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Environmental Protection Agency.
By: [illegible] Date 4/13/92

BEFORE THE

OHIO ENVIRONMENTAL PROTECTION AGENCY

In the Matter of	:	
	:	
COOPER TIRE & RUBBER COMPANY	:	
Lima & Western Avenues	:	
Findlay, OH 45840-2316	:	
	:	DIRECTOR'S FINAL
	:	FINDINGS AND ORDERS
	:	
Respondent	:	

ADMINISTRATIVE ORDER ON CONSENT

I. JURISDICTION

This Administrative Order on Consent (Consent Order) constitutes Director's Final Findings and Orders and is issued pursuant to the authority vested in the Director of the Ohio Environmental Protection Agency (OEPA) by Ohio Revised Code (ORC) Sections 3734.13(A), 3734.20(B), 6111.03(H), and 3745.01.

II. STATEMENT OF PURPOSE

In entering into this Consent Order, the mutual objectives of OEPA and Respondent are to: (1) complete a full investigation of the Site, as defined in paragraph III.L. below; (2) determine the extent of contamination at the Site caused by the release of hazardous waste or substances, industrial waste and/or other waste; and (3) develop and evaluate a program of appropriate remedial measures employing sound scientific, engineering and construction practices which shall be consistent with federal, state and local law.

III. DEFINITIONS

The terms used in this Consent Order, and the workplans and any [illegible] document required by this Consent Order, shall have the same meaning as used [illegible]

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in ORC Chapters 3734. and 6111. and/or as defined below:

A. "Contractor" means a qualified contractor retained by Respondent pursuant to this Consent Order, and any subcontractor, representative, agent, employee or designee thereof.

B. "Days" means calendar days, including weekends and holidays.

C. "Document" means any record, report, photograph, videotape, correspondence, computer disk or tape, recorded or retrievable information of any kind, including raw data, narrative reports and any and all documentary evidence, relating to treatment, storage, disposal and concerning the investigation and remediation of hazardous waste or substances or industrial waste or pollutants or other waste at the Site. "Document" shall be construed broadly to promote the effective sharing of information and views concerning the work to be done between Respondent and OEPA.

D. "Feasibility Study" ("FS") means the development, evaluation and analysis of remedial alternatives for cleanup action conducted by Respondent in accordance with State environmental laws and this Consent Order.

E. "Hazardous waste" shall have the same meaning as defined at ORC 3734.01(J), and in Rules 3745-51-03 and 3745-50-10(A)(36) of the Ohio Administrative Code (OAC), and "hazardous constituents" shall have the same meaning as that term is defined in OAC Rule 3745-50-10(A)(16). For the purposes of this Consent Order, the use of the term, "hazardous substances," shall have the same meaning as defined in Section 101(14) of The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended, 42 USC 9601.

F. "NCP" means the National Oil and Hazardous Substances Pollution

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Contingency Plan, referred to in CERCLA as the National Contingency Plan, and codified at 40 C.F.R. Part 300 (1990) (as subsequently amended).

G. "OEPA" means the Ohio Environmental Protection Agency and its designated representatives, including any contractor retained by OEPA, pursuant to this Consent Order.

H. "Party" or "Parties" means Respondent and/or OEPA.

I. "Remedial Investigation" ("RI") means the investigation conducted in accordance with State environmental laws by Respondent, to determine the nature and extent of the contamination at the Site, and includes the gathering of all necessary data to support the Feasibility Study.

J. "Remedial Investigation/Feasibility Study" ("RI/FS") means the Remedial Investigation and Feasibility Study together.

K. "Respondent" means Cooper Tire & Rubber Company, its successors, designated representatives, and assigns acting under, for, or in concert with Respondent.

L. "Site" means the Cooper Engineered Products facility which is located at 1175 North Main Street, Bowling Green, Ohio, described at Article IV below, where treatment, storage, placement or disposal of hazardous waste or substances and/or industrial waste and/or other waste were conducted, including any other area contaminated or threatened to be contaminated by hazardous waste or substances and/or industrial waste and/or other wastes migrating therefrom.

M. "U.S. EPA" means the United States Environmental Protection Agency.

N. "Workplan" means that document detailing the requirements for characterizing the Site and for support of the Remedial Investigation and Feasibility Study. The Workplan shall include a detailed

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description of the proposed investigations and/or implementation activities; a time schedule for those actions; and personnel and equipment requirements. The Workplan, which includes sampling as an element, shall also include: a sampling plan together with the rationale for sampling activities; locations, quantity and frequency of sampling; sampling and analytical methods; constituents for analysis; and quality control/quality assurance procedures. The required content of the Workplan is outlined in the Generic Statement of Work (SOW) for the RI/FS attached hereto and incorporated herein as Exhibit A.

IV. FINDINGS OF FACT, DETERMINATIONS, AND CONCLUSIONS OF LAW

OEPA has determined that all findings of fact necessary for the issuance of this Consent Order pursuant to ORC Sections 3734.13(A), 3734.20(B) and 6111.03(H) have been made and are outlined below. Without trial or adjudication of any issue of fact or law and without admission of any fact or liability by Respondent, OEPA has determined and concluded that:

A. Cooper Tire & Rubber Company currently owns and operates Cooper Engineered Products ("Cooper"), which is located at 1175 North Main Street, Bowling Green, Ohio. Cooper has produced rubber industrial products at the Site since 1977.

B. From 1969 to 1977, the Site was owned by Gulf & Western Manufacturing, Inc. ("Gulf & Western"), and operated by the Daybrook Ottawa Division, which manufactured dump bodies for trucks. Gulf & Western Manufacturing, Inc. was acquired by Wickes Companies, Inc. in 1985.

C. According to a former employee at the Site, the manufacturing operations included the cutting and welding of steel, surface preparation and painting of dump bodies, and mounting of dump bodies onto truck chassis. These operations also involved the use of a steel tank inside a pit which

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was located in the middle of the plant and filled with solvent for degreasing.

D. A Cooper employee, who was involved in the reconstruction of the plant for Cooper, recalls the removal of overhead lines that ran from the tank/pit area to the west wall of the plant. A drawing from the Cooper files dated October 4, 1964 and labelled "Bulk Storage - Outside West Wall" indicates that trichloroethylene (TCE) was one of the items stored in bulk along the west wall. An air contaminant emissions survey, dated October 8, 1970 and prepared by the Daybrook Ottawa Division, indicates that a degreaser using TCE in the amount of 3200 gallons a year was operated on the Site.

E. In April 1986, two 8,000 gallon underground xylene storage tanks were removed at the Cooper plant. During the removal process, a hole was found in a supply pipe to one of the tanks. The soil and liquid samples that were collected indicate that the tank system was leaking.

F. In May 1986, QSource Environmental Services ("QSource") conducted an investigation to define vertical and horizontal migration of xylene from the area where the tanks were removed. The sampling results indicated that xylene was present in the soil at the edge of the tank excavation up to 1330 ppm. Water collected from the excavation under one of the tanks also contained xylene up to 2640 ppm, however the xylene was limited to the area excavated for the removal of the storage tanks.

G. The testing by QSource of samples collected following tank removal also revealed the presence of TCE in three borings. There was a maximum concentration level of 773 ppm at between 6.5 to 9.5 feet below grade at boring E. In addition, toluene, freon TF, a mineral spirits blend, isopropyl acetate and cyclohexanone were found to be present.

H. In October 1988, Target Environmental Services (Target) conducted a

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soil gas survey at the Site. This study revealed the presence of TCE, perchloroethene (PCE), trichloroethane (TCA), dichloroethene (DCE), dichloroethane (DCA), toluene, ethylbenzene and xylene in the soil gas. The following table lists the maximum concentration levels for constituents found during the soil gas survey.

Contaminant	Concentration (ppb)
TCE	4,299
PCE	15
TCA	1,612
DCE	207
Toluene	6.7
Ethylbenzene	4.3
Xylene	12

I. Additional soil and ground water sampling was conducted in December 1990, January 1991, and April 1991 by QSource and EMG, Inc. (Environmental Mitigation Group) for Cooper. In addition, EMG conducted geophysical investigations and Petrex passive soil gas surveys in June to September, 1991. This investigatory work may be used by Cooper as the basis for selecting soil and groundwater samples to complete the RI portion of the work called for by this Consent Order. The following tables list information about the highest concentrations of contaminants found as a result of the soil and groundwater testing.

Soil Sampling

Dec.'90 - Jan.'91 (only):

Borehole	Constituent	Concentration (ppb)/Depth
9	TCE	33,700 at 6 - 7 feet
9	1,2-DCE	878 at 2 - 3 feet
14	TCE	38,200 at 4 - 5 feet
14	TCE	31,400 at 9 - 11 feet
14	1,2-DCA	6,300 at 4 - 5 feet
16	TCE	1,750 at 14 - 16 feet

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By: Mike Mackey Date 4/13/92

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Ground Water Sampling

Dec.'90 - Jan.'91:

Monitoring Well	Constituent	Concentration (ppb)	MCL (ppb
MW-3S	TCE	65	5
MW-3	Benzene	6.8	5

April'91:

MW-3S	TCE	460	5
MW-3S	1,2-DCE	420	70
MW-3	Benzene	9	5

J. The work performed by Q-Source, Target, and EMG was completed prior to approval of the Quality Assurance Plan called for in Task 2 of the SOW. It is understood by OEPA that Respondents may rely on work performed by QSource, Target, and EMG to prepare the RI/FS Workplan called for by the Consent Order and as a basis for conducting additional selective soil and ground water sampling to complete their obligations under the Workplan and as described in Task 4 of the SOW. The work performed by QSource, Target, and EMG will be reviewed, and approved or disapproved by OEPA when the Workplan is submitted to OEPA in accordance with this Consent Order.

K. The TCE, PCE, TCA, 1,2-DCE, DCE, 1-2-DCA, DCA, toluene, benzene, ethylbenzene, xylene, freon TF, mineral spirits blend, isopropyl acetate, and cyclohexanone became "industrial waste" and/or "other wastes," as defined in ORC Section 6111.01(C) and (D), and/or "hazardous waste," as defined in ORC Section 3734.01(J), and/or "hazardous substance," as defined in Section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, when they were released to the soil.

L. Well drilling logs indicate there are private wells within a three mile radius of the Site. Based on existing data, the geology of the Site appears to consist of clay 1 to 16 feet below grade with sand and gravel lenses of unknown horizontal and vertical extent.

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M. The discharging, depositing, injecting, dumping, leaking, spilling or placing of hazardous waste into or on the soil, ground or surface water at or from the Site constitutes "disposal" of hazardous waste as defined in ORC Section 3734.01(F), and any site at which such disposal occurs is a "facility," as that term is defined in ORC Section 3734.01(N). This constitutes an unlawful placement or "disposal" or threatened placement or "disposal" of waste in violation of ORC Sections 6111.04, 3734.02 and 3734.11.

N. The migration or threatened migration of the hazardous waste and/or hazardous substance and/or industrial waste and/or other wastes into the soil, ground water and surface water at or from the Site constitutes a "release," as that term is defined in Section 101(22) of CERCLA, and the migration of industrial waste, other waste and/or hazardous waste and substances into "waters of the State" constitutes a discharge into waters of the State, as that term is defined in ORC Section 6111.01(H).

O. The unpermitted discharge of industrial waste, other waste and/or hazardous waste and substances into "waters of the State" is prohibited by ORC Section 6111.04.

P. The release or disposal of industrial waste and/or hazardous waste from the Site may pose a substantial threat to public health or safety or is causing or contributing to or threatening to cause or contribute to air or water pollution or soil contamination within the meaning of ORC Section 3734.20(B).

Q. Respondent is an "owner" and/or "operator," within the meaning of Section 107(a) of CERCLA, of a "facility," as that term is defined in Section 101(9) of CERCLA.

R. Respondent is a potentially "responsible person," within the meaning

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of Section 107 of CERCLA. Respondent is a "person," as defined in Section 101(21) of CERCLA, and ORC Section 3734.01(G).

S. The actions to be taken pursuant to this Consent Order are reasonable and necessary to protect the public health or welfare or the environment, and the Director believes the issuance of this Consent Order is furthering the intent of the General Assembly and the Environmental Protection Agency, and that this Consent Order will prevent and abate pollution of the environment for the health, safety, welfare, and property of the people of the State.

T. The Director has given consideration to and based his determination on evidence relating to the technical feasibility and economic reasonableness of complying with this Consent Order and on evidence relating to conditions calculated to result from compliance with this Consent Order, and its relation to the benefits to the people of the State to be derived from such compliance in accomplishing the purposes of Chapters 3734 and 6111 of the ORC.

U. A reasonable time for beginning and completing the actions required by this Consent Order has been provided herein.

V. Respondent has agreed to undertake the actions in this Consent Order.

V. COMMITMENT OF RESPONDENT

A. Respondent consents to and will not challenge OEPA's jurisdiction to enter and enforce this Consent Order, and do hereby agree to undertake, at their expense, the actions required by the terms and conditions of this Consent Order within the time frames specified herein, except as the provisions of Articles XIV, XV and XXI are deemed to apply to the time for performance.

B. Respondent shall assume any and all liability arising from or relating

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By: Gabi Mackey Date 4/13/92

to their acts or omissions in the performance of the work or their failure to perform fully to complete the work under this Consent Order.

VI. PARTIES BOUND

A. This Consent Order shall apply to and be binding upon Respondent, its officers, directors, agents, acting in their corporate capacity, and their successors and assigns. The signatories to this Consent Order certify that they are fully authorized to execute and legally bind the parties they represent to this Consent Order. No change in ownership or corporate status of Respondent shall alter their responsibilities under this Consent Order. The Respondent shall provide a copy of this Consent Order to any subsequent owners or successors before ownership rights are transferred. In the event that Cooper shall transfer control of its Engineered Products division to a subsidiary corporation to Cooper, said transfer shall include provisions making this Consent Order binding on the subsidiary and Cooper.

B. Respondent will notify OEPA of the selection of all contractors and subcontractors who will perform work in accordance with this Consent Order. Respondent shall provide a copy of this Consent Order and applicable sections of the approved Workplan to all contractors, subcontractors and consultants which are retained to conduct any work performed under this Consent Order, according to the schedules set forth in the approved Workplan.

C. Respondent shall require all such contractors, subcontractors and consultants to sign an acknowledgement that they have read this Consent Order and understand that the work they are doing is necessary for the Respondent to comply with this Consent Order. Notwithstanding the terms of any contract, Respondent shall be responsible for ensuring that all contractors, consultants, firms, and other persons acting for them comply

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By: Julie Mackey Date 4/13/02

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with the terms of this Consent Order.

VII. ACCESS

A. To the extent that portions of the Site or areas where work is to be performed are presently owned by persons other than Respondent, Respondent shall use its best efforts to obtain voluntary access agreements from the present owners, including any agreements necessary to provide access to OEPA and its authorized representatives. Copies of these agreements are attached or will be provided to OEPA.

B. In the event Respondent is unable to obtain such access, Respondent shall notify OEPA promptly in writing regarding both the lack of access agreements and the efforts to obtain such access agreements. In the event OEPA agrees that Respondent has used its best efforts, OEPA will contact the landowners. Best efforts may include, but shall not be limited to: making a request in writing for an access agreement to the owner of record of the property in question, sending that request by certified mail, and making a follow-up telephone call to the party to whom the request for access was made.

C. Pursuant to this Consent Order and any access agreements obtained under paragraphs A and B above, OEPA, through its authorized representatives, shall have authority to enter all property at the site and freely move about at all times to assure compliance with this Consent Order, including, but not limited to: inspection of records, operating logs, and contractor activities arising from work required under this Consent Order; reviewing the progress of Respondent in carrying out the terms of this Consent Order; conducting such tests as OEPA or its Site Coordinator deems necessary to further the purposes of this Consent Order; and verifying data submitted to OEPA by Respondent. This provision shall not limit OEPA's authority

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By: Arthur Mackey Date 4/13/92

to gain access for inspection under ORC Sections 3734.20 and 6111.05. With the exception of documents described in Article XIII, Respondent shall permit during daytime working hours such OEPA representatives to inspect and request copies of all documents which pertain to this Consent Order. With the exception of documents described in Article XIII, OEPA shall be given access to documents which pertain to this Consent Order for inspection and copying during non-working hours upon prior arrangement with Respondent.

D. All parties with access to the Site and other areas where work is to be performed pursuant to this paragraph shall comply with the Health and Safety Plan approved by OEPA as part of the RI/FS Workplan. Nothing herein shall act to limit the statutory authority of OEPA to conduct inspections and gather information.

VIII. WORK TO BE PERFORMED

A. All work to be performed by Respondent pursuant to this Consent Order shall be under the direction and supervision of a qualified environmental engineer, geologist, or other appropriate professional person with expertise in hazardous waste or substances site investigation. Prior to the initiation of site work, Respondent shall notify OEPA in writing regarding the name, title, and qualifications of such engineer, geologist, or other appropriate professional person and of any contractors and/or subcontractors to be used at the Site in carrying out the terms of this Consent Order.

B. Attachment A to this Consent Order contains the Generic Statement of Work (SOW) for performance of the complete RI/FS which is incorporated into and made a part of this Consent Order.

C. Respondent shall contact OEPA to schedule a meeting to discuss the requirements for a Data Collection Quality Assurance Plan, which is described in Task 3 of the Generic SOW. This meeting shall take place

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By: [illegible] Date 4/13/92

within ten (10) days of the effective date of this Consent Order.

D. Within sixty (60) days of the effective date of this Consent Order, Respondent shall submit a draft Workplan for the implementation of the complete RI/FS at the Site. This RI/FS Workplan shall be developed in conformance with the SOW attached to the Consent Order, ORC Chapters 3734. and 6111., and the regulations promulgated thereunder, and the NCP. Preparation of the Workplan and OEPA's review of the Workplan shall be consistent with the version of the following guidance documents that are in effect at the time of the approval of the Workplan by OEPA:

1. How Clean is Clean, Final, Ohio EPA, Division of Emergency and Remedial Response, Policy No. DERR-00-RR-009, July 26, 1991.
2. Background Guidance, Interim Final, Ohio EPA, Division of Emergency and Remedial Response, April, 1991.
3. Guidance for Conducting Remedial Investigation and Feasibility Studies near CERCLA, Interim Final, OSWER 9355.3-01, October, 1988; EPA/540/G-89/004;
4. Risk Assessment Guidance for Superfund, Volume 1 - Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002, December, 1989;
5. Risk Assessment Guidance for Superfund, Volume II -Environmental Evaluation Manual - Interim Final, OSWER Directive 9285.7-01. EPA/540/1-89/001A, 1989;
6. Superfund Exposure Assessment Manual, OSWER 9285.5-1, EPA/540/1-88/001, April, 1988;
7. Exposure Factors Handbook. EPA/600/8-89/043, July, 1989;
8. RCRA Ground Water Monitoring Technical Enforcement Guidance Document (TEGD), OSWER 9950.1, September , 1986;

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9. Remedial Actions for Contaminated Ground Water at Superfund Sites, OSWER 9283.1-2, August, 1988;

10. Data Quality Objectives for Remedial Response Activities, Volume I, EPA/540/G-87/004, Example Scenario;

11. Superfund Remedial Design and Remedial Action Guidance, OSWER 9355.0-4A;

12. Ecological Assessments of Hazardous Wastes Sites: A Field and Laboratory Reference, EPA/600/3-89/013, March, 1989;

13. Guidelines and Specifications for Preparing Quality Assurance Project Plans, Ohio EPA, Division of Emergency and Remedial Response, Policy No. DERR-00-RR-008, March, 1990;

14. CERCLA Compliance with Other Laws Manual, Part I, OSWER 9234.1-01, March 6, 1988;

15. CERCLA Compliance with Other Laws Manual, Part II, OSWER 9234.1-02, August, 1989;

16. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors," OSWER 9285.6-03, March 1991;

17. U.S. EPA Integrated Risk Information System (IRIS) Data Base;

18. Guidance for Data Usability in Risk Assessment, Interim Final, EPA/540/G-90/008, October, 1990; and

19. Health Effects Assessment Summary Tables, DERR 9200.6-303, published quarterly.

If OEPA determines that any additional guidance documents affect the work to be performed under this Consent Order, OEPA will notify Respondent and the affected Workplan or reports shall be modified accordingly.

E. Should Respondent identify any inconsistency between any of the laws, rules, regulations, or guidance documents which it is required to follow by

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this Consent Order and which will affect any of the work required by this Consent Order, Respondent shall notify OEPA in writing of each such inconsistency and its effect on the work to be performed. Respondent shall recommend, along with a supportable rationale justifying each recommendation, the requirement which it believes should be followed. Subject to Section XV, Respondent shall implement the affected work based upon OEPA's direction in resolving any inconsistencies.

F. The draft RI/FS Workplan, any plans or reports required by this Consent Order or approved Workplan, and any Amendments or supplements to the Workplan shall be subject to review, and approval or disapproval by OEPA in accordance with the procedures set forth in Section XIV of this Consent Order.

G. Upon approval of the RI/FS Workplan, Respondent shall promptly implement the work detailed therein in accordance with the schedule contained in the RI/FS Workplan, except as provided in Sections XIV, XV and XXI below.

IX. AMENDMENT OF THE WORKPLAN

A. OEPA may determine that in addition to tasks defined in the approved RI/FS Workplan and any previously approved Amendments, additional work may be necessary to accomplish the purposes and objectives of the RI/FS as set forth in the Statement of Purpose and Generic SOW for this Consent Order. Additional work may include, by way of illustration and not limitation, additional sampling due to the discovery of previously unknown contamination. OEPA may require, in a written notice, that Respondent performs this work in addition to the work required by the approved RI/FS Workplan and any previously approved Amendments, if OEPA determines that such work is necessary for a complete RI/FS. Respondent shall confirm its

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By: Nikki Mackey Date 4/13/92

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willingness to perform the work in writing to OEPA within fifteen (15) days of receipt of OEPA's written notice and shall submit the draft Amendment in the time frame specified in OEPA's written notice. The Respondent may request a meeting to discuss the additional work. If requested, this meeting shall be held within ten (10) days of receipt of OEPA's written notice of additional work. OEPA shall comply with the request for a meeting as soon as possible. Respondent shall implement the tasks which OEPA determines are necessary. The work shall be completed according to the standards, specifications, and schedule, as proposed by Respondent, and approved by OEPA in a written Amendment to the RI/FS Workplan.

B. If at any time during the RI/FS process, Respondent seeks to perform additional field work which will require an Amendment of the work required under this Consent Order for the RI/FS, including changes to any schedules, Respondent shall submit a prior written request for Amendment to OEPA explaining the need for and nature of the additional work or extension. OEPA shall respond in writing within ten (10) days of receipt of Respondents' request and shall either approve or disapprove such request. Upon verbal notice to the OEPA site coordinator, Respondent may conduct additional field work not requiring a change to a schedule in the approved RI/FS Workplan. Within ten (10) days of the verbal notice, Respondent will send a letter to OEPA documenting the additional work.

C. OEPA reserves the right to: conduct the additional work at any point to further the purposes of this Consent Order, as stated in Article II; seek reimbursement from Respondents; and/or seek any other appropriate relief.

D. Work beyond the purposes of this Consent Order may be implemented through modification of this Consent Order by mutual agreement of the Parties. Any such work beyond the purpose of this Consent Order implemented

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By: Cathi Rackey Date 4/13/92

under a modification shall be subject to the approval of OEPA.

X. DESIGNATED SITE COORDINATORS

A. Respondent and OEPA shall each designate a Site Coordinator and an alternate for the purpose of overseeing the implementation of this Consent Order. To the maximum extent possible, except as specifically provided in this Consent Order, communications between Respondent and OEPA concerning the terms and conditions of this Consent Order shall be made between the designated Site Coordinators. Each designated Site Coordinator shall be responsible for assuring that all communications from the other parties are appropriately disseminated and processed. The Site Coordinators shall attempt to resolve disputes informally through good faith discussion on the technical issues.

B. Without limitation of any authority conferred on OEPA by statutes or regulations, the OEPA Site Coordinator's authority includes, but is not limited to: (1) taking samples, which shall be split with Respondent upon request, or, in accordance with the terms of any workplan, directing the type, quantity and location of samples to be taken by Respondent; (2) observing, and taking photographs and making such other reports on the progress of the work as deemed appropriate; (3) directing that work stop, for a period not to exceed 48 hours, whenever the OEPA Site Coordinator determines that activities at the Site may create a threat to public health or welfare or the environment; (4) reviewing documents which pertain to this Consent Order.

C. The Respondent's designated Site Coordinators or his/her designee shall be at the Site during all hours of field work at the Site required under the Workplan and shall make himself/herself available for the pendency of this Consent Order. The absence of the OEPA Site Coordinator from the Site shall

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By: Debbi Mackey Date 4/13/92

not be cause for stoppage of work unless otherwise provided.

D. OEPA and Respondent each have the right to change their respective Site Coordinator or alternate. Such a change shall be accomplished by notifying the other parties in writing at least five (5) days prior to the change.

XI. REPORTING

A. Respondent shall submit written progress reports which describe the activities which have been taken pursuant to this Consent Order during the previous month, as well as activities which are scheduled for the next month, to OEPA by the tenth day of every month following the effective date of this Consent Order, unless otherwise designated pursuant to this Consent Order.

At the minimum, these reports shall:

1. Identify the Site and activity;
2. Describe status of work at the Site and progress to date;
3. Demonstrate the percentage of work completed in accordance with the approved schedule;
4. Describe difficulties encountered during the reporting period;
5. Describe actions being taken to rectify problems;
6. Describe activities planned for the next month;
7. Identify changes in key personnel;
8. List target and actual completion dates for each element of activity, including the project completion; and
9. Provide an explanation of any deviation from the milestones in the Workplan schedules.

B. Such progress reports and any other documents, reports, approvals or correspondence submitted pursuant to this Consent Order shall be sent by Courier or overnight mail or certified mail return receipt requested (or the

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By: Vicki Mackey Date 4/13/95

equivalent) to the OEPA at the following addresses (or to such address as the OEPA may hereafter designate in writing):

Ohio EPA
1800 WaterMark Drive
P. O. Box 1049
Columbus, Ohio 43266-0149
ATTN: Manager, Technical and Program Support Section, Division of Emergency and Remedial Response

Ohio EPA
Northwest District Office
347 North Dunbridge Road
Bowling Green, Ohio 43402
ATTN: Todd Kelleher, DERR (or his successor)

All correspondence to Respondent will be directed to the following:

Cooper Tire & Rubber Company
Lima & Western Avenues
Findlay, Ohio 45840-2316
ATTN: Thomas E. Wood (or his successor)

C. OEPA may, at its discretion, direct that reports or plans or proposals made pursuant to the Consent Order be submitted at extended intervals or that no further reports need be submitted.

XII. SAMPLING AND DATA/DOCUMENT AVAILABILITY

A. OEPA and Respondent shall make available to each other the results of sampling, tests or other data, including raw data, generated by any of them, or on their behalf, with respect to the implementation of this Consent Order.

B. Upon request of OEPA, Respondent shall require all laboratories and/or contractors to simultaneously deliver all raw data and all original reports of analytical procedures and results to OEPA and Respondent.

C. Respondent may submit to OEPA any interpretive reports and written explanations concerning raw data and original laboratory reports. Such interpretive reports or explanations may not be submitted in lieu of original laboratory reports and raw data. Should Respondent subsequently

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By: Nikki Mackey Date 4/13/92

discover any error in any report or raw data, Respondent shall promptly notify OEPA of such discovery and provide the correct information.

D. At the request of OEPA, Respondent shall allow OEPA to take split and/or duplicate samples collected by Respondent during the implementation of the Consent Order. Respondent shall notify the OEPA Site Coordinator not less than twenty-one (21) days, or some other time period agreed to by the Site Coordinators, in advance of any sample collection for which the OEPA Site Coordinator has indicated that (s)he may wish to obtain split or duplicate samples.

E. Respondent shall preserve, during the pendency of this Consent Order and for a minimum of seven (7) years after its termination, copies of all records and documents within its possession or that of its divisions, employees, agents, accountants or contractors which relate to work performed under this Consent Order, despite any document retention policy to the contrary. Non-technical administrative documents maintained by the contractor shall be preserved for a period of two (2) years after completion of the work called for in the Consent Order rather than for seven (7) years as specified above. After the seven (7) year period, Respondent shall notify OEPA within thirty (30) days prior to the destruction of any such documents required to be kept pursuant to this Article. Upon request by OEPA, Respondent shall make available to OEPA copies of any such documents, except for such documents as are protected by legal privileges or immunities.

XIII. CONFIDENTIAL INFORMATION

A. Respondent reserve any rights it may have pursuant to law to claim that they may withhold from disclosure those documents protected by attorney-client communication or attorney work product privilege. Respondent shall

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By: Cathy Mackey Date 4/13/92

not withhold as privileged any analytical data or technical documents that are created, generated or collected pursuant to the requirements of this Consent Order, regardless of whether the document has been generated in the form of attorney-client communication or other generally privileged manner.

B. Respondent may assert a claim of business confidentiality covering the information requested by this Consent Order, except for analytical data, pursuant to OAC Rule 3745-50-30(A) and ORC 6111.05(A). Information determined to be confidential in accordance with OAC Rule 3745-49-03(A) will be afforded protection under OAC Rule 3745-50-30. If no such claim accompanies the information when it is submitted to OEPA, it may be made available to the public by the OEPA without further notice to Respondent.

XIV. REVIEW OF SUBMITTALS

A. Respondent shall submit all documents required by the Consent Order or RI/FS Workplan in accordance with the schedule contained in the RI/FS Workplan.

B. OEPA shall endeavor to review and approve or disapprove each document specified in the Consent Order or the RI/FS Workplan requiring OEPA approval within forty-five (45) days of receipt by OEPA. In the event that any document requires a longer review period, OEPA shall notify Respondent in writing of that fact within forty-five (45) day of receipt of the document. Documents which are submitted in sections or which form the basis for a more extensive final required submittal shall be reviewed when the final completed document is submitted to OEPA, unless otherwise agreed to by OEPA. In the event Respondent is notified that a document is disapproved in whole or in part, OEPA shall include a statement in the notification as to the changes, deletions, or additions which shall be made to the document prior to approval, and an explanation as to why such changes, deletions, or

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additions are necessary. Within thirty (30) days of: (1) receipt of OEPA notification requiring changes, deletions, or additions, or (2) completion of the disputes resolution process pursuant to Section XV below, whichever shall be later, Respondent shall amend and submit to OEPA a revised document, correcting the deficiencies and incorporating all of the required changes, deletions, or additions.

C. In the event such changes, deletions, additions, or OEPA's review of such items delay the time schedules set forth in the Workplans, schedules may be adjusted accordingly upon agreement of the parties; such agreement will not be unreasonably withheld by OEPA, and such delay shall not be considered a violation of this Consent Order. The period for performance of only those activities contingent on completion of OEPA document review shall be extended, if needed, upon agreement of the parties.

D. In the event of subsequent disapproval of any revised document or submittal of a document of unacceptable quality and completion of the dispute resolution procedure under Section XV below, if invoked, or failure to submit a document, OEPA retains the right to terminate this Consent Order, to perform additional studies or remediation, to conduct a complete or partial RI/FS, and enforce the terms of this Consent Order, or any combination of all of the above.

XV. DISPUTE RESOLUTION

A. The Site Coordinators shall, whenever possible, operate by consensus, and in the event that there is a disapproval of any report or disagreement about the conduct of the work performed under this Consent Order or Workplans, or modified or additional work or schedules required under this Consent Order, the Site Coordinators shall have seven (7) days to negotiate in good faith in an attempt to resolve the differences.

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B. In the event that the Site Coordinators are unable to reach consensus on the disapproval or disagreement in seven (7) days, then each Site Coordinator shall reduce his/her position to written form within seven (7) days of the end of the good faith negotiations referenced above. Those written positions shall be immediately exchanged by the Site Coordinators. Following the exchange of written positions, the parties shall have an additional seven (7) days to resolve their differences. During this seven (7) day period the Respondent shall have the opportunity to discuss resolution of the dispute with a Section Manager or her/his designee, Central Office, Division of Emergency and Remedial Response. If the dispute is still not resolved at the end of the seven (7) days, at the request of Respondent the matter may be referred to the Chief, Division of Emergency and Remedial Response, or her/his designee for final resolution. If OEPA concurs with the position of Respondent, OEPA shall amend the Workplan or modify the Consent Order to include necessary extensions of time or variances of required work.

C. If OEPA does not concur with the position of Respondent, OEPA will resolve the dispute based upon and consistent with the Consent Order, the Workplan, ORC Sections 6111.03(H), 3734.20 and the regulations promulgated thereunder and any other appropriate state or federal law. OEPA will provide the Respondents with OEPA's decision concerning the dispute in writing. It is OEPA's position that OEPA's decision is not a final "action" or "act," as defined in ORC Section 3745.04. However, Respondent reserves any rights it may have to claim that OEPA's decision is a final "action" or "act." The pendency of dispute resolution set forth in this Article shall not affect the time period for completion of work to be performed under this Consent Order or the Workplan, except that upon mutual agreement of the parties, any

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time may be extended as appropriate under the circumstances. Such agreement will not be unreasonably withheld by OEPA. Elements of work not affected by the dispute will be completed in accordance with the schedules contained in the Workplan.

XVI. RESERVATION OF RIGHTS

A. Notwithstanding compliance with the terms of this Consent Order, but subject to Articles XXIII and XXIV below, the Respondent is not released from liability, if any, for any actions beyond the terms of this Consent Order. OEPA reserves the right to take any enforcement action pursuant to any available legal authority, including, but not limited to the right to seek injunctive relief, monetary penalties, natural resources damages, and punitive damages for any violation of this Consent Order or Chapters 3734., 3745., and 6111. of the ORC.

B. Except as otherwise provided in Article V, above, the Respondent and OEPA expressly reserve all rights and defenses that they may have, including OEPA's right both to disapprove any work performed by Respondent and to request that Respondent perform tasks in addition to those detailed in the RI/FS Workplan, including RI work and/or engineering evaluation necessary to conform with the provisions of this Consent Order. In the event that Respondent declines to perform the work or declines to perform any additional and/or modified tasks, OEPA will have the right to undertake the work. In addition, OEPA reserves the right to undertake removal actions and/or remedial actions in accordance with ORC Sections 3734.20 through 3734.26, or Section 107 of CERCLA, or any applicable law. In any event, OEPA reserves the right to seek reimbursement from Respondent thereafter for such costs incurred by the State of Ohio.

C. Nothing herein shall waive the right of OEPA to enforce this Consent

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By: Cathy Mackey Date 4/13/92

Order under ORC Chapters 6111. and 3734.

D. Following satisfaction of the requirements of this Consent Order, Respondent shall have resolved its liability to OEPA for the work performed by Respondent pursuant to this Consent Order. Respondent is not released from liability, if any, for any response actions taken beyond the scope of this Consent Order regarding removals, other operable units, remedial design/remedial action of this operable unit, or activities arising pursuant to Chapters 3734. and 6111. of the ORC.

E. Informal advice, guidance, suggestions, or comments by OEPA regarding reports, plans, specifications, schedules, or any other writings submitted by Respondent shall not relieve Respondent of its obligation to obtain such formal approval as may be required by this Consent Order.

XVII. OTHER CLAIMS

Nothing herein is intended to release, discharge or in any way affect any claims, causes of action or demands in law or equity against any person, firm, partnership or corporation not a signatory to this Consent Order from any liability he, she or it may have arising out of or relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous wastes, hazardous substances, industrial wastes, other wastes, or pollutants at, to or from the Site. The parties to this Consent Order expressly reserve all rights (including any right to contribution or indemnity possessed by Respondent against any other parties who may be responsible for actual or threatened releases at the Site), claims, demands, and causes of the action they have or may have against any and all other persons and entities not parties to this Consent Order.

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By: Nikki Mackey Date 4/13/92

XVIII. DEED NOTICE, LAND USE AND CONVEYANCE OF TITLE

Respondent shall assure that no portion of the Site will be used in any manner which would adversely affect the integrity of any containment systems or monitoring systems which may remain at the Site pursuant to this Consent Order. Respondent shall notify OEPA by registered mail at least ninety (90) days prior to any conveyance or an intent to convey any interest in land which is known to comprise the Site and of the provision made for continued maintenance of the system(s). Respondent shall assure that an appropriate notice shall be put in the deed as to the condition of the property. The notice shall first be approved by the OEPA.

XIX. OTHER APPLICABLE LAWS

All actions required to be taken pursuant to this Consent Order shall be undertaken in accordance with the requirements of all applicable local, state, and federal laws and regulations including all environmental laws and regulations. OEPA shall consider any permit applications which Respondent may be required to submit pursuant to the work required to be performed under this Consent Order.

XX. INDEMNITY

A. Respondent agrees to indemnify, save, and hold harmless OEPA from any and all claims or causes of action arising from, or on account of, acts or omissions of the Respondent, its officers, employees, receivers, trustees, agents, or assigns in carrying out any activities pursuant to this Consent Order. OEPA shall not be considered a party to and shall not be held liable under any contract entered into by Respondents in carrying out the activities pursuant to this Consent Order. Consistent with federal, state and common law, nothing in this Consent Order shall render Respondent liable for any act or omission of OEPA.

[illegible] copy of the [illegible] filed in the records of the Ohio [illegible]vironmental Protection Agency.

: [illegible] Date 4/13/92

[illegible] DIRECTOR'S [illegible]

B. OEPA agrees to provide notice to Respondent within thirty (0) days of receipt of any claim which may be the subject of the indemnity in paragraph A., above, and to cooperate with Respondent in the defense of any claim or action against OEPA; provided that, parties asserting claims or defenses against each other are excluded from this requirement to the extent of their dispute.

XXI. UNAVOIDABLE DELAYS

A. Respondent shall cause all work to be performed within the agreed time schedules provided for in this Consent Order and/or any approved Workplan, unless any such performance is prevented or delayed by an event which constitutes an unavoidable delay. For purposes of this Consent Order, an "unavoidable delay" shall mean any event(s) beyond the control of Respondent which prevents or delays performance of any obligation required by this Consent Order and which could not be overcome by due diligence on the part of Respondent. Increased costs of compliance shall not be considered circumstances beyond the control of Respondent.

B. Respondent shall notify the OEPA in writing no later than fourteen (14) days after their discovery of the occurrence of any event which Respondent contends is an unavoidable delay. Such written notification shall describe the anticipated length of the delay, the cause(s) of the delay, the measures taken and/or to be taken by Respondent to minimize the delay, and the timetable under which these measures will be implemented. The Respondent shall have the burden of demonstrating that the event(s constitute(s) an unavoidable delay, and OEPA shall make any determination with regard to such a claim.

C. In the event that OEPA agrees that an unavoidable delay has occurred, this Consent Order, including incorporated documents and any affected

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By: Vicki Meckey Date 4/13/92

schedules thereunder, may be modified in the event the unavoidable delay affects such schedules.

XXII. REIMBURSEMENT OF COSTS

A. Respondent shall reimburse OEPA for all oversight costs and response costs incurred by OEPA in connection with this Consent Order from the effective date hereof. Within thirty (30) days of the effective date of this Consent Order, Respondent shall also reimburse OEPA for costs of $5346.74 incurred by OEPA in connection with this Site prior to the effective date of this Consent Order. Within sixty (60) days of the end of each calendar year, OEPA will submit to Respondent an itemized statement of such costs of OEPA for the previous year.

Payment shall be due and owing upon receipt of the itemized statement from OEPA. Respondent shall pay within forty-five (45) days such sums as follows: payment to OEPA shall be made by check payable to "Treasurer, State of Ohio," and shall be forwarded to Fiscal Officer, Division of Emergency and Remedial Response, P. O. Box 1049, 1800 WaterMark Drive, Columbus, Ohio 43266-0149.

B. Oversight and response costs may include, but shall not be limited to: (1) OEPA staff time computed on hourly wage rates plus overhead costs and fringe benefits, and may also include hourly wages (plus overhead and fringe) at the normal rate multiplied by 1.5 for necessary overtime compensation; (2) laboratory costs, including Ohio Department of Health invoiced costs per invoices submitted to OEPA; (3) OEPA equipment, but only that which is solely acquired for use at this Site; (4) travel expenses incurred by OEPA personnel; and (5) reimbursement for costs incurred by contractors hired by OEPA, provided that all contractors hired by OEPA shall be selected through a competitive bidding process conducted by OEPA or the

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By: Kelli Mackey Date 4/13/92

Department of Administrative Services, pursuant to Chapter 125 and Section 127.16 of the ORC, and rules adopted thereunder, if this should prove necessary.

C. A copy of the transmittal letter and a photocopy of the check shall be sent to the Site Coordinator.

D. A copy of the transmittal letter and a photocopy of the check shall be sent to Catherine Stroup (or her successor), Counsel for the Director of the Environmental Protection Agency, at the address above.

E. In the event that Respondent fails to complete the RI/FS in compliance with the terms of this Consent Order, OEPA reserves its right to bring an action against Respondent to enforce this Consent Order for recovery of past response costs in connection with the Site and any costs incurred in oversight of Respondent's implementation of this Consent Order (which are not paid pursuant to paragraph A of this Article) and all costs associated with OEPA's performance of the RI/FS or any part thereof. Nothing in this Consent Order shall be construed as a waiver of any right that OEPA may have to seek reimbursement of any response costs from any person not a party hereto.

XXIII. EFFECTIVE DATE AND SUBSEQUENT MODIFICATION OF CONSENT ORDER

A. The effective date of this Consent Order shall be the date on which it is entered in the Journal of the Director of OEPA.

B. This Consent Order may be modified by mutual agreement of the Parties. Modifications shall be in writing and shall be effective on the date the modification is entered in the Journal of the Director of OEPA.

C. Any reports, plans, specifications, schedules, and attachments and amendments required by this Consent Order are, upon approval by OEPA, incorporated into and made an enforceable part of this Consent Order.

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ivironmental Protection Agency.
... Date 4/13/92

D. No informal advice, guidance, suggestions, or comments by OEPA regarding reports, plans, specifications, schedules, and any other writing submitted by Respondent will be construed as relieving Respondent of its obligation to obtain such formal approval as may be required by this Consent Order.

XXIV. TERMINATION AND SATISFACTION

The provisions of this Consent Order shall be satisfied and this Consent Order shall terminate when Respondent mails to OEPA by certified mail its certification that all activities required under this Consent Order (including any additional tasks which OEPA determined to be necessary in accordance with the provisions of this Consent Order and payment of oversight costs) have been completed and OEPA approves such certification in writing. Termination of this Consent Order shall not, however, terminate the obligation of Respondent to comply with Sections XII and XVI (record preservation and reservation of rights).

IT IS SO ORDERED:

By: Gerry Scannides APR 13 1992

Donald R. Schregardus, Director
Ohio Environmental Protection Agency FOR Date

XXV. WAIVER

In order to resolve disputed claims, without admission of fact, violation, or liability, Respondent agrees that this Consent Order is lawful and reasonable, and agree to perform all actions required by this Consent Order.

Respondent hereby waives all rights to appeal the issuance, terms and service of this Consent Order, and hereby waives any and all rights it might have to seek judicial review of said Consent Order either in law or equity.

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By: [illegible] Mackey By: 4/13/92

Notwithstanding the proceeding, OEPA and Respondent agree that in the event that this Consent Order is appealed by any other party to the Environmental Board of Review, or any court, Respondent retains the right to intervene and participate in such appeal. In such event, Respondent shall continue to comply with this Consent Order notwithstanding such appeal and intervention unless such Consent Order is stayed, vacated or modified.

IT IS SO AGREED:

By: _____ March 27, 1992
Cooper Tire & Rubber Company — Date

J. A. Reinhardt
Typed or Printed Name

Executive Vice President
Title

By: _____ March 27, 1992
Cooper Tire & Rubber Company — Date

Robert C. Gasser
Typed or Printed Name

Vice President
Title

Ohio Environmental Protection Agency:

_____ APR 13 1992
Donald R. Schregardus, Director — Date

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By: _____ Date 4/13/92

WOOD COUNTY

PUBLIC NOTICE

OHIO ENVIRONMENTAL PROTECTION AGENCY

Notice is hereby given that the Director of the Ohio Environmental Protection Agency (Ohio EPA) has issued as a final action, an Administrative Consent Order in the matter of Cooper Tire & Rubber Company as Respondent. OEPA is hereby giving Notice that Respondent has consented to: complete a full investigation of the Site; determine the extent of contamination caused by hazardous waste, industrial waste or other waste; and develop and evaluate a program of appropriate remedial measures. The Site includes the Cooper Engineered Products facility located at 1175 North Main Street, Bowling Green, Ohio. The effective date of this action is April 13, 1992. The action of the Director is final and may be appealed to the Environmental Board of Review (EBR) pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be filed with the EBR within thirty (30) days after notice of the Director's action. A copy of the appeal must be served upon the Director of the Ohio Environmental Protection Agency within three (3) days of filing at the EBR. The EBR's address is:

Environmental Board of Review
236 East Town Street
Room 300
Columbus, Ohio 43215

A copy of the Administrative Consent Order may be obtained from the Hearing Clerk, Ohio EPA, P. O. Box 1049, 1800 WaterMark Drive, Columbus, Ohio 43266-0149.

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By: Cathie Mackay Date 4/13/92

EXHIBIT A

GENERIC STATEMENT OF WORK
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
STATE VERSION

PURPOSE:

The purpose of this remedial investigation/feasibility study (RI/FS) is to investigate the nature and extent of releases of hazardous waste or constituents, pollutants, wastes, industrial wastes or contaminants at the Site, assess the potential risk to human health and the environment, and develop and evaluate potential remedial alternatives. The RI and FS are interactive and may be conducted concurrently so that the data collected in the RI influences the development of remedial alternatives in the FS, which in turn affects the data needs and the scope of treatability studies.

The respondent will conduct this RI/FS and will produce an RI and FS report that are in accordance with this statement of work, the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (RI/FS Guidance) (U.S. EPA, Office of Emergency and Remedial Response, October 1988), and any other guidances that Ohio EPA uses in conducting an RI/FS (a list of the primary guidances is attached), as well as any additional requirements in the administrative order. The RI/FS Guidance describes the report format and the required report content. The respondent will furnish all necessary personnel, materials, and services needed, or incidental to, performing the RI/FS, except as otherwise specified in the administrative order.

At the completion of the RI/FS and the terms of this Order, the Ohio EPA will be responsible for the selection of a site remedy. The remedial action alternative selected by the Ohio EPA will meet the cleanup standards specified in the How Clean Is Clean Policy. That is, the selected remedial action will be protective of human health and the environment, will be in compliance with, or include a waiver of, applicable or relevant and appropriate requirements of other laws, will be cost-effective, will utilize permanent solutions and alternative treatment technologies or resource recovery technologies, to the maximum extent practicable, and will address the statutory preference for treatment as a principal element. The final RI/FS report, as approved by the Ohio EPA, will, with the administrative record, form the basis for the selection of the site's remedy and will

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By: Nikki Mackey Date 4/13/92

provide the information necessary to support the development of a decision document.

The Ohio EPA will provide oversight of the respondent's activities throughout the RI/FS. The respondent will support the Ohio EPA's initiation and conduct of activities related to the implementation of oversight activities.

TASKS/DELIVERABLES:

The Remedial Investigation/Feasibility Study consists of ten tasks:

TASK 1 -- Scoping of the RI/FS

A. Site Background/Site History
B. Implementation of Interim/Emergency Actions

TASK 2 -- Work Plan Requirements

A. RI/FS Work Plan
B. Quality Assurance Project Plan
C. Field Sampling Plan
D. Health and Safety Plan

TASK 3 -- Community Relations

TASK 4 -- Remedial Investigation

A. Environmental Setting
B. Source Characterization
C. Contamination Characterization
D. Ecological Assessment
E. Potential Receptor Identification
F. RI report

TASK 5 -- Human Health Baseline Risk Assessment

A. Conceptual Site Model
B. Human Risk Assessment Report

TASK 6 -- Environmental Baseline Risk Assessment

A. Conceptual Site Model
B. Environmental Risk Assessment Report

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By: Aiki Mackey Date 4/13/92

TASK 7 -- Treatability Study

A. Treatability Study Work Plan
B. Treatability Study Evaluation Report

TASK 8 -- Development and Screening Alternatives

A. Remedial Action Objectives
B. Technologies Screening
C. Alternatives Array

TASK 9 -- Detailed Analysis of Alternatives

A. Detailed Analysis of Alternatives Report
B. Feasibility Study Report

TASK 10 -- Monthly Pregress Reports

TASK 1 -- SCOPING OF THE RI/FS

The Respondent shall describe the background of the Site, it's history and current condition and outline the purpose and need for remedial investigation of the Site. Data gathered during previous investigations, site inspections and other relevant activities shall be used. Previous investigations shall be summarized and referenced. This information shall be documented in the RI/FS Work Plan (Task 2.A.).

A. Site Background/Site History

The Respondent will review and analyze all existing site background information and will conduct a site visit to assist in planning the scope of the RI/FS.

1. Collect and analyze existing data and document the need for additional data

Before planning RI/FS activities, all existing site data will be thoroughly compiled and reviewed by the Respondent. Specifically, this will include presently available data relating to the varieties and quantities of hazardous, industrial and/or other wastes at the Site, and past disposal practices. This will also include results from any previous sampling events that may have been conducted. The Respondent will refer to Table 2-1 of the RI/FS Guidance for a comprehensive list of data collection information sources. This information will be utilized in determining additional data needed to

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By: Cathi Mackey Date 4/13/92

characterize the Site, better define potential applicable requirements, and develop a range of preliminarily identified remedial alternatives. Data Quality Objectives (DQOs) will be established subject to Ohio EPA approval which specify the usefulness of existing data. Decisions on the necessary data and DQOs will be made by the Ohio EPA.

2. Conduct Site Visit

The Respondent will conduct a site visit during the project scoping phase to assist in developing a conceptual understanding of sources and areas of contamination as well as potential exposure pathways and receptors at the site. During the site visit the respondent should observe the Site's physiography, hydrology, geology, and demographics, as well as natural resource, ecological and cultural features. This information will be utilized to better scope the project and to determine the extent of additional data necessary to characterize the site, better define potentially applicable requirements and narrow the range of preliminarily identified remedial alternatives.

Following completion of Tasks 1A.1. and 1A.2. and prior to development of the RI/FS work plans, Respondent shall submit a report to the OEPA documenting the results of said tasks.

B. Implementation of Interim/Emergency Actions.

1. The Respondent's report shall document any interim or emergency action which were or are being undertaken at the Site. This shall include:

   a. Objectives of the interim or emergency actions: how the action has mitigated or is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long term remedial action at the Site;

   b. Design, construction, operation and maintenance requirements;

   c. Schedules for design, construction and monitoring; and

   d. Schedule for progress reports.

2. At any time during the Remedial Investigation, Respondent may propose to conduct or OEPA may require

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By: Ottie Mackey Date 4/13/92

that the Respondent conduct an interim remedial action. Any interim remedial action proposed by the Respondent for the Site must be approved by the Ohio prior to implementation. The following factors shall be considered in determining the appropriateness of an interim remedial action:

a. Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous wastes or substances;

b. Actual or potential contamination of drinking water supplies or sensitive ecosystems;

c. Hazardous waste or substances in drums, barrels, tanks or other bulk storage containers that may pose a threat of release;

d. High levels of hazardous waste or substances in soils largely at or near the surface that may migrate;

e. Weather conditions that may cause hazardous waste or substances to migrate or be released;

f. Threat of fire or explosion; and

g. Other situations or factors that may pose threats to public health, welfare or the environment.

TASK 2 -- RI/FS WORKPLAN REQUIREMENTS

At the conclusion of the scoping phase, the Respondent will submit an RI/FS work plan, a field sampling plan, a Quality Assurance Project Plan (QAPP), and a site health and safety plan. The RI/FS work plan, field sampling plan, and QAPP must be reviewed and approved by Ohio EPA prior to the initiation of field activities.

A. RI/FS Work Plan

A work plan documenting the decisions and evaluations completed during the scoping process will be submitted to Ohio EPA for review and approval. The work plan should be developed in conjunction with the QAPP, field sampling plan and the site health and safety plan, although each plan may be delivered under separate cover. The RI/FS Work Plan will also include a comprehensive description of the work

DIRECTOR'S JOURNAL

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By: Cathi Mackey Date 4/13/92

to be performed as outlined in this SOW, including the methodologies to be utilized, as well as a corresponding schedule for completion. In addition, the work plan must include the rationale for performing the required activities.

Specifically, the RI/FS Work Plan will present a statement of the real or potential problem(s) posed by the Site and the objectives of the RI/FS. Furthermore, the plan will include a site background summary setting forth the Site description including the geographic location of the Site, and to the extent possible, a description of the Site's physiography, hydrology, geology, demographics, ecological, cultural and natural resource features; a synopsis of the site history and a description of previous responses that have been conducted at the site by local, state, federal, or private parties; a summary of the existing data in terms of physical and chemical characteristics of the contaminants identified, and their distribution among the environmental media at the site. In addition, the plan will include a description of the site management strategy developed during scoping and data needs for evaluation of remedial alternatives. The plan will reflect coordination with treatability study requirements. It will include a process for and manner of identifying applicable or relevant and appropriate Federal and state requirements (chemical-specific, location-specific and action-specific).

The RI/FS work plan shall provide a detailed description of the tasks to be performed, information needed for each task (e.g., for human health and environmental risk evaluation), information to be produced during and at the conclusion of each task, and a description of the work products that will be submitted to the Ohio EPA. This includes the deliverables set forth in the remainder of this statement of work: a schedule for each of the required activities; the conceptual site model for and the human health baseline risk assessment; the conceptual site model for and the environmental baseline risk assessment; the RI report; the FS report and required interim deliverables; monthly reports to the Ohio EPA; and meetings and presentations to the Ohio EPA at the conclusion of each major phase of the RI/FS.

Because of the unknown nature of the Site and iterative nature of the RI/FS, additional data requirements and analyses may be identified throughout the process. The respondent will submit a technical memorandum documenting the need for additional data, and identifying the DQOs whenever such requirements are identified. In any event, the respondent is responsible for fulfilling additional data and analysis needs identified by the Ohio EPA consistent with the purposes and objectives of this RI/FS.

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E. Quality Assurance Project Plan

The Respondent shall prepare a plan to document all monitoring and investigation procedures: sampling, field measurements, sample analysis, toxicity testing, bioassays, and all modeling performed during the investigation to characterize the environmental setting, source(s), contamination, and human and biological receptors to ensure that all information, data and resulting decisions are technically sound, statistically valid and properly documented. This plan shall comport with Ohio EPA's Guidelines and Specifications for Preparing Quality Assurance Projects Plans. As required by Section VIII, Paragraph C, of this Order, Respondent shall schedule a meeting with this Agency to discuss the requirements of this plan.

1. Data Collection Strategy

The strategy section of the (QAPP) shall include but not be limited to the following:

a. Description of the types and intended uses for the data, relevance to remediation or restoration goals, and the necessary level of precision, accuracy, and statistical validity for these intended uses;

b. Description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data;

c. Description of the rational used to assure that the data accurately and precisely represent a characteristic of a population, variation of physical or chemical parameters throughout the Site, a process condition or an environmental condition. Factors which shall be considered and discussed include, but are not limited to:

i) Environmental conditions at the time of sampling;

ii) Sampling design (including number, location and distribution);

iii) Representativeness of selected media, exposure pathways, or receptors; and

iv) Representativeness of selected analytical parameters.

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v) Representativeness of testing procedures and conditions; and

vi) Independence of background or baseline from site influences.

d. Description of the measures to be taken to assure that the following data sets can be compared quantitatively or qualitatively to each other:

i) RI data collected by the Respondent over some time period;

ii) RI data generated by an outside laboratory or consultant employed by the Respondent versus data collected by the Respondent, and;

iii) Data generated by separate consultants or laboratories over some time period not necessarily related to the RI effort.

iv) Data generated by OEPA or by an outside laboratory or consultant employed by OEPA;

e. Details relating to the schedule and information to be provided in quality assurance reports. These reports should include but not be limited to:

i) Periodic assessment of measurement data accuracy, precision and completeness;

ii) Results of performance audits;

iii) Results of system audits;

iv) Significant quality assurance problems and recommended solutions; and

v) Resolutions of previously stated problems.

2. Sample Analysis

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The Sample Analysis section of the Quality Assurance Project Plan shall specify the following:

a. Chain-of-custody procedures, including:

i) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment and verify the data entered onto the sample custody records;

ii) Provision for a laboratory sample custody log consisting of serially numbered lab-tracking report sheets; and

iii) Specification of laboratory sample custody procedures for sample handling, storage and dispersement for analysis.

b. Sample storage procedures and storage times;

c. Sample preparation methods;

d. Analytical procedures, including:

i) Scope and application of the procedure;

ii) Sample matrix;

iii) Potential interferences;

iv) Precision and accuracy of the methodology;

v) Method detection limits;

vi) Special analytical services required to ensure contract required detection limits do not exceed known toxicity criteria; and

vii) Verification and reporting of tentatively identified compounds.

e. Calibration procedures and frequency;

f. Data reduction, validation and reporting;

g. Internal quality control checks, laboratory performance and systems audits and frequency, including:

i) Method blank(s);

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ii) Laboratory control sample(s);

iii) Calibration check sample(s);

iv) Replicate sample(s);

v) Matrix-spiked sample(s);

vi) "Blind" quality control sample(s);

vii) Control charts;

viii) Surrogate samples;

ix) Zero and span gases; and

x) Reagent quality control checks.

h. Preventative maintenance procedures and schedules;

i. Corrective action (for laboratory problems); and

j. Turnaround time.

3. Modeling

The Modeling section of the Quality Assurance Project Plan shall apply to all models used to predict or describe fate, transport or transformation of contaminants in the environment and shall discuss:

a. Model assumptions and operating conditions;

b. Input parameters; and

c. Verification and calibration procedures.

3. In Situ or Laboratory Toxicity Tests

The Toxicity Test section of the Quality Assurance Project Plan shall apply to all tests or bioassays used to predict or describe impacts of contaminants on a population, community, or ecosystem level.

4. Data Record

The QAPP shall also provide the format to be used to present the raw data and the coclusions of the investigation, as described in a, b, and c below:

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a. The data record shall include the following:

i. Unique sample or field measurement code;

ii. Sampling or field measurement location and sample or measurement type;

iii. Sampling or field measurement raw data;

iv. Laboratory analysis ID number;

v. Property or component measured; and

vi. Result of analysis (e.g., concentration).

b. Tabular Displays

The following data shall be presented in tabular displays:

i. Unsorted (raw) data;

ii. Results for each medium, organism, or for each constituent measured;

iii. Data reduction for statistical analysis;

iv. Sorting of data by potential stratification factors (e.g., location, soil layer, topography, vegetation form);

v. Summary data (i.e., mean, standard deviation, min/max values, and sample number); and

vi. Comparisons with background or reference data.

c. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

i. Display sampling locations and sampling grid;

ii. Indicate boundaries of sampling area, and areas where more data are required;

iii. Display levels of contamination at each sampling location or location from which organism was taken;

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iv. Display geographical extent of contamination;

v. Display contamination levels, averages and maxima;

vi. Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters;

vii. Indicate features affecting intramedia transport and show potential receptors;

viii. Compare nature and extent of contamination with results of ecological or biological sampling or measurements; and

ix. Display comparisons with background or reference analyses or measurements.

C. Field Sampling Plan

1. Sampling

The Sampling section of the Field Sampling Plan shall discuss:

a. Sufficient preliminary sampling to ensure the proper planning of b through o below;

b. Selecting appropriate sampling locations, depths, vegetation strata, organism age, etc.;

c. Providing a sufficient number of samples to meet statistical or other data useability objectives;

d. Measuring all necessary ancillary data such as ambient conditions, baseline monitoring, etc.;

e. Determining environmental conditions under which sampling should be conducted;

f. Determining which media, pathways, or receptors are to be sampled (e.g., ground water, air, soil, sediment, biota, etc.);

g. Determining which parameters are to be measured and where;

h. Selecting the frequency and length of sampling

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period;

i. Selecting the sample design (e.g., composites, grabs, random, repeated, etc.);

j. Selecting the number, location, media or organisms for determining background conditions or reference conditions (refer to Appendix B, Background Sampling Guidance, of Ohio EPA's How Clean Is Clean Policy);

k. Measures to be taken to prevent contamination of the sampling equipment and cross contamination between sampling points;

l. Documenting field sampling operations and procedures, including;

i) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters and adsorbing reagents);

ii) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;

iii) Documentation of specific sample preservation method;

iv) Calibration of field devices;

v) Collection of replicate and field duplicate samples;

vi) Submission of field-biased and equipment blanks, where appropriate;

vii) Potential interferences present at the site or facility;

viii) Construction materials and techniques associated with monitoring wells and piezometers;

ix) Field equipment listing and sample containers;

x) Sampling order; and

xi) Decontamination procedures.

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m. Selecting appropriate sample containers;

n. Sample preservation; and

o. Chain-of-custody, including:

i) Standardized field tracking reporting forms to establish sample custody in the field prior to and during shipment;

ii) Sample sealing, storing and shipping procedures to protect the integrity of the sample; and,

iii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

2. Field Measurements

The Field Measurements section of the Field Sampling Plan shall discuss:

a. Selecting appropriate field measurement locations, depths, organism age etc.;

b. Providing a sufficient number of field measurements that meet statistical or data useability objectives;

c. Measuring all necessary ancillary data such as ambient or baseline environmental conditions;

d. Determining conditions under which field measurement should be conducted;

e. Determining which media, pathways, or receptors are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, biota, etc.);

f. Determining which physical, chemical, or biological parameters are to be measured and where;

g. Selecting the frequency and duration of field measurement; and

h. Documenting field measurement operations and procedures, including:

i) Procedures and forms for recording raw

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data and the exact location, time and site or facility specific considerations associated with the data acquisition;

ii) Calibration of field devices;

iii) Collection of replicate measurements;

iv) Submission of field-biased blanks, where appropriate;

v) Potential interferences present at the site or facility;

vi) Construction materials and techniques associated with monitoring wells and piezometers used to collect field data;

vii) Field equipment listing;

viii) Order in which field measurements were made; and

ix) Decontamination procedures; and

i. Selecting the number, location, media, and organisms for determining background or reference conditions.

D. Health and Safety Plan. The Respondent shall develop a Health and Safety plan to protect the health and safety of personnel involved in the site investigations and the surrounding community.

1. Major elements of the Health and Safety Plan shall include:

a. Facility or site description including availability of resources such as roads, water supply, electricity and telephone service;

b. Description of the known hazards and an evaluation of the risks associated with the incident and with each activity conducted;

c. Listing of key personnel (including the site safety and health officer) and alternates responsible for site safety, response operations, and for protection of public health;

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d. Delineation of work area, including a map;

e. Description of levels of protection to be worn by personnel in the work area;

f. Description of the medical monitoring program for on-site responders;

g. Description of standard operating procedures established to assure the proper use and maintenance of personal protective equipment;

h. The establishment of procedures to control site access;

i. Description of decontamination procedures for personnel and equipment;

j. Establishment of site emergency procedures;

k. Availability of emergency medical care for injuries and toxicological problems;

l. Description of requirements for an environmental monitoring program. (This should include a description of the frequency and type of air and personnel monitoring, environmental sampling techniques and a description of the calibration and maintenance of the instrumentation used.);

m. Specification of any routine and special training required for responders; and

n. Establishment of procedures for protecting workers from weather-related problems.

2. The Health and Safety Plan shall be consistent with:

a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);

b. Section 111(c)(6) of CERCLA;

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c. EPA Order 1440.3 -- Respiratory Protection;

d. EPA Order 1440.2 -- Health and Safety Requirements for Employees Engaged in Field Activities;

e. EPA Occupational Health and Safety Manual;

f. EPA Interim Standard Operating Safety Procedures and other EPA guidance as developed by EPA;

g. OSHA regulations particularly in 29 CFR 1910 and 1926;

h. State and local regulations; and

i. Site or facility conditions.

The Safety Plan should identify problems or hazards that may be encountered and their solution. Safety procedures to be followed to protect third parties, such as visitors or the surrounding community, should also be provided.

TASK 3 -- COMMUNITY RELATIONS

This task shall be completed by the Ohio EPA.

TASK 4 -- REMEDIAL INVESTIGATION

The Respondent shall conduct those investigations necessary to: characterize the site (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contamination Characterization and Ecological Assessment); and identify actual or potential receptors (Ecological and Human Risk Assessment).

The investigations should result in data of adequate technical quality to support the development of the Human Health Baseline Risk Assessment and the Ecological Risk Assessment and the evaluation of remedial action alternatives of the Feasibility Study.

Remedial Investigation activities shall follow the plans set forth in Task 2. All sampling, analyses, and measurements shall be conducted in accordance with the QAPP. All sampling and

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measurement locations shall be documented in a log and identified on a detailed site map.

A. Environmental Setting

The Respondent shall collect information to supplement and verify existing information on the environmental setting at the site as well as the environmental setting adjacent to and surrounding the Site. The Respondent shall characterize the following:

1. Regional Hydrogeology

The Respondent shall conduct a program to evaluate the regional hydrogeologic characteristics surrounding the facility. Regional information can be obtained as described in Task 1. This shall include but not be limited to:

a. Depth to bedrock and lithology;

b. Characteristics of major stratigraphic units and the depositional environment;

c. Identification of regional aquifer(s);

d. Average yield of water wells within a one mile radius of the site or facility;

e. Direction of ground water flow in the regional aquifer(s);

f. Identification and characterization of recharge and discharge areas, with amount of recharge and discharge;

g. Description of regional geomorphology, including locations of surface water bodies and floodways, etc. This description should include an analysis of any topographic features that may influence the ground water flow system; and

h. Description of structural features such as jointing, faulting and folding.

2. Site Hydrogeology and Soil Characteristics

The Respondent shall conduct a program to evaluate site-specific hydrogeologic conditions and soil characteristics at the Site. This description shall be based on data collected from

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bore holes, piezometers, laboratory and field tests. The description shall include:

a. An accurate classification and description of the consolidated and unconsolidated stratigraphic units beneath the Site. This shall include:

i) Hydraulic conductivity (vertical and horizontal);

ii) Porosity, permeability, and bulk density;

iii) Rock and soil (Unified Soil Classification System) classification;

iv) Grain size distribution (sieve or hydrometer) curves;

v) Thickness;

vi) Lateral extent;

vii) Moisture content;

viii) The contaminant attenuation capacity and mechanisms of attenuation of the soil or fill (i.e., ion exchange capacity, organic carbon content, mineral content, soil sorptive capacity, base saturation, storage capacity);

ix) Soil pH;

x) Soil profile, including ASTM classification of soils;

xi) Transects of soil stratigraphy;

xii) Effect of stratification on unsaturated flow;

xiii) Infiltration;

xiv) Evapotranspiration;

xv) A discussion of the local occurrence of ground water including:

a) Identification of all aquifer systems,

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including depth from the surface and lateral and vertical extent. (Aquifer system means one or more geologic unit or formation that is wholly or partly saturated with water and is able to store, transmit and yield significant amounts of water to wells or springs.);

b) Identification of all significant saturated zones above the aquifer systems;

c) Depth to the water table;

d) Ground water flow direction and rates in the aquifers and all strata above the aquifers;

e) Description of the interconnection between the saturated zones and the aquifers, surface water, seeps and springs;

f) Description of recharge and discharge areas within the site boundaries. This shall include any relationship between ground water and springs, streams and other surface water features;

g) Temporal fluctuations (i.e., seasonal and man-made) in ground water levels and their effects on ground water flow direction; and

h) Identification of zones of high permeability that may act as a migration route for contaminants.

xvi) Hydrogeologic cross sections showing the extent (depth, thickness and lateral extent) of hydrogeologic units shall be developed. At a minimum, the following shall be identified:

a) Sand and gravel deposits in the unconsolidated deposits;

b) Zones of fracturing or channeling in the consolidated or unconsolidated deposits;

c) Zones of higher permeability that might direct the flow of contaminants;

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d) Zones of low permeability that may restrict and/or attenuate the flow of contaminants; and

e) Water-bearing zones above the confining layer that may serve as pathways for contaminant migration including perched zones of saturation.

xvii) Based on data obtained from ground water monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:

a) Water level contour and/or potentiometric surface maps;

b) Hydraulic cross sections showing vertical gradients;

c) Flow nets, including the vertical and horizontal components of flow and the interconnection between waterbearing strata; and

d) Any temporal changes in hydraulic gradients and flow directions due, for example, to seasonal or man-made influences.

xviii) A description of man-made influences that may affect the hydrogeology of the Site, identifying:

a) Active and inactive water supply and production wells with appropriate pumping schedules; and

b) Man-made structures such as pipelines, french drains, ditches, unlined and lined ponds, lagoons, septic tanks, NPDES permitted outfalls, retention areas and utility lines.

b. A description of the geomorphology at the Site or facility;

c. A description of the structural geology at the site or facility;

d. The RI report shall document the methods and

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procedures used to gather the hydrogeologic data. This may include but is not limited to:

i) The drilling and soil sampling methods used in characterizing the soil and hydrogeologic characteristics of the Site (including all boring logs and raw data);

ii) The analytical procedures and methods used to characterize the soil and rock materials obtained from the borings and/or test pits;

iii) The methods, equipment and procedures used to define the uppermost aquifer system and all significant zones of saturation above the uppermost aquifer system including:

1) Well and piezometer location, depth, construction and installation specifications (including diagrams);

2) Water level measurements and procedures;

3) Ground water seepage observations during drilling; and

4) Pumping tests and slug tests (including type, description and rational for its use, raw data and method of interpreting the results).

iv) A description, rationale and raw data of indirect methods such as soil survey, geophysical and modeling. (These methods can be used to infer ground water characteristics and support or guide direct methods. However, no site remedial investigation can be based strictly on these methods.)

3. Surface Water and Sediment

The Respondent shall conduct a program to characterize any surface water bodies in the vicinity of the Site. Such characterization shall include, but not be limited to, the following activities and information:

a. Description of the temporal and permanent surface water bodies including:

i) For lakes and estuaries: location, elevation, surface area, inflow, outflow, depth, temperature stratification and volume;

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ii) For impoundments: location, elevation, surface area, depth, volume, freeboard and purpose of impoundment;

iii) For streams, ditches, drains, swamps and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations and flood zones (i.e., 50 and 100 year events);

iv) Drainage patterns;

v) Evapotranspiration; and

vi) Any other known discharges including those permitted by NPDES.

b. Description of the chemistry of the surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients, chemical oxygen demand, total and dissolved organic carbon, specific contaminant concentrations, etc.

c. Description of sediment characteristics including:

i) Deposition area, patterns, and rates;

ii) Thickness profile; and

iii) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, pH, etc.)

4. Air

The Respondent shall provide information characterizing the climate in the vicinity of the Site in general, and at the time of the investigation(s). Such information shall include, but not be limited to:

a. A description of the following parameters:

i) Annual and monthly rainfall averages;

ii) Monthly temperature averages and extremes;

iii) Wind speed and direction;

iv) Relative humidity/dew point;

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v) Atmospheric pressure;

vi) Evaporation data;

vii) Development of inversions; and

viii) Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence.

b. A description of topographic and manmade features which affect air flow or emission patterns, including:

i) Ridges, hills or mountain areas;

ii) Canyons or valleys;

iii) Surface water bodies (e.g. rivers, lakes, bays, etc.);

iv) Wind breaks and forests; and

v) Buildings; and

vi) Any other features that may affect air flow or emission patterns.

B. Source Characterization

The Respondent shall collect analytical data to completely characterize the wastes and the areas where wastes have been placed, collected, came to be located or removed including: type (hazardous, solid, residential, industrial, etc.); quantity; physical form; disposition (containment or nature of deposits); and Site characteristics affecting release (e.g., Site security and engineering barriers). Data shall include all information referenced in the Remedial Investigation Workplan (Task 2). This shall include quantification of the following specific characteristics, at each source area:

1. Unit/Disposal Area characteristics:

a. Location of unit/disposal area;
b. Type of unit/disposal area;
c. Design features;
d. Operating practices (past and present);
e. Period of operation;
f. Age of unit/disposal area;
g. General physical conditions; and

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h. Method used to close the unit/disposal area.

2. Waste Characteristics:

a. Type of waste placed in the unit;

i) Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent);

ii) Quantity; and

iii) Chemical composition.

b. Physical and chemical characteristics;

i) Physical form (solid, liquid, gas);

ii) Physical description (e.g., powder, oily sludge;

iii) Temperature;

iv) pH;

v) General chemical class (e.g., acid, base, solvent);

vi) Molecular weight;

vii) Density;

viii) Boiling point;

ix) Viscosity;

x) Solubility in water;

xi) Cohesiveness of the wastes;

xii) Vapor pressure; and

xiii) Flash point.

c. Migration and dispersal characteristics of the waste;

i) Sorption;

ii) Biodegradability, bioconcentration, biotransformation;

iii) Photodegradation rates;

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iv) Hydrolysis rates;

v) Chemical transformations;

vi) Chemical interactions; and

vii) Products of all such reactions or processes.

The Respondent shall document the procedures used in making the above determinations.

C. Contamination Characterization

The respondent shall collect analytical data on air, ground water, soils, surface water, sediment and subsurface gas contamination in the vicinity of the Site. This data shall be sufficient to define the extent, origin, direction and rate of movement of contaminants. Data shall include all information referenced in the Remedial Investigation Workplan (Task 2). The Respondent shall address the following types of contamination at the Site:

1. Ground Water Contamination

The Respondent shall conduct a ground water investigation to characterize the nature and extent of any plumes of contamination at the Site. The investigation shall include a description and quantification of ground water quality in the aquifer systems and all significant zones of saturation or permeable zones that may act as pathways for contaminant migration. This investigation shall at a minimum provide the following information:

a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Site;

b. The horizontal and vertical direction of contamination movement;

c. The velocity of contaminant movement;

d. The horizontal and vertical concentration profiles of Appendix VIII constituents in the plume(s);

e. An evaluation of site specific factors influencing the plume movement; and

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f. An extrapolation of future contaminant movement.

The Respondent shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

2. Soil Contamination

The Respondent shall conduct an investigation to characterize the nature and extent of contamination of the soil and rock units in the vicinity of the contaminant release. The investigation shall include the following information:

a. A description of the vertical and horizontal extent and pattern of contamination.

b. A description of contaminant and soil chemical physical, and biological properties within the contaminant source area and plume. This includes a site specific discussion of contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradation, hydrolysis, photolysis, oxidation and other factors that might affect contamination migration and transformation.

c. Specific contaminant concentrations.

d. The velocity and direction of contaminant movement.

e. An extrapolation of future contaminant movement.

The Respondent shall document the procedures used in making the above determinations.

3. Surface Water and Sediment Contamination

The Respondent shall conduct a investigation to characterize the nature and extent of contamination in surface water bodies and sediment resulting from contaminant releases at the Site. The investigation shall include, but not be limited to, the following information:

a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility on [illegible]

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site, and the extent of contamination in underlying sediments;

b. The horizontal and vertical direction of contaminant movement in surface water and sediment;

c. The contaminant velocity;

d. An evaluation of the physical, biological and chemical factors influencing contaminant movement;

e. An extrapolation of future contaminant movement; and

f. A description of the chemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations, etc.

g. Respondent shall document the procedures used in making the above determinations.

4. Air Contamination

The Respondent shall conduct an investigation to characterize the nature and extent of particulate and gaseous contaminants released into the atmosphere. The investigation shall provide the following information:

a. A description of the horizontal and vertical direction and velocity of contaminant movement;

b. The rate and amount of the release;

c. Chemical and physical nature of contaminated particulates including respirable portion, source emission rates, contaminant concentrations in respirable portions;

d. Existing or potential human or biological receptors, of air contaminants, including respirable contaminant concentrations at known or potential receptors; and

e. The chemical and physical composition of the contaminant(s) released, including vertical and horizontal concentration profiles;

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f. Environmental factors that alter or mitigate fate and transport of contaminants in the atmosphere.

The Respondent shall document the procedures used in making the above determinations.

5. Subsurface Gas Contamination

The Respondent shall conduct an investigation to characterize the nature and extent of subsurface gases emitted from buried hazardous, industrial and/or other waste and hazardous constituents in the soil and/or ground water. This investigation shall include the following information:

a. A description of the horizontal and vertical extent of subsurface gases migration;

b. The chemical composition of the gases being emitted from the subsurface or surface;

c. The rate, amount, and density of the gases being emitted; and

d. Horizontal and vertical concentration profiles of the subsurface gases emitted.

The Respondent shall document the procedures used in making the above determinations.

D. Ecological Assessment

The Respondent shall conduct an investigation to characterize any adverse effects to flora and fauna, at the population, community or ecosystem level, that is or has been caused or influenced by contamination from the facility. The data from this investigation shall be collected in a manner that is compatible and concurrent with the other sections of Task 4. The activities described for this section may be performed iteratively and/or in a phased approach as more data is gathered during other portions of the remedial investigation.

1. Site Characterization

Based on existing data and limited field work, the respondent shall consider the following:

a. See Task 1, A (Site Background/Site History);

b. Identification of potential and probable exposure points for ecological receptors;

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and

c. Additional data needed for site characterization and the rationale for its necessity.

2. Additional Site Characterization (to be performed concurrently with Task 4., D., 3)

If existing information is insufficient to determine whether the extent and magnitude of adverse impacts warrants a more intensive ecological assessment, the respondent shall complete the following:

a. Habitat identification and evaluation;

b. Semiquantitative surveys of flora and fauna which shall include, but not be limited to:

i) All vegetative strata;

ii) Flora and fauna in all contaminated media;

iii) Population parameters (e.g., density, frequency, age distribution); and

iv) Community parameters (e.g., diversity, structure, stability)

c. Identification of background or reference area for each exposed population, community or ecosystem;

d. Additional sampling of media or biota for determination of contaminant concentrations or intakes; and

e. Toxicity tests.

3. Initial Toxicity Assessment (to be performed in conjunction with 2 above)

The respondent shall perform a literature review of information regarding the toxicity, fate and transport characteristics, ecological effects, and likely biological receptors for the contaminants of concern.

4. Preliminary Ecological Assessment

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The respondent shall combine the results of Tasks 4.D.1 to 4.D.3, above in order to define or evaluate the following on a site-specific basis:

a. Initial identification of exposure pathways and ecological receptors;

b. The potential for current or adverse effects to occur on a population, community or ecosystems level; and

c. Determine the need for further ecological studies.

5. Phase II Ecological Assessment

Respondent shall prepare a detailed work plan for further site investigations that shall be compatible with requirements listed in 4.D.3, but also include the following:

a. Study objectives and relevance to risk assessment objectives;

b. Identification of ecological measurement endpoints, assessment endpoints, and endpoint selection criteria;

c. Semiquantitative and quantitative surveys of flora and fauna;

d. Chemical sampling in potentially exposed habitats and reference sites;

e. Laboratory and in situ toxicity testing; and

f. Tissue analyses.

6. Ecological Assessment Report

The respondent shall prepare a report including all results from 1 to 5 above for incorporation into the Environmental Risk Assessment (see Task 5C).

Special Note: Because seasonal effects can impart a profound influence on the results of biological or ecological sampling, the Ohio EPA requires that all sampling or testing of flora and fauna shall take place between April 1 and October 30 unless otherwise approved by the Site Coordinator.

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E. Potential Receptor Identification

The Respondent shall collect data describing the human populations, plant and animal populations, communities, and ecosystems that are or may be susceptible to contaminant exposure from the Site. Chemical analysis of biological samples or data on observable effects in ecosystems may be needed to properly identify biological receptors. This information shall be obtained from information gathered during the Ecological Assessment (see Task 4D). The following characteristics shall be identified:

1. Local current and potential future uses of ground water:

   a. Type of use (e.g., municipal or residential, agricultural, domestic/non-potable and industrial, nonagricultural use by flora and fauna); and

   b. Location of ground water users including wells and discharge areas.

2. Local current and potential future uses of surface waters in the vicinity of the Site:

   a. Type of use (e.g., municipal or residential, agricultural, domestic/non-potable and industrial, nonagricultural use be flora and fauna); and

   b. Location of surface water users or use areas.

3. Use of or access by humans or biota to the site or facility and adjacent lands, including but not limited to:

   a. Recreational;

   b. Hunting;

   c. Residential;

   d. Commercial;

   e. Zoning;

   f. Nonagricultural use by flora and fauna; and

   g. Future land use or access.

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4. A description of biological receptors, adjacent to, or affected by the site or facility for all contaminated media.

5. A description of any endangered or threatened species near the site or facility.

6. A description of sensitive or unique habitats or natural resources.

7. A demographic profile of the people who use or who have access to the facility and adjacent land including, but not limited to age, sex and sensitive subgroups.

F. RI Report

The Respondent shall prepare a Remedial Investigation (RI) Report to present Task 4,above, and Tasks 4 and 5, described below. The RI Report shall be developed in draft form for Ohio review and approval (refer to Section XIV of this Order, Review of Submittals). The report shall describe the nature and extent of contamination (qualitative/quantitative) in relation to background areas indicative for the area.

TASK 5 -- HUMAN HEALTH BASELINE RISK ASSESSMENT

The Respondent shall prepare a thorough analysis and summary of all Site investigations and their results. The objective of this task will be to ensure that the investigation data are sufficient in quality (e.g, quality assurance procedures have been followed) and quantity to adequately describe the nature and extent of contamination, actual and potential future threats to human health and/or the environment and to support the feasibility study.

The results and data from all site investigations shall be organized and presented logically so that the relationships between and among remedial investigations for all media and receptors are apparent.

A. Conceptual Site Model. In order to expedite review and approval of the Human Risk Assessment by the Ohio EPA the Respondent shall prepare a Conceptual Site Model (CSM) prior to completing the Human Risk Assessment Report. The CSM is an interim document that shall briefly describe the following in tables or lists based on pre-existing site information and information gathered to date during the RI:

1. Goals of the assessment;

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2. Types and sources of information or data that will be used in the assessment;

3. Major assumptions or limitations influencing the application of the assessment;

4. Criteria for selecting chemicals of concern;

5. Exposure pathways, scenarios, and assumptions; and

6. Other interim deliverables.

B. Human Risk Assessment Report. Based upon the CSM, the Respondent shall prepare a risk assessment which shall contain a discussion of and present the data required in the tasks outlined below:

1. Selection of Contaminants of Concern. Respondent shall:

   a. Evaluate data based on approved data useability procedures (e.g., laboratory or data validation qualifiers, frequency and contaminant concentrations);

   b. Further reduce the number of chemicals of concern based on chemical toxicity to human and biological receptors, number of chemicals, environmental mobility, background data, etc.; and

   c. Develop a final list of Contaminants of Concern.

2. Estimate of Exposure Point Concentrations of Indicator Chemicals. Respondent shall:

   a. Combine site monitoring data and environmental modeling results to:

      i. identify exposure pathways;

      ii. estimate exposure point concentrations; and

      iii. compare these concentrations to requirements, standards and criteria.

3. Estimate of Chemical Intakes. Respondent shall:

   a. Provide estimates of chemical intakes from:

      i. Air

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ii. Ground water

iii. Surface water

iv. Other exposure pathways (soils, foodstuffs, recreation, etc.)

b. Combine pathway-specific intakes to yield total oral and total inhalation routes.

4. Respondent shall evaluate critical toxicity values (i.e., numerical values describing a chemical toxicity) and review general toxicological information for the indicator chemicals.

5. Risk Characterization. Respondent shall provide a detailed characterization of the risk posed by releases of toxic chemicals from the site. The characterization shall include the following elements:

a. Noncarcinogenic effects using the Hazard Index approach, where

$$HI = E(1)/RL(1) + E(2)/RL(2) + \ldots E(i)/RL(i)$$

E(i) = Exposure level (or intake) for the (i)th toxicant

RL(i) = Reference level (or intake) for the (i)th toxicant

b. Potential carcinogenic effects using the predicted risk approach, where

Risk = CDI x Carcinogenic Potency Factor

CDI = Chronic Daily Intake

It is assumed that risks are additive and there is independence of action by the compounds involved. Therefore, the following equations are used:

Carcinogenic risk for chemical X = [CDI (inhalation) x PF (inhalation)] + [CDI (oral) x PF (oral)]

Total carcinogenic risk = (carcinogenic risk for chemical 1 + carcinogenic risk for chemical 2 + ... + carcinogenic risk for

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chemical (1))

c. Uncertainties. Respondent shall provide a discussion of the uncertainties and assumptions made in the assessment process.

TASK 6 -- ENVIRONMENTAL BASELINE RISK ASSESSMENT.

The Respondent shall prepare a risk assessment which shall contain a discussion of present and future potential risk to ecosystems and populations exposed to contamination; information necessary to evaluate the environmental impact of proposed remedial alternatives; and information that can be utilized for the development of subsequent cleanup criteria in the tasks outlined below (note the Site Coordinator may approve combination of Tasks 5 and 6 into a single set of deliverables):

A. Conceptual Site Model. The respondent shall prepare an interim document as defined in Task 5, A. above with emphasis on site ecology and biological receptors.

B. Environmental Risk Assessment Report

1. Briefly Describe the Site and Study Area:

a. Describe physical and chemical factors that impact site ecology (e.g., fate and transport of contaminants, bioavailability, etc.);

b. Describe past or current practices, disturbances, or stresses that impact(ed) site ecology;

c. Describe the areal extent of environmental assessment;

d. Provide a full account of ecosystems and populations potentially exposed to contamination; and

e. Describe current and projected land use in and around the site as relevant to site ecology.

2. Describe Contaminants and Ecological Endpoints of Concern:

a. (See Task 5, B.1);

b. Specifically consider contaminants that pose toxicity or bioaccumulation potential to biological receptors and/or are available for exposure to populations and ecosystems; and

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c. Measurement and assessment endpoints and indicator species and rationale for their selection.

3. Characterize Exposure:

a. Combine site data, environmental modeling results and peer reviewed scientific literature to:

i) identify exposure pathways; and

ii) estimate exposure point concentrations by species, habitat, and exposure scenario; and

iii) identify site specific fate and transport processes.

b. Verify exposure to populations or ecosystems:

i. show correlations between concentrations and effects data (e.g., toxicity tests and population studies) along likely exposure pathways; and

ii. compare data from other toxicity tests, population studies, modeled uptakes,or reference areas to show exposure has occurred.

4. Characterize Risk or Threat.

The Respondent shall discuss and reduce the uncertainty over the receptor populations, communities, or ecosystems that are or may be affected; the estimation that adverse effect(s) will or are occur(ring); the magnitude of such an effect(s); and the temporal character of such an effect(s) by:

a. Identifying requirements, standards and criteria;

b. Identifying relevant, peer reviewed literature toxicity values or toxicological effects where the above are lacking;

c. Comparison of exposure concentrations to a. and b. above;

d. Presenting the number and magnitude of exceedances of a and b above;

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e. Presenting supporting evidence of risk from:

i. contaminant concentrations in biota;

ii. toxicity test results;

iii. supporting literature;

iv. field surveys of receptor populations;

v. measures of community structure and ecosystem function;

vi. comparison with reference or background data or observations; and

f. Discussing adverse or potential adverse effects under future use conditions.

5. Summary and Conclusions:

a. Summarize effects or potential effects of contamination to populations or ecosystems under current and future use conditions;

b. Describe future effects in absence of remedial action; and

c. Describe population or ecosystem characteristics that may impact the nature of remedial actions.

6. Assessment of Uncertainties and Limitations:

a. Describe all sources of uncertainty (e.g., variance estimates, underlying model assumptions, lack of toxicity information, unexpected influences on ecological assessment, etc.), their magnitude and direction of impact on estimation of risk; and

b. Describe assessment limitations (e.g., deviations from intended goals, data gaps, etc.).

TASK 7-TREATABILITY STUDY

A. Treatability Study Work Plan

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1. Determining the Need for Treatability Studies

a. Ohio EPA Required Treatability Studies
The Respondent shall conduct any necessary laboratory and treatability study(ies) required by the Ohio EPA to determine the applicability of remedial technologies.

b. Respondent-Proposed Treatability Studies
Upon approval by the Ohio EPA the Respondent may conduct any laboratory and treatability study(ies) that it has proposed to the Agency to determine the applicability of remedial technologies.

2. Treatability Study Work Plan

When required or approved of by the Ohio EPA, the Respondent shall develop and submit to this Agency for approval a testing work plan identifying the type(s) and goal(s) of the treatability study(ies), the level of effort needed, the experimental design, and the procedures to be used for data management, validation and interpretation. This work plan shall comport with U.S. EPA's guidance document, Guide for Conducting Treatability Studies Under CERCLA (Interim Final) EPA/540/2-89/058.

The work plan shall include the following elements:

a. Establishing data quality objectives
b. Selecting a contracting mechanism
c. Issuing the Work Assignment
d. Complying with regulatory requirements
e. Executing the study
f. Analyzing and interpreting the data
g. Reporting the results
h. Sampling and Analysis Plan
i. Health and Saftey Plan

B. Treatability Study Evaluation Report

1. Conducting A Treatability Study

The Respondent will perform the treatability study in accordance with the approved work plan in a systematic fashion to ensure that the data generated can support the remedy evaluation process.

2. Submission of Treatability Study Evaluation Report

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Upon completion of the treatability study(ies), the Respondent

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will prepare a treatability study evaluation report. The Respondent will follow U.S. EPA's guidance document, Guide for Conducting Treatability Studies Under CERCLA (Interim Final) EPA/540/2-89/058, for the appropriate format and content.

TASK 8-DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES

The development and screening of remedial alternatives is performed to develop an appropriate range of waste management options that will be evaluated. This range of alternatives should include as appropriate, options in which treatment is used to reduce the toxicity, mobility, or volume of wastes, but varying in the types of treatment, the amount treated, and the manner in which long-term residuals or untreated wastes are managed; options involving containment with little or no treatment; options involving both treatment and containment; and a no-action alternative. The following activities will be performed by the Respondent as a function of the development and screening of remedial alternatives.

The Respondent will begin to develop and evaluate a range of appropriate waste management options that at a minimum ensure protection of human health and the environment, concurrent with the RI site characterization tasks.

A. Remedial Action Objectives

1. Develop and document remedial action objectives

The Respondent shall develop preliminary remedial objectives, specifying the contaminant(s) and media or medium of interest, exposure pathway and preliminary remediation goals that establish a range of treatment and containment alternatives to be evaluated.

These remedial action objectives will be based on information gathered during the remedial investigation, Ohio EPA's How Clean Is Clean policy and other pertinent Ohio EPA guidance, chemical specific ARAR's, when available other information (e.g., Rfds) and site specific factors, and shall be consistent with section 300.430 of the NCP. Final remediation goals shall be determined by the Ohio EPA at or after the point the remedy is selected and are not part of this order.

In order to expedite review and approval of the Feasibility Study, the Respondent shall prepare a technical memorandum outlining the remedial action objectives.

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B. Technologies Screening

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1. Develop general response actions

The Respondent will develop general response actions for each medium of interest defining containment, treatment, excavation, pumping, or other actions, singly or in combination, to satisfy the remedial action objectives.

2. Identify areas or volumes of media

The Respondent will identify volumes of media to which general response actions may apply, taking into account requirements for protectiveness as identified in the remedial action objectives. The chemical and physical characterization of the site will also be taken into account.

3. Identify, screen, and document remedial technologies

The Respondent will identify and evaluate technologies applicable to each general response action to eliminate those that cannot be implemented at the site. General response actions will be refined to specify remedial technology types. Technology process options for each of the technology types will be identified either concurrent with the identification of technology types, or following the screening of the considered technology types. Process options will be evaluated on the basis of effectiveness, implementability, and cost factors to select and retain one or, if necessary, more representative process for each technology type. The technology types and process options will be summarized for inclusion in a technical memorandum. The reasons for eliminating technologies must be specified.

C. Alternatives Array

1. Assemble and document alternatives

The Respondent will assemble selected representative technologies into alternatives for each affected medium or operable unit. Together, all of the alternatives will represent a range of treatment and containment combinations that will address either the Site or the operable unit as a whole. A summary of the assembled alternatives and their related ARARs will be prepared by the Respondent for inclusion in a technical memorandum. The reasons for eliminating alternatives during the preliminary screening process must be specified.

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2. Refine alternatives

The Respondent will refine the remedial alternatives to identify contaminant volume addressed by the proposed

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process and sizing of critical unit operations as necessary. Sufficient information will be collected for an adequate comparison of alternatives. Remedial action objectives for each medium will also be refined as necessary to incorporate any new risk assessment information being generated from the remedial investigation. Additionally, ARARs will be updated as the remedial alternatives are refined.

3. Conduct and document screening evaluation of each alternative

The Respondent may perform a final screening process based on short and long term aspects of effectiveness, implementability, and relative cost. Generally, this screening process is only necessary when there are many feasible alternatives available for detailed analysis. If necessary, the screening of alternatives will be conducted to assure that only the alternatives with the most favorable composite evaluation of all factors are retained for further analysis.

As appropriate, the screening will preserve the range of treatment and containment alternatives that was initially developed. The range of remaining alternatives will include options that use treatment technologies and permanent solutions to the maximum extent practicable, and minimize media transfer. The Respondent will prepare a technical memorandum summarizing the results and reasoning employed in screening, arraying alternatives that remain after screening, and identifying the ARARs for the alternatives that remain after screening.

4. Alternatives Development and Screening Deliverables

In order to expedite review and approval of, the Respondent will prepare a technical memorandum summarizing the work performed in and the results of each task above, including an Alternatives Array summary. These will be modified by the Respondent if required by Ohio EPA's comments to assure identification of a complete and appropriate range of viable alternatives to be considered in the detailed analysis. This interim deliverable will document the methods, rationale, and results of the alternatives screening process.

TASK 9 - DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES

A. Detailed Analysis of Alternatives Report

The detailed analysis will be conducted by the Respondent to provide the Ohio EPA with the information needed to enable for

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the selection of a site remedy. Respondent shall conduct a detailed analysis of the alternatives that pass through the initial screening. This detailed analysis shall consist of an analysis of each option against a set of eight evaluation criteria and a comparative analysis of all options using the same evaluation criteria as a basis for comparison.

The detailed analysis shall consist of the following elements:

1. Detailed Description

   The detailed description of each remaining alternative shall include as a minimum:

   a. Description of appropriate treatment and disposal technologies;

   b. Special engineering considerations required to implement the alternative, e.g., pilot treatment facility or additional studies needed to proceed with final remedial design;

   c. Operation, maintenance and monitoring requirements of the completed remedy;

   d. Off-site disposal needs and transportation plans;

   e. Temporary storage requirements;

   f. Safety requirements for remedial implementation, including both on-site and off-site health and safety considerations;

   g. An analysis of how the alternatives could be phased into individual operations and a discussion of how these operations could best be implemented (individually or in groups) to produce significant environmental improvement;

   h. A review of any off-site treatment or disposal facilities to ensure compliance with RCRA, TSCA and State requirements, both current and proposed; and

   i. An analysis of the projected performance and expected results of the alternative with emphasis on potential for further future release of hazardous substances;

2. Environmental Assessment

   An Environmental Assessment (EA) shall be performed for each alternative including, as a minimum, an evaluation of each alternative's environmental effects, an analysis of measures to mitigate adverse effects, physical or legal constraints.

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and compliance with Federal and State regulatory requirements.

Each alternative will be assessed in terms of the extent to which it will mitigate damage to or protect public health, welfare and the environment, in comparison to the other remedial alternatives.

The no action alternative will be fully evaluated to describe the current site conditions and anticipate environmental conditions if no actions are taken. The no action alternative will serve as a baseline for the Environmental Assessment.

3. Apply Eight Criteria and Document Analysis

The respondent shall apply the eight evaluation criteria described below to the assembled remedial alternatives.

a. Overall Protection of Human Health and the Environment. Alternatives shall be assessed as to whether they can adequately protect human health and the environment from unacceptable risks posed by hazardous substances, pollutants or contaminants present at the site by eliminating, reducing or controlling exposures to levels established during development of remediation goals. This is a threshold requirement and the primary objective of the remediation program.

b. Compliance with Applicable or Relevant and Appropriate Requirements. The alternatives shall be assessed as to whether they attain applicable or relevant and appropriate standards, criteria and requirements of state and federal environmental and public health laws.

c. Long-term Effectiveness and Permanence. Alternatives shall be assessed for the long-term effectiveness and permanence they afford, along with the degree of certainty that the alternative will prove successful. Factors that shall be considered, as appropriate, include the following:

i) Nature and magnitude of total residual risks in terms of amounts; potential for exposure of human and environmental receptors; concentrations of hazardous substances, pollutants or contaminants remaining following implementation of remedial alternative, considering the persistence, toxicity, mobility and propensity to bioaccumulate of such hazardous substances and their constituents;

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ii) The type, degree and adequacy of long-term man-

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agement required for untreated substances and treatment residuals, including engineering controls (such as containment technologies), institutional controls, monitoring and operation and maintenance;

iii) Long-term reliability of the engineering and institutional controls, including uncertainties associated with land disposal of untreated hazardous substances, pollutants and contaminants, as well as treatment residuals, and;

iv) Potential need for replacement of the remedy, as well as the continuing need for repairs to maintain the performance of the remedy.

d. Reduction of Toxicity, Mobility or Volume. The degree to which alternatives employ treatment that reduces toxicity, mobility or volume of contaminants shall be assessed. Alternatives which, at a minimum, address the principal threats posed by the site through treatment shall also be identified. Factors that shall be considered, as appropriate, include the following:

i) The treatment or recycling processes the alternatives employ and materials they will treat;

ii) The amount of hazardous substances, pollutants or contaminants that will be destroyed, or treated, or recycled;

iii) The degree of expected reduction in toxicity, mobility or volume of the waste due to treatment or recycling and the specifications of which reduction(s) are occurring;

iv) The degree to which the treatment is irreversible;

v) The type and quantity of residuals that will remain following treatment, considering the persistence, toxicity, mobility and propensity to bioaccumulate;

vi) The degree to which treatment will reduce the inherent hazards posed by the principal threats at the Site; and

vii) The degree to which the treatment processes employed reduce the transfer of contaminants between environmental media.

e. Short-term Effectiveness. The short-term impacts of the alternatives during the construction and implementation phase, and until the objectives of the remedial action

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have been met, shall be assessed considering the following:

i) Short-term risks that may be posed to the community during construction and implementation of an alternative and until the remedial action objectives have been met;

ii) Potential impacts on workers during remedial action and with the objectives of remedial action have been met, the effectiveness and reliability of protective measures;

iii) Potential environmental impacts that may result from the remedial action and the effectiveness and reliability of mitigative measures during implementation and until the objectives of the remedial action have been met; and

iv) Time until response action objectives are achieved.

f. Implementability. The technical and administrative feasibility of implementing the alternatives shall be assessed by considering the following types of factors, as appropriate:

i) Technical Feasibility

-Degree of difficulty or uncertainty associated with construction and operation of the alternative;

-Expected operational reliability of the alternative;

-Ease of undertaking, additional remedial action(s); and

-Ability to monitor the effectiveness of the remedy.

ii) Administrative Feasibility

-Activities needed to coordinate state, local, and federal agencies (e.g., obtaining necessary approvals and permits, right-of-way for construction)

iii) Feasibility of Obtaining Services and Materials

-Capacity and location of adequate treatment, storage, and disposal services;

-Availability of necessary equipment and specialists and provisions to ensure any necessary additional resources;

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-Availability of services and materials; and

-Availability of prospective technologies

g. Cost. The types of costs that shall be assessed include the following:

i) Direct and indirect capital costs, including contingency and engineering fees;

ii) Annual operation and maintenance costs; and

iii) Net present value of capital and O&M costs.

h. Community Acceptance. This assessment includes determining which components of the alternatives interested persons in the community support, have reservations about, or oppose. This assessment will be completed by the Ohio EPA after comments on the proposed remedy are received and is not part of this order until comments on the proposed remedy are received.

4. Compare Alternatives Against Each Other and Document the Comparison of Alternatives

The Respondent will perform a comparative analysis between the remedial alternatives. That is, each alternative will be compared against the others using the evaluation criteria as a basis of comparison. Identification and selection of the preferred alternative are reserved by the Ohio EPA and are not part of this Order. The Respondent will prepare a technical memorandum summarizing the results of the comparative analysis.

B. Feasibility Study Report

The Respondent will submit a draft feasibility study report to the Ohio EPA for review, comment, and approval. The respondent will refer to the U.S.EPA Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA for an outline of the report format and the required report content. Upon satisfactorily addressing Ohio EPA's comments, the Respondent will prepare and submit a final feasibility study report.

TASK 10-Monthly Progress Reports

Progress

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Monthly Technical Progress Reports are required of the Respondent. For each on-going work assignment, Respondent shall submit progress reports with the following elements:

1. Identification of site and activity.

2. Status of work at the site and progress to date.

3. Percentage of completion.

4. Data generated to date

5. Difficulties encountered during the reporting period.

6. Actions being taken to rectify problems.

7. Activities planned for the next month.

8. Changes in personnel.

The monthly progress report will list target and actual completion dates for each activity including project completion and provide an explanation of any deviation from the milestones in the work plan schedule.

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