile organic compounds and semi-volatile organic compounds, results would be reported, and the site action would be re-evaluated every 5 years.

Estimated costs for the no action alternative are described on Worksheet 2 for this alternative and summarized on Table VI. Estimated annual O&M costs are approximately $11,000. Estimated net present worth of implementing and performing the alternative range from approximately $47,400 (5-year period of performance) to $168,000 (30-year period. of performance).

B. Excavation and Off-site Disposal Without Treatment

Excavation and off-site disposal would affect only those soils which can be feasibly excavated from the former drum storage and TCE degreaser areas. Based on site layout, it was assumed that all drum storage area soils could be excavated. The degreaser area soils, however, are covered partially by the existing building. Building structural elements (columns, footers) are founded on relatively shallow supporting soils. Exterior walls consist of concrete "tip-up" panels reportedly founded at the sane approximate shallow depth. Therefore, excavation at depth, close to or beneath the existing building would not be possible without significant structural support for un-demolished portions of the building or columns/footers left in place.

Reason not to excavate under the bldg.

Accordingly, to prevent undermining of the existing Dollinger building, estimates of soil that could he excavated from adjacent to the former TCE degreaser area include excavation only to approximately 4 feet depth immediately adjacent to the foundation wall, and then leave a 1:1 slope away from the foundation footer to support the foundation footers and columns. The total amount of VOC-containing soil was estimated to be approximately 648 cy. from the former drum storage area and approximately 609 cy. from the former TCE degreaser area.

Is this based on good engineering? Would not get source.

Following excavation, the soils would be loaded and hauled to a permitted off-site disposal facility. Off-site disposal of soils containing VOCs must comply with land disposal restrictions (LDRs). It is currently unknown whether concentrations of all excavated soils would be below applicable LDRs. Therefore, estimated costs of off-site disposal are represented as a range, with the low end of the range based on landfill disposal and the high end of the range based on treatment (incineration or other) prior to land disposal.

Annual O&M costs assumed for this alternative include costs associated with monitoring [redacted] and (2) the effectiveness of source control to groundwater in and around the removal area. Estimated costs of this alternative range from $1,006,000 to $3,183,000 for implementation over a 5-year period, to $1,093,000 to $3,270,000 for a 30-year implementation.

C. <u>In-situ High Vacuum Extraction of Soil Vapor From In-place Soil</u>

This alternative would address treatment of VOC source soils in both the former drum storage and TCE degreaser areas, outside and below the current building footprint. To implement the alternative, a pilot test would first be performed to identify soil vapor permeabilities and possible areas of influence around an extraction point. It was assumed for purposes of cost evaluation that the former TCE degreaser area would require approximately 7 additional wells to implement a vapor extraction remedy (this allows a nominal area of vacuum influence up to approximately 15 to 20 ft.). Due to the shallow nature of VOC containing soils in the former drum storage area, extraction would be possible in this area using a series of three parallel extraction trenches.

at what depth? Work sheet 2 states 16'

Similar high vacuum remedial operations are in progress at other sites in Monroe County. Although relatively few such operations have occurred in such low permeability soils as are present at the Dollinger site, H&A of New York and Xerox Corporation are implementing a high vacuum extraction remediation at Xerox's Building 801 facility on Jefferson Road, east of the Dollinger site, at which similar soil and groundwater conditions are present, although VOC concentrations are significantly higher at the Xerox site. Results of the high vacuum pilot program and startup at the Xerox facility should be available before the scheduled Record of Decision for the Dollinger site, and therefore should indicate more detailed relevant technical information with respect to implementing a high vacuum extraction alternative at the Dollinger facility.

Due to the high groundwater conditions at the site and high vacuums applied to source soils (15 to 22+ in. Hg), some groundwater will be produced incidental to the extraction process. The conceptual system has been configured to allow for handling such water and discharging it to the building sanitary sewer system.

Estimated capital costs for instituting this alternative are approximately $216,500. Total net present worth of operation is estimated to range from $458,000 over a 5-year period, to $1,074,000 over a 30-year period.

D. Ex-situ High Vacuum Extraction of Soil Vapor From Areas Not Under the Building

This alternative is similar in concept to the in-situ high vacuum extraction. However, due to numerous limitations associated with excavating VOC-affected soils below the existing building, this remedial alternative would apply only to those soils that could be feasibly excavated (see building structural elements discussion in the Excavation and Off-site Disposal Without Treatment section). The advantage of ex-situ high vacuum extraction over in-situ is that excavation and stockpiling of soils allow soil structure to be loosened, thereby allowing enhanced vapor flow and potentially shorter remediation times for the treated soil.

To implement this alternative, it was assumed that soils would be (1) excavated from the former drum storage area and outside the building limits of the former TCE degreaser area, (2) placed on a constructed containment pad on-site, north of the facility building, and (3) covered with a light, impermeable cover. Perforated piping, placed in the extraction cell, would be connected to similar high vacuum extraction equipment as would be used in the in-situ high vacuum extraction scenario. It is anticipated that treatment of the excavated soils might last up to a year or more, and therefore estimated costs have been included to backfill the open excavations with clean soil to restore existing grades. Following remediation, the treated soils would be replaced on-site, graded and seeded.

Similar to the in-situ vacuum extraction alternative, it is anticipated that scme water would be produced from the excavated soil in the course of performing remediation. The amount of water would be iimited, however, to that which is excavated with the soils and would overall constitute a lower volume than the amount of water that would be produced incidental to the in-situ high vacuum extraction.

Estimated capital costs for the ex-situ high vacuum alternative are approximately $332,400. Total net present worth is estimated to range from $588,000 for a 5-year implementation to $1,240,000 for a 30-year implementation.

4.2 SEDIMENT ALTERNATIVES

Remedial technology alternatives considered for application to affected sediment in the site storm water detention pond are (1) no action, (2) removal and off-site disposal, and (3) two ex-situ stabilization technology alternatives.

A. No Action

Implementation of the no action alternative for pond sediment would include performance of the EPA-recommended annual sampling and a 5-year review of accumulated data. The compounds of concern in the pond sediments are semi-volatile and volatile organics. Therefore, it was assumed that sampling and analysis would be performed to address the presence of these compounds. Results would be submitted to NYSDEC on a routine basis, and evaluation would be performed at 5-year intervals. Results of the 5-year review would be used to modify subsequent sampling as necessary. No capital costs are associated with implementing the no action alternative and annual O&M costs are estimated to be approximately $9,300. Net present worth of implementing the alternative ranges from approximately $40,000 over a 5-year period, to approximately $142,500 over a 30-year period (see Table VI).

B. Remove and Dispose Without Treatment Off-site

Under this alternative, the estimated 167 cy. of affected sediment in the pond would be removed and disposed of at an appropriate permitted disposal facility off-site. It is not known at this time whether the sediments would be classified as industrial non-hazardous solid waste, or as hazardous waste subject to LDRs. The former classification would allow for a relatively low cost off-site disposal; the latter classification would result in a higher cost of off-site disposal. Based on concentrations detected in pond sediment during the RI, an estimated range of disposal costs is presented in Worksheet 2 for this alternative (Appendix C). TCLP analyses of selected pond samples would likely be necessary to resolve classification status for waste disposal purposes.

No discussion of confirmatory samples

If the sediments are classified as industrial non-hazardous solid waste, estimated costs to implement the alternative are approximately $34,000. To estimate costs under a hazardous waste disposal scenario, it was assumed that up to 1/3 of the pond sediments may not meet LDRs (based on the range of existing pond concentrations exhibited between sample locations SS-201S and SS-204S). Under the hazardous waste disposal scenario and based on this assumption, estimated capital costs are approximately $210,250.

C. Ex-situ Stabilization

Is this appropriate for volatiles?

stabilization treatment is a chemical process which alters a metal or semi-volatile compound's ability to participate in chemical reactions that are associated with environmental migration (e.g., oxidation-reduction, dissociation, ionization, hydrolysis). Two stabilization technologies are considered in this feasibility study. The first (Chemfix stabilization) is a cementitious treatment that results in solidification of the soil mineral matrix in which the compounds reside. This results in physical immobilization of the compounds contained in the matrix. The second stabilization technology (STS Polysilicate) chemically immobilizes compounds by forming meta-silicate compounds from the metals, or incorporating the compounds (semi-volatiles) within a polysilicate lattice. Application of both stabilization techniques would involve removing affected sediments from the pond, placing the sediments on or in treatment equipment or a cell, blending stabilizatіcn compounds into the treated sediments, allowing time for curing, and replacing the sediments elsewhere on site after treatment. For both stabilization treatment methods, it was assumed that confirmation sampling would take place following excavation of sediments from the pond to determine adequate removal of sediments. This would be determined by comparing analytical results from remaining sediments to concentrations exhibited by sample SS-202S, which is the assumed background set of values for the pond (see Tabie I).

Why is this stated not in the previous alternative ... ?

Estimated capital costs for instituting ex-situ stabilization range from approximately $79,000 (STS Polysilicate) to $116,400 (Chemfix stabilization).

4.3 GROUNDWATER ALTERNATIVES

Remedial investigation results for the Dollinger site indicate relatively low VOC concentrations detected in a limited number of wells on the property. Only dissolved phase VOC constituents have been detected in groundwater; no free product has been observed at the site nor is it indicated by other site data. Comparison of groundwater concentrations to those of soils in the

50ppm TCE is low?

apparent source areas (former TCE degreaser area and former drum storage area) indicates that groundwater concentrations appear to be derived from residual concentrations in source soils. The rate of groundwater migration is extremely low, and VOCs in groundwater and soil are confined to the property. Risk assessment evaluation of the current groundwater concentrations did not reveal unacceptable risks associated with concentrations in groundwater under either typical or reasonable maximum exposure scenarios. Further, groundwater is not presently used as a water supply in the site area, nor does this appear to be a potential future use due to low soil permeability. Therefore, implementation of a no action alternative for groundwater is appropriate, particularly if source area remedial alternatives, such as those described above, are implemented.

A. <u>No Action</u>

+ semi annual in source areas

The no action alternative would involve annual sampling and analysis of groundwater, routine reporting of sample results, and 5-year review of the alternative to monitor changes. Results of the 5-year review would be used to modify subsequent sampling as necessary. It was a s s . that routine sampling would be performed at certain site wells and analysis on samples would be performed for VOC compounds. Further, allowance is made for time to evaluate variation in concentrations and groundwater data, and potential trends in data at each 5-year interval. The annual O&M costs of the no action alternative are approximately $18,580. Net present worth costs to implement the no action alternative range from approximately $80,500 to $285,600 (see Table VI).

No action would [illegible] site wells

B. <u>Bentonite Collar Migration Control Along Storm Sewer</u>

Because the site storm sewer line bedding appears to be acting as a potential contaminant transport pathway (<u>i.e.</u>, compounds originating at the former TCE degreaser and drum storage areas appear to be transported to the pond sediment by way of the storm sewer line bedding), this FS evaluated the installation of an impermeable collar around the storm sewer outfall, at th2 former TCE degreaser area, and at the former drum storage area. This would be performed by excavating around the 21-inch storm sewer pipe and placing a bentonite collar around the pipe at each lccation to prevent compound migration along the bedding.

What if there is infiltration into the sewer

Bentonite collars would be placed at three locations so as to reduce potential hydraulic head build-up between and downstream of source areas. This would reduce the likelihood that VOC-containing groundwater would be forced into the storm sewer pipe along cracks or joints.

For purposes of cost evaluation, it was assumed that excavation would be performed so as to expose an approximate 3-foot section of the pipe at each location. Sufficient soil would be cleared from around the pipe to allow placement of a slurry or hydrated bentonite collar up to approximately 2 feet in thickness around the storm sewer pipe. Allowance is made in the cost estimates for backfilling and disposal of potentially affected soils. Capital costs for installing the collar range from approximately $5,225 to $14,950.

4.4 COMBINATION OF ALTERNATIVES

This portion of the feasibility study compares feasible alternatives for each environmental media to those for other media in order to identify technologies that may be mutually complementary or exclusive. A complementary technology is one which either enhances the performance of another technology or enhances a technology's effectiveness in meeting site remedial objectives. Exclusive technologies are those which either prevent implementation of another technology or create the need for detailed planning to prevent increases in cost or time to meet remedial objectives.

Potential Complementary Technologies

The primary complementary technology resulting from the detailed analysis of remedial alternatives is implementation of the bentonite collar migration control alternative along with the selected soil and sediment remedial alternatives. Reduction of concentrations near the source areas as a result of implementing one of the soil treatment alternatives may require several years. Until such reduction has occurred, the potential remains for affected groundwater to migrate along storm sewer bedding and affect residual concentrations in pond sediment near the outfall. Consequently, a remedial activity implemented on the pond sediments may need to be repeated if the collar is not constructed.

Based on a review of the remaining alternatives, no other combinations appear to result in significant enhancement of meeting overall site remedial objectives. Based on the considerations described above, it is recommended that the bentonite collar migration control alternative be implemented in combination with the selected soil and sediment treatment alternatives, including the no action alternatives.

Potentially Exclusive Alternatives

Due to the distance between media to be remediated at the site, it does not appear that there are any remedial technologies that would significantly impede the performance of another technology. Collar construction should be coordinated with pond sediment removal, if selected, to prevent multiple mobilization/demobilization of equipment.

4.5 CRITERIA EVALUATION AND SCORING

Scoring of the various alternatives with respect to the seven criteria described in the NYSDEC 15 May 1990 TAGM is summarized on Table V. As indicated previously, the TAGM provides a weighted scoring mechanism by which to consider the various criteria (compliance with ARARs, protection of health and the environment, short-term effectiveness, etc.). Table V presents relative scoring of the alternatives for each criterion and a subtotal of overall score for each remedial alternative, excluding cost. A summary of costs associated with each remedial alternative is presented in Table VI, and the effect of cost on scoring is discussed in this section.

Ranking of alternatives is described below according to media (soil, sediment, and groundwater).

- Soil Alternatives Ranking

  Of the soil treatment alternatives, the three highest ranking alternatives, without considering costs, are: (1) In-situ high vacuum vapor extraction with a score of 74 out of 85 possible points, (2) Ex-situ high vacuum vapor extraction with a score of 55 out of 85 possible points and (3) Excavation and off-site disposal with a score of 48 out of a possible 85 points. When cost is considered (see Table VI), in-situ vacuum extraction exhibits the lowest capital and net present worth costs (with the exception of the no action alternative), and therefore this alternative ranks highest of those considered. The capital cost for ex-situ high vacuum extraction is approximately half that of excavation and off-site removal, even assuming that direct disposal off-site will meet LDRs (which is not likely for all soils excavated). Further, excavation and off-site disposal does not effectively reduce toxicity, mobility or volume of the hazardous constituents, nor is it an effective long-term remedy. For these reasons, in-situ vacuum extraction ranks first, ex-situ vacuum extraction ranks second, and excavation and off-site disposal ranks third.

- ## Sediment Alternatives Ranking

  Overall scores summarized on Table V for sediment treatment alternatives indicate, without considering cost, that removal and off-site disposal ranks equally with ex-situ stabilization. When considering cost, removal and off-site disposal may rank above ex-situ stabilization, assuming the sediments can meet an industrial non-hazardous waste classification or meet LDRs if the sediments are deemed a hazardous waste. Further, removal and off-site disposal is favored in terms of implementability. This is partly reflected by the high equipment/personnel mob/demob. costs estimated for both stabilization techniques (see Worksheet 2 in Appendix C for costs associated with each stabilization alternative). In summary, removal and off-site disposal may be more cost effective for the low volume of sediments considered for remediation at this site.

  In implementing an alternative for sediment remediation, it is recommended that analysis (TCLP, etc.) to profile the sediment as waste first be performed. If analyses support a non-hazardous waste classification or indicate that LDRs are met, then removal for off-site disposal should be implemented. If LDRs are not met, then consideration should be given to implementing a stabilization alternative, because a stabilization alternative then becomes cost competitive with off-site disposal.

- ## Groundwater Alternatives

  As indicated previously, the baseline health risk for potential groundwater exposures is within or below EPA acceptable ranges. In combination with source area remediation, the no action alternative is the only recommended remedial alternative for groundwater at the site.

  The bentonite collar migration control alternative evaluated under the detailed analysis provides an effective means to limit migration along the only migration route that is not controlled by low permeability site soils. This alternative requires relatively low implementation costs and significantly reduces the possibility that future remediation would need to be repeated on pond sediments. Therefore, it is recommended that the bentonite collar alternative be implemented in combination with the selected source control alternatives evaluated above.

V. SUMMARY AND CONCLUSIONS

5.1 SUMMARY

Potential feasible remedial alternatives for the Dollinger NYSDEC Registry Site No. 828078 have been evaluated in this FS report in accordance with EPA "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" dated October 1988, and the NYSDEC 15 May 1990 Technical and Administrative Guidance Memorandum (TAGM) for the Selection of Remedial Actions at Inactive Hazardous Waste Sites.

Remedial alternatives were evaluated in a detailed preliminary analysis in light of their ability to address volatile organic compounds in source soils at a former TCE degreaser area and drum storage area; semi-volatile compounds and volatile compounds in pond sediments; and volatile compounds in site groundwater (below the former drum storage and degreaser areas). Based on a health risk assessment, remedial action is recommended in order to reduce theoretical acute health risks to an on-site worker or trespasser entering an excavated construction trench, without protective clothing or respiratory equipment, immediately outside the former TCE degreaser area. No unacceptable health risks were identified as associated with residual soil, groundwater, or sediment concentrations at the remaining areas of concern. Because compound-specific criteria were provided by NYSDEC for site soils and sediments (see Tables I and II) based on a source control type model, source control remedial alternatives were identified and evaluated for both soils and sediments. A migration control alternative was also evaluated for a potential groundwater migration pathway.

Fifteen general response actions and 29 remedial alternative technologies under the response actions were subjected to preliminary screening based on effectiveness and implementability. Based on the preliminary screening, 8 general response actions and 9 potential remedial alternative technologies were then subjected to detailed analysis in light of EPA and NYSDEC criteria for the selection of remedial alternatives.

Numerical scoring of the remedial alternatives with respect to the criteria, including costs, are summarized on Tables V and VI. Ranking of the remedial technologies is summarized below with respect to applicable media:

Soil Remedial Alternatives

1. In-situ high vacuum extraction of soil vapor from in-place soil.

2. Ex-situ high vacuum extraction of soil vapor from areas not under the building.

3. Excavation and off-site disposal without treatment of soils outside the building.

Sediment Remedial Alternatives

1. Removal and off-site disposal.

2. Ex-situ stabilization using STS Polysilicate technology.

Groundwater Alternatives

1. Bentonite collar migration control along the storm sewer.

2. No action alternative (in conjunction with the bentonite collar and source control alternatives for soil).

5.2 CONCLUSIONS AND RECOMMENDED ALTERNATIVES

Based on the summary ranking of alternatives described above, the following source and migration control alternatives are recommended for implementation. These appear to rank highest with respect to EPA and NYSDEC evaluation criteria and appear to be the most cost effective alternatives. Please note that the no action alternative for soil is not recommended as a result of a theoretical exposure for a utility/foundation excavation outside the former TCE degreaser area.

Recommended alternatives are:

- Soil - In-situ high vacuum extraction from the former drum storage and TCE degreaser areas (within designated areas both inside and outside the building footprint).

- Sediment - Removal and off-site disposal of sediments from the site pond (assuming the sediments are not hazardous waste).
  What if they are?

- Groundwater - The no action alternative and installation of bentonite collars for migration control along the storm sewer line between the former TCE degreaser area and site pond.

The combined estimated capital costs to implement the recommended alternatives range from approximately $250,000 to $442,000 depending primarily on waste classification of the pond sediments for off-site disposal. If performance of TCLP analysis on the sediments indicates concentrations to be sufficiently high so that the sediments would be subject to LDRs, thereby increasing costs, then one of the ex-situ stabilization alternatives may become more cost-effective. Annual O&M costs for the recommended alternatives are limited to those associated with the high vacuum extraction alternative, and total approximately $55,800 per year. Net present worth of O&M costs range from approximately $241,600 over a 5-year period and $857,500 over a 30-year period.

not good on VOC

VI. CERTIFICATION

H&A of New York hereby states that, to the best of knowledge and opinion, the activities, sampling and analyses described by the following:

1. AFC-Dollinger Work Plan, Remedial Investigation/Feasibility Study, dated 15 February 1991.

2. Work Plan Addendum I, AFC-Dollinger Facility, dated 11 March 1991.

Work has been performed in accordance with the above-noted approved Work Plan and addendum. This report is an accounting of the Feasibility Study work performed. The conclusions provided are based solely on scope of work conducted and sources of information referenced in the report. This work has been undertaken in accordance with generally accepted environmental consulting practices; no other warranty, express or implied, is made.

Lawrence P. Smith, P.E.
Partner

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TABLE I

RECOMMENDED SEDIMENT CLEANUP CRITERIA
(Mg/kg or ppm)
ORGANIC CONTAMINANTS
DOLLINGER CORPORATION SITE, 8-28-078

CONTAMINANT	RECOMMENDED SEDIMENT CLEANUP OBJECTIVE (ppm)
1,1,1-trichloroethane	0.007
toluene	0.005
acetone	0.14
2-butanone	0.069
methylene chloride	0.015
di-n-butylphthalate	5.5
bis(2-ethylhexyl)phthalate	4.2
butylbenzylphthalate	0.48
acenapthene	0.13
anthracene	0.68
benzo(a)anthracene	3.5
benzo(b)fluoranthene	6.0
benzo(k)fluoranthene	2.5
benzo(g,h,i)perylene	1.6
benzo(a)pyrene	3.7
chrysene	4.2
dibenz(a,h)anthracene	0.043
fluoranthene	10.0
indeno(1,2,3-cd)pyrene	2.8
phenanthrene	3.8
pyrene	7.2

Notes:

1. Cleanup objectives represent detections at sediment sample location SS-202s; as agreed upon by NYSDEC.

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TABLE II
RECOMMENDED SOIL CLEANUP CRITERIA (Mg/kg or ppm)
ORGANIC CONTAMINANTS
DOLLINGER CORPORATION SITE, SITE NO. 8-28-078

Contaminant	Solubility mg/l or ppm S	Partition Coefficient Koc	Groundwater Standards/Criteria CW. ug/l or ppb.	Allowable Soil Concentration ppm. Cs (a)	Soil Cleanup Objectives to Protect GW Quality (ppm) ** (b)	USEPA Health Based (ppm)		CRQL (ppb)	Recommended Soil Cleanup Objective (ppm)***
						Carcinogens	Systemic Toxicants		
Xylenes	198	240	5	0.012	1.2	N/A	200,000	---	1.2
Trichloroethene	1,108	126	5	0.007	0.70	64	N/A	5	1.0
1,2-Dichloroethene (trans)	6,300	59	5	0.003	0.3	N/A	N/A	5	0.5
Vinyl Chloride	2,670	57	2	0.0012	0.12	N/A	N/A	10	0.15
Benzo(a)pyrene	0.0012	5,500,000	0.002(ND)	0.110	11.0	0.0609	N/A	330	0.330 or MDL
Benzo(a)anthracene	0.0057	1,380,000	0.002	0.03	3.0	0.224	N/A	330	0.330 or MDL

Notes:

1. (a) Allowable Soil Concentration Cs = f x Cw x Koc
2. (b) Soil cleanup objective = Cs x Correction Factor (CF)
3. MDL = Method Detection Limit
4. * Partition coefficient is calculated by using the following equation:
   log Koc = -0.55 log S + 3.64. Other values are experimental values.
5. ** Correction Factor (CF) of 100 is used as per proposed TAGM.
6. *** As per proposed TAGM, Total VOCs <10 ppm., total Semi-VOCs <500 ppm. and Individual Semi-VOCs <50 ppm.
7. Soil cleanup objectives are developed for soil organic carbon content (f) of 1%, and should be adjusted for the actual soil organic carbon content if it is known.
8. Prepared by Technology Section Bureau of Technical Services Division of Hazardous Waste Remediation, NYSDEC.

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TABLE III
FEASIBILITY STUDY SCREENING
DOLLINGER FACILITY
BRIGHTON, NEW YORK

REMEDIAL TECHNOLOGIES
MEDIA: SOIL

GENERAL RESPONSE ACTION: No Action

Remedial Technology	Synopsis of Method	Applicability	Technical Feasibility
No Action	No action is taken to remove contaminants or lower the contaminant level in soil. Human contact with the affected soil is prevented by access control such as fencing, guards, and posted warnings. Limited monitoring will be undertaken as necessary.	Applicable where access can be controlled, contaminants are unremediable, or where remediation activities pose an unacceptable environmental threat. This may also be applicable where natural processes are remediating soil at an acceptable rate.	Required for consideration by NCP.

GENERAL RESPONSE ACTION: Excavation and Off-Site Disposal Without Treatment

Remedial Technology	Synopsis of Method	Applicability	Technical Feasibility
Excavation and Off-Site Disposal Without Treatment	Excavate soils and dispose as hazardous waste/special waste; backfill/revegetate.	Applicable to contaminated soil, but may require treatment to satisfy LDRs. Excavation may result in limited VOC release to ambient air.	Feasible.

GENERAL RESPONSE ACTION: On-Site Containment/Disposal Without Treatment

Remedial Technology	Synopsis of Method	Applicability	Technical Feasibility
On-Site Disposal Without Treatment	Excavate soils and dispose in on-site landfill, with no treatment.	Applicable to contaminated soil. Excavation may result in limited VOC release to ambient air.	Likely not allowed by local, state and federal officials due to LDRs.

TABLE III
FEASIBILITY STUDY SCREENING
DOLLINGER FACILITY
BRIGHTON, NEW YORK

REMEDIAL TECHNOLOGIES
MEDIA: SOIL

GENERAL RESPONSE ACTION: On-Site Containment/Disposal Without Treatment (Continued)

Remedial Technology	Synopsis of Method	Applicability	Technical Feasibility
Impermeable Cover	An impermeable cover material such as pavement or geotextile is placed over the area of contaminated soil to prevent the infiltration of water, the escape of fugitive dust, or human contact with the soil.	Applicable to contaminated soil after treatment, but not acceptable in lieu of treatment.	Feasible.

GENERAL RESPONSE ACTION: In-Situ Treatment With On-Site or Off-Site Disposal

Remedial Technology	Synopsis of Method	Applicability	Technical Feasibility *
Batch Steam Distillation	Volatile organics are separated from the soil by steam injection. The resulting vapors are condensed and decanted to separate organic liquids from the aqueous phase.	This process is applicable to soils contaminated with organics.	Applicable for site but may not be feasible considering the low permeability of the soils.
In-Situ Bioremediation	Organic chemicals in soil are oxidized by aerobic bacteria to carbon dioxide, water and chloride. This process is enhanced by the injection of nutrients into the ground to stimulate bacterial growth.	Soil and groundwater contaminated with organic chemicals. Soil and aquifer material must be porous and have a resident bacterial population.	Not feasible due to low permeability soils and difficulty in breaking apart clays.
In-Situ High or Low Pressure Vacuum Extraction	A process of removing and venting volatile organic compounds from the unsaturated zone of soils. A well is used to extract subsurface organic contaminants. The extracted contaminant stream passes through a vapor/liquid separator, and the resulting off-gases treated using activated carbon before being released to the atmosphere.	Organic compounds that are volatile or semivolatile at ambient temperatures in soil and groundwater.	The low pressure method would not be feasible due to low permeability. High pressure method is feasible.

* Assumes on-site or off-site disposal of treatment process residuals, as applicable.

TABLE III
FEASIBILITY STUDY SCREENING
DOLLINGER FACILITY
BRIGHTON, NEW YORK

REMEDIAL TECHNOLOGIES
MEDIA: SOIL

GENERAL RESPONSE ACTION: In-Situ Treatment With On-Site or Off-Site Disposal (Continued)

Remedial Technology	Synopsis of Method	Applicability	Technical Feasibility *
Soil Flushing	Injection or flushing of a solvent or surfactant solution to enhance contaminant solubility, which results in increased recovery of contaminants in the groundwater. The system includes extraction wells drilled in the contaminated soils zone, reinjection wells upgradient of the contaminated area and a wastewater treatment system.	Applicable to soils contaminated with only a few specific chemicals. Uniform soils with high permeability are necessary for this process, which is in the development stages.	Not feasible due to low permeability.
In-Situ Stabilization	Stabilization of soil using silicates or cement stabilizing compounds.	Applicable for semi-volatile organics.	Not feasible for soils under building degreaser area.
Steam Injection & Vacuum Extraction	Steam is used to heat the area to be remediated, increasing the vapor pressure of the volatile contaminants and thereby increasing the rate at which they can be stripped. Both the air and steam carry the contaminants to the surface. At the surface the volatile contaminants and the water vapor are removed from the off-gas stream by condensation.	Applicable to organic contaminants such as hydrocarbons and solvents with sufficient partial pressure in the soil.	Site permeability may be too low to work effectively.
In-Situ Vitrification	Contaminated soil is converted into a chemically inert glass-like substance. Electrodes are buried in the soil and are subject to an electrical potential. The natural resistance of the soil causes it to heat to above its melting point.	Organic chemicals are destroyed during vitrification and metallic or radioactive contaminants are encapsulated in the glass.	Not feasible for under building degreaser area. Technology has marginal field scale record.

* Assumes on-site or off-site disposal of treatment process residuals, as applicable.

TABLE III
FEASIBILITY STUDY SCREENING
DOLLINGER FACILITY
BRIGHTON, NEW YORK

REMEDIAL TECHNOLOGIES
MEDIA: SOIL

GENERAL RESPONSE ACTION: Excavation and Ex-Situ Treatment With On-Site or Off-Site Disposal

Remedial Technology	Synopsis of Method	Applicability	Technical * Feasibility
Circulating Fluidized Bed Combustor	Waste material and limestone are fed into a combustion chamber along with the recirculating bed material from a hot cyclone. The limestone neutralizes acid gases. The treated ash is transported out of the system by an ash conveyor. Hot gases produced during combustion pass through a convective gas cooler and baghouse before being released to the atmosphere.	This technology is suitable for treating halogenated and non-halogenated organic compounds in soils, sludges and slurries. Excavation may result in limited VOC release to ambient air.	Requires excavation. Not feasible for the soils under building degreaser area or beneath the water table.
Ex-Situ Bioremediation	Organic chemicals in soil are oxidized by aerobic bacteria. The soil, once treated, is returned to the site area from which it was removed.	Soil and groundwater contaminated with organic chemicals. Soil and aquifer material must be porous and have a resident bacterial population. Excavation may result in limited VOC release to ambient air.	Requires excavation. May not be feasible due to low permeability soils and difficulty in breaking apart clays.
Ex-Situ Vapor Extraction	Excavated soil is placed in a covered roll-off container. The roll-off is equipped with a series of porous pipes below the soil. A vacuum applied to the pipes removes volatile organics from the soil.	Soil contaminated with volatile organic chemicals. Excavation may result in limited VOC release to ambient air.	Requires excavation. Not feasible for soils under building degreaser area or beneath the water table.
Ex-Situ Stabilization	Stabilization of soil using silicates or cement stabilizing compounds.	Applicable for semi-volatile organics. Excavation may result in limited VOC release to ambient air.	Requires excavation. Not feasible for soils under building degreaser area or beneath the water table.

* On-site or off-site disposal subject to administrative approval.

TABLE III
FEASIBILITY STUDY SCREENING
DOLLINGER FACILITY
BRIGHTON, NEW YORK

REMEDIAL TECHNOLOGIES
MEDIA: SOIL
GENERAL RESPONSE ACTION: Excavation and Ex-Situ Treatment With On-Site or Off-Site Disposal (Continued)

Remedial Technology	Synopsis of Method	Applicability	Technical Feasibility *
Soil Tilling	Contaminated soils are excavated and placed on a concrete pad with curbing. The soil is periodically mechanically tilled or agitated to release volatilized organics to the atmosphere. The treated soils are used as backfill in excavated areas once selected action levels are reached.	Soils contaminated with volatile organics at low concentrations. Excavation may result in limited VOC release to ambient air.	Requires excavation. Not feasible for soils under building degreaser area or beneath the water table.
Low Temperature Thermal Desorption	The pilot-scale system is mounted on two trailers and has a capacity of treating 5 tons of material per day. The first trailer contains a rotary dryer used to heat contaminated materials and drive off water and organic contaminants. The second trailer contains a gas treatment system that condenses and collects the contaminants driven from the soil.	Applicable for volatile and semivolatile organics, and PCB's. Excavation may result in limited VOC release to ambient air.	Requires excavation. Not feasible for soils under building degreaser area or beneath the water table.
Pyretron Oxygen Burner	The Pyretron technology involves an oxygen-air-fuel burner, and uses advanced fuel injection and mixing concepts to burn wastes.	Technology not suitable for processing aqueous wastes or inorganic wastes. Excavation may result in limited VOC release to ambient air.	Requires excavation. Not feasible for soils under the building degreaser area or beneath the water table.

* On-site or off-site disposal subject to administrative approval.

TABLE III
FEASIBILITY STUDY SCREENING
DOLLINGER FACILITY
BRIGHTON, NEW YORK

REMEDIAL TECHNOLOGIES
MEDIA: SEDIMENT

GENERAL RESPONSE ACTION: No Action

Remedial Technology	Synopsis of Method	Applicability	Technical Feasibility
No Action	No action is taken to remove contaminant or lower contaminant levels in sediment. Human contact with the affected sediment is prevented by access control such as fencing, guards and posted warnings. Limited monitoring will be undertaken as necessary.	Applicable where access can be controlled, contaminants are unremediable, or where remediation activities pose an unacceptable environmental threat. This may also be applicable where natural processes are remediating sediment at an acceptable rate.	Required for consideration by NCP.

GENERAL RESPONSE ACTION: Removal and Off-site Disposal Without Treatment

Remedial Technology	Synopsis of Method	Applicability	Technical Feasibility
Removal and Off-site Disposal Without Treatment	Excavate, dredge or vacuum sediment and dispose of in off-site facility as hazardous waste/special waste.	Applicable to contaminated sediment, but may require treatment to satisfy LDRs.	Feasible. Location of disposal subject to waste classification.

GENERAL RESPONSE ACTION: On-site Disposal Without Treatment

Remedial Technology	Synopsis of Method	Applicability	Technical Feasibility
On-site Disposal without Treatment	Excavate, dredge or vacuum sediment and dispose of on-site.	Applicable to contaminated sediment. Because VOC concentrations low, not likely to result in VOC emission to ambient air.	Likely not allowed by local, state and federal officials due to LDRs.

TABLE III
FEASIBILITY STUDY SCREENING
DOLLINGER FACILITY
BRIGHTON, NEW YORK

REMEDIAL TECHNOLOGIES
MEDIA: SEDIMENT

GENERAL RESPONSE ACTION: Ex-Situ Stabilization

Remedial Technology	Synopsis of Method	Applicability	Technical Feasibility
Ex-situ Chemical Stabilization	Stabilization of sediment using silicates or cement stabilizing compounds.	Applicable for semivolatile compounds.	Feasible.

TABLE III
FEASIBILITU' STUDY SCREENING
DOLLINGER FACILITU'
BRIGHTON, NEW YORK

REMEDIAL TECHNOLOGIES
MEDIA: GROUNDWATER

GENERAL RESPONSE ACTION: No Action

Remedial Technology	Synopsis of Method	Applicability	Technical Feasibility
No Action	Allow natural migration to result in dilution, dispersion, degradation and attenuation. Contaminant toxicity, volume and mobility are not reduced. Limited monitoring will be undertaken as necessary.	Applicable to non-mobile contaminants, or where natural processes are effectively remediating groundwater.	Required for consideration by NCP.

GENERAL RESPONSE ACTION: Active Containment

Remedial Technology	Synopsis of Method	Applicability	Technical Feasibility
Active Containment	Groundwater flow velocity and direction is controlled by a series of extraction and/or injection wells. The wells create hydraulic barriers that prevent contaminated groundwater from travelling off-site.	Applicable to granular aquifers where groundwater movement can be accurately predicted and controlled.	Not feasible due to low permeability-effective gradient control likely to be difficult.

GENERAL RESPONSE ACTION: Passive Containment

Remedial Technology	Synopsis of Method	Applicability	Technical Feasibility
Passive Containment	Groundwater and/or contaminant migration is controlled by emplacement of a surface cap over contaminated areas, a subsurface vertical barrier or subsurface horizontal barrier.	Applicable to areas of shallow, overburden contaminants.	Surface cap potentially applicable/feasible. Subsurface barriers not feasible due to low permeability (low likelihood of improvement over already-low permeability).

TABLE III
FEASIBILITY STUDY SCREENING
DOLLINGER FACILITY
BRIGHTON, NEW YORK

REMEDIAL TECHNOLOGIES
MEDIA: GROUNDWATER

GENERAL RESPONSE ACTION: Conventional Groundwater Recovery

Remedial Technology	Synopsis of Method	Applicability	Technical Feasibility
Physical/Chemical/Biological Treatment of Extracted Groundwater	Groundwater which has been removed from the aquifer is treated to remove organics using a variety of chemical, physical or biological means.	Applicable to aqueous media contaminated with organic compounds. Applicable to granular aquifers where groundwater can readily be removed.	Not feasible due to low permeability.
Temperature-Aided Treatment	Groundwater which has been removed from the aquifer is treated to remove organics using freezing separation or thermal destruction.	Applicable to aqueous media contaminated with organic compounds. Applicable to granular aquifers where groundwater can readily be removed for treatment.	Not feasible due to low permeability.

GENERAL RESPONSE ACTION: High Vacuum Dual-Phase Recovery

Remedial Technology	Synopsis of Method	Applicability	Technical Feasibility
High Vacuum In-situ Vacuum Extraction	A process of removing and venting volatile organic compounds from the unsaturated zone of soil and shallow groundwater using high vacuum withdrawal methods. A well is used to extract subsurface organic contaminants. The extracted contaminant stream passes through a vapor/liquid separator, and the resulting off-gases are treated before being released to the atmosphere.	Organic compounds that are volatile at ambient temperatures in soils and groundwater.	Not feasible due to low permeability.

TABLE III
FEASIBILITY STUDY SCREENING
DOLLINGER FACILITY
BRIGHTON, NEW YORK

REMEDIAL TECHNOLOGIES
MEDIA: GROUNDWATER

GENERAL RESPONSE ACTION: In-Situ Delivery of Treatment

Remedial Technology	Synopsis of Method	Applicability	Technical Feasibility
In-situ Treatment	Groundwater containing organics is treated in place using aeration, chemical reactions (such as surfactant flushing), physical systems (such as emplaced carbon treatment beds) or biological treatment (injection of organisms/nutrients).	Applicable to aqueous media containing organic compounds. Applicable to aquifers where permeability allows controllable groundwater movement and extraction.	Not feasible due to low permeability of soils.

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TABLE IV
REMEDIAL ALTERNATIVES PRELIMINARY
SCREENING SCORING
DOLLINGER FACILITY
BRIGHTON, NEW YORK

MEDIA	RESPONSE ACTION/ REMEDIAL TECHNOLOGY	SCORES	
		Effectiveness*	Implementability*
SOIL	No Action	Not Scored	
	Excavation and Off-Site Disposal Without Treatment	18	10
	On-Site Containment/Disposal Without Treatment	9	9
	In-Situ Treatment with On-Site or Off-Site Disposal	24	9
	Excavation and Ex-Situ Treatment with On-Site or Off-site Disposal	23	10
SEDIMENT	No Action	Not Scored	
	Removal and Off-Site Disposal Without Treatment	21	13
	On-Site Disposal Without Treatment	9	8
	Ex-Situ Stabilization	24	10
GROUNDWATER	No Action	Not Scored	
	Active Containment	9	7
	Passive Containment	10	7
	Conventional Groundwater Recovery	16	7
	High Vacuum Dual-Phase Recovery	17	6
	In-Situ Delivery of Treatment	14	7

* A score of <10 on Effectiveness or <8 on Implementability allows rejection of the corresponding alternative from further Feasibility Study consideration according to NYSDEC Revised TAGM, Selection of Remedial Actions at Inactive. Hazardous Waste Sites, dated 15 May 1990.

VBD:gma/TDOLLI03.wp

TABLE V

DETAILED ANALYSIS SCORING SUMMARY
DOLLINGER CORPORATION SITE, SITE NO. 8-28-078

MEDIA / Remedial Technology	CRITERIA: SCGs/ ARARs (10)	HEALTH & ENVIRONMENT (20)	SHORT-TERM (10)	LONG TERM (15)	REDUCTION (15)	IMPLEMEN-TABILITY (15)	COST * (15)	SUB-TOTAL
SOIL								
No Action	0	2	7	2	0	11	--	22
Excavation and Off-site Disposal Without Treatment	10	11	8	8	2	9	--	48
In-situ High Vacuum Extraction of Soil Vapor from In-place Soil	10	20	9	13	13	9	--	74
Ex-situ High Vacuum Extraction of Soil Vapor from Areas Not Under the Building	10	13	8	12	4	8	--	55
SEDIMENT								
No Action	0	12	6	5	0	11	--	34
Remove and Dispose Without Treatment Off-site	10	20	9	12	15	14	--	80
Ex-situ Stabilization (Chemfix or STS Polysilicate)	10	20	10	15	15	11	--	81
GROUNDWATER								
No Action	0	15	10	5	0	13	--	43
Bentonite Collar Migration Control Along Storm Sewer	3	20	10	12	5	14	--	64

NOTES:

1. The full criteria names are as follows:
   SCGs = Compliance with Applicable or Relevant and Appropriate New York State Standards, Criteria and Guidelines.
   HEALTH AND ENVIRONMENT = Protection of Human Health and the Environment.
   SHORT-TERM = Short-Term Effectiveness.
   LONG-TERM = Long-Term Effectiveness and Permanence.
   REDUCTION = Reduction of Toxicity, Mobility or Volume.
2. Detailed analysis scoring sheets are provided in Appendix B. The procedure for detailed analysis scoring is provided in the NYSDEC's 15 May 1990 TAGM for the Selection of Remedial Actions at Inactive Hazardous Waste Sites. The number in parenthesis after each criteria is the weight (in percentage) given to that criteria. It is also equal to the total possible points available for the criteria.
3. * - Remedial Technology costs are presented in Table VI, Remedial Alternatives Estimated Costs Summary. As shown, the cost criteria has a weight of 15%.
4. The Subtotal presented represents 85% of the total possible weight or points for a remedial technology (cost is not included- see Table VI for costs summary).

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TABLE VI
REMEDIAL ALTERNATIVES ESTIMATED COSTS SUMMARY
DOLLINGER CORPORATION SITE, SITE NO. 8-28-078

MEDIA	CAPITAL	ANNUAL O&M	NET PRESENT WORTH 5 YR	10 YR	20 YR	30 YR
SOIL						
No Action		$10,948	$47,405	$84,519	$136,412	$168,271
Excavation and Off-site Disposal Without Treatment	$971,490 / $3,148,490	$7,900	$34,207	$60,988	$98,434	$121,423
In-situ High-Vacuum Extraction of Soil Vapor from In-place Soil	$216,485	$55,792	$241,579	$430,714	$695,168	$857,523
Ex-situ High Vacuum Extraction of Soil Vapor From Areas Not Under the Building	$332,373	$59,048	$255,678	$455,851	$735,738	$907,568
SEDIMENT						
No Action		$9,269	$40,135	$71,557	$115,492	$142,465
Remove and Dispose Without Treatment Off-site	$33,885 / $210,249					
Ex-situ Stabilization (Chemfix)	$116,424					
Ex-situ Stabilization (STS Polysilicate)	$79,130					
GROUNDWATER						
No Action		$18,584	$80,469	$143,468	$231,557	$285,636
Bentonite Collar Migration Control Along Storm Sewer	$5,225 / $14.945					

NOTES:

1. Refer to Worksheets 1-3 for each remedial action alternative for further detail.

2. Sources for cost estimates are as follows:

   "Means Site Work Cost Data 1991" Smit, K., ed., Roger Grant, publ., 1990.

   Telecommunication with Chemfix, Inc., 9 March 1992.

   Communication with STS, Inc., November 1991

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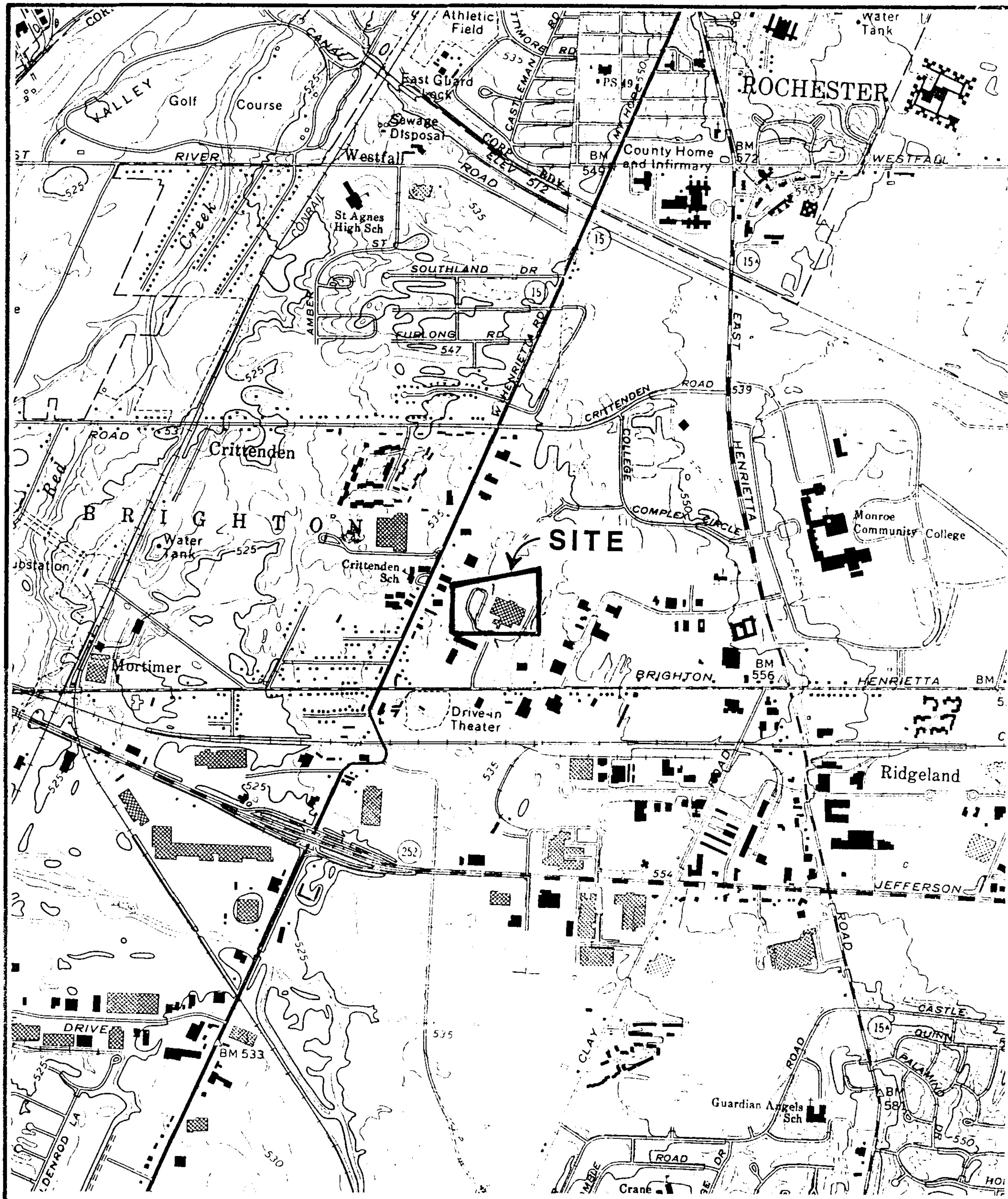

LATITUDE: 43" 05' 49"N LONGITUDE: 77" 37' 38"W

NEW YORK

QUADRANGLE LOCATION

USGS QUADRANGLE: WEST HENRIETTA AND PITTSFORD, NY

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DOLLINGER FS REPORT
DOLLINGER - A FILTRONA COMPANY
BRIGHTON. NEW YORK

PROJECT LOCUS

SCALE: 1 IN. = 2000 FT.

MARCH 1992

FILE NO. 70007-43

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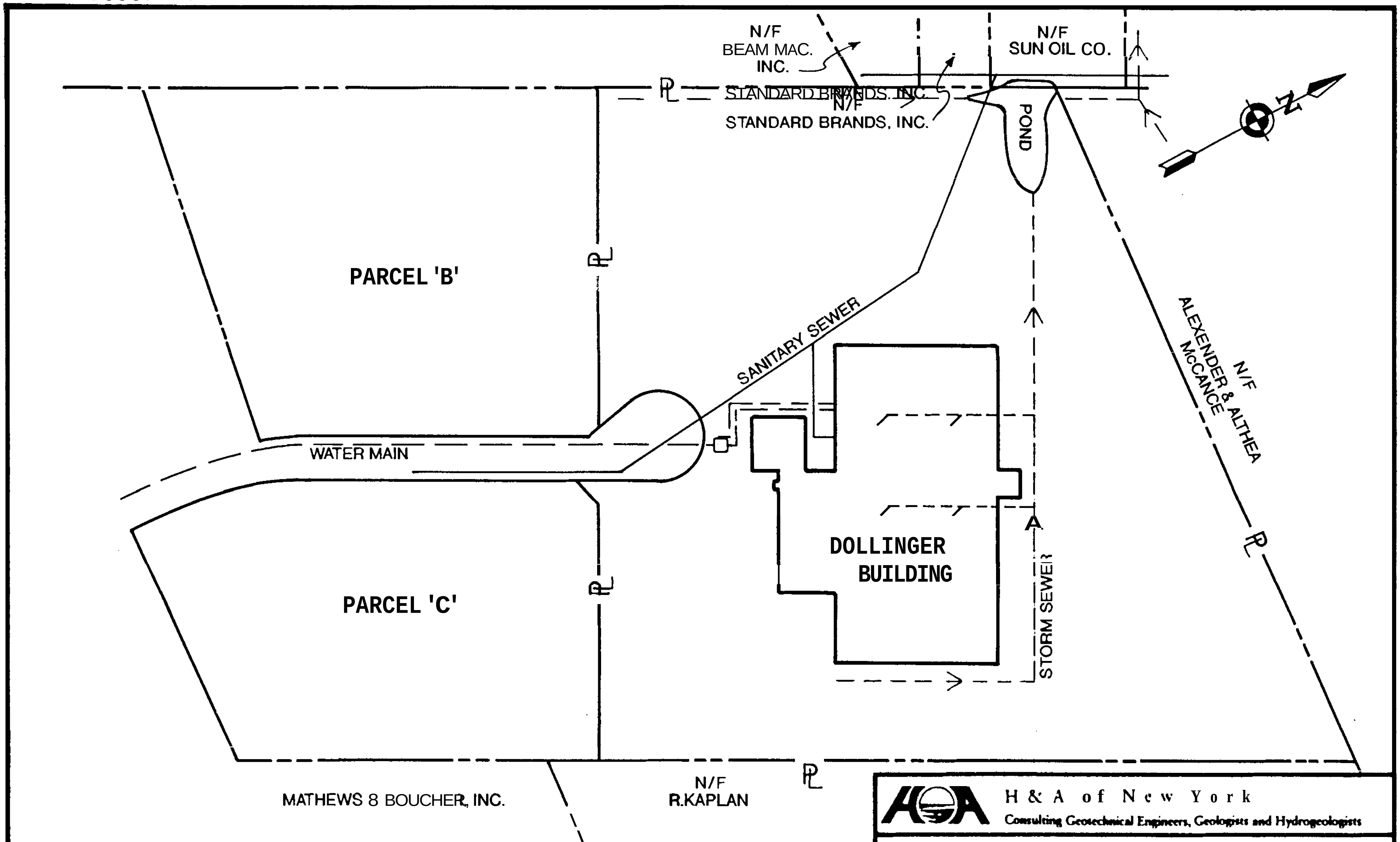
FIGURE 1

FILE NO. 70007-43



NOTES:

1. Figure based on plan entitled "Dollinger Property, Site and Utility Plan" prepared by Sear Brown, Schoenberger & Costich dated 2 February 1968.

2. See accompanying text for additional information.

H & A of New York
Consulting Geotechnical Engineers, Geologists and Hydrogeologists

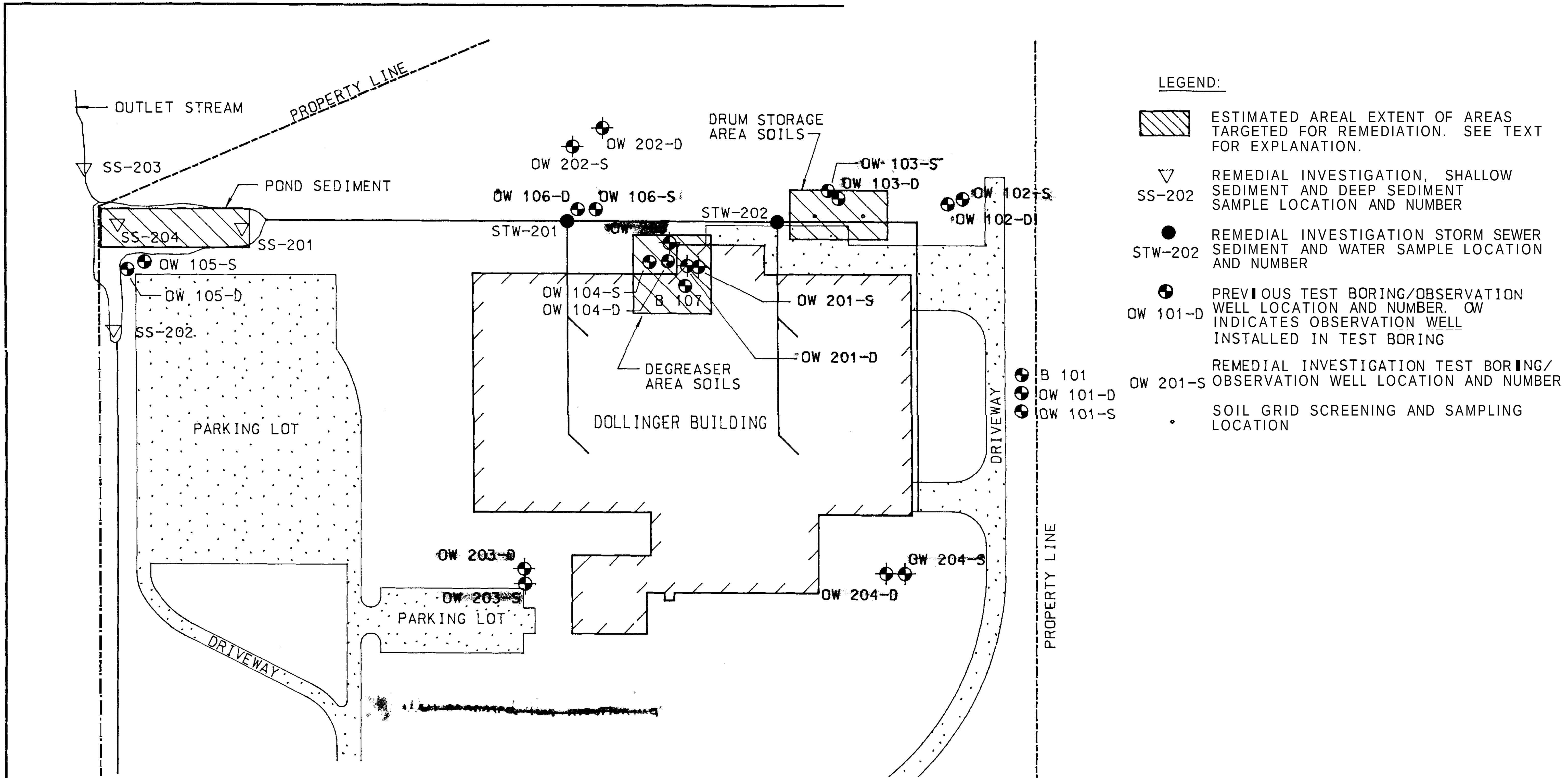
DOLLINGER FS REPORT
DOLLINGER - A FILTRONA COMPANY
BRIGHTON. NEW YORK

SITE AREA PLAN

SCALE: 1 IN. = 200 FT.

MARCH 1992

FIGURE 2



NOTES:

1. FIGURE BASED ON PLAN ENTITLED "DOLLINGER PROPERTY, SITE AND UTILITY PLAN" PREPARED BY SEAR-BROWN* SCHOENBERGER & COSTICH DATED 2 FEBRUARY 1968 AND REVISED 28 JUNE 1968.

2. SEE ACCOMPANYING TEXT FOR ADDITIONAL INFORMATION.

H & A OF NEW YORK
Geotechnical Engineers A Environmental Consultants

DOLLINGER FS REPORT
DOLLINGER - A FILTRONA COMPANY
BRIGHTON, NEW YORK

SOIL AND SEDIMENT REMEDIATION AREAS PLAN

SCALE: AS SHOWN — MARCH 1992

FILENAME: FIG3FS.DGN

FIGURE 3

FILE NO. 70007-43

APPENDIX A

Preliminary Screening Scoring Sheets

Table 4.1

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
SOIL: EXCAVATION AND OFF-SITE DISPOSAL WITHOUT TREATMENT				
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.) (EXCAVATION MAY RELEASE VOCs)	Yes		0
		No	___	4
	° Can the short-term risk be easily controlled?	Yes	X	1
		No	___	0
	° Does the mitigative effort to control short-term risk impact the community life-style?	Yes	___	0
		No	X	2
Subtotal (maximum = 4) 3				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes	X	0
		No	___	4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes	X	3
		No	___	0
Subtotal (maximum = 4) 3				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr.	X	1
		> 2yr.	___	0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr.	X	1
		> 2yr.	___	0
Subtotal (maximum = 2) 2				
4. On-site or off-site treatment or land disposal	° On-site treatment*			3
	° Off-site treatment*			1
	° On-site or off-site land disposal			0
Subtotal (maximum = 3) ϕ				
*treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes				
5. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section 2.1(a), (b), or (c). (If answer is yes, go to Factor 7.)	Yes	___	3
		No	X	0
Subtotal (maximum = 3) ϕ				

B-1

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening		Score
6. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr. X	3
		20-25yr. ___	2
		15-20yr. ___	1
		< 15yr. ___	0
Subtotal (maximum = 3) 3			
7. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None ___	3
		≤ 25% X	2
		25-50% ___	1
		≥ 50% ___	0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 8.)	Yes ___	0
		No X	2
	iii) Is the treated residual toxic?	Yes ___	0
		No ___	1
	iv) Is the treated residual mobile?	Yes ___	0
		No ___	1
Subtotal (maximum = 5) 4			
8. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of:	< 5yr. X	1
		> 5yr. ___	0
	ii) Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes X	0
		No ___	1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident X	1
		Somewhat to not confident ___	0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum ___	2
		Moderate X	1
		Extensive ___	0
Subtotal (maximum = 4) 3			
TOTAL (maximum = 25) 18			

IF THE TOTAL IS LESS THAN 10, PROJECT MANAGER MAY REJECT ME REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.2

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening		Score
1. Technical Feasibility			
a. Ability to construct technology.	i) Not difficult to construct. No uncertainties in construction.	___	3
	ii) Somewhat difficult to construct. No uncertainties in construction.	X	2
	iii) Very difficult to construct and/or significant uncertainties in construction.	___	1
b. Reliability of technology.	i) Very reliable in meeting the specified process efficiencies or performance goals.	___	3
	ii) Somewhat reliable in meeting the specified process efficiencies or performance goals.	X	2
c. Schedule of delays due to technical problems.	i) Unlikely	___	2
	ii) Somewhat likely	X	1
d. Need of undertaking additional remedial action, if necessary.	i) No future remedial actions may be anticipated.	___	2
	ii) Some future remedial actions may be necessary. (UNDER THE BUILDING DEGREASER AREA WHERE THIS OPTION IS NOT FEASIBLE).	X	1
Subtotal (maximum = 10) 6			
2. Administrative Feasibility			
a. Coordination with other agencies.	i) Minimal coordination is required.	___	2
	ii) Required coordination is normal.	X	1
	iii) Extensive coordination is required.	___	0
Subtotal (maximum = 2) 1			
3. Availability of Services and Materials			
a. Availability of prospective technologies.	i) Are technologies under consideration generally commercially available for the site-specific application?	Yes X	1
		No ___	0
	ii) Will more than one vendor be available to provide a competitive bid?	Yes X	1
		No ___	0

Table 4.2 (cont'd)

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes	X	1
		No		0

Subtotal (maximum = 3) 3

TOTAL (maximum = 15) 10

IF M E TOTAL IS LESS THAN 8, PROJECT MANAGER MAY REJECT M E REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.1

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
SOIL: ON-SITE CONTAINMENT/DISPOSAL WITHOUT TREATMENT				
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.)	Yes	X	0
		No		4
	° Can the short-term risk be easily controlled?	Yes	X	1
		No		0
	° Does the mitigative effort to control short-term risk impact the community life-style?	Yes		0
		No	X	2
Subtotal (maximum = 4) 3				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes	X	0
		No		4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes		3
		No	X	0
Subtotal (maximum = 4) ∅				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr.	X	1
		> 2yr.		0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr.		1
		> 2yr.	X	0
Subtotal (maximum = 2) 1				
4. On-site or off-site treatment or land disposal	° On-site treatment*			3
	° Off-site treatment*			1
	° On-site or off-site land disposal			0
Subtotal (maximum = 3) ∅				
*treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes				
5. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section 2.1(a), (b), or (c). (If answer is yes, go to Factor 7.)	Yes		3
		No	X	0
Subtotal (maximum = 3) ∅				

Table 4.1 (cont'd)

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
6. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr.		3
		20-25yr.	___	2
		15-20yr.	___	1
		< 15yr.	X	0
Subtotal (maximum = 3) ∅				
7. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None	___	3
		≤ 25%	___	2
		25-50%	___	1
		≥ 50%	X	0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 8.) (UNTREATED RESIDUAL IS LEFT)	Yes	___	0
		No	X	2
	iii) Is the treated residual toxic?	Yes	___	0
		No	___	1
	iv) Is the treated residual mobile?	Yes	___	0
		No	___	1
Subtotal (maximum = 5) 2				
8. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of:	< 5yr.	X	1
		> 5yr.	___	0
	ii) Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes	X	0
		No	___	1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident	X	1
		Somewhat to not confident	___	0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum	___	2
		Moderate	X	1
		Extensive	___	0
Subtotal (maximum = 4) 3				

TOTAL (maximum = 25) 9

IF THE TOTAL IS LESS THAN 10, PROJECT MANAGER MAY REJECT THE REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.2

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening		Score
1. Technical Feasibility			
a. Ability to construct technology.	i) Not difficult to construct. No uncertainties in construction.	___	3
	ii) Somewhat difficult to construct. No uncertainties in construction.	X	2
	iii) Very difficult to construct and/or significant uncertainties in construction.	___	1
b. Reliability of technology.	i) Very reliable in meeting the specified process efficiencies or performance goals.	___	3
	ii) Somewhat reliable in meeting the specified process efficiencies or performance goals.	X	2
c. Schedule of delays due to technical problems.	i) Unlikely	___	2
	ii) Somewhat likely	X	1
d. Need of undertaking additional remedial action, if necessary.	i) No future remedial actions may be anticipated.	___	2
	ii) Some future remedial actions may be necessary.	X	1
Subtotal (maximum = 10) 6			
2. Administrative Feasibility			
a. Coordination with other agencies.	i) Minimal coordination is required.	___	2
	ii) Required coordination is normal.	___	1
	iii) Extensive coordination is required.	X	0
Subtotal (maximum = 2) #			
3. Availability of Services and Materials			
a. Availability of prospective technologies.	i) Are technologies under consideration generally commercially available for the site-specific application?	Yes X No ___	1 0
	ii) Will more than one vendor be available to provide a competitive bid?	Yes ___ No ___	1 0

B-7

Table 4.2 (cont'd)

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening		Score
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes X No ___	1 0

Subtotal (maximum = 3) 3

TOTAL (maximum = 15) 9

IF M E TOTAL IS LESS M A N 8, PROJECT MANAGER MAY REJECT M E REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.1

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
SOIL: IN-SITU TREATMENT WITH ON-SITE OR OFF-SITE DISPOSAL				
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.) (ASSUME NO EXCAVATION METHODS, SUCH AS VAPOR EXTRACTION)	Yes		0
		No	X	4
	° Can the short-term risk be easily controlled?	Yes		1
		No		0
	° Does the mitigative effort to control short-term risk impact the community life-style?	Yes		0
		No		2
Subtotal (maximum = 4) 4				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes		0
		No	X	4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes		3
		No		0
Subtotal (maximum = 4) 4				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr.	X	1
		> 2yr.		0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr.	X	1
		> 2yr.		0
Subtotal (maximum = 2) 2				
4. On-site or off-site treatment or land disposal	° On-site treatment*			3
	° Off-site treatment*			1
	° On-site or off-site land disposal			0
Subtotal (maximum = 3) 3				
*treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes				
5. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section 2.1(a), (b), or (c). (If answer is yes, go to Factor 7.)	Yes	X	3
		No		0
Subtotal (maximum = 3) 3				

Table 4.1 (cont'd)

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
6. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr.		3
		20-25yr.		2
		15-20yr.		1
		< 15yr.		0
Subtotal (maximum = 3)				
7. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None		3
		≤ 25%	X	2
		25-50%		1
		≥ 50%		0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 8.) (ASSUME YES)	Yes		0
		No	X	2
	iii) Is the treated residual toxic?	Yes		0
		No		1
	iv) Is the treated residual mobile?	Yes		0
		No		1
Subtotal (maximum = 5) 4				
8. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of:	< 5yr.	X	1
		> 5yr.		0
	ii) Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes	X	0
		No		1
	iii) Degree of confidence that controls can adequately handle potential problems. (ASSUME YES)	Moderate to very confident	X	1
		Somewhat to not confident		0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum	X	2
		Moderate		1
		Extensive		0
Subtotal (maximum = 4) 4				

TOTAL (maximum = 25) 24

IF THE TOTAL IS LESS THAN 10, PROJECT MANAGER MAY REJECT THE REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

B-10

Table 4.2

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
1. Technical Feasibility				
a. Ability to construct technology.	i) Not difficult to construct. No uncertainties in construction.		___	3
	ii) Somewhat difficult to construct. No uncertainties in construction.		X	2
	iii) Very difficult to construct and/or significant uncertainties in construction.		___	1
b. Reliability of technology.	i) Very reliable in meeting the specified process efficiencies or performance goals.		___	3
	ii) Somewhat reliable in meeting the specified process efficiencies or performance goals.		X	2
c. Schedule of delays due to technical problems.	i) Unlikely		___	2
	ii) Somewhat likely		X	1
d. Need of undertaking additional remedial action, if necessary.	i) No future remedial actions may be anticipated.		X	2
	ii) Some future remedial actions may be necessary.		___	1
Subtotal (maximum = 10) 7				
2. Administrative Feasibility				
a. Coordination with other agencies.	i) Minimal coordination is required.		___	2
	ii) Required coordination is normal.		X	1
	iii) Extensive coordination is required.		___	0
Subtotal (maximum = 2) 1				
3. Availability of Services and Materials				
a. Availability of prospective technologies.	i) Are technologies under consideration generally commercially available for the site-specific application?	Yes	X	1
		No	___	0
	ii) Will more than one vendor be available to provide a competitive bid?	Yes	___	1
		No	X	0

B-11

Table 4.2 (cont'd)

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes	____	1
		No	X	0

Subtotal (maximum = 3) 1

TOTAL (maximum = 15) 9

IF THE TOTAL IS LESS THAN 8, PROJECT MANAGER MAY REJECT ME REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.1

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
SOIL: EXCAVATION AND EX-SITU TREATMENT WITH ON-SITE OR OFF-SITE DISPOSAL				
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.)	Yes	X	0
		No		4
	° Can the short-term risk be easily controlled?	Yes	X	1
		No		0
	° Does the mitigative effort to control short-term risk impact the community life-style?	Yes		0
		No	X	2
Subtotal (maximum = 4) 3				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes	X	0
		No		4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes	X	3
		No		0
Subtotal (maximum = 4) 3				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr.	X	1
		> 2yr.		0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr.	X	1
		> 2yr.		0
Subtotal (maximum = 2) 2				
4. On-site or off-site treatment or land disposal	° On-site treatment*			3
	° Off-site treatment*			1
	° On-site or off-site land disposal			0
Subtotal (maximum = 3) 3				
*treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes				
5. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section (a , (b), or (c). (If answer is yes, go to Factor 7.)	Yes	X	3
		No		0
Subtotal (maximum = 3) 3				

Tsble 4.1 (cont'd)

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
6. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr.		3
		20-25yr.		2
		15-20yr.		1
		< 15yr.		0
Subtotal (maximum = 3) ∅				
7. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None	X	3
		≤ 25%		2
		25-50%		1
		≥ 50%		0
	ii) Is there tre--ed residual left at the site? (If answer is no, go to Factor 8.) (FOR TREATED MATERIALS ONLY)	Yes	X	0
		No		2
	iii) Is the treated residual toxic?	Yes		0
		No	X	1
	iv) Is the treated residual mobile?	Yes		0
		No	X	1
Subtotal (maximum = 5) 5				
8. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of: (FOR TREATED MATERIALS ONLY)	< 5yr.	X	1
		> 5yr.		0
	ii) Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes	X	0
		No		1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident	X	1
		Somewhat to not confident		0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum	X	2
		Moderate		1
		Extensive		0
Subtotal (maximum = 4) 4				
TOTAL (maximum = 25) 23				

IF THE TOTAL IS LESS MAN 10. PROJECT MANAGER MAY REJECT THE REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.2

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
1. Technical Feasibility				
a. Ability to construct technology.	i) Not difficult to construct. No uncertainties in construction.		___	3
	ii) Somewhat difficult to construct. No uncertainties in construction.		X	2
	iii) Very difficult to construct and/or significant uncertainties in construction.		___	1
b. Reliability of technology.	i) Very reliable in meeting the specified process efficiencies or performance goals.		___	3
	ii) Somewhat reliable in meeting the specified process efficiencies or performance goals.		X	2
c. Schedule of delays due to technical problems.	i) Unlikely		___	2
	ii) Somewhat likely		X	1
d. Need of undertaking additional remedial action, if necessary.	i) No future remedial actions may be anticipated.		X	2
	ii) Some future remedial actions may be necessary.		___	1
Subtotal (maximum = 10) 7				
2. Administrative Feasibility				
a. Coordination with other agencies.	i) Minimal coordination is required.		___	2
	ii) Required coordination is normal.		X	1
	iii) Extensive coordination is required.		___	0
Subtotal (maximum = 2) 1				
3. Availability of Services and Materials				
a. Availability of prospective technologies.	i) Are technologies under consideration generally commercially available for the site-specific application?	Yes	X	1
		No	___	0
	ii) Will more than one vendor be available to provide a competitive bid?	Yes	X	1
		No	___	0

B-15

Table 4.2 (cont'd)

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes	___	1
		No	X	0

Subtotal (maximum = 3) 2

TOTAL (maximum = 15) 10

IF THE TOTAL IS LESS THAN 8, PROJECT MANAGER MAY REJECT THE REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.1

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
SEDIMENT: REMOVAL AND OFF-SITE DISPOSAL WITHOUT TREATMENT				
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.) (LOW VOCs, LOW/NO EMISSION ON EXCAVATION)	Yes	___	0
		No	X	4
	° Can the short-term risk be easily controlled?	Yes	___	1
		No	___	0
	° Does the mitigative effort to control short-term risk impact the community life-style?	Yes	___	0
		No	___	2
Subtotal (maximum = 4) 4				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes	X	0
		No	___	4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes	X	3
		No	___	0
Subtotal (maximum = 4) 3				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr.	X	1
		> 2yr.	___	0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr.	X	1
		> 2yr.	___	0
Subtotal (maximum = 2) 2				
4. On-site or off-site treatment or land disposal	° On-site treatment*			3
	° Off-site treatment*			1
	° On-site or off-site land disposal			0
Subtotal (maximum = 3) ϕ				
*treatment is defined as destruction or separation/treatment or solidification/chemical fixation of inorganic wastes				
5. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section 2.1(a), (b), or (c). (If answer is yes, go to Factor 7.)	Yes	___	3
		No	X	0
Subtotal (maximum = 3) ϕ				

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SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
6. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr.	X	3
		20-25yr.		2
		15-20yr.		1
		< 15yr.		0
Subtotal (maximum = 3) 3				
7. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None	X	3
		≤ 25%		2
		25-50%		1
		≥ 50%		0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 8.)	Yes		0
		No	X	2
	iii) Is the treated residual toxic?	Yes		0
		No		1
	iv) Is the treated residual mobile?	Yes		0
		No		1
Subtotal (maximum = 5) 5				
8. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of:	< 5yr.	X	1
		> 5yr.		0
	ii) Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes	X	0
		No		1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident	X	1
		Somewhat to not confident		0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives) (EXCEPT UNDER BUILDING DEGREASER AREA)	Minimum	X	2
		Moderate		1
		Extensive		0
Subtotal (maximum = 4) 4				
TOTAL (maximum = 25) 21				

IF THE TOTAL IS LESS THAN 10, PROJECT MANAGER MAY REJECT THE REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.2

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening		Score
1. Technical Feasibility			
a. Ability to construct technology.	i) Not difficult to construct. No uncertainties in construction.	___	3
	ii) Somewhat difficult to construct. No uncertainties in construction.	X	2
	iii) Very difficult to construct and/or significant uncertainties in construction.	___	1
b. Reliability of technology.	i) Very reliable in meeting the specified process efficiencies or performance goals.	X	3
	ii) Somewhat reliable in meeting the specified process efficiencies or performance goals.	___	2
c. Schedule of delays due to technical problems.	i) Unlikely	X	2
	ii) Somewhat likely	___	1
d. Need of undertaking additional remedial action, if necessary.	i) No future remedial actions may be anticipated.	X	2
	ii) Some future remedial actions may be necessary.	___	1
Subtotal (maximum = 10) 9			
2. Administrative Feasibility			
a. Coordination with other agencies.	i) Minimal coordination is required.	___	2
	ii) Required coordination is normal.	X	1
	iii) Extensive coordination is required.	___	0
Subtotal (maximum = 2) 1			
3. Availability of Services and Materials			
a. Availability of prospective technologies.	i) Are technologies under consideration generally commercially available for the site-specific application?	Yes X No ___	1 0
	ii) Will more than one vendor be available to provide a competitive bid?	Yes X No ___	1 0

Table 4.2 (cont'd)

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes	X	1
		No		0

Subtotal (maximum = 3) 3

TOTAL (maximum = 15) 13

IF M E TOTAL IS LESS THAN 8, PROJECT MANAGER MAY REJECT M E REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

B-2Ø

Table 4.1

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
SEDIMENT: ON-SITE DISPOSAL WITHOUT TREATMENT				
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.) (SEDIMENT RELEASE IF EXCAVATED/PLACED)	Yes	X	0
		No		4
	° Can the short-term risk be easily controlled?	Yes	X	1
		No		0
	° Does the mitigative effort to control short-term risk impact the community life-style?	Yes		0
		No	X	2
Subtotal (maximum = 4) 3				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes	X	0
		No		4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes	X	3
		No		0
Subtotal (maximum = 4) 3				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr.	X	1
		> 2yr.		0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr.	X	1
		> 2yr.		0
Subtotal (maximum = 2) 2				
4. On-site or off-site treatment or land disposal	° On-site treatment*			3
	° Off-site treatment*			1
	° On-site or off-site land disposal			0
Subtotal (maximum = 3) φ				
*treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes				
5. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section 2.1(a), (b), or (c). (If answer is yes, go to Factor 7.)	Yes		3
		No	X	0
Subtotal (maximum = 3) φ				

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SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
6. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr.	___	3
		20-25yr.	___	2
		15-20yr.	___	1
		< 15yr.	X	0
Subtotal (maximum = 3) Ø				
7. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None	___	3
		≤ 25%	___	2
		25-50%	___	1
		≥ 50%	X	0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 8.)	Yes	X	0
		No	___	2
	iii) Is the treated residual toxic?	Yes	X	0
		No	___	1
	iv) Is the treated residual mobile?	Yes	X	0
		No	___	1
Subtotal (maximum = 5) Ø				
8. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of:	< 5yr.	X	1
		> 5yr.	___	0
	ii) Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes	X	0
		No	___	1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident	___	1
		Somewhat to not confident	X	0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum	___	2
		Moderate	___	1
		Extensive	X	0
Subtotal (maximum = 4) 1				
TOTAL (maximum = 25) 9				

IF ME TOTAL IS LESS THAN 10, PROJECT MANAGER MAY REJECT ME REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.2

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
1. Technical Feasibility				
a. Ability to construct technology.	i) Not difficult to construct. No uncertainties in construction.		___	3
	ii) Somewhat difficult to construct. No uncertainties in construction.		___	2
	iii) Very difficult to construct and/or significant uncertainties in construction.		X	1
b. Reliability of technology.	i) Very reliable in meeting the specified process efficiencies or performance goals.		___	3
	ii) Somewhat reliable in meeting the specified process efficiencies or performance goals.		X	2
c. Schedule of delays due to technical problems.	i) Unlikely		___	2
	ii) Somewhat likely		X	1
d. Need of undertaking additional remedial action, if necessary.	i) No future remedial actions may be anticipated.		___	2
	ii) Some future remedial actions may be necessary.		X	1
Subtotal (maximum = 10) 5				
2. Administrative Feasibility				
a. Coordination with other agencies.	i) Minimal coordination is required.		___	2
	ii) Required coordination is normal.		___	1
	iii) Extensive coordination is required. (PERMIT ON-SITE DISPOSAL)		X	0
Subtotal (maximum = 2) ϕ				
3. Availability of Services and Materials				
a. Availability of prospective technologies.	i) Are technologies under consideration generally commercially available for the site-specific application?	Yes	X	1
		No	___	0
	ii) Will more than one vendor be available to provide a competitive bid?	Yes	X	1
		No	___	0

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening		Score
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes X No ___	1 0

Subtotal (maximum = 3) 3

TOTAL (maximum = 15) 8

IF THE TOTAL IS LESS THAN 8, PROJECT MANAGER MAY REJECT THE REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.1

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
SEDIMENT: EX-SITU STABILIZATION				
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.)	Yes No	 X	0 4
	° Can the short-term risk be easily controlled?	Yes No		1 0
	° Does the mitigative effort to control short-term risk impact the community life-style?	Yes No		0 2
Subtotal (maximum = 4) 4				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes No	X 	0 4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes No	X 	3 0
Subtotal (maximum = 4) 3				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr. > 2yr.	X 	1 0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr. > 2yr.	X 	1 0
Subtotal (maximum = 2) 2				
4. On-site or off-site treatment or land disposal	° On-site treatment* ° Off-site treatment* ° On-site or off-site land disposal			3 1 0
Subtotal (maximum = 3) 3				
*treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes				
5. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section 2.1(a), (b), or (c). (If answer is yes, go to Factor 7.)	Yes No	X 	3 0
Subtotal (maximum = 3) 3				

Table 4.1 (cont'd)

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
6. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr.		3
		20-25yr.	___	2
		15-20yr.	___	1
		< 15yr.	___	0
Subtotal (maximum = 3)				
7. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None	X	3
		< 25%	___	2
		25-50%	___	1
		≥ 50%	___	0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 8.)	Yes	X	0
		No	___	2
	iii) Is the treated residual toxic?	Yes	___	0
		No	X	1
	iv) Is the treated residual mobile?	Yes	___	0
		No	X	1
Subtotal (maximum = 5) 5				
8. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of:	< 5yr.	X	1
		> 5yr.	___	0
	ii) Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes	X	0
		No	___	1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident	X	1
		Somewhat to not confident	___	0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum	X	2
		Moderate	___	1
		Extensive	___	0
Subtotal (maximum = 4) 4				
TOTAL (maximum = 25) 24				

IF M E TOTAL IS LESS THAN 10, PROJECT MANAGER MAY REJECT M E REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.2

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor		Basis for Evaluation During Preliminary Screening		Score
1. Technical Feasibility				
a. Ability to construct technology.	i)	Not difficult to construct. No uncertainties in construction.	___	3
	ii)	Somewhat difficult to construct. No uncertainties in construction.	X	2
	iii)	Very difficult to construct and/or significant uncertainties in construction.	___	1
b. Reliability of technology.	i)	Very reliable in meeting the specified process efficiencies or performance goals.	___	3
	ii)	Somewhat reliable in meeting the specified process efficiencies or performance goals.	X	2
c. Schedule of delays due to technical problems.	i)	Unlikely	___	2
	ii)	Somewhat likely	X	1
d. Need of undertaking additional remedial action, if necessary.	i)	No future remedial actions may be anticipated.	X	2
	ii)	Some future remedial actions may be necessary.	___	1
Subtotal (maximum = 10) 7				
2. Administrative Feasibility				
a. Coordination with other agencies.	i)	Minimal coordination is required	___	2
	ii)	Required coordination is normal.	X	1
	iii)	Extensive coordination is required.	___	0
Subtotal (maximum = 2) 1				
3. Availability of Services and Materials				
a. Availability of prospective technologies.	i)	Are technologies under consideration generally commercially available for the site-specific application?	Yes X / No ___	1 / 0
	ii)	Will more than one vendor be available to provide a competitive bid?	Yes X / No ___	1 / 0

Table 4.2 (cont'd)

IMPLEMENTABILITY
(Plaximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes	___	1
		No	X	0

Subtotal (maximum = 3) 2

TOTAL (maximum = 15) 1ϕ

IF M E TOTAL IS LESS M A N 8, PROJECT MANAGER MAY REJECT M E REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.1

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
GROUNDWATER: ACTIVE CONTAINMENT				
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.)	Yes	X	0
		No		4
	° Can the short-term risk be easily controlled?	Yes	X	1
		No		0
	° Does the mitigative effort to control short-term risk impact the community life-style?	Yes		0
		No	X	2
Subtotal (maximum = 4) 3				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes		0
		No	X	4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes		3
		No		0
Subtotal (maximum = 4) 4				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr.		1
		> 2yr.	X	0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr.		1
		> 2yr.	X	0
Subtotal (maximum = 2) ϕ				
4. On-site or off-site treatment or land disposal	° On-site treatment*			3
	° Off-site treatment*			1
	° On-site or off-site land disposal			0
Subtotal (maximum = 3) ϕ				
"treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes				
5. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section 2.1(a), (b), or (c). (If answer is yes, go to Factor 7.)	Yes		3
		No	X	0
Subtotal (maximum = 3) ϕ				

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Table 4.1 (cont'd)

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
6. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr.		3
		20-25yr.		2
		15-20yr.		1
		< 15yr.	X	0
Subtotal (maximum = 3) Ø				
7. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None		3
		< 25%		2
		25-50%		1
		≥ 50%	X	0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 8.) (UNTREATED RESIDUAL LEFT)	Yes		0
		No	X	2
	iii) Is the treated residual toxic?	Yes		0
		No		1
	iv) Is the treated residual mobile?	Yes		0
		No		1
Subtotal (maximum = 5) 2				
8. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of:	< 5yr.		1
		> 5yr.	X	0
	ii) Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes	X	0
		No		1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident		1
		Somewhat to not confident	X	0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum		2
		Moderate		1
		Extensive	X	0
Subtotal (maximum = 4) 0				

TOTAL (maximum = 25) 9

IF THE TOTAL IS LESS THAN 10, PROJECT MANAGER MAY REJECT ME REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.2

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
1. Technical Feasibility				
a. Ability to construct technology.	i) Not difficult to construct. No uncertainties in construction.		___	3
	ii) Somewhat difficult to construct. No uncertainties in construction.		___	2
	iii) Very difficult to construct and/or significant uncertainties in construction.		X	1
b. Reliability of technology.	i) Very reliable in meeting the specified process efficiencies or performance goals.		___	3
	ii) Somewhat reliable in meeting the specified process efficiencies or performance goals.		X	2
c. Schedule of delays due to technical problems.	i) Unlikely		___	2
	ii) Somewhat likely		X	1
d. Need of undertaking additional remedial action, if necessary.	i) No future remedial actions may be anticipated.		___	2
	ii) Some future remedial actions may be necessary.		X	1
Subtotal (maximum = 10) 5				
2. Administrative Feasibility				
a. Coordination with other agencies.	i) Minimal coordination is required.		___	2
	ii) Required coordination is normal.		___	1
	iii) Extensive coordination is required. (LENGTH OF TIME OF REMEDY)		X	0
Subtotal (maximum = 2) ϕ				
3. Availability of Services and Materials				
a. Availability of prospective technologies.	i) Are technologies under consideration generally commercially available for the site-specific application?	Yes	X	1
		No	___	0
	ii) Will more than one vendor be available to provide a competitive bid?	Yes	X	1
		No	___	0

Table 4.2 (cont'd)

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes	____	1
		No	X	0

Subtotal (maximum = 3) 2

TOTAL **(maximum = 15)** 7

IF THE TOTAL IS LESS THAN 8, PROJECT MANAGER **MAY** REJECT THE REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.1

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
GROUNDWATER: PASSIVE CONTAINMENT				
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.)	Yes	X	0
		No		4
	° Can the short-term risk be easily controlled?	Yes	X	1
		No		0
	° Does the mitigative effort to control short-term risk impact the community life-style?	Yes		0
		No		2
Subtotal (maximum = 4) 3				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes		0
		No	X	4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes		3
		No		0
Subtotal (maximum = 4) 4				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr.	X	1
		> 2yr.		0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr.		1
		> 2yr.	X	0
Subtotal (maximum = 2) 1				
4. On-site or off-site treatment or land disposal	° On-site treatment*			3
	° Off-site treatment*			1
	° On-site or off-site land disposal			0
Subtotal (maximum = 3) ϕ				
*treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes				
5. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section 2.1(a), (b), or (c). (If answer is yes, go to Factor 7.)	Yes		3
		No	X	0
Subtotal (maximum = 3) ϕ				

Tsble 4.1 (cont'd)

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
6. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr.		3
		20-25yr.		2
		15-20yr.		1
		< 15yr.	X	0
Subtotal (maximum = 3) Ø				
7. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None		3
		≤ 25%		2
		25-50%		1
		≥ 50%	X	0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 8.) (UNTREATED RESIDUAL LEFT)	Yes		0
		No	X	2
	iii) Is the treated residual toxic?	Yes		0
		No		1
	iv) Is the treated residual mobile?	Yes		0
		No		1
Subtotal (maximum = 5) 2				
8. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of:	< 5yr.		1
		> 5yr.	X	0
	ii) Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes	X	0
		No		1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident		1
		Somewhat to not confident	X	0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum		2
		Moderate		1
		Extensive	X	0
Subtotal (maximum = 4) Ø				
TOTAL (maximum = 25) 1Ø				

IF THE TOTAL IS LESS THAN 10, PROJECT MANAGER MAY REJECT THE REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.2

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening		Score
1. Technical Feasibility			
a. Ability to construct technology.	i) Not difficult to construct. No uncertainties in construction.	___	3
	ii) Somewhat difficult to construct. No uncertainties in construction.	___	2
	iii) Very difficult to construct and/or significant uncertainties in construction.	X	1
b. Reliability of technology.	i) Very reliable in meeting the specified process efficiencies or performance goals.	___	3
	ii) Somewhat reliable in meeting the specified process efficiencies or performance goals.	X	2
c. Schedule of delays due to technical problems.	i) Unlikely	___	2
	ii) Somewhat likely	X	1
d. Need of undertaking additional remedial action, if necessary.	i) No future remedial actions may be anticipated.	___	2
	ii) Some future remedial actions may be necessary.	X	1
Subtotal (maximum = 10) 5			
2. Administrative Feasibility			
a. Coordination with other agencies.	i) Minimal coordination is required.	___	2
	ii) Required coordination is normal.	___	1
	iii) Extensive coordination is required.	X	0
Subtotal (maximum = 2) Ø			
3. Availability of Services and Materials			
a. Availability of prospective technologies.	i) Are technologies under consideration generally commercially available for the site-specific application?	Yes X	1
		No ___	0
	ii) Will more than one vendor be available to provide a competitive bid?	Yes X	1
		No ___	0

Table 4.2 (cont'd)

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes	___	1
		No	X	0

Subtotal (maximum = 3) 2

TOTAL (maximum = 15) 7

IF THE TOTAL IS LESS MAN 8, PROJECT MANAGER MAY REJECT M E REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.1

SHORT-TERMJLONG-TERM EFFECTIVENESS
(Maximum Score ¤ 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
GROUNDWATER: CONVENTIONAL GROUNDWATER RECOVERY				
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.)	Yes		0
		No	X	4
	° Can the short-term risk be easily controlled?	Yes		1
		No		0
	° Does the mitigative effort to control short-term risk impact the community life-style?	Yes		0
		No		2
Subtotal (maximum = 4) 4				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes		0
		No	X	4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes		3
		No		0
Subtotal (maximum = 4) 4				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr.		1
		> 2yr.	X	0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr.		1
		> 2yr.	X	0
Subtotal (maximum = 2) φ				
4. On-site or off-site treatment or land disposal	° On-site treatment*			3
	° Off-site treatment*			1
	° On-site or off-site land disposal			0
Subtotal (maximum = 3) 3				
"treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes				
5. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section 2.1(a), (b), or (c). (If answer is yes, go to Factor 7.)	Yes	X	3
		No		0
Subtotal (maximum = 3) 3				

Table 4.1 (cont'd)

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening		Score
6. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr.	3
		20-25yr. ___	2
		15-20yr. ___	1
		< 15yr. ___	0
Subtotal (maximum = 3)			
7. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None ___	3
		≤ 25% ___	2
		25-50% ___	1
		≥ 50% X	0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 8.) (UNTREATED RESIDUAL LIKELY LEFT)	Yes ___	0
		No X	2
	iii) Is the treated residual toxic?	Yes ___	0
		No ___	1
	iv) Is the treated residual mobile?	Yes ___	0
		No ___	1
Subtotal (maximum = 5) 2			
8. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of:	< 5yr. ___	1
		> 5yr. X	0
	ii) Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes X	0
		No ___	1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident ___	1
		Somewhat to not confident X	0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum ___	2
		Moderate ___	1
		Extensive X	0
Subtotal (maximum = 4) Ø			
TOTAL (maximum = 25) 16			

IF THE TOTAL IS LESS THAN 10, PROJECT MANAGER MAY REJECT THE REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.2

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
1. Technical Feasibility				
a. Ability to construct technology.	i) Not difficult to construct. No uncertainties in construction.		___	3
	ii) Somewhat difficult to construct. No uncertainties in construction.		___	2
	iii) Very difficult to construct and/or significant uncertainties in construction.		X	1
b. Reliability of technology.	i) Very reliable in meeting the specified process efficiencies or performance goals.		___	3
	ii) Somewhat reliable in meeting the specified process efficiencies or performance goals.		X	2
c. Schedule of delays due to technical problems.	i) Unlikely		___	2
	ii) Somewhat likely		X	1
d. Need of undertaking additional remedial action, if necessary.	i) No future remedial actions may be anticipated.		___	2
	ii) Some future remedial actions may be necessary.		X	1
Subtotal (maximum = 10) 5				
2. Administrative Feasibility				
a. Coordination with other agencies.	i) Minimal coordination is required		___	2
	ii) Required coordination is normal.		___	1
	iii) Extensive coordination is required. (LENGTH OF TIME REQUIRED FOR EFFORT)		X	0
Subtotal (maximum = 2) Ø				
3. Availability of Services and Materials				
a. Availability of prospective technologies.	i) Are technologies under consideration generally commercially available for the site-specific application? (NOT FOR RAPID RECOVERY)	Yes	___	1
		No	X	0
	ii) Will more than one vendor be available to provide a competitive bid?	Yes	X	1
		No	___	0

Table 4.2 (cont'd)

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening		Score
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes X No ___	1 0

Subtotal (maximum = 3) 2

TOTAL (maximum = 15) 7

IF THE TOTAL IS LESS THAN 8, PROJECT MANAGER MAY REJECT THE REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.1

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
GROUNDWATER: HIGH VACUUM DUAL-PHASE RECOVERY				
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.)	Yes		0
		No	X	4
	° Can the short-term risk be easily controlled?	Yes		1
		No		0
	° Does the mitigative effort to control short-term risk impact the community life-style?	Yes		0
		No		2
Subtotal (maximum = 4) 4				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes		0
		No	X	4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes		3
		No		0
Subtotal (maximum = 4) 4				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	< 2yr.		1
		> 2yr.	X	0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr.		1
		> 2yr.	X	0
Subtotal (maximum = 2) Φ				
4. On-site or off-site treatment or land disposal	° On-site treatment*			3
	° Off-site treatment*			1
	° On-site or off-site land disposal			0
Subtotal (maximum = 3) 3				
*treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes				
5. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section 2.1(a), (b), or (c). (If answer is yes, go to Factor 7.)	Yes	X	3
		No		0
Subtotal (maximum = 3) 3				

Table 4.1 (cont'd)

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
6. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr.		3
		20-25yr.		2
		15-20yr.		1
		< 15yr.	X	0
Subtotal (maximum = 3) ∅				
7. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None		3
		≤ 25%		2
		25-50%		1
		≥ 50%	X	0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 8.)	Yes		0
		No	X	2
	iii) Is the treated residual toxic?	Yes		0
		No		1
	iv) Is the treated residual mobile?	Yes		0
		No		1
Subtotal (maximum = 5) 2				
8. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of:	< 5yr.		1
		> 5yr.	X	3
	ii) Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes	X	0
		No		1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident		1
		Somewhat to not confident	X	0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum		2
		Moderate	X	1
		Extensive		0
Subtotal (maximum = 4) 1				
TOTAL (maximum = 25) 17				

IF THE TOTAL IS LESS THAN 10, PROJECT MANAGER MAY REJECT THE REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.2

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor		Basis for Evaluation During Preliminary Screening		Score
1. Technical Feasibility				
a. Ability to construct technology.	i)	Not difficult to construct. No uncertainties in construction.	___	3
	ii)	Somewhat difficult to construct. No uncertainties in construction.	___	2
	iii)	Very difficult to construct and/or significant uncertainties in construction.	X	1 NO
b. Reliability of technology.	i)	Very reliable in meeting the specified process efficiencies or performance goals.	___	3
	ii)	Somewhat reliable in meeting the specified process efficiencies or performance goals.	X	2
c. Schedule of delays due to technical problems.	i)	Unlikely	___	2
	ii)	Somewhat likely	X	1
d. Need of undertaking additional remedial action, if necessary.	i)	No future remedial actions may be anticipated.	___	2
	ii)	Some future remedial actions may be necessary.	X	1
Subtotal (maximum = 10) 5				
2. Administrative Feasibility				
a. Coordination with other agencies.	i)	Minimal coordination is required.	___	2
	ii)	Required coordination is normal.	___	1 NO
	iii)	Extensive coordination is required.	X	0
Subtotal (maximum = 2) Ø				
3. Availability of Services and Materials				
a. Availability of prospective technologies.	i)	Are technologies under consideration generally commercially available for the site-specific application?	Yes ___ No X	1 0 NO
	ii)	Will more than one vendor be available to provide a competitive bid?	Yes X No ___	1 0

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening	Score
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes ___ No X 1 no 0

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Subtotal (maximum = 3) 1

TOTAL (maximum = 15) 6

IF M E TOTAL IS LESS THAN 8, PROJECT MANAGER MAY REJECT THE REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.1

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
GROUNDWATER: IN-SITU DELIVERY OF TREATMENT				
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.)	Yes		0
		No	X	4
	° Can the short-term risk be easily controlled?	Yes		1
		No		0
	° Does the mitigative effort to control short-term risk impact the community life-style?	Yes		0
		No		2
Subtotal (maximum = 4) 4				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes		0
		No	X	4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes		3
		No		0
Subtotal (maximum = 4) 4				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr.		1
		> 2yr.	X	0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr.		1
		> 2yr.	X	0
Subtotal (maximum = 2) Ø				
4. On-site or off-site treatment or land disposal	° On-site treatment"			3
	° Off-site treatment*			1
	° On-site or off-site land disposal			0
Subtotal (maximum = 3) 3				
*treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes				
5. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section 2.1(a), (b), or (c). (If answer is yes, go to Factor 7.)	Yes	X	3
		No		0
Subtotal (maximum = 3) 3				

Table 4.1 (cont'd)

SHORT-TERM/LONG-TERM EFFECTIVENESS
(Maximum Score = 25)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
6. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr.		3
		20-25yr.		2
		15-20yr.		1
		< 15yr.		0
Subtotal (maximum = 3)				
7. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None		3
		≤ 25%		2
		25-50%		i
		≥ 50%	X	0
	ii) Is there tre--ed residual left at the site? (If answer is no, go to Factor 8.)	Yes	X	0
		No		2
	iii) Is the treated residual toxic?	Yes	X	0
		No		1
	iv) Is the treated residual mobile?	Yes	X	0
		No		1
Subtotal (maximum = 5) Ø				
8. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of:	< 5yr.		1
		> 5yr.	X	3
	ii) Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes	X	0
		No		1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident		1
		Somewhat to not confident		0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum		2
		Moderate		1
		Extensive	X	0
Subtotal (maximum = 4) Ø				
TOTAL (maximum = 25) 14				

IF THE TOTAL IS LESS THAN 10, PROJECT MANAGER MAY REJECT THE REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

Table 4.2

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor		Basis for Evaluation During Preliminary Screening		Score
1. Technical Feasibility				
a. Ability to construct technology.	i)	Not difficult to construct. No uncertainties in construction.	___	3
	ii)	Somewhat difficult to construct. No uncertainties in construction.	___	2
	iii)	Very difficult to construct and/or significant uncertainties in construction.	X	1
b. Reliability of technology.	i)	Very reliable in meeting the specified process efficiencies or performance goals.	___	3
	ii)	Somewhat reliable in meeting the specified process efficiencies or performance goals.	X	2
c. Schedule of delays due to technical problems.	i)	Unlikely	___	2
	ii)	Somewhat likely	X	1
d. Need of undertaking additional remedial action, if necessary.	i)	No future remedial actions may be anticipated.	___	2
	ii)	Some future remedial actions may be necessary.	X	1
Subtotal (maximum = 10) 5				
2. Administrative Feasibility				
a. Coordination with other agencies.	i)	Minimal coordination is required.	___	2
	ii)	Required coordination is normal.	___	1
	iii)	Extensive coordination is required. (LENGTH OF REMEDY)	X	0
Subtotal (maximum = 2) ϕ				
3. Availability of Services and Materials				
a. Availability of prospective technologies.	i)	Are technologies under consideration generally commercially available for the site-specific application?	Yes X No ___	1 0
	ii)	Will more than one vendor be available to provide a competitive bid?	Yes X No ___	1 0

IMPLEMENTABILITY
(Maximum Score = 15)

Analysis Factor	Basis for Evaluation During Preliminary Screening			Score
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes	___	1
		No	X	0

Subtotal (maximum = 3) 2

TOTAL (maximum = 15) 7

IF M E TOTAL IS LESS THAN 8, PROJECT MANAGER MAY REJECT M E REMEDIAL ALTERNATIVE FROM FURTHER CONSIDERATION.

APPENDIX B

Detailed Screening Scoring Sheets

Table 5.2

COMPLIANCE WITH APPLICABLE OR RELEVANT AND
APPROPRIATE NEW YORK STATE STANDARDS CRITERIA AND GUIDELINES (SCGs)
(Relative Weight = 10)

SOIL: NO ACTION

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Compliance with chemical-specific SCGs	Meets chemical specific SCGs such 3s groundwater standards	Yes		4
		No	X	0
2. Compliance with action-specific SCGs	Meets SCGs such as technology standards for incineration or landfill	Yes		3
		No	X	0
3. Compliance with location-specific SCGs	Meets location-specific SCGs such as Freshwater Wetlands Act	Yes		3
		No	X	0

TOTAL (Maximum = 10) Ø

Table 5.3

PROTECTION OF HUMAN HEALTH AND THE ENVIROMENT
(Relative Weight = 20)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Use of the site after renediation.	Unrestricted use of the land and water. (*If* answer is yes, go to the end of the Table.)	Yes		20
		No	X	0
TOTAL (Maximum = 20) ∅				
2. Human health and the environment exposure after the remediation.	i) Is the exposure to contaminants via air route acceptable?	Yes		3
		No	X	0
	ii) Is the exposure to contaminants via groundwater/surface water acceptable?	Yes		4
		No	X	0
	iii) Is the exposure to contaminants via sediments/soils acceptable?	Yes		3
		No	X	0
Subtotal (maximum = 10) ∅				
3. Magnitude of residual public health risks after the remediation.	i) Health risk	≤ 1 in 1,000,000		5
	ii) Health risk	≤ 1 in 100,000	X	2
Subtotal (maximum = 5) 2				
4. Magnitude of residual environmental risks after the remediation.	i) Less than acceptable			5
	ii) Slightly greater than acceptable			3
	iii) Significant risk still exists		X	0
Subtotal (maximum = 5) 0				
TOTAL (maximum = 20) 2				

Table 5.4

SHORT-TERM EFFECTIVENESS
(Eelative Weight = 10)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Protection of community during remedial actions.	o Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.) *	Yes	___	0
		No	___	4
	o Can the risk be easily controlled?	Yes	X	1
		No	___	0
	o Does the mitigative effort to control risk impact the community life-style?	Yes	___	0
		No	X	2
Subtotal (maximum = 4) 3				
2. Environmental Impacts	o Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes	X	0
		No	___	4
	o Are the available mitigative measures reliable to minimize potential impacts?	Yes	X	3
		No	___	0
Subtotal (maximum = 4) 3				
3. Time to implement the remedy.	o What is the required time to implement the remedy?	< 2yr.	X	1
		> 2yr.	___	0
	o Required duration of the mitigative effort to control short-term risk.	≤ 2yr.	___	1
		> 2yr.	X	0
Subtotal (maximum = 2) 1				
TOTAL (maximum = 10) 7				

*** - Risks are limited to a theoretical exposure scenario associated with an on-site utility or foundation trench exploration in the former degreaser area (see text Section I, page 3).**

Table 5.5

LONG-TERM EFFECTIVENESS AND PERMANENCE
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis		Score
1. On-site or off-site treatment or land disposal	° On-site treatment*		3
	° Off-site treatment*		1
	° On-site or off-site land disposal		0
Subtotal (maximum = 3) NA			
*treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes			
2. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section 2.1(a), (b), or (c). (If answer is yes, go to Factor 4.)	Yes ___	3
		No X	0
Subtotal (maximum = 3) ϕ			
3. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr. ___	3
		20-25yr. ___	2
		15-20yr. ___	1
		< 15yr. ___	0
Subtotal (maximum = 3) NA			
4. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None ___	3
		≤ 25% ___	2
		25-50% ___	1
		≥ 50% X	0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 5.)	Yes ___	0
		No X	2
	iii) Is the treated residual toxic?	Yes ___	0
		No ___	1
	iv) Is the treated residual mobile?	Yes ___	0
		No ___	1
Subtotal (maximum = 5) 2			

Table 5.5 (cont'd)

LONG-TERM EFFECTIVENESS AND PERMANENCE
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Scare
5. Adequacy and reliability of controls.	i) Operation and maintenance required for a pericd of:	< 5yr.	____	1
		> 5yr.	X	0
	ii) Are environmental controls required as a part of the remedy to handle potential problem? (If answer is no, go to "iv")	Yes		0
		No	____	1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident		1
		Somewhat to not confident	X	0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum		2
		Moderate	____	1
		Extensive	____	0

Subtotal (maximum = 4) 0

TOTAL (maximum = 15) 2

Table 5.6
REDUCTION OF TOXICITY, MOBILITY OR VOLUME
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis		Score
1. Volume of hazardous waste reduced (reduction in volume or toxicity). If Factor 1 is not applicable, go to Factor 2.	i) Quantity of hazardous waste destroyed or treated. Immobilization technologies do not score under Factor 1. NA	99-100% ____	8
		30-99% ____	7
		80-90% ____	6
		60-80% ____	4
		40-60% ____	2
		20-40% ____	1
		< 20% ____	0
	ii) Are there untreated or concentrated hazardous waste produced as a result of (i)? If answer is no, go to Factor 2 NA	Yes ____	0
		No ____	2
Subtotal (maximum = 10) NA If subtotal = 10, go to Factor 3	iii) After remediation, how is the untreated, residual hazardous waste material disposed? NA	Off-site land disposal ____	0
		On-site land disposal ____	1
		Off-site destruction or treatment ____	2
2, Reduction in mobility of hazardous waste. If Factor 2 is not applicable, go to Factor 3	i) Quality of Available Wastes immobilized After Destruction/ Treatment	90-100% ____	2
		60-90% ____	1
		< 60% ____	0
	ii) Method of Immobilization		
	- Reduced mobility by containment	____	0
	- Reduced mobility by alternative treatment technologies	____	3
Subtotal (maximum = 5) NA			
3. Irreversibility of the destruction or treatment or immobilization of hazardous waste	Completely irreversible		5
	Irreversible for most of the hazardous waste constituents.	____	-
	Irreversible for only some of the hazardous waste constituents	____	2
	Reversible for most of the hazardous waste constituents.	____	0
Subtotal (maximum = 5) NA			
TOTAL (maximum = 15) NA			

Table 5.7

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor		Basis for Evaluation During Detailed Analysis		Score
1. Technical Feasibility				
a. Ability to construct technology.	i)	Not difficult to construct. No uncertainties in construction.	X	3
	ii)	Somewhat difficult to construct. No uncertainties in construction.	___	2
	iii)	Very difficult to construct and/or significant uncertainties in construction.	___	1
b. Reliability of technology.	i)	Very reliable in meeting the specified process efficiencies or performance goals.	___	3
	ii)	Somewhat reliable in meeting the specified process efficiencies or performance goals.	X	2
c. Schedule of delays due to technical problems.	i)	Unlikely	X	2
	ii)	Somewhat likely	___	1
d. Need of undertaking additional remedial action, if necessary.	i)	No future remedial actions may be anticipated.	___	2
	ii)	Some future remedial actions may be necessary.	X	1
Subtotal (maximum = 10) 8				
2. Administrative Feasibility				
a. Coordination with other agencies.	i)	Minimal coordination is required.	___	2
	ii)	Required coordination is normal.	___	1
	iii)	Extensive coordination is required.	X	0
Subtotal (maximum = 2) 0				
3. Availability of Services and Materials				
a. Availability of prospective technologies.	i)	Are technologies under consideration generally commercially available for the site-specific application?	Yes X No ___	1 0
	ii)	Will more than one vendor be available to provide a competitive bid?	Yes X No ___	1 0

Table 5.7 (cont'd)

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis		Score
t. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes No	1 0

Subtotal (maximum = 3) 3

TOTAL (maximum = 15) 11

Table 5.2

COMPLIANCE WITH APPLICABLE OR RELEVANT AND
APPROPRIATE NEW YORK STATE STANDARDS CRITERIA AND GUIDELINES (SCGs)
(Relative Weight = 10)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
SOIL: EXCAVATION AND OFF-SITE DISPOSAL WITHOUT TREATMENT				
1. Compliance with chemical-specific SCGs	Meets chemical specific SCGs such as groundwater standards	Yes	X	4
		No		0
2. Compliance with action-specific SCGs	Meets SCGs such as technology standards for incineration or landfill	Yes	X	3
		No		0
3. Compliance with location-specific SCGs	Meets location-specific SCGs such as Freshwater Wetlands Act	Yes	X	3
		No		0

TOTAL (Maximum = 10) 10

Table 5.3

PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT
(Relative Weight = 20)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Use of the site after remediation.	Unrestricted use of the land and water. (If answer is yes, go to the end of the Table.)	Yes		20
		No		0
TOTAL (Maximum = 20) Ø				
2. Human health and the environment exposure after the remediation.	i) Is the exposure to contaminants via air route acceptable?	Yes	X	3
		No		0
	ii) Is the exposure to contaminants via groundwater/surface water acceptable?	Yes		4
		No	X	0
	iii) Is the exposure to contaminants via sediments/soils acceptable?	Yes		3
		No		0
Subtotal (maximum = 10) b				
3. Magnitude of residual public health risks after the remediation.	i) Health risk	≤ 1 in 1,000,000		5
	ii) Health risk	≤ 1 in 100,000	X	2
Subtotal (maximum = 5) 2				
4. Magnitude of residual environmental risks after the remediation.	i) Less than acceptable			5
	ii) Slightly greater than acceptable (Only if [illegible])			3
	iii) Significant risk still exists			0
Subtotal (maximum = 5) 3				
TOTAL (maximum = 20) 11				

Table 5.4

SHORT-TERM EFFECTIVENESS
(Eelative Weight = 10)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.)	Yes	X	0
		No		4
	° Can the risk be easily controlled?	Yes	X	1
		No		3
	° Does the mitigative effort to control risk impact the community life-style?	Yes		0
		No		2
Subtotal (maximum = 4) 3				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes		0
		No		4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes	X	3
		No		0
Subtotal !maximum = 4) 3				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr.	X	1
		≥ 2yr.		0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr.	X	1
		≥ 2yr.		0
Subtotal (maximum = 2) 2				
TOTAL (maximum = 10) 8				

Table 5.5 (cont'd)

LONG-TERM EFFECTIVENESS AND PERMANENCE
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
5. Adequacy and reliability of controls.	i) Operation and maintenance required for a pericd of:	< 5yr.	X	1
		> 5yr.	____	0
	ii) Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes	X	0
		No	____	1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident		1
		Somewhat to not confident	____	0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum		2
		Moderate		1
		Extensive	____	0

Subtotal (maximum = 4) 3

TOTAL (maximum = 15) 8

Table 5.6
REDUCTION OF TOXICITY, MOBILITY OR VOLUME
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Volume of hazardous waste reduced (reduction in volume or toxicity). If Factor 1 is not applicable, go to Factor 2.	i) Quantity of hazardous waste destroyed or treated. Immobilization technologies do not score under Factor 1.	99–100%		8
		90-99%		7
		80–90%		6
		60–80%		4
		40-60%		2
		20-40%		1
		< 20%	X	0
	ii) Are there untreated or concentrated hazardous waste produced as a result of (i)? If answer is no, go to Factor 2	Yes	X	0
		No		2
Subtotal (maximum = 10) 0 If subtotal = 10, go to Factor 3	iii) After remediation, how is the untreated, residual hazardous waste material disposed?	Off-site land disposal	X	0
		On-site land disposal		1
		Off-site destruction or treatment		2
2. Reduction in mobility of hazardous waste. If Factor 2 is not applicable, go to Factor 3	i) Quality of Available Wastes immobilized After Destruction/Treatment	90–100%		2
		60-90%		1
		< 60%		0
	ii) Method of Immobilization - Reduced mobility by containment			0
	- Reduced mobility by alternative treatment technologies			3
Subtotal (maximum = 5) NA				
3. Irreversibility of the destruction or treatment or immobilization of hazardous waste	Completely irreversible			5
	Irreversible for most of the hazardous waste constituents.			3
	Irreversible for only some of the hazardous waste constituents		X	2
	Reversible for most of the hazardous waste constituents.			0
Subtotal (maximum = 5) 2				
TOTAL (maximum = 15) 2				

Table 5.7

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Technical Feasibility				
a. Ability to construct technology.	i) Not difficult to construct. No uncertainties in construction.		___	3
	ii) Somewhat difficult to construct. No uncertainties in construction.		X	2
	iii) Very difficult to construct and/or significant uncertainties in construction.		___	1
b. Reliability of technology.	i) Very reliable in meeting the specified process efficiencies or performance goals.		___	3
	ii) Somewhat reliable in meeting the specified process efficiencies or performance goals.		X	2
c. Schedule of delays due to technical problems.	i) Unlikely		___	2
	ii) Somewhat likely		X	1
d. Need of undertaking additicnal remedial action, if necessary.	i) No future remedial actions may be anticipated.		___	2
	ii) Some future remedial actions may be necessary.		X	1
Subtotal (maximum = 10) 6				
2. Administrative Feasibility				
a. Coordination with other agencies.	i) Minimal coordination is required.		___	2
	ii) Required coordination is normal.		X	1
	iii) Extensive coordination is required.		___	0
Subtotal (maximum = 2) 1				
3. Availability of Services and Materials				
a. Availability of prospective technologies.	i) Are technologies under consideration generally commercially available for the site-specific application?	Yes	X	1
		No	___	0
	ii) Will more than one vendor be available to provide a competitive bid?	Yes	___	1
		No	X	0

Table 5.7 (cont'd)

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
t. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes	X	1
		No		3

Subtotal (maximum = 3) 2

TOTAL (maximum = 15) 9

Table 5.2

COMPLIANCE WITH APPLICABLE OR RELEVANT AND
APPROPRIATE NEW YORK STATE STANDARDS CRITERIA AND GUIDELINES (SCGs)
(Relative Weight = 10)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
SOIL: IN-SITU HIGH VACUUM EXTRACTION OF SOIL VAPOR FROM IN PLACE SOIL				
1. Compliance with chemical-specific SCGs	Meets chemical specific SCGs such as groundwater standards	Yes	X	4
		No		0
2. Compliance with action-specific SCGs	Meets SCGs such as technology standards for incineration or landfill	Yes	X	3
		No		0
3. Compliance with location-specific SCGs	Meets location-specific SCGs such as Freshwater Wetlands Act	Yes	X	3
		No		0

TOTAL (Maximum = 10) 10

Table 5.3

PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT
(Relative Weight = 20)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Use of the site after remediation.	Unrestricted use of the land and water. (If answer is yes, go to the end of the Table.)	Yes	X	20
		No		0
TOTAL (Maximum = 20) 20				
2. Human health and the environment exposure after the remediation.	i) Is the exposure to contaminants via air route acceptable?	Yes		3
		No		0
	ii) Is the exposure to contaminants via groundwater/surface water acceptable?	Yes		4
		No		0
	iii) Is the exposure to contaminants via sediments/soils acceptable?	Yes		3
		No		0
Subtotal (maximum = 10) NA				
3. Magnitude of residual public health risks after the remediation.	i) Health risk	≤ 1 in 1,000,000		5
	ii) Health risk	≤ 1 in 100,000		2
Subtotal (maximum = 5) NA				
4. Magnitude of residual environmental risks after the remediation.	i) Less than acceptable			5
	ii) Slightly greater than acceptable			3
	iii) Significant risk still exists			0
Subtotal (maximum = 5) NA				
TOTAL (maximum = 20) 20				

Table 5.4

SHORT-TERM EFFECTIVENESS
(Relative Weight = 10)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.)	Yes	X	0
		No		4
	° Can the risk be easily controlled?	Yes	X	1
		No		0
	° Does the mitigative effort to control risk impact the community life-style?	Yes		0
		No	X	2
Subtotal (maximum = 4) 3				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes		0
		No	X	4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes		3
		No		0
Subtotal (maximum = 4) 4				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr.	X	1
		> 2yr.		0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr.	X	1
		> 2yr.		0
Subtotal (maximum = 2) 2				
TOTAL (maximum = 10) 9				

Table 5.5

LONG-TERM EFFECTIVENESS AND PERMANENCE
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. On-site or off-site treatment or land disposal	° On-site treatment*			3
	° Off-site treatment*			1
	° On-site or off-site land disposal			0
Subtotal (maximum = 3) 3				
*treatment is defined as destruction or separation/treatment or solidification/chemical fixation of inorganic wastes				
2. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section (a), (b), or (c). (If answer is yes, go to Factor 4.)	Yes	X	3
		No		0
Subtotal (maximum = 3) 3				
3. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr.		3
		20-25yr.		2
		15-20yr.		1
		< 15yr.		0
Subtotal (maximum = 3) NA				
4. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None		3
		≤ 25%	X	2
		25-50%		1
		≥ 50%		0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 5.)	Yes		0
		No	X	2
	iii) Is the treated residual toxic?	Yes		0
		No		1
	iv) Is the treated residual mobile?	Yes		0
		No		1
Subtotal (maximum = 5) 4				

LONG-TERM EFFECTIVENESS AND PERMANENCE
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis		Score
5. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of:	< 5yr. ___	1
		> 5yr. X	0
	ii) Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes X	0
		No ___	1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident X	1
		Somewhat to not confident	0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum X	2
		Moderate ___	1
		Extensive ___	0
Subtotal (maximum = 4) 3			
TOTAL (maximum = 15) 13			

Table 5.6
REDUCTION OF TOXICITY, MOBILITY OR VOLUME
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis		Score
1. Volume of hazardous waste reduced (reduction in volume or toxicity). If Factor 1 is not applicable, go to Factor 2.	i) Quantity of hazardous waste destroyed or treated. Immobilization technologies do not score under Factor 1.	99-100% ___	8
		30-99% ___	7
		80-90% X	6
		60-8016 ___	4
		40-60% ___	2
		20-40% ___	1
		< 20% ___	0
	ii) Are there untreated or concentrated hazardous waste produced as a result of (i)? If answer is no, go to Factor 2	YES X	
		No ___	
Subtotal (maximum = 10) 8 If subtotal = 10, go to Factor 3	iii) After remediation, how is the untreated, residual hazardous waste material disposed?	Off-site land disposal ___	0
		On-site land disposal ___	1
		Off-site destruction or treatment X	2
2. Reduction in mobility of hazardous waste. If Factor 2 is not applicable, go to Factor 3	i) Quality of Available Wastes immobilized After Destruction/Treatment	90-100% ___	2
		60-90% ___	1
		< 60% ___	0
	ii) Method of Immobilization		
	- Reduced mobility by containment	___	0
	- Reduced mobility by alternative treatment technologies	___	3
Subtotal (maximum = 5) NA			
3. Irreversibility of the destruction or treatment or immobilization of hazardous waste	Completely irreversible	X	5
	Irreversible for most of the hazardous waste constituents.	___	3
	Irreversible for only some of the hazardous waste constituents		2
	Reversible for most of the hazardous waste constituents.	___	0
Subtotal (maximum = 5) 5			
TOTAL (maximum = 15) 13			

Table 5.7

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Technical Feasibility				
a. Ability to construct technology.	i) Not difficult to construct. No uncertainties in construction.		___	3
	ii) Somewhat difficult to construct. No uncertainties in construction.		X	2
	iii) Very difficult to construct and/or significant uncertainties in construction.		___	1
b. Reliability of technology.	i) Very reliable in meeting the specified process efficiencies or performance goals.		___	3
	ii) Somewhat reliable in meeting the specified process efficiencies or performance goals.		X	2
c. Schedule of delays due to technical problems.	i) Unlikely		___	2
	ii) Somewhat likely		X	1
d. Need of undertaking additicnal remedial action, if necessary.	i) No future remedial actions may be anticipated.		X	2
	ii) Some future remedial actions may be necessary.		___	1
Subtotal (maximum = 10) 7				
2. Administrative Feasibility				
a. Coordination with other agencies.	i) Minimal coordinatian is required.		___	2
	ii) Required coordination is normal.		X	1
	iii) Extensive coordination is required.		___	0
Subtotal (maximum = 2) 1				
3. Availability of Services and Materials				
a. Availability of prospective technologies.	i) Are technologies under consideration generally commercially available for the site-specific application?	Yes	___	1
		No	___	0
	ii) Will more than one vendor be available to provide a competitive bid?	Yes	___	1
		No	X	0

Table 5.7 (cont'd)

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
t. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes		1
		No	X	0

Subtotal (maximum = 3) 1

TOTAL (maximum = 15) 9

Table 5.2

COMPLIANCE WITH APPLICABLE OR RELEVANT AND
APPROPRIATE NEW YORK STATE STANDARDS CRITERIA AND GUIDELINES (SCGs)
(Relative Weight = 10)

Analysis Factor	Rasis for Evaluation During Detailed Analysis			Score
SOIL: EX-SITU HIGH VACUUM EXTRACTION OF SOIL VAPOR FROM AREAS NOT UNDER THE BUILDING				
1. Compliance with chemical-specific SCGs	Meets chemical specific SCGs such 3s groundwater standards	Yes	X	4
		No		0
2. Compliance with action-specific SCGs	Meets SCGs such as technology standards for incineration or landfill	Yes	X	3
		No		0
3. Compliance with location-specific SCGs	Meets location-specific SCGs such as Freshwater Wetlands Act	Yes	X	3
		No		0

TOTAL (Maximum = 10) 1ϕ

Table 5.3

PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT
(Relative Weight = 20)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Use of the site after remediation.	Unrestricted use of the land and water. (If answer is yes, go to the end of the Table.)	Yes	___	20
		No	X	0
TOTAL (Maximum = 20) Ø				
2. Human health and the environment exposure after the remediation.	i) Is the exposure to contaminants via air route acceptable?	Yes	X	3
		No	___	0
	ii) Is the exposure to contaminants via groundwater/surface water acceptable?	Yes	___	4
		No	X	0
	iii) Is the exposure to contaminants via sediments/soils acceptable?	Yes	X	3
		No	___	0
Subtotal (maximum = 10) 6				
3. Magnitude of residual public health risks after the remediation.	i) Health risk	≤ 1 in 1,000,000	___	5
	ii) Health risk	≤ 1 in 100,000	X	2
Subtotal (maximum = 5) 2				
4. Magnitude of residual environmental risks after the remediation.	i) Less than acceptable		X	5
	ii) Slightly greater than acceptable		___	3
	iii) Significant risk still exists		___	0
Subtotal (maximum = 5) 5				
TOTAL (maximum = 20) 13				

Table 5.4

SAORT-TERM EFFECTIVENESS
(Relative Weight = 10)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.)	Yes No	X ___	0 4
	° Can the risk be easily controlled?	Yes No	X ___	1 0
	° Does the mitigative effort to control risk impact the community life-style?	Yes No	___ X	0 2
Subtotal (maximum = 4) 3				
2. Environmental Impacts	° Are thers significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes No	___ X	0 4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes No	___ ___	3 0
Subtotal (maximum = 4) 4				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr. > 2yr.	X ___	1 0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr. > 2yr.	___ X	1 0
Subtotal (maximum = 2) 1				
TOTAL (maximum = 10) 8				

Table 5.5

LONG-TERM EFFECTIVENESS AND PERMANENCE
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis		Score
1. On-site or off-site treatment or land disposal	° On-site treatment*		3
	° Off-site treatment*		1
	° On-site or off-site land disposal		0
Subtotal (maximum = 3) 3			
*treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes			
2. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section 2.1(a), (b), or (c). (If* answer is yes, go to Factor 4.)	Yes ____	3
		No ____	0
Subtotal (maximum = 3) 3			
3. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr. X	3
		20-25yr. ____	2
		15-20yr. ____	1
		< 15yr. ____	0
Subtotal (maximum = 3) 3			
4. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None ____	3
		< 25% ____	2
		25-50% ____	1
		≥ 50% X	0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 5.)	Yes X	0
		No ____	2
	iii) Is the treated residual toxic?	Yes X	0
		No ____	1
	iv) Is the treated residual mobile?	Yes ____	0
		No X	1
Subtotal (maximum = 5) 1			

* - Permanent with respect to the soils that are treated.

LONG-TERM EFFECTIVENESS AND PERMANENCE
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
5. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of:	< 5yr.	___	1
		> 5yr.	X	0
	ii) Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes	X	0
		No	___	1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident	X	1
		Somewhat to not confident	___	0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum	___	2
		Moderate	X	1
		Extensive	___	0

Subtotal (maximum = 4) 2

TOTAL (maximum = 15) 12

Table 5.6
REDUCTION OF TOXICITY, MOBILITY OR VOLUME
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis		Mark	Score
1. Volume of hazardous waste reduced (reduction in volume or toxicity). If Factor 1 is not applicable, go to Factor 2.	i) Quantity of hazardous waste destroyed or treated. Immobilization technologies do not score under Factor 1.	99-100%		8
		90-99%		7
		80-90%		6
		60-80%		4
		40-60%		2
		20-40%	X	1
		< 20%		0
	ii) Are there untreated or concentrated hazardous waste produced as a result of (i)? if answer is no, go to Factor 2	Yes	X	0
		No		2
Subtotal (maximum = 10) 2 If subtotal = 10, go to Factor 3	iii) After remediation, how is the untreated, residual hazardous waste material disposed?	Off-site land disposal		0
		On-site land disposal	X	1
		Off-site destruction or treatment		2
2. Reduction in mobility of hazardous waste. If Factor 2 is not applicable, go to Factor 3	i) Qua~~l~~ntity of Available Wastes Immobilized After Destruction/Treatment	90-100%		2
		60-90%		1
		< 60%	X	0
	ii) Method of Immobilization			
	- Reduced nobility by containment			0
	- Reduced mobility by alternative treatment technologies			3
Subtotal (maximum = 5) 0				
3. Irreversibility of the destruction or treatment or immobilization of hazardcus waste	Completely irreversible			5
	Irreversible for most of the hazardous waste constituents.			3
	Irreversible for only some of the hazardous waste constituents		X	2
	Reversible for most of the hazardous waste constituents.			0
Subtotal (maximum = 5) 2				
TOTAL (maximum = 15) 4				

Table 5.7

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis		Score
1. Technical Feasibility			
a. Ability to construct technology.	i) Not difficult to construct. No uncertainties in construction.	___	3
	ii) Somewhat difficult to construct. No uncertainties in construction.	X	2
	iii) Very difficult to construct and/or significant uncertainties in construction.	___	1
b. Reliability of technology.	i) Very reliable in meeting the specific process efficiencies or performance goals.	___	3
	ii) Somewhat reliable in meeting the specified process efficiencies or performance goals.	X	2
c. Schedule of delays due to technical problems.	i) Unlikely	___	2
	ii) Somswhat likely	X	1
d. Need of undertaking additional remedial action, if necessary.	i) No future remedial actions may be anticipated.	___	2
	ii) Some future remedial actions may be necessary.	X	1
Subtotal (maximum = 10) 6			
2. Administrative Feasibility			
a. Coordination with other agencies.	i) Minimal coordination is required.	___	2
	ii) Required coordination is normal.	X	1
	iii) Extensive coordination is required.	___	0
Subtotal (maximum = 2) 1			
3. Availability of Services and Materials			
a. Availability of prospective technologies.	i) Are technologies under consideration generally commercially available for the site-specific application? Yes / No	Yes: X; No: ___	Yes: 1; No: 0
	ii) Will more than one vendor be available to provide a competitive bid? Yes / No	Yes: ___; No: X	Yes: 1; No: 0

Table 5.7 (cont'd)

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes		1
		No	X	3

Subtotal (maximum = 3) 1

TOTAL (maximum = 15) 8

Table 5.2

COMPLIANCE WITH APPLICABLE OR RELEVANT AND
APPROPRIATE NEW YORK STATE STANDARDS CRITERIA AND GUIDELINES (SCGs)
(Relative Weight = 10)

SEDIMENT: NO ACTION

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Compliance with chemical-specific SCGs	Meets chemical specific SCGs such as groundwater standards	Yes	___	4
		No	X	0
2. Compliance with action-specific SCGs	Meets SCGs such as technology standards for incineration or landfill	Yes	___	3
		No	___	0
3. Compliance with location-specific SCGs	Meets location-specific SCGs such as Freshwater Wetlands Act	Yes	___	3
		No	X	0

TOTAL [Maximum = 10) 0

Table 5.3

PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT
(Relative Weight = 20)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Use of the site after renediation.	Unrestricted use of the land and water. (If answer is yes, go to the end of the Table.)	Yes	___	20
		No	X	0
TOTAL (Maximum = 20) ϕ				
2. Human health and the environment exposure after the remediation.	i) Is the exposure to contaminants via air route acceptable?	Yes	X	3
		No	___	0
	ii) Is the exposure to contaminants via groundwater/surface water acceptable?	Yes	X	4
		No	___	0
	iii) Is the exposure to contaminants via sediments/soils acceptable?	Yes	___	3
		No	X	0
Subtotal (maximum = 10) 7				
3. Magnitude of residual public health risks after the remediation.	i) Health risk	$\leq$ 1 in 1,000,000	___	5
	ii) Health risk	$\leq$ 1 in 100,000	X	2
Subtotal (maximum = 5) 2				
4. Magnitude of residual environmental risks after the rernediation.	i) Less than acceptable		___	5
	ii) Slightly greater than acceptable		X	3
	iii) Significant risk still exists		___	0
Subtotal (maximum = 5) 3				
TOTAL (maximum = 20) 12				

Table 5.4

SHORT-TERM EFFECTIVENESS
(Relative Weight = 10)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Protection of community during remedial actions	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.)	Yes No		0 4
	° Can the risk be easily controlled?	Yes No	___ ___	1 0
	° Does the mitigative effort to control risk impact the community life-style?	Yes No	___ ___	0 2
Subtotal (maximum = 4) 4				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes No	X ___	0 4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes No	___	3 0
Subtotal (maximum = 4) ∅				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr. > 2yr.	X ___	1 0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr. > 2yr.	X ___	1 0
Subtotal (maximum = 2) 2				
TOTAL (maximum = 10) 6				

Table 5.5

LONG-TERM EFFECTIVENESS AND PERMANENCE
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. On-site or off-site treatment or land disposal	° On-site treatment*			3
	° Off-site treatment*			1
	° On-site or off-site land disposal			0
Subtotal (maximum = 3) NA				
*treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes				
2. permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section 2.1(a), (b), or (c). (If answer is yes, go to Factor 4.)	Yes	___	3
		No	X	0
Subtotal (maximum = 3) Ø				
3. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr.	___	3
		20-25yr.	___	2
		15-20yr.	___	1
		< 15yr.	___	0
Subtotal (maximum = 3) NA				
4. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None	___	3
		≤ 25%	___	2
		25-50%	___	1
		≥ 50 %	X	0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 5.)	Yes	___	0
		No	X	2
	iii) Is the treated residual toxic?	Yes	___	0
		No	___	I
	iv) Is the treated residual mobile?	Yes	___	0
		No	___	1
Subtotal (maximum = 5) 2				

Table 5.5 (cont'd)

LONG-TERM EFFECTIVENESS AND PERMANENCE
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Scare
5. Adequacy and reliability of controls.	i) Operation and maintenance required for a. period of:	< 5yr.	___	1
		> 5yr.	X	0
	ii) Are environmental controls required as a part of the remedy to handle potential problems? *(If answer is no, go to "iv")*	Yes	X	0
		No	___	1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident	X	1
		Somewhat to not confident	___	0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum	X	2
		Moderate	___	1
		Extensive	___	0

Subtotal (maximum = 4) 3

TOTAL (maximum = 15) 5

Table 5.6
REDUCTION OF TOXICITY, MOBILITY OR VOLUME
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis		Score
1. Volume of hazardous waste reduced (reduction in volume or toxicity). If Factor 1 is not applicable, go to Factor 2.	i) Quantity of hazardous waste destroyed or treated. Immobilization technologies do not score under Factor 1. NA	99-100% ____	8
		90-99% ____	7
		80-90% ____	6
		60-80% ____	4
		40-60% ____	2
		20-40% ____	1
		< 20% ____	0
	ii) Are there untreated or concentrated hazardous waste produced as a result of (i)? If answer is no, go to Factor 2 NA	Yes ____	0
		No ____	2
Subtotal (maximum = 10) NA If subtotal = 10, go to Factor 3	iii) After remediation, how is the untreated, residual hazardous waste material disposed? NA	Off-site land disposal	0
		On-site land disposal ____	1
		Off-site destruction or treatment ____	2
2. Reduction in mobility of hazardous waste. If Factor 2 is not applicable, go to Factor 3	i) Quality of Available Wastes immobilized After Destruction/ Treatment	90-100% ____	2
		60-90% ____	1
		< 60% ____	0
	ii) Method of Immobilization		
	- Reduced mobility by containment	____	0
	- Reduced mobility by alternative treatment technologies	____	3
Subtotal (maximum = 5) NA			
3. Irreversibility of the destruction or treatment or immobilization of hazardous waste	Completely irreversible	____	5
	Irreversible for most of the hazardous waste constituents.	____	3
	Irreversible for only some of the hazardous waste constituents	____	2
	Reversible for most of the hazardous waste constituents.	____	0
Subtotal (maximum = 5) NA			
TOTAL (maximum = 15) NA			

Table 5.7

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis		Score
1. Technical Feasibility			
a. Ability to construct technology.	i) Not difficult to construct. No uncertainties in construction.	X	3
	ii) Somewhat difficult to construct. No uncertainties in construction.		2
	iii) Very difficult to construct and/or significant uncertainties in construction.		1
b. Reliability of technology.	i) Very reliable in meeting the specifiea process efficiencies or performance goals.		3
	ii) Somewhat reliable in meeting the specified process efficiencies or performance goals.	X	2
c. Schedule of delays due to technical problems.	i) Unlikely	X	2
	ii) Somswhat likely		1
d. Need of undertaking additicnal remedial action, if necessary.	i) No future remedial actions may be anticipated.		2
	ii) Some future remedial actions may be necessary.	X	1
Subtotal (maximum = 10) 8			
2. Administrative Feasibility			
a. Coordination with other agencies.	i) Minimal coordination is required.		2
	ii) Required coordination is normal.		1
	iii) Extensive coordination is required.		0
Subtotal (maximum = 2) Ø			
3. Availability of Services and Materials			
a. Availability of prospective technologies.	i) Are technologies under consideration generally commercially available for the site-specific application?	Yes X No	1 0
	ii) Will more than one vendor be available to provide a competitive bid?	Yes X No	1 0

Table 5.7 (cont'd)

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis		Score
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes ___	1
		No ___	3

Subtotal (maximum = 3) 3

TOTAL (maximum = 15) 11

Table 5.2

COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE NEW YORK STATE STANDARDS CRITERIA AND GUIDELINES (SCGs)
(Relative Weight = 10)

Analysis Factor	Rasis for Evaluation During Detailed Analysis			Score
SEDIMENT: REMOVE AND DISPOSE WITHOUT TREATMENT OFF-SITE				
1. Compliance with chemical-specific SCGs	Meets chemical specific SCGs such as groundwater standards	Yes		4
		No		0
2. Compliance with action-specific SCGs	Meets SCGs such as technology standards for incineration or landfill	Yes	X	3
		No		0
3. Compliance with location-specific SCGs	Meets location-specific SCGs such as Freshwater Wetlands Act	Yes	X	3
		No		0

TOTAL (Maximum = 10) 1∅

Table 5.3

PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT
(Relative Weight = 20)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Use of the site after remediation.	Unrestricted use of the land and water. (If answer is yes, go to the end of the Table.)	Yes	X	20
		No		0
TOTAL (Maximum = 20) 20				
2. Human health and the environment exposure after the remediation.	i) Is the exposure to contaminants via air route acceptable?	Yes		3
		No		0
	ii) Is the exposure to contaminants via groundwater/surface water acceptable?	Yes		3
		No		0
	iii) Is the exposure to contaminants via sediments/soils acceptable?	Yes		3
		No		0
Subtotal (maximum = 10)				
3. Magnitude of residual public health risks after the remediation.	i) Health risk	$\leq$ 1 in 1,000,000		5
	ii) Health risk	$\leq$ 1 in 100,000		2
Subtotal (maximum = 5)				
4. Magnitude of residual environmental risks after the remediation.	i) Less than acceptable			5
	ii) Slightly greater than acceptable			3
	iii) Significant risk still exists			0
Subtotal (maximum = 5)				
TOTAL (maximum = 20) 20				

Table 5.4

SHORT-TERM EFFECTIVENESS
(Relative Weight = 10)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.)	Yes		0
		No		4
	° Can the risk be easily controlled?	Yes		1
		No	___	0
	° Does the mitigative effort to control risk impact the community life-style?	Yes	___	0
		No	___	2
Subtotal (maximum = 4) 4				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes	X	0
		No	___	4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes	X	3
		No	___	0
Subtotal {maximum = 4) 3				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr.	X	1
		> 2yr.	___	0
	° Required duration of the mitigative effort to control short-term risk.	< 2yr.	X	1
		> 2yr.	___	0
Subtotal (maximum = 2) 2				
TOTAL (maximum = 10) 9				

Table 5.5

LONG-TERM EFFECTIVENESS AND PERMANENCE
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis		Score
1. On-site or off-site treatment or land disposal	° On-site treatment*		3
	° Off-site treatment*		1
	° On-site or off-site land disposal		0
Subtotal (maximum = 3) 0			
*treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes			
2. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section 2.1(a), (b), or (c). (If answer is yes, go to Factor 4.)	Yes ___	3
		No X	0
Subtotal (maximum = 3) 0			
3. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr. X	3
		20-25yr. ___	2
		15-20yr. ___	1
		< 15yr. ___	0
Subtotal (maximum = 3) 3			
4. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None X	3
		≤ 25% ___	2
		25-50% ___	1
		≥ 50% ___	0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 5.)	Yes ___	0
		No X	2
	iii) Is the treated residual toxic?	Yes ___	0
		No ___	1
	iv) Is the treated residual mobile?	Yes ___	0
		No ___	1
Subtotal (maximum = 5) 5			

LONG-TERM EFFECTIVENESS AND PERMANENCE
(Relative Weight = 15)

Analysis Factor		Basis for Evaluation During Detailed Analysis			Scare
5. Adequacy and reliability of controls.	i)	Operation and maintenance required for a period of:	< 5yr.	X	1
			> 5yr.	___	C
	ii)	Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes	___	C
			No	X	1
	iii)	Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident		1
			Somewhat to not confident	___	0
	iv)	Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum	X	2
			Moderate	___	1
			Extensive	___	0

Subtotal (maximum = 4) 4

TOTAL (maximum = 15) 12

Table 5.6
REDUCTION OF TOXICITY, MOBILITY OR VOLUME
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Volume of hazardous waste reduced (reduction in volume or toxicity). If Factor 1 is not applicable, go to Factor 2.	i) Quantity of hazardous waste destroyed or treated. Immobilization technologies do not score under Factor 1.	99-1001	X	8
		30-99%		7
		80-90%		6
		60-80%		4
		40-60%		2
		20-40%		1
		< 20%		0
	ii) Are there untreated or concentrated hazardous waste produced as a result of (i)? If answer is no, go to Factor 2	Yes		0
		No	X	2
Subtotal (maximum = 10) 10 If subtotal = 10, go to Factor 3	iii) After remediation, how is the untreated, residual hazardous waste material disposed?	Off-site land disposal		0
		On-site land disposal		1
		Off-site destruction or treatment		2
2. Reduction in mobility of hazardous waste. If Factor 2 is not applicable, go to Factor 3	i) Quality of Available Wastes immobilized After Destruction/ Treatment	90-100%		2
		60-90%		1
		< 60%		0
	ii) Method of Immobilization			
	- Reduced mobility by containment			0
	- Reduced mobility by alternative treatment technologies			3
Subtotal (maximum = 5) NA				
3. Irreversibility of the destruction or treatment or immobilization of hazardous waste	Completely irreversible		X	5
	Irreversible for most of the hazardous waste constituents.			3
	Irreversible for only some of the hazardous waste constituents			2
	Reversible for most of the hazardous waste constituents.			0
Subtotal (maximum = 5) 5				
TOTAL (maximum = 15) 15				

Table 5.7

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation Dcring Detailed Analysis		Score
1. Technical Feasibility			
a. Ability to construct technology.	i) Not difficult to construct. No uncertaintiss in construction.	X	3
	ii) Somewhat difficult to construct. No uncertainties in construcrion.		2
	iii) Very difficult to construct and/or significant uncertainties in construction.		1
b. Reliability of technology.	i) Very reliable in meeting the specified process efficiencies or performance goals.	X	3
	ii) Somewhat reliable in meeting the specified process efficiencies or performance goals.		2
c. Schedule of delays due to technical problems.	i) Unlikely	X	2
	ii) Somewhat likely		1
d. Need of undertaking additicnal remedial action, if necessary.	i) No future remedial actions may be anticipated.	X	2
	ii) Some future remedial actions may be necessary.		1
Subtotal (maximum = 10) 10			
2. Administrative Feasibility			
a. Coordination with other agsncies.	i) Minimal coordination is required.		2
	ii) Required coordination is normal.	X	1
	iii) Extensive coordination is required.		0
Subtotal (maximum = 2) 1			
3. Availability of Services and Materials			
a. Availability of prospective technologies.	i) Are technologies under consideration generally commercially available for the site-specific application?	Yes X	1
		No	0
	ii) Will more than one vendor be available to provide a competitive bid?	Yes X	1
		No	0

Table 5.7 (cont'd)

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes	X	1
		No		3

Subtotal (maximum = 3) 3

TOTAL (maximum = 15) 14

Table 5.2

COMPLIANCE WITH APPLICABLE OR RELEVANT AND
APPROPRIATE NEW YORK STATE STANDARDS CRITERIA AND GUIDELINES (SCGs)
(Relative Weight = 10)

SEDIMENT: EX-SITU STABILIZATION (USING CHEMFIX OR STS POLYSILICATE)

Analysis Factor	Rasis for Evaluation During Detailed Analysis			Score
1. Compliance with chemical-specific SCGs	Meets chemical specific SCGs such as groundwater standards	Yes	X	4
		No		0
2. Compliance with action-specific SCGs	Meets SCGs such as tschnology standards for incineration or landfill	Yes		3
		No		0
3. Compliance with location-specific SCGs	Meets location-specific SCGs such as Freshwater Wetlands Act	Yes	X	3
		No		0

TOTAL (Maximum = 10) 10

Table 5.3

PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT
(Relative Weight = 20)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Use of the site after remediation.	Unrestricted use of the land and water. (If answer is yes, go to the end of the Table.)	Yes	X	20
		No		0
TOTAL (Maximum = 20) 20				
2. Human health and the environment exposure after the remediation.	i) Is the exposure to contaminants via air route acceptable?	Yes		3
		No		0
	ii) Is the exposure to contaminants via groundwater/surface water acceptable?	Yes		4
		No		0
	iii) Is the exposure to contaminants via sediments/soils acceptable?	Yes		3
		No		0
Subtotal (maximum = 10) NA				
3. Magnitude of residual public health risks after the remediation.	i) Health risk	≤ 1 in 1,000,000		5
	ii) Health risk	≤ 1 in 100,000		2
Subtotal (maximum = 5) NA				
4. Magnitude of residual environmental risks after the remediation.	i) Less than acceptable			5
	ii) Slightly greater than acceptable			3
	iii) Significant risk still exists			0
Subtotal (maximum = 5) NA				
TOTAL (maximum = 20) 20				

Table 5.4

SHORT-TERM EFFECTIVENESS
(Eelative Weight = 10)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.)	Yes	___	0
		No	X	4
	° Can the risk be easily controlled?	Yes	___	1
		No	___	0
	° Does the mitigative effort to control risk impact the community life-style?	Yes	___	0
		No	___	2
Subtotal (maximum = 4) 4				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes	___	0
		No	X	4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes	___	3
		No	___	0
Subtotal [maximum = 4) 4				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr.	X	1
		> 2yr.	___	0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr.	X	1
		> 2yr.	___	0
Subtotal (maximum = 2) 2				
TOTAL (maximum = 10) 10				

Table 5.5

LONG-TERM EFFECTIVENESS AND PERMANENCE
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis		Score
1. On-site or off-site treatment or land disposal	° On-site treatment*		3
	° Off-site treatment*		1
	° On-site or off-site land disposal		0
Subtotal (maximum = 3) 3			
*treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes			
2. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section (a), (b), or (c). (If answer is yes, go to Factor 4.)	Yes X	3
		No ___	0
Subtotal (maximum = 3) 3			
3. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr. ___	3
		20-25yr. ___	2
		15-20yr. ___	1
		< 15yr. ___	0
Subtotal (maximum = 3)			
4. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None X	3
		≤ 25% ___	2
		25-50% ___	1
		≥ 50% ___	0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 5.)	Yes X	0
		No ___	2
	iii) Is the treated residual toxic?	Yes ___	0
		No X	1
	iv) Is the treated residual mobile?	Yes ___	0
		No X	1
Subtotal (maximum = 5) 5			

Table 5.5 (cont'd)

LONG-TERM EFFECTIVENESS AND PERMANENCE
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis		Score
5. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of:	< 5yr. X	1
		> 5yr. ___	0
	ii) Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes ___	0
		No X	1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident ___	1
		Somewhat to not confident	0
	iv) Relative degree of long-term monitoring required (compare with other remedial alternatives)	Minimum X	2
		Moderate	1
		Extensive	0

Subtotal (maximum = 4) 4

TOTAL (maximum = 15) 15

+DEC score

Table 5.6
REDUCTION OF TOXICITY, MOBILITY OR VOLUME
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Volume of hazardous waste reduced (reduction in volume or toxicity). If Factor 1 is not applicable, go to Factor 2.	i) Quantity of hazardous waste destroyed or treated. Imobilization technologies do not score under Factor 1.	99-100%	X	8
		90-99%		7
		80-90%		6
		60-80%		4
		40-60%		2
		20-40%		1
		< 20%		0
Ø	ii) Are there untreated or concentrated hazardous waste produced as a result of (i)? If answer is no, go to Factor 2	Yes		0
		No	X	2
Subtotal (maximum = 10) 10 If subtotal = 10, go to Factor 3	iii) After remediation, how is the untreated, residual hazardous waste material disposed?	Off-site land disposal		0
		On-site land disposal		1
		Off-site destruction or treatment		2
2. Reduction in mobility of hazardous waste. If Factor 2 is not applicable, go to Factor 3	i) Quality of Available Wastes immobilized After Destruction/ Treatment	90-100%		2
		60-90%		1
		< 60%		0
3	ii) Method of Immobilization - Reduced mobility by containment			0
	- Reduced mobility by alternative treatment technologies		X	3
Subtotal (maximum = 5) NA				
3. Irreversibility of the destruction or treatment or immobilization of hazardous waste	Completely irreversible		X	5
3	Irreversible for most of the hazardous waste constituents.		X	3
	Irreversible for only some of the hazardous waste constituents			2
	Reversible for most of the hazardous waste constituents.			0
Subtotal (maximum = 5) 5				
TOTAL (maximum = 15) 15				

Table 5.7

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis		Score
1. Technical Feasibility			
a. Ability to construct technology.	i) Not difficult to construct. No uncertainties in construction.	___	3
	ii) Somewhat difficult to construct. No uncertainties in construction.	X	2
	iii) Very difficult to construct and/or significant uncertainties in construction.	___	1
b. Reliability of technology.	i) Very reliable in meeting the specified process efficiencies or performance goals.	X	3
	ii) Somewhat reliable in meeting the specified process efficiencies or performance goals.	___	2
c. Schedule of delays due to technical problems.	i) Unlikely	___	2
	ii) Somewhat likely	X	1
d. Need of undertaking additional remedial action, if necessary.	i) No future remedial actions may be anticipated.	X	2
	ii) Some future remedial actions may be necessary.	___	1
Subtotal (maximum = 10) 8			
2. Administrative Feasibility			
a. Coordination with other agencies.	i) Minimal coordination is required.	___	2
	ii) Required coordination is normal.	X	1
	iii) Extensive coordination is required.	___	0
Subtotal (maximum = 2) 1			
3. Availability of Services and Materials			
a. Availability of prospective technologies.	i) Are technologies under consideration generally commercially available for the site-specific application?	Yes ✓	1
		No ___	0
	ii) Will more than one vendor be available to provide a competitive bid?	Yes X	1
		No ___	0

Table 5.7 (cont'd)

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
t. Availability of necessary squipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes		1
		No	X	0

Subtotal (maximum = 3) 2

TOTAL (maximum = 15) 11

Table 5.2

COMPLIANCE WITH APPLICABLE OR RELEVANT AND
APPROPRIATE NEW YORK STATE STANDARDS CRITERIA AND GUIDELINES (SCGs)
(Relative Weight = 10)

GROUNDWATER: NO ACTION

Analysis Factor	Rasis for Evaluation During Detailed Analysis			Score
1. Compliance with chemical-specific SCGs	Meets chemical specific SCGs such as groundwater standards	Yes		4
		No	X	0
2. Compliance with action-specific SCGs	Meets SCGs such as technology standards for incineration or landfill	Yes		3
		No	X	0
3. Compliance with location-specific SCGs	Meets location-specific SCGs such as Freshwater Wetlands Act	Yes		3
		No	X	0

TOTAL (Maximum = 10) 0

Table 5.3

PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT
(Relative Weight = 20)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Use of the site after remediation.	Unrestricted use of the land and water. (If answer is yes, go to the end of the Table.)	Yes	___	20
		No	X	0
TOTAL (Maximum = 20) ϕ				
2. Human health and the environment exposure after the remediation.	i) Is the exposure to contaminants via air route acceptable?	Yes	X	3
		No	___	0
	ii) Is the exposure to contaminants via groundwater/surface water acceptable? *	Yes	X	4
		No	___	0
	iii) Is the exposure to contaminants via sediments/soils acceptable?	Yes		3
		No	___	0
Subtotal (maximum = 10) 10				
3. Magnitude of residual public health risks after the remediation.	i) Health risk	≤ 1 in 1,000,000	___	5
	ii) Health risk	≤ 1 in 100,000	X	2
Subtotal (maximum = 5) 2				
4. Magnitude of residual environmental risks after the remediation.	i) Less than acceptable		___	5
	ii) Slightly greater than acceptable		X	3
	iii) Significant risk still exists		___	0
Subtotal (maximum = 5) 3				
TOTAL (maximum = 20) 15				

* – Assumes site groundwater is not used for drinking water purposes. Municipal water is available at the site. Potential development of groundwater as a drinking water source improbable based on low permeability of soils.

Table 5.4

SHORT-TERM EFFECTIVENESS
(Eslative Weight = 10)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Sccre
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.)	Yes		0
		No		4
	° Can the risk be easily controlled?	Yes	___	1
		No	___	0
	° Does the mitigative effort to control risk impact the.community life-style?	Yes	___	0
		No	___	2
Subtotal (maximum = 4) 4				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes	___	0
		No	X	4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes	___	3
		No	___	0
Subtotal (maximum = 4) 4				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr.		1
		> 2yr.	___	0
	° Required duration of the mitigative effort to control short-term risk.	≤ 2yr.	X	1
		> 2yr.	___	0
Subtotal (maximum = 2) 2				
TOTAL (maximum = 10) 10				

Table 5.5

LONG-TERM EFFECTIVENESS AND PERMANENCE
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis		Score
1. On-site or off-site treatment or land disposal	° On-site treatment*		3
	° Off-site treatment*		1
	° On-site or off-site land disposal		0
Subtotal (maximum = 3) NA			
*treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes			
2. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section 2.1(a), (b), or (c). (If answer is yes, go to Factor 4.)	Yes ___	3
		No X	0
Subtotal (maximum = 3) 0			
3. Lifetime of remedial actions.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr. ___	3
		20-25yr. ___	2
		15-20yr. ___	1
		< 15yr. ___	0
Subtotal (maximum = 3) NA			
4. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None ___	3
		≤ 25% ___	2
		25-50% ___	1
		≥ 50% X	0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 5.)	Yes ___	0
		No	2
	iii) Is the treated residual toxic?	Yes	0
		No ___	1
	iv) Is the treated residual mobile?	Yes ___	0
		No ___	1
Subtotal (maximum = 5) 2			

LONG-TERM EFFECTIVENESS AND PERMANENCE
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
5. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of:	< 5yr.	___	1
		> 5yr.	X	0
	ii) Are environmental controls required as a part cf the rsnedy to handle potential problems? (If answer is *no*, go to "iv")	Yes	___	0
		No	X	1
	iii) Degree of confidence that controls can adequately handle potential probl ems.	Moderate to very confident	X	1
		Somewhat to not confident		0
	iv) Relative degree of long-term monitaring required (compare with other remedial alternatives)	Minimum	___	2
		Moderate	X	1
		Extensive	___	0

Subtotal (maximum = 4) 3

TOTAL (maximum = 15) 5

Table 5.6
REDUCTION OF TOXICITY, MOBILITY OR VOLUME
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Volume of hazardous waste reduced (reduction in volume or toxicity). If Factor 1 is not applicable, go to Factor 2.	i) Quantity of hazardous waste destroyed or treated. Imobilization technologies do not score under Factor 1. NA	99-100%	____	8
		30-99%	____	7
		80-90%	____	6
		60-80%	____	4
		40-60%	____	2
		20-40%	____	1
		< 20%	____	0
	ii) Are there untreated or concentrated hazardous waste produced as a result of (i)? If answer is no, go to Factor 2 NA	Yes	____	0
		No	____	2
Subtotal (maximum = 10) NA If subtotal = 10, go to Factor 3	iii) After remediation, how is the untreated, residual hazardous waste material disposed? NA	Off-site land disposal	____	0
		On-site land disposal	____	1
		Off-site destruction or treatment	____	2
2. Reduction in mobility of hazardous waste. If Factor 2 is not applicable, go to Factor 3	i) Quality of Available Wastes immobilized After Destruction/ Treatment	90-100%	____	2
		60-90%	____	1
		< 60%	____	0
	ii) Method of Immobilization			
	- Reduced mobility by containment			0
	- Reduced mobility by alternative treatment technologies		____	3
Subtotal (maximum = 5) NA				
3. Irreversibility of the destruction or treatment or immobilization of hazardous waste	Completely irreversible		____	5
	Irreversible for most of the hazardous waste constituents.		____	3
	Irreversible for only some of the hazardous waste constituents		____	2
	Reversible for most of the hazardous waste constituents.		____	0
Subtotal (maximum = 5) NA				
TOTAL (maximum = 15) NA				

Table 5.7

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Technical Feasibility				
a. Ability to construct technology.	i) Not difficult to construct. No uncertainties in construction.		X	3
	ii) Somewhat difficult to construct. No uncertainties in construction.		___	2
	iii) Very difficult to construct and/or significant uncertainties in construction.		___	1
b. Reliability of technology.	i) Very reliable in meeting the speciFied process efficiencies or performance goals.		___	3
	ii) Somewhat reliable in meeting the specified process efficiencies or performance goals.		X	2
c. Schedule of delays due to technical problems.	i) Unlikely		X	2
	ii) Somswhat likely		___	1
d. Need of undertaking additicnal remedial action, if necessary.	i) No future remedial actions may be anticipated.		X	2
	ii) Some future remedial actions may be necessary.		___	1
Subtotal (maximum = 10) 9				
2. Administrative Feasibility				
a. Coordination with other agencies.	i) Minimal coordination is required.		___	2
	ii) Required coordination is normal.		X	1
	iii) Extensive coordination is required.		___	0
Subtotal (maximum = 2) 1				
3. Availability of Services and Materials				
a. Availability of prospective technologies.	i) Are technologies under consideration generally commercially available for the site-specific application?	Yes	X	1
		No	___	0
	ii) Will moro than one vendor be available to provide a competitive bid?	Yes	X	1
		No	___	0

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
t. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes	X	1
		No	___	0

Subtotal (maximum = 3) 3

TOTAL (maximum = 15) 13

Table 5.2

COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE NEW YORK STATE STANDARDS CRITERIA AND GUIDELINES (SCGs)
(Relative Weight = 10)

GROUNDWATER: BENTONITE COLLAR MIGRATION CONTROL ALONG STORM SEWER

Analysis Factor	Rasis for Evaluation During Detailed Analysis			Score
1. Compliance with chemical-specific SCGs	Meets chemical specific SCGs such as groundwater standards	Yes		4
		No	X	0
2. Compliance with action-specific SCGs	Meets SCGs such as technology standards for incineration or landfill	Yes	X	3
		No		0
3. Compliance with location-specific SCGs	Meets location-specific SCGs such as Freshwater Wetlands Act	Yes		3
		No	X	0

TOTAL **(Maximum** = 10) 3

Table 5.3

PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT
(Relative Weight = 20)

Analysis Factor	Basis for Evaluation During Detailed Analysis	DEC Score			Score
1. Use of the site after remediation.	Unrestricted use of the land and water. (If answer is yes, go to the end cf the Table.)		Yes	X	20
		0	No		0
TOTAL (Maximum = 20) 2∅					
2. Human health and the environment exposure after the remediation.	i) Is the exposure to contaminants via air route acceptable?	3	Yes		3
			No		0
	ii) Is the exposure to contaminants via groundwater/surface water acceptable?	0	Yes		4
			No		0
	iii) Is the exposure to contaminants via sediments/soils acceptable?	3	Yes		3
			No		0
Subtotal (maximum = 10) NA		b			
3. Magnitude of residual public health risks after the remediation.	i) Health risk		≤ 1 in 1,000,000		
	ii) Health risk		≤ 1 in 100,000		
Subtotal (maximum = 5) NA					
4. Magnitude of residual environmental risks after the remediation.	i) Less than acceptable	5			5
	ii) Slightly greater than acceptable				3
	iii) Significant risk still exists				0
Subtotal (maximum = 5) NA		lb			
TOTAL (maximum = 20) 2∅					

Table 5.4

SHORT-TERM EFFECTIVENESS
(Relative Weight = 10)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Protection of community during remedial actions.	° Are there significant short-term risks to the community that must be addressed? (If answer is no, go to Factor 2.)	Yes		0
		No	X	4
	° Can the risk be easily controlled?	Yes		1
		No		0
	° Does the mitigative effort to control risk impact the community life-style?	Yes		0
		No		2
Subtotal (maximum = 4) 4				
2. Environmental Impacts	° Are there significant short-term risks to the environment that must be addressed? (If answer is no, go to Factor 3.)	Yes		0
		No	X	4
	° Are the available mitigative measures reliable to minimize potential impacts?	Yes		3
		No		0
Subtotal (maximum = 4) 4				
3. Time to implement the remedy.	° What is the required time to implement the remedy?	≤ 2yr.	X	1
		> 2yr.		0
	° Required duration of the mitigative effort to control short-Term risk.	≤ 2yr.	X	1
		> 2yr.		0
Subtotal (maximum = 2) 2				
TOTAL (maximum = 10) 10				

Table 5.5

LONG-TERM EFFECTIVENESS AND PERMANENCE
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. On-site or off-site treatment or land disposal	° On-site treatment*			3
	° Off-site treatment*			1
	° On-site or off-site land disposal			0
Subtotal (maximum = 3) 3				
*treatment is defined as destruction or separation/ treatment or solidification/ chemical fixation of inorganic wastes				
2. Permanence of the remedial alternative.	° Will the remedy be classified as permanent in accordance with Section 2.1(a), (b), or (c). (If answer is yes, go to Factor 4.)	Yes	___	3
		No	X	0
Subtotal (maximum = 3) 0				
3. Lifetime of remedial actio'ns.	° Expected lifetime or duration of of effectiveness of the remedy.	25-30yr.	X	3
		20-25yr.	___	2
		15-20yr.	___	1
		< 15yr.	___	0
Subtotal (maximum = 3) 3				
4. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous waste left at the site.	None	___	3
		≤ 25%	___	2
		25-50%	___	1
		≥ 50%	X	0
	ii) Is there treated residual left at the site? (If answer is no, go to Factor 5.)	Yes	___	0
		No	X	2
	iii) Is the treated residual toxic?	Yes	___	0
		No	___	1
	iv) Is the treated residual mobile?	Yes	___	0
		No	___	1
Subtotal (maximum = 5) 2				

Table 5.5 (cont'd)

LONG-TERM EFFECTIVENESS AND PERMANENCE
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
5. Adequacy and reliability of controls.	i) Operation and maintenance required for a pericd of:	< 5yr.	X	1
		> 5yr.		0
	ii) Are environmental controls required as a part of the remedy to handle potential problems? (If answer is no, go to "iv")	Yes		0
		No	X	1
	iii) Degree of confidence that controls can adequately handle potential problems.	Moderate to very confident		1
		Somewhat to not confident		
	iv) Relativo degree of long-term monitoring required (compare with other remedial alternatives)	Minimum	X	2
		Moderate		1
		Extensive		0

Subtotal (maximum = 4) 4

TOTAL (maximum = 15) 12

Table 5.6
REDUCTION OF TOXICITY, MOBILITY OR VOLUME
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
1. Volume of hazardous waste reduced (reduction in volume or toxicity). If Factor 1 is not applicable, go to Factor 2.	i) Quantity of hazardous waste destroyed or treated. Immobilization technologies do not score under Factor 1.	99-100%	____	8
		90-99%	____	7
		80-90%	____	6
		60-80%	____	4
		40-60%	____	2
		20-40%	____	1
		< 20%	____	0
	ii) Are there untreated or concentrated hazardous waste produced as a result of (i)? if answer is no, go to Factor 2	Yes	____	0
		No	____	2
Subtotal (maximum = 10) NA If subtotal = 10, go to Factor 3	iii) After remediation, how is the untreated, residual hazardous waste material disposed?	Off-site land disposal	____	0
		On-site land disposal	____	1
		Off-site destruction or treatment	____	2
2. Reduction in mobility of hazardous waste. If Factor 2 is not applicable, go to Factor 3	i) Quality of Available Wastes immobilized After Destruction/ Treatment	90-100%	____	2
		60-90%	____	1
		< 60%	____	0
	ii) Method of Immobilization			
	- Reduced mobility by containment		____	0
	- Reduced mobility by alternative treatment technologies		____	3
Subtotal (maximum = 5) NA				
3. Irreversibility of the destruction or treatment or immobilization of hazardous waste	Completely irreversible		X	5
	Irreversible for most of the hazardous waste constituents.		____	3
	Irreversible for only some of the hazardous waste constituents		____	2
	Reversible for most of the hazardous waste constituents.		____	0
Subtotal (maximum = 5) 5				
TOTAL (maximum = 15) 5				

Table 5.7

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis		Score
1. Technical Feasibility			
a. Ability to construct technology.	i) Mot difficult to construct. No uncertainties in construction.	X	3
	ii) Somewhat difficult to construct. No uncertainties in construccion.		2
	iii) Very difficult to construct and/or significant uncertainties in construction.		1
b. Reliability of technology.	i) Very reliable in meeting the specified process efficiencies or performance goals.	X	3
	ii) Somewhat reliable in meeting the specified process efficiencies or performance goals.		2
c. Schedule of delays due to technical problems.	i) Unlikely	X	2
	ii) Somewhat likely		1
d. Need of unaertaking additicnal remedial action, if necessary.	i) No future remedial actions may be anticipated.	X	2
	ii) Some future remedial actions may be necessary.		1
Subtotal (maximum = 10) 10			
2. Administrative Feasibility			
a. Coordination with other agsncies.	i) Minimal coordination is required.		2
	ii) Required coordination is normal.		1
	iii) Extensive coordination is required.		0
Subtotal (maximum = 2) 1			
3. Availability of Services and Materials			
a. Availability of prospective technologies.	i) Are technologies underconsideration generally commercially available for the site-specific application?	Yes X No	1 0
	ii) Will more than one vendor be available to provide a cornpetitive bid?	Yes X No	1 0

Table 5.7 (cont'd)

IMPLEMENTABILITY
(Relative Weight = 15)

Analysis Factor	Basis for Evaluation During Detailed Analysis			Score
t. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	Yes No	 ____	1 0

Subtotal (maximum = 3) 3

TOTAL (maximum = 15) 14

APPENDIX C

Remedial Alternative Summary Worksheets

MEDIA: Soil – Worksheet 1
REMEDIAL TECHNOLOGY: No Action

Activities/Work Items

1. Sample/analyze soils in two source areas annually: in degreaser area obtain 0-7 foot samples and 7-14 foot samples; in drum storage area obtain samples from 0-3.5 feet.

2. Soil analytes to consist of USEPA Method 8240 for VOCs, USEPA Method 8270 for semi-VOCs. At the end of 5 years evaluate if soil sample concentrations have dropped below the site-specific soil criteria for selected compounds in soil as provided by the NYSDEC and found in FS report Table II.

3. If 5 year evaluation shows:
   1) concentrations above criteria; then continue for 5 more years with same program.
   2) one location has concentrations below criteria; then modify program to eliminate source area which is below criteria.
   3) both locations sampled have concentrations below criteria; then discontinue the annual sampling and analysis.

edh:70007-43/sonawk1

MEDIA: Soil – Worksheet 2
REMEDIAL TECHNOLOGY: No Action

Unit Cost Estimates

Item	Quantity	Unit	Unit Cost	Capital	O&M
Sample 2 source areas					
2@ drum storage area					
4@ degreaser area					
1x/yr for VOCs	6	sample	$200		$1,200
and Semi-VOCs	6	sample	$500		$3,000
Drill rig mob/demob	1	LS	$500		$500
4 boreholes					
2@ 3.5 ft. – drum storage	2	boring	$200		$400
2@ 0-7 & 7-14 ft. – degreaser	2	boring	$500		$1,000
Sample crew – 1@ 1x/yr	10	hr	$70		$700
10 hr event					
Validation – 1 hr/sample	12	hr	$80		$960
Report prep – 1x/yr @ 12 hr each	12	hr	$80		$960
5 yr review allowance	10	hr	$80		$800
10 hr/yr x 5 = 50 hr/5 yr					
			Subtotal		$9,520
			Engineering (%)		
			Equip. Replace (%)		
			Contingency (10%)		$952
			Administration (5%)		$476
			TOTAL		510,948
		Net Present Worth		(i=5%,n=5)	$47,405
				(i=5%,n=10)	$84,519
				(i=5%,n=20)	$136,412
				(i=5%,n=30)	$168,271

EDH:70007-40/sonawk2

MEDIA: Soil − Worksheet 3
REMEDIAL TECHNOLOGY: No Action

Applicable or Relevant and Appropriate Requirements

Site specific soil criteria provided by the NYSDEC.

edh:70007-43/sonawk3

MEDIA: Soil – Worksheet 1
REMEDIAL TECHNOLOGY: Excavation and Off-site Disposal Without Treatment

Activities/Work Items

1.	Mob/demob excavation equipment.
2.	Excavate all except under bldg. (degreaser = 609 cy + drum storage = 648 cy = 1257 cy).
3.	Load and haul (1257 cy 115 cy truck = 84 trips).
4.	Disposal Fee.
5.	Backfill, compact, re-grade and re-seed excavations.
6.	Monitor areas that cannot be excavated (below bldg.) following remediation of excavated soils.

edh:70007-43/sodntwk1

MEDIA: Soil – Worksheet 2
REMEDIAL TECHNOLOGY: Excavation and Off-site Disposal Without Treatment

Unit Cost Estimates

Item	Quantity	Unit	Unit Cost	Capital	O&M
Mob/Demob 1.5 cy hoe	1	LS	$1,500	$1,500	
Load 1257 cy in-place w/20% expan.	1508	cy	$5	$7,540	
Haul	1508	cy	$10	$15,080	
Disposal haz. waste @1.65T/cy @ landfill or incinerator	2488	ton	$300 to $1000	$746,400 to $2,488,000	
Confirm. sampling x10 + 10% QNQC	11	sample	$200	$2,200	
Backfill 1508 cy (bankrun delivered)	1508	cy	$2.50	$3,770	
Compact in lft. lifts	1508	cy	$0.20	$302	
Reseed exc + 25% add'tl dist. area	200	sy	$2	$400	
GW Monitor Wells @ Source Areas x 13 wells for VOCs + 10% QNQC	14	sample	$200		$2,800
Sample Crew 2 @ llyr @ 16 hr.	16	hr	$70		$1,120
Validate 1 hr/sample	14	hr	$80		$1,120
5 yr. Rev. Allowance 16 hr/yr x 5 = 80 hr/5 yr	16	hr	$80		$1,280
		Subtotal		$777,192 / $2,518,792	$6,320
		Engineering (10%)		$77,719 / $251,879	$632
		Equip. Replace (%)			
		Contingency (10%)		$77,719 / $251,879	$632
		Administration (5%)		$38,860 / $125,940	$316
		TOTAL		$971,490 / $3,148,490	$7,900
	Net Present Worth	(i=5%,n=5)			$34,207
		(i=5%,n=10)			$60,988
		(i=5%,n=20)			$98,434
		(i=5%,n=30)			$121,423

EDH:70007-40/sodntwk2

MEDIA: Soil – Worksheet 3
REMEDIAL TECHNOLOGY: Excavation and Off-site Disposal Without Treatment

Applicable or Relevant and Appropriate Requirements

6 NYCRR PT. 364 Waste Transporter Permits
6 NYCRR PT. 372 Hazardous Waste Manifest System and Related Standards for Gen., Transporters & Facilities
Site specific soil criteria provided by the NYSDEC

* Need to add [illegible]'s but they are mentioned in the description.

edh:70007-43/sodntwk3

MEDIA: Soil - Worksheet 1
REMEDIAL TECHNOLOGY: In-situ High Vacuum Extraction of Soil Vapor From In-place Soil

Activities/Work Items

1. Perform vapor extraction pilot test to determine specific well spacing and production rates.
2. Install wells/trenches for vapor extraction. Assume 3 shallow trenches through former drum storage area and 7 additional wells for former degreaser area.
3. Obtain permits/authorizations - air discharge, POTW discharge for water produced in course of remediating soils. ✓
4. Deliver high-vacuum VES module to site and assemble piping, controls, etc.
5. Startup, debug and balance system.
6. Operate and monitor; replace granular activated carbon canisters (regenerate) as necessary.
7. Perform periodic sampling to monitor progress.
8. Shut down when target concentrations met.

edh:70007-43/sovewk1

MEDIA: Soil - Worksheet 2
REMEDIAL TECHNOLOGY: In-situ High Vacuum Extraction of Soil Vapor From In-place Soil

Unit Cost Estimates

Item	Quantity	Unit	Unit Cost	Capital	O&M
Pilot test VES/Vac Truck Unit Rental	1	ls	$5,000	$5,000	
Pilot Test Analytical Portable GC	1	wk	$1,000	$1,000	
Pilot Test Monitor Crew 3x40 hr	120	hr	$80	$9,600	
Add'tl wells assume 7 to 16 ft	7	ea	$2,000	$14,000	
Extract. trenches 3x100 lf x 4 ft depth	300	lf	$5	$1,500	
Piping - Trench	300	lf	$10	$3,000	
Piping - Transfer	500	lf	$20	$10,000	
VES Skid, Installed	1	unit	$60,000	$60,000	
Air Phase Carbon Canisters	3	ea	$8,000	$24,000	
Water phase carbon polish drums (200 lb. ec)	2	ea	$600	$1,200	
Date Acquis. - System/Process Monitor Equip.	1	ea	$15,000	$15,000	
Misc. Construction	1	ls	$5,000	$5,000	
Energy 25 HP x 0.748 HP/KW @ 0.10/kwh for 1 year.	164,000	kwh	$0.10		$16,400
Vapor Carbon - 20% of VOC ext/yr avg. 180 lb/yr @ 10% adsorption	1800	lb	$3		$5,400
Water Carbon - 2 changeslyr, avg. 200 lb. ea	4	ea	$600		$2,400
Misc. Maintenance 4hr/wk x 52	208	hr	$70		$14,560
Monitor Soil Progress 2 samples, 2 x/yr	4	ea	$200		$800
Monitor Air Discharge 4 samples x 4 locations for VOCs	16	ea	$200		$3,200
Monitor GW x 13 wells for VOCs + 10% QA/QC	14	ea	$200		$2,800
Sample Crew 2@ 1 x/yr x 16 hr.	16	hr	$70		$1,120
Monitor Water Discharge 1 sample/mo + 10% QA/QC	13	ea	$200		$2,600
Sample Validate 1 hr/sample (GW/soil only)	18	hr	$80		$1,440
		Subtotal		$149,300	$50,720
		Engineering (30%)		$44,790	
		Equip. Replace (10%)			$5,072
		Contingency (10%)		$14,930	
		Administration (5%)		$7,465	
		TOTAL		$216,485	$55,792

Net Present Worth	(i=5%,n=5)	$241,579
	(i=5%,n=10)	$430,714
	(i=5%,n=20)	$695,168
	(i=5%,n=30)	$857,523

EDH:70007-40/sovewk2

MEDIA: Soil - Worksheet 3
REMEDIAL TECHNOLOGY: In-situ High Vacuum Extraction of Soil Vapor From In-place Soil

Applicable or Relevant and Appropriate Requirements

6 NYCRR Subpart 373-1,2,3-Haz Wst TSDs
6 NYCRR Pt. 212 - General Process Emission Sources
6 NYSCRR Part 257 - Air Quality Standards
Air Guide 1 - Guidelines for the Control of Toxic Ambient Air Contaminants
Site specific soil criteria provided by the NYSDEC

edh:70007-43/sovewk3

MEDIA: Soil - Worksheet 1
REMEDIAL TECHNOLOGY: Ex-situ High Vacuum Extraction of Soil Vapor From Areas Not Under the Building

Activities/Work Items

1.	Mob/demob excavation equipment.
2.	Excavate 1257 cy. soil placed into constructed vapor extraction cell (base pad and cover).
3.	Treat soil.
4.	Backfill excavation.
5.	Monitor treatment process and perform confirmation sampling of soil to track progress.
6.	Treatment affects soils that can be excavated only. Monitor sub-building areas where no treatment occurs.
7.	Replace soil on site after SCGs are met. Grade and seed.

edh:70007-43/sohvewk1

MEDIA: Soil − Worksheet 2
REMEDIAL TECHNOLOGY: Ex-situ High Vacuum Extraction of Soil Vapor From Areas Not Under the Building

Unit Cost Estimates

Item	Quantity	Unit	Unit Cost	Capital	O&M
Mob/demob	1	LS	$2,000	$2,000	
Contract Treatment Pad Approx. 90x90 ft.	8100	sf	$7.30	$59,130	
Piping Through Treatment Pad @ 500 LF	500	lf	$10	$5,000	
Excavate & Stockpile on Pad 1257 cy. @ 20% exp.	1508	cy	$5	$7,540	
Place Cover light HDPE @ $0.5/sf	10250	sf	$0.50	$5,125	
Bank run backfill delivered to exc.	1508	cy	$2.50	$3,770	
Place & Compact	1508	cy	$0.20	$302	
Vapor Ext. Treatment (from in-situ sheets)					
Capital $ less trench, pipe wells	--	ea	$120,800	$120,800	
Transfer piping - 500 ft.	500	lf	$20	$10,000	
Operation O&M Annual	--	ea	$44,560		$44,560
Replace soils on site after treatment	1508	cy	$5	$7,540	
Grade/Seed	1508	cy	$2	$3,016	
Liner, misc. mat'l disposal (non-haz.) with haul	50	cy	$100	$5,000	
Confirm Sampling x 2 loc., 2/yr. for VOCs, semi-VOCs	4	ea	$700		$2,800
GW Monitor Wells @ below bldg. x 13 wells for VOCs + 10% QA/QC	14	ea	$200		$2,800
Sample crew 2 @ 1 xlyr x 16 hr.	16	hr	$70		$1,120
Validate 1 hr/sample	14	ea	$80		$1,120
5 yr. Rev. Allowance 16 hrlyr x 5 = 80hr/5 yr	16	hr	$80		$1,280
		Subtotal		$229,223	$53,680
		Engineering (30%)		$68,767	
		Equip. Replace (10%)			$5,368
		Contingency (10%)		$22,922	
		Administration (5%)		$11,461	
		TOTAL		$332,373	$59,048
	Net Present Worth		(i=5%,n=5)		$255,678
			(i=5%,n=10)		$455,851
			(i=5%,n=20)		$735,738
			(i=5%,n=30)		$907,568

MEDIA: Soil – Worksheet 3

REMEDIAL TECHNOLOGY: Ex–situ High Vacuum Extraction of Soil Vapor From Areas Not Under the Building

Applicable or Relevant and Appropriate Requirements

6 NYCRR Subpart 373-1,2,3-Haz Wst TSDs
6 NYCRR Pt. 212 - General Process Emission Sources
6 NYCRR Pt. 257 - Air Quality Standards
Air Guide 1 - Guidelines for the Control of Toxic Ambient Air Contaminants
Site specific soil criteria provided by the NYSDEC

edh:70007-43/sohvewk3

MEDIA: Sediment - Worksheet 1
REMEDIAL TECHNOLOGY: No Action

Activities/Work Items

1. Annual sampling of the sediment from four (4) locations within the pond to test for the presence and migration of volatiles and semi-volatile organic compounds. Submit sampling results to the NYSDEC and NYSDOH.

2. Evaluate results at 5 year intervals. Compare results to prior data and NYSCGs as found in FS report Table I.

3. If 5 year evaluation shows:
   1) concentrations above criteria; then continue for 5 more years with same program.
   2) one or more locations have concentrations below criteria; then modify program to eliminate source areas which are below criteria.
   3) all locations sampled have concentrations below criteria; then discontinue the annual sampling and analysis.

edh:70007-43\senawk1

MEDIA: Sediment - Worksheet 2
REMEDIAL TECHNOLOGY: No Action

Unit Cost Estimates

Item	Quantity	Unit	Unit Cost	Capital	O&M
4 samples + 5% QA/QC					
2x/yr VOCs by GC/MS	5	ea	$200		$1,000
Semi-VOCs by GCIMS	5	ea	$500		$2,500
Sample crew - 2@ 2x/yr 8 hr/event	32	hr	$70		$2,240
Validation - 1 hr/sample	5	hr	$80		$400
Report prep - W y r @ 8 hr each	16	hr	$80		$1,280
5 yr review allowance 8 hr/yr x 5 = 40 hr/5 yr			$80		$640
			Subtotal		$8,060
			Engineering (%)		
			Equip. Replace (%)		
			Contingency (10%)		$806
			Administration (5%)		$403
			TOTAL		$9,269
		Net Present Worth		(i=5%,n=5)	$40,135
				(i=5%,n=10)	$71,557
				(i=5%,n=20)	$115,492
				(i=5%,n=30)	$142,465

EDH:70007-40/senawk2

MEDIA: Sediment − Worksheet 3
REMEDIAL TECHNOLOGY: No Action

Applicable or Relevant and Appropriate Requirements

Site specific sediment criteria provided by the NYSDEC.

edh:70007-43/senawk3

MEDIA: Sediment – Worksheet 1
REMEDIAL TECHNOLOGY: Remove and Dispose Without Treatment Off-site

Activities/Work items

1. Excavate pond sediments (estimated 167 cy) using backhoe.
2. Load sediments into 15 cy truck trailers for offsite disposal at permitted landfill. (Estimates provided for solid and hazardous pending waste profile).
3. Conduct confirmation sampling to determine adequate removal of affected sediments from the pond.
4. Haul excavated sediments to a NYSDEC-approved hazardous waste landfill.
5. Backfill excavated area with clean fill.

edh:70007-43/sedntwk1

MEDIA: Sediment - Worksheet 2
REMEDIAL TECHNOLOGY: Remove and Dispose Without Treatment Off-site

Unit Cost Estimates

Item	Quantity	Unit	Unit Cost	Capital	O&M
Mob/Demob 1.5 cy hoe	1	ls	$1,500	$1,500	
Load 167 cy in-place w/20% expan.	200	cy	$5	$1,000	
Haul	200	cy	$10	$2.000	
Dispose of waste (@1.65T/cy)					
Solid Waste	276	ton	$60	$16,560	
Hazardous at landfill (assume 2/3)	184	ton	$300	$55,200	
Incineration (assume 1/3)	92	ton	$1,000	$92,000	
Confirm. sampling	5	ea	$700	$3,500	
Backfill 200 (bankrun delivered)	200	cy	$2.50	$500	
Compact 1 ft lift		cy	$0.20	$40	
		Subtotal		$25,100 to	$155,740
		Engineering (20%)		$5,020 to	$31,148
		Equip. Replace (%)			
		Contingency (10%)		$2,510 to	$15,574
		Administration (5%)		$1,255 to	$7,787
		TOTAL		$33,885 to	$210,249

Note:

Table assumes two disposal options: disposal as a solid waste or disposal as a hazardous waste.
If disposed as a hazardous waste, assume 113 vol. goes to incinerator, 2/3 vol. goes to hazardous waste landfill, based on range of sample analytical data.

EDH:70007-40/sedntwk2

MEDIA: Sediment – Worksheet 3
REMEDIAL TECHNOLOGY: Remove and Dispose Without Treatment Off–site

Applicable or Relevant and Appropriate Requirements

6 NYCRR PT. 364 Waste Transporter Permits
6 NYCRR PT. 372 Hazardous Waste Manifest System and Related Standards for Gen., Transporters & Facilities
6 NYCRR Subpart 373-1,2,3 Haz Wst TSDS
Site specific sediment criteria provided by the NYSDEC

edh:70007-43/sedntwk3

MEDIA: Sediment - Worksheet 1
REMEDIAL TECHNOLOGY: Ex-situ Stabilization (Chemfix)

Activities/Work Items

1.	Collect sediment sample from affected pond area and submit to Chemfix for treatability test to determine blend of sediments and fixative for stabilizationlsolidification treatment technology.
2.	Excavate pond sediments (estimated 167 cy) using backhoe.
3.	Stockpile sediments on plastic liners on site.
4.	Conduct confirmation sampling to determine sufficient removal of affected sediments from the pond.
5.	Treat stockpiled sediments with fixative to create a friable, clay-like material.
6.	Perform TCLP to determine compliance with LDRs.
7.	Following curing/TCLP results on the treated sediments, use the material as on-site fill.

edh:70007-43\sestwk1

MEDIA: Sediment - Worksheet 2
REMEDIAL TECHNOLOGY: Ex-situ Stabilization (Chemfix)

Unit Cost Estimates

Item	Quantity	Unit	Unit Cost	Capital	O&M
Collect sediment sample; conduct treatability test (Chemfix)	1	event	$1,500	$1,500	
Mob/demob equipment, Chemfix pers.	1	event	$50,000	$50,000	
Excavate and stockpile on site	200	cy	$5.00	$1,000	
Backfill (bankrun delivered)	200	cy	$2.50	$500	
Compact, 1 ft lift	200	cy	$0.20	$40	
Chemfix Stabilization	330	T	$90	$29,700	
Confirmation sample analyses x 4 locations + 1 QA/QC for VOCs and Semi-VOCs by GCNS	5	ea	$700	$3,500	
		Subtotal		$86,240	
		Engineering (20%)		$17,248	
		Equip. Replace (%)			
		Contingency (10%)		$8,624	
		Administration (5%)		$4,312	
		TOTAL		$116,424	

Notes:
1. Estimated costs from "Means Site Work Cost Data 1991", Smit, K., ed, Roger Grant, publ, 1990 and Chemfix.

2. Assumed pond is dry at time of excavation.

EDH:70007-43/sestwk2

MEDIA: Sediment − Worksheet 3
REMEDIAL TECHNOLOGY: Ex–situ Stabilization (Chemfix)

Applicable or Relevant and Appropriate Requirements

6 NYCRR Subpart 373-1,2,3 Hazardous Waste TSDS **Site specific sediment criteria provided by the NYSDEC**

edh:70007-43/sestwk3

MEDIA: Sediment - Worksheet 1
REMEDIAL TECHNOLOGY: Ex-situ Stabilization (STS Polysilicate)

Activities/Work Items

1. Collect sediment sample from affected pond area and submit to STS for treatability test to determine blend of sediments and fixative for stabilizationlsolidification treatment technology.
2. Excavate pond sediments (estimated 167 cy) using backhoe.
3. Stockpile sediments on plastic liners on site.
4. Conduct confirmation sampling to determine sufficient removal of affected sediments from the pond.
5. Treat stockpiled sediments with fixative to create a friable, clay-like material.
6. Perform TCLP to determine compliance with LDRs.
7. Following curing/TCLP results on the treated sediments, use the material as on-site fill.

edh:70007-43\sestpwk1

MEDIA: Sediment – Worksheet 2
REMEDIAL TECHNOLOGY: Ex-situ Stabilization (STS Polysilicate)

Unit Cost Estimates

Item	Quantity	Unit	Unit Cost	Capital	O&M
Collect sediment sample; conduct treatability test (STS-Polysilicate)	1	event	$1,000	$1,000	
Mob/demob equipment, STS pers.	1	event	$30,000	$30,000	
Excavate, screen out + 1 in.size on site 167 cy. w/20% expansion	200	cy	$6.50	$1,300	
Backfill (bankrun delivered)	200	cy	$2.50	$500	
Compact, 1 ft lift	200	cy	$0.20	$40	
STS Polysilicate Stabilization (@ 1.65 T/cy and 10% reduction w/ screening	297	T	$75	$22,275	
Confirmation sample analyses x 4 locations + 1 QA/QC for VOCs and Semi-VOCs by GC/MS	5	ea	$700	$3,500	
		Subtotal		$58,615	
		Engineering (20%)		$11,723	
		Equip. Replace (%)			
		Contingency (10%)		$5,862	
		Administration (5%)		$2,931	
		TOTAL		$79,130	

EDH:70007-43/sestpwk2

MEDIA: Sediment - Worksheet 3
REMEDIAL TECHNOLOGY: Ex-situ Stabilization (STS Polysilicate)

Applicable or Relevant and Appropriate Requirements

6 NYCRR Subpart 373-1,2,3 Hazardous Waste TSDS Site specific sediment criteria provided by the NYSDEC

edh:70007-43/sestpwk3

MEDIA: Groundwater - Worksheet 1
REMEDIAL TECHNOLOGY: No Action

Activities/Work Items

1.	Sample/analyze groundwater from certain observation wells annually for USEPA Method 8240 VOCs. Report results to NYSDECINYSDOH.
2.	Evaluate at 5 year intervals - compare VOC concentrations to prior data and NYS SCGs.
3.	If 5 year evaluation shows: 1) reduction below SCGs not achieved; then continue for 5 more years with same program. 2) one or more locations have concentrations below criteria; modify yearly program to delete wells which have VOC concentration decreases to below NYS SCGs. 3) all wells below NYS groundwater SCGs; cease further yearly sampling/analysis.

edh:70007-43/gwnawk1

MEDIA: Groundwater – Worksheet 2
REMEDIAL TECHNOLOGY: No Action

Unit Cost Estimates

Item	Quantity	Unit	Unit Cost	Capital	O&M
13 Wells + 5% QA/QC - 2x/yr VOCs by GC/MS	28	sample	$200		$5,600
Sample crew - 2 @ Wyr @ 16hr/event	64	hr	$70		$4,480
Validation - 1 hrlsample	28	hr	$80		$2,240
Report prep - 2x/yr @ 16 hr each	32	hr	$80		$2,560
5 yr review allowance 16 hr/yr x 5 = 80 hr/5 yr	16	hr	$80		$1,280
			Subtotal		$16,160
			Engineering (%)		
			Equip. Replace (%)		
			Contingency (10%)		$1,616
			Administration (5%)		$808
			TOTAL		$18,584
		Net Present Worth		(i=5%,n=5)	$80,469
				(i=5%,n=10)	$143,468
				(i=5%,n=20)	$231,557
				(i=5%,n=30)	$285,636

EDH:70007-43/gwnawk2

MEDIA: Groundwater – Worksheet 3
REMEDIAL TECHNOLOGY: No Action

Applicable or Relevant and Appropriate Requirements

6 NYCRR Part 703 – NYSDEC Groundwater Quality Regulations TOGS 1.1.1 – Ambient Water Quality Standards and Guidance Values

edh:70007-43/gwnawk3

MEDIA: Groundwater - Worksheet 1
REMEDIAL TECHNOLOGY: Bentonite Collar Migration Control Along Storm Sewer

Activities/Work Items

1. Excavate 3 +/- ft. long segments of soil from around storm sewer at three locations: 1) just upstream from outlet to pond; 2) just downstream of former degreaser; and 3) at former drum storage area.

2. Replace soillbedding around pipe with hydrated bentonite collar (slurry) up to 1.5-2.0 ft. thick around pipe.

3. Backfill soils.

4. Treatldispose of excess soils, as appropriate.

edh:70007-43/gwbcwk1

MEDIA: Groundwater – Worksheet 2

REMEDIAL TECHNOLOGY: Bentonite Collar Migration Control Along Storm Sewer

Unit Cost Estimates

Item	Quantity	Unit	Unit Cost	Capital	O&M
Mob/demob 0.75 cy hoe	1	ls	$750	$750	
Excavate @ 5 cyllocation x 3 location	15	cy	$5	$75	
Hand Exc. @ 1 cyllocation x 3 location	3	cy	$50	$150	
Bentonite grout slurry place @ 2 cylloc x 3 x 27 cf/cy	54	cf	$20	$1,080	
Backfill 2 cylloc. x 3	6	cy	$2.50	$15	
Dispose excess fill 3 cylloc x 3 If On-site Treatment-see on-site treatment	9	cy	--	--	
If Off-site haz.	9	cy	$200-1000	$1800-9,000	

Subtotal	$3,870-$11,070
Engineering (20%)	$774 - 2,214
Equip. Replace (%)	
Contingency (10%)	$387 - 1,107
Administration (5%)	$194 - 554
TOTAL	$5,225-$14,945

EDH:70007-40/gwbcwk2

MEDIA: Groundwater – Worksheet 3
REMEDIAL TECHNOLOGY: Bentonite Collar Migration Control Along Storm Sewer

Applicable or Relevant and Appropriate Requirements

6 NYCRR PT. 364 Waste Transporter Permits
6 NYCRR PT. 372 Hazardous Waste Manifest System and Related Standards for Gen., Transporters & Facilities
6 NYCRR Subpart 373-1,2,3 Haz Waste TSDS
6 NYCRR Part 703 - NYSDEC Groundwater Quality Regulation
6 NYCRR Part 702 - Surface Water Quality Standards
TOGS 1.1.1 - Ambient Water Quality Standards and Guidance Values

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