

**STATEMENT OF WORK  
FOR SUPPLEMENTAL REMEDIAL INVESTIGATIONS AND FEASIBILITY STUDIES  
FOR THE ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER  
SUPERFUND SITE IN KALAMAZOO AND ALLEGAN COUNTIES, MICHIGAN**

**I. PURPOSE**

This Statement of Work (“SOW”) sets forth the requirements for conducting Supplemental Remedial Investigations and Feasibility Studies (“SRI/FS”) at the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site (“Site”), including defined areas of Operable Unit 5 (“OU5”), with the exception of the following operable units (“OUs”): the Willow Boulevard/A-Site Landfill (“OU2”); the King Highway Landfill (“OU3”); the 12<sup>th</sup> Street Landfill (“OU4”); and the Plainwell Mill property (“OU7”). In addition, pursuant to the 2007 Site-Specific Amendment to the Enforcement Agreement for State-Enforcement-Lead Sites in Michigan under the Superfund Memorandum of Agreement, the Michigan Department of Environmental Quality (“MDEQ”) shall complete and submit a state-approved Remedial Investigation (“RI”) Report for the Allied Paper Landfill (“OU1”) to the United States Environmental Protection Agency (“U.S. EPA”) no later than May 1, 2007. If the MDEQ fails to submit a state-approved RI Report to U.S. EPA on or before May 1, 2007 the enforcement lead for the RI Report for OU1 will be assumed by U.S. EPA. If the U.S. EPA concludes that any additional response activities are necessary to complete the RI for OU1, and/or modifications are necessary to complete the RI Report for OU1, then Respondents shall perform such work under the provisions of this SOW.

The Site is located in the Allegan and Kalamazoo Counties in Michigan. This SOW addresses the following areas of the Site (hereinafter “Areas”):

- Morrow Dam to Plainwell Dam, which includes approximately 21.9 miles of the Kalamazoo River and a 3-mile stretch of Portage Creek from Cork Street to its confluence with the Kalamazoo River and any nearby areas where hazardous substances, pollutants, or contaminants have or may have come to be located;
- Plainwell Dam to Otsego City Dam, which includes approximately 1.7 miles of the Kalamazoo River and any nearby areas where hazardous substances, pollutants, or contaminants have or may have come to be located;
- Otsego City Dam to Otsego Dam, which includes approximately 3.4 miles of the Kalamazoo River and any nearby areas where hazardous substances, pollutants, or contaminants have or may have come to be located;
- Otsego Dam to Trowbridge Dam, which includes approximately 4.7 miles of the Kalamazoo River and any nearby areas where hazardous substances, pollutants, or contaminants have or may have come to be located;

- Trowbridge Dam to Allegan City Dam, which includes approximately 9.1 miles of the Kalamazoo River and any nearby areas where hazardous substances, pollutants, or contaminants have or may have come to be located;
- Allegan City Dam to Lake Allegan Dam, which includes approximately 9.8 miles of the Kalamazoo River and any nearby areas where hazardous substances, pollutants, or contaminants have or may have come to be located; and
- Lake Allegan Dam to Lake Michigan, which includes approximately 28 miles of the Kalamazoo River and any nearby areas where hazardous substances, pollutants, or contaminants have or may have come to be located.

In addition to the above, the former paper mill properties, identified below, shall be investigated to determine whether each mill property is a source of PCBs to the Site. If U.S. EPA determines that the mill property is not a source of PCBs to the Site, then U.S. EPA may decide that no additional investigation related to this Site under CERCLA is required. If U.S. EPA determines that the mill property is a source of PCBs to the Site, then the mill property is subject to requirements set forth in the AOC and this SOW:

- Former Allied Paper, Inc. Bryant Mill, to the extent not included in the RI for OU1;
- Former Allied Paper Company King Mill and the King Street Storm Sewer area;
- Former Allied Paper Company Monarch Mill;
- Georgia-Pacific Corporation Kalamazoo Mill and former Hawthorne Mill.

Each SRI report shall fully evaluate the nature and extent of hazardous substances, pollutants, or contaminants at and/or from each Area or OU. U.S. EPA-approved Areas may be combined for purposes of preparing SRI reports; for example, the Areas from Morrow Dam to Plainwell Dam are likely to be combined into one SRI report. Each SRI report shall also assess the risk which these hazardous substances, pollutants, or contaminants present for human health and the environment. Each SRI report shall provide sufficient data to develop and evaluate effective remedial alternatives. Each FS report shall evaluate alternatives for addressing the impact to human health and the environment from hazardous substances, pollutants, or contaminants at the Area or OU.

The Respondents shall prepare and complete each SRI and FS report in compliance with the SRI/FS Administrative Order on Consent (“AOC”); this SOW; the Comprehensive Environmental Response, Compensation and Liability Act (“CERCLA”), as amended; the National Oil and Hazardous Substances Pollution Contingency Plan (“NCP”) (40 C.F.R. Part 300), as amended; and all requirements and guidance for RI/FS studies and reports including, but not limited to, U.S. EPA Superfund *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (OSWER Directive # 9355.3-01, EPA/540/G-89/004, October 1988) (“RI/FS Guidance”), and any other guidance that the U.S. EPA uses in conducting

or submitting deliverables for a RI/FS. Exhibit B sets forth a partial list of guidance used by U.S. EPA for a RI/FS.

The Respondents shall furnish all personnel, materials, and services necessary for, or incidental to, performing the SRI/FS at each Area of the Site where Respondents perform SRI/FS activities, except as otherwise specified herein.

This SOW is intended to achieve expedited, cost-effective SRIs and FSs at Areas or OUs of the Site using iterative approaches, flexible planning, and Multi-Area documents to be subsequently tailored to each Area of the Site where Respondents perform SRI/FS activities, as appropriate. All phases of the SRIs and FSs will be a collaborative process between the Respondents and U.S. EPA, with an opportunity for the participation of the MDEQ. The parties will meet and confer on a regular basis and seek to anticipate and resolve key issues in advance of document development and completion.

## **II. DOCUMENT REVIEW**

The Respondents shall submit all documents or deliverables required as part of this SOW to the U.S. EPA, with a copy(ies) to the MDEQ, for review and approval in accordance with Section X of the AOC.

To support document development and review, the parties will use a series of meetings and calls. During scoping of the Multi-Area and Area-specific tasks and/or when preparing a draft document for submittal, the Respondents shall meet or confer with U.S. EPA, with an opportunity for MDEQ to participate, to discuss all project planning decisions, special concerns, and/or preliminary findings. After receipt of a draft document for review and approval in accordance with Section X of the AOC, U.S. EPA, at its sole discretion, may meet or confer with Respondents to give preliminary Agency feedback on the document.

## **III. SCOPE**

The Respondents shall complete the following tasks as part of the SRI/FS for each Area or OU:

Task 1: Project Scoping and SRI/FS Planning Documents

Task 2: Site Characterization

Task 3: Remedial Investigation Report (including human health and ecological risk assessment)

Task 4: Treatability Studies (if needed)

Task 5: Development and Screening of Alternatives (Technical Memoranda)

Task 6: Detailed Analysis of Alternatives (FS Report)

Task 7: Progress Reports

Details regarding the aforementioned seven tasks are specified below. It is expected that the Respondents will conduct each task (as appropriate) for each Area or OU of the Site where Respondents conduct SRI/FS activities. However, where a task and/or document may be applicable to more than one Area or OU, the Respondents may combine tasks to address multiple Areas with the approval of U.S. EPA.

## **TASK 1: PROJECT SCOPING AND SRI/FS PLANNING DOCUMENTS**

### **1.1 Site Background**

The Respondents shall gather and analyze the existing Site background information and shall conduct a Site visit to assist in planning the scope of the SRI/FS.

#### **1.1.1 Ongoing Work**

For each Area or OU of the Site with ongoing work, including ongoing monitoring and/or operation and maintenance of existing systems, the Respondents shall continue any such ongoing work unless modifications are approved in writing by U.S. EPA. Reporting of any such ongoing work will be in accordance with the Schedule in Exhibit A to this SOW.

##### **1.1.1.1 Long-term Monitoring Program**

In the event the MDEQ discontinues implementation of its long-term monitoring program at the Site, Respondents shall be responsible for implementing a long-term monitoring program that is similar to and meets the same objectives of the program currently being implemented by the MDEQ, subject to approval by U.S. EPA. U.S. EPA will meet with MDEQ and Respondents to discuss the details of a long-term monitoring program, including objectives of the program and U.S. EPA approved QA/QC and field sampling methods, prior to U.S. EPA approving the workplan for the long-term monitoring program.

#### **1.1.2 Collect and Analyze Existing Data**

Before planning the SRI/FS activities, the Respondents shall thoroughly compile and review all existing Site data. The use of existing Site data is subject to review by U.S. EPA to ensure data usability. For Areas or OUs of the Site where environmental clean-up work has not been conducted, but environmental investigation work has been performed, the Respondents may summarize and document the data collected, subject to U.S. EPA's determination of data usability, to support the Area-specific SRI planning. Historical data shall be submitted electronically according to U.S. EPA Region 5 specifications. Existing Site data includes presently available data relating to the varieties and quantities of hazardous substances, pollutants, and contaminants at the Site; past disposal practices; the results of previous sampling activities; and information about past response actions and residual contamination at the Site. Exhibit C is a partial listing of the existing data that will be reviewed by U.S. EPA to ensure data usability and considered by both U.S. EPA and Respondents.

#### **1.1.3 Conduct Site Visits**

The Respondents shall visit each Area of the Site where Respondents plan to conduct SRI/FS activities during the project scoping phase. The Respondents shall coordinate visits to all Areas of the Site with the U.S. EPA's Project Manager, and MDEQ shall be invited to attend.

## **1.2 Multi-Area SRI/FS Planning Documents**

In accordance with the Schedule in Exhibit A to this SOW, the Respondents shall submit draft Multi-Area SRI/FS Planning Documents to U.S. EPA, with copies to the MDEQ, for review and approval in accordance with Section X of the AOC. Prior to submittal of the documents, the Respondents shall meet or confer with U.S. EPA, with an invitation to MDEQ to participate, to discuss the scope and likely content of each of the documents. The Respondents shall prepare the Multi-Area SRI/FS Planning Documents to be consistent with applicable portions of the RI/FS Guidance.

The Multi-Area documents shall set forth general approaches and concepts with the intent of streamlining preparation of work plans and minimizing review times for future deliverables. An additional intention is to promote a consistent approach to investigate and assess actual or potential contaminant releases between Areas and/or OUs of the Site, as appropriate. An Area-Specific Work Plan shall be prepared for each Area based on area-specific conditions, but incorporating the Multi-Area documents by reference, modified as appropriate.

### **1.2.1 Multi-Area SRI Documents**

#### **1.2.1.1 Multi-Area Field Sampling Plan**

The Respondents shall prepare the Multi-Area Field Sampling Plan (“FSP”) portion of the SRI Planning Documents to ensure that sample collection and analytical activities are conducted in accordance with technically acceptable protocols and that the data meet Data Quality Objectives (“DQOs”) as established in the Multi-Area Quality Assurance Project Plan (“QAPP”) and FSP. All sampling and analyses performed shall conform to U.S. EPA direction, approval, and guidance regarding sampling, quality assurance/quality control (“QA/QC”), data validation, and chain of custody procedures. This document shall provide standard operating procedures (“SOPs”) for sampling activities. Area-Specific Work Plans will include supplemental SOPs if necessary, based on site-specific conditions.

To the extent appropriate, the Multi-Area FSP will incorporate elements of dynamic field activities. Each Area-Specific Work Plan shall incorporate the elements of dynamic field activities set forth in the Multi-Area FSP, to the extent appropriate, based on area-specific conditions. Dynamic field activities will be used to streamline Area activities with real-time data and real-time decisions in accordance with area-specific QA/QC requirements. This approach, sometimes called the Triad approach, involves systematic planning, a dynamic work plan strategy, and real-time field measurements. Dynamic field activities will be conducted consistent with OSWER No. 9200.1-40, *Using Dynamic Field Activities for On-Site Decision Making: A Guide for Project Managers* (EPA/540/R03/002, May 2003).

#### **1.2.1.2 Multi-Area Quality Assurance Project Plan**

The Respondents shall prepare a Multi-Area QAPP that covers sample analysis and data handling for samples collected during the SRI, based on the AOC and guidance provided by U.S. EPA. The Respondents shall prepare the QAPP in accordance with the Uniform Federal Policy for Implementing Environmental Quality Systems (UFP-QS), the Uniform Federal Policy for

Quality Assurance Project Plans (UFP-QAPP) Manual, the UFP-QAPP Workbook, and the UFP-QAPP Compendium. The U.S. EPA Office of Solid Waste and Emergency Response (OSWER) approved the UFP-QS (Final, Version 2, March 2005). The QAPP may include Field-Based Analytical Methods, if appropriate and scientifically defensible.

The Respondents shall demonstrate, in advance to U.S. EPA's satisfaction, that each laboratory it may use is qualified to conduct the proposed work. This includes use of methods and analytical protocols for the contaminants of concern (COCs) in the media sampled within detection and quantification limits consistent with both QA/QC procedures and DQOs approved in the QAPP. Area-specific DQOs for each Area will be detailed in the Area-Specific Work Plan. The laboratory must have and follow an approved QA program. If a laboratory not in the Contract Laboratory Program ("CLP") is selected, methods consistent with CLP methods that would be used at the Areas for the purposes proposed and QA/QC procedures approved by U.S. EPA shall be used. The Respondents shall only use laboratories which have a documented QA program which complies with ANSI/ASQC E-4 1994, *Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs*, (American National Standard, January 5, 1995) and *EPA Requirements for Quality Management Plans (QA/R-2)* (EPA/240/B-01/002, March 2001), or equivalent documentation as determined by U.S. EPA.

Upon request by U.S. EPA, the Respondents shall have its laboratory analyze samples submitted by U.S. EPA for QA monitoring. The Respondents shall provide U.S. EPA with the QA/QC procedures followed by all sampling teams and laboratories performing data collection and/or analysis. The Respondents shall also ensure the provision of analytical tracking information consistent with OSWER Directive No. 9240.0-2B, *Extending the Tracking of Analytical Services to PRP-Lead Superfund Sites* (July 6, 1992).

The Respondents shall participate in a pre-QAPP meeting or conference call with U.S. EPA. The purpose of this meeting or conference call is to discuss QAPP requirements and obtain any clarification needed to prepare the Multi-Site QAPP.

#### **1.2.1.3 Baseline Ecological Risk Assessment Peer Review**

The Respondents, U.S. EPA, MDEQ, and the Natural Resource Trustees, including the Michigan Department of Natural Resources ("MDNR"), the Michigan Attorney General, the United States Department of the Interior ("DOI"), and the National Oceanic and Atmospheric Administration ("NOAA"), shall develop a mutually agreeable process for conducting a peer review of the April 2003 Baseline Ecological Risk Assessment Report and the Respondents' ecological studies that have been performed to date with respect to floodplain soils.

#### **1.2.1.4 Generalized Conceptual Area Model**

The Respondents shall prepare a generalized Conceptual Site Model ("CSM") that is applicable to each Area of the Site where Respondents conduct SRI/FS activities. The generalized CSM shall show potential contaminant sources, fate and transport routes, and exposure pathways for the Area. Area-specific information will be used to refine the generalized CSM to tailor it for

each Area. Evaluation of each area-specific CSM will be done in an iterative fashion, starting with the SRI Planning Documents and continuing through completion of the FS.

#### **1.2.1.5 Risk Assessment Framework**

The Respondents shall prepare a Risk Assessment (“RA”) Framework which will be the basis for performing risk assessments at each Area. The RA Framework will be based on the generalized CSM. The RA Framework will include provisions for performing the ecological and human health risk assessments. At a minimum, the RA Framework shall include:

- A discussion of the role of the existing baseline Risk Assessments
- Likely COCs
- Potential human health exposure populations and pathways
- Potential intake assumptions for potentially exposed populations
- Target species for ecological risk
- Potential ecological exposure pathways

To the extent possible, the RA Framework will also discuss the role of screening values, benchmarks, and guidelines; and may discuss a process for establishing contaminant levels or ranges that are protective of human health and the environment.

#### **1.2.1.6 Multi-Area Health and Safety Plan**

The Respondents shall prepare a Multi-Area Health and Safety Plan (“HSP”). Each Area-Specific Work Plan shall be based on the Multi-Area HSP, modified as necessary to reflect area-specific conditions. The HSP shall conform to the Respondents health and safety program and comply with the Occupational Safety and Health Administration (“OSHA”) regulations and protocols outlined in 29 C.F.R. Part 1910. The HSP shall be prepared in accordance with U.S. EPA’s *Standard Operating Safety Guides* (PUB 9285.1-03, PB 92-963414, June 1992). The HSP shall include the 11 elements described in the RI/FS Guidance, such as a health and safety risk analysis, a description of monitoring and personal protective equipment, medical monitoring, and Area control. U.S. EPA does not “approve” the Respondents HSP, but rather U.S. EPA reviews it to ensure that all the necessary elements are included, and that the plan provides for the protection of human health and the environment, and after that review provides comments as may be necessary and appropriate. The HSP must, at a minimum, follow the U.S. EPA’s guidance document *Standard Operating Safety Guides* (Publication 9285.1-03, PB92-963414, June 1992).

### **1.2.2 Multi-Area FS Documents**

#### **1.2.2.1 Preliminary Remedial Technology Screening**

The Respondents shall develop general response actions and a preliminary list of remedial technologies to address contaminated soil, sediments, and groundwater at each Area that shall consist of, but is not limited to, treatment technologies, removal and off-site treatment/disposal, removal and on-site disposal, and in-place containment. This initial screening may include

technologies for management of possible residuals or by-products (e.g., water or air). An initial screening of remedial technologies will be conducted in accordance with U.S. EPA Guidance (see Exhibit B), including *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites*, December 2005 (OSWER #9355.0-85, EPA/540/R05/012).

#### **1.2.2.2 Preliminary List of Possible Applicable or Relevant and Appropriate Requirements**

The Respondents will propose preliminary list of possible state and federal applicable or relevant and appropriate requirements (“ARARs”), including chemical-specific, location-specific, and action-specific, as appropriate, which may apply to the circumstances and array of potential remedies at each Area. This Preliminary ARARs document will be further refined in area-specific alternatives screening and FS documents.

#### **1.2.2.3 Preliminary Permitting/Equivalency Requirements**

The Respondents will provide a preliminary analysis of likely permit or permit equivalency requirements. The preliminary analysis will focus on substantive requirements and will discuss potential waivers, as appropriate.

### **1.3 Area-Specific Work Plans**

Area-Specific Work Plans shall be prepared to accomplish the following:

- A SRI that fully determines the nature and extent of the release or threatened release of hazardous substances, pollutants, or contaminants at and from the Area. In performing this investigation, the Respondents shall gather sufficient data, samples, and other information to fully characterize the nature and extent of the contamination at the Area, to support the human health and ecological risk assessments, and to provide sufficient data for the identification and evaluation of remedial alternatives for each Area.
- A FS that identifies and evaluates alternatives for remedial action to protect human health and the environment by preventing, eliminating, controlling or mitigating the release or threatened release of hazardous substances, pollutants, or contaminants at and from the Area.

The Area-Specific Work Plan shall incorporate by reference the Multi-Area SRI Documents, modified as appropriate for Area-specific concerns, and include a detailed description of the tasks the Respondents shall perform, the information needed for each task, a detailed description of the information the Respondents shall produce during and at the conclusion of each task, and a description of the work products that the Respondents shall submit to U.S. EPA and MDEQ including the deliverables set forth in this SOW; a schedule for each of the required activities; and a project management plan including a data management plan (e.g., requirements for project management systems and software, minimum data requirements, requirements for submittal of electronic data, data format and backup data management, unless otherwise covered by the Multi-Area RI documents).

The Area-Specific Work Plan shall include any appropriate Area-specific modifications to the Multi-Area SRI Documents and include: DQOs; number and types of sampling locations; analytical, physical, and/or biological tests; an Area-specific CSM; any Area-specific risk assessment considerations; preliminary objectives for the remedial action at the Area; a description of the Area management strategy developed by the Respondents and U.S. EPA during scoping; and data needs for fully characterizing the nature and extent of the contamination at the Area, evaluating risks and developing and evaluating remedial alternatives. The Area-Specific Work Plan shall reflect coordination with treatability study requirements, if any. In addition, the Area-Specific Work Plan shall include the following:

### **1.3.1 Area Background**

The Area Background section shall include a brief summary of the Area location, description, physiography, hydrology, geology, demographics, ecological, cultural and natural resource features; Area history; description of previous investigations and responses conducted at the Area by local, state, federal, or private parties; and Area data evaluations and project planning completed during the scoping process.

The Area Background section shall discuss areas of waste handling and disposal activities, the locations of existing groundwater monitoring wells, if any, and previous surface water, sediment, soil, groundwater, and air sampling locations. The Area Background section shall include a summary description of available data and identify Areas where hazardous substances, pollutants, or contaminants were detected and the detected levels. The Area Background section shall include tables and/or figures displaying the minimum and maximum levels of detected hazardous substances, pollutants, or contaminants in the Area and media. The Area Background section may refer to the Completion Report, as appropriate.

### **1.3.2 Data Gap Description/Data Acquisition**

As part of the Area-Specific Work Plan, the Respondents shall analyze the currently available data, including all data previously collected by U.S. EPA and MDEQ, and the data collected by Respondents pursuant to its 1991 agreement with the State of Michigan to conduct RI work. The Respondents shall identify those areas of the Area and nearby areas that require additional data and evaluation in order to define the extent of hazardous substances, pollutants, or contaminants. The Area-Specific Work Plan shall include a description of the number, types, and locations of samples to be collected. As needed, the Area-Specific Work Plan shall include an environmental program to accomplish the following:

- Area Reconnaissance. The Respondents shall conduct, as appropriate:
  - Area surveys including property, boundary, utility rights-of-way, and topographic information
  - Land survey
  - Topographic mapping
  - Field screening

- Geological Investigations (Soils and Sediments). The Respondents shall conduct geological investigations to determine the extent of hazardous substances, pollutants, or contaminants (including waste materials) in surface soils, subsurface soils, and sediments at the Area. As part of this geological investigation, Respondents shall, as appropriate:
  - Collect surface soil samples
  - Collect subsurface soil samples
  - Perform soil boring and permeability sampling
  - Collect sediment samples
  - Survey soil gases
  - Test pit
  - Identify real-world horizontal, vertical, and elevation coordinates for all samples and Area features in accordance with U.S. EPA Region 5 electronic data requirements
  
- Air Investigations. The Respondents shall conduct air investigations to determine the extent of atmospheric hazardous substances, pollutants, or contaminants at and from the Area, which shall include, as appropriate:
  - Collect air samples
  - Establish air monitoring stations
  
- Hydrogeological Investigations (Groundwater). The Respondents shall conduct hydrogeological investigations of groundwater to determine the horizontal and vertical distribution of hazardous substances, pollutants, or contaminants in the groundwater and the extent, fate, and transport of any groundwater plumes containing hazardous substances, pollutants, or contaminants. The hydrogeological investigation shall include, as appropriate:
  - Install well systems
  - Collect samples from upgradient, downgradient, private, and municipal wells
  - Collect samples during drilling (e.g., HydroPunch or equivalent)
  - Perform hydraulic tests (such as pump tests, slug tests, and grain size analyses)
  - Measure groundwater elevations and determine horizontal and vertical sample locations in accordance with U.S. EPA Region 5 electronic data requirements
  - Modeling
  - Determine the direction of regional and local groundwater flow
  - Identify the local uses of groundwater including the number, location, depth, and use of nearby private and municipal wells
  
- Hydrogeological Investigations (Surface Water). The Respondents shall conduct hydrogeological investigations to determine the nature and extent of contamination of surface water at or from the Area. The hydrogeological investigation shall include, as appropriate:
  - Collect samples
  - Measure surface water elevation and depth

- Evaluate flow and hydrodynamics
- Geophysical Investigation. The Respondents shall conduct geophysical investigations to delineate waste depths, thicknesses, and volume; the elevations of the underlying natural soil layer and the extent of cover over fill areas including the following, as appropriate:
  - Magnetometer
  - Electromagnetic
  - Ground-penetrating Radar
  - Seismic refraction
  - Resistivity
  - Area meteorology
  - Cone penetrometer survey
  - Remote sensor survey
  - Radiological investigation
  - Test pits, trenches and soil borings
- Conduct Ecological Investigation. The Respondent(s) shall conduct ecological investigations to assess the impact to aquatic and terrestrial ecosystems from the disposal, release, and migration of hazardous substances, pollutants, or contaminants at the Site including:
  - Wetland and Habitat Delineation
  - Wildlife Observations
  - Community Characterization
  - Endangered Species Identification
  - Biota Sampling and Population Studies
- Dispose of Investigation-Derived Waste. The Respondents shall characterize and dispose of investigation-derived wastes in accordance with local, state, and federal regulations as specified in the FSP (see the Fact Sheet, *Guide to Management of Investigation-Derived Wastes*, 9345.3-03FS (January 1992)).
- Evaluate and Document the Need for Treatability Studies. If the Respondents or U.S. EPA identify remedial actions that involve treatment, the Respondents shall include treatability studies as outlined in Task 5 of this SOW unless the Respondents satisfactorily demonstrate to U.S. EPA that such studies are not needed. When treatability studies are needed, the Respondents shall plan initial treatability testing activities (such as research and study design) to occur concurrently with Area characterization activities.

**TASK 2: SITE CHARACTERIZATION**

**2.1 Investigate and Define Area Physical and Biological Characteristics**

The Respondents shall implement the Area-Specific Work Plan and collect data on the physical and biological characteristics of the Area and its surrounding areas including, as needed, the physical physiography, geology, hydrology, and specific physical characteristics. This

information will be ascertained through a combination of acceptable existing data, and physical measurements, observations, and sampling efforts and will be utilized to define potential transport pathways and human ecological receptor populations. In defining the Area's physical characteristics, the Respondents will also obtain sufficient engineering data for the projection of contaminant fate and transport, and development and screening of remedial action alternatives, including information to assess treatment technologies.

The Respondents shall provide the U.S. EPA RPM or the entity designated as the Project Coordinator in the AOC with a paper copy and an electronic copy (according to U.S. EPA Region 5 format specification) of laboratory data within the monthly progress reports and in no event later than 90 days after samples are shipped for analysis. In addition, the monthly progress reports will summarize field activities (including drilling locations, depths and field notes if requested by the U.S. EPA RPM), problems encountered, solutions to problems, and upcoming field activities.

Upon request by U.S. EPA, the Respondents shall allow U.S. EPA or its authorized representatives to take split and/or duplicate samples of any samples collected by the Respondents or their contractors or agents. The Respondents shall notify U.S. EPA and MDEQ not less than fifteen (15) business days in advance of any sample collection activity. U.S. EPA shall have the right to take any additional samples that it deems necessary.

## **2.2 Define Sources of Contamination**

The Respondents shall locate each source of contamination. For each location, Respondents shall determine the aerial extent and depth of contamination by sampling in accordance with the approved plans. Respondents shall determine the physical characteristics and chemical constituents and their concentrations for all known and discovered sources of contamination. The Respondents shall conduct sufficient sampling to define the boundaries of the contaminant sources to the level established in the QAPP and DQOs. Defining the source of contamination will include analyzing the potential for contaminant release (e.g., long-term leaching from soil), contaminant mobility and persistence, and characteristics important for evaluating remedial actions, including information to assess treatment technologies.

### **2.2.1 Source Investigation at Former Paper Mills**

The Respondents shall investigate each former paper mill property ("Mill") identified under Task 1 to this SOW, to determine whether the Mill is a source, or a potential source, of PCBs to the Site. As part of this investigation, the Respondents shall identify and characterize potential source areas at each Mill and determine the presence of a complete pathway for PCB migration from the source area to the Site, in accordance with the approach outlined below.

#### **2.2.1.1 Identification and Characterization of Source Areas**

The Respondents shall identify and characterize potential PCB source area(s) at the Mill. Respondents may propose use of existing data, if adequate, as determined by U.S. EPA, to sufficiently characterize media (surface and/or subsurface soil, surface water, groundwater, etc.) at the potential source area. If U.S. EPA determines the existing data is inadequate to

sufficiently characterize media at the potential source area, then Respondents shall propose the collection of supplemental samples, as approved by U.S. EPA. The Respondents shall then compare the concentrations of PCBs in samples collected to screening criteria established by U.S. EPA. If PCB concentrations do not exceed screening criteria, then the potential source area will be eliminated from further evaluation. If PCB concentrations exceed screening criteria, then the source area will be further evaluated under Section 2.2.1.2 to determine the presence of a complete pathway for PCB migration from the source area to the Site.

#### **2.2.1.2 Evaluation of Presence of Complete Pathways**

The Respondents shall evaluate the presence of a complete pathway for PCB migration from the source area to the Site. The pathways to be evaluated shall include:

- Surface water and sediment runoff;
- Surface and/or subsurface soil leaching into groundwater;
- Direct discharge through outfalls, storm sewers, etc.;
- Erosion of PCB-contaminated residual, soil, or sediment into Site sediments; and
- Groundwater discharge to surface water.

#### **2.2.1.3 Determination of Mill as an Area**

If a Mill contains a source area or potential source area with a complete pathway for PCB migration to the Site, then the Mill will be identified as an Area of the Site and Respondents will be responsible for investigating the Area in accordance with the SRI/FS AOC and this SOW to assess the extent to which source areas or potential source areas are contributing PCBs to the Site. If a Mill contains source areas or potential source areas without a complete pathway for PCB migration to the Site, then U.S. EPA may decide that the Mill will be eliminated from further CERCLA investigation as an Area of this Site.

### **2.3 Describe the Nature and Extent/Fate and Transport of Contamination**

The Respondents shall gather information to describe the nature and extent of contamination as a step during the field investigation. To describe the nature and extent of contamination, the Respondents will utilize the information on Area physical and biological characteristics and sources of contamination to give a preliminary estimate of the contaminants that may have migrated. The Respondents will then implement an iterative monitoring program and any study program identified in the work plan or sampling plan such that by using analytical techniques sufficient to detect and quantify the concentration of contaminants, the migration of contaminants through the various media at the Area can be determined. In addition, the Respondents shall gather data for calculations of contaminant fate and transport. This process is continued until the Area and depth of contamination are characterized as established in the QAPP and DQOs.

### **2.3.1 Evaluate Area Characteristics**

The Respondents shall analyze and evaluate the data to describe: (1) Area physical and biological characteristics; (2) contaminant source characteristics; (3) nature and extent of contamination; and (4) contaminant fate and transport. Results of the Area physical characteristics, source characteristics, and extent of contamination analyses are utilized in the analysis of contaminant fate and transport. The Respondents shall evaluate the actual and potential magnitude of releases from the sources, and horizontal and vertical spread of contamination as well as mobility and persistence of contaminants. Where modeling is appropriate, such models shall be identified to U.S. EPA in a technical memorandum prior to their use. Upon request, all model data and programming, including any proprietary programs, shall be made available to U.S. EPA together with a sensitivity analysis and discussion of uncertainty and limitations of the model. The SRI data shall be presented electronically according to U.S. EPA Region 5 format requirements. Analysis of data collected for Area characterization will meet the DQOs developed in the QAPP and stated in the FSP (or revised during the SRI).

### **2.3.2 Area-Specific Baseline Human Health Risk Assessment**

As an attachment to the SRI Report, the Respondents shall submit an Area-Specific Baseline Human Health Risk Assessment Report to U.S. EPA, with a copy to the MDEQ, for review and approval pursuant to Section X of the AOC. Respondents will utilize the U.S. EPA-approved risk assessment in accordance with the Risk Assessment Framework developed under Section 1.2.1.5. The Respondents shall conduct the baseline risk assessment to determine whether Area contaminants pose a current or potential risk to human health and the environment in the absence of any remedial action. The Area-Specific Baseline Risk Assessment will build on the RA Framework and major components will include contaminant identification, exposure assessment, toxicity assessment, and human health and ecological risk characterization.

Respondents shall conduct a baseline human health risk assessment that focuses on actual and potential risks to persons coming into contact with on-site hazardous substances, pollutants, or contaminants, as well as risks to the nearby residential, recreational, and industrial worker populations from exposure to hazardous substances, pollutants, or contaminants in groundwater, soils, sediments, surface water, air, and ingestion of contaminated organisms in nearby, impacted ecosystems. The human health risk assessment shall define central tendency and reasonable maximum estimates of exposure for current land use conditions and reasonable future land use conditions. The human health risk assessment shall use data from the Area and nearby areas to identify the COCs, provide an estimate of how and to what extent human receptors might be exposed to these COCs, and provide an assessment of the health effects associated with these COCs. The human health risk assessment shall project the potential risk of health problems occurring if no cleanup action is taken at the Area and/or nearby areas, and establish target action levels for COCs (carcinogenic and non-carcinogenic).

Respondents shall conduct the human health risk assessment in accordance with U.S. EPA guidance including, at a minimum: *Risk Assessment Guidance for Superfund ("RAGS"), Volume I - Human Health Evaluation Manual (Part A)*, Interim Final (EPA/540/1-89/002), OSWER

Directive 9285.7-01A, December 1, 1989; and *Risk Assessment Guidance for Superfund (“RAGS”), Volume I - Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments)*, Interim (EPA /540/R-97/033), OSWER 9285.7-01D, January 1998; or subsequently issued guidance.

As appropriate, Respondents shall also conduct the human health risk assessment in accordance with the following additional guidance found in the following OSWER directives:

- 1) *Clarification to the 1994 Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, OSWER Directive 9200.4-27, EPA/540/F-98/030, August 1998;
- 2) *Implementation of the Risk Assessment Guidance for Superfund (“RAGS”) Volume I - Human Health Evaluation Manual, (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments)*, Interim, OSWER Directive 9285.7-01D-1, December 17, 1997;
- 3) *Soil Screening Guidance: Technical Background Document*, OSWER Directive 9355.4-17A, EPA/540/R-95/128, May 1, 1996, and *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites*, OSWER Directive 9355.4, March 24, 2001;
- 4) *Soil Screening Guidance: User’s Guide*, Publication 9355.4-23, EPA/540/R-96/018, July 1996;
- 5) *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, OSWER Directive 9355.4-12, July 14, 1994;
- 6) *Guidance Manual for the Integrated Exposure Uptake Biokinetic (“IEUBK”) Model for Lead in Children*, Publication 9285.7-15-1, February 1994, and associated, clarifying Short Sheets on IEUBK Model inputs including, but not limited to, OSWER 9285.7-32 through 34, as listed on the OSWER lead internet site at [www.epa.gov/superfund/programs/lead/products.htm](http://www.epa.gov/superfund/programs/lead/products.htm);
- 7) *Integrated Exposure Uptake Biokinetic (“IEUBK”) Model for Lead in Children*, Version 0.99D NTIS PB94-501517, 1994, or *Integrated Exposure Uptake Biokinetic (“IEUBK”) Model for Lead in Children*, Windows© Version 2001;
- 8) *Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual: (Part B, Development of Risk-based Preliminary Remediation Goals)*, Interim, OSWER Directive 9285.7-01B, December 1991;
- 9) *Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors*, OSWER Directive 9285.6-03, March 25, 1991; and
- 10) *Exposure Factors Handbook*, Volumes I, II, and III, August 1997 (EPA/600/P-95/002Fa, b, c).

Respondents shall also comply with the guidance on assessing human health risk associated with adult exposures to lead in soil as found in the following document: *Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil*, December 1996. This document may be downloaded from the Internet at the following address: [www.epa.gov/superfund/programs/lead/products.htm](http://www.epa.gov/superfund/programs/lead/products.htm).

Additional applicable or relevant guidance may be used for the human health risk assessment only if approved by U.S. EPA.

Respondents shall prepare the Human Health Risk Assessment Report according to the guidelines outlined below:

- Hazard Identification (sources). The Respondents shall review available information on the hazardous substances present at the Area and identify the major COCs.
- Dose-Response Assessment. The Respondents shall select COCs based on their intrinsic toxicological properties.
- Conceptual Exposure/Pathway Analysis. The Respondents shall identify and analyze critical exposure pathways (e.g., drinking water). The proximity of contaminants to exposure pathways and their potential to migrate into critical exposure pathways shall be assessed.
- Characterization of Area and Potential Receptors. The Respondents shall identify and characterize human populations in the exposure pathways.
- Exposure Assessment. The exposure assessment will identify the magnitude of actual or potential human exposures, the frequency and duration of these exposures, and the routes by which receptors are exposed. The exposure assessment shall include an evaluation of the likelihood of such exposures occurring and shall provide the basis for the development of acceptable exposure levels. In developing the exposure assessment, the Respondents shall develop reasonable maximum estimates of exposure for both current land use conditions and potential land use conditions at the Area.
- Risk Characterization. During risk characterization, Respondents shall compare chemical-specific toxicity information, combined with quantitative and qualitative information from the exposure assessment, to measured levels of contaminant exposure levels and the levels predicted through environmental fate and transport modeling. These comparisons shall determine whether concentrations of contaminants at or near the Area are affecting or could potentially affect human health.
- Identification of Limitations/Uncertainties. The Respondents shall identify critical assumptions (e.g., background concentrations and conditions) and uncertainties in the report.

- CSM. Based on contaminant identification, exposure assessment, toxicity assessment, and risk characterization, the Respondents shall reevaluate the preliminary CSM.

### **2.3.3 Area-Specific Baseline Ecological Risk Assessment**

As an attachment to the SRI Report, the Respondents shall submit an Area-Specific Baseline Ecological Risk Assessment Report to U.S. EPA, with a copy to the MDEQ, for review and approval by U.S. EPA. In the Ecological Risk Assessment Report, the Respondents shall evaluate and assess the risk to the environment posed by Area contaminants. Respondents shall incorporate, if available, the results of the peer-reviewed Baseline Ecological Risk Assessment in each Area-Specific Baseline Ecological Risk Assessment Report. For the Plainwell Impoundment to Plainwell Dam Area of OU5, a residual risk analysis will proceed after implementation of a Time-Critical Removal Action that will be conducted pursuant to a separate AOC without awaiting the results of this process, unless the peer review process has been completed by the time residual risk analysis has commenced, in which case, the results of the peer review will be considered in that residual risk analysis. Respondents shall prepare the Ecological Risk Assessment Report in accordance with U.S. EPA guidance including, at a minimum: *Ecological Risk Assessment Guidance for Superfund, Process for Designing and Conducting Ecological Risk Assessments*, (EPA/540/R-97/006, June 1997), OSWER Directive 9285.7-25, and as appropriate, shall follow the guidelines outlined below:

- Hazard Identification (sources). The Respondents shall review available information on the hazardous substances present at the Area and identify the major COCs.
- Dose-Response Assessment. The Respondents must select COCs based on their intrinsic toxicological properties.
- Conceptual Exposure/Pathway Analysis. Critical exposure pathways (e.g., surface water) shall be identified and analyzed. The proximity of contaminants to exposure pathways and their potential to migrate into critical exposure pathways shall be assessed.
- Characterization of Site and Potential Receptors. The Respondents shall identify and characterize environmental exposure pathways.
- Selection of Chemicals, Indicator Species, and End Points. In preparing the assessment, the Respondents will select representative chemicals, indicator species (species that are especially sensitive to environmental contaminants), and end points on which to concentrate.
- Exposure Assessment. In the exposure assessment, Respondents must identify the magnitude of actual or environmental exposures, the frequency and duration of these exposures, and the routes by which receptors are exposed. The exposure assessment shall include an evaluation of the likelihood of such exposures occurring and shall provide the basis for the development of acceptable exposure levels. In developing the exposure assessment, the Respondents shall develop reasonable maximum estimates of exposure for both current land use conditions and potential land use conditions at the Area.

- Toxicity Assessment/Ecological Effects Assessment. The toxicity and ecological effects assessment will address the types of adverse environmental effects associated with chemical exposures, the relationships between magnitude of exposures and adverse effects, and the related uncertainties for contaminant toxicity (e.g., weight of evidence for a chemical's carcinogenicity).
- Risk Characterization. During risk characterization, Respondents shall compare chemical-specific toxicity information, combined with quantitative and qualitative information from the exposure assessment, to measured levels of contaminant exposure levels and the levels predicted through environmental fate and transport modeling. These comparisons shall determine whether concentrations of contaminants at or near the Area are affecting or could potentially affect the environment.
- Identification of Limitations/Uncertainties. The Respondents shall identify critical assumptions (e.g., background concentrations and conditions) and uncertainties in the report.
- CSM. Based on information developed for the Baseline Ecological Risk Assessment, the Respondents shall reevaluate the preliminary CSM.

#### **2.4 Current and Future Land Uses and Reuse Assessment**

As an attachment to the SRI Report, Respondents shall submit a Memorandum to U.S. EPA for review and approval that evaluates the current and reasonably anticipated future land uses at the Area. The Memorandum shall identify: 1) past uses at the Area including title and lien information; 2) current uses of the Area and neighboring areas; 3) the owner's plans for the Area following cleanup and any prospective purchasers; 4) applicable zoning laws and ordinance; 5) current zoning; 6) applicable local area land use plans, master plans and how they affect the Area; 7) existing local restrictions on property; 8) property boundaries; 9) groundwater use determinations, wellhead protection areas, recharge areas, and other areas identified in the state's Comprehensive Ground Water Protection Program; 10) flood plains, wetland, or endangered or threatened species; and 11) utility rights-of-way.

If U.S. EPA, in its sole discretion, determines that a Reuse Assessment is necessary, Respondents will perform the Reuse Assessment in accordance with U.S. EPA guidance including, but not limited to: *Reuse Assessments: A Tool To Implement The Superfund Land Use Directive*, OSWER 9355.7-06P, June 4, 2001, upon request of U.S. EPA. The Reuse Assessment should provide sufficient information to develop realistic assumptions of the reasonably anticipated future uses for the Area.

#### **TASK 3: SRI REPORT**

In accordance with the Schedule in the U.S. EPA-approved final SRI/FS Planning Documents, the Respondents shall submit to U.S. EPA, with a copy to the MDEQ, for review and approval pursuant to Section X of the AOC, a SRI Report addressing the Area or OU and nearby areas. The SRI Report shall be consistent with the AOC and this SOW. The SRI Report shall

accurately establish the Area characteristics such as media contaminated, extent of contamination, and the physical boundaries of the contamination. Pursuant to this objective, the Respondents shall obtain only the essential amount of detailed data necessary to determine the key contaminants' movement and extent of contamination. The key contaminants must be selected based on persistence and mobility in the environment and the degree of hazard. The key contaminants identified in the SRI shall be evaluated for receptor exposure and an estimate of the key contaminants level reaching human or environmental receptors must be made. The Respondents shall use existing standards and guidelines, such as drinking-water standards, water-quality criteria, and other criteria, accepted by the U.S. EPA as appropriate for the situation may be used to evaluate effects on human receptors that may be exposed to the key contaminant(s) above appropriate standards or guidelines. Respondents shall complete the SRI Report in accordance with the following requirements:

The Respondents shall submit a SRI Report that builds on the Multi-Area SRI Documents and includes Area-specific findings, and the following:

- Executive Summary
- Area Background. The Respondents shall assemble and review available facts about the regional conditions and conditions specific to the Area under investigation.
- Investigation (as applicable)
  - Area Reconnaissance
  - Field Investigation & Technical Approach
  - Chemical Analysis & Analytical Methods
  - Field Methodologies
  - Biological
  - Surface Water
  - Sediment
  - Soil Boring
  - Soil Sampling
  - Monitoring Well Installation
  - Groundwater Sampling
  - Hydrogeological Assessment
  - Air Sampling
  - Waste Investigation
  - Geophysical Investigation
- Area Characteristics (as applicable)
  - Geology
  - Hydrogeology
  - Meteorology
  - Demographics and Land Use
  - Ecological Assessment

- Hydrodynamics
- Nature and Extent of Contamination
  - Contaminant Sources
  - Contaminant Distribution and Trends
- Fate and Transport
  - Contaminant Characteristics
  - Transport Processes
  - Contaminant Migration Trends
- Human Health Risk Assessment
  - Hazard Identification (sources)
  - Dose-Response Assessment
  - Prepare Conceptual Exposure/Pathway Analysis
  - Characterization of Area and Potential Receptors
  - Exposure Assessment
  - Risk Characterization
  - Identification of Limitations/Uncertainties
  - Site Conceptual Model
- Ecological Risk Assessment
  - Hazard Identification (sources)
  - Dose-Response Assessment
  - Prepare Conceptual Exposure/Pathway Analysis
  - Characterization of Area and Potential Receptors
  - Selection of Chemicals, Indicator Species, and End Points
  - Exposure Assessment
  - Toxicity Assessment/Ecological Effects Assessment
  - Risk Characterization
  - Identification of Limitations/Uncertainties
  - Site Conceptual Model
- Summary and Conclusions

**TASK 4: TREATABILITY STUDIES**

If U.S. EPA or the Respondents determine that treatability testing is necessary, the Respondents shall conduct treatability studies as described in this Task 4 of this SOW. In addition, if applicable, the Respondents shall use the testing results and operating conditions in the detailed design of the selected remedial technology. The Respondents shall perform the following activities.

#### **4.1 Determine Candidate Technologies and the Need for Testing**

The Respondents shall submit a Candidate Technologies and Testing Needs Technical Memorandum to U.S. EPA, with a copy to MDEQ, for review and approval by U.S. EPA that identifies candidate technologies for a treatability studies program no later than at the time of submittal of the draft SRI/FS Planning Documents. The list of candidate technologies shall cover the range of technologies required for alternatives analysis. The Respondents shall determine and refine the specific data requirements for the testing program during Area characterization and the development and screening of remedial alternatives.

##### **4.1.1 Conduct Literature Survey and Determine the Need for Treatability Testing**

Within the Candidate Technologies and Testing Needs Technical Memorandum, the Respondents shall conduct a literature survey to gather information on the performance, relative costs, applicability, removal efficiencies, operation and maintenance (“O&M”) requirements, and implementability of candidate technologies. Respondents shall conduct treatability studies except where Respondents can demonstrate to U.S. EPA’s satisfaction that they are not needed.

#### **4.2 Treatability Testing and Deliverables**

##### **4.2.1 Treatability Study Work Plan and Sampling and Analysis Plan (“SAP”)**

If U.S. EPA determines that treatability testing is necessary, U.S. EPA will decide on the type of treatability testing to use (e.g., bench versus pilot). At the request of U.S. EPA, and in accordance with the Schedule in Exhibit A to this SOW, the Respondents shall submit a Treatability Study Work Plan and a SAP, or amendments to the Area-Specific Work Plan, to U.S. EPA, with a copy to the MDEQ, for review and approval pursuant to Section X of the AOC, that describes the Area background, the remedial technology(ies) to be tested, test objectives, experimental procedures, treatability conditions to be tested, measurements of performance, analytical methods, data management and analysis, health and safety, residual waste management, and a schedule. The Respondents shall document the DQOs for treatability testing as well. If pilot scale treatability testing is to be performed, the Treatability Study Work Plan shall describe pilot plant installation and start-up, pilot plant operation and maintenance procedures, operating conditions to be tested, a sampling plan to determine pilot plant performance, and a detailed HSP. If testing is to be performed off-site, the plans shall address all permitting requirements.

##### **4.2.2 Treatability Study HSP**

If the Multi-Area HSP and Area-Specific Work Plan are not adequate for defining the activities to be performed during the treatability tests, the Respondents shall submit a separate or amended HSP. Task 1.2.1.5 of this SOW provides additional information on the requirements of the HSP. U.S. EPA and MDEQ review, but do not “approve” the Treatability Study HSP.

### **4.2.3 Treatability Study Evaluation Report**

Following the completion of the treatability testing, the Respondents shall analyze and interpret the testing results in a technical report to U.S. EPA and MDEQ. Respondents shall submit the Treatability Study Evaluation Report according to the schedule in the Treatability Study Work Plan. This report may be a part of the SRI Report or submitted as a separate deliverable. The Treatability Study Evaluation Report shall evaluate each technology's effectiveness, implementability and cost, and actual results as compared with predicted results. The report shall also evaluate full scale application of the technology, including a sensitivity analysis identifying the key parameters affecting full-scale operation.

### **TASK 5: DEVELOPMENT AND SCREENING OF ALTERNATIVES**

The Respondents shall develop and screen an appropriate range of area-specific remedial alternatives that will be evaluated in the FS. The area-specific alternative array will build on the Multi-Area FS Documents, as appropriate. The area-specific range of alternatives shall include, as appropriate, options in which treatment is used to reduce the toxicity, mobility, or volume of wastes, but which vary in the types of treatment, the amount treated, and the manner in which long-term residuals or untreated wastes are managed; options involving containment with little or no treatment; options involving both treatment and containment; and a no-action alternative. The Respondents shall perform the following activities as a function of the development and screening of remedial alternatives.

The Respondents shall prepare and submit to U.S. EPA and MDEQ a technical memorandum for this task. An Area-Specific Alternatives Screening Technical Memorandum shall be submitted in accordance with the Schedule in Exhibit A to this SOW. Comments on the Area-Specific Alternatives Screening shall be addressed in the draft FS.

### **5.1 Area-Specific Alternatives Screening Technical Memorandum**

The Area-Specific Alternatives Screening Technical Memorandum shall summarize the work performed and the results of each of the above tasks, and shall include an alternatives array summary. If required by U.S. EPA, the Respondents shall modify the alternatives array to assure that the array identifies a complete and appropriate range of viable alternatives to be considered in the detailed analysis. The Alternatives Screening Technical Memorandum shall document the methods, the rationale and the results of the alternatives screening process, and shall include:

#### **5.1.1 Remedial Action Objectives**

The Respondents shall develop area-specific Remedial Action Objectives ("RAOs"). Based on the baseline human health and ecological risk assessments, the Respondents shall document the area-specific RAOs which shall specify the COCs and media of concern, potential exposure pathways and receptors, and contaminant level or range of levels (at particular locations for each exposure route) that are protective of human health and the environment. RAOs shall be developed by considering the factors set forth in 40 C.F.R. § 300.430(e)(2)(i).

### **5.1.2 Identify Areas or Volumes of Media**

In the Area-Specific Alternatives Screening Technical Memorandum, the Respondents shall identify areas or volumes of media to which response actions may apply, taking into account requirements for protectiveness as identified in the remedial action objectives. The Respondents shall also take into account the chemical and physical characterization of the Area.

### **5.1.3 Identify, Screen, and Document Remedial Technologies**

Based on the Preliminary Remedial Technology Screening Document, in the Area-Specific Alternatives Screening Technical Memorandum, the Respondents shall identify and evaluate applicable technologies and eliminate those that cannot be implemented at the Area. The Respondents shall evaluate process options on the basis of effectiveness, implementability, and cost factors to select and retain one or, if necessary, more representative processes for each technology type. The Respondents shall summarize and include the technology types and process options in the Area-Specific Alternatives Screening Technical Memorandum. Whenever practicable, the alternatives shall also consider the CERCLA preference for treatment over conventional containment or land disposal approaches.

### **5.1.4 Assemble and Document Alternatives**

The Respondents shall assemble the selected representative technologies into alternatives for each affected medium or OU. Together, all of the alternatives shall represent a range of treatment and containment combinations that shall address either the Area or the OU as a whole. The Respondents shall prepare a summary of the assembled alternatives and their related ARARs. If necessary, the Respondents shall conduct the screening of alternatives to assure that only the alternatives with the most favorable composite evaluation of all factors are retained for further analysis. As appropriate, the screening shall preserve the range of treatment and containment alternatives that was initially developed. The Respondents shall specify the reasons for eliminating alternatives during the preliminary screening process.

## **TASK 6: DETAILED ANALYSIS of ALTERNATIVES (“FS REPORT”)**

Building on the Multi-Area FS Documents and the Area-Specific SRI Report, the Respondents shall conduct and present a detailed analysis of remedial alternatives to provide U.S. EPA with the information needed to select an Area-specific remedy.

### **6.1 Detailed Analysis of Alternatives**

The Respondents shall conduct a detailed analysis of the remedial alternatives for the Area. The detailed analysis shall include an analysis of each remedial option against each of the nine evaluation criteria set forth in 40 C.F.R. § 300.430(e)(9)(iii) and a comparative analysis of all options using the same nine criteria as a basis for comparison.

### **6.1.1 Apply Nine Criteria and Document Analysis**

The Respondents shall apply the nine evaluation criteria to the assembled remedial alternatives to ensure that the selected remedial alternative will protect human health and the environment and meet remedial action objectives; will comply with or include a waiver of ARARs; will be cost-effective; will utilize permanent solutions and alternative treatment technologies, or resource recovery technologies, to the maximum extent practicable; and will address the statutory preference for treatment as a principal element. The evaluation criteria include: 1) overall protection of human health and the environment and how the alternative meets each of the remedial action objectives; 2) compliance with ARARs; 3) long-term effectiveness and permanence; 4) reduction of toxicity, mobility, or volume through treatment; 5) short-term effectiveness; 6) implementability; 7) cost; 8) state (or support agency) acceptance; and 9) community acceptance. (Note: criteria 8 and 9 are considered after the SRI/FS report has been released to the general public.) For each alternative, the Respondents shall provide: 1) a description of the alternative that outlines the waste management strategy involved and identifies the key ARARs associated with each alternative, and 2) a discussion of the individual criterion assessment. If the Respondents does not have direct input on criteria 8 state (or support agency) acceptance and 9 community acceptance, U.S. EPA will address these criteria.

### **6.1.2 Compare Alternatives Against Each Other and Document the Comparison of Alternatives**

The Respondents shall perform a detailed comparative analysis between the remedial alternatives. That is, the Respondents shall compare each alternative against the other alternatives using the nine evaluation criteria as a basis of comparison. U.S. EPA will identify and select the preferred alternative.

### **6.1.3 Alternatives Analysis for Institutional Controls**

For any alternative that relies on Institutional Controls, Respondents shall include an evaluation of the following: 1) *Overall Protection of Human Health and the Environment* including what specific institutional control components will ensure that the alternative will remain protective and how these specific controls will meet remedial action objectives; 2) *Compliance with ARARs*; 3) *Long Term Effectiveness* including the adequacy and reliability of institutional controls and how long the institutional control must remain in place; 4) *Short Term Effectiveness* including the amount of time it will take to impose the Institutional Control; 5) *Implementability* including research and documentation that the proper entities (e.g., potentially responsible parties, state, local government entities, local landowners conservation organizations) are willing to enter into any necessary agreement or restrictive covenant with the proper entities and/or that laws governing the restriction exist or allow implementation of the institutional control; 6) *Cost* including the cost to implement, maintain, monitor and enforce the institutional control; and 7) *State and Community Acceptance* of the Institutional Control.

## **6.2 Feasibility Study Report**

In accordance with the Schedule in Exhibit A to this SOW, the Respondents shall prepare and submit a draft FS Report to U.S. EPA and MDEQ for review and approval pursuant to Section X

of the AOC. The FS report shall summarize the development and screening of the remedial alternatives and present the detailed analysis of remedial alternatives. In addition, the FS Report shall also include the information U.S. EPA will need to prepare relevant sections of the Record of Decision (“ROD”) for the Site [see Chapters 6 and 9 of EPA’s *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents* (EPA/540/R-98/031, OSWER Publication 9200.1-23P, July 1999) for the information that is needed].

## **TASK 7: PROGRESS REPORTS**

### **7.1 Area-Specific Monthly Progress Reports**

The Respondents shall submit written Area-Specific Monthly Progress Reports to U.S. EPA and the MDEQ concerning actions undertaken pursuant to the AOC and this SOW, in accordance with the Schedule in Exhibit A to this SOW, unless otherwise directed in writing by the U.S. EPA RPM. These reports shall include, but not be limited to, a description of all significant developments during the preceding period, including the specific work that was performed and any problems that were encountered; a paper and electronic copies (formatted according to U.S. EPA specifications) and summary of the analytical data that was received during the reporting period; and the developments anticipated during the next reporting period, including a schedule of work to be performed, anticipated problems, and actual or planned resolutions of past or anticipated problems. The area-specific monthly progress reports will summarize the field activities conducted each month including, but not limited to drilling and sample locations, depths and descriptions; boring logs; sample collection logs; field notes; problems encountered; solutions to problems; a description of any modifications to the procedures outlined in the Work Plans, with justifications for the modifications; a summary of all data received during the reporting period and the analytical results; and upcoming field activities. In addition, the Respondents shall provide the U.S. EPA RPM or the entity designated by the U.S. EPA RPM with all laboratory data within the monthly progress reports and in no event later than 90 days after samples are shipped for analysis.

### **7.2 Semi-Annual Progress Reports**

In accordance with the Schedule in Exhibit A to this SOW, the Respondents shall submit Semi-Annual Progress Reports to U.S. EPA and MDEQ. These reports shall address all of the Areas of the Site where Respondents perform SRI/FS activities and shall summarize overall progress in completing the work required by the AOC and this SOW. These reports will continue until termination of the AOC, unless otherwise directed in writing by U.S. EPA.

**EXHIBIT A  
SCHEDULE FOR MAJOR DELIVERABLES**

**A. Project Start Dates**

The AOC and SOW establish requirements for an SRI/FS for each Area of the Site where Respondents perform SRI/FS activities. To maximize efficiency in conducting multiple SRI/FS activities, Multi-Area SRI/FS Documents will be developed. Each of the Areas have been or will be assigned a unique Project Start Date that triggers the area-specific SRI/FS work for that Area. The following Project Start Dates have been established:

- Morrow Dam to Plainwell Dam - the effective date of the AOC

No later than 18 months after the effective date of the AOC, U.S. EPA will propose Project Start Dates for the Areas of OU5 beginning at the Plainwell Dam and continuing to Lake Michigan by an evaluation of the Master Schedule as established under Sections C and D. The Project Start Dates and Area prioritization are subject to review through periodic evaluation of the Master Schedule.

**B. General Schedule**

The following general schedule shall apply to the Multi-Area SRI/FS Documents and the SRI/FS for each Area. The general schedule for a specific Area may be modified when: 1) a different schedule is approved by U.S. EPA in an Area-Specific Work Plan, Treatability Testing Work Plan, or other U.S. EPA-approved document; or 2) the Respondents submits in writing a request for an Area-specific extension or schedule modification, and U.S. EPA approves any such request

<b>DELIVERABLE DUE DATE</b>	
<b>TASK 1.1.1</b> – Ongoing Work Reports	For each Area, annually until U.S. EPA’s approval of an Area-Specific Work Plan for that Area. The specific annual date for each Area will be determined in the first Master Schedule (Section C).
<b>TASK 1.2.1</b> – Multi-Area SRI Documents, including QAPP, FSP, Generalized CSM, BERA Peer Review, RA Framework, and HSP.	Draft Multi-Area QAPP and HSP due 60 days after the effective date of the AOC. Draft Multi-Area FSP, Generalized CSM, BERA Peer Review Scope of Work and RA Framework due 120 days after the effective date of the AOC, provided that the RA Framework may be modified within 45 days of receipt of the final BERA Peer Review conclusions. Final Multi-Area SRI Documents due 45 days after U.S. EPA direction to modify pursuant to Section X of

<b>DELIVERABLE DUE DATE</b>	
	the AOC.
<b>TASK 1.2.2</b> – Multi-Area FS Documents, including Preliminary Remedial Technology Screening, ARARs, and Permitting/Equivalency documents	Draft Multi-Area FS Documents due one year after the effective date of the AOC. Final Multi-Area FS Documents due 45 days after U.S. EPA direction to modify pursuant to Section X of the AOC.
<b>TASK 1.3</b> – Area-Specific Work Plans	Area-Specific Work Plans for each Area are due 90 days after its Project Start Date. Final Area-Specific Work Plan due 60 days after U.S. EPA direction to modify pursuant to Section X of the AOC.
<b>TASK 2</b> - Area Characterization Technical Communications	To be included in the monthly Progress Reports.
<b>TASK 3</b> - SRI Report	Draft SRI Report due one year following U.S. EPA approval of the Area-Specific Work Plan, or on a schedule approved in the Area-Specific Work Plan. Final SRI Report due 60 days after receipt of U.S. EPA’s direction to modify pursuant to Section X of the AOC.
<b>TASK 4.1</b> - Candidate Technologies and Testing Needs Technical Memorandum	With the draft SRI/FS Planning Documents (Task 1.2.2).
<b>TASK 4.2.1</b> - Treatability Testing Work Plan and SAP or Amendments to the Original Area-Specific Work Plan.	Within 45 days of request of U.S. EPA. Final documents due 45 days after receipt of U.S. EPA’s direction to modify pursuant to Section X of the AOC.
<b>TASK 4.2.2</b> - Treatability Testing Health and Safety Plan or Amendment to the Original Health and Safety Plan	Within 30 days of request of U.S. EPA. Final document due thirty calendar days after receipt of U.S. EPA’s direction to modify pursuant to Section X of the AOC.
<b>TASK 4.2.3</b> - Treatability Study Evaluation Report	Draft due with the SRI Report (Task 3), or as approved by U.S. EPA in the Treatability Testing Work Plan. Final Treatability Study Evaluation Report due 45 days after receipt of U.S. EPA’s direction to modify pursuant to Section X of the AOC.
<b>TASK 5.1</b> – Area-Specific Alternatives Screening Technical Memorandum	60 days after submittal of the draft SRI Report.
<b>TASK 6</b> - FS Report	Draft FS Report due 90 days after receipt of U.S. EPA’s comments on the Area-Specific

<b>DELIVERABLE DUE DATE</b>	
	Alternatives Screening Technical Memorandum. Final FS Report due 45 days after receipt of U.S. EPA's direction to modify pursuant to Section X of the AOC.
<b>TASK 7.1 - Area-Specific Monthly Progress Reports</b>	For each Area or OU, on the 15 <sup>th</sup> day of each month or the first business day after the 15 <sup>th</sup> of the month commencing 60 days after the Project Start Date and continuing until U.S. EPA issues the Record of Decision for the Area or OU.
<b>TASK 7.2 – Semi-annual Progress Reports</b>	Due six months after the effective date of the AOC and every six months thereafter.
Miscellaneous Documents	In accordance with the submittal date provided by the U.S. EPA RPM.

**C. Master Schedule**

In addition to the General Schedule for each SRI/FS at each Area or OU, the Respondents shall maintain a Master Schedule that includes the SRI/FS activities for all Areas or OUs. The first Master Schedule shall be submitted within fifteen (15) days of the effective date of the AOC. The Master Schedule shall be updated within fifteen (15) days of U.S. EPA approval of a document or plan that provides an Area-specific modification to the General Schedule.

**D. Periodic Evaluation of the Master Schedule**

On a periodic basis, starting six months after the effective date of the AOC and every six months thereafter, either the Respondents or U.S. EPA, or each of them, may submit an evaluation with modifications to the Master Schedule. Two years after the effective date of the AOC, the frequency of the evaluation of the Master Schedule may be changed to an annual evaluation, if U.S. EPA so determines. These periodic evaluations may address such matters as the priorities between Areas and/or OUs (reflected in the Project Start Dates), minimizing the time between project start and remedial action, and whether the Master Schedule should allow parallel activities at two or more Areas or OUs. Each such evaluation shall be submitted to the other party in writing and shall state the reasons for any proposed changes. No modification will be made to the existing Master Schedule without U.S. EPA approval, and such approval shall be at the sole discretion of U.S. EPA. Changes to the Project Start Dates and prioritization may be considered and approved by U.S. EPA due to relative risk issues, multi-site management issues, the need to efficiently allocate available resources, the need for interim responses to releases or potential releases of pollutants or contaminants, or other matters U.S. EPA deems appropriate. If U.S. EPA rejects or modifies a proposed modification to the Master Schedule submitted by Respondents, or if Respondents objects to a proposed modification to the Master Schedule submitted by U.S. EPA, Respondents may invoke the Dispute Resolution procedures contained in Section XV of the AOC.

**EXHIBIT B**  
**PARTIAL LIST OF GUIDANCE**

The following list, although not comprehensive, comprises many of the regulations and guidance documents that apply to the RI/FS process. The majority of these guidance documents, and additional applicable guidance documents, may be downloaded from the following websites:

<http://www.epa.gov/superfund/pubs.htm> (General Superfund)  
<http://cluoin.org> (Site Characterization, Monitoring and Remediation)  
<http://www.epa.gov/nrmrl/publications.html> (Site Characterization and Monitoring)  
[http://www.epa.gov/quality/qa\\_docs.html#guidance](http://www.epa.gov/quality/qa_docs.html#guidance) (Quality Assurance)  
<http://www.epa.gov/superfund/programs/dfa/index.htm> (Dynamic Field Activities)  
<http://www.epa.gov/oswer/riskassessment/toolthh.htm> (Risk Assessment - Human)  
<http://www.epa.gov/oswer/riskassessment/ecorisk/ecorisk.htm> (Ecological Risk Assessment)  
<http://www.epa.gov/superfund/programs/lead> (Risk Assessment - Lead)  
<http://cfpub.epa.gov/ncea> (Risk Assessment - Exposure Factors/Other)  
<http://nepis.epa.gov> (General Publications Clearinghouse)  
<http://nepis.epa.gov/pubtitle.htm>  
<http://www.epa.gov/superfund/programs/lead/products.htm> (General Publications Clearinghouse)

1. The (revised) National Contingency Plan.
2. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, U.S. EPA, Office of Emergency and Remedial Response, OSWER Directive No. 9355.3-01, EPA/540/G-89/004, October 1988.
3. *Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites*, U.S. EPA, Office of Emergency and Remedial Response, OSWER Directive No. 9355.3-11, EPA/540/P-91/001, February 1991.
4. *Implementing Presumptive Remedies: A Notebook of Guidance and Resource Materials*, U.S. EPA, Office of Emergency and Remedial Response, OSWER Directive No. 9378.0-11, EPA/540/R-97/029, October 1997.
5. *Presumptive Remedy for CERCLA Municipal Landfill Sites*, U.S. EPA, OSWER Directive No. 9355.0-49FS, EPA/540/F-93/035, September 1993.
6. *Presumptive Remedies: CERCLA Landfill Caps RI/FS Data Collection Guide*, U.S. EPA, OSWER 9355.3-18FS, EPA/540/F-95/009, August 1995.
7. *Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites*, OSWER 9283.1-12, EPA/540/R-96/023, October 1996.
8. *Field Analytical and Site Characterization Technologies, Summary of Applications*, U.S. EPA, EPA/542/F-97/024, November 1997.

9. *CLU-IN Hazardous Waste Clean-Up Information World Wide Web Site*, U.S. EPA, EPA/542/F-99/002, February 1999.
10. *Field Sampling and Analysis Technologies Matrix and Reference Guide*, U.S. EPA, EPA/542/F-98/013, July 1998.
11. *Subsurface Characterization and Monitoring Techniques: A Desk Reference Guide, Volumes 1 and 2*, U.S. EPA, EPA/625/R-93/003a and b, May 1993.
12. *Use of Airborne, Surface, and Borehole Geophysical Techniques at Contaminated Sites: A Reference Guide*, U.S. EPA, EPA/625/R-92/007(a,b), September 1993.
13. *Innovations in Site Characterization: Geophysical Investigation at Hazardous Waste Sites*, U.S. EPA, EPA/542/R-00/003, August 2000.
14. *Innovative Remediation and Site Characterization Technology Resources*, U.S. EPA, OSWER, EPA/542/F-01/026b, January 2001.
15. *Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells*, U.S. EPA, EPA/600/4-89/034, March 1991.
16. *Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers*, U.S. EPA, EPA/542/S-02/001, May 2002.
17. *Ground Water Issue: Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures*, U.S. EPA, EPA/540/S-95/504, April 1996.
18. *Superfund Ground Water Issue: Ground Water Sampling for Metals Analyses*, U.S. EPA, EPA/540/4-89/001, March 1989.
19. *Resources for Strategic Site Investigation and Monitoring*, U.S. EPA, OSWER, EPA/542/F-01/030b, September 2001.
20. *Region 5 Framework for Monitored Natural Attenuation Decisions for Groundwater*, U.S. EPA Region 5, September 2000.
21. *Ground Water Issue: Suggested Operating Procedures for Aquifer Pumping Tests*, U.S. EPA, OSWER, EPA/540/S-93/503, February 1993.
22. *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water*, U.S. EPA, EPA/600/R-98/128, September 1998.
23. *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action and Underground Storage Tank Sites*, U.S. EPA, OSWER Directive 9200.4-17P, EPA/540/R-99/009, April 21, 1999.
24. *Ground Water Issue: Fundamentals of Ground-Water Modeling*, U.S. EPA, OSWER, EPA/540/S-92/005, April 1992.

25. *Assessment Framework for Ground-Water Model Applications*, U.S. EPA, OSWER Directive #9029.00, EPA/500/B-94/003, July 1994.
26. *Ground-Water Modeling Compendium - Second Edition: Model Fact Sheets, Descriptions, Applications and Cost Guidelines*, U.S. EPA, EPA/500/B-94/004, July 1994.
27. *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents*, U.S. EPA, Office of Solid Waste and Emergency Response, OSWER Directive No. 9200.1-23P, EPA/540/R-98/031, July 1999.
28. *Region 5 Instructions on the Preparation of A Superfund Division Quality Assurance Project Plan Based on EPA QA/R-5, Revision 0*, U.S. EPA Region 5, June 2000.
29. *Guidance for the Data Quality Objectives Process (QA-G-4)*, U.S. EPA, EPA/600/R-96/055, August 2000.
30. *Guidance for the Data Quality Objectives Process for Hazardous Waste Sites (QA/G-4HW)*, U.S. EPA, EPA/600/R-00/007, January 2000.
31. *Guidance for Preparing Standard Operating Procedures (QA/G-6)*, U.S. EPA, EPA/240/B-01/004, March 2001.
32. *EPA Requirements for Quality Management Plans (QA/R-2)*, U.S. EPA, EPA/240/B-01/002, March 2001.
33. *EPA Requirements for QA Project Plans (QA/R-5)*, U.S. EPA, EPA/240/B-01/003, March 2001.
34. *Guidance for Quality Assurance Project Plans (QA/G-5)*, U.S. EPA, EPA/600/R-98/018, February 1998.
35. *Users Guide to the EPA Contract Laboratory Program*, U.S. EPA, Sample Management Office, OSWER Directive No. 9240.0-01D, January 1991.
36. *Technical Guidance Document: Quality Assurance and Quality Control for Waste Containment Facilities*, U.S. EPA, EPA/600/R-93/182, September 1993.
37. *Risk Assessment Guidance for Superfund - Volume I Human Health Evaluation Manual (Part A)*, U.S. EPA, EPA/540/1-89/002, December 1989.
38. *Risk Assessment Guidance for Superfund - Volume I Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals)*, U.S. EPA, EPA/540/R-92/003, OSWER Publication 9285.7-01B, December 1991.
39. *Risk Assessment Guidance for Superfund - Volume I Human Health Evaluation Manual (Part C - Risk Evaluation of Remedial Alternatives)*, U.S. EPA, Office of Emergency and Remedial Response, Publication 9285.7-01C, EPA/540/R-92/004, December 1991.

40. *Risk Assessment Guidance for Superfund - Volume I Human Health Evaluation Manual (Part D - Standardized Planning, Reporting, and Review of Superfund Risk Assessments)*, U.S. EPA, Office of Emergency and Remedial Response, Publication 9285.7-47, December 2001.
41. *Risk Assessment Guidance for Superfund: Volume III - Part A, Process for Conducting Probabilistic Risk Assessment*, U.S. EPA, OSWER Publication 9285.7-45, EPA/540/R-02/002, December 2001.
42. *Policy for Use of Probabilistic Analysis in Risk Assessment at the U.S. Environmental Protection Agency*, U.S. EPA, Office of Research and Development, May 15, 1997.
43. *Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors*, U.S. EPA, OSWER Directive 9285.6-03, March 25, 1991.
44. *Exposure Factors Handbook*, Volumes I, II, and III, U.S. EPA, EPA/600/P-95/002Fa,b,c, August 1997.
45. *Supplemental Guidance to RAGS: Calculating the Concentration Term*, U.S. EPA, OSWER Publication 9285.7-08I, May 1992.
46. *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, U.S. EPA, OSWER Directive 9355.4-12, EPA/540/F-94/043, July 14, 1994.
47. *Clarification to the 1994 Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, U.S. EPA, OSWER Directive 9200.4-27, EPA/540/F-98/030, August 1998.
48. *Guidance Manual for the Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children*, U.S. EPA, OSWER Publication 9285.7-15-1, February 1994; and associated, clarifying Short Sheets on IEUBK Model inputs, including but not limited to OSWER 9285.7-32 through 34, as listed on the OSWER lead internet site at [www.epa.gov/superfund/programs/lead/prods.htm](http://www.epa.gov/superfund/programs/lead/prods.htm).
49. *Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children*, Version 0.99D, NTIS PB94-501517, 1994 or *Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children*, Windows© version, 2001.
50. *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions*, U.S. EPA, OSWER Directive 9355.0-30, April 22, 1991.
51. *Performance of Risk Assessments in Remedial Investigation /Feasibility Studies (RI/FSs) Conducted by Potentially Responsible Parties (PRPs)*, OSWER Directive No. 9835.15, August 28, 1990.
52. *Supplemental Guidance on Performing Risk Assessments in Remedial Investigation Feasibility Studies (RI/FSs) Conducted by Potentially Responsible Parties (PRPs)*, OSWER Directive No. 9835.15(a), July 2, 1991.

53. *Role of Background in the CERCLA Cleanup Program*, U.S. EPA, OSWER 9285.6-07P, April 26, 2002.
54. *Soil Screening Guidance: User's Guide*, U.S. EPA, OSWER Publication 9355.4-23, EPA/540/R-96/018, July 1996.
55. *Soil Screening Guidance: Technical Background Document*, U.S. EPA, OSWER Publication No. 9355.4-17A, EPA/540/R-95/128, May 1996.
56. *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (Peer Review Draft), U.S. EPA, OSWER Publication 9355.4-24, March 2001.
57. *Ecological Risk Assessment Guidance for Superfund: Process for Designing & Conducting Ecological Risk Assessments*, U.S. EPA, OSWER Directive 9285.7-25, EPA/540/R-97/006, June 1997.
58. *Guidelines for Ecological Risk Assessment*, U.S. EPA, EPA/630/R-95/002F, April 1998.
59. *The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments*, U.S. EPA, OSWER Publication 9345.0-14, EPA/540/F-01/014, June 2001.
60. *Ecotox Thresholds*, U.S. EPA, OSWER Publication 9345.0-12FSI, EPA/540/F-95/038, January 1996.
61. *Issuance of Final Guidance: Ecological Risk Assessment and Risk Management Principles for Superfund Sites*, U.S. EPA, OSWER Directive 9285.7-28P, October 7, 1999.
62. *Guidance for Data Usability in Risk Assessment (Quick Reference Fact Sheet)*, OSWER 9285.7-05FS, September 1990.
63. *Guidance for Data Usability in Risk Assessment (Part A)*, U.S. EPA, Office of Emergency and Remedial Response, Publication 9285.7-09A, April 1992.
64. *Guide for Conducting Treatability Studies Under CERCLA*, U.S. EPA, OSWER Directive No. 9380.3-10, EPA/540/R-92/071a, October 1992.
65. *CERCLA Compliance with Other Laws Manual, Volume I*, U.S. EPA, Office of Emergency and Remedial Response, OSWER Directive No. 9234.1-01, EPA/540/G-89/006, August 1988.
66. *CERCLA Compliance with Other Laws Manual, Volume II*, U.S. EPA, Office of Emergency and Remedial Response, OSWER Directive No. 9234.1-02, EPA/540/G-89/009, August 1989.
67. *Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites*, U.S. EPA, Office of Emergency and Remedial Response, (Interim Final), OSWER Directive No. 9283.1-2, EPA/540/G-88/003, December 1988.

68. *Considerations in Ground-Water Remediation at Superfund Sites and RCRA Facilities - Update*, U.S. EPA, OSWER Directive 9283.1-06, May 27, 1992.
69. *Methods for Monitoring Pump-and-Treat Performance*, U.S. EPA, EPA/600/R-94/123, June 1994.
70. *Pump-and-Treat Ground-Water Remediation: A Guide for Decision Makers and Practitioners*, U.S. EPA, EPA/625/R-95/005, July 1996.
71. *Ground-Water Treatment Technology Resource Guide*, U.S. EPA, OSWER, EPA/542/B-94/009, September 1994.
72. *Land Use in the CERCLA Remedy Selection Process*, U.S. EPA, OSWER Directive No. 9355.7-04, EPA/540/F-95/052, May 25, 1995.
73. *Reuse Assessments: A Tool To Implement The Superfund Land Use Directive*, U.S. EPA, OSWER 9355.7-06P, June 4, 2001.
74. *Reuse of CERCLA Landfill and Containment Sites*, U.S. EPA, OSWER 9375.3-05P, EPA/540/F-99/015, September 1999.
75. *Reusing Superfund Sites: Commercial Use Where Waste is Left on Site*, U.S. EPA, OSWER 9230.0-100, EPA/540/K-01/008, February 2002.
76. *Covers for Uncontrolled Hazardous Waste Sites*, U.S. EPA, EPA/540/2-85/002, September 1985.
77. *Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments*, U.S. EPA, OSWER, EPA/530/SW-89/047, July 1989.
78. *Engineering Bulletin: Landfill Covers*, U.S. EPA, EPA/540/S-93/500, February 1993.
79. *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites*, U.S. EPA, OSWER Directive 9285.6-08, February 12, 2002.
80. *Institutional Controls: A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups*, U.S. EPA, OSWER 9355.0-74FS-P, EPA/540/F-00/005, September 29, 2000.
81. *Health and Safety Requirements of Employees Employed in Field Activities*, U.S. EPA, Office of Emergency and Remedial Response, EPA Order No. 1440.2, July 12, 1981.
82. *OSHA Regulations in 29 CFR 1910.120*, Federal Register 45654, December 19, 1986.
83. *Standard Operating Safety Guides*, PB92-963414, June 1992.
84. *Community involvement in Superfund: A Handbook*, U.S. EPA, Office of Emergency and Remedial Response, OSWER Directive No. 9230.0#3B June 1988; and OSWER Directive No. 9230.0-3C, January 1992.

85. *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites*, EPA/540/R-05/012, OSWER Publication No.9355.0-85, December 2005.

**Exhibit C**  
**Available Site Investigation Data for Characterizing the**  
**Allied Paper Inc./Portage Creek/Kalamazoo River Superfund Site**

	Investigation	Data Generated
<b>KRSG Data</b>	<b>Remedial Investigations</b>	Sediment transect probing data, 1993
		Sediment PCB and TOC data, 1993
		Sediment particle size data, 1993
		Floodplain soil data, 1993
		Exposed sediment PCB and TOC data, 1993
		Surface water data, 1993
		Fish data, multiple locations, 1993
		Exposed sediment earthworm and mouse sampling, 1993
	<b>Supplemental Investigations</b>	Fish data, multiple locations, 1999
		Geotechnical sediment sampling, 1999
		Sediment PCB and TOC data, 1999
		OSI bathymetry maps, 1999
		Sediment erodibility data (Lick, UCSB), 1999
		Surface water PCB loading data, 1999-2000
		Erosion pin measurements, 2000 – 2002
		Ecological risk assessment sampling (Giesy)
		Finely-sectioned sediment PCB, TOC, and radionuclide data, 1999
	Diver Survey of Lake Allegan	
	<b>Phase II Lower River Investigations (Lake Allegan to Lake Michigan)</b>	Sediment transect probing data, 2000
		Sediment PCB and TOC data, 2000
Sediment particle size data, 2000		
Floodplain soil data, 2000		
Kalamazoo Lake sediment data, 2000		
Pottowattamie Marsh and Ottawa Marsh soil data, 2000		
<b>Former Plainwell Impoundment Investigations</b>	Plainwell bank profile survey data, 2003	
	Plainwell top-of-bank PCB sampling, 2003	
	Plainwell habitat description and classification, 2003	
	2006 sediment sampling in support of removal design	
<b>Agency Data</b>	MDEQ Long-Term Monitoring Data (sediment, surface water, fish)	
	EPA Phase I (grid) sediment and soil sampling, 2001	
	EPA Phase II (radial) sediment and soil sampling, 2001	

Notes:

PCB - polychlorinated biphenyls

TOC - total organic carbon

KRSG- Kalamazoo River Study Group

MDEQ - Michigan Department of Environmental Quality

EPA - United States Environmental Protection Agency

OSI - Ocean Surveys, Inc.