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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1—NEW ENGLAND REGION



SDMS DocID 000213098

In the Matter of:)

Callahan Mine Superfund Site)
Brooksville, Maine)

Maine Department of Transportation,)
Respondent)

Docket No.
CERCLA-01-2005-0022

Proceedings relating to a settlement agreement under)
Section 122(d)(3) for action under Section 104(b) of the)
Comprehensive Environmental Response, Compensation)
and Liability Act, as amended,)
42 U.S.C. §§ 9604(b) & 9622(d)(3))

ADMINISTRATIVE ORDER BY CONSENT
FOR REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

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Appendix A: Statement of Work

JURISDICTION AND GENERAL PROVISIONS

1. This Administrative Order by Consent (“Order”) is entered into voluntarily by and among the United States Environmental Protection Agency (“EPA”), Maine Department of Environmental Protection (“DEP”), and Respondent Maine Department of Transportation (“Respondent” or “MaineDOT”). This Order concerns the preparation of, performance of, oversight and review of, and reimbursement of oversight costs for certain Work as described herein and in the Statement of Work (“SOW,” attached to this Order as Appendix A), consisting of a Remedial Investigation and Feasibility Study (“RI/FS”), for the Superfund Site known as the Callahan Mine Superfund Site (the “Site”) in Brooksville, Maine.¹
2. This Order is issued pursuant to the authority vested in the President of the United States by Sections 104 and 122(d)(3) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended (“CERCLA”), 42 U.S.C. §§ 9604 & 9622(d)(3), which authorize the President to issue an Order setting forth the obligations of the Respondent with respect to a settlement agreement for action under Section 104(b) of CERCLA. This authority was delegated to the Administrator of EPA on January 23, 1987, by Executive Order 12580, 52 Fed. Reg. 2926 (January 29, 1987), further delegated to the Regional Administrator on April 15, 1994, by EPA Delegation No. 14-14-C, and redelegated to Region 1’s Director of the Office of Site Remediation and Restoration (“Director of OSRR”) on September 3, 1996 by EPA Region 1 Delegation No. 14-14-C.
3. In accordance with Sections 104(b)(2) and 122(j)(1) of CERCLA, 42 U.S.C. §§ 9604(b)(2) and 9622(j)(1), EPA notified the U.S. Department of the Interior, the National Oceanic and Atmospheric Administration, and the State of Maine on May 14, 2004, of negotiations with potentially responsible parties regarding the release of hazardous substances that may have resulted in injury to the natural resources under Federal and/or State trusteeship.
4. EPA, DEP, and the Respondent recognize that this Order has been negotiated in good faith, and that the execution and performance of this Order is not an admission of liability by the Respondent, nor is it an admission or denial of any matter of fact or law. The Respondent does not admit, and retains the right to controvert in any subsequent proceedings, other than proceedings to implement or enforce this Order, the validity of the findings of fact, conclusions of law and determinations in this Order. The Respondent reserves any and all rights and defenses that it may have in any such subsequent proceedings. The Respondent agrees to comply with and be bound by the terms of this Order and further agrees that it will

¹ Begun as an EPA-lead Fund-financed response action in the fall of 2004, the RI/FS will now be performed by MaineDOT under EPA oversight (with the assistance of DEP).

not contest the basis or validity of this Order or its terms in any proceeding related to this Order.

PARTIES BOUND

5. This Order shall apply to and be binding upon EPA, DEP, and MaineDOT (collectively referred to as the "Parties"); their agents, successors, and assigns; and upon all persons, contractors, and consultants whom the MaineDOT has authorized to act on its behalf to perform the Work. The signatories to this Order certify that they are authorized to execute and legally bind the parties they represent.
6. The Respondent shall provide a copy of this Order to all contractors, subcontractors, laboratories, and consultants retained to conduct any portion of the Work performed pursuant to this Order within fourteen (14) days after the effective date of this Order or after the date of such retention. Notwithstanding the terms of any contract, the Respondent is responsible for compliance with this Order and for ensuring that its contractors and agents comply with this Order.

STATEMENT OF PURPOSE

7. In entering into the Order, the mutual objectives of EPA, DEP and the Respondent are: (i) to determine the nature and extent of contamination and any threat to the public health, welfare, or the environment caused by the release or threatened release of hazardous substances, pollutants, or contaminants from the Site by conducting a Remedial Investigation (including a human health and ecological risk assessment); and (ii) to determine and evaluate alternatives for remedial action (if any) to prevent, mitigate or otherwise respond to or remedy any release or threatened release of hazardous substances, pollutants, or contaminants from the Site by conducting a Feasibility Study.
8. The activities conducted under this Order are subject to approval or modification by EPA and shall provide all appropriate necessary information for the completion of the RI/FS and the issuance of a Record of Decision that are consistent with CERCLA §§ 104, 121, and 122, and the National Contingency Plan, as amended ("NCP"), 40 C.F.R. Part 300.
9. In addition to assuming its traditional support agency role, DEP will provide the technical resources in assisting EPA in overseeing and reviewing MaineDOT's conduct of the RI/FS. DEP will oversee MaineDOT's field work and will make recommendations to EPA following its review of MaineDOT's deliverables.

10. Any reference herein to the "Order" shall mean this Order, the SOW, any attachments to the SOW, and any future modifications as provided by the terms of this Order, including any reports, plans, work plans, specifications, schedules, and appendices required by this Order, which, upon approval or modification by EPA, shall be incorporated into and become enforceable under this Order. Any reference herein to the "Work" shall mean all of the Respondent's activities conducted pursuant to this Order.

EPA'S FINDINGS OF FACT

11. The Site is located approximately 1,000 feet east and southeast of Harborside Village in the Town of Brooksville, Maine. The Site includes an approximately 150-acre property in a coastal rural setting on the Cape Rosier peninsula. The Site abuts and extends into Goose Pond Estuary to the east, and private properties to the south, west, and north. The developed portion of the Site extends about 5,000 feet south-southeast from the Goose Falls Road, and approximately 1,000 to 1,500 feet west from Goose Pond Estuary. The Holbrook Island Sanctuary, a State owned nature preserve, is located on the eastern shore of the estuary opposite the Site.
12. The Site is the former location of a zinc/copper open-pit mine. The mining operations were conducted adjacent to and beneath Goose Pond, a tidal estuary, from approximately 1968 to 1972. Goose Pond is connected to Goose Cove to the north by a reversing falls known as Goose Falls. Goose Cove is located on the southern part of Penobscot Bay.
13. Site facility features include large waste piles (waste rock piles), a tailings pond, and mine operations buildings and structures.
14. Investigations of the Site by State and Federal organizations have revealed the presence of hazardous substances in on-site surface water, sediment, and soil samples. These substances included arsenic, cadmium, copper, lead, and zinc.
15. Pursuant to Section 105(8)(b) of CERCLA, 42 U.S.C. § 9605(8)(b), the Site was proposed for inclusion on the National Priorities List ("NPL") published by the Administrator of EPA in the *Federal Register* on September 13, 2001 (66 Fed. Reg. 47612). The Site's NPL listing was finalized on September 5, 2002 (67 Fed. Reg. 56757).
16. EPA alleges that the State of Maine (with its agency MainesDOT as the Respondent under this Order) is a current owner of a portion of the Site and an owner of a portion of the Site at the time of disposal of hazardous substances.

17. The State of Maine (with its agency MaineDOT as the Respondent under this Order) is a State of the United States.

EPA'S DETERMINATIONS

18. On the basis of the Findings of Fact, EPA has determined that:
- a. The State of Maine (with its agency MaineDOT as the Respondent under this Order) is a "person" as that term is defined in Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).
 - b. The State of Maine (with its agency MaineDOT as the Respondent under this Order) is a liable party within the meaning of Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), and a "potentially responsible party" within the meaning of Section 122(d)(3) of CERCLA, 42 U.S.C. § 9622(d)(3).
 - c. The Site is a "facility" as that term is defined in Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).
 - d. The substances listed above in Paragraph 14 are "hazardous substances" as that term is defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).
 - e. The past, present or potential future migration of hazardous substances at or from the Site constitutes a "release" or substantial threat of a release into the "environment" within the meaning of Sections 101(8), (22) and 104(a) of CERCLA, 42 U.S.C. §§ 9601(8), (22) & 9604(a).
 - f. It is necessary, in order to protect the public health and welfare and the environment, to conduct an RI/FS to determine the nature and extent of contamination that exists at or near the Site and to the extent necessary to determine what remedial actions are necessary to be carried out under Sections 104 and 122 of CERCLA or secured through enforcement action under Section 106 of CERCLA.
 - g. The Work will be done properly and promptly by the Respondent, in accordance with Sections 104(a)(1) and 122(a) of CERCLA, provided that the Respondent performs all actions in accordance with the terms of this Order and any modifications thereto.

- h. The actions called for in this Order will be consistent with the NCP and CERCLA, provided that the Respondent performs all such actions in accordance with the terms of this Order and any modifications thereto.
- i. The Respondent is qualified to conduct the RI/FS, in accordance with Section 104(a)(1) of CERCLA, if the Respondent engages a qualified contractor pursuant to Paragraph 22 of this Order.
- j. Pursuant to this Order, EPA is contracting with or arranging for DEP, as a “qualified person” in accordance with Section 104(a)(1) of CERCLA, to assist EPA in overseeing and reviewing the Respondent’s conduct of the RI/FS. DEP shall provide technical expertise to review the deliverables submitted to determine the technical adequacy of the information and to confirm that the submittal and technical work conform with EPA guidance and policy. If DEP does not have the “in-house” capability in certain subject areas (*e.g.*, chemistry for quality assurance project plan review, human health risk assessment, ecological risk assessment, mine waste geochemistry, or mine waste remediation evaluation), DEP shall arrange for a qualified person to perform the review in order to maintain its CERCLA § 104(a)(1) “qualified person” status.
- k. Pursuant to this Order, the Respondent has agreed to reimburse EPA’s Hazardous Substance Superfund for any oversight costs incurred by EPA under, or in connection with, this Order.

ORDER

BASED ON THE FOREGOING FACTS AND DETERMINATIONS, EPA, DEP AND THE RESPONDENT HEREBY AGREE, AND EPA HEREBY ORDERS THAT:

Implementation

- 19. Subject to EPA’s right to conduct the Work as set forth herein, the Respondent shall perform the Work in accordance with all terms of this Order, the SOW, any work plans or documents and/or deliverables required to be submitted to EPA and DEP by the SOW or any work plan, and with any modifications made or required by EPA to bring any deliverable or other document into conformance with this Order, the attached SOW, the EPA-approved Revised RI/FS Work Plan, and CERCLA. Upon the effective date of this Order, the Respondent shall commence implementation of this Order and of Work required by the SOW and shall conclude implementation of such in accordance with the terms and schedules set forth in this Order and the SOW. The activities conducted pursuant to this Order are subject to approval

by EPA. Such activities shall be consistent with the NCP and with "A Guide to Selecting Superfund Remedial Actions," OSWER Directive Number 9355.0-27FS; "Guidance for Conducting Remedial Investigation and Feasibility Studies under CERCLA," OSWER Directive Number 9355.3-01; and other relevant guidance documents referenced in the SOW or provided to the Respondent by EPA, reasonably in advance of the applicable deliverables.

20. If any inconsistencies between any of the above-referenced laws, regulations or guidance exist, CERCLA shall govern. If any of the above-referenced laws, regulations or guidance are amended prior to the signing of a Record of Decision for final remedial action at the Site, EPA, consistent with the preceding paragraph, may modify or require modification to the SOW and to any EPA-approved work plan or other deliverable accordingly. EPA may also require the Respondent to develop a new work plan or other deliverable accordingly, and the Respondent shall conduct all activities required by the new or modified work plan or other deliverable.
21. EPA may determine that additional tasks, including remedial investigatory work other than those specified in the SOW, are part of the RI/FS. The Respondent shall, subject to the Respondent's right to invoke dispute resolution, implement any additional tasks which EPA determines are necessary as part of performing the activities required under this Order. The additional tasks shall be completed in accordance with the standards, specifications, and schedule determined or approved by EPA.

Engagement of the Respondent's Contractor

22. Within thirty (30) days after the effective date of this Order, the Respondent shall engage a qualified contractor ("Contractor") to perform the technical activities required under this Order. The Contractor shall employ key personnel dedicated to the Work that shall have a minimum of five (5) years of direct experience in performing investigations and studies at hazardous waste sites. Subcontractors retained by the Contractor shall contribute no more than fifty percent (50%) of the total work to be conducted under the agreement between the Respondent and the Contractor, not including the costs of laboratory analysis, well drilling, and geophysical techniques. All work performed by said Contractor pursuant to this Order shall be under the general direction and supervision of a qualified individual with expertise in hazardous waste site investigation and cleanup. The Contractor shall employ such professional staff sufficient to perform the Work prior to engagement by the Respondent.
23. The Respondent shall provide written notice to EPA and DEP within ten (10) days after engaging the Contractor to perform the Work. The notice shall include a representation that the Respondent has entered into a contract with the Contractor, a statement of qualifications, identification of project personnel, and language dedicating the specific professional staff

devoted to the project. The Respondent shall notify EPA and DEP regarding the identity and qualifications of all subcontractors at least fourteen (14) days prior to the subcontractors' commencement of site work. With respect to any proposed contractor, the Respondent shall demonstrate that the proposed contractor has a quality system by submitting a copy of the proposed contractor's Quality Management Plan ("QMP"). The QMP shall be prepared in accordance with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001), or equivalent documentation as determined by EPA. EPA shall have the right to disapprove, based on professional qualifications, conflicts of interest, and/or deficiencies in previous similar work, any contractor or subcontractor or other person engaged directly or indirectly by the Respondent to conduct the Work under this Order. Subcontractors performing work on-site shall conduct activities in accordance with the Contractor's QMP and Quality Assurance Project Plan.

Designation of the Respondent's Project Coordinator

24. The Respondent has designated Dwight Doughty of MaineDOT as its Project Coordinator who shall be responsible for the administration of all actions called for by this Order. The Respondent's Project Coordinator shall have the technical expertise to oversee adequately all aspects of the Work and shall not be an attorney for the Respondent. Any subsequent change in the Respondent's Project Coordinator shall be accomplished by notifying EPA and DEP in writing at least fourteen (14) days prior to the change.

Designation of Government Coordinators

25. EPA has designated Edward M. Hathaway of the CT/ME/VT Superfund Section, Remediation and Restoration II Branch, Office of Site Remediation and Restoration, EPA Region 1, as its Remedial Project Manager ("RPM") for administration of its responsibilities, for managing oversight of the Work conducted under the Order, and for receipt of all written matter required by the Order. DEP has designated Naji Akladiss as its Project Manager ("DEP Project Manager") for administration of its responsibilities, in providing EPA assistance in overseeing and reviewing the Respondent's performance of the Work, and for receipt of all written matter required by the Order. In addition, EPA has designated Mary Jane O'Donnell of the CT/ME/VT Superfund Section, Remediation and Restoration II Branch, Office of Site Remediation and Restoration, EPA Region 1, as the Geographic Section Chief ("GSC") who shall have ultimate responsibility for the approval/disapproval findings on the Respondent's submissions pursuant to Paragraphs 31, 32 and 33 of this Order. EPA shall notify the Respondent in writing of any changes in the RPM or GSC; EPA and/or DEP shall notify the Respondent in writing of any changes in the DEP Project Manager.

26. The RPM shall have the authority vested in the On-Scene Coordinator and the Remedial Project Manager by the NCP, 40 C.F.R. Part 300. This includes the authority to halt, conduct, or direct any tasks required by this Order and/or any response action, or portions thereof when conditions present an imminent and substantial endangerment to public health or welfare or the environment. The absence of the RPM from the Site shall not be cause for the Respondent to halt actions at the Site.

Place and Manner of Notice

27. Communications among EPA, DEP, and the Respondent, and all documents including reports, approvals, disapprovals, written notice, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the RPM, the DEP Project Manager, and the Respondent's Project Coordinator. For each plan, report (except a quarterly report), or other deliverable identified in the SOW or EPA-approved work plans, at least three (3) copies and one (1) camera ready (unbound) original (and more if requested) shall be submitted to EPA unless EPA directs otherwise. Additionally, at least three (3) copies shall be submitted to the DEP Project Manager. All such documents submitted to EPA pursuant to this Order shall be sent by certified mail, return receipt requested, by courier, or by overnight mail, to the RPM. All such documents submitted to DEP pursuant to this Order shall be hand-delivered or sent by interoffice mail to the DEP Project Manager.

Observation of the Respondent's RI/FS Activities

28. The Respondent shall allow the RPM, the DEP Project Manager, and EPA and DEP employees, agents, consultants, contractors, and authorized representatives to observe the Respondent's work at the Site in implementing the activities pursuant to this Order. The Respondent shall permit such persons: (i) to inspect and copy all records, documents, files or other writings insofar as they would be available to EPA pursuant to its authority under Section 104(e) of CERCLA; (ii) to record all field activities by means of photographic or other recording equipment; (iii) to enter and to freely move about all property on or about the Site; (iv) to conduct such tests as EPA may deem necessary; and (v) to verify the data submitted to EPA by the Respondent.
29. While DEP shall provide the day-to-day oversight of the Respondent's field activities, EPA may also exercise its authority to observe and oversee field activities.

Necessity of Formal Approval

30. No informal advice, guidance, suggestions or comments by EPA or DEP regarding reports, plans, specifications, schedules, or any other writing submitted by the Respondent shall be construed as relieving the Respondent of its obligations to obtain such formal reviews as may be required by this Order.

Submissions Requiring EPA Approval

31. All plans, reports and other deliverables, identified in the SOW or EPA-approved work plans, for submittal to EPA and DEP shall be so delivered by the Respondent to EPA and DEP in accordance with the terms and schedule set forth in this Order (including but not limited to the SOW and any approved work plans). Prior to receipt of EPA approval, any plan, report or other deliverable submitted to EPA and DEP for approval shall be marked "Draft" on each page and shall include, in a prominent location in the document, the following disclaimer: "Disclaimer: This document is a DRAFT document prepared by the Respondent pursuant to a government administrative order which has not received final acceptance from the U.S. Environmental Protection Agency. The opinions, findings, and conclusions expressed are those of the authors and not those of the U.S. Environmental Protection Agency."
32. DEP will review the deliverable documents required by this Order to determine whether they are consistent with the requirements of this Order, the NCP, EPA guidance and policy, and DEP guidance and policy, and will make recommendations to EPA of one or more of four findings, enumerated in subparagraphs a, b, c, and d, below. EPA, based on the recommendations from DEP or based upon its own review, shall issue one or more of the following findings:
- a. Approval—means that the Respondent shall proceed with the next scheduled Work activity consistent with this Order and the approved deliverable.
 - b. Approval with Conditions—means that the Respondent shall proceed with the next scheduled Work activity, subject to certain required modifications or conditions set forth in the EPA comments. EPA will specify a schedule for resubmitting the deliverable with the required modifications or conditions as set forth in the EPA comments. If the Respondent fails to resubmit the deliverable within the specified time, EPA may order the Respondent to cease the Work or any portion thereof until such time as the modification is made or the condition is met.

- c. Disapproval with Modification Required—means that the Respondent shall not proceed until it modifies the deliverable to correct the deficiencies delineated in EPA's comments, and resubmit the deliverable for further EPA review. Modifications may be required in any originally-submitted deliverable, any portions of a deliverable, or any deliverable or portion of deliverable resubmitted to EPA. EPA will specify a schedule for resubmitting deliverables requiring modifications.
- d. Disapproval with EPA Modification—means that EPA has determined that it will modify the submission to cure any deficiencies and/or undertake the Work or any portion of the Work itself. In either case, the Respondent agrees to reimburse EPA for the costs of such modification of deficiencies or undertaking of Work as an oversight cost.

A finding of Approval or Approval with Conditions shall not be construed to mean that EPA concurs with all conclusions, methods, or statements in the deliverables. EPA shall not modify a submission without first providing the Respondent at least one notice of deficiency and an opportunity to cure within fifteen (15) days or such longer time as is specified by EPA, except where to do so would cause serious disruption to the Work or where previous submission(s) have been disapproved due to material defects and the deficiencies in the submission under consideration indicate a bad faith lack of effort to submit an acceptable deliverable.

33. Any reports, plans, specifications, schedules, and other major deliverables required by this Order shall, upon approval or modification by EPA, be incorporated in and be an enforceable part of this Order. Any delay or noncompliance with such reports, plans, specifications, schedules, and attachments or other deliverables shall be considered delay or noncompliance with requirements of this Order and may subject the Respondent to penalties pursuant to Paragraphs 66 and/or 67.

Quarterly Progress Reports

34. The Respondent shall provide quarterly written progress reports ("Progress Reports") to EPA and DEP. These Progress Reports shall succinctly describe the progress made during the preceding quarter by: (1) describing the actions which have been taken toward achieving compliance with this Order; and (2) describing actions, data, plans, and procedures which are scheduled for the next quarter. Upon request by EPA or DEP, the Respondent shall submit with its quarterly progress reports a summary of results of all sampling and/or tests and all other data generated by the Respondent, by its Contractor, or on the Respondent's behalf, in the course of implementation of the Order. The first Progress Report shall be

submitted to the RPM and the DEP Project Manager by July 15, 2005 for the preceding calendar quarter of April, May and June, 2005. Progress Reports for subsequent quarters shall be submitted every three months thereafter. Meetings among EPA's RPM, the DEP Project Manager, the Respondent's Project Coordinator, and the Contractor shall be held at least once per quarter in Maine, unless EPA designates another location or determines that a quarterly meeting is not required for a particular quarter. The Respondent and the Contractor engaged to perform Work under this Order shall also meet with and make presentations to EPA's and DEP's technical staffs at the completion of major components of the Work, as specified by the RPM.

Administrative Record

35. EPA will determine the contents of the administrative record file for selection of the remedial action. The Respondent shall submit to EPA documents developed during the course of the RI/FS upon which selection of the response action may be based. Upon request of EPA, the Respondent shall provide copies of plans, task memoranda for further action, quality assurance memoranda and audits, raw data (including underlying documentation, such as quality assurance/quality control documentation and chain of custody records), field notes, laboratory analytical reports and other reports. Upon request of EPA, the Respondent shall additionally submit any previous studies conducted under state, local or other federal authorities relating to selection of the response action, and communications between the Respondent and state, local or other federal authorities concerning selection of the response action. At EPA's discretion, the Respondent shall establish a community information repository at or near the Site, to house one copy of the administrative record.

Quality Assurance/Quality Control; Health and Safety Compliance

36. While conducting all sample collection and analysis activities required by this Order, the Respondent shall use quality assurance, quality control, and chain of custody procedures in accordance with the SOW and guidance documents, including "EPA Guidance for Quality Assurance Project Plans (QA/G-5)" (EPA/600/R-98/018, February 1998), and "EPA Requirements for Quality Assurance Project Plans (QA/R-5)" (EPA/240/B-01/003, March 2001). The Respondent shall only use laboratories which have a documented quality system that complies with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001) or equivalent documentation as determined by EPA. EPA may consider laboratories accredited under the National Environmental Laboratory Accreditation Program ("NELAP") to meet the quality system requirements. To provide quality assurance and maintain quality control, the Respondent shall submit a Quality Assurance Project Plan ("QAPP") to EPA consistent with the requirements, guidances, and

schedule contained in the SOW. Upon EPA approval (or disapproval with EPA modification) pursuant to Paragraph 32, the Respondent shall comply with the QAPP.

37. The Respondent also shall prepare a Health and Safety Plan as required and described in the SOW. The accepted Health and Safety Plan shall be consistent with and implement standards promulgated by the Secretary of Labor pursuant to CERCLA and Section 6 of the Occupational Safety and Health Act of 1970, as amended.

Split Sampling

38. At the request of EPA and/or DEP, the Respondent shall provide split or duplicate samples to EPA, DEP and/or their authorized representatives of any samples collected by the Respondent pursuant to the implementation of this Order. Similarly, the Respondent shall allow such split or duplicate samples to be taken by EPA, DEP and/or their authorized representatives. To the extent practicable, the Respondent shall notify EPA and DEP twenty-one (21) days in advance of field sampling or monitoring activities. If twenty-one (21) days notice is not practicable, the Respondent shall provide EPA and DEP with no less than five (5) days notice prior to any field sampling or monitoring activities.

Record Preservation

39. During the pendency of this Order and for a period of not less than seven (7) years after EPA certification pursuant to Paragraph 72 of this Order, the Respondent shall preserve originals or identical copies of all records and documents in their possession or under its control and in the possession of its employees, agents, officials, authorized representatives, accountants, contractors, attorneys, and successors or assigns, which relate to their obligations to perform the Work required by this Order, in accordance with the State of Maine's document retention policies. At the conclusion of this document retention period, the Respondent shall notify EPA at least ninety (90) days prior to the destruction of any such records or documents. The Respondent shall send such notice, accompanied by a copy of this Order, to:

Chief, Superfund Legal Office
Office of Environmental Stewardship, Mail Code SES
U.S. Environmental Protection Agency
1 Congress Street, Suite 1100
Boston, Massachusetts 02114-2023
Attention: Callahan Mine Site

Upon request by EPA, the Respondent shall deliver to EPA any or all such records and documents or copies of any such records and documents.

Confidentiality Claims

40. The Respondent may assert a confidentiality claim, if appropriate, covering all or part of the information requested by this Order pursuant to 40 C.F.R. § 2.203(b). Such an assertion shall be adequately substantiated when it is made. At least the first page of each document as to which a confidentiality claim is asserted shall be so marked when submitted to EPA. Neither analytical data nor any information specified in Section 104(e)(7)(F) of CERCLA shall be claimed as confidential by the Respondent. Information determined to be confidential by EPA shall be afforded the protection specified by 40 C.F.R. Part 2, Subpart B, and Section 104(e)(7) of CERCLA. If no such claim accompanies the information when it is submitted to EPA and DEP, it may be made available to the public by EPA and DEP without further notice to the Respondent.

Site Access

41. To the extent that the Respondent owns, occupies, or controls property at the Site, or property adjacent to the Site to which access is required in order to properly carry out the terms of this Order, the Respondent shall grant access to EPA, DEP and their officers, employees, agents, contractors, consultants, and other authorized representatives for purposes of implementing and monitoring Work to be performed under this Order.
42. To the extent access to, use or ownership of, or easements over property other than the Site is required for the proper and complete implementation of this Order, the Respondent shall use its best efforts to obtain site access agreements or other interests in such property within thirty (30) days after the Order's effective date.
43. Such written access agreements or other interests obtained pursuant to the preceding paragraph shall, at a minimum, allow the Respondent, the Respondent's authorized representatives, and EPA and DEP and their officers, employees, agents, contractors, consultants, and other authorized representatives to enter freely and move about the Site at all times in order to implement and oversee the implementation of Work under this Order. In the event that the Respondent fails to obtain any necessary access agreements within the time period specified above, the Respondent shall notify EPA and DEP in writing within four (4) days thereafter. Such notification shall include a description of the efforts made by the Respondent to obtain the necessary access and the reason for its lack of success. The Respondent shall reimburse EPA, in accordance with Paragraphs 54 and 55, for all costs EPA may incur in exercising its statutory authority to gain access to the Site.

Endangerment and Emergency Response

44. Upon the occurrence of any event during or relating to the performance of Work pursuant to this Order that causes or threatens any release of hazardous substances, pollutants or contaminants from the Site into the environment or that endangers the public health, welfare, or the environment, the Respondent shall immediately take all appropriate action to prevent, abate or minimize such release or endangerment. The Respondent shall also orally notify the RPM within twenty-four (24) hours, or in the event of his unavailability, shall notify within the same period the Regional Duty Officer of the Emergency Planning and Response Branch, EPA Region 1, telephone (617) 918-1224. The Respondent shall act in accordance with all applicable provisions of the Health and Safety Plan prepared pursuant to this Order.
45. The Respondent shall submit a written report to EPA within five (5) days after each such event setting forth: (i) the events that have occurred; (ii) the measures taken and to be taken to mitigate any harm caused or threatened by the event; and (iii) the measures taken and to be taken to prevent the reoccurrence of such an event.
46. Regardless of whether or not such a report is made to EPA, if EPA determines that activities in compliance or noncompliance with this Order have caused or may cause a release of a hazardous substance, pollutant or contaminant or a threat to the public health or welfare or to the environment, EPA may: (i) order the Respondent to stop further implementation of this Order for such period of time as may be needed to abate such release or threat; and/or (ii) undertake any action which EPA determines is necessary to abate such a release or threat. In the event that EPA takes action at the Site to remedy such a release, threat of release, or endangerment, the Respondent shall reimburse EPA for the costs of such action pursuant to the terms of Paragraphs 54 and 55.

Use of Resource Conservation and Recovery Act Facilities

47. All facilities used by the Respondent for the off-site transfer, treatment, storage, or disposal of hazardous substances removed from the Site must be in compliance with applicable requirements of the Resource Conservation and Recovery Act, as amended ("RCRA"), and state law. The Respondent is responsible for complying with applicable requirements, including fulfilling the standards applicable to generators of hazardous waste found at 40 C.F.R. Part 262. In particular, this responsibility may include using and signing manifest forms for hazardous waste leaving the Site. Further, the Respondent must designate, in a written report to EPA, any facilities that the Respondent proposes to use for such off-site transfer, storage, treatment, or disposal, and EPA must approve the use of such proposed facilities prior to the shipment of hazardous substances from the Site.

Other Laws

48. The Respondent shall comply with all applicable local, state and federal laws and regulations when performing the RI/FS. No local, state, or federal permit shall be required for any portion of any action conducted entirely on-site, including studies, if the action is selected and carried out in compliance with Section 121 of CERCLA, 42 U.S.C. § 9621. Where any portion of the activities is to be conducted off-site and requires a federal or state permit or approval, the Respondent shall submit timely and complete applications and take all other actions necessary to obtain and to comply with all such permits or approvals. This Order is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.

Public Review and Comment on Deliverables

49. When EPA determines a deliverable required under this Order is acceptable for public review, the deliverable shall be made available by EPA for public comment for a period of not less than thirty (30) days. The dates and length of the public comment period shall be established by EPA. Following the public review and comment period, EPA may refer the deliverable back to the Respondent for revision pursuant to public comments and EPA and DEP comments. In addition, the Respondent shall, at EPA's request, assist EPA in the drafting of responses to public comments on the deliverable; this assistance shall include, but not be limited to, the provision of additional information necessary to respond to such comments and the production of draft responses. EPA will prepare all final responses to public comments.

Community Relations

50. EPA shall be responsible for preparing a Community Relations Plan and conducting a community relations program. The Respondent and the Contractor engaged to conduct the Work under this Order shall, consistent with the Community Relations Plan: (i) attend and participate in public meetings regarding the Site, to the extent specified by the RPM; (ii) prepare fact sheets concerning the Site and activities conducted under this Order for submission to the RPM; and (iii) provide timely and appropriate responses to inquiries from the public at the request of the RPM.

Financial Assurance; Insurance

51. Within thirty (30) days after the effective date of this Order and, if requested, annually thereafter until certification of the Work under Paragraph 72, the Respondent shall demonstrate to EPA that it meets one of the financial assurance mechanisms specified in

40 C.F.R. § 264.143, or equivalent financial assurance as determined by EPA, for the estimated costs of Work to be performed by the Respondent under this Order.

52. At least seven (7) days prior to commencing any on-site Work under this Order, the Respondent shall require the Contractor or the subcontractors to secure, and maintain for the duration of this Order, comprehensive and/or commercial general liability insurance with limits of three million dollars (\$3,000,000), combined single limit, and automobile insurance with limits of two million dollars (\$2,000,000), combined single limit, unless a lower limit is approved by EPA for a particular subcontractor. EPA shall be named as an insured for all such insurance policies, unless EPA agrees to waive this requirement for a particular subcontractor. Within the same time period, the Respondent shall provide EPA with certificates of such insurance and a copy of each insurance policy. If the Respondent demonstrates by evidence satisfactory to EPA that any subcontractor maintains insurance equivalent to that described above or insurance covering the same risks but in a lesser amount, then the Contractor needs to provide only that portion of the insurance described above which is not maintained by the subcontractor.
53. For the duration of this Order, the Respondent shall satisfy, or shall ensure that the Contractor and subcontractors satisfy, all applicable laws and regulations regarding worker's compensation insurance for all persons performing the Work on behalf of the Respondent in furtherance of this Order.

Reimbursement of EPA Oversight Costs

54. The Respondent shall make payment into the Callahan Mine Special Account within the EPA Hazardous Substance Superfund to be retained and used to conduct or finance response actions at or in connection with the Site, or transferred by EPA to the EPA Hazardous Substance Superfund, for all oversight costs incurred after the effective date of this Order by the United States in connection with the Work and this Order. For the purposes of this Order, oversight costs shall include all direct costs related to the Work and this Order and all indirect costs calculated in accordance with EPA policy, including without limitation: time and travel costs of EPA personnel regarding Work activities (including access and community relations); costs related to discussing the interpretation of Order provisions or reviewing any report delivered pursuant to this Order; costs related to resolving disputes which arise under this Order; the costs of modifying a submission to cure any deficiencies and/or undertaking the Work or any portion of the Work itself pursuant to Paragraph 32(d); and any interest that accrues from the date on which payment becomes due pursuant to Paragraph 55. In addition, EPA and the Respondent may agree to enlist the services of other federal agencies to assist in the Respondent's performance of the Work through an

interagency agreement. For the purposes of this Order, costs incurred through such an interagency agreement shall be considered oversight costs.

55. On a quarterly basis, EPA will submit to the Respondent a bill for oversight costs incurred by EPA with respect to the Work and this Order. This bill will consist of a line-item summary of costs incurred during the preceding quarter; the summary will include a breakdown of costs by category, including without limitation payroll, travel, indirect costs, and a brief narrative description of EPA's work related to such costs (generally one to two paragraphs in length). The Respondent shall, within sixty (60) days after receipt of each quarterly bill, remit a State of Maine Treasurer's check payable to the Callahan Mine Special Account within the Hazardous Substance Superfund for the amount of such bill. The Respondent shall include the name of the Site, Site/Spill Identification Number 01-7H, and the docket number for this Order (CERCLA-01-2005-0022) on the check or the transmittal letter and mail the check with the transmittal letter to:

U.S. EPA—Region 1
Attn: Superfund Accounting
P.O. Box 360197M
Pittsburgh, PA 15251

A copy of the transmittal letter and the check shall be provided simultaneously to the EPA Remedial Project Manager.

56. If the Respondent disputes a bill or any portion of a bill submitted by EPA, the Respondent may initiate dispute resolution pursuant to the procedures of Paragraph 63 and 64; provided, however, that the Respondent notifies EPA in writing within sixty (60) days after receipt of the disputed bill and that the Respondent pays all undisputed portions of the bill in accordance with the provisions of this reimbursement section. Unless a determination is made under dispute resolution that the Respondent is not obligated to pay the disputed portion of the bill, the time for payment of the disputed portion shall remain the original payment due date, interest shall accrue on any unpaid portion of the bill from the original payment due date, and EPA may seek stipulated penalties or otherwise act to enforce the Respondent's compliance with this section and the Order. If the Respondent fails to raise a dispute within sixty (60) days of their receipt of the bill, the Respondent remains obligated for payment of the entire amount of the bill on the original payment due date, interest shall accrue on any unpaid portion of the bill from the original payment due date, and EPA may seek stipulated penalties or otherwise act to enforce the Respondent's compliance with this section and the Order.

Funding

57. It is the expectation of the Parties that all obligations of the Respondent arising under this Order will be fully funded. MaineDOT agrees to seek sufficient funding through the State of Maine budgetary process to fulfill the Respondent's obligations under this Order by including in its budget requests the specific cost estimates and budgetary proposals associated with implementation of this Order.
58. Any obligation of the Respondent established by the terms of this Order, including any requirement for the payment or obligation of funds, such as stipulated penalties, shall be subject to the availability of funds appropriated by the Maine Legislature.
59. If appropriated funds are not available or sufficient to fulfill the Respondent's obligations under this Order, EPA and DEP reserve the right to initiate an action against the Respondent or any other person, or take such response action which would be appropriate absent this Order; provided however that nothing in this section shall preclude the Parties from agreeing if they so choose to appropriately adjust the dates established for the Respondent's obligations under this Order when appropriated funds are not available or sufficient for the Respondent to meet those dates.

Force Majeure

60. The Respondent agrees to perform all requirements of this Order within the time limits established under this Order, unless the performance is delayed by a *force majeure*. For purposes of this Order, *force majeure* is defined as any event arising from causes beyond the control of the Respondent or of any entity controlled by the Respondent, including but not limited to its Contractor and subcontractors, which delays or prevents performance of any obligation under this Order despite the Respondent's best efforts to fulfill the obligation. *Force majeure* does not include financial inability to complete the Work or increased cost of performance.
61. If any event occurs or has occurred that may delay the performance of any obligation under this Order, whether or not caused by a *force majeure* event, the Respondent shall notify the RPM and the DEP Project Manager orally within seventy-two (72) hours of when the Respondent first knew that the event might cause a delay. Within seven (7) days thereafter, the Respondent shall provide to EPA and DEP in writing an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; the Respondent's rationale for attributing such delay to a *force majeure* event if it intends to assert such a claim; and a

statement as to whether, in the opinion of the Respondent, such event may cause or contribute to an endangerment to public health, welfare or the environment. Failure to comply with the above requirements shall preclude the Respondent from asserting any claim of *force majeure* for that event for the period of time of such failure to comply and for any additional delay caused by such failure.

62. If EPA agrees that the delay or anticipated delay is attributable to a *force majeure* event, the time for performance of the obligations under this Order that are affected by the *force majeure* event will be extended by EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the *force majeure* event shall not, of itself, extend the time for performance of any other obligation. If EPA does not agree that the delay or anticipated delay has been or will be caused by a *force majeure* event, EPA will notify the Respondent in writing of its decision. If EPA agrees that the delay is attributable to a *force majeure* event, EPA will notify the Respondent in writing of the length of the extension, if any, for performance of the obligations affected by the *force majeure* event.

Dispute Resolution

63. If the Respondent objects to any EPA notice of disapproval or decision made pursuant to this Order, including any decision which has resulted in the assessment of stipulated penalties, the Respondent shall notify EPA and DEP in writing of its objections within ten (10) days of receipt of the notice or decision. EPA's RPM, the DEP Project Manager and the Respondent's Project Coordinator shall communicate on the disputed matter and shall have fourteen (14) days from the receipt by EPA of the notification of objection to reach agreement. If agreement cannot be reached on any issue within this fourteen (14) day period, the Respondent shall have five (5) additional days to submit its position in writing to the Chief of OSRR's Remediation & Restoration Branch ("R&R Branch Chief"). After giving the Respondent an opportunity to meet with EPA, the R&R Branch Chief shall provide a written determination of the issue to the Respondent. The Respondent shall implement the activities required by this determination beginning no later than ten (10) days after receipt of this determination unless the Respondent still has objections, in which case it shall have five (5) additional days to submit its position in writing to the Director of OSRR. After giving the Respondent an opportunity to meet with EPA, the Director of OSRR shall provide a written statement of its determination of the issue to the Respondent. The Respondent shall implement the activities required by the Director of OSRR's determination beginning no later than ten (10) days after receipt of this determination. Except as specifically provided herein, engagement of dispute resolution among the Parties shall not be cause for the delay of any Work.

64. Mediation.

- a. At any time during the dispute resolution period, either the Respondent or EPA may propose the use of a mediator to assist in resolving the dispute. Upon the request of the Respondent or EPA, a meeting shall take place among the Parties with the assistance of a mediator for the purpose of resolving the dispute and/or determining whether to undertake further mediated discussions. The Respondent and EPA shall confer and jointly select a mediator. This initial meeting shall take place within ten business days of the party's request, unless the Respondent and EPA agree to extend that period.
- b. After the initial mediated meeting, the decision to continue the mediation shall be in the sole discretion of each party.
- c. EPA and the Respondent agree that they will share equitably the costs of mediation, subject to the availability of funds for this purpose. If either EPA or the Respondent determine that no mediation funding is available, each party shall have the option to cover all of the mediation costs or to request the services of a trained mediator from EPA's in-house program or any other dispute resolution professional whose services may be available to the parties at no cost.
- d. EPA and the Respondent agree that the mediation discussions shall be considered compromise negotiations under Rule 408 of the Federal Rules of Evidence and Rule 408 of the Maine Rules of Evidence.

65. In the event that the Respondent does not implement the activities required by the EPA determination, EPA may take such civil enforcement actions against the Respondent as may be provided by statutory or equitable authorities, including, but not limited to, the assessment of such civil penalties or damages as are authorized by Sections 122 and 109 of CERCLA. In such an event, EPA retains the right to undertake any obligations of the Respondent under this Order pursuant to its authority under CERCLA and to recover the costs thereof from the Respondent.

Stipulated Penalties for Delays in Performance

66. For each day that the Respondent fails to submit a timely or adequate plan, report, or other deliverable identified in the SOW or EPA-approved work plans (except for a Progress Report or any deliverable identified as "interim" in an EPA-approved work plan), unless excused by EPA pursuant to Paragraph 62 as a *force majeure* event, upon receipt of a written

demand by EPA, the Respondent shall pay to EPA the sums set forth below as stipulated penalties:

<u>Period of Failure to Comply</u>	<u>Penalty Per Day</u>
1st - 10th day	\$750
11th - 20th day	\$1,500
each day thereafter	\$2,500

Penalties shall begin to accrue on the day after performance is due, and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity.

67. For each day that the Respondent fails to comply with any deadline established pursuant to this Order other than deadlines governed by the preceding paragraph, unless excused by EPA pursuant to Paragraph 62 as a *force majeure* event, stipulated penalties to EPA in the amount of three hundred seventy five dollars (\$375) per day shall accrue on the day after performance is due and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity.
68. Stipulated penalties shall not accrue: (1) with respect to a deficient submission under Paragraphs 31, 32 and 33 (Submissions Requiring EPA Approval), during the period, if any, beginning on the 31st day after EPA's receipt of such submission until the date that EPA notifies the Respondent of any deficiency; and (2) with respect to a determination by the R&R Branch Chief or the Director of OSRR, under Paragraph 63 (Dispute Resolution), during the period, if any, beginning on the 21st day after the Respondent submits its position in writing until the date that the EPA management official issues a determination regarding such dispute. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Order.
69. Any penalty accruing under Paragraphs 66 or 67 shall be due and payable within thirty (30) days of the receipt of a written demand by EPA. Payment of such penalty shall be made by State of Maine Treasurer's check payable to the EPA Hazardous Substance Superfund, and mailed to the following address with the name of the Site, Site/Spill Identification Number 01-7H, and a notation of the docket number of this Order (CERCLA-01-2005-0022) on the check or the transmittal letter:

U.S. EPA—Region 1
Attn: Superfund Accounting
P.O. Box 360197M
Pittsburgh, PA 15251

A copy of the check shall be sent to the RPM within ten (10) days of payment. The stipulated penalties set forth in this section do not preclude EPA from electing to pursue any other remedies or sanctions which may be available to EPA by reason of the Respondent's violation of this Order or the Respondent's failure or refusal to comply with any of the requirements of this Order. Such remedies and sanctions include injunctive relief, the assessment of such civil penalties or damages as are authorized by Sections 122 and 109 of CERCLA, or the performance of a federally-funded response action, and a corresponding suit for reimbursement of costs incurred by the United States.

70. If the Respondent invokes dispute resolution regarding any decision which has resulted in the assessment of stipulated penalties, the Respondent shall pay all stipulated penalties for which EPA has made a written demand into an interest-bearing escrow account within thirty (30) days of receipt of the EPA demand. The Respondent shall pay penalties into this account as they continue to accrue, at least every thirty (30) days. Within seven (7) days after receipt of the EPA decision regarding the disputed matter, the escrow agent shall pay the balance of the account to the prevailing party identified in the EPA decision.

Civil Penalties for Noncompliance

71. Nothing in this Order shall be construed as prohibiting, altering, or in any way limiting the ability of EPA to seek any other remedies or sanctions available by virtue of the Respondent's violation of this Order or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Section 122(l) of CERCLA, 42 U.S.C. § 9622(l), and punitive damages pursuant to Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3); provided, however, that EPA shall not seek civil penalties pursuant to Section 122(l) of CERCLA or punitive damages pursuant to Section 107(c)(3) of CERCLA for any violation for which a stipulated penalty has been paid by the Respondent as provided herein, except in the case of willful violation of this Order or in the event that EPA assumes performance of a portion or all of the Work pursuant to Paragraphs 75 and 76 (EPA's Reservation of Rights). Notwithstanding any other provision of this section, EPA may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this Order.

Certification of the Respondent's Performance of the Work Activities

72. Upon EPA's issuance of the final Record of Decision, EPA shall promptly determine if the Respondent has met all of its responsibilities hereunder, including payment of oversight costs and any stipulated penalties or other penalties or damages that the Respondent may have incurred during the course of their activities under the Order, with the exception of any continuing obligations required by this Order. If EPA determines that such responsibilities

have been satisfied, EPA will, after issuance of the final Record of Decision for the Site, certify to the Respondent that its responsibilities under this Order have been discharged, and this Order shall terminate. This certification shall not, however, terminate the Respondent's obligation to comply with Paragraph 39.

Covenant Not to Sue; Denial of Liability

73. Upon certification by EPA that the Respondent has completed all obligations under this Order, EPA covenants not to sue the Respondent for all Work completed under this Order. This covenant not to sue shall not take effect and shall be rendered null and void in the event that the Respondent fails to make all of the payments required of them by this Order. The Respondent is not released from liability, if any, for any actions taken beyond the terms of this Order regarding investigations, removals, other operable units, remedial design/remedial action of any operable unit, or activities arising pursuant to Section 121(c) of CERCLA, 42 U.S.C. § 9621(c).

Contribution Protection

74. EPA and the Respondent agree that the Respondent is entitled, as of the effective date of this Order, to protection from contribution actions or claims as provided by Sections 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4), for "matters addressed" in this Order. The "matters addressed" in this Order are the Work and all oversight costs incurred after the effective date of this Order by the United States in connection with the Work and this Order. Nothing in this Order precludes the United States, DEP or the Respondent from asserting any claims, causes of action, or demands against any person not parties to this Order for indemnification, contribution, or cost recovery.

EPA's Reservation of Rights

75. EPA reserves the right to bring an action against the Respondent under Section 107 of CERCLA for recovery of: (i) all past response costs incurred by the United States at the Site not reimbursed by the Respondent; (ii) any costs incurred in the event that EPA performs all or a portion of the Work; and (iii) any future costs incurred by the United States in connection with response activities conducted under CERCLA at this Site. EPA expressly reserves any and all rights and defenses that it may have to enforce this Order against the Respondent, including EPA's right under this Order both to disapprove of Work performed by the Respondent and to require that the Respondent perform tasks in addition to those detailed in this Order. In addition, EPA reserves the right to undertake actions under Section 104 of CERCLA, including removal and/or remedial actions, at any time, and to perform any and all portions of the RI/FS or Work which the Respondent fails to perform to EPA's

satisfaction. EPA reserves all rights against the Respondent with respect to liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments, and liability for costs incurred or to be incurred by the Agency for Toxic Substances and Disease Registry related to the Site. Except as expressly provided herein, issuance of this Order shall not affect or limit in any way any rights which EPA may have in relation to any liabilities or obligations which the Respondent or other persons may be subject to under CERCLA or other laws by virtue of any connections that the Respondent or those other persons have or may have had with the Site. EPA reserves any and all rights to take any enforcement action pursuant to CERCLA and/or any other available legal authority, including the right to seek injunctive relief, response costs, monetary penalties, punitive damages, and criminal actions for any violation of law or this Order.

76. Notwithstanding any other provision of this Order, EPA shall retain all of its information gathering, entry, inspection, and enforcement authorities and rights under CERCLA and under any other applicable law, regulation, or permit.

Covenant Not to Sue by the Respondent and DEP

77. The Respondent and DEP covenant not to sue and agree not to assert any claims or causes of action against the United States, or its contractors or employees, with respect to the Work, the costs of the Work, or any other cost incurred pursuant to this Order, including, but not limited to:
- a. any direct or indirect claim for reimbursement from the Hazardous Substance Superfund established by 26 U.S.C. § 9507, based on Sections 106(b)(2), 107, 111, 112, or 113 of CERCLA, 42 U.S.C. §§ 9606(b)(2), 9607, 9611, 9612, or 9613, or any other provision of law;
 - b. any claim arising out of the Work or arising out of the response actions for which any other cost incurred pursuant to this Order have or will be incurred, including any claim under the United States Constitution, the Maine Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, as amended, or at common law; or
 - c. any claim against the United States pursuant to Sections 107 and 113 of CERCLA, 42 U.S.C. §§ 9607 and 9613, relating to the Work or payment of any other cost incurred pursuant to this Order; or

- d. any claim for funding for support agency activities under a support agency cooperative agreement pursuant to Section 104(d) of CERCLA, 42 U.S.C. § 9604(d).
78. Nothing in this Order shall be deemed to constitute approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. § 300.700(d).

Other Claims

79. By issuance of this Order, the United States, EPA and DEP assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondents.
80. Except as expressly provided herein, nothing in this Order shall constitute or be construed as a release or covenant not to sue by EPA, DEP or the Respondent regarding any claim, cause of action, or demand in law or equity against any person, firm, trust, trustee, joint venture, partnership, corporation, or other entity for any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous substances, hazardous wastes, pollutants, or contaminants found at, taken to, or taken from the Site. Except as expressly provided herein, this Order shall not estop or limit any legal or equitable claims of the United States against the Respondent, its agents, contractors, or assigns, including, but not limited to, claims related to releases of hazardous substances or other pollutants or contaminants.
81. No action or decision by EPA pursuant to this Order shall give rise to any right to judicial review except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).

Indemnification

82. The United States does not assume any liability by entering into this Order or by virtue of any designation of the Respondent as EPA's authorized representative. The Respondent shall require the Contractor to indemnify and save and hold harmless the United States Government, its agencies, departments, agents, offices, employees, and representatives from any and all claims or causes of action arising from or on account of negligent or other wrongful acts or omissions of the Contractor, and its officers, employees, agents, servants, receivers, successors, trustees, assignees, or contractors in carrying out the activities pursuant to this Order. In addition, the Respondent shall require the Contractor to pay the United States all costs incurred by the United States, including but not limited to attorneys fees and other expenses of litigation and settlement, arising from or on account of claims made against the United States based upon negligent or other wrongful acts or omissions of

the Contractor, and its officers, employees, agents, servants, receivers, successors, trustees, assignees, or contractors in carrying out activities pursuant to this Order. The United States shall not be held out as a party to, or in any other way be held liable under, any contract entered into by the Respondent or by the Contractor in carrying out the activities pursuant to this Order.

Waiver of Settlement Conference

83. In consideration of the communications among EPA, DEP and the Respondent regarding the terms of this Order prior to its issuance, the Respondent hereby agrees that there is no need for a settlement conference prior to the effective date of this Order.

Modification of Order

84. This Order, with the exception of the SOW or deliverables thereunder, may only be modified upon the written agreement of the Parties by signature of the Director of OSRR, the Director of the Division of Site Investigation & Remediation of DEP, and the Respondent's Project Coordinator. The SOW or any accepted deliverables may be modified upon signature of the Geographic Section Chief.

Separate Documents

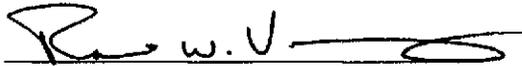
85. This Order may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

Effective Date; Computation of Time

86. This Order shall be effective five (5) days after the Order is signed by the Regional Administrator. All times for performance of activities under this Order shall be calculated from the effective date. For purposes of this Order, the term "day" shall mean a calendar day unless otherwise noted herein. When computing any period of time under this Order, if the last day would fall on a Saturday, Sunday, or federal holiday, the period shall run until the next working day. EPA shall promptly inform the Respondent of the execution of this Order by the Regional Administrator. EPA shall provide written notice, by e-mail, on the date the Regional Administrator signs this Order.

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IT IS SO AGREED AND ORDERED BY:



Robert W. Varney
Regional Administrator
EPA Region 1

6/7/05
Date

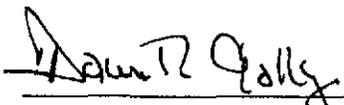


Man Chak Ng
Senior Enforcement Counsel
EPA Region 1

6/2/05
Date

IT IS SO AGREED,

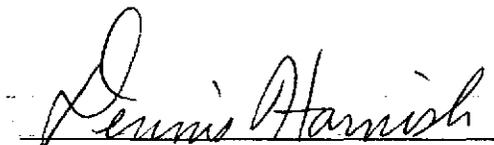
For Maine Department of Environmental Protection



Dawn R. Gallagher
Commissioner

5/27/05

Date



Dennis J. Harnish, Esq.
Assistant Attorney General
Department of the Attorney General

5/27/05

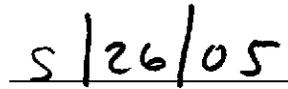
Date

IT IS SO AGREED,

For Maine Department of Transportation



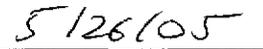
David A. Cole
Commissioner



Date



Mary M. Sauer, Esq.
Assistant Attorney General
Department of the Attorney General



Date

CALLAHAN MINE SUPERFUND SITE

STATEMENT OF WORK

(Appendix A of Administrative Order by Consent for Remedial Investigation and Feasibility Study, U.S. EPA Region 1 Docket No. CERCLA-01-2005-0022)

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SECTION 1: OBJECTIVES, REPORTING REQUIREMENTS & SCHEDULE

I. Objectives

The primary objective of the Remedial Investigation and Feasibility Study (“RI/FS”) shall be to assess site conditions and evaluate alternatives to the extent necessary to select a remedy for the Site, as defined in the Administrative Order by Consent for Remedial Investigation and Feasibility Study (“Order”), U.S. EPA Region 1 Docket No. CERCLA-01-2005-0022, that shall be consistent with the most recent National Oil and Hazardous Contingency Plan (40 C.F.R. Part 300) (“NCP”) and relevant guidance. The RI and FS shall be conducted simultaneously as integrated, phased studies leading to the selection of a remedy. The integration and phasing of the RI and FS reflect the intent of EPA’s developing policies for RI/FS studies as reflected in Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final (EPA/540/G-89/004, OSWER Directive 9355.3-01, October 1988) and the NCP. The RI/FS shall also consider the information contained in the Abandoned Mine Site Characterization and Cleanup Handbook (EPA/910-B-00-001, August 2000).

A. Remedial Investigation

The objectives of the RI are, consistent with the NCP and taking into consideration existing information regarding the Site, to:

1. define the source(s), nature, extent, and distribution of contaminants released;
2. provide sufficient information for EPA to assess the current and future potential risks to human health and to the environment; and
3. provide sufficient information to evaluate remedial alternatives, conceptually design remedial actions, select a remedy, and issue a record of decision.

If EPA, after reasonable opportunity for review and comment by the State of Maine Department of Environmental Protection (“DEP”), determines that any of these objectives are not fully met, additional Work Plans, studies or other appropriate activities shall be designed and performed by EPA or the Respondent until EPA, after reasonable opportunity for review and comment by DEP, decides that no further investigation is necessary to achieve the goals and intentions of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended (“CERCLA”).

The RI shall include, but is not limited to, data gathering (monitoring and testing), and developing methodologies, procedures, and assessments for characterizing the physical and chemical attributes of the Site.

B. Feasibility Study

The objectives of the FS portions are to:

1. review the applicability of various remedial technologies, including innovative technologies, to determine whether they are appropriate remedies for the Site;
2. determine if each alternative developed by combining technologies is effective, by evaluating in the short and long term each alternative's:
 - (a) effectiveness,
 - (b) implementability, and
 - (c) cost;
3. evaluate each alternative or combination of alternatives through a detailed and comparative analysis based upon the nine (9) criteria listed in the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final (EPA/540/G-89/004, OSWER Directive 9355.3-01, October 1988), and any criteria identified in the NCP (40 C.F.R. Part 300) or CERCLA; and
4. provide direction to the RI to ensure that sufficient data of the appropriate type are gathered to select a remedy based on the factors mentioned in the objectives listed above.

The FS shall include, but is not limited to, conceptualizations, engineering analyses, cost analyses, and an analysis of time frames for the achievement of clean-up goals.

II. Reporting Requirements

All data, methods, and interpretations must be:

- A. scientifically and technically sound with relevant assumptions, biases, potential deficiencies, safety factors, and design criteria explicitly stated in writing;
- B. discussed with observations and interpretation clearly identifiable and distinguishable;
- C. discussed with relevant supporting reference material clearly identified and included;
- D. concisely illustrated and presented in separate graphs, charts, maps, plans and/or

cross-sections where possible so that the text provides a clear discussion of such illustrations;

- E. linked to each and every objective for which they were completed and to which they are applicable; and
- F. sufficient to satisfy the objectives of the RI and FS listed above.

III. Steps, Deliverables & Schedule

A. RI/FS Steps

The Respondent shall perform the RI/FS as presented in this Statement of Work ("SOW"), which is based on the current understanding of the Site. The integrated RI/FS process ensures an orderly selection of a remedy. Site data needed to perform the FS shall be identified as early as possible in the RI. However, the results of investigations during the RI/FS may require changes in the process.

The integrated RI/FS process described herein for the Site has several major steps, as shown in Table 1. Each step of the RI/FS process is associated with one or more phases of the RI or the FS (or the preparation of additional drafts and revisions of the RI/FS) and at least one deliverable, as shown in Table 1 and discussed in Sections 2 through 5. Prior to the initiation of the RI/FS, there is a scoping phase that requires review of all existing data and the development of the basis project plans to support the RI. The RI has two phases, and the FS has two phases (see Figure 1.1 in the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final, OSWER Directive 9355.3-01, EPA/540/G-89/004, October 1988). Phase 1 of the RI, including the field investigation component of the Site Characterization, has been divided into Phase 1A and Phase 1B Field Investigations. Phase 2 of the RI includes, but is not limited to, if necessary, bench and pilot studies of potential technologies, literature searches, and field investigations to address any data gaps identified as a result of the Phase 1 RI. Phase 1 of the FS is the development and screening of alternatives, while Phase 2 of the FS consists of a detailed analysis of alternatives.

EPA performed the scoping activities, including the development of draft project plans in 2003 and 2004. In addition, EPA completed a portion of the Phase 1A program in the fall of 2004 prior to the Respondent's initiation of work. The Respondent shall update the project plans and complete the Phase 1A as the initial activities required by this SOW. The Respondent shall complete the remaining tasks in this SOW as specified herein.

In addition to the above-described major steps shown in Table 1, this SOW describes an additional component of the RI/FS process: the Baseline Risk Assessment (which is also

shown in Table 1). The Respondent shall conduct a Baseline Risk Assessment, producing a report which shall be submitted as a separate document. The Baseline Risk Assessment shall be separated into a Baseline Human Health Risk Assessment and Baseline Ecological Risk Assessment.

B. RI/FS Deliverables

Deliverables for each step of the RI/FS are shown on Table 1. The actual number of deliverables may vary depending on:

1. the types of deliverables proposed by the Respondent and approved by EPA;
2. tasks within the RI/FS steps, particularly the tasks planned for the scoping of the RI/FS (Step 1) and the Phase 1A RI (Step 2);
3. revisions based on EPA and DEP review;
4. necessity for additional field studies, analyses, and documentation;
5. the quality and completeness of the Respondent's work; and
6. the total number of steps required by EPA to be completed, after providing reasonable opportunity for review and comment by DEP.

EPA will consult with DEP (in DEP's traditional support agency and oversight assistance roles) in its review of each deliverable; however, pursuant to the procedures described in the Order, EPA retains the authority to approve, disapprove, or modify all deliverables.

C. RI/FS Schedule

Initiation of the schedule for the Respondent to submit the Revised RI/FS Work Plan shall be triggered by the Effective Date of the Order to perform the RI/FS. Initiation of the other steps and components of the RI/FS shall be triggered by notice from EPA as stated in Table 1. EPA may give notice to start a component of the study if appropriate even if prior steps have not been completed. If EPA agrees, the schedule may be modified by the Respondent from time to time, as may be appropriate.

The established schedule shall be included as a component of the Revised RI/FS Work Plan. Modifications of the schedule must be approved by EPA, after providing reasonable opportunity for review and comment by DEP, prior to their implementation. The schedule shall be presented as a chart or table, which shall be updated when the schedule changes. A copy of the schedule shall be contained in each major deliverable of

the RI/FS and a summary status provided in each quarterly progress report required by the Order.

Table 1—Schedule for RI/FS Process

<i>Step</i>	<i>Deliverable</i>	<i>Due Date</i>
1. Scoping the RI/FS	Revised RI/FS Work Plan, including Project Operations Plan ("POP")	June 30, 2005
2. Phase 1A RI	Initial Site Characterization (Phase 1A RI) Report; Phase 1B Field Investigation Work Plan (if required)	April 30, 2006
3. Phase 1B & 2 (if required) RI and Phase 1 & 2 FS	First Draft RI/FS, including draft Human Health and Ecological Baseline Risk Assessment; Post-Screening Field Investigation (Phase 2 RI) Work Plan (if required); Work Plan for Additional Studies (if required)	March 30, 2007
4. Additional RI/FS Drafts, Reviews, and Revisions	Second Draft RI/FS and subsequent drafts of the RI/FS until a Final Draft RI/FS is accepted by EPA for public review and comment, a responsiveness summary is completed, and a Record of Decision is signed; draft responses to public comments for EPA's responsiveness summary	To be determined by EPA (following notice to proceed)

SECTION 2: STEP 1—SCOPING OF THE RI/FS

I. Objectives

EPA has completed the scoping for the RI/FS tasks with respect to the fall 2004 field activities. The Respondent shall conduct a detailed review of available historical information and data pertaining to the Site, EPA and DEP guidance and policy, EPA's RI/FS Work Plan, and the information derived from the fall 2004 field program, and submit a Revised RI/FS Work Plan that is consistent with the requirement of this SOW. As part of the Revised RI/FS Work Plan, the Respondent shall review the Conceptual Site Model ("CSM") presented in EPA's RI/FS Work Plan to assist in the development of the plans for field activities during the RI/FS. The requirements listed in the Project Operations Plans ("POP") will apply to every Work Plan that involves field activities and will be updated via addenda as needed for every such Work Plan that involves field activities.

II. Step 1 Deliverables

A. Overview

As part of the Revised RI/FS Work Plan, the Respondent shall deliver to EPA and DEP the following updated plans in writing:

1. Project Operations Plan;
2. Preliminary Identification of Probable ARARs;
3. Data Requirements of Potential Remedial Alternatives and Technologies;
and
4. Expanded Schedule for the RI/FS.

Collectively, these documents are referred to as the Revised RI/FS Work Plan in Table 1 and elsewhere in this document. The initial Revised RI/FS Work Plan shall describe necessary studies to be done to complete the RI/FS. The Project Operation Plans shall be revised as necessary, and revisions submitted prior to each subsequent phase of work as described in Table 1.

B. Project Operations Plan

Before the initiation of field activities as part of the Phase 1A RI, several site-specific plans shall be written to establish procedures to be followed by the Respondent in performing field and laboratory work, and community and agency liaison activities. These site-specific plans include the:

- 1) Sampling and Analysis Plan ("SAP"), consisting of a Quality Assurance

- Project Plan (“QAPP”) and a Field Sampling Plan (“FSP”);
- 2) Health and Safety Plan (“HSP”); and
- 3) Community Relations Support Plan (“CRSP”).

The Respondent shall combine these plans into the Project Operations Plan (“POP”). The POP is part of the Revised RI/FS Work Plan. The POP is subject to EPA and DEP review, subsequent requests by EPA for revision, and rewriting by the Respondent before the commencement of RI field work at the Site. The three components of the POP are discussed in the following sub-sections.

The Respondent shall modify the format and scope of each plan as needed to describe the sampling, analyses, and other activities that are determined to be needed as the RI/FS progresses. These activities may include on-site pilot studies and/or laboratory bench scale studies of remedial technologies, and subsequent rounds of field sampling. EPA, after consultation with the Respondent, may modify the scopes of these activities at any time during the RI/FS at the discretion of EPA in response to the evaluation of RI/FS results or other developments or circumstances.

1. Sampling and Analysis Plan (“SAP”)

The purpose of the Sampling and Analysis Plan is to ensure that sampling data collection activities will be consistent with current sampling and analytical methodologies and will be comparable to and compatible with previous EPA and DEP data collection activities performed at the Site while providing a mechanism for planning and approving field activities.

The overall objectives of the Sampling and Analysis Plan are as follows:

- a. to document specific data quality objectives (“DQOs”), procedures, and rationales for field work and sample analytical work;
- b. to provide a mechanism for planning and approving site and laboratory activities;
- c. to ensure that sampling and analysis activities are necessary and sufficient; and
- d. to provide a common point of reference for all parties to ensure the comparability and compatibility of sampling and analysis activities to meet the stated project objectives.

The first SAP shall be the framework of all anticipated field activities (*e.g.*, sampling objectives, evaluation of existing data, standard operating procedures) and contain specific information on the Phase 1A field work (*e.g.*, sampling

locations and rationale, sample numbers and rationale, analyses of samples). During the RI/FS, the SAP shall be revised as necessary to cover each round of field or laboratory activities.

The SAP consists of two parts: (1) a Quality Assurance Project Plan ("QAPP"), and (2) a Field Sampling Plan ("FSP"). The QAPP shall follow the requirements in QA/R-5 and the "Region I, EPA-New England Compendium of Quality Assurance Project Plan Requirements and Guidance." The FSP will contain all of the standard operating procedures ("SOPs") and other documentation to support specific sections of the QAPP. In some cases where there are unique FSP components for special applications, they will be added to the QAPP in the appropriate sections. In addition, the FSP and QAPP should be submitted as a single document (although they may be bound separately to facilitate use of the FSP in the field).

The SAP shall specify in the QAPP/FSP provisions for notifying EPA and DEP prior to the initiation of each field sampling or monitoring activities. To the extent practicable, the Respondent shall notify EPA and DEP twenty-one (21) days in advance of field sampling or monitoring activities. If twenty-one (21) days notice is not practicable, the Respondent shall provide EPA and DEP with no less than five (5) days notice prior to any field sampling or monitoring activities. The plan shall also allow split, replicate, or duplicate samples to be taken by EPA, DEP (or their contractor personnel or other government agencies working with EPA). At the request of EPA or DEP, the Respondent shall provide these samples in appropriate containers to the government representatives. Identical procedures shall be used to collect the Respondent's, EPA, and DEP samples, unless otherwise specified by EPA or DEP. In the event that, following good-faith sampling efforts, insufficient sample volume is available to provide all the requested samples (*e.g.*, due to poor recovery), priority shall be given to addressing quantity requirements for the Respondent's samples (as opposed to providing reduced volumes to all collectors and compromising analytical detection limits).

Guidance on the topics covered in the QAPP and FSP and their integration into each of these plans and the integration of the QAPP and the FSP into the SAP can be found in the following several references which shall be used to develop the SAP:

EPA Requirements for Quality Assurance Plans, EPA QA/R-5 (EPA/240/B-01/003, March 2001);

Guidance for Quality Assurance Project Plans, QA/G-5 (EPA 600/R-02/009, December 2002);

Region I, EPA-New England Compendium of Quality Assurance Project Plan Requirements and Guidance (U.S. EPA-New England Region I Quality Assurance Unit Staff, Office of Environmental Measurement and Evaluation, October 1999);

Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final (OSWER Directive 9355.3-01, EPA/540/G-89/004, October 1988);

Guidance for the Data Quality Objectives Process, QA/G-4 (EPA/600/R-96/055, August 2000);

Draft Data Quality Objectives Decision Errors Feasibility Trials (DEFT) Software (EPA/600/R-96/056, September 1994);

Guidance for the Data Quality Objectives Process for Hazardous Waste Sites, QA/G-4HW (EPA/600/R-00/007, January 2000);

Guidance for Preparing Standard Operating Procedures (SOPs), EPA QA/G-6 (EPA/240/B-01/004, March 2001);

Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses, (Revised December 1996);

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA Pub. SW-846, Third Edition, latest update); and

Guidance for Data Quality Assessment: Practical Methods for Data Analysis, EPA QA/G-9 (EPA/600/R-96-084, QA 97 Version, January 1998).

1a. Quality Assurance Project Plan (“QAPP”)

The Quality Assurance Project Plan (“QAPP”) shall document in writing the site-specific objectives, policies, organizations, functional activities, sampling and analysis activities and specific quality assurance/quality control activities designed to achieve the DQOs of the RI/FS. The QAPP developed for this project shall document quality control and quality assurance policies, procedures, routines, and specifications.

Project activities throughout the RI/FS shall comply with the QAPP. QAPP sampling and analysis objectives and procedures shall be consistent with EPA Requirements for Quality Assurance Plans, EPA QA/R-5 (EPA/240/B-01/003, March 2001), Guidance for Quality Assurance Project Plans, QA/G-5 (EPA 600/R-98/018, February 1998), and appropriate EPA handbooks, manuals, and guidelines, including Region I, EPA-New England Compendium of Quality Assurance Project Plan Requirements and Guidance (October 1999 Final, the "Compendium"), Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA Pub. SW-846, Third Edition, latest update) (CLP Routine Analytical Services, RAS, latest Statement of Work should be used), Guidelines Establishing Test Procedures for the Analysis of Pollutants (40 CFR, Part 136), and Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air (EPA-600/4-84-041, April 1984).

All the QAPP elements identified in QA/R-5 and the Compendium must be addressed.

As indicated in QA/R-5 and the Compendium, a list of essential elements must be considered in the QAPP for the RI/FS. If a particular element is not relevant to a project and therefore excluded from the QAPP, specific and detailed reasons for exclusion must be provided.

Information in a plan other than the QAPP may be cross-referenced clearly in the QAPP, provided that all objectives, procedures, and rationales in the documents are consistent, and the reference material fulfills requirements of QA/R-5. Examples of how this cross-reference might be accomplished can be found in the Guidance for the Data Quality Objectives Process (EPA/600/R-96/055) and the Data Quality Objectives Decision Errors Feasibility Trials (DEFT) Software (EPA/600/R-96/056). EPA-approved references, or equivalent, or alternative methods approved by EPA shall be used, and their corresponding EPA-approved guidelines should be applied when they are available and applicable.

Laboratory QA/QC Procedures:

The QA/QC procedures and SOPs for any laboratory (both fixed and mobile) used during the RI/FS shall be included in the Respondent's QAPP. When this work is performed by a contractor to a private party, each laboratory performing chemical analyses shall meet the following requirements:

1. be approved by the State Laboratory Evaluation Program, if available;
2. have successful performance in one of EPA's National Proficiency Sample Programs (e.g., Water Supply or Water Pollution Studies or the State's proficiency sampling program);
3. be familiar with the requirements of 48 C.F.R. Part 1546 contract requirements for quality assurance; and
4. have a QAPP for the laboratory including all relevant analysis. This plan shall be referenced as part of the Respondent's QAPP.

Data Validation Procedures:

The Respondent is required to certify that a representative portion of the data has been validated by a person independent of the laboratory according to the Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses, Revised December 1996 (amended as necessary to account for the differences between the approved analytical methods for the project and the current Contract Laboratory Program Statements of Work ("CLP SOW")). A data validation reporting package as described in the guidelines cited above must be delivered at the request of the EPA Remedial Project Manager. Approved validation methods shall be contained in the QAPP.

The independent validator shall not be the laboratory conducting the analysis and should be a person with a working knowledge of or prior experience with EPA data validation procedures. The independent validator shall certify that the data have been validated, discrepancies have been resolved, if possible, and the appropriate qualifiers have been provided.

Data Package Requirements:

The Respondent must require and keep the complete data package and make it available to EPA on request in order for EPA to conduct an independent validation of the data. The complete data package shall consist of all results, a case narrative, the raw data, and all relevant QA/QC information. The forms contained in the data validation functional guidelines must be utilized to report the data when applicable. Raw data include the associated chromatograms and the instrument printouts with area and height peak results. The peaks in all standards and samples must

be labeled, or, for each sample and standard, a summary page will be provided that lists, for each retention time peak, the compound identified. The concentration of all standards analyzed with the amount injected must be included. All laboratory tracking information must also be included in the data package.

If the CLP program is used to analyze data, then all deliverables required under the current CLP SOW, must be delivered. An example CLP-like set of data package deliverables is listed below:

1. a summary of positive results and detection limits of non-detects with all raw data;
2. tabulated surrogate recoveries and QC limits from methods 3500 and 8000 in SW-846 and all validation and sample raw data;
3. tabulated matrix spike/matrix spike duplicate recoveries, relative percent differences, spike concentrations, and QC limits from methods 3500 and 8000 in SW-846 and all validation and sample raw data;
4. associated blanks (trip, equipment, and method with accompanying raw data for tests);
5. tabulated initial and continuing calibration results (concentrations, calibration factors or relative response factors and mean relative response factors, % differences and % relative standard deviations) with accompanying raw data;
6. tabulated retention time windows for each column;
7. a record of the daily analytical scheme (run logbook, instrument logbook) which includes samples and standards order of analysis;
8. the chain of custody for the sample shipment groups, DAS packing slip, DAS analytical specifications;
9. a narrative summary of method and any problems encountered during extraction or analysis;
10. tabulated sample weights, volumes, and % solids used in each sample calculation;
11. example calculation for positive values and detection limits; and
12. SW-846 method 3500 and 8000 validation data for all tests.

The forms contained in Chapter 1 of SW-846 (Second Edition 1982 as amended by Update I, April 1984, and Update II, April 1985) or the

current CLP SOW forms must be utilized to report the data when applicable. Raw data includes the associated chromatograms and the instrument printouts with area and height peak results. The peaks in all standards and samples must be labeled. The concentration of all standards analyzed with the amount injected must be included. All internal and external laboratory sample tracking information must be included in the data package.

1b. Field Sampling Plan (“FSP”)

The objective of the Field Sampling Plan (“FSP”) is to provide EPA, DEP and all parties involved with the collection and use of field data with a common written understanding of all fieldwork and the standard procedures that will be used to collect samples and to supplement the sampling rationale information found in the QAPP. The FSP shall address the RI/FS objectives and conform to the procedures in Section 2 of this document and the NCP.

The FSP shall define in detail the sampling and data gathering methods used on a project. The FSP should be written so that a field sampling team unfamiliar with the Site would be able to gather the samples and field information required. Guidance for the selection of field methods, sampling procedures, and custody can be acquired from the Compendium of Superfund Field Operations Methods (OSWER Directive 9355.0-12, EPA/540/P-87/001), which is a compilation of demonstrated field techniques that have been used during remedial response activities at hazardous waste sites.

The FSP shall supplement the site-specific sample collection information in the QAPP and shall include the following information only if the QAPP does not contain the information (this information is provided in Sections 5 through 10 of the Region I, EPA-New England Compendium of Quality Assurance Project Plan Requirements and Guidance, October 1999 Final (the “Compendium”)):

Site Background. (Compendium Sections 5, 6, and 7) The analysis of the existing site details must be included in the FSP. This analysis shall include a conceptual site model. A conceptual site model includes a description of the Site and surrounding areas and a discussion of known and suspected contaminant sources, probable transport pathways, and other information about the Site. The FSP shall also include descriptions of specific data gaps and

ways in which sampling is designed to fill those gaps.

Sampling Objectives. (Compendium Sections 7 and 8) Specific objectives of a sampling effort that describe the intended uses of data must be clearly and succinctly stated.

Sample Location, Analytes, and Frequency. (Compendium Section 8) This section of the sampling plan identifies each sample matrix to be collected and the constituents to be analyzed. Tables shall be used to clearly identify the number of samples to be collected along with the appropriate number of replicates and blanks. Figures shall be included to show the locations of existing or proposed sample points.

Sample Designation. (Compendium Section 10) A sample numbering system shall be established. The sample designation should include the sample or well number, the sample round, and the sample matrix (*e.g.*, surface soil, groundwater, soil boring).

Sampling Equipment and Procedures. (Compendium Section 9) Sampling procedures must be clearly written. Step-by-step instructions for each type of sampling are necessary to enable the field team to gather data that shall meet the Data Quality objectives (DQOs). A list should include the equipment to be used and the material composition (*e.g.*, Teflon, stainless steel) of equipment along with decontamination procedures.

Sample Handling and Analysis. (Compendium Section 10) A table shall be included that identifies sample preservation methods, types of sampling jars, shipping requirements, and holding times. Examples of paperwork such as traffic reports, chain of custody forms, packing slips or Analysis Request forms, and sample tags filled out for each sample as well as instructions for filling out the paperwork must be included. Field documentation methods including field notebooks and photographs shall be described.

Each part of the FSP submitted as a part of the Revised RI/FS Work Plan shall be sufficiently detailed to carry out the study, and shall provide data needed to address the objective of the study and to complete the study. Each study shall be designed to achieve a high performance on the first attempt. Each part of the FSP shall be related (by cross-references) to the other requirements in the POP.

In the part of the Revised RI/FS Work Plan's FSP pertaining to the Phase 1A RI, the Respondent shall include plans that describe how each of the following and other necessary studies shall be addressed during the Phase 1A RI. See Section 3 of this document to facilitate understanding of the type and quality of the deliverable required for each activity of the Site Characterization.

1. site survey;
2. soils and sources of contaminants;
3. subsurface and hydrogeological factors for overburden and bedrock;
4. air quality;
5. surface water and sediment sampling;
6. ecological assessment;
7. pre-ROD monitoring and sampling; and
8. treatability and pilot studies (if required).

The complete results of these studies shall be described in the Phase 1A RI Report.

2. Health and Safety Plan ("HSP")

The objective of the site-specific HSP is to establish the procedures, personnel responsibilities, and training necessary to protect the health or safety of all on-site personnel during the RI/FS. The plan shall provide for routine but hazardous field activities and for unexpected site emergencies.

The site-specific health or safety requirements and procedures in the HSP shall be based on an ongoing assessment of site conditions, including the most current information on each medium. For each field task during the RI/FS, the HSP shall identify:

- a. possible problems and hazards and their solutions;
- b. environmental surveillance measures;
- c. specifications for protective clothing;
- d. the appropriate level of respiratory protection;
- e. the rationale for selecting that level; and

- f. criteria, procedures, and mechanisms for upgrading the level of protection and for suspending activity, if necessary.

The HSP shall also include the delineation of exclusion areas on a map and describe provisions for this delineation in the field. The HSP shall indicate the on-site person responsible for implementing the HSP as a representative of the Respondent, protective equipment, personnel decontamination procedures, and medical surveillance. The following documents shall be consulted:

EPA's Standard Operating Safety Guide (OSWER Directive No. 9285.1-03, PB 92-963414, June 1992);

Occupational Safety and Health Standards (Department of Labor, Occupational Safety and Health Administration ("OSHA"), 29 C.F.R. Part 1910);

Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities: Appendix B (NIOSH/OSHA/USCG/EPA 1985);

Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final (OSWER Directive 9355.3-01, EPA/540/G-89/004); and

OSHA regulations at 40 C.F.R. § 1910 and Chapter 9 of the Interim Standard Operating Safety Guide, which describes the routine emergency provisions of a site-specific health and safety plan, shall be the primary reference used by the Respondent in developing and implementing the Health and Safety Plan.

The measures in the HSP shall be developed and implemented to comply with applicable State and Federal occupational health and safety regulations. The HSP shall be consistent with the objectives and contents of all other plans submitted by the Respondent. The HSP shall be updated during the course of the RI/FS, as necessary.

3. Community Relations Support Plan ("CRSP")

EPA, in coordination with DEP, shall develop a Community Relations Plan ("CRP") to describe public relations activities anticipated during the RI/FS. The Respondent shall develop a Community Relations Support Plan ("CRSP"), whose objective is to ensure and specify adequate support from the Respondent for the community relations efforts of EPA. This support shall include, at a minimum:

- a. participation in public informational or technical meetings, including the provision of visual aids and equipment;
- b. publication and copying of fact sheets or updates; and
- c. assistance in preparing a responsiveness summary after the RI/FS public comment period.

C. Applicable or Relevant and Appropriate Requirements (“ARARs”)

The Respondent shall update the identification of probable federal, state and local ARARs that was provided in EPA’s RI/FS Work Plan. Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other, circumstances at a CERCLA site. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal or state environmental or facility siting laws that, while not applicable to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site.

In addition to ARARs, the Respondent shall also make preliminary determinations on the extent that other publicly available criteria, advisories, and guidances are pertinent to the hazardous substances, location of the Site, and remedial actions. ARARs and other criteria, advisories, and guidances shall be:

1. considered in terms of their chemical-specific, location-specific, and action-specific attributes;
2. evaluated for each medium (surface water, groundwater, sediment, soil, air, biota, and facilities), particularly for chemical-specific ARARs, but including other ARARs as appropriate;
3. distinguished for each technology considered, particularly for action-specific ARARs, but including other ARARs as appropriate; and
4. considered at each major step of the RI/FS where they are indicated.

In general, identification of chemical- and location- specific ARARs is more important in the beginning steps of the RI/FS, whereas the identification of action-specific ARARs gain importance later, during the more FS-oriented steps. If a requirement is determined to be not applicable, the Respondent shall subsequently consider whether it is relevant

and appropriate. When any new site-specific information becomes available, ARARs should be re-examined.

Chemical-specific ARARs are usually health or risk-based numerical limits on the amount of, or concentration of, a chemical that may be found in, or discharged to the ambient environment.

Location-specific ARARs are general restrictions placed upon the concentration of hazardous substances or the conduct of activities solely because they are in special locations. Some examples of special locations include, but are not limited to, floodplains, wetlands, historic places, places with objects of archaeological significance, and sensitive ecosystems or habitats.

Action-specific ARARs are usually technology-based or activity-based directions or limitations which control actions taken at CERCLA sites. Action-specific ARARs, as the name implies, govern the remedial actions.

As part of the Revised RI/FS Work Plan, the Respondent shall provide a list in the form of a chart of preliminary and probable ARARs and publicly available EPA and DEP criteria, advisories, and guidances, and limitations. The description shall briefly describe the requirements and shall include: if it is a numerical requirement; what it is based upon (*e.g.*, health, technical practicality); and what media it is designed for (*e.g.*, surface water, ambient air, etc.). The list shall indicate whether each requirement is: potentially applicable or relevant and appropriate; chemical-specific, location-specific, or action-specific; pertinent to surface water, groundwater, soil, air, biota, or facilities; and affixed with specific levels or goals to be attained. If specific levels or goals are affixed, they must be enumerated in the chart. It is expected that this preliminary list will be modified during the RI/FS as more information is gathered.

Data requirements in terms of physical and chemical characteristics needed to evaluate ARARs shall be considered as part of the scoping. Such requirements may include but are not limited to chemical residuals, background levels, or various modeling parameters. Such data requirements shall be satisfied during Phase IA of the RI to the extent possible, rather than during the later phases of the RI/FS.

The following shall be consulted during the ARAR identification process:

CERCLA Compliance with Other Laws Manual: Draft Guidance (August 1988, EPA/540/G-89/006);

CERCLA Compliance with Other Laws Manual: Part II, Clean Air Act and Other Environmental Statutes and State Requirements (August 1989, EPA/540/G-

89/009); and

Section 4 of Guidance on Feasibility Studies Under CERCLA (EPA/540/G-85/003); and Appendix E of the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (EPA/540/G-89/004, OSWER Directive 9355.3-01, October 1988), which present a partial list of potential ARARs.

The Respondent shall make best efforts to identify any mining specific requirements that may apply and any requirements that may apply to mine waste. Also, the Respondent shall evaluate the applicability of the National Historic Preservation Act and similar State of Maine requirements, in consultation with Maine's State Historic Preservation Officer ("SHPO"). Finally, the Respondent shall identify the water quality standards and the potential points of compliance that will also help guide the field programs.

Chemical- and location-specific ARARs, as well as action-specific ARARs, shall be identified after the development and Initial Screening of the Remedial Alternatives. EPA shall have final authority in deciding which ARARs are retained or added for consideration, and the extent to which they must be considered in remedy selection. Justifications for incorporating or dropping a requirement shall be provided where such decisions are made.

D. Data Requirements for Potential Remedial Alternatives and Technologies

EPA's RI/FS Work Plan identified a range of potential remedial alternatives that may be useful in remediating affected media including natural attenuation or no action, if appropriate. In discussing potential remedial alternatives, EPA described an alternative as a group of technologies, including innovative ones, that will achieve certain remedial action goals (see Section 4 of this SOW). The Respondent shall review the information provided in EPA's RI/FS Work Plan to help ensure that data needed to evaluate the technologies are collected in the Phase IA Field Investigation and Phase IB Field Investigation. As part of the Revised RI/FS Work Plan, the Respondent shall update the preliminary technology evaluation table and associated data requirements to reflect the most recent Site information. These data requirements shall be further updated and incorporated in subsequent field investigation Work Plans.

A preliminary list of broadly defined alternatives shall be developed by the Respondent. Consistent with Section 4 of this SOW, where practicable, this list shall include a range of alternatives in which treatment that significantly reduces the toxicity, mobility, or volume of waste is a principal element; one or more alternatives that involve containment with little or no treatment; and a no-action alternative. The Respondent shall present a chart, or a series of charts, showing the requirements and technologies to be considered

for remedial alternatives. In the charts, data requirements shall be linked to the Work Plans for each field investigation.

E. Expanded Schedule for Remedial Investigation/Feasibility Study

The major predetermined deliverables are identified in Table 1. The established schedule along with a more detailed, expanded schedule for subtasks shall be included as a component of the Revised RI/FS Work Plan. Modifications of the schedule must be approved by EPA, after providing reasonable opportunity for review and comment with DEP, prior to their implementation. The schedule shall be presented as a chart or table, which shall be updated when the schedule changes. A copy of the schedule shall be contained in each major deliverable of the RI/FS and a summary status provided in each quarterly progress report required by the Order.

SECTION 3: STEP 2—PHASE 1A RI

I. Objectives and Requirements

At its onset, the goal of the Site Characterization (Phases 1A and 1B of the RI) shall be to collect and review existing field data and reports, and collect all new field data which can reasonably be assumed to be necessary to complete the RI, the FS, and the Baseline Risk Assessment, and which will be sufficient to select a remedy. The Site Characterization (Phase 1 RI), including Phase 1A RI's Phase 1A Field Investigation, shall specifically consist of the activities and deliverables described in this section (Section 3). At a minimum, the Respondent shall characterize and/or describe the following:

- A. nature and extent of hazardous substance source areas;
- B. lateral and vertical extent, concentration, toxicity, environmental fate, transport (*e.g.*, bioaccumulation, persistence, mobility), phase (*e.g.*, solid, liquid), and other significant characteristics of hazardous substances identified at the Site;
- C. the media of occurrence, interface zones between media, and critical parameters for treatment (*e.g.*, soil chemistry, soil types, porosity);
- D. hydrogeologic factors for overburden, bedrock (*e.g.*, depth to water table and water table fluctuations, hydraulic gradients, hydraulic conductivity, porosity, and estimated recharge), and waste piles (including tailing pile);
- E. delineation and detail of the current status of any contaminant plume present;
- F. chemical, physical, and biological processes that may work to limit the continued transport, diminish the concentration, or otherwise attenuate contamination. Identify the degree to which these processes can be expected to provide adequate natural attenuation and how these processes may be enhanced;
- G. climate and water table fluctuation (*e.g.*, precipitation, run-off, stream flow, water budget);
- H. extent to which the hazardous substances have migrated or are expected to migrate from their original location, and identify probable receptor areas;
- I. extent to which buildings, foundations, or other underground structures contain or overlie hazardous substances or contaminant plumes and the potential for a contaminant plume;

- J. contaminant(s) contribution to the air, land, waters, and sediments, and the food chain;
- K. flood plain and wetland delineation, if necessary, surface water classifications and their existing use designations;
- L. groundwater characteristics and current and potential groundwater uses (*e.g.*, characteristics related to the groundwater classes described in the Groundwater Protection Strategy (EPA, 1984) and under Maine law);
- M. waste characteristics that affect the type of treatment possible, if appropriate;
- N. potential extent and risk of future releases of substances or residuals remaining on-site and off-site;
- O. physical characteristics of the Site, including important surface features, soils, geology, hydrogeology, meteorology, and ecology;
- P. characteristics or classifications of air, surface water, and groundwater;
- Q. location of public and private water wells (*e.g.*, aquifers used, construction details external or internal spigots, water quality);
- R. extent to which contamination levels exceed health-based levels prompting a necessary response action;
- S. extent to which substances at the Site may be reused or recycled;
- T. general characteristics of the waste, including quantities, type, phase, concentration, toxicity, propensity to bioaccumulate, persistence, and mobility;
- U. extent to which the source can be adequately identified and characterized;
- V. actual and potential exposure pathways through environmental media;
- W. actual and potential exposure routes, for example, inhalation and ingestion;
- X. other factors, such as sensitive populations, that pertain to the characterization of the Site or support the analysis of potential remedial action alternatives; and
- Y. characterization of possible site-specific source areas.

Using this information, the Respondent may be required to further define the boundaries of the RI/FS study area. The Site Characterization shall provide information sufficient to refine the preliminary identification of potentially feasible remedial technologies, probable ARARs, and data needed to perform the Baseline Risk Assessment.

II. Components of the Site Characterization (as well as Treatability Investigations)

A. Site Survey

EPA has developed a site survey (base map) for the Site. The Respondent shall expand and update the base map as necessary. The Respondent shall provide a site map which shall have elevation contours and shall display survey data collected at the Site. The map shall contain standard topographic, physiographic, cultural, and facility features, the surveyed locations of all wells, and surface sampling locations.

If necessary, the Respondent shall prepare similar maps of appropriate scale that show off-site sampling locations. The basis of one of these maps shall be the U.S. Geological Survey 7.5-minute quadrangle which includes the Site.

The Respondent shall determine the elevations and locations of all wells and piezometers utilized in the RI, and samples collected as part of the RI. It may be necessary to modify the site base map based on the results of the Phase 1A RI. The site base map shall encompass an area large enough to show all pathways of surface water run-off from the Site. The site base map shall be of sufficient detail to delineate areas into which contaminants may migrate. The site survey should be compatible with EPA's computer system. The plan for this component will be completed and shall be part of the Revised RI/FS Work Plan's POP.

B. Soils and Sources of Contaminants

1. Objectives

To assess the soils and sources of contamination in the unconsolidated sediments and soils, the Respondent shall characterize and/or describe the following, as needed:

- a. a characterization of the vertical and horizontal extent of soil contamination at the Site by soil sampling (*e.g.*, coring, geo-probe, head-space measurements, etc.) and analysis. Areas with elevated concentrations of contaminants shall be sampled and analyzed in accordance with the approved Work Plan. The extent of contamination shall be bounded by sampling points showing non-

detect or background concentrations of compounds identified in the contaminated-area. Analysis may be supported by isocon maps, area calculations, and volume calculations. Concentration of contaminants shall be defined in the surface soils (0-6 inches), and subsurface soils (6-inches to 10 feet below ground surface or to the limit of contaminated soils which ever one is greater) over the entire Site (including wetland areas, if necessary) expected to have been impacted by site contamination;

- b. an identification/verification of contaminated soil areas at the Site;
- c. a review of the data to determine if further soil and unconsolidated material sampling and analysis is needed to accomplish the goals of the RI/FS;
- d. a determination of the background levels of contaminants for each soil type and stratigraphic unit based on sampling at a sufficient number of locations (at least one sample per stratum);
- e. fate and transport assessment to estimate unconsolidated material concentration action limits based on the contamination levels that are preventive of ground-water contamination by leaching of contaminants to the saturated zone (including assumptions and values used in the assessment);
- f. sufficient data on soil characteristics to understand the requirements of on-site materials handling and pretreatment so that the cost estimates are accurate to a +50 to -30% cost range and can be developed for the evaluation of remedial alternatives;
- g. an estimation of the volumes of contaminated unsaturated soils and levels of confidence for the various soil action limits (from e. above) and a plot of these estimates on a graph of volume vs. soil action limits;
- h. an estimate of present and future contamination levels for soil at points of current and future potential exposure;
- i. the phase in which the contaminants exist or chemical complexes (e.g., dissolved in groundwater, adsorbed by grains);
- j. the critical parameters for each soil type and layer that is

- contaminated (*e.g.*, soil moisture, soil profile, soil type, density, porosity, grain size, distribution, total organic carbon, mineralogy). This information may be reported on charts, maps, and cross sections;
- k. the waste characteristics and mixtures that affect the type of treatment possible (pertinent physical and chemical characteristics of each compound may be reported in a chart);
 - l. the extent to which the contaminants may be reused and/or recycled;
 - m. the background concentrations representative of each soil type and stratigraphic unit found to be contaminated;
 - n. the physical limitations and other materials handling aspects of the soil and other sources that are contaminated;
 - o. the estimated volumes of soils and other sources of contamination that are contaminated for a range of contaminant concentrations; and
 - p. engineering properties of soils and wastes for settlement and slope stability analyses if capping is considered.

2. Work Plan Requirements

A detailed Work Plan for the investigation of soils and contaminant sources shall be part of the Revised RI/FS Work Plan's FSP. This Work Plan shall describe and justify the approximate numbers and locations of each boring, test pit, and sample to be performed, and shall provide for the sampling and analysis needed to fulfill the objectives listed previously.

3. Reporting Requirements

Results of these studies shall be described in the text of the Phase 1A and RI Reports and may be presented on maps, cross sections, charts, tables, and computer data bases. Based on the definition of initial soil sampling, the possible need for additional sampling and analysis shall be specified. The analysis of data shall be sufficient to map the sources, to show contaminant concentrations in three dimensions, and to estimate the volumes of soil should a soil excavation and/or in-situ treatment program be required later.

C. Subsurface and Hydrogeological Investigations

1. Objectives

The Respondent shall plan, conduct, and report subsurface and hydrogeological investigations sufficient to characterize and/or describe, at a minimum, the following:

- a. the nature and extent of contamination (lateral and vertical, in each hydrologic unit) sufficiently to define the boundaries of any contaminant plumes and to characterize the aquifers in three dimensions, including bedrock;
- b. populations and environments at risk and potential risks associated with future releases;
- c. an estimate of the number of years necessary to achieve clean-up goals for groundwater extraction and treatment remedial alternatives;
- d. the subsurface stratigraphy, structure and properties for each hydrologic unit. The following may be included in this analysis: thickness, lithology, grain size distribution (glacial deposits), soil index properties (*e.g.*, plasticity index), porosity, hydraulic conductivity, fraction of organic carbon, storativity, sorting, fracturing (orientation, frequency, width, degree of interconnection and extent), moisture content, and petrology.
- e. the concentration, transport mechanisms, potential receptor locations, and other significant characteristics of each contaminant;
- f. a quantification of the hydrogeological factors (*e.g.*, in-situ hydraulic conductivity, storativity, conductivity, and storage capacity of each hydrologic unit; aquifer thickness; hydraulic and pressure gradients; assessment of the interconnection of bedrock fractures); and degree of interconnection between the different hydrogeologic units (*e.g.*, bedrock and specific overburden strata);
- g. the routes of groundwater migration, transport rates, and potential receptors. Also determine or qualitatively describe the locations, flow rates, contaminant concentrations, variability for discharge to bodies of surface water and wetlands, and head distributions within

- the geohydrologic units;
- h. depth to and seasonal fluctuations in the water table, flow gradients, and contaminant concentrations, simultaneously with other factors such as precipitation, run-off, and stream flow;
 - i. the construction location, and proximity, of residential, municipal, and previously installed monitoring wells, if available;
 - j. the extent to which the hazardous substances will migrate once the current limits of plumes are determined (analytical and/or numerical models and a process for modeling should be identified. The parameters, assumptions, accuracy, contingencies of the studies must be explicitly stated, and a plan established to verify the modeling if a significant risk is indicated for a specific population or environment);
 - k. a review and illustration of groundwater classifications (the need for institutional controls on ground-water use, considering such controls as adjuncts to remedial action, must be assessed);
 - l. physical and chemical characteristics that may affect the possible type of treatment (this information must be reported in a chart); and
 - m. the background concentrations for groundwater at a sufficient number of horizontal and vertical locations, including at least one for the saturated unconsolidated overburden and bedrock.

2. Work Plan Requirements

The Respondent shall design investigations that are sufficient to fully address the objectives listed above and others that may arise during the RI/FS. The Work Plan for the subsurface and hydrogeological investigations shall be presented in the Revised RI/FS Work Plan's FSP. This Work Plan shall also describe the locations, methods, field forms, procedures, and types of analyses to be used in performing the subsurface and hydrogeological investigations. This description shall include specific drilling methods and protocol to be used. The Groundwater Technical Enforcement Guidance Document (OSWER Directive 9950, September 1986) and the Guidance on Remedial Actions for Contaminated Groundwater at Superfund Sites (OSWER Directive 9283.1-2, Final Review Draft, EPA, August 1988) shall provide the framework of these subsurface and hydrogeological

investigations. This Work Plan shall clearly show the relationship between the objectives and the studies to be performed (see Sections 1 and 3). This Work Plan shall provide a mechanism for EPA to review and approve of deviations from the approved Work Plan (that may be necessary due to unforeseen field conditions). This Work Plan shall allow for the potential for additional work contingent on the results of the studies described in the Revised RI/FS Work Plan.

3. Reporting Requirements

For the subsurface and hydrogeological investigations, the Respondent shall present the results and describe the actual procedures (especially when the actual procedures differ from those in the Work Plan) in a section of the Phase 1A RI Report. This section of the report may contain all data, analyses, maps, cross sections, and charts necessary to meet the objectives for which the investigations were performed. Illustrations shall clearly identify the data points, values, and the degree of interpolation or extrapolation necessary to draw conclusions.

D. Air Quality Assessment

Air data will be collected in sufficient quantity to perform baseline risk assessment analyses.

1. Objectives

The Respondent shall characterize and/or describe, the impact of the Site on the surrounding air quality (if any), which may require the following activities:

- a. identification of any likely or detected point and area emissions of particulate, volatiles, and semi-volatiles for the existing Site, including volatilization from soil, leachate, contaminated water, waste piles, and other contaminant areas;
- b. determination of background concentrations (before or after any intrusive field work performed during non-summer months) at a sufficient number of locations;
- c. characterization of emissions as indicated above (*i.e.*, particulate, vapors, precipitates, and gases);
- d. estimation of the emission rates and worst case impacts on and off-site for the existing Site (detailed techniques for the characterizing of air emissions and impacts shall be used if

- screening data indicate a potentially significant concentration);
- e. supplementation of ambient air monitoring with the collection of on-site meteorological data including ambient temperature, wind speed, wind direction, and barometric pressure, if necessary;
 - f. provision for monitoring of ambient air quality as described in the Work Plan that shall include a description of (i) the sampling methodology (including instrumentation, sampling times, locations, detection limits, QA/QC procedures) and (ii) the analytical methodology including instrumentation, detection limits and QA/QC procedures;
 - g. provision for modeling for potential emission sources (if necessary), including documentation of (i) source characteristics (*e.g.*, emission rates, release height, velocity, temperature, source configuration, etc.), (ii) meteorological conditions, (iii) receptor locations, and (iv) background concentrations; and
 - h. evaluation of the factors that are critical in characterizing the nature and extent of airborne contaminants from the Site, such as background air quality.

2. Work Plan Requirements

The Respondent shall prepare a Work Plan for the air quality assessment during the scoping of the RI/FS. This plan shall become part of the Revised RI/FS Work Plan's FSP. This Work Plan shall be implemented during the Phase 1A RI. As early as possible in the RI/FS, the Respondent shall gather data on the factors critical to assessing impacts on air quality. This Work Plan shall allow EPA and DEP to review differences between the specifications for the field work and the actual field work. This Work Plan shall also provide for additional monitoring and studies, if EPA determines they are necessary.

3. Reporting Requirements

The results of the air quality assessment shall be submitted to EPA and DEP for review, as part of the Phase 1A RI Report. Some of the air monitoring work may continue throughout the RI/FS. The Respondent shall discuss the potential for the control of gaseous emissions, including fugitive emissions.

E. Surface Water and Sediments

1. Objectives

The Respondent shall determine the nature and extent of contamination to nearby surface water bodies and associated wetlands. Releases of concern may occur through overland flow and ground-water migration. The Respondent shall also evaluate the nature and extent of contaminants in surface water and sediments at upgradient/upstream reference locations.

The Respondent shall determine the nature and extent of contaminants in the water and sediments of surface drainage areas and associated wetlands, both perennial and intermittent, potentially affected by contaminants from the Site. Samples of surface water and sediment shall be collected (and analyzed) from several locations and in each surface water flow path that may be affected by contaminants at the Site. The collection and analysis of the upgradient samples shall be sufficient to determine background concentrations of analytical parameters or to discriminate contaminants from the Site from those originating at other sources. Sampling schedules shall include the monitoring of seasonal changes including low flow periods. Sediment sampling shall be implemented to determine the vertical and horizontal limit of sediments impacted by the Site. The potential volume of sediments that may require remediation shall also be determined. Data to determine the grain size and organic content of the sediments as well as the bioavailability of the contamination in the sediments shall be collected. The Respondent shall evaluate sediment deposition rates, sediment transport, and the fate of contaminated sediment. The Respondent shall also determine the extent to which the sediments are a source of surface water contamination and biota contamination.

2. Work Plan Requirements

The Respondent shall prepare a Work Plan for surface water and sediment sampling during the scoping of the RI/FS. This Work Plan shall be part of the Revised RI/FS Work Plan's FSP. It shall contain provisions for sampling events and more general assessments of wetlands, streams, and ponds if this additional work is needed. This Work Plan will include sampling events during both low and high flow periods. This Work Plan shall allow for EPA's and DEP's review of proposed differences between the actual field work and the specifications for the field work.

3. Reporting Requirements

The surface water and sediment sampling data shall be compiled and presented in the Phase 1A RI Report and may include tables, graphs, charts, and other visual aids. These illustrations shall indicate the static water levels at the time of sampling and seasonal fluctuations of water levels and the impacts of those changes on contaminant concentration and migration.

F. Ecological Assessment

1. Objectives

The Respondent shall conduct an ecological assessment to determine the nature and extent of contamination to the ecological resources on, nearby, or otherwise influenced by the Site. A reference site may be required by EPA to be designated and sampled to produce data for EPA's and DEP's use in evaluating the impact of the Site on the ecological receptors. The extent of the area to be studied shall be determined by the results of the relevant field investigation data, and upon the collection and review of available information concerning the biota expected to occur on or near the Site as either resident or transient species.

The Respondent shall determine the basic environmental characteristics at the Site, and to identify and characterize ecological communities, habitat types, and species, which are present on or surrounding the Site. The Respondent shall perform qualitative or quantitative assessments, bioassays, or tissue sampling to better determine the actual impact of the Site on the environment and to support the ecological risk assessment to be prepared by the Respondent. It is important to note that the collection of site specific information of good quality is often critical in evaluating ecological impacts at sites with widespread contamination. Both terrestrial and aquatic receptors shall be evaluated with respect to the ecological characterization. A discussion of the impacts of proposed remedial alternatives on ecological receptors shall be included in the Feasibility Study.

Specific attention shall be placed on the Section 404(b)(1) Guidelines of the Clean Water Act regarding wetlands. Specifically, Executive Order 11990 ("Protection of Wetlands," May 24, 1977) concerns impacts to wetlands, and Executive Order 11988 ("Floodplain Management") is involved where actions are to be evaluated in regard to projects which may impact a floodplain.

The information gathered during the ecological assessment will be used to develop the baseline ecological risk assessment, which is included in the Baseline Risk Assessment. Tables and other pertinent information shall be developed

before EPA provides notice to proceed with Baseline Risk Assessment component identified in Table 1.

2. Work Plan Requirements

The Respondent shall submit a Work Plan for an ecological assessment as part of the Revised RI/FS Work Plan's FSP. This Work Plan shall contain an evaluation of the applicability of the following elements, and a plan to implement those elements determined to be applicable:

- a. an accurate delineation of the wetland boundary using the U.S. ACE, 1987, Wetlands Delineation Manual with N.E. Division Field Data Collection Sheets, and classification of the wetland types using the Classification of Wetlands and Deepwater Habitats of the United States (FWS/OBS-79/31, US Fish and Wildlife Service, 1979) and determination of the functions and values of the wetlands;
- b. an accurate description and delineation of the ten (10) year and hundred (100) year floodplains;
- c. a description of habitat types including a map of all major habitats present at the Site and a list of plant and animal species, both resident and transient;
- d. a determination of the status of those species identified in terms of sport or commercial usage, protected status, endangered, threatened, or of special concern;
- e. sampling of environmental receptors for analysis of community composition, abundance, or body burden of contaminants;
- f. sampling of chemical and physical parameters for surface water and sediments (*e.g.*, grain size, total organic carbon, dissolved oxygen, etc.);
- g. toxicity testing of indicator species to determine acute and chronic effects of contaminated media on the environment;
- h. an evaluation of how the contamination from the Site has affected the receptors, including a discussion of fate and transport of the contaminants to the various habitat types or organisms; and

- i. an evaluation of whether contamination has affected the health of the wetland and other major habitats present at the Site (*e.g.*, reduced plant growth or vigor or contributed contaminants to the food web).

G. Pre-Record of Decision Monitoring and Sampling

1. Objectives

The Respondent shall monitor the groundwater and surface water/sediments to determine the potential changes in the nature, extent, quantity, seasonal variability, climatological influence, environmental fate and transport, background levels, and migration pathways for each contaminant identified at the Site. The extent of this sampling will be dependent on the results of the Phase 1A RI. Pre-ROD monitoring and sampling shall commence with Phase 1A Field Investigation and continue until the issuance of the ROD.

2. Work Plan Requirements

The Respondent shall submit a Work Plan for pre-ROD sampling and monitoring of contaminants in groundwater and surface water/sediments. This Work Plan shall be submitted as part of the Phase 1A RI Report. This Work Plan shall include provisions for needed expansions of the type, quantity, and coverage of the monitoring. This Work Plan shall be consistent with the procedures and requirements established in the Revised RI/FS Work Plan's POP (Section 2), the overall objectives (Section 1), and the other components of the Phase 1A RI (Section 3).

Plans shall be developed for surface-water courses, groundwater (including nearby residential wells), and the biota potentially affected by contaminants released from the Site, as necessary. The pre-ROD monitoring may be separate and in addition to the site-specific studies.

3. Reporting Requirements

Results shall be presented after each sampling event and in accordance with the procedures described in the Revised RI/FS Work Plan's POP (Section 2). Results of each round of sampling may be statistically and mathematically compared with results of previous rounds. Deviations and trends shall be illustrated and explained. All sampling reports shall be summarized for EPA and DEP review, and submitted as soon as possible following the sampling event.

H. Treatability and Pilot Studies (If Required)

1. Objectives

The objective of the treatability and pilot studies is to obtain the information necessary to evaluate the effectiveness of potential remedial treatment technologies. The Respondent may need to conduct laboratory-scale simulations of treatment processes to evaluate the treatability of contaminated groundwater, surface water, soils, and other environmental media. In any treatability and/or pilot studies, the Respondent may evaluate treatment options (*e.g.*, biological treatments, physical separation, chemical conditioning, and in-situ treatments).

The data from additional sampling programs and previously published data on the Site may be sufficient to develop a well-designed pilot program, if such a program is necessary. Before dynamic modeling, bench-scale tests may be performed to establish the "preliminary" treatability of contaminated media. Through the bench-scale tests, the Respondent may initially evaluate the applicability of treatments. Treatability studies to determine the most effective technologies to remediate acid rock drainage shall be initiated as early as possible, but no later than the post-screening field investigation (Phase 2 RI, Phase 2 FS). These studies may be conducted anytime during the RI upon approval of EPA, after providing reasonable opportunity for review and comment by DEP.

2. Work Plan Requirements

Upon the request of EPA, the Respondent shall prepare a Treatability Study Work Plan for bench-scale and pilot-scale treatability investigations. This Treatability Study Work Plan shall be submitted to EPA for approval prior to the performance of treatability and pilot studies, and shall be made part of the Revised RI/FS Work Plan. Likewise, a copy of this Work Plan shall be submitted to DEP for review and comment. This Treatability Study Work Plan must clearly define the purpose of the study and include a detailed test plan including drawings and a step-by-step procedure, if applicable.

3. Reporting

Results of treatability and pilot studies shall be submitted to EPA and DEP in the form of a report describing methods, analyses, and results.

III. Step 2 Deliverables

A. Initial Site Characterization (Phase 1A RI) Report

The Respondent shall submit an Initial Site Characterization (Phase 1A RI) Report as a Step 2 deliverable. The Phase 1A RI Report, which meets the reporting requirements stated in this section, shall include the methods, data gathered, and analyses of results of all Phase 1A RI activities, as well as detail from all studies and findings that have been completed at the Site. This report shall also include data in the form of summary tables organized by media, a data base management system that is compatible with hardware and software currently available to EPA Region 1 and DEP personnel, and a detailed description (with figures) of all sampling locations and depths. The Respondent shall evaluate how well the studies satisfy the objectives of the RI/FS (Section 1) and the objectives for each of the components stated above in this section. The report shall also explain differences between the actual field work and the work specified by the EPA-approved Revised RI/FS Work Plan. Deficiencies in satisfying the objectives shall be clearly stated. Compilations of data shall be presented in formats that can accommodate the results of additional studies. To the extent practicable, the Respondent shall provide data compilations on computer data bases that are compatible with those currently available to EPA and DEP if requested. The Respondent shall work closely with EPA during the development of the data bases.

As part of the preparation of the Initial Site Characterization (Phase 1A RI) Report, the Respondent may prepare a concise Site Characterization Summary Report. This report may summarize the investigative activities that have taken place, and describe and display the locations, dimensions, physical condition and varying concentrations of each contaminant throughout each source, and the extent of contamination through each of the affected media. The report may include tabular summaries of analytical, survey, and hydrogeologic data. In addition, maps may be presented that depict the location and characteristics of site features, groundwater potentiometric contours, and the distribution of various analytical parameters in the tested media (*e.g.*, soil, sediments, groundwater, surface water, and air). Vertical cross sections may be used to display the distribution of selected analytical parameters in the subsurface. Copies of boring logs and other selected data may be provided as appendices. The primary objectives of the Site Characterization Summary Report will be to provide an initial submittal of the RI data that will allow an assessment of data gaps that remain to be filled. If appropriate, EPA and the Respondent will have a technical meeting(s) prior to the Respondent's submission of the Initial Site Characterization (Phase 1A RI) Report.

B. Phase 1B Field Investigation Work Plan (If Required)

After Phase 1A RI's Phase IA Field Investigation, the need for additional information

may become apparent. If EPA, after consultation with DEP, determines that additional data are necessary to meet the objectives of the RI/FS, the Respondent shall prepare a Phase 1B Field Investigation Work Plan that describes the data to be obtained. The Respondent shall submit a Phase 1B Field Investigation Work Plan to EPA and DEP for review as a Step 2 deliverable, and shall perform the necessary studies after receiving a notice to proceed with the Phase 1B Field Investigation by EPA. The Phase 1B Field Investigation Work Plan shall be scoped to meet all field data collection objectives of the RI/FS (Section 1), be consistent with the procedures in the Revised RI/FS Work Plan's POP (Section 2), and fulfill the requirements of the Site Characterization (Section 3).

If the Respondent believes that data collected during the Phase 1A Field Investigation is sufficient to meet all the objectives detailed in Section 3 (Phase 1A RI) and Section 4 (Phase 1B RI), then the Respondent shall submit a letter report supporting this recommendation for EPA's review and approval. Likewise, a copy of this report shall be submitted to DEP for review and comment.

SECTION 4: STEP 3—PHASE 1B & 2 (If Required) RI and PHASE 1 & 2 FS

I. Phase 1B RI

In the Site Characterization (Phase 1 RI), including the Phase 1B Field Investigation, if deemed necessary by EPA, the Respondent shall gather field data necessary to fulfill the requirements of the following deliverables:

- A. First Draft RI/FS, in particular the Development and Initial Screening of Alternatives;
- B. Post-Screening Field Investigation (Phase 2 RI) Work Plan (if required); and
- C. Work Plan for Additional Studies (if required).

Phase 1B RI's Phase 1B Field Investigation is the second set of field investigations. Data gaps identified through the Phase 1A Field Investigation and further data requirements from the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final (EPA/540/G-89/004, OSWER Directive 9355.3-01, October 1988), the NCP, and the three previous sections of this SOW shall provide the focus for the studies.

II. Phase 2 RI

The purpose and objective of the Phase 2 RI is to provide for the information required to fill all relevant data gaps and to provide information necessary to perform the Detailed Analysis of Alternatives and the preparation of the First Draft RI/FS. This may include, but not be limited to, bench and pilot scale treatability studies of potential technologies, literature searches, and field investigations. Field investigations may be performed by the Respondent if information relevant to the selection of a remedial action alternative is not sufficient to perform a Detailed Analysis of Alternatives that shall result in a remedy consistent with the NCP.

III. The Development and Initial Screening of Alternatives (Phase 1 FS)

A. Development of Alternatives

The Respondent shall develop an appropriate range of waste management options in a manner consistent with the NCP, the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final (OSWER Directive 9355.3-01), and any format or guidance provided by EPA Region 1. Alternatives for remediation shall be developed by assembling combinations of technologies (including innovative ones that offer the potential for superior treatment performance or lower cost for performance similar to that of demonstrated technologies) and the media to which they

would be applied into alternatives that address contamination at the Site or for an identified operable unit.

1. Objectives

Alternatives shall be developed that:

- a. protect human health and the environment by recycling waste or by, eliminating, reducing, and/or controlling risks to human health and the environment posed through each pathway at the Site;
- b. consider the long-term uncertainties associated with land disposal;
- c. consider the goals, objectives, and requirements of the Solid Waste Disposal Act;
- d. consider the persistence, toxicity, mobility, and propensity to bioaccumulate of hazardous substances and their constituents;
- e. consider the short and long term potential for human exposure;
- f. consider the potential threat to human health and the environment if the remedial alternative proposed were to fail;
- g. consider the threat to human health and the environment associated with the excavation, transportation, and redisposal or containment of contaminated substances and/or media; and
- h. consider potential impacts to wetlands and wetland biota.

2. Development

In addition, the Respondent shall perform the following activities:

- a. development of remedial action objectives, specifying the contaminants and media of concern (approved by EPA), potential exposure pathways (approved by EPA), and preliminary remedial goals that are based on chemical specific ARARs, EPA risk assessment data, and Site characterization data;
- b. development of response actions for each media of interest defining engineering controls, treatment, excavation, pumping, or

- other actions, separately and in combinations;
- c. identification of volumes or areas of media to which response actions shall apply;
- d. identification and screening of technologies, including innovative ones, that would be applicable to each response action;
- e. assembly of the selected technologies into alternatives representing a range of treatment and containment options; and
- f. identification and evaluation of appropriate handling, treatment, and final disposal of all treatment residuals (*e.g.*, ash, decontaminated soil, sludge, decontamination fluids).

B. Initial Screening of Alternatives

1. Criteria

In screening the alternatives, the Respondent shall consider, but not be limited to, the short and long term aspects of the following three criteria:

- a. Effectiveness. This criterion focuses on the degree to which an alternative reduces toxicity, mobility, or volume through treatment; minimizes residual risks and affords long term protection; complies with ARARs, and minimizes short-term impacts. It also focuses on how quickly the alternative achieves protection with a minimum of short term impact in comparison to how quickly the protection shall be achieved.
- b. Implementability. This criterion focuses on the technical feasibility and availability of the technologies that each alternative would employ and the administrative feasibility of implementing the alternative.
- c. Cost. The costs of construction and any long-term costs to operate and maintain the alternatives shall be considered.

2. Range of Alternatives

The Respondent shall develop a series of alternatives for the Site. These alternatives may include the following:

- a. An alternative that, throughout the entire soil, source, and/or groundwater plume, reduces the contaminant concentrations to meet or exceed all MCLs, ARARs, and a 10^{-6} excess cancer risk. It shall achieve this objective as rapidly as possible and must be completed in less than ten (10) years, if possible, and shall require no long term maintenance.
- b. A no action alternative that would rely solely upon natural attenuation to meet clean-up standards. This may be "no further action," if some removal or remedial action has already occurred or is undertaken during the RI/FS at the Site.
- c. For source control actions, as appropriate:
 - i. A range of alternatives in which treatment that reduces the toxicity, mobility, or volume of the hazardous substances, pollutants, or contaminants is a principal element. As appropriate, this range shall include an alternative that removes or destroys hazardous substances, pollutants, or contaminants to the maximum extent feasible, eliminating or minimizing, to the degree possible, the need for long-term management. The Respondent shall also develop, as appropriate, other alternatives which, at a minimum, treat the principal threats posed by the Site but vary in the degree of treatment employed and the quantities and characteristics of the treatment residuals and untreated waste that must be managed.
 - ii. One or more alternatives that involve little or no treatment, but provide protection of human health and the environment primarily by preventing or controlling exposure to hazardous substances, pollutants, or contaminants through engineering controls, for example, containment and, as necessary, institutional controls to protect human health and the environment and to assure continued effectiveness of the response action.
- d. For groundwater response actions, the Respondent shall develop a limited number of remedial alternatives that attain site-specific remediation levels within different restoration time periods.

The Respondent shall give special consideration to innovative technologies. If

any innovative technologies pertinent to the Site can be identified, then one or more such technologies shall be evaluated beyond the initial screening.

A no-action alternative that involves no long-term maintenance shall be carried through the development and screening, and shall be analyzed during the Detailed Analysis of Alternatives (see Section 4.IV. below).

C. Reporting

All alternatives shall be presented in the Development and Initial Screening of Alternatives section of the First Draft RI/FS. If an alternative is to be eliminated, it must be screened out for clearly stated reasons contained in the NCP and other EPA guidances.

IV. Detailed Analysis of Alternatives (Phase 2 FS)

A. Analysis

The detailed analysis of alternatives consists of an assessment of individual alternatives against each of the nine (9) evaluation criteria and a comparative analysis that focuses upon the relative performance of each alternative against those criteria. The analysis shall be consistent with the NCP and shall consider the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final (OSWER Directive 9355.3-01).

The nine criteria are as follows:

1. Overall protection of human health and the environment
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 acceptance
9. Community acceptance

Criteria one (1) and two (2) from the above list are considered threshold criteria. This means that an alternative must meet these two (2) criteria or must contain a statutory basis for waiving compliance with specific ARARs in order for it to be eligible for selection. Criteria three (3) through seven (7) on the above list are considered primary balancing criteria. These five (5) criteria are used to further evaluate alternatives that satisfy the threshold criteria. The final two (2) criteria, state acceptance and community

acceptance, are modifying criteria that shall be considered by EPA in remedy selection.

B. Reporting

The Detailed Analysis of Alternatives, which shall be presented in the FS, shall contain the following:

1. further definition of each alternative with respect to the volumes or areas of contaminated media to be addressed, the technologies to be used, and any performance requirements associated with those technologies;
2. a process scheme for each alternative which describes how each process stream, waste stream, emission residual, or treatment product shall be handled, treated and/or disposed;
3. an assessment and a summary profile of each alternative against the nine (9) evaluation criteria; and
4. a comparative analysis among the alternatives to assess the relative performance of each alternative with respect to each evaluation.

V. Step 3 Deliverables

A. First Draft RI/FS

The Respondent shall submit a complete First Draft RI/FS to EPA and DEP for review. This and any subsequent drafts of the RI/FS shall conform to the NCP, the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final (EPA/540/G-89/004, OSWER Directive 9355.3-01, October 1988), and any additional format, guidance, or examples provided by EPA.

The RI portion of the RI/FS shall describe and display in appropriate maps, tables, and figures, the Phase 1A and Phase 1B Field Investigations, and parallel samples taken by EPA or DEP, available to the Respondent. It shall include a Site Characterization Report which shall consider, and if appropriately valid, use all available pre-RI/FS, Phase 1A, Phase 1B, and government field sample results.

The FS portion of the RI/FS shall include a chart that delineates each criteria listed in Section 4.IV. for each alternative. Other graphics shall be included that allow for comparisons of multiple alternatives at various risk, cost, and clean-up levels of soils, sediments, groundwater and surface water. These graphs may include the cost of potential remediation alternatives plotted against a range of soil clean-up levels; graphs

of soil/sediment/waste volumes plotted against a range of soil clean-up volumes; and projected groundwater and surface water concentrations plotted against time for groundwater and surface water alternatives. The Respondent shall compare the alternatives by using the listed criteria and other appropriate criteria consistent with the NCP and all previous sections of this SOW.

The First Draft RI/FS shall also include a draft Human Health and Ecological Baseline Risk Assessment, which is described below in Section 6.

B. Post-Screening Field Investigation (Phase 2 RI) Work Plan (If Required)

A Post-Screening Field Investigation (Phase 2 RI) Work Plan shall be prepared by the Respondent and submitted to EPA and DEP for review as a Step 3 deliverable, if EPA, after consultation with DEP and the Respondent, determines that additional data are necessary to meet the objectives of the RI/FS. EPA shall also consult with the Respondent prior to providing notice that additional data are necessary to meet the objectives of the RI/FS. Alternatives, particularly those involving innovative technologies, may require additional field investigations to obtain data needed for further evaluation of site characteristics and the *Detailed Analysis of Alternatives*. The Phase 2 RI Work Plan shall include, but not be limited to:

1. supplemental literature searches to obtain additional data on treatment technologies;
2. bench and pilot scale treatability tests if necessary; and
3. the collection of additional field data to assess further the characteristics of the Site.

The Phase 2 RI Work Plan shall conform to the objectives, procedures, and methods described in Sections 1-4 of this SOW. The investigations shall include the collection of data needed to evaluate the effectiveness of the remedial alternatives, conceptually design remedial actions, select a remedy, and sign a record of decision. In the Phase 2 RI Work Plan, the Respondent shall describe the methods and procedures to be followed to perform field investigations necessary to fill the remaining data gaps. If the Respondent believes that no further field investigations are necessary, they must provide an explanation of how the previous studies fulfilled the data objectives and requirements of the NCP and the SOW. EPA shall have the final authority to determine if further field investigations are necessary.

C. Work Plan for Additional Studies (If Required)

If EPA, after providing reasonable opportunity for review and comment by DEP, or the Respondent deems that additional studies are needed, the Respondent shall submit a Work Plan for approval by EPA, and perform the studies consistent with an EPA-approved Work Plan.

SECTION 5: STEP 4—ADDITIONAL RI/FS DRAFTS, REVIEWS & REVISIONS

Following EPA comments on the First Draft RI/FS, the Respondent shall prepare a Second Draft RI/FS addressing all EPA comments and requested changes. Depending on Site conditions, the acceptability of the latest Draft RI/FS, or other conditions, EPA may either request draft revisions until a Draft RI/FS is produced which EPA determines is satisfactory for public comment, or EPA may chose to complete the documents. The approval process shall be done pursuant to the “Submissions Requiring EPA Approval” section of the Order (U.S. EPA Region 1 Docket No. CERCLA-01-2005-0022).

When EPA determines that no other studies or drafts of the RI/FS are needed, the most recent Draft RI/FS submitted by the Respondent shall be considered the Final Draft RI/FS. The Final Draft RI/FS shall be submitted for public comment by EPA.

After the public comment period, the Respondent shall assist EPA in preparing a responsiveness summary. This assistance shall include, but not be limited to, providing EPA with draft responses to any comments provided by EPA to the Respondent within three (3) weeks of the date EPA provides the comments to the Respondent. If EPA seeks assistance from the Respondent in responding to numerous technical or extensive comments and an extension is requested, EPA shall extend the three (3) week deadline by an appropriate time period.

SECTION 6: BASELINE RISK ASSESSMENT

I. Risk Assessment Objectives

The Respondent shall complete a Baseline Risk Assessment. After evaluation of the field investigation information and establishment of the data base for the Site, the Respondent shall conduct a Baseline Risk Assessment and prepare the necessary risk assessment documents. The objective of this assessment is to characterize, and quantify where appropriate, the current and potential human health and environmental risks that would prevail if no further remedial action is taken.

II. Risk Assessment Guidance

The Baseline Risk Assessment shall be done in accordance with the guidance, procedures, assumptions, methods, and formats listed below.

For both human health and ecological risk assessments:

US EPA Region I Waste Management Division Risk Updates: 1992, 1994, 1995, 1996, & 1999.

For the human health risk assessment:

Risk Assessment Guidance for Superfund (RAGS): Volume I, Human Health Evaluation Manual (Part A), Interim Final, OSWER Directive 9285.7-01A, EPA/540/1-89/002, December 1989.

Risk Assessment Guidance for Superfund (RAGS): Volume I - Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments), Final, OSWER Directive 9285.7-47, December 2001.

Risk Assessment Guidance for Superfund (RAGS): Volume I - Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals), Interim, OSWER Directive 9285.7-01B, EPA/540/R-92/003, PB92-963333, December 1991.

Risk Assessment Guidance for Superfund (RAGS): Volume I - Human Health Evaluation Manual (Part C, Risk Evaluation of Remedial Alternatives), OSWER Directive 9285.7-01C, PB92-963334, October 1991.

Risk Assessment Guidance for Superfund (RAGS): Volume I - Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment), Interim, OSWER Directive 9285.7-02EP, PB99-963312, September 2001.

Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors", OSWER Directive 9285.6-03 (EPA, March 25, 1991).

Supplemental Guidance to RAGS: Calculating the Concentration Term, OSWER Directive 9285.7-08I, June 22, 1992.

EPA Region I Supplemental Risk Assessment Guidance for the Superfund Program Part 1: Public Health Risk Assessment, EPA 901/5/89-001, June 1989.

Final Guidance Data Usability in Risk Assessment (Part A), OSWER Directive 9285.7-09A, PB92-963356, April 1992.

Guidance for Data Usability in Risk Assessment (Part B), OSWER Directive 9285.7-09B, PB92-963362, May-1992.

Dermal Exposure Assessment: Principles and Applications, Interim Report, Office of Research and Development, EPA/600/8-91/B, 1992.

Exposure Factors Handbook, Volumes I, II, and III, EPA/600/P-95/002Fa, August 1997.

Role of Background in the CERCLA Cleanup Program, OSWER Directive 9285.6-07P, April 26, 2002.

Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites, EPA/540/R-01/003, OSWER Directive 9285.7-41, September 2002.

Guidance on Risk Characterization for Risk Managers and Risk Assessors (Memorandum from F. Henry Habicht, EPA Deputy Administrator, to Assistant Administrators and Regional Administrators), Office of the Administrator, Washington, DC, 1992.

EPA Risk Characterization Program (Memorandum from Administrator Carol M. Browner to Assistant Administrators, Associate Administrators, Regional Administrators, General Counsel and Inspector General), Office of the Administrator, Washington, DC, March 21, 1995.

Soil Screening Guidance: User's Guide, EPA/540/1R-96/018, July 1996.
Calculating Upper Confidence Limits in Exposure Point Concentrations at Hazardous Waste Sites, OSWER Directive 9285.6-10, December 2002.

Proposed Guidelines for Carcinogen Risk Assessment, Office of Research and Development, Washington, DC, EPA/600P-92/003C, 1996.

Guidelines for Carcinogenic Risk Assessment, SAB Review Draft, NCEA-F-0644, July 1999.

Draft Final Guidelines for Carcinogenic Risk Assessment, External Review Draft, Risk Assessment Forum, NCEA-F-0644A, March 2003.

Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, Peer Review Draft, OSWER Directive 9355.4-24, March 2001.

Integrated Risk Information System (IRIS).

Health Effects Assessment Summary Tables (HEAST), EPA/540/R-97/036, July 1997.

Land Use in the CERCLA Remedy Process (Memorandum from E.P. Laws to EPA Regional Directors), OSWER Directive 9355.7-04, May 1995.

Air/Superfund National Technical Guidance Study Series, Volumes I, II, III, and IV, EPA 450/1-89/001,002,003,004, July 1989.

Guidance Manual for Health Risk Assessments of Hazardous Substance Sites.

For the ecological risk assessment:

Risk Assessment Guidance for Superfund (RAGS): Volume II - Environmental Evaluation Manual, Interim Final, EPA/540/1-89/001, March 1989.

Guidelines for Ecological Risk Assessment, EPA/630/R-95/002F, April 1998.

Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final, OSWER Directive 9285.7-25, EPA/540/R-97/006, PB97-963211, June 1997.

Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference Document, EPA/600/3-89/013, March 1989.

Wildlife Exposure Factors Handbook, Volume I of II, EPA/600/R-93/187a, December 1993.

Wildlife Exposure Factors Handbook - Appendix: Literature Review Database, Volume II of II, EPA/600/R-93/187b, December 1993.

ECO Update - The Role of Biological Technical Assistance Groups (BTAGs) in

Ecological Assessment, Intermittent Bulletin Volume 1, Number 1, OSWER Directive 9345.0-05I, September 1991.

ECO Update - Ecological Assessment of Superfund Sites: An Overview, Intermittent Bulletin Volume 1, Number 2, OSWER Directive 9345.0-05I, December 1991.

ECO Update - The Role of Natural Resource Trustees in The Superfund Process, Intermittent Bulletin Volume 1, Number 3, OSWER Directive 9345.0-05I, March 1992.

ECO Update - Developing a Work Scope For Ecological Assessments, Intermittent Bulletin Volume 1, Number 4, OSWER Directive 9345.0-05I, May 1992.

ECO Update - Briefing the BTAG: Initial Description of Setting, History, and Ecology of a Site, Intermittent Bulletin Volume 1, Number 5, OSWER Directive 9345.0-05I, August 1992.

ECO Update - Using Toxicity Tests in Ecological Risk Assessment, Intermittent Bulletin Volume 2, Number 1, OSWER Directive 9345.0-05I, March 1994.

ECO Update - Catalogue of Standard Toxicity Tests for Ecological Risk Assessment, Intermittent Bulletin Volume 2, Number 2, OSWER Directive 9345.0-05I, March 1994.

ECO Update - Field Studies for Ecological Risk Assessment, Intermittent Bulletin Volume 2, Number 3, OSWER Directive 9345.0-05I, March 1994.

ECO Update - Ecotox Thresholds, Intermittent Bulletin Volume 3, Number 2, OSWER Directive 9345.0-12FSI, EPA/540/F-95/038, PB95-963324, January 1996.

Issuance of Final Guidance: Ecological Risk Assessment and Risk Management Principles for Superfund Sites, OSWER Directive 9285.7-28 P, October 7, 1999.

Framework for Ecological Risk Assessment, EPA/630/R-92/001.

Additional guidance that may be used to prepare and conduct the Baseline Risk Assessment are:

Guidelines for:

- a. Carcinogen Risk Assessment (51 FR 33992, September 24, 1986);
- b. Mutagenicity Risk Assessment (51 FR 34006, September 24, 1986);
- c. The Health Risk Assessment of Chemical Mixtures (51 FR 34014, September 24, 1986);
- d. The Health Assessment of Suspect Developmental Toxicants (56 FR 63798, December 5, 1991); and

- e. Guidelines for Exposure Assessment (57 FR 22888, May 29, 1992).

III. Risk Assessment Methodologies

A. Components of the Risk Assessment

The Baseline Risk Assessment shall be separated into two components: 1) the human health risk assessment; and 2) the ecological risk assessment. The human health risk assessment shall address the following five categories at a minimum:

1. hazard identification;
2. dose-response assessment;
3. exposure assessment;
4. risk characterization; and
5. limitations/uncertainties.

The ecological risk assessment shall address the following seven categories:

1. definition of objectives;
2. characterization of site and potential receptors;
3. selection of chemicals, species and endpoints for risk evaluation;
4. exposure assessment;
5. toxicity assessment;
6. risk characterization; and
7. limitations/uncertainties.

B. Data Acquisition

The Baseline Risk Assessment shall be based upon information gathered prior to and during the RI/FS at the Site, as well as on data available through peer-reviewed literature. The Respondent shall, at the direction of EPA, collect additional field data to support the Baseline Risk Assessment. The decision regarding the need for supplemental data collection will be made by EPA (after providing reasonable opportunity for review and comment by DEP) following a review of the Phase 1A RI data. Primary importance will be placed upon data collected in the field at the Site, with data collected from the literature used to support or explain field results.

C. Deliverables

The final product(s) shall be the Draft Baseline Risk Assessment Report(s), which will comprise the human health and ecological risk assessments. Prior to submission of the final report(s), portions of the Baseline Risk Assessment in the form of interim

deliverables may be submitted. The final schedule and the need for the interim deliverables shall be finalized in the approval of the Revised RI/FS Work Plan.

The suggested interim deliverables for the Baseline Human Health Risk Assessment include:

- Exposure Pathway Analysis
- Selection of Contaminants of Concern
- Exposure Point Concentrations and Exposure Parameters

The suggested interim deliverables for the Baseline Ecological Risk Assessment include:

- Screening Level Ecological Risk Assessment
- Problem Formulation
- Exposure Assessment and Effects Analysis (including baseline assumptions and input parameters for food chain modeling and toxicity reference values)

These interim deliverables, if needed, shall be reviewed and accepted by EPA before proceeding with the next interim deliverable. Once all of the interim deliverables are accepted, a Draft Baseline Risk Assessment Report(s) shall be submitted as part of the First Draft RI/FS and subsequent drafts of the RI/FS. Following review and feedback from EPA and DEP on the Draft Baseline Risk Assessment Report(s), a Revised Draft Baseline Risk Assessment Report(s) and subsequent drafts of the Baseline Risk Assessment Report(s) may be required incorporating EPA's comments and any additional validated data or information, which were obtained after the completion of the draft report, that may have bearing on the Baseline Risk Assessment.

The exact number and format of the interim deliverables will be determined in the Revised RI/FS Work Plan. Technical meetings may substitute for some of the interim deliverables.

IV. Schedule

The Revised RI/FS Work Plan shall include a schedule for the Baseline Risk Assessment, including any interim deliverables.