REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SCOPE OF WORK

DOVER INTERNATIONAL
(Former Binghamton Plastics)
Binghamton, New York

Prepared by:

SHIELD ENVIRONMENTAL ASSOCIATES, INC.
Lexington, Kentucky
Job No. 396-0460

May 22, 1998

TABLE OF CONTENTS

1.0 INTRODUCTION

The purpose of this Scope of Work (SOW) is to define the planned remedial investigation and feasibility study (RI/FS) for the Dovatron International (former Binghamton Plastics), Broome County, New York, site (#7-04-024). The purpose of the RI/FS is to investigate the nature and extent of contamination at the former Binghamton Plastics site and to develop and evaluate remedial alternatives, as appropriate. This document will be attached to and incorporated into the Order on Consent (Index #B7-0516-97-05).

This SOW is based on the United States Environmental Protection Agency's (USEPA) *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA, October 1988): specifically, Appendix C, Model Statement of Work for Remedial Investigations and Feasibility Studies (RI/FS) and New York State's *Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites* (NYSDEC, October 1994). Shield Environmental Associates, Inc. (Shield) will furnish all the necessary personnel, materials and services needed for, or incidental to, performing the RI/FS, except as otherwise specified herein.

2.0 SCOPE OF WORK OUTLINE

The specific RI/FS activities to be conducted at the site have been divided into twelve separate tasks:

- Task 1 - Project Planning
- Task 2 - Citizens' Participation Program
- Task 3 - Field Investigations
- Task 4 - Sample Analysis/Validation
- Task 5 - Data Evaluation
- Task 6 - Risk Assessment
- Task 7 - Fish and Wildlife Impact Analysis
- Task 8 - Treatability Studies
- Task 9 - RI Report
- Task 10 - Remedial Alternatives Development and Screening
- Task 11 - Detailed Analysis of Alternatives
- Task 12 - FS Report

2.1 Task 1 - Project Planning

This task involves outlining the general project scope. Shield has begun planning the specific RI/FS activities that will need to be conducted. Shield's *Baseline Summary Report, DII Binghamton Plastics, New York* (January 1998, Revised May 1998) was presented to the New York State Department of Environmental Conservation (NYSDEC). This report contained a background summary, including the location of the site; descriptions of the pertinent area boundary features, general site physiography, hydrology, and geology; and local environmentally sensitive features. The Baseline Summary Report also included a summary of the previous site investigation and the nature and extent of the actual and potential on-site environmental effects posed by the remaining site contamination. Additionally, the report provided a conceptual model of the contamination source and potential contaminant migration pathways. The Baseline Summary Report contained the following table of contents:

- Site Background
  - Site Location
  - Site History
  - Historical Aerial Photographs
  - Database Search Information

- Site Setting
  - Topography
  - Geology
  - Hydrogeology
  - Soil Types
  - Surface Water
  - Air Quality
  - Meteorology
  - Ecology

- Summary of Previous Site Investigations
  - Hagopian, Stetson-Harza, Harza Northeast Investigations
  - Shield Investigation

- Data Analysis
  - Data Validation of Soil and Groundwater Analyses

- Currently Known Extent of Contamination

- Proposed Site-Specific Parameter List

- Conceptual Model

- Proposed Scope of Work

The Baseline Summary Report also included Table 1 - Chronology of Significant Site Events.

Prior to developing the RI/FS Work Plan, Shield will meet with the NYSDEC to discuss the specific investigative and analytical activities required. The topics will include but will not be limited to:

- Review of the site geology, hydrogeology and conceptual models to develop a consistent and operative theory of contaminant fate and transport.
- The proposed scope of the project and the investigative and analytical activities that will be required.
- Interim remedial measures (IRMs) and their specific components and objectives.
- Potential remedial technologies and the need for, or usefulness of, treatability studies or pilot studies.
- Potential applicable or relevant and appropriate requirements (ARARs) associated with the location and contaminants of the site and the potential response actions being contemplated.
- The location of the site headquarters and support area for field work activities.

Once Shield and the NYSDEC have agreed upon the project scope, Shield will develop a specific project work plan to meet the RI/FS objectives and initiate subcontractor procurement and coordination with analytical laboratories. The project work plan will include:

- A **work plan** that provides a project description and outlines the overall technical approach, complete with corresponding personnel requirements, activity schedules and due dates for deliverables.
- A **field sampling and analysis plan** (FSAP) that will be comprised of the field sampling plan (FSP) and the quality assurance project plan (QAPP).
- A **health and safety plan** (HASP) that will provide health and safety protection to all site-related personnel and surrounding communities in accordance with 29 CFR 1910.120.

The latter two plans are described below.

2.1.1 Field Sampling and Analysis Plan

Shield will prepare an FSAP consisting of the following:

Field Sampling Plan (FSP)

The FSP will specify and outline all activities necessary to obtain additional site data. It will contain an evaluation of what additional data will be required to adequately characterize the site, to conduct a baseline risk assessment, and to support the evaluation of remedial

technologies in the FS. The FSP will clearly state the types, locations, and frequency of sampling and highlight the analyses of interest. It will also contain a schedule indicating when field activities will take place and when deliverables will be submitted.

Quality Assurance Project Plan (QAPP)

The QAPP will encompass all the investigations being conducted and will contain the following:

- A project description that will duplicate the project description in the Work Plan.
- A project organization chart illustrating the lines of responsibility for personnel involved in the project sampling phase.
- Quality assurance objectives for data such as required precision and accuracy, completeness, representativeness, comparability, and intended use.
- Sample chain-of-custody procedures to be followed during sample collection, in the laboratory, and as a part of the final evidence files.
- The development of data usability summary reports based on the Guidance document published by NYSDEC's Division of Environmental Remediation: *Guidance for the Development of Data Usability Summary Reports.* Data usability summary reports will be prepared for all soil, water, and air laboratory analyses, used in the RI/FS report.
- The schedule and details of preventative maintenance procedures and the corrective action procedures for field and laboratory instruments.
- Specific procedures to assess data precision, representativeness, comparability, accuracy and completeness of specific measurement parameters.

The standard operating procedures for quality assurance/quality control (QA/QC) established within the EPA will be referenced but not duplicated in the Quality Assurance Project Plan.

2.1.2 Health and Safety Plan

Shield will develop a HASP based upon site conditions to protect personnel involved in site activities and the surrounding community. The HASP will address all applicable regulatory requirements contained in 29 CFR 1910.120(I)(2) - Occupational Health and Safety Administration, Hazardous Waste Operations and Emergency Response, Interim Rule, December 19, 1986; USEPA Order 1440.2 - Health and Safety Requirements for Employees Engaged in Field Activities; USEPA Order 1440.3 - Respiratory Protection; USEPA Occupational Health and Safety Manual; and USEPA Interim Standard Operating Procedures (September 1982). The HASP will provide a site background discussion and describe the health and safety procedures/protocols, decontamination procedures, personnel training, and the type and extent of medical surveillance. The HASP will also identify problems or hazards that may be encountered, with a discussion of how these problems or hazards will be addressed. Procedures for protecting third parties (e.g., visitors or the surrounding

community) will also be provided. Standard operating procedures for ensuring workers' safety will be referenced but not duplicated in the HASP.

2.2 Task 2 - Citizens' Participation Program

The NYSDEC will prepare the Citizen Participation Plan (CPP) for the RI/FS activities. Shield will assist the NYSDEC in implementing the elements of the CPP.

2.3 Task 3 - Field Investigations

Shield will conduct the field investigations necessary to characterize the site and evaluate the actual or potential risk to human health and the environment posed by the site. Investigative activities will focus on problem definition and result in data of adequate technical content to evaluate potential risks and to support the development and evaluation of remedial alternatives during the FS. The extent of the investigation will be finalized during the RI.

Site investigative activities will follow the plans developed in Task 1. Strict chain-of-custody procedures will be followed, and all sample locations will be identified on a site map. Shield will provide project management and QC review of all activities conducted under this task. Field investigative activities anticipated for this site include:

- *Surveying and Mapping the Site* - Develop a site map that includes topographic information and physical features on and near the site.

- *Waste Characterization* - Establish the locations, types, and quantities of waste as well as the physical or chemical characteristics of any waste remaining at the site.

- *Hydrogeologic Investigation* - Establish the potential extent of groundwater contamination. Efforts will begin with a survey of previous hydrogeologic studies and other existing data. The survey will address the soil's retention capacity/mechanisms, discharge/recharge areas, regional flow directions and quality, and the likely effects of any alternatives that are developed involving the pumping and disruption of groundwater flow. Results from the sampling program will be used to establish the horizontal and vertical distribution of contaminants and the contaminants' mobility. The results will also be used to predict the long-term contaminant disposition.

- *Soil and Sediment Investigation* - Establish the vertical and horizontal extent of surface/subsurface soil contamination and sediments and identify any uncertainties with the associated analytical reports. Information on the degree of hazard, locations of samples, techniques used, and methods of analysis will be included.

- *Surface Water Investigation* - Establish the extent and fate of any contamination in the nearby surface waters. This effort will include an evaluation of possible future discharges and the degree of contaminant reduction expected.

- *Air Investigation* - Investigate the extent of atmospheric contamination based upon the contaminants found at the site.

The RI/FS report appendices will include the following information: geologic boring logs, analytical data, disposal manifests, and other relevant data/information from the RI/FS activities.

2.4 Task 4 - Sample Analysis/Validation

Shield will develop a management system that will include field logs, sample management, and tracking procedures. Shield will also document control and inventory procedures for both laboratory data and field measurements so that the data collected during the investigation are of adequate quality and quantity to support the risk assessment and the FS. Collected data will be validated at the appropriate field or laboratory QC level to establish whether they are appropriate for this intended use. Shield will provide task management and quality controls. Shield will also incorporate information from this task into the RI/FS report appendices.

2.5 Task 5 - Data Evaluation

Shield will analyze all site investigative data and present the analytical results in an organized and logical manner so that the relationships between site investigative results for each medium are apparent. Shield will prepare a summary that describes the quantities and concentrations of specific chemicals at the site; the number, locations, and types of nearby populations and activities; and the potential transport mechanism and the expected fate of the contaminant in the environment. Shield will submit the data evaluation summary to the NYSDEC as part of the RI report.

2.6 Task 6 - Risk Assessment

Shield will conduct a baseline risk assessment to assess the potential human health and environmental risks posed by the site in the absence of any remedial action. This effort will involve four components: contaminant identification, exposure assessment, toxicity assessment, and risk characterization.

- *Contaminant Identification* - Shield will review available information on the hazardous substances present at the site and identify the major contaminants of concern. Contaminants of concern will be selected based on their intrinsic toxicological properties, because they are present in large quantities, and/or because they are currently in, or potentially may migrate into, critical exposure pathways (e.g., drinking water).

- *Exposure Assessment* - Shield will identify actual or potential exposure pathways, characterize potentially exposed populations, and evaluate the actual or potential extent of exposure.

- *Toxicity Assessment* - Shield will provide a toxicity assessment of those chemicals found to be of concern during site investigative activities. This assessment will include the types of adverse health or environmental effects associated with chemical exposures, the

relationships between magnitudes of exposure and effects, and the related uncertainties for contaminant toxicity (e.g., weight of evidence for a chemical's carcinogenicity).

- *Risk Characterization* - Shield will integrate the information developed during the exposure and toxicity assessments to characterize the current or potential risk the site poses to human health and/or the environment. This characterization will identify the potential for adverse health or environmental effects for the chemicals of concern and identify any uncertainties associated with the contaminant(s), toxicity(ies), and/or exposure assumptions.

Shield will submit the risk assessment to the NYSDEC as part of the RI report.

2.7 Task 7 - Fish and Wildlife Impact Analysis

A Fish and Wild Life Impact Analysis (FWIA) will be conducted as a part of the RI/FS. The FWIA will follow the procedures outlined in the NYSDEC guidance document published by the Division of Fish and Wildlife: *Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites* (October 1994).

The above-referenced guidance document outlines decision points for establishing when the process is complete and further assessment is unnecessary. A flow chart in Appendix C of the FWIA guidance document details the impact evaluation process. The five major steps outlined by the NYSDEC's guidance document are as follows:

Step 1 - Site Description
Step 2 - Contaminant-Specific Impact Assessment
Step 3 - Ecological Effects of Remedial Alternatives
Step 4 - Fish and Wildlife Requirements for Implementation of Remedial Actions
Step 5 - Monitoring Program

2.8 Task 8 - Treatability Studies

Shield will conduct bench and/or pilot studies as necessary to establish the suitability of remedial technologies for site conditions and problems. Technologies that may be suitable for the site will be identified as early as possible to establish whether a need exists for treatability studies to better estimate costs and performance capabilities. If treatability studies are established to be necessary, a testing plan identifying the types and goals of the studies, the level of effort needed, a schedule for completion, and the data management guidelines will be submitted to the NYSDEC for its review and approval. Upon NYSDEC approval, Shield will procure test facilities and any necessary equipment, vendors, and analytical services.

Upon completion of the testing, Shield will evaluate the results to assess the technologies with respect to the goals identified in the test plan. Shield will prepare a report summarizing the testing program and its results, which will be presented in the final RI/FS report. Shield will implement all management and QC review activities for this task.

2.9 Task 9 - RI Report

The activities conducted and the conclusions drawn during the RI (Tasks 3 through 7) will be documented in an RI report (supporting data and information will be included in the appendices of the report). Shield will prepare and submit a draft RI report to the NYSDEC for its review and comments. Upon completion of the review and comment phase, Shield will submit a final RI report to the NYSDEC. In addition, Shield will prepare monthly reports to describe the technical progress at the site. These monthly reports will include the following items:

- Status of the work and the progress to date.
- All sampling and test results received within 10 working days before the monthly report due dates. QA/QC information will be included.
- All work plans, reports, and other deliverables required by the Order on Consent during the previous month.
- Information regarding percentage of completion and unresolved delays encountered or anticipated that may affect the future schedule for RI/FS implementation.
- A description of all actions including, but not limited to, data collection and implementation of work plans that are scheduled for the next month.
- Any other information relating to the progress at the site.
- A description of any proposed or approved modifications to any work plan.
- A description of all activities undertaken to support the Citizens' Participation Plan during the previous month and those planned for the upcoming month.

Shield will submit monthly reports to the NYSDEC as specified in the Order on Consent.

2.10 Task 10 - Remedial Alternatives Development and Screening

Shield will develop a range of distinct hazardous waste management alternatives designed to remediate or control any contaminated media (soil, surface water, air, groundwater, sediments) remaining at the site, as deemed necessary in the RI, to provide adequate protection of human health and the environment. The potential alternatives will encompass, as appropriate, a range of alternatives in which treatment is used to reduce the toxicity, mobility, or volume of wastes but vary in the degree to which long-term management of residuals or untreated waste is required; one or more alternatives involving containment with little or no treatment; and a no-action alternative. Alternatives that involve minimal efforts to reduce potential exposure (e.g., site fencing, deed restrictions) will be presented as "limited action" alternatives.

The following steps will be conducted to establish the appropriate range of alternatives for this site:

- *Establish Remedial Action Objectives and General Response Actions* - Based on existing information, site-specific remedial action objectives to protect human health and the environment will be developed. The objectives will specify the contaminant(s) and media of concern, the exposure route(s) and receptor(s), and an acceptable contaminant level or range of levels for each exposure route (i.e., preliminary remediation goals).

Preliminary remediation goals will be established based on readily available information (e.g., Reference Doses) or chemical-specific ARARs (e.g., maximum contaminant levels). Shield will meet with the NYSDEC to discuss the remedial action objectives for the site. As more information is collected during the RI, Shield, in consultation with the NYSDEC, will refine remedial action objectives as appropriate.

General response actions will be developed for each medium of interest defining contaminant, treatment, excavation, pumping, or other actions, singly or in combination, to satisfy remedial action objectives. Volumes or areas of media to which general response actions may apply will be identified, taking into account requirements for protectiveness as identified in the remedial action objectives and the chemical and physical characteristics of the site.

- *Identify and Screen Technologies* - Based on the developed general response actions, hazardous waste treatment technologies will be identified and screened so that only those technologies applicable to the contaminants present, their physical matrix, and other site characteristics will be considered. This screening will be based primarily on a technology's ability to effectively remediate the contaminants at the site, but it will also take into account a technology's implementability. Shield will select representative process options, as appropriate, to carry forward into alternative development. Shield will identify the need for treatability testing (as described under Task 8) for those technologies that are probable candidates for consideration during the detailed analysis.

- *Configure and Screen Alternatives* - The potential technologies and process options will be combined into media-specific or sitewide alternatives. The developed alternatives will be defined with respect to size and configuration of the representative process options; time for remediation; rates of flow or treatment; spatial requirements; distances for disposal; and required permits, imposed limitations, and other factors necessary to evaluate the alternatives. If many distinct, viable options are available and developed, a screening of alternatives will be conducted to limit the number of alternatives that undergo the detailed analysis and to provide consideration of the most promising process options. The alternatives will be screened on a general basis with respect to their effectiveness and implementability. Shield will meet with the NYSDEC to discuss which alternatives will be evaluated in the detailed analysis and to facilitate the identification of action-specific ARARs.

2.11 Task 11 - Detailed Analysis of Alternatives

Shield will conduct a detailed analysis of alternatives that will consist of an individual analysis of each alternative against a set of evaluation criteria and a comparative analysis of all options against the evaluation criteria with respect to one another.

The evaluation criteria are as follows:

- *Overall Protection of Human Health and the Environment* addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

- *Compliance with ARARs* addresses whether or not a remedy will meet all of the ARARs of other federal and state environmental statutes and/or provide grounds for invoking a waiver.

- *Long-Term Effectiveness and Permanence* refers to the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

- *Cost Effectiveness* addresses a remedial option's effectiveness based on relative cost comparisons in association with remediation objectives.

- *Reduction of Toxicity, Mobility, or Volume Through Treatment* will be the anticipated performance of the treatment technologies a remedy may employ.

- *Short-Term Effectiveness* addresses the time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

- *Implementability* will be the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

The individual analysis will include a technical description of each alternative that outlines the waste management strategy involved and identifies the key ARARs associated with each alternative and a discussion that profiles the performance of that alternative with respect to each of the evaluation criteria. A table summarizing the results of this analysis will be prepared. Once the individual analysis is complete, the alternatives will be compared and contrasted to one another with respect to each of the evaluation criteria.

2.12 Task 12 - FS Report

Shield will present the results of Tasks 10 and 11 in an FS report. Supporting data, information, and calculations will be included in appendices to the report. Shield will prepare and submit a draft FS report to the NYSDEC for its review and comments. Upon completion of the review and comment phase, Shield will submit a final FS report to the NYSDEC. Additional copies of the final report

will be made and distributed to those individuals identified by the NYSDEC.

Shield's monthly report requirements for the FS are the same as those specified for the RI under Task 9.

3.0 SCHEDULE

A detailed schedule of RI/FS activities will be included in the RI/FS Work Plan. Shield will submit a draft of the RI/FS Work Plan to the NYSDEC within 75 days of the signing of the Order on Consent.

REMEDIAL INVESTIGATION/FEASIBILITY STUDY
INTERIM REMEDIAL MEASURES
SCOPE OF WORK

DOVER INTERNATIONAL
(Former Binghamton Plastics)
Binghamton, New York

Prepared by:

SHIELD ENVIRONMENTAL ASSOCIATES, INC.
Lexington, Kentucky
Job No. 396-0460

May 22, 1998

TABLE OF CONTENTS

1.0 INTRODUCTION

The purpose of this Scope of Work (SOW) is to establish the parameters of Interim Remedial Measures (IRM) during the remedial investigation/feasibility study (RI/FS) of the Dovatron International (former Binghamton Plastics), Broome County, New York, site (#7-04-024). The purpose of the IRM is to reduce contaminant plume migration, reduce risk of human or environmental exposure and/or remove source contamination. This document will be attached to and incorporated into the Order on Consent (Index #B7-0516-97-05). This IRM SOW is based on the United States Environmental Protection Agency's (USEPA) *Guidance for Conducting Remedial Investigation and Feasibility Studies Under CERCLA* (EPA, October 1988) and USEPA's *Guidance on Remedial Actions for Contaminated Groundwater at Superfund Sites* (EPA, December 1988). Shield Environmental Associates, Inc. (Shield) will furnish all necessary personnel, materials and services needed for, or incidental to, performing the IRM, except as otherwise specified herein.

The SOW associated with an IRM is less detailed than a SOW for an RI/FS. In particular, fewer alternatives are considered because, in most cases, the decision that a particular scope of the IRM would be beneficial is based on best professional judgment.

1.1 Recognition of the Problem

This process will delineate the rationale for considering the implementation of an interim measure. Typically, the interim measure would be implemented to minimize source contamination and/or reduce plume migration. The characteristics of the problem, i.e., the groundwater and/or soil contamination, is documented, examined, and if appropriate, analyzed. If an interim measure is implemented to reduce contaminant exposure to the environment or population, the affected environmental media or population will be identified, and the concentrations of the contaminants of concern listed.

1.2 IRM Objectives and Screening

During the preliminary evaluation process, the objectives of the proposed IRM will be outlined. The preliminary objective outline will consider the affected medium, the nature and extent of contamination and other relevant characteristics of the recognized problem. After the objectives of the proposed IRM are established, a screening process will identify alternative measures that would respond to the objectives required.

2.0 DETAILED ANALYSIS OF ALTERNATIVES AND SELECTION OF REMEDY

During the detailed analysis, remedial alternatives that have been retained from the alternative development phase are analyzed against the seven evaluation criteria. The purpose of the detailed analysis will be to compare alternatives so that the IRM that offers the most favorable balance among the seven criteria can be selected. The seven evaluation criteria include:

- Overall protection of human health and the environment

- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)
- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, or volume
- Short-term effectiveness
- Implementability
- Cost

The selected remedy must protect human health and the environment and attain ARARs or provide grounds for invoking a waiver. Alternatives will be analyzed, determinations will be made of how they compare to one another, trade-offs among them will be identified. The seven criteria that should be used during the IRM selection are described in the following sections.

2.1 Overall Protection of Human Health and the Environment

This criterion addresses whether the measure will be protective of human health and the environment considering the site's characteristics. During the evaluation of an IRM's ability to effectively protect human health and the environment, the following criteria will be considered: long-term effectiveness and permanence; short-term effectiveness; toxicity, mobility, and volume reduction. How each alternative achieves protection over time and whether site risks are eliminated, reduced, or controlled will also be analyzed.

Human health and the environment must be protected during implementation, and the measure must mitigate or fully control risks for the site problem being addressed. For example, an alternative water supply must prevent exposure to groundwater contamination, but it need not address other threats from the site. Further, an interim measure that contains the plume need not remediate groundwater. As appropriate, interim measures can be justified by the need to take rapid action. Short-term effects from residual contamination or effluent disposal will also be addressed.

2.2 Compliance with ARARs

Unless a waiver has been obtained for a particular ARAR, the selected IRM must comply with all location-, action-, and chemical-specific ARARs. An IRM can be part of the final remedy or it can be a partial remedy that will be implemented while constructing the final remedy or while the necessary arrangements for the final remedy (e.g., obtaining permits) are being made.

2.3 Long-Term Effectiveness and Permanence

The next criterion used to evaluate and compare alternatives will be long-term effectiveness and permanence. This criterion addresses how well an IRM maintains protection of human health and the environment after remedial action objectives have been met. Components of analyzing long-term effectiveness include examining the magnitude of residual risk and the adequacy and long-term

reliability of management controls. The probability of attaining cleanup levels, particularly in a complex or technically limiting situation, will also be considered under this criterion.

2.4 Reduction of Mobility, Toxicity, or Volume

The anticipated performance of treatment technologies used in the alternatives will be evaluated under this criterion. The amount of hazardous material destroyed or treated and the amount remaining on-site will be assessed, along with the degree of expected reduction in mobility, toxicity, or volume. In addition, the degree to which the treatment could be reversed will be evaluated. This criterion will also be related to the preference for treatment as a principal element. In determining whether the preference will be satisfied, all of the principal threats posed by the site must be considered.

2.5 Short-Term Effectiveness

The effectiveness of the alternative in protecting human health and the environment during construction and implementation will be assessed under the short-term effectiveness criterion. The length of time required to achieve protection, the short-term reliability of the technology, and protection of the community and of workers during remediation will be considered. The time frame for plume removal will be analyzed with reference to on-site and off-site human and environmental exposure points. The evaluation will include consideration of short-term and cross-media impacts that may be posed during the IRM implementation. Short-term effects, such as the disruption to residential neighborhoods or sensitive environments caused by construction of a slurry wall, will also be evaluated.

2.6 Implementability

The technical and administrative feasibility of alternatives as well as the availability of needed goods and services will be evaluated to assess the remedy's implementability. The factors that make up the implementability criterion are as follows:

- Ability to construct, operate, and maintain the technology; e.g., a slurry wall generally will be more difficult to construct than a groundwater extraction system alone and thus may receive a less favorable evaluation under this criterion.

- Ability to phase in other actions, if necessary; e.g., a groundwater extraction system implemented prior to the source control action may restrict the type of source control actions that could be implemented.

- Ease of undertaking additional remedial actions, if necessary; e.g., the capacity of an air-stripper and its ability to treat larger volumes of groundwater may make it a more favorable option than an alternative using a system limited to low groundwater flow rates.

- Ability to monitor the effectiveness of the IRM; e.g., variations in groundwater monitoring requirements, the length of time that monitoring will be required, the frequency of monitoring, and the depth of monitoring might be compared for different alternatives.

- Ability to obtain approvals and permits from other agencies (for off-site actions); e.g., obtaining approval to discharge to a publicly-owned treatment works (POTW) may be more difficult than meeting the substantive state pollution discharge elimination system (SPDES) requirements for discharging to surface water.

- Coordination with other agencies; e.g., certain IRMs may require more coordination with local agencies, such as obtaining approval to discharge to a POTW.

- Availability of hazardous waste treatment, storage, and disposal facilities to dispose of treatment residuals, and their capacity; e.g., IRMs that generate groundwater treatment residuals such as sludges or spent carbon may be less favorable under this criterion than remedies that do not.

- Availability of necessary equipment and specialists; e.g., innovative treatment techniques may be less implementable than treatment techniques that are in common use.

2.7 Cost

Capital and operation and maintenance costs will be evaluated for each alternative. These costs include design and construction costs, remedial action operating costs, other capital and short-term costs, costs associated with maintenance and costs of performance evaluations, including monitoring. All costs will be calculated on a present worth basis. Also, cost effectiveness will be addressed during the alternative analysis. An IRM's effectiveness based on relative cost comparisons in association with remediation objectives will be considered.

3.0 IRM SELECTION

The IRM will be selected by balancing the seven evaluation criteria. First, it will be confirmed that all alternatives provide adequate protection of human health and the environment and either attain or exceed all of their ARARs or provide grounds for invoking a waiver. As part of the balancing, the total cost of each alternative will be compared to the overall effectiveness each affords. The costs and the overall effectiveness of the alternatives will be examined to establish which alternatives offer results proportional to their costs. This demonstration might be accomplished by comparing the relative plume reduction to the cost for various restoration alternatives.

The preferred alternative will be selected by evaluating the relative long-term effectiveness; short-term effectiveness; reduction in toxicity, mobility, or volume; implementability; and cost of the alternative. The alternative that represents the best combination of those factors deemed most important to the site will be chosen. In performing the necessary balancing, the preference for remedies involving treatment as a principal element must be considered. The proposed plan will identify the alternative that appears to offer the best balance of the trade-offs among the alternatives in terms of the criteria and confirm the expectation that all statutory requirements would be satisfied.

4.0 IRM WORK PLAN

The IRMs proposed for the site will include a detailed work plan. The Work Plan will contain the following sections.

4.1 Statement of the Problem

This section in the IRM Work Plan will delineate the rationale for implementing an interim measure. For example, if an interim measure would be implemented to minimize source contamination and/or reduce plume migration, characteristics of the plume would be described. If an interim measure would be implemented to reduce exposure to the environment or population, the affected environmental media or population would be identified, and the concentrations of the contaminants of concern listed.

4.2 Background

The background section will include the sites location, a brief description of the site topography and geology, a brief site history, and the current status of remedial activities.

4.3 Objectives of the Remedy

This section of the IRM Work Plan will state how the implementation of an interim measure will respond to the problem. It will also describe the relationship between the interim measure and final remediation.

4.4 Alternatives Evaluated and Rationale for Selecting the Interim Measure

A limited number of alternatives will be evaluated on the basis of their ability to meet the objectives of the interim measure. The selected interim measure will be justified by evaluating the benefits of taking the action. In addition, the following points will be made:

- The interim measure will be necessary or appropriate to stabilize the site, control the source, prevent further degradation, prevent exposure, or otherwise significantly reduce threats to human health and the environment.
- The interim measure will not exacerbate the site problem.
- The interim measure will be consistent with the final remedy.
- A commitment will be made to evaluate additional information and select a final remedy within a specified time frame.

4.5 IRM Implementation

This section will include a complete, detailed descriptions of the methods and procedures to be implemented in performing the IRM. These descriptions will include materials used for the IRM,

location(s) of site activities, sampling regiments, analytical methods, and other relevant information significant to the construction and performance of the IRM.

4.6 Attached and/or Referenced Documents

The IRM Work Plan will include a site-specific Health and Safety Plan (HASP); Field Sampling and Analysis Plan (FSAP) which will include a Quality Assurance Project Plan (QAPP) and a Field Sampling Plan (FSP). These documents will in accordance with the Order on Consent (Index # B7-0516-97-05) and the RI/FS SOW. If appropriate, a reference to the RI/FS HASP, QAPP, FSAP and/or Citizens Participation Plan may suffice in lieu of attaching the aforementioned documents.

4.7 Schedule

A detailed schedule of activities will be included in the IRM Work Plan. The Work Plan schedule will also include a submittal date for a final engineering report. Shield will submit a draft IRM Work Plan to the NYSDEC within 60 days of the time that NYSDEC and Shield document the need for the IRM.

5.0 FINAL ENGINEERING REPORT

If the performance of the IRM encompasses construction activities, a final engineering report will be submitted to the NYSDEC. The report will include all data generated, other information gathered during the IRM program, "as-built" drawings, and an Operation and Maintenance Plan.