PLANS AND SPECIFICATIONS
FOR THE CONSTRUCTION OF THE

BATTLE CREEK, MICHIGAN
THOMAS SOLVENTS
RAYMOND ROAD
REMEDIAL ACTION
SOIL VAPOR EXTRACTION
SYSTEM

For Information Contact:
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ISSUED FOR BID
MARCH 25, 1987
CONTRACT DOCUMENTS
for the construction of the
BATTLE CREEK, MICHIGAN
THOMAS SOLVENTS RAYMOND ROAD
REMEDIAL ACTION
SOIL VAPOR EXTRACTION SYSTEM

****
CONSISTING OF:
BIDDING REQUIREMENTS
CONTRACT FORMS
CONDITIONS OF THE CONTRACT
SPECIFICATIONS
DRAWINGS
****

CH2M HILL
Corvallis, Oregon
March 1987

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Project No. W68471.BA
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* * * * * *
PART 1

BIDDING REQUIREMENTS
INVITATION FOR TECHNICAL PROPOSALS AND BIDS

Technical Proposals and sealed Bids for the design, construction, and operation of the Battle Creek, Thomas Solvents Raymond Road Remedial Action, Soil Vapor Extraction System, addressed to CH2M HILL SOUTHEAST, INC., hereinafter called CH2M HILL, will be received at 2300 N.W. Walnut Blvd., P.O. Box 428, Corvallis, OR 97339, Attention: Alan Amoth, until 2:00 p.m., local time on the 24th day of April, 1987.

The Work contemplated is described in the Specifications. The Work includes, but is not limited to, design of a soil vapor extraction system including a vapor phase carbon adsorption emission control system; construction of the soil vapor extraction system; operation of the soil vapor extraction system for a period of 2 years beyond substantial completion or until the performance objective is met; and removal of an estimated 21 underground storage tanks.

The work involves the partial cleanup of the Verona Wellfield, a U.S. Environmental Protection Agency Superfund site that is included on the National Priorities List. The groundwater and some of the unsaturated zone soils in the work area have been contaminated with volatile organic compounds.

The site of Work is near the intersection of Raymond Road and Emmett Street, in Emmett Township and Calhoun County, near the City of Battle Creek, MI. The work is on property of the Thomas Solvent Company which is under a stipulation and order from the United States Bankruptcy Court for the Eastern District of Michigan. The stipulation and order provides for access to the site for remedial actions under Superfund.

Additional Contract Documents may be obtained at CH2M HILL's office upon payment of $50 for each Document. No refunds will be provided for additional sets.

The attention of Bidders is directed to the Instructions to Bidders which describe in detail the two-step bidding process for the contemplated work, the requirements for proposals, the basis for determining the acceptability of technical proposals, and the basis for selection of the successful Bidder.

Each Technical Proposal shall contain all of the requirements described herein, including the Design Criteria Summary and the other required attachments. No indication of Bid price(s) shall be included in the Technical Proposal.

Bids shall be submitted at the same time to the same address as Technical Proposals. Each bid shall be sealed separately and shall clearly indicate on the outside of the envelope the Technical Proposal to which it corresponds. Each Bid must be submitted on the
prescribed form and accompanied by bid security executed on the
prescribed form, payable to CH2M HILL SOUTHEAST, INC., in an amount
not less than 5 percent of the amount bid.

The attention of Bidders is directed to the applicable federal and
state requirements and conditions of employment to be observed and
minimum wage rates to be paid under the Contract.

Before a contract will be awarded, compliance with all EPA and state
requirements specified in the Contract Documents will be subject to
EPA and state review and approval.

For information concerning the proposed Work, contact Mr. Alan
Amoth, telephone 503/752-4271.

A pre-bid conference will be held beginning at 10:00 a.m., local
time, April 1, 1987. Prospective Bidders may meet with CH2M HILL at
the Thomas Solvents Raymond Road Facility, 1194 N. Raymond Rd.,
Battle Creek, MI.

The right is reserved to reject all Proposals or any Proposal not
conforming to the intent and purpose of the Contract Documents, and
to postpone the award of the Contract for a period of time which,
however, shall not extend beyond 60 days from the bid opening date.

Dated this 25th day of March, 1987.

CH2M HILL SOUTHEAST, INC.

By Alan Amoth, Project Manager

* * * * *
PAYMENT BOND

BOND NO. __________________________

AMOUNT: $___________________________

KNOW ALL MEN BY THESE PRESENTS, that _________________________________________

of _____________________________________

hereinafter called the CONTRACTOR (Principal), and __________________________

a corporation duly organized and existing under and by virtue of the laws of the State of __________________________,

hereinafter called the SURETY, and authorized to transact business within the State of__________________________ as SURETY, are held and firmly bound unto CH2M HILL SOUTHEAST, INC., as the CONSTRUCTION MANAGER (Obligee), in the sum of: ____________________________ DOLLARS ($__________________________), lawful money of the United States of America, for the payment of which, well and truly made to the CONSTRUCTION MANAGER, the CONTRACTOR and the SURETY bind themselves and each of their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents as follows:

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

WHEREAS, the CONTRACTOR has executed and entered into a certain contract hereto attached, with the CONSTRUCTION MANAGER, dated _____________, 19__, for:

___________________________________________________________________________

If CONTRACTOR shall make all payments as required by the terms and conditions of the within and foregoing Contract, as well as all other payments for goods and services rendered in connection with the performance of said Contract for which any common law or statutory mechanics lien is available, then this obligation shall be void; otherwise it shall be and remain in full force and effect.
Provided, however, that no final settlement between the construction manager and the contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

Provided, further, that the surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the contract documents or to the work to be performed thereunder, shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the contract documents.

In witness whereof, the above parties bounded together have executed this instrument this ___ day of ______________, 19__, the name and corporate seal of each corporate party being hereto affixed and those presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Contractor

By______________________(Seal)

Attest

Surety

By______________________(Seal)

Attest

Note: The surety named on this bond shall be one who is licensed to conduct business in the state where the project is located, and named in the current list of companies holding certificates of authority as acceptable sureties on federal bonds and as acceptable reinsuring companies, as published in circular 570 (amended) by the audit staff bureau of accounts, U.S. Treasury department. All bonds signed by an agent must be accompanied by a certified copy of the authority to act for the surety at the time of the signing of this bond.

* * * * *
INSTRUCTIONS TO BIDDERS

1. FORMAT

The Contract Documents are divided into parts, divisions, and sections in keeping with accepted industry practice in order to separate categories of subject matter for convenient reference thereto. Generally, there has been no attempt to divide the Specification sections into Work performed by the various building trades, or Work by separate subcontractors.

2. SPECIFICATION LANGUAGE

Imperative ("command") sentences are used in the Contract Documents. These refer to and are directed to the Contractor.

3. GENERAL DESCRIPTION OF THE PROJECT

A general description of the Work to be done is contained in the Invitation to Bid. The scope is indicated on the accompanying Drawing and specified in applicable parts of these Contract Documents.

4. REGISTRATION REQUIREMENTS FOR CONTRACTORS

All Bidders, including General Contractors and Specialty Contractors, shall hold or obtain such Contractors' or Business Licenses as required by State and local statutes.

5. DOCUMENT INTERPRETATION

The separate sections contained within these Contract Documents are intended to be complementary and to provide all details reasonably required for the execution of the proposed Work. Any person contemplating the submission of a bid shall have thoroughly examined all of the various parts of these Documents, and should there be any doubt as to the meaning or intent of said Contract Documents, the Bidder should request of the Construction Manager, in writing (at least 7 working days prior to bid opening) an interpretation thereof. Any interpretation or change in said Contract Documents will be made only in writing, in the form of Addenda to the Documents which will be furnished to all registered holders of Contract Documents. Questions received less than 7 days prior to the date for opening of bids will not be answered. Bidders shall submit with their bids, or indicate receipt of, all Addenda. The Construction Manager will not be responsible for any other explanation or interpretations of said Documents.
6. **PRIVITY OF AGREEMENT**

This Contract is expected to be funded in part with funds from the U.S. Environmental Protection Agency. Neither the U.S. Environmental Protection Agency nor any of its departments, agencies, or employees is, or will be, a party to this Contract or any subcontract.

7. **SMALL DISADVANTAGED BUSINESS ENTERPRISES PARTICIPATION**

   **A. POLICY**

   It is the policy of CH2M HILL SOUTHEAST, INC. on a flowdown basis from its Contract No. 68-01-7251 with the U.S. EPA, that Small Business Enterprises (SBE) and Small Disadvantaged Business Enterprises (SDBE's) shall have the maximum opportunity to participate in the performance of contracts under this agreement.

   **B. ELIGIBILITY**

   The Bidder shall require SBE and SDBE's proposed for the project to complete the enclosed certification form (Attachment 1). Completed forms shall be submitted with the Bid.

   In the event the apparent low Bidder, in good faith, proposes to use a firm that has not provided certification, and that firm is later found to be ineligible or is unable to perform, then the apparent low Bidder will immediately notify the Construction Manager so that a decision can be made as to substitution requirements for another certified SBE or SDBE.

   **C. GOALS**

   To establish required levels of participation for this project, the Construction Manager has specified goals in the amounts indicated in the Bid.

   The Bidder is required to submit the Small Disadvantaged Business Utilization Certification included in the bid and the following information with its bid:

   1. Names of SBE and SDBE firms
   2. Description of utilization
   3. Dollar amount of utilization of each SBE and SDBE firm
   4. Total dollar amount of utilization of SBE and SDBE firms
Should the Bidder fail to complete the SBE and SDBE Utilization Certification section of the bid, or submit false certification, the bid will be rejected as "nonresponsive".

D. COUNTING SBE AND SDBE PARTICIPATION TOWARD MEETING GOALS

An SDBE firm must be at least 51 percent owned and controlled by a minority to qualify toward SDBE goals (refer to Attachment 1).

The subcontracts with SBE and SDBE that perform a commercially useful function in the Work or supply process may be counted toward the SBE and SDBE goals:

1. For subcontracts; an SBE or SDBE is considered to perform a commercially useful function when it is responsible for execution of a distinct element of the Work, and actually performs, manages, and supervises the Work involved. The amount of work subcontracted, industry practices, and other relevant factors will be considered in determining "commercially useful functions".

2. For providing materials, equipment, or supplies; an SBE or SDBE which performs a function that is customarily performed as a distinct and necessary part of the supply process is considered to provide a commercially useful function, provided that it:
   a. Assumes the actual and contractual responsibility for furnishing the supplies and materials and is the manufacturer of those supplies and materials;
   b. Is recognized as a distributor by the manufacturers involved in the contracted supplies and materials; and
   c. Owns or leases warehouses, yards, or buildings for storage of manufactured materials; or whatever other facilities are viewed as customary or necessary by the industry; and
   d. Distributes, delivers, or arranges delivery and services products with its own staff.

When a firm acts only as a passive conduit in the supply process or duplicates a service provided by others in the same chain of supply from manufacturer to purchaser, no credit will be granted toward the SBE or SDBE.
E. SELECTION OF SUCCESSFUL BIDDER

Award of the Contract shall be based on the technical merit of the Bidder's Technical Proposal and lowest responsive bid if it meets the SBE and SDBE goals indicated on the bid form, or has made a good faith effort to meet the goals.

Determination of "good faith effort" will be based on the following objective measurement:

For bids that are opened, a good faith effort, for the purpose of determining the responsiveness of a bid, shall be meeting or exceeding the average of SBE and SDBE participation indicated on all competitive bids submitted for the project. (A competitive bid is one which is not more than 25 percent above the lowest Bid.) Should the low Bidder's SBE and SDBE participation be below the average in either category, the bid will be considered as nonresponsive and may be rejected.

If the lowest bid has neither met the goals indicated on the bid form, nor made a good faith effort to meet those goals in accordance with the foregoing, then either all bids will be rejected or, at the option of the Construction Manager, the Contract may be awarded to the next lowest Bidder if that Bidder either meets the goals, or has made a good faith effort to meet the goals.

F. CONTRACT COMPLIANCE

The Contract will include the successful Bidder's SBE and SDBE obligations as certified in the Bid.

To ensure all obligations under subcontracts awarded to SBE's and SDBE's are met, the Construction Manager will review the Contractor's SBE and SDBE involvement efforts during the performance of the Contract. The Contractor shall bring to the attention of the Construction Manager any situation in which regularly scheduled progress payments are not made to SBE and SDBE subcontractors.

8. COMPLIANCE WITH LABOR STANDARDS AND RATE OF WAGE REQUIREMENTS

The Work under this Contract is to be paid for by federal funds; therefore, minimum prevailing wage rates published by the Federal Department of Labor apply.
9. BIDDER'S UNDERSTANDING

Each Bidder must inform itself of the conditions relating to the execution of the Work, and it is assumed that it will inspect the site and make itself thoroughly familiar with all the Contract Documents. Failure to do so will not relieve the successful Bidder of its obligation to enter into a contract and complete the contemplated Work in strict accordance with the Contract Documents. It shall be the Bidder's obligation to verify for itself and to its complete satisfaction all information concerning site and subsurface conditions.

Appendix A contains information on subsurface conditions, surface topography, and the nature and extent of hazardous constituents contamination at the Work site. Investigations conducted to determine subsurface conditions and the nature and extent of contamination were made for the purpose of study and design, and the Construction Manager assumes no responsibility whatever in respect to the sufficiency or accuracy of sampling, or the results of tests, or of other investigations that have been made, or of the interpretations made thereof, and there is no warranty or guarantee, either expressed or implied, that the conditions indicated by such investigations are representative of those existing throughout such area, or any part thereof, or that unforeseen developments may not occur.

It is not the intent of the Contract Documents to define the exact conditions or nature and quantities of contaminants at the site. Data provided are to be considered for determining a project approach. It is understood that there may be variations in the level of accuracy of these data. There may also be variations in the concentrations and/or volumes of contaminants.

Logs of test borings, geotechnical reports, or topographic maps showing a record of the data obtained during investigations of surface and subsurface conditions that are made available shall not be considered a part of the Contract Documents. Said logs represent only the opinion of the Construction Manager as to the character of the materials encountered by it in its investigations, and are available only for the convenience of the Bidders.

Additional copies of Appendix A will be provided to Bidders by the Construction Manager for $50 each.

Contractor shall be responsible for discovery of existing underground installations, in advance of excavating, drilling, or trenching, by contacting all local utilities and by prospecting.
Information derived from inspection of logs of test borings, geotechnical reports, topographic maps, or from Drawings showing location of utilities and structures will not in any way relieve the Contractor from any risk, or from properly examining the site and making such additional investigations as it may elect, or from properly fulfilling all the terms of the Contract Documents.

Each Bidder shall inform itself of, and the Bidder awarded Contract shall comply with, federal, state, and local laws, statutes, and ordinances relative to the execution of the Work. This requirement includes, but is not limited to, applicable regulations concerning minimum wage rates, nondiscrimination in the employment of labor, protection of public and employee safety and health, environmental protection, the protection of natural resources, fire protection, burning and nonburning requirements, permits, fees, and similar subjects.

Contractor shall comply with ambient air quality standards established by MDNR. This requirement includes adherence with acceptable ambient concentrations established for specific compounds (see Table 1). Compliance also requires that emissions of total volatile organic compounds not exceed 1 ppm above background for greater than 5 minutes at the nearest downwind residence during any phase of work.

**TABLE 1**

**MDNR Ambient Air Quality Standards**

<table>
<thead>
<tr>
<th>C.A.S. No.</th>
<th>Compound</th>
<th>Acceptable Ambient conc. ug/m³</th>
<th>Basis of Acceptable Ambient conc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>74-87-3</td>
<td>Chloromethane</td>
<td>0.40</td>
<td>R.A.V.</td>
</tr>
<tr>
<td>74-83-9</td>
<td>Bromomethane</td>
<td>1.00</td>
<td>R.A.V.</td>
</tr>
<tr>
<td>75-01-4</td>
<td>Vinyl Chloride</td>
<td>17800.00</td>
<td>1%TLV</td>
</tr>
<tr>
<td>75-00-3</td>
<td>Chloroethane</td>
<td>8100.00</td>
<td>1%TLV</td>
</tr>
<tr>
<td>75-09-2</td>
<td>Methylene Chloride</td>
<td>67-64-1</td>
<td>1%TLV</td>
</tr>
<tr>
<td>75-15-0</td>
<td>Carbon Disulfide</td>
<td>300.00</td>
<td>1%TLV</td>
</tr>
<tr>
<td>75-35-4</td>
<td>1,1-Dichloroethene</td>
<td>200.00</td>
<td>1%TLV</td>
</tr>
<tr>
<td>75-34-3</td>
<td>1,1-Dichloroethene</td>
<td>8100.00</td>
<td>1%TLV</td>
</tr>
<tr>
<td>156-60-5</td>
<td>Trans-1,2-Dichloroethene</td>
<td>0.02</td>
<td>R.A.V.</td>
</tr>
<tr>
<td>67-66-3</td>
<td>Chloroform</td>
<td>0.02</td>
<td>R.A.V.</td>
</tr>
<tr>
<td>107-06-2</td>
<td>1,2-Dichloroethane</td>
<td>0.09</td>
<td>R.A.V.</td>
</tr>
<tr>
<td>78-93-3</td>
<td>2-Butanone</td>
<td>5900.00</td>
<td>R.A.V.</td>
</tr>
</tbody>
</table>
33. WORK PLAN AND SCHEDULE

The Bidder shall include with its Technical Proposal a proposed Work plan and schedule of the proposed design, construction, tank removal, and operation of the system.

The Work plan shall be in narrative form and shall describe the various operations of the proposed design, construction, tank removal, and operation of the system in sufficient detail to demonstrate the Bidder's understanding of the Work.

34. SUBCONTRACTORS AND SUPPLIERS

The Bidder shall include with its Technical Proposal a list of all subcontractors it expects to use in the Work on the form provided as Attachment 2.

If requested by the Construction Manager, an experience statement with pertinent information as to similar projects and other evidence of qualification shall be furnished for each named subcontractor. If the Construction Manager after due investigation has reasonable objection to any proposed subcontractor, it will, before opening the Bids, request the Bidder to submit a substitute subcontractor. Should an otherwise acceptable Bidder decline to make any such substitution, the Contract may not be awarded to such Bidder, but its declining to make any such substitution will not constitute grounds for sacrificing its Bid Security. Any subcontractor so listed and to whom the Construction Manager does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to the Construction Manager.

The use of subcontractors listed by the Bidder and accepted prior to the Notice of Award will be required in the performance of the Work.

The list of subcontractors shall also include the suppliers and manufacturers of principal items of materials and equipment the Bidder expects to use in the Work.
29. NOTICE TO PROCEED

It is expected that within 10 days, but no more than 30 days following execution of the Contract and receipt of all required submittals, the Contractor will be issued the Notice to Proceed.

30. PERFORMANCE AND PAYMENT BONDS

The successful Bidder shall file with the Construction Manager a Performance Bond and a Payment Bond on the forms bound herewith each in the full amount of the Contract price, as security for the faithful performance of the Contract Documents and the payment of all persons supplying labor and materials for the construction of the Work, and to cover all guarantees against defective workmanship or materials, or both, for a period of 1 year after the date of final acceptance of the Work by the Construction Manager. The Surety furnishing these bonds shall be licensed to conduct business in the state where the project is located, and named in the current list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies, as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department.

The Attorney-in-Fact (Resident Agent) who executes these bonds in behalf of the Surety must attach a notarized copy of its power-of-attorney as evidence of its authority to bind the Surety on the date of execution of the bond.

31. FAILURE TO EXECUTE CONTRACT AND FURNISH BOND

The Bidder who has a Contract awarded to it and who fails to promptly and properly execute the Contract and furnish the Performance Bond and Payment Bond shall forfeit the bid security that accompanied its bid, and the bid security shall be retained as liquidated damages, and it is agreed that this said sum is a fair estimate of the amount of damages that will be sustained in case the Bidder fails to enter into a Contract and furnish the bonds as hereinbefore provided. Bid security deposited in the form of cash, a certified check, or cashier's check shall be subject to the same requirement as a bid bond.

32. TIME OF COMPLETION

The time of completion of the Work to be performed under this Contract is the essence of the Contract. Delays and extensions of time may be allowed in accordance with the provisions stated in the General Conditions. The time allowed for the completion of the Work is stated in the Bid.
25. RETURN OF BID SECURITY

Within 15 days after the award of the Contract, the Construction Manager will return the bid securities to all Bidders whose bids are not to be further considered in awarding the Contract. Retained bid securities will be held until the Contract has been finally executed, after which all bid securities, other than Bidders' bonds and any guarantees which have been forfeited, will be returned to the respective Bidders whose bids they accompanied.

26. ACCEPTANCE AND AWARD OF CONTRACT

Within 20 calendar days after the opening of bids, the Construction Manager will notify one of the Bidders that its bid has been accepted by the Construction Manager or act in accordance with the BASIS OF AWARD. The acceptance of the bid will be by written notice, mailed or delivered to the office designated in the Bid. Upon approval by EPA of the accepted bid, the Bidder will be notified of Contract award. In the event of failure of the lowest responsible Bidder to sign the Contract and provide acceptable Performance and Payment Bonds, the Construction Manager may award the Contract to the next lowest responsible Bidder. In such case, notification to the next lowest responsible Bidder will be made within 60 days after the opening of Bids.

27. BASIS OF AWARD

After evaluation of the Technical Proposals, bids for technically acceptable Technical Proposals will be opened. The award will be made by the Construction Manager on the basis of the lowest responsible Bidder that has also demonstrated the required technical qualifications.

The Construction Manager reserves the right to accept or reject any or all bids, and to waive any informalities and irregularities in said bids.

28. EXECUTION OF CONTRACT

The successful Bidder shall, within 10 working days after receiving notice of award, sign and deliver to the Construction Manager the Contract hereto attached together with the acceptable security or bonds as required in these Documents. It is expected that within 20 working days after receiving the signed Contract with acceptable security or bonds from the successful Bidder, the Construction Manager's authorized agent will sign the Contract. Signature by both parties constitutes execution of the Contract.
submitted intact with the Contract Documents. Each bid must be submitted in a sealed envelope, so marked as to indicate the Bidder's name and its contents without being opened, and addressed in conformance with the instructions in the Invitation to Bid.

The following items shall be submitted with the bid:
- Completed Bid
- Bid Bond
- Completed Attachment No. 1

23. MODIFICATION OR WITHDRAWAL OF BIDS

Prior to the time and date designated for receipt of bids, any bid submitted may be modified or withdrawn by notice to the party receiving bids at the place designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder or by telegram. If by telegram, written confirmation over the signature of the Bidder shall be mailed and postmarked on or before the date and time set for receipt of bids, and it shall be so worded as not to reveal the amount of the original Bid. No Bid may be withdrawn for 60 days after the time scheduled for receipt of bids.

24. BID SECURITY

Bids must be accompanied by cash, a certified check, or cashier's check drawn on a bank in good standing, or a bid bond issued by a Surety authorized to issue such bonds in the State where the Work is located, in an amount not less than 5 percent of the total amount of the bid submitted. This bid security shall be given as a guarantee that the Bidder will not withdraw its bid for a period of 60 days after bid opening, and that if awarded the Contract, the successful Bidder will execute the attached Contract and furnish a properly executed Performance Bond and Payment Bond in the full amount of the Contract price within the time specified.

The Attorney-in-Fact (Resident Agent) who executes this bond in behalf of the Surety must attach a notarized copy of its power-of-attorney as evidence of its authority to bind the Surety on the date of execution of the bond.

If the Bidder elects to furnish a Bid Bond, it shall use the Bid Bond form bound herewith, or one conforming substantially thereto in form and content.
2. For activated carbon, per pound. For the purposes of comparing bids, the assumption will be made that 20,000 pounds of carbon will be required, total, for the 2-year Period of Operation.

For unit price items, payment to the Contractor will be made for the Work actually performed by the Contractor as specified in the Contract Documents.

20. PREPARATION OF BIDS

All blank spaces in the bid form must be filled in, preferably in BLACK ink, in both words and figures where required. No changes shall be made in the phraseology of the forms. Written amounts shall govern in case of discrepancy between the amounts stated in writing and the amounts stated in figures. In case of discrepancy between unit prices and totals, total prices will prevail.

Any bid shall be deemed informal which contains omissions, erasures, alterations, or additions of any kind, or prices uncalled for, or in which any of the prices are obviously unbalanced, or which in any manner shall fail to conform to the conditions of the Contract Documents.

The Bidder shall sign its bid in the blank space provided therefor. If Bidder is a corporation, the legal name of the corporation shall be set forth above, together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation. If Bidder is a partnership, the true name of the firm shall be set forth above, together with the signature of the partner or partners authorized to sign contracts in behalf of the partnership. If signature is by an agent, other than an officer of a corporation or a member of a partnership, a notarized power-of-attorney must be on file with the Construction Manager prior to opening of bids or submitted with the bid, otherwise the bid will be regarded as not properly authorized.

21. SALES TAXES

The successful Bidder shall pay sales taxes, as required by the laws and statutes of the State and its political subdivisions. The Bidder's estimate of the sales tax to be paid shall be included in the lump sum bid and individual unit prices, as applicable.

22. SUBMISSION OF BID

All bids must be submitted not later than the time prescribed, at the place, and in the manner set forth in the Invitation to Bid. Bids must be made on the bid forms provided herein and
16. SUBMISSION OF TECHNICAL PROPOSALS

All Technical Proposals must be submitted with the sealed bids not later than the time prescribed, at the place, and in the manner set forth in the Invitation to Bid.

The following items shall be submitted with the Technical Proposal:

- Technical Proposal
- Design Criteria Summary (Attachment 4)
- Work Plan and Schedule for Design, Implementation and Operation
- Proposed Subcontractor List (Attachment 2)
- Experience Questionnaire (Attachment 3)
- Certification of Training, Medical and Safety Requirements (Attachment B)

17. NOTIFICATION OF UNACCEPTABLE TECHNICAL PROPOSALS

Bidders whose Technical Proposals are judged to be unacceptable will be notified in writing.

18. OPENING OF BIDS

Bids will be opened if at least three Technical Proposals are judged to be technically acceptable, to ensure adequate price competition. Only those bids will be considered that correspond to Technical Proposals that are acceptable either initially or as a result of discussions.

19. TYPE OF BID

A. LUMP SUM

The bid for the Work is to be submitted on a lump sum basis. A single lump sum price shall be submitted in the appropriate place. The total amount to be paid the Contractor shall be the amount of the lump sum bid as adjusted for additions or deletions resulting from approved changes in construction.

B. UNIT PRICES

The following unit prices are requested:

1. For continuing to operate the Soil Vapor Extraction System on a per month charge basis beyond the maximum 2-year Period of Operation or after the performance objective has been attained for an additional period of up to 24 months.
Technical Proposal and shall in no way relieve the successful Bidder of its responsibility to provide a complete and workable system in accordance with the requirements of the Contract Documents.

The successful Bidder shall be required to use approach and procedures submitted in its technical proposal and these Specifications when completing final design unless approved by the Construction Manager.

13. NO PRICES IN TECHNICAL PROPOSALS

Technical Proposals shall not include any indication of cost of, or prices for, the Soil Vapor Extraction System or any element thereof. Technical Proposals that indicate costs or prices may be considered informal.

14. CONFIDENTIALITY OF TECHNICAL PROPOSALS

It is the intent of EPA that experience gained from this Work will be available for technology transfer. Any Bidder requesting confidential treatment of information in its Technical Proposal or of information concerning the actual system shall clearly state in a conspicuous location in its Technical Proposal. Such statement shall clearly identify the extent of the information that is requested to receive confidential treatment.

The Construction Manager will make a reasonable effort to comply with Bidders' requests for confidentiality. Where a request for confidentiality conflicts too strongly with EPA's intentions for technology transfer, the Construction Manager may judge the Technical Proposal to be technically unacceptable.

15. CRITERIA FOR EVALUATING TECHNICAL PROPOSALS

In evaluating the Technical Proposals, the Construction Manager will consider all of the information provided under REQUIREMENTS OF TECHNICAL PROPOSALS. The following weighting system shall be used when evaluating the Technical Proposals:

A. Description of Technical Approach 25 percent
B. Work Plan and Schedule for Design, Implementation, and Operation 10 percent
C. Description of Operating Procedures 15 percent
D. Health and Safety Criteria 15 percent
E. Bidder's Qualifications for the Work 35 percent
2. Resumes and availability of key project staff

3. Description of hazardous waste remedial action, construction and operation projects bidder has undertaken

4. Description of any soil vapor extraction pilot projects bidder has undertaken

5. Description of similar full-scale soil vapor extraction projects

6. Name, address and telephone number for responsible persons from previous similar projects

7. Name, address and telephone number for proposed supplier of Activated Carbon System

Supplier shall be:

Carbon Air Services, Inc.
5780 Lincoln Drive
Minneapolis, MN 55436
Attn: Mr. Jeffrey Hill
612/935-1844

Calgon Corporation
P.O. Box 1346
Pittsburgh, PA 15230
Attn: Mr. Ward Rogers
412/787-6700

-OR-

Cameron Water Services
P.O. Box 160
Hillsboro, OR 97123
Attn: Mr. Marty Sunness
503/640-2606

or a supplier of equal experience and reputation

8. Name, address and telephone number for three previous projects for which the proposed carbon system supplier has furnished similar systems

The information provided in the Technical Proposal shall be for use by the Construction Manager in determining the technical acceptability of the Proposals. The Construction Manager's examination of such information shall not be construed as approval of the assumptions, models, or any other aspect of the
Each Technical Proposal shall describe the procedures to be used in operating the system including, but not limited to, the following:

1. Description of how ongoing system supervision will be provided, including identity of the person or organization that will be responsible for such supervision

2. Listing and brief description of routine maintenance procedures that will be required and frequency of such procedures

3. A brief description of equipment and instrumentation and controls to be used for monitoring process variables

4. Listing and brief description of emergency or upset conditions that may occur in the facility and a description of how each condition will be handled with minimum risk to onsite personnel and the public

5. Description of how cleanup progress will be monitored including type and frequency of analysis to be made

6. Description of special cold weather operating procedures to be employed

D. Health and Safety Criteria

1. A detailed outline of Bidder's site safety plan proposed to meet the requirements set forth in Section GENERAL REQUIREMENTS

2. As an alternative to a detailed outline, Bidder may submit a site safety plan used on a previous hazardous waste project

3. Name and qualification of Bidder's proposed site safety officer

4. A copy of the Bidder's corporate Health and Safety Program for work at hazardous waste sites

E. Bidder's Qualifications for the Work

Technical Proposals shall describe Bidder's qualifications to perform the Work including:

1. Description of the amount of Bidders subcontracting experience especially on projects similar in scope to the SVE system
5. A marked-up plan view of the site showing preliminary locations of wells, Activated Carbon System, and mechanical equipment and piping

6. A drawing of a typical well cross-section showing construction details of the casing, screen, well pack, well cap, and connection to vapor transfer piping

7. Listing and description of any mathematical models used in designing the system; such listing and description may be by reference to published literature provided such literature is readily available to the Construction Manager

8. An estimate as to the time of operation that will be required to achieve the performance objective and a discussion of how that estimate was made

9. A brief description of the Activated Carbon System, including instrumentation and controls

10. A discussion of expected VOC loading, adequacy of the system to effectively treat expected VOC loading, and expected carbon replacement rate

11. A discussion of how the estimated 21 buried tanks will be addressed in the design and placement of vapor extraction wells

12. A discussion of the methods and equipment to be used for removing the underground storage tanks

B. Work Plan and Schedule for Design, Implementation, and Operation

1. Discussion of work plan and schedule for:
   a. Preliminary field investigation and design
   b. Major activities that will occur during the installation of the system
   c. Removal of underground tanks and reasoning to support sequence of tank removal in the cleanup process
   d. Operation of the SVE system

C. Description of Operating Procedures
11. TWO-STEP PROCUREMENT PROCESS

The Work under this Contract will be procured using a two-step formal advertising procurement process. The two steps, which are being initiated concurrently, are:

A. Step 1, which includes request for, submission, evaluation and (if necessary) discussion of Technical Proposals. Bidders shall only submit one Technical Proposal.

B. Step 2, during which sealed bids will be opened for only those Technical Proposals that after Step 1 are judged to be technically qualified. Bids shall include Attachment 1 to these instructions. Bids opened in Step 2 will be evaluated and the award made in accordance with the Basis of Award.

12. REQUIREMENTS OF TECHNICAL PROPOSALS

Bidder's Technical Proposal shall include all information required by the Construction Manager to make a fair and proper evaluation of the Bidder's technical qualifications to do the Work. As a minimum, Attachments 2, 3 and 4 to these Instructions and the following information shall be included in the Technical Proposal:

A. Description of Technical Approach

Each Technical Proposal shall include a description of the approach used to design and install the soil vapor extraction system. Exhibit D shall be used as the design basis. Such description shall include, but not be limited to:

1. Listing and brief discussion of assumptions made in designing the system including discussion of the importance of each assumption to the workability of the system

2. A discussion of any exploratory investigation which may be necessary to determine a more precise location of the underground storage tanks

3. A discussion of any predesign soil sampling and water surface measurement plan, if required, to aid the Bidder in determining the number, depth, and location of extraction wells

4. A discussion of the rationale used in determining the number and size of major system components entered in Attachment 4, Design Criteria Summary
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<thead>
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<tbody>
<tr>
<td>71-55-6</td>
<td>1,1,1-Trichloroethane</td>
<td>19000.00</td>
<td>1%TLV</td>
</tr>
<tr>
<td>56-23-5</td>
<td>Carbon Tetrachloride</td>
<td>0.04</td>
<td>R.A.V.</td>
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<tr>
<td>108-05-4</td>
<td>Vinyl Acetate</td>
<td>300.00</td>
<td>1%TLV</td>
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<tr>
<td>75-27-4</td>
<td>Bromodichloromethane</td>
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<td>R.A.V.</td>
</tr>
<tr>
<td>79-34-5</td>
<td>1,1,2,2,-Tetrachloroethane</td>
<td></td>
<td></td>
</tr>
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<td>78-87-5</td>
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<td>3500.00</td>
<td>1%TLV</td>
</tr>
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<td>Trans-1,3-Dichloropropene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>79-01-6</td>
<td>Trichloroethene</td>
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<td>R.A.V.</td>
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<tr>
<td>124-48-1</td>
<td>Dibromochloromethane</td>
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<td></td>
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<tr>
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<td>0.06</td>
<td>R.A.V.</td>
</tr>
<tr>
<td>71-43-2</td>
<td>Benzene</td>
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<td>R.A.V.</td>
</tr>
<tr>
<td>10061-01-5</td>
<td>cis-1,3-Dichloropropene</td>
<td></td>
<td></td>
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<tr>
<td>110-75-8</td>
<td>2-Chloroethylvinyl-ether</td>
<td></td>
<td></td>
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<tr>
<td>75-25-2</td>
<td>Bromoform</td>
<td>50.00</td>
<td>1%TLV</td>
</tr>
<tr>
<td>591-78-6</td>
<td>2-Hexanone</td>
<td>200.00</td>
<td>1%TLV</td>
</tr>
<tr>
<td>108-10-1</td>
<td>4-Methyl-2-Pentanone</td>
<td>2050.00</td>
<td>1%TLV</td>
</tr>
<tr>
<td>127-18-4</td>
<td>Tetrachloroethene</td>
<td>0.06</td>
<td>R.A.V</td>
</tr>
<tr>
<td>108-88-3</td>
<td>Toluene</td>
<td>3750.00</td>
<td>1%TLV</td>
</tr>
<tr>
<td>108-90-7</td>
<td>Chlorobenzene</td>
<td>3500.00</td>
<td>1%TLV</td>
</tr>
<tr>
<td>100-41-4</td>
<td>Ethylbenzene</td>
<td>4350.00</td>
<td>1%TLV</td>
</tr>
<tr>
<td>100-42-5</td>
<td>Styrene</td>
<td>2150.00</td>
<td>1%TLV</td>
</tr>
<tr>
<td>Total Xylenes</td>
<td></td>
<td>4350.00</td>
<td>1%TLV</td>
</tr>
</tbody>
</table>

**NOTES:**
- C.A.S. - Chemical Abstract Service
- RAV - Risk-assessed value based on 1 in a million cancer risk
- TOX - Use of toxicity model for AAC (LD50, Inhal LC50, etc.)
- 1%TLV - 1 percent of the Threshold Limit Value
- µg/m^3 - Micrograms per cubic meter

10. **DRAWINGS**

Where the Drawings are reduced in size from the original tracings, the amount of reduction is indicated by a note or a scale bar which has been provided for verification of scale. Prints of original scale Drawings may be obtained at the office of CH2M HILL in Corvallis for the cost of reproduction and shipping costs.
NOTE TO BIDDER:  Use preferably BLACK ink for completing this BID form.

BID

To:  
CH2M HILL,
Attn:  Alan Amoth

Address:  
CH2M HILL
2300 N.W. Walnut Blvd.
P.O. Box 428
Corvallis, OR 97339

Project Title:  
Thomas Solvents Raymond Road Remedial Action
Soil Vapor Extraction System
Battle Creek, Michigan 49017

Bidder:  
__________________________________________

Address:  
__________________________________________

Date:  
__________________________________________

Bidder's person to contact for additional information on this Bid:

Name:  
__________________________________________

Telephone:  
__________________________________________

BIDDER'S DECLARATION AND UNDERSTANDING

The undersigned, hereinafter called the Bidder, declares that the only persons or parties interested in this Bid are those named herein, that this Bid is, in all respects, fair and without fraud, that it is made without collusion with any official of CH2M HILL, City of Battle Creek, Michigan, or EPA and that the Bid is made without any connection or collusion with any person submitting another Bid on this Contract.

The Bidder further declares that it has carefully examined the Contract Documents for the contemplated Work, that it has personally inspected the site, that it has satisfied itself as to the quantities involved, including materials and equipment, and conditions of Work involved, including the fact that the description of the quantities of Work and materials, as included herein, is brief and is intended only to indicate the general nature of the Work and to identify the said quantities with the detailed requirements of the Contract Documents, and that this Bid is made according to the provisions and under the terms of the Contract Documents, which Documents are hereby made a part of this Bid.

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MAR 24, 1987

BID
The Bidder further acknowledges that it has satisfied itself as to the nature and location of the Work, the general and local conditions, particularly those bearing upon availability of transportation, access to the site, disposal, handling and storage of materials, availability of labor, water, electric power, roads, and uncertainties of weather, river stages, or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during the prosecution of the Work and all other matters which can in any way affect the Work or the cost thereof under this Contract.

The Bidder further acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials to be encountered from its inspection of the site and from reviewing any available records of exploratory Work furnished by the Construction Manager or included in these Documents. Failure by the Bidder to acquaint itself with the physical conditions of the site and all the available information will not relieve it from responsibility for properly estimating the difficulty or cost of successfully performing the Work.

The Bidder warrants that as a result of its examination and investigation of all the aforesaid data that it can perform the Work in a good and workmanlike manner and to the satisfaction of the Construction Manager. The Construction Manager assumes no responsibility for any representations made by any of its officers or agents during or prior to the execution of this Contract, unless (1) such representations are expressly stated in the Contract, and (2) the Contract expressly provides that the responsibility therefor is assumed by the Construction Manager.

The Bidder further certifies that it has exercised all options available to it toward reaching the goals for small and minority business enterprise utilization specified in these Documents.

The Bidder assures that no person or selling agency has been employed or retained to solicit or secure this Contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Bidder for the purpose of securing business. For breach or violation of this assurance, the Construction Manager shall have the right to annul this agreement without liability or, at its discretion, to deduct from the Contract price or consideration, or otherwise recover the full amount of such commission, percentage, brokerage, or contingent fee.

CONTRACT EXECUTION AND BONDS

The Bidder agrees that if this Bid is accepted, it will, within 10 working days, after notice of award, sign the Contract in the
form annexed hereto, and will at that time, deliver to the Construction Manager the Performance Bond and Payment Bond required herein.

CERTIFICATES OF INSURANCE

The Bidder further agrees to furnish the Construction Manager, before commencing the Work under this Contract, the certificates of insurance as specified in these Documents.

START OF CONSTRUCTION AND CONTRACT COMPLETION TIME

The Bidder agrees to complete the final design of the Soil Vapor Extraction System within 45 days from the Notice to Proceed (NTP), and to substantially complete the work within 150 days from the Notice to Proceed.

The Bidder further agrees to maintain continuous operation of the Soil Vapor Extraction System for a maximum of 2 years (or less if the performance objective is achieved) following substantial completion. Each day the Soil Vapor Extraction System does not operate for at least 16 hours, an additional day shall be added to the required 2 years of continuous operation following substantial completion.

LIQUIDATED DAMAGES

In the event the Bidder is awarded the Contract and shall fail to complete the Work within the time limit or extended time limit agreed upon, as more particularly set forth in the Contract Documents, liquidated damages shall be paid to the Construction Manager at the rate of $1,000 per day for each day, Sundays and holidays included, that substantial completion is not accomplished beyond the Contract substantial completion date and for each day after 24 months from NTP that underground tank removal is not completed.

ADDENDA

The Bidder hereby acknowledges that it has received Addenda No.'s (Bidder insert No. of each Addendum received) to these Specifications.

SALES TAXES

The Bidder agrees that all sales and use taxes, where applicable, are included in the stated bid prices for the Work.
LUMP SUM BID FOR
THOMAS SOLVENTS RAYMOND ROAD
REMEDIAL ACTION SOIL VAPOUR EXTRACTION SYSTEM
BATTLE CREEK, MICHIGAN

(The Bidder must submit with this Bid apportioned amounts for the items listed below.)

The Bidder agrees to accept as full payment for the lump sum Work (including SVE and Underground Tank Removal Lump Sum Amounts) proposed under this project, as herein specified and as shown on the Drawings, based upon the undersigned's own estimate of quantities and costs, the following lump sum of:

<table>
<thead>
<tr>
<th>Section No.</th>
<th>Title</th>
<th>Total Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bond</td>
<td>$___________</td>
</tr>
<tr>
<td></td>
<td>Insurance</td>
<td>$___________</td>
</tr>
<tr>
<td>01001</td>
<td>General Requirements</td>
<td>$___________</td>
</tr>
<tr>
<td>11001</td>
<td>Vapor Collection System</td>
<td>$___________</td>
</tr>
<tr>
<td>11002</td>
<td>Activated Carbon System</td>
<td>$___________</td>
</tr>
<tr>
<td></td>
<td>Disposal of Twenty 55-gallon Drums of Contaminated Sludge from Storage Tanks at a RCRA-Compliant Hazardous Waste Landfill</td>
<td>$___________</td>
</tr>
<tr>
<td></td>
<td>SVE LUMP SUM AMOUNT</td>
<td>$___________</td>
</tr>
<tr>
<td>02300</td>
<td>UNDERGROUND TANK REMOVAL LUMP SUM AMOUNT</td>
<td>$___________</td>
</tr>
</tbody>
</table>

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MAR 24, 1987

00300
UNIT PRICE ITEMS

The Bidder further proposes to accept as full payment for the unit price work proposed herein the amounts computed under the provisions of the Contract Documents and based on the following unit price amounts, it being expressly understood that the unit prices are independent of the exact quantities involved. Estimated quantities listed below are for purposes of bid comparisons only. The Bidder agrees that the unit prices represent a true measure of the labor and materials required to perform the work, including all allowances for overhead and profit for each type and unit of work called for in these Contract Documents. The amounts shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.

<table>
<thead>
<tr>
<th>Item</th>
<th>Est. Item Quan.</th>
<th>Unit</th>
<th>UP (Fig)</th>
<th>Unit Price (Words)</th>
<th>Ext. Total Amt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>UNIT PRICE BID FOR SOIL VAPOR EXTRACTION SYSTEM OPERATION</td>
<td>Additional services, operation and maintenance of the Vapor Collection and Activated Carbon Systems, per month beyond the maximum 2-year period of operation or after performance objective has been attained; Unit price bid shall be in dollars per month for up to an additional 24 months</td>
<td>24 MONTHS @ $________ per month</td>
<td>$_________ Dollars per month</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>UNIT PRICE FOR ACTIVATED CARBON</td>
<td>Total price per pound of carbon as specified in Section ACTIVATED CARBON SYSTEM</td>
<td>20,000 LBS @ $________ per lb.</td>
<td>$________ Dollars per pound</td>
<td></td>
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TOTAL OF EXTENDED TOTAL AMOUNT FOR UNIT PRICE ITEMS LISTED ABOVE $________

TOTAL OF SVE LUMP SUM BID, UNDERGROUND TANK REMOVAL LUMP SUM BID, AND TOTAL OF EXTENDED TOTAL AMOUNT FOR UNIT PRICE ITEMS $________
UNIT PRICE BID FOR
DISPOSAL OF DRUM WASTE

(The Bidder must submit with this Bid
a unit price for disposal of contaminated sludge
from tanks to a RCRA-compliant hazardous waste
landfill for quantities greater or less than
that included in the Lump Sum Bid)

Unit price cost per drum for
disposing of more (add on) or
less than (deduct) the number of 55-gallon drums included
in the Lump Sum Bid

$_______/drum (add on)
$_______/drum (deduct)

SMALL AND SMALL DISADVANTAGED BUSINESS ENTERPRISE UTILIZATION CERTIFICATION

To be eligible for award of this Contract, the Bidder must execute and submit with its Bid the certification relating to Small Business Enterprise Participation. This certification shall be deemed a part of the resulting contract; therefore, a failure to complete this section of the Bid, or the inclusion of false information, shall be considered as evidence that the Bid is nonresponsive to the Invitation to Bid.

The undersigned acknowledges that goals have been established for this Contract in the amount of:

- Small Business Enterprise (SBE) 30 percent
- Small Disadvantaged Business Enterprise (SDBE) 10 percent

The undersigned certifies that if it is the successful Bidder on this project, the following SBE/SDBE firms will be utilized on the project and compensated in the amounts shown:
<table>
<thead>
<tr>
<th>Firm Name</th>
<th>Description of Utilization</th>
<th>Dollar Amount</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>SBE</td>
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<tr>
<td>1.</td>
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<td>2.</td>
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**Total Participation**  
* * * * *
ATTACHMENT NO. 1

(To be completed by each Bidder and proposed subcontractors and submitted with Bid)

SMALL DISADVANTAGED BUSINESS CERTIFICATION

A. The offeror certifies that it is ____, is not ____ a small business concern as defined in accordance with Section 3 of the Small Business Act (15 U.S.C. 632).

B. The offeror certifies that it is a small business (as set forth in A. above) and is ____ is not ____ owned and controlled by socially and economically disadvantaged individuals. Such a firm is defined as one:

1. Which is at least 51 percent owned by one or more such individuals or, in the case of publicly owned business, at least 51 percent of the stock is owned by such individuals and

2. Whose management and daily business operations are controlled by one or more such individuals and

3. Which certifies said ownership and control in accordance with Item C. below.

C. The offeror certifies that for purposes of Item B, the individual(s) involved is (are) ____ is (are) not ____ a minority individual(s) in accordance with C.1. below; or that the individual(s) is (are) ____ is (are) not ____ socially and economically disadvantaged in accordance with Item C.2. or C.3.

1. United States citizens who are Black Americans, Hispanic Americans, Native Americans, or other specified minorities

2. Any other individual found to be disadvantaged pursuant to Section 8(a) of the Small Business Act (15 U.S.C. 637)

3. Any other individual defined as socially, and economically disadvantaged, for purposes relating to other sections of the Small Business Act
D. The offeror certifies that for purpose of Item B, the concern is ____, is not ____, a woman-owned business. A woman-owned business is a business which is, at least, 51 percent owned, controlled, and operated by a woman or women. "Controlled" is defined as exercising the power to make policy decisions. "Operated" is defined as actively involved in the day-to-day management. For the purposes of this definition, businesses which are publicly owned, joint stock associations, and business trusts may be unable to answer the question. Such businesses may voluntarily represent that they are, or are not, women-owned if this information is available.

__________________________
Firm

__________________________
Signature

__________________________
Title (Authorized Representative)

__________________________
Date

* * * * * *
Name ____________________________ Present Position _________

Yrs. of Construction Experience ___

Magnitude & Type of Work __________________________________________

In What Capacity? ________________________________________________

11. List the major items of equipment which you own or which will be available for use on the proposed work:

<table>
<thead>
<tr>
<th>Quantity, Description, &amp; Capacity</th>
<th>Age in Years</th>
<th>Condition</th>
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<tbody>
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12. List below the contracts to which you, or your company, or corporation were party, during the previous 5 years, which contracts were involved in litigation of any type or had a claim over $10,000:

__________________________________________________________________
<p>| | | |</p>
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</table>
13. On a typical project, what percent of the work is completed by your own forces; what percent by subcontract? _______

14. Attach copies of your most recently prepared balance sheet and income statement. These financial statements should have been audited by a Certified Public Accountant.

* * * * *
ATTACHMENT NO. 2

(To be completed by each Bidder and submitted with Technical Proposal)

PROPOSED SUBCONTRACTOR LIST

Each Bidder shall enter in the spaces provided the names of the subcontractors it proposes to employ. The Bidder shall also enter in the spaces provided the names of manufacturers of the indicated equipment and materials which it proposes to furnish.

Upon award of the Contract to the Contractor, the named subcontractors shall be employed to perform the Work unless changes are specifically authorized by the Construction Manager.

Equipment or materials substitutions will be permitted only if named equipment does not meet the requirements of the Contract Documents, the manufacturer is unable to meet the delivery requirements of the construction schedule, or the manufacturer is dilatory in complying with the requirements of the Contract Documents. Substitutions shall be subject to concurrence of the Construction Manager and shall be confirmed by Change Order.

Preliminary acceptance of equipment listed by manufacturer's name shall not in any way constitute a waiver of the specifications covering such equipment; final acceptance will be based on full conformity with the Contract Documents.

Failure to furnish all information requested in this attachment may be cause for rejection of the Bid.

<table>
<thead>
<tr>
<th>WORK</th>
<th>SUBCONTRACTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment Installation</td>
<td>Name</td>
</tr>
<tr>
<td></td>
<td>Address</td>
</tr>
<tr>
<td>Well Installation</td>
<td>Name</td>
</tr>
<tr>
<td></td>
<td>Address</td>
</tr>
<tr>
<td>Mechanical</td>
<td>Name</td>
</tr>
<tr>
<td></td>
<td>Address</td>
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</tbody>
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WORK (Continued)

Electrical

Health and Safety

EQUIPMENT

Pipe and Fittings

Vacuum Pump

Instrumentation and Control Equipment

Activated Carbon System

OPERATION

Operation and Maintenance of System

OTHER

SUBCONTRACTOR

Name

Address

Name

Address

MANUFACTURER

Name

Address

Name

Address

Name

Address

SUBCONTRACTOR

Name

Address

SUBCONTRACTOR

Name

Address

* * * * *
ATTACHMENT NO. 3

EXPERIENCE QUESTIONNAIRE

1. How many years has your organization been in business as a designer and/or contractor under your present business name? ______________

2. How many years' experience in the proposed type and size of design and/or construction work has your organization had:
   (a) As a general contractor ______; (b) As a subcontractor ______?

3. List the three most recent projects your organization has completed similar in scope to the proposed work:

<table>
<thead>
<tr>
<th>Name</th>
<th>Contact of Owner</th>
<th>Phone</th>
<th>Contract Amount $</th>
<th>When Completed?</th>
<th>Description of Work</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Contact of Owner</th>
<th>Phone</th>
<th>Contract Amount $</th>
<th>When Completed?</th>
<th>Description of Work</th>
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</tr>
</tbody>
</table>
Name __________________________ Phone ________________
Contact of Owner ____________________________
Contract Amount $ __________ When Completed? ____________
Description of Work ____________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
4. What other important projects has your organization completed?
Name __________________________ Phone ________________
Contact of Owner ____________________________
Contract Amount $ __________ When Completed? ____________
Description of Work ____________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Name __________________________ Phone ________________
Contact of Owner ____________________________
Contract Amount $ __________ When Completed? ____________
Description of Work ____________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Name ___________________________ Phone ___________________________

Contact of Owner ______________________________________________________

Contract Amount $___________ When Completed? ________________

Description of Work ____________________________________________________

5. In addition to the Owners above, list at least two corporations, individuals, cities, counties, or states for whom you have performed work, and the name of the individual to whom you refer:

6A. If your firm provides mainly construction contracting services, list at least two engineering firms with whom you have worked, and the name of the individual to whom you refer:

6B. If your firm provides mainly engineering services, name at least two construction firms with whom you have worked, and the name of the individual to whom you refer:
7. Have you ever failed to complete any work awarded to you? 
   If so, where and why?

8. Name of your Surety Company, and the name and address of your 
   agent you expect to use in the event this Contract is awarded to 
   you:

9. What is your present bonding capacity?

10. What is the design and construction experience of the principal 
    individuals of your organization:

    | Name                  | Present Position | Yrs. of Construction Experience |
    |-----------------------|------------------|-------------------------------|
    |                       |                  |                               |

    | Magnitude & Type of Work | In What Capacity? |
    |--------------------------|-------------------|
    |                          |                   |

    | Name                  | Present Position | Yrs. of Construction Experience |
    |-----------------------|------------------|-------------------------------|
    |                       |                  |                               |

    | Magnitude & Type of Work | In What Capacity? |
    |--------------------------|-------------------|
    |                          |                   |
# Design Criteria Summary

(To be completed by each Bidder and submitted with Technical Proposal)

## Vapor Collection System

### Extraction Wells

<table>
<thead>
<tr>
<th>Number</th>
<th>Diameter</th>
<th>Screened depth</th>
<th>Radius of influence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Extraction Well Transfer Lines

<table>
<thead>
<tr>
<th>Type of valves</th>
<th>Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Vacuum Pump

<table>
<thead>
<tr>
<th>Number</th>
<th>Flow</th>
<th>Vacuum at inlet</th>
<th>Pressure at outlet</th>
<th>Speed</th>
<th>Motor hp</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>inches H2O</td>
<td>psig</td>
<td>rpm</td>
<td>hp</td>
</tr>
</tbody>
</table>

### CAP (If applicable)

<table>
<thead>
<tr>
<th>Material</th>
<th>Approximate Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mils</td>
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</table>

### Air Heater

<table>
<thead>
<tr>
<th>Temperature out</th>
<th>Deg F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### AIR INJECTION SYSTEM (If applicable)

#### INJECTION WELLS
- **Number**: 
- **Diameter**: ________ inches
- **Depth**: ________ feet

#### INJECTION AIR
- **Temperature of inlet air**: ________ deg F
- **Natural or forced injection**: 

#### ACTIVATED CARBON SYSTEM

#### VESSELS
- **Number**: ________ each
- **Flow per vessel**
  - **Normal**: ________ scfm
  - **Maximum**: ________ scfm
- **Diameter**: ________ feet
- **Height**: ________ feet
- **Carbon bed depth**: ________ feet
- **Total pressure drop across vessel**: ________ psi

#### ACTIVATED CARBON
- **Type**: 
- **Amount of carbon per vessel**: ________ lbs
- **Number of vessels**: 
- **Estimated frequency of change**: 

STACK

Diameter

Height

Gas velocity at outlet

* * * * *
KNOW ALL MEN BY THESE PRESENTS, that ________________
hereinafter called the PRINCIPAL, and ________________

a corporation duly organized under the laws of the State of ___________,
having its principal place of business at ________________
in the State of ___________, and authorized to do business in the State of ___________, as SURETY,
are held and firmly bound unto CH2M HILL SOUTHEAST, INC.,
hereinafter called the OBLIGEE, in the sum of ________________

DOLLARS ($ ________________),

for the payment of which we bind ourselves, our heirs, executors,
administrators, successors, and assigns, jointly and severally,
firmly by these presents.

THE CONDITION OF THIS BOND IS SUCH THAT:

WHEREAS, the PRINCIPAL is herewith submitting his or its Bid Proposal for

said Bid Proposal, by reference thereto, being hereby made a part hereof.

NOW, THEREFORE, if the Bid Proposal submitted by the PRINCIPAL is accepted, and the Contract awarded to the PRINCIPAL, and if the PRINCIPAL shall execute the proposed Contract and shall furnish such Performance Bond and Payment Bond as required by the Contract Documents within the time fixed by the Documents, then this obligation shall be void; if the PRINCIPAL shall fail to execute the proposed Contract and furnish these bonds, the SURETY hereby agrees to pay to the OBLIGEE the said sum as liquidated damages.
PART 2

CONTRACT FORMS
CONTRACT

This Contract is made and entered into this ______ day of _____, 19____, by and between CH2M HILL SOUTHEAST, INC., hereinafter called the "Construction Manager", and

__________,__________

hereinafter called the "Contractor".

The Contractor, in consideration of the sum to be paid it by the Construction Manager and of the covenants and agreements herein contained, hereby agrees at its own cost and expense to perform all the Work and furnish all the necessary materials, tools, labor, appliances, machinery, and appurtenances as set forth in the Contract Documents referenced below.

The TECHNICAL PROPOSAL, the BIDDING REQUIREMENTS, including without limitation the signed copy of the Bid, the CONTRACT FORM, the CONDITIONS OF THE CONTRACT, the GENERAL AND TECHNICAL SPECIFICATIONS, and the DRAWINGS, are incorporated herein by reference and made a part of this Contract.

In consideration of the performance of the Work as set forth in these Contract Documents, the Construction Manager agrees to pay to the Contractor the amount in the Bid as adjusted in accordance with the Contract Documents, or as otherwise herein provided, and to make such payments in the manner and at the times provided herein.

Substantial completion of the Work is required by ___, 1987. The Contractor agrees to complete the Work by ___, 1991, time being of the essence in this Contract, and to accept as full payment hereunder the amounts computed as determined by the Contract Documents and based on the said Bid.
In the event that the Contractor shall fail to complete the Work within the time limit or the extended time limit agreed upon, as more particularly set forth in the Contract Documents, liquidated damages shall be paid at the rate of $1,000 per day for each day substantial completion is not accomplished beyond the Contract substantial completion date and for each day after 24 months from NTP that underground tank removal is not completed. It is further agreed that the Contract shall be complete following a maximum of 4 years of continuous operation as defined in the Bid.

CH2M HILL SOUTHEAST, INC.

By ____________________________

Title __________________________

Contractor

By ____________________________

Title __________________________

* * * * * *
PERFORMANCE BOND

BOND NO. ____________________________

AMOUNT: $__________________________

KNOW ALL MEN BY THESE PRESENTS, that ________________________________

of ________________________________,

hereinafter called the CONTRACTOR (Principal), and ________________________________

a corporation duly organized and existing under and by virtue of the laws of the State of ________________________________,

hereinafter called the SURETY, and authorized to transact business within the State of ________________________________ as SURETY, are held and firmly bound unto CH2M HILL SOUTHEAST, INC., as CONSTRUCTION MANAGER (Obligee), in the sum of: ____________________ DOLLARS ($____________________),

lawful money of the United States of America, for the payment of which, well and truly be made to the CONSTRUCTION MANAGER, the CONTRACTOR and the SURETY bind themselves and each of their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents as follows:

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

WHEREAS, the CONTRACTOR has executed and entered into a certain contract hereto attached, with the CONSTRUCTION MANAGER, dated ________________, 19____, for:

______________________________

NOW, THEREFORE, if the CONTRACTOR shall in all things perform all the terms and conditions of the within and foregoing contract as provided in the Contract Documents to be by such CONTRACTOR performed, and shall honor all claims for defective work made until the maximum 2-year period of operation is complete, or until the performance objective has been attained, and shall pay over, make good and reimburse to the CONSTRUCTION MANAGER, all loss or damage
which the CONSTRUCTION MANAGER may sustain by reason of failure or
default on the part of CONTRACTOR, then this obligation shall be
void; otherwise it shall be and remain in full force and effect.

PROVIDED, HOWEVER, that the SURETY, for value received, hereby
stipulates and agrees that no change, extension of time, alteration,
or addition to the terms of the Contract Documents or to the Work to
be performed thereunder, shall in any wise affect its obligation on
this bond, and it does hereby waive notice of any such change,
extension of time, alteration, or addition to the terms of the
Contract Documents.

IN WITNESS WHEREOF, the above parties bounded together have executed
this instrument this ___ day of __________, 19___; the
name and corporate seal of each corporate party being hereto affixed
and those presents duly signed by its undersigned representative,
pursuant to authority of its governing body.

CONTRACTOR

________________________________________
By_________________________(Seal)

Attest

SURETY

________________________________________
By_________________________(Seal)

Attest

NOTE: The SURETY named on this bond shall be one who is licensed to
conduct business in the state where the project is located, and
named in the current list of Companies Holding Certificates of
Authority as Acceptable Sureties on Federal Bonds and as Acceptable
Reinsuring Companies, as published in Circular 570 (amended) by the
Audit Staff Bureau of Accounts, U.S. Treasury Department. All bonds
signed by an agent must be accompanied by a certified copy of the
authority to act for the SURETY at the time of the signing of this
bond.

* * * * * *
PART 3

CONDITIONS OF THE CONTRACT
# Superfund General Conditions for Construction

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SUPERFUND GENERAL CONDITIONS
FOR CONSTRUCTION

This section of the Contract Documents is preprinted. Any modifications to the following Articles required for this project are made in the Supplementary Conditions.

DEFINITIONS

Wherever in the Contract Documents the following terms are used, the intent and meaning shall be interpreted as follows:

1. ACTIVATED CARBON SYSTEM

   All equipment and controls making up the activated carbon treatment unit. System includes vessels, carbon, stack, and controls.

2. AS APPROVED

   The words "as approved", unless otherwise qualified, shall be understood to be followed by the words "by the Construction Manager for conformance with the Contract Documents".

3. AS SHOWN, AND AS INDICATED

   The words "as shown" and "as indicated" shall be understood to be followed by the words "on the Drawings".

4. BIDDER

   The person or persons, partnership, firm, or corporation submitting a Bid for the Work contemplated.

5. CONSTRUCTION MANAGER

   The term "Construction Manager" refers to the Construction Manager or its authorized representative. Wherever in these Contract Documents the words "Construction Manager" appears it shall be understood to mean CH2M HILL SOUTHEAST, INC., P.O. Box 4400, Reston, VA 22090.

6. CONTRACT DOCUMENTS

   The "Contract Documents" consist of the Bidding Requirements, the Contract Form, Conditions of the Contract, Specifications, Drawings, all modifications thereof incorporated into the Documents, and including all other requirements incorporated by specific reference. These form the contract.
7. CONTRACTOR

The person or persons, partnership, firm, or corporation who enters into the contract awarded it by the Construction Manager.

8. CONTRACT COMPLETION

The "Contract Completion" is the date the Construction Manager and EPA accept the entire Work as being in compliance with the Contract Documents, or formally waives nonconforming Work to the extent of nonconformity, and issues the final payment in accordance with the requirements set forth in Article FINAL PAYMENT of these General Conditions.

9. DAYS

Unless otherwise specifically stated, the term "days" will be understood to mean calendar days. Business day or working day means any day other than Saturday, Sunday, or legal holiday.

10. DRAWINGS

The term "Drawings" refers to the official Drawings, profiles, cross sections, elevations, details, and other working drawings and supplementary drawings, or reproductions thereof, signed by the Construction Manager, which show the location, character, dimensions, and details of the Work to be performed. Drawings may either be bound in the same book as the balance of the Contract Documents or bound in separate sets, and are a part of the Contract Documents, regardless of the method of binding.

11. HEALTH AND SAFETY PROGRAM

The Health and Safety Program is the written procedures employed by the Subcontractor to meet the requirements of local, state, and federal ordinances, rules, regulations, and guidelines concerning occupational health and safety issues for the Work contemplated. A health and safety program addresses such items as medical surveillance of workers; selection, issue, storage, maintenance, repair, and training in the use of respiratory and dermal protective devices; training of Subcontractor personnel in Work practices in hazardous environments; monitoring procedures and reporting procedures for hazardous conditions; and comprehensive protection against all potential hazards and specific protection against individual known hazards.

12. NOTICE

The term "notice" or the requirement to notify, as used in the Contract Documents or applicable state or federal statutes, shall signify a written communication delivered in person or by certified or registered mail to the individual, or to a member of the firm, or to an officer of the corporation for whom it is intended. Certified or registered mail shall be addressed to the last business address known to it who gives the notice.

13. NOTICE TO PROCEED

A written notice given by the Construction Manager to the Contractor fixing the date on which the contract time will commence to run and on which the Contractor shall start to perform its obligations under the Contract Documents.

14. OR EQUAL

The term "or equal" shall be understood to indicate that the "equal" product is the same or better than the product named in function, performance, reliability, quality, and general configuration. Determination of equality in reference to the project design requirements will be made by the Construction Manager. Such equal products shall not be purchased or installed by the Contractor without written authorization.

15. OWNER

The Owner for this project shall be the U.S. Environmental Protection Agency, and may also be identified as the "Government" or "EPA".

16. PRIME CONTRACT

The Contract between the Construction Manager and EPA, Contract No. 68-01-7251, will hereafter be referred to as the "Prime Contract".

17. SITE SAFETY PLAN

The term "Site Safety Plan" refers to the plan that describes the expected hazardous waste exposure hazards at the site, the required levels of protection relative to hazardous materials, and operational constraints at or near the site.

18. SOIL VAPOR EXTRACTION (SVE) SYSTEM

Entire system including Vapor Collection System, Activated Carbon System, and all ancillary components.
19. SPECIFICATIONS

The term "Specifications" refers to those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards, and workmanship as applied to the Work and certain administrative details applicable thereto. Where standard specifications, such as those of ASTM, AASHTO, etc., have been referred to, the applicable portions of such standard specifications shall become a part of these Contract Documents. If referenced specifications conflict with specifications contained herein, the requirements contained herein shall prevail.

20. SUBSTANTIAL COMPLETION

"Substantial Completion" shall be that degree of completion of the project or a defined portion of the project, as evidenced by the Construction Manager's written notice of Substantial Completion, sufficient to provide the EPA, at its discretion, the full-time use of the project or defined portion of the project for the purposes for which it was intended. "Substantial Completion" of an operating facility shall be that degree of completion that has provided a minimum of 7 continuous days of successful, trouble-free, operation, which period shall begin after all performance and acceptance testing has been successfully demonstrated to the Construction Manager. All equipment contained in the Work, plus all other components necessary to enable the facility to be operated in the manner that was intended, shall be complete on the substantial completion date.

21. TECHNICAL PROPOSAL

Technical Proposal shall include all information in item 12, REQUIREMENTS OF TECHNICAL PROPOSALS of the Instructions to Bidders. Technical Proposal shall not include any indication of cost of, or prices for, the Soil Vapor Extraction System or any element thereof.

22. VAPOR COLLECTION SYSTEM

All equipment and controls used to extract vapor from the soil. System includes such items as extraction wells, transfer piping, and vacuum pump.
23. WORK

The word "Work" within these Contract Documents shall include all material, labor, tools, and all appliances, machinery, transportation, and appurtenances necessary to perform and complete the Contract Documents, and such additional items not specifically indicated or described which can be reasonably inferred as belonging to the item described or indicated and as required by good practice to provide a complete and satisfactory system or structure. As used herein, "provide" shall be understood to mean "furnish and install, complete in-place".

CONTRACT DOCUMENTS

24. INTENT OF CONTRACT DOCUMENTS

The Contract Documents are complementary, and what is called for by one shall be as binding as if called for by all. The intent of the Documents is to include all Work necessary for completion of the contract. Materials or Work described in words which so applied have a well-known technical and trade meaning shall be held to refer to such recognized standards.

25. ADDITIONAL TERMS AND CONDITIONS

The clauses set forth in Attachment A are incorporated herein by reference.

26. DISCREPANCIES AND OMISSIONS

Any discrepancies or omissions found in the Contract Documents shall be reported to the Construction Manager immediately. The Construction Manager will clarify discrepancies or omissions, in writing, within a reasonable time.

In resolving inconsistencies among two or more sections of the Contract Documents, precedence shall be given in the following order:

A. CONTRACT
B. BID
C. SUPPLEMENTARY CONDITIONS
D. INVITATION TO BID
E. INSTRUCTIONS TO BIDDERS
F. GENERAL CONDITIONS
G. SPECIFICATIONS
H. DRAWINGS

Addenda shall take precedence over all sections referenced therein. Figure dimensions on Drawings shall take precedence over scale dimensions. Detailed Drawings shall take precedence over general Drawings.
27. ALTERATIONS

EPA, without invalidating the Prime Contract, may order changes in the Work within the general scope of the Prime Contract by altering, adding to, or deducting from the Work, the Prime Contract being adjusted accordingly. The Construction Manager, without notice to the Sureties and without invalidating the Contract Documents, may order changes, revisions, additions, deletions (collectively hereinafter called "changes") in the scope of Work to be performed under the Contract Documents.

In giving instructions, the Construction Manager may order minor changes in the Work not involving extra cost and not inconsistent with the purposes of the project, but otherwise, except in an emergency endangering life or property, additions or deductions from the Work shall be performed only in pursuance of an approved Change Order from the Construction Manager, signed by the Construction Manager.

Contractor shall, immediately upon receipt of any potential changes (including actions, inactions, and written or oral communications) that do not conform to the authorized method of directing changes specified herein, notify the Construction Manager of such changes and shall request written disposition. The Contractor's notice to the Construction Manager shall indicate the following:

A. The date, nature and circumstance of the conduct regarded as a potential change;

B. The name, function, and activity of each EPA individual, Construction Manager, and Contractor official or employee, involved in or knowledgeable of such conduct;

C. The identification of any document(s) and the substance of any oral communication relating to the proposed change; and

D. The particular elements of performance for which the Contractor may seek an equitable adjustment, if the changes are approved including:

1. Those portions of the statements of Work that the Contractor believes will be affected by the proposed change;

2. The estimated adjustment with respect to estimated cost and delivery or performance schedule;

3. To the extent practicable, what adjustment in schedule or effect on performance may result from the proposed change;
4. Any other provisions affected by the proposed change.

E. The Contractor's estimate of the time by which the Construction Manager must respond to the Contractor's notice of a change to minimize cost, delay, or disruption of performance.

The Contractor shall not proceed with any proposed changes as identified in the notice required above unless notified to proceed in writing by the Construction Manager. Until such notification is received, the Contractor shall continue performance of the Contract Documents in accordance with its terms and conditions.

Nothing herein shall be construed as relieving the Contractor of its obligation so to perform, including without limitation the failure of the parties to agree upon the Contractor's entitlement to, or the amount of, any adjustment.

Any claim by the Contractor for an adjustment under this Article must be asserted, in writing, in the form of a complete change proposal fully supported by factual information to the Construction Manager, within 30 days from the date of receipt by the Contractor of the written change authorization from the Construction Manager, or within such extension of that 30-day period as the Construction Manager, in its sole discretion, may grant in writing at Contractor's request prior to expiration of said period.

If the Work is reduced by alterations, such action shall not constitute a claim for damages based on loss of anticipated profits.

28. EXAMINATION AND VERIFICATION OF CONTRACT DOCUMENTS

The Contractor shall thoroughly examine and become familiar with all of the various parts of these Contract Documents and determine the nature and location of the Work, the general and local conditions, and all other matters which can in any way affect the Work under the Contract Documents. Failure to make an examination necessary for this determination shall not release the Contractor from the obligations of this contract. No verbal agreement or conversation with any officer, agent, or employee of the EPA, or with the Construction Manager either before or after the execution of this contract, shall affect or modify any of the terms or obligations herein contained.

29. DOCUMENTS TO BE KEPT ON THE JOBSITE

The Contractor shall keep one copy of the Contract Documents and one copy of the required submittals on the jobsite, in good
order, available to the Construction Manager and to its representatives.

The Contractor shall maintain on a daily basis at the jobsite, and make available to the Construction Manager on request, one current record set of the Drawings which have been accurately marked to indicate all modifications in the completed Work that differ from the design information shown on the Drawings. Upon substantial completion of the Work, the Contractor shall give the Construction Manager one complete set of these marked up record Drawings.

30. ADDITIONAL CONTRACT DOCUMENTS

Additional copies of Contract Documents or Drawings may be obtained on request by paying the actual cost of reproducing the Contract Documents or Drawings.

31. OWNERSHIP OF CONTRACT DOCUMENTS

All portions of the Contract Documents, and copies thereof furnished by the Construction Manager are the property of the Construction Manager. They are not to be used on other Work and are to be returned to the Construction Manager on request at the completion of the Work. Any reuse of these materials without specific written verification or adaptation by the Construction Manager will be at the risk of the user and without liability or legal expense to the Construction Manager. Such user shall hold the Construction Manager harmless from any and all damages, including reasonable attorneys' fees, from any and all claims arising from any such reuse. Any such verification and adaptation shall entitle the Construction Manager to further compensation at rates to be agreed upon by the user and the Construction Manager.

THE CONSTRUCTION MANAGER

32. AUTHORITY OF THE CONSTRUCTION MANAGER

The authority and responsibility of the Construction Manager shall be limited to the provisions set forth in these Contract Documents. The Construction Manager shall have the authority to reject Work which does not conform to the Contract Documents. However, neither the Construction Manager's authority to act under this provision, nor any decision made by it in good faith either to exercise or not to exercise such authority, shall give rise to any duty or responsibility of the Construction Manager to the Contractor, any subcontractor, their respective Sureties, any of their agents or employees, or any other person performing any of the Work.
any duty or authority to undertake responsibility contrary to the provisions of this Article.

35. REJECTED WORK

Any defective Work or nonconforming materials or equipment that may be discovered at any time prior to expiration of the warranty period, shall be removed and replaced by Work which shall conform to the provisions of the Contract Documents. Any material condemned or rejected shall be removed at once from the project site. Failure on the part of the Construction Manager to condemn or reject bad or inferior Work or to note nonconforming materials or equipment on Contractor's submittals shall not be construed to imply acceptance of such Work. It is also understood by the Contractor that payment by the Construction Manager for the services and materials provided under the Contract Documents shall not constitute acceptance. Nothing in the Contract Documents shall require the Construction Manager to accept any services or materials prior to acceptance thereof by EPA, nor shall anything in this section be construed as a waiver of any rights or remedies of Contractor for latent defects.

36. LINES AND GRADES

Lines and grades shall be established as provided in the Supplementary Conditions. All stakes, marks, and other reference information shall be carefully preserved by the Contractor, and in case of their careless or unnecessary destruction or removal by it or its employees, such stakes, marks, and other information shall be replaced at the Contractor's expense.

37. SHOP DRAWING SUBMITTAL PROCEDURE

After checking and verifying all field measurements and after complying with applicable procedures specified in Section GENERAL REQUIREMENTS, Contractor shall submit to Construction Manager, in accordance with the schedule for submittals for review, shop drawings, electrical diagrams, and catalog cuts for fabricated items and manufactured items (including mechanical and electrical equipment), which shall bear a stamp or specific written indication that Contractor has satisfied Contractor's responsibilities under the Contract Documents with respect to the review of the submittal. All submittals shall be identified as Construction Manager may require. The data shown shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to enable Construction Manager to review the information.

Contractor shall also submit to Construction Manager for review with such promptness as to cause no delay in work, all samples
33. DUTIES AND RESPONSIBILITIES OF THE CONSTRUCTION MANAGER

The Construction Manager will be onsite during the various stages of construction to observe the progress and quality of the Work and to determine, in general, if the Work is proceeding in accordance with the intent of the Contract Documents. The Construction Manager will not make comprehensive or continuous review or observation to check quality or quantity of the Work.

One or more representatives of the Construction Manager may be assigned to observe the Work. It is understood that such representatives shall have the authority to issue notice of nonconformance and make decisions within the limitations of the authority of the Construction Manager. The Contractor shall furnish all reasonable assistance required by the Construction Manager or its representatives for proper observation of the Work.

The above-mentioned duties and responsibilities of the Construction Manager shall not relieve the Contractor of its obligations to conduct comprehensive inspections of the Work, to furnish materials, to perform acceptable Work, and to provide adequate safety precautions, in conformance with the intent of the Contract Documents.

34. LIMITATIONS ON CONSTRUCTION MANAGER'S RESPONSIBILITIES

The Construction Manager will not be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, and Construction Manager will not be responsible for Contractor's failure to perform or furnish the Work in accordance with the Contract Documents.

The Construction Manager will not be responsible for the acts or omissions of Contractor or of any subcontractor, any supplier, or of any other person or organization performing or furnishing any of the Work.

Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed", "as approved", or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper", or "satisfactory", or adjectives of like effect or import are used to describe a requirement, direction, review or judgment of the Construction Manager as to the Work, it is intended that such requirement, direction, review, or judgment will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to the Construction Manager any duty or authority to supervise of direct the furnishing or performance of the Work or
required by the Contract Documents. All samples shall have been
checked by and accompanied by a specific written indication that
Contractor has satisfied Contractor's responsibilities under the
Contract Documents with respect to the review of the submission
and shall be identified clearly as to material, supplier,
pertinent data such as catalog numbers and the use for which
intended.

Before submission of each submittal, Contractor shall have
determined and verified all quantities, dimensions, specified
performance criteria, installation requirements, materials,
catalog numbers, and similar data with respect thereto and
reviewed or coordinated each submittal with other submittals and
with the requirements of the Work and the Contract Documents.

At the time of each submission, Contractor shall give
Construction Manager specific written notice of each variation
that the submittal may have from the requirements of the
Contract Documents, and, in addition, shall cause a specific
notation to be made on each shop drawing submitted to
Construction Manager for review and approval of each such
variation.

Construction Manager will review submittals with reasonable
promptness, but Construction Manager's review will be only for
conformance with the design concept of the project and for
compliance with the information given in the Contract Documents
and shall not extend to means, methods, techniques, sequences,
or procedures of construction (except where a specific means,
method, technique, sequence, or procedure of construction is
indicated in or required by the Contract Documents) or to safety
precautions or programs incident thereto. The review of a
separate item as such will not indicate review of the assembly
in which the item functions. Contractor shall make corrections
required by Construction Manager, and shall return the required
number of corrected copies of shop drawings and submit as
required new samples for review. Contractor shall direct
specific attention in writing to revisions other than the
corrections called for by Construction Manager on previous
submittals.

Construction Manager's review of submittals shall not relieve
Contractor from responsibility for any variation from the
requirements of the Contract Documents unless Contractor has in
writing called Construction Manager's attention to each such
variation at the time of submission and Construction Manager has
given written approval of each such variation by a specific
written notation thereof incorporated in or accompanying the
shop drawing or sample approval; nor will any approval by
Construction Manager relieve Contractor from responsibility for
errors or omissions in the shop drawings or from responsibility
for having complied with the provisions herein.
Where a shop drawing or sample is required by the Specifications, any related work performed prior to Construction Manager's review and approval of the pertinent submission shall be the sole expense and responsibility of Contractor.

38. DETAIL DRAWINGS AND INSTRUCTIONS

The Construction Manager will furnish, with reasonable promptness, additional instructions by means of Drawings or otherwise, if, in the Construction Manager's opinion, such are required for the proper execution of the Work. All such Drawings and instructions will be consistent with the Contract Documents, true developments thereof, and reasonably inferable therefrom.

39. SITE ACCESS

The parties understand that EPA is solely responsible for obtaining necessary access to hazardous waste sites for the purposes set forth in the Prime Contract and in the Contract Documents. The Construction Manager will be responsible for notifying the Contractor of site access once it has been obtained, but the Construction Manager has no other responsibility or liability to the Contractor or any of its subcontractors for site access or any delays associated therewith. The Contractor will not be allowed onsite until access has been obtained.

THE CONTRACTOR AND ITS EMPLOYEES

40. CONTRACTOR, AN INDEPENDENT AGENT

The Contractor shall independently perform all Work under this contract and shall not be considered as an agent of the Construction Manager, nor shall the Contractor's subcontractors or employees be subagents of the Construction Manager.

41. SUBCONTRACTING

The Contractor shall submit to the Construction Manager with the Bid, the names of all subcontractors proposed for the Work. The Contractor shall not employ any subcontractors that the Construction Manager objects to as lacking capability to properly perform Work of the type and scope anticipated. No changes will be allowed from the submitted Subcontractor List without approval of the Construction Manager.

The Contractor is as fully responsible to the Construction Manager for the acts and omissions of its subcontractors and of persons either directly or indirectly employed by them as it is for the acts and omissions of persons directly employed by it.
Nothing contained in the Contract Documents shall create any contractual relationship between any subcontractor and the Construction Manager.

Lower-tier subcontractors who have a proven record in performing hazardous waste sitework shall be preferred. The Contractor shall assure in writing that all of its subcontractors proposed for the Work are qualified and reputable and that none are on any list of barred companies kept by EPA.

The Contractor shall certify that all subcontractor employees working at or near the site meet the conditions of medical fitness, training, and experience required of the Contractor personnel.

42. INSURANCE AND LIABILITY

A. GENERAL

The Contractor shall provide (from insurance companies acceptable to the Construction Manager) the insurance coverage designated hereinafter and pay all costs.

Before commencing Work under this contract, Contractor shall furnish the Construction Manager with certificates of insurance specified herein showing the type, amount, class of operations covered, effective dates, and date of expiration of policies, and containing substantially the following statement:

"The insurance covered by this certificate shall not be cancelled or materially altered, except after 30 days' written notice has been received by the Construction Manager."

In case of the breach of any provision of this Article, the Construction Manager, at its option, may take out and maintain, at the expense of the Contractor, such insurance as the Construction Manager may deem proper and may deduct the cost of such insurance from any monies which may be due or become due the Contractor under this contract.

B. CONTRACTOR AND SUBCONTRACTOR INSURANCE

The Contractor shall not commence Work under this contract until it has obtained all the insurance required hereunder and certification of such insurance has been received by the Construction Manager, nor shall the Contractor allow any subcontractor to commence Work on its subcontract until insurance specified below has been obtained. Review of the insurance certificate by the Construction Manager shall not relieve or decrease the liability of the Contractor hereunder.
C. WORKER'S COMPENSATION AND EMPLOYER'S LIABILITY INSURANCE

The Contractor shall maintain during the life of the Contract Documents Worker's Compensation in the statutory amount and Employer's Liability Insurance or "Stop Gap" Insurance in an amount not less than $500,000 for all employees engaged in Work under the Contract Documents. In case any such Work is sublet, the Contractor shall require the subcontractor similarly to provide Worker's Compensation and Employer's Liability Insurance for all of the latter's employees to be engaged in such Work.

D. GENERAL LIABILITY INSURANCE (INCLUDING AUTOMOBILE)

The Contractor shall maintain during the life of the Contract Documents such comprehensive general liability and automobile liability insurance as will provide coverage for claims for damages for personal injury, including accidental death, as well as for claims for property damage, which may arise directly or indirectly from performance of the Work under the Contract Documents. Coverage for property damage shall be on a "broad form" basis with no exclusions for "X, C & U". The amount of insurance to be provided shall be not less than $500,000 combined single limit, plus umbrella excess liability for the comprehensive general liability and automobile liability insurance in an amount not less than $1,000,000. The comprehensive general liability insurance shall include a broad form contractual liability endorsement.

In the event any Work under the Contract Documents is performed by a subcontractor, the Contractor shall be responsible for any liability directly or indirectly arising out of the Work performed, which liability is not covered by the subcontractor's insurance.

The Construction Manager, its officers, agents, and employees shall be named as Additional Insureds on the Contractor's and any subcontractor's general liability and automobile liability insurance policies and shall be primary to any coverage maintained by the Construction Manager.

E. BUILDERS RISK ALL RISK INSURANCE

The Contractor shall secure and maintain during the life of the Contract Documents, Builders Risk All Risk Insurance coverage in an amount equal to 100 percent of the contract amount. Such insurance shall include coverage for earthquake, landslide, flood, collapse, loss due to the results of faulty workmanship, and all other risks, and...
shall provide for losses to be paid to the Construction Manager.

F. NO PERSONAL LIABILITY OF PUBLIC OFFICIALS

In carrying out any of the provisions hereof in exercising any authority granted by the contract, there will be no personal liability upon any public official.

43. INDEMNITY

The Contractor shall defend, indemnify and hold harmless the Construction Manager and its agents and employees from and against any and all claims, damages, losses, and expenses including court costs and attorneys' fees arising out of or resulting from the Contractor's performance of the Work under the Contract Documents, including any act or omission of the Contractor, any of its subcontractors, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable. The foregoing shall not apply in the event that the claim, damages, losses, or expenses are caused by the sole negligence of the Construction Manager, but this indemnity obligation shall be enforced to the maximum extent permissible by law.

For any such claims, this indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Contractor or any subcontractor under Worker's Compensation Acts, Disability Benefit Acts, or other Employee Benefit Acts.

44. TAXES AND CHARGES

The Contractor shall withhold and pay any and all sales and use taxes and all withholding taxes, whether state or federal, and pay all Social Security charges and also all State Unemployment Compensation charges, and pay or cause to be withheld, as the case may be, any and all taxes, charges, or fees or sums whatsoever, which are now or may hereafter be required to be paid or withheld under any laws.

45. COMPLIANCE WITH LAWS, PERMITS, AND LICENSES

The Contractor shall comply with all state, federal, and local laws, executive orders, rules, and regulations which in any manner affect the Work herein specified, and protect and indemnify the Construction Manager and its officers and agents against any claim or liability arising from or based on the violation of any of the above. All permits, licenses, and inspection fees necessary for prosecution and completion of the Work shall be secured and paid for by the Contractor, unless modified in Section GENERAL REQUIREMENTS.
46. SUPERINTENDENCE

The Contractor shall keep at the project site, competent supervisory personnel. The Contractor shall designate, in writing, before starting Work, a project superintendent who shall be an employee of the Contractor and shall have complete authority to represent and to act for the Contractor. Construction Manager shall be notified in writing prior to any change in superintendent assignment. The Contractor shall give efficient supervision to the Work, using its best skill and attention. The Contractor shall be solely responsible for all construction means, methods, techniques, sequences, and procedures, and for providing adequate safety precautions and coordinating all portions of the Work under the Contract Documents.

47. RECEPTION OF CONSTRUCTION MANAGER'S COMMUNICATIONS

The superintendent shall receive for the Contractor all communications from the Construction Manager. Communications of major importance will be confirmed in writing upon request from the Contractor.

The Construction Manager may schedule project meetings for the purposes of discussing and resolving matters concerning the various elements of the Work. Time and place for these meetings and the names of persons required to be present shall be as determined by the Construction Manager. Contractor shall comply with these attendance requirements and shall also require its subcontractors to comply.

48. COMMUNICATIONS WITH EPA

All of the Contractor's written or verbal communications to or with EPA, State, or local agencies relative to Work under the Contract Documents must be through or with the knowledge of the Construction Manager.

49. WORKING FILES

The Contractor shall maintain accurate working files containing all Work documentation including calculations, assumptions, interpretations of regulations, sources of information, and other raw data required in the performance of the Contract Documents. The Contractor shall provide the information contained in its working files to the Construction Manager upon request.

50. EMPLOYEES

The Contractor shall employ only competent, skillful workers to do the Work.
51. SAFETY

The Contractor shall be solely and completely responsible for conditions of the jobsite, including safety of all persons (including employees) and property during performance of the Work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to U.S. Department of Labor Occupational Safety and Health Act, any equivalent state law, and all other applicable federal, state, county, and local laws, ordinances, codes, and regulations. Where any of these are in conflict, the more stringent requirement shall be followed. The Contractor's failure to thoroughly familiarize itself with the aforementioned safety provisions shall not relieve it from compliance with the obligations and penalties set forth therein.

Contractor understands that the nature of the Work to be performed under these Contract Documents is potentially hazardous. In performance of the Work the Contractor shall, as a minimum, satisfy all federal, state, and local statutes, regulations, and ordinances, regarding health and safety, including medical record retention requirements.

The Contractor shall develop and maintain for the duration of this contract, a safety program that will effectively incorporate and implement all required safety provisions including, but not limited to, provisions of the Site Safety Plan. The Contractor shall appoint a representative who is qualified and authorized to supervise and enforce compliance with the safety program and who shall be onsite at all times when Work is in progress.

The duty of the Construction Manager to conduct construction review of the Work does not include review or approval of the adequacy of the Contractor's safety program, safety supervisor, or any safety measures taken in, on, or near the construction site.

The Contractor, as a part of its safety program, shall maintain at its office or other well-known place at the jobsite, safety equipment applicable to the Work as prescribed by the aforementioned authorities, all articles necessary for giving first-aid to the injured, and shall establish the procedure for the immediate removal to a hospital or a doctor's care of persons (including employees) who may be injured on the jobsite.

If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to the Construction Manager. In addition, the Contractor must promptly report in writing to the Construction Manager all accidents whatsoever arising out of, or in connection with, the
performance of the Work whether on, or adjacent to, the site, giving full details and statements of witnesses.

52. MEDICAL AND TRAINING CERTIFICATION

The Contractor agrees to submit to the Construction Manager a certification for each employee assigned to hazardous waste site field activities that said employee has been medically certified by a physician for this Work, including the use of a respirator in accordance with the provisions of 29 CFR 1910.134 and that said employee has been properly trained for Work on hazardous waste sites in accordance with the provisions of 29 CFR 1910.120. All Contractor's personnel engaged in fieldwork must be trained for such activity. Training shall include, but not be limited to, use of personnel protection equipment (including respirators), decontamination, hazard recognition, safe operating procedures, and emergency response. Certifications of employee medical status and training must be submitted to the Construction Manager before an employee shall be permitted to enter a hazardous waste site under the Contract Documents. The certification form is included as Attachment B.

53. PROTECTION OF WORK AND PROPERTY

The Contractor shall at all times safely guard and protect from damage the project property, adjacent property, and its own Work from injury or loss in connection with the Contract Documents. All facilities required for protection by federal, state, or municipal laws and regulations and local conditions must be provided and maintained.

The Contractor shall protect its Work and materials from damage due to the nature of the Work, the elements, carelessness of other contractors, or from any cause whatever until the completion and acceptance of the Work. All loss or damages arising out of the nature of the Work to be done under these Contract Documents, or from any unforeseen obstruction or defects which may be encountered in the prosecution of the Work, or from the action of the elements, shall be sustained by the Contractor.

54. GOVERNMENT PROPERTY

Title to all property, including material obtained from General Services Administration supply sources, furnished by the Government to the Contractor, either directly or through the Construction Manager, shall remain with the Government. The Contractor shall control, protect, preserve, and maintain such property in accordance with the requirements of the Construction Manager's equipment management system and shall be liable for and indemnify the Construction Manager for any loss or damage to such property excepting reasonable wear and tear. The
Contractor agrees that (i) upon completion of the Work required under the Contract Documents or at such times designated by the Construction Manager, all such property will be returned to the Construction Manager in a state free from contamination by any hazardous or toxic substances; and (ii) it shall indemnify the Construction Manager for any costs or damages incurred by the Construction Manager consequent to Contractor's failure to comply with (i).

55. RESPONSIBILITY OF CONTRACTOR TO ACT IN EMERGENCY

In case of an emergency which threatens release of toxic or hazardous material, loss or injury of property, and/or safety of life, the Contractor shall act, without previous instructions from the Construction Manager, as the situation may warrant. The Contractor shall notify the Construction Manager thereof immediately thereafter.

56. MATERIALS AND APPLIANCES

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, heat, light, fuel, power, transportation, construction equipment and machinery, appliances, telephone, sanitary facilities, temporary facilities and other facilities and incidentals, including health protection devices as specified in the Site Safety Plan, necessary for the execution and completion of the Work. The Contractor agrees that each employee shall wear the protective clothing and use the equipment as specified in the Site Safety Plan and comply with the Plan at all times when such employee is onsite.

Unless otherwise specified, all materials shall be new, and both workmanship and materials shall be of good quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

In selecting and/or approving equipment for installation in the project, the Construction Manager assumes no responsibility for injury or claims resulting from failure of the equipment to comply with applicable federal, state, and local safety codes or requirements, or the safety requirements of a recognized agency, or failure due to faulty design concepts, or defective workmanship and materials.

57. CONTRACTORS' AND MANUFACTURERS' COMPLIANCE WITH STATE SAFETY, OSHA, AND OTHER CODE REQUIREMENTS

The completed Work shall include all necessary permanent safety devices, such as machinery guards and similar ordinary safety items required by the State and Federal (OSHA) industrial authorities and applicable local and national codes. Further,
any features of the Work subject to such safety regulations shall be fabricated, furnished, and installed (including Construction Manager-furnished equipment) in compliance with these requirements. Contractors and manufacturers of equipment shall be held responsible for compliance with the requirements included herein. Contractors shall notify all equipment suppliers and subcontractors of the provisions of this Article.

58. SUBSTITUTION OF MATERIALS

Except for Construction Manager-selected equipment items, and items where no substitution is clearly specified, whenever any material, article, device, product, fixture, form, type of construction, or process is indicated or specified by patent or proprietary name, by name of manufacturer, or by catalog number, such specifications shall be deemed to be used for the purpose of establishing a standard of quality and facilitating the description of the material or process desired. This procedure is not to be construed as eliminating from competition other products of equal or better quality by other manufacturers where fully suitable in design, and shall be deemed to be followed by the words "or equal". The Contractor may, in such cases, submit complete data to the Construction Manager for consideration of another material, type, or process which shall be substantially equal in every respect to that so indicated or specified. Substitute materials shall not be used unless approved in writing. The Construction Manager will be the sole judge of the substituted article or material.

59. TESTS, SAMPLES, AND OBSERVATIONS

The Contractor shall furnish, without extra charge, the necessary test pieces and samples, including facilities and labor for obtaining the same, as requested by the Construction Manager. When required, the Contractor shall furnish certificates of tests of materials and equipment made at the point of manufacture by a recognized testing laboratory.

The Construction Manager, EPA, and their representatives shall at all times be provided safe access to the Work wherever it is in preparation or progress, and the Contractor shall provide facilities for such access and for observations, including maintenance of temporary and permanent access.

If the Specifications, laws, ordinances, or any public authority require any Work to be specially tested or approved, the Contractor shall give timely notice of its readiness for observations. If any Work should be covered up without approval or consent of the Construction Manager, it shall, if required by the Construction Manager, be uncovered for examination at the Contractor's expense.
Reexamination of questioned work may be ordered by the Construction Manager, and, if so ordered, the work shall be uncovered by the Contractor. If such work is found to be in accordance with the Contract Documents, the Construction Manager will pay the cost of uncovering, exposure, observation, inspection, testing and reconstruction. If such work is found to be not in accordance with the Contract Documents, the Contractor shall correct the defective work, and the cost of reexamination and correction of the defective work shall be paid by the Contractor.

60. ROYALTIES AND PATENTS

The Contractor shall pay all royalty and license fees, unless otherwise specified. The Contractor shall defend all suits or claims for infringement of any patent rights and shall save the Construction Manager harmless from any and all loss, including reasonable attorneys' fees, on account thereof.

61. CONTRACTOR'S RIGHT TO TERMINATE CONTRACT

If the work should be stopped under an order of any court or other public authority for a period of more than 3 months, through no act or fault of the Contractor, its subcontractors, or respective employees or if the Construction Manager should fail to pay the Contractor within 30 days after time specified in Article PARTIAL PAYMENTS, then the Contractor may, upon 15 days' written notice to the Construction Manager, stop work or terminate this contract and recover from the Construction Manager payment for all acceptable work performed and any loss sustained plus reasonable termination expenses as determined by the Construction Manager, unless said default has been remedied.

62. CORRECTION OF DEFECTIVE WORK DURING WARRANTY PERIOD

The Contractor hereby agrees to make, at its own expense, all repairs or replacements necessitated by defects in materials or workmanship, supplied under terms of the Contract Documents, and pay for any damage to other works resulting from such defects, which become evident within 1 year after the date of final acceptance of the work or within 1 year after the date of substantial completion established by the Construction Manager for specified items of equipment, or within such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents. Unremedied defects identified for correction during the warranty period but remaining after its expiration shall be considered as part of the obligations of the warranty. The Contractor further assumes responsibility for a similar guarantee for all work and materials provided by subcontractors or manufacturers of packaged equipment components. The effective date for the start of the guarantee or warranty period for equipment qualifying as
substantially complete is defined in Article SUBSTANTIAL COMPLETION, and Article SUBSTANTIAL COMPLETION DATE, in these General Conditions.

The Contractor also agrees to hold the Construction Manager harmless from liability of any kind arising from damage due to said defects. The Contractor shall make all repairs and replacements promptly upon receipt of written order for same from the Construction Manager. If the Contractor fails to make the repairs and replacements promptly, or in an emergency where delay would cause serious risk, or loss, or damage, the Construction Manager may have the defective Work corrected or the rejected Work removed and replaced, and the Contractor and its Surety shall be liable for the cost thereof.

63. BEGINNING OF THE WORK

Following execution of the contract, the Contractor shall meet with the Construction Manager relative to its arrangements for prosecuting the Work.

64. SCHEDULES AND PROGRESS REPORTS

Prior to starting the construction, the Contractor shall prepare and submit to the Construction Manager, a progress schedule showing approximately the dates on which each part or division of the Work is expected to be started and finished, and a preliminary schedule for submittals. The progress schedule and schedule for submittals shall be brought up to date and submitted to the Construction Manager at the end of each month or at such other times the Construction Manager may request.

The Contractor shall forward to the Construction Manager, at the end of each month, an itemized report of the delivery status of major and critical items of purchased equipment and material, including shop drawings and the status of shop and field fabricated Work. These progress reports shall indicate the date of the purchase order, the current percentage of completion, estimated delivery, and cause of delay, if any.

If the completion of any part of the Work or the delivery of materials is behind the submitted progress schedule, the Contractor shall submit in writing a plan acceptable to the Construction Manager for bringing the Work up to schedule.

The Construction Manager shall have the right to withhold progress payments for the Work if the Contractor fails to update and submit the progress schedule and reports as specified.
65. PROSECUTION OF THE WORK

It is expressly understood and agreed that the time of beginning, rate of progress, and time of completion of the Work are the essence of this contract. The Work shall be prosecuted at such time, and in or on such part or parts of the project as may be required, to complete the project as contemplated in the Contract Documents and the submitted progress schedule.

If the Contractor desires to carry on Work at night or outside the regular hours, it shall give timely notice to the Construction Manager to allow satisfactory arrangements to be made for observing the Work in progress. The Contractor shall obtain any necessary permits, easements, or licenses required to prosecute the Work under these conditions.

PAYMENT

66. PAYMENT FOR CHANGE ORDERS

At the Construction Manager's option, payment or credit for any alterations covered by a Change Order shall be determined by one or a combination of the methods set forth in A, B, or C below, as applicable:

A. UNIT PRICES

Those unit prices stipulated in the Bid shall be utilized where they are applicable. In the event the Change Order results in a change in the original quantity in excess of 25 percent of the original bid quantity, and the total dollar value of that bid item is significant, the Construction Manager will review the unit price to determine if a new unit price shall be negotiated. Unit prices for new items included in the Change Order shall be negotiated and mutually agreed upon.

B. LUMP SUM

A total lump sum for the Work negotiated and mutually acceptable to the Contractor and Construction Manager.

Lump sum quotations for modifications to the Work shall include substantiating documentation with an itemized breakdown of Contractor and subcontractor costs, including labor, material, rentals, approved services, overhead, and profit, all calculated as specified under "C" below.
C. COST REIMBURSEMENT WORK

The term "cost reimbursement" shall be understood to mean that payment for the Work will be made on a time and expense basis, that is, on an accounting of the Contractor's forces, materials, equipment, and other items of cost as required and used to do the Work.

If the method of payment cannot be agreed upon prior to the beginning of the Work, and the Construction Manager directs by written Change Order that the Work be done on a cost reimbursement basis, then the Contractor shall furnish labor, and furnish and install equipment and materials necessary to complete the Work in a satisfactory manner and within a reasonable period of time. For the Work performed, payment will be made for the documented actual cost of the following:

1. Labor, including foremen, for those hours they are assigned and participating in the cost reimbursement Work (actual payroll cost, including wages, fringe benefits as established by negotiated labor agreements, labor insurance, and labor taxes as established by law).

2. Material delivered and used on the designated Work, including sales tax, if paid for by the Contractor or its subcontractor.

3. Rental, or equivalent rental cost of equipment, including necessary transportation for items having a value in excess of $100.

Rental or equivalent rental cost will be based on the "Cost Reference Guide for Construction Equipment" as published by Dataquest, Incorporated, 1290 Ridder Park Drive, San Jose, CA 95131, for equipment owned or leased by the Contractor. Equipment that is actually used on the project and rented from an equipment supplier will be paid for based upon the "Rental Rate Blue Book" as published by Dataquest, Incorporated or actual invoice, whichever is less.

Equipment used more than 160 hours in a 1-month period will be paid at the monthly rate; equipment used more than 35 hours per week but less than 160 hours per month will be paid at the weekly rate; equipment used more than 4 hours but less than 7 hours per day will be paid at the daily rate; and equipment used less than 4 hours per day will be paid for at the hourly rate, so long as the total use in a 1-month period does not exceed either the weekly amount or the monthly amount.
The rentals allowed for equipment will, in all cases, be understood to cover all fuel, supplies, repairs, and renewals, and no further allowances will be made for those items, unless specific agreement to that effect is made.

4. Additional bond, as required and approved by the Construction Manager.

5. Additional insurance (other than labor insurance) as required and approved by the Construction Manager.

6. An added fixed fee of 10 percent for general overhead and profit shall be allowed for the Contractor (or approved subcontractor) actually executing the Cost Reimbursement Work.

7. An additional fixed fee of 10 percent shall be allowed the Contractor for the administrative handling of portions of the Work that are executed by an approved subcontractor. No additional fixed fee will be allowed for the administrative handling of Work executed by a subcontractor of a subcontractor, unless by written permission from the Construction Manager.

The added fixed fees shall be considered to be full compensation, covering the cost of general supervision, overhead, profit, and any other general expense.

The Contractor's records shall make clear distinction between the direct costs of Work paid for on a cost reimbursement basis and the costs of other Work. The Contractor shall furnish the Construction Manager report sheets in duplicate of each day's cost reimbursement Work no later than the working day following the performance of said Work. The daily report sheets shall itemize the materials used, and shall cover the direct cost of labor and the charges for equipment rental, whether furnished by the Contractor, subcontractor, or other forces. The daily report sheets shall provide names or identifications and classifications of workers, the hourly rate of pay and hours worked, and also the size, type, and identification number of equipment and hours operated.

Material charges shall be substantiated by valid copies of vendors' invoices. Such invoices shall be submitted with the daily report sheets, or, if not available, they shall be submitted with subsequent daily report sheets. Said daily report sheets shall be signed by the Contractor or its authorized agent.
The Construction Manager reserves the right to furnish such materials and equipment as it deems expedient, and the Contractor shall have no claim for profit or added fees on the cost of such materials and equipment.

To receive partial payments and final payment for cost reimbursement Work, the Contractor shall submit to the Construction Manager, in a manner approved by the Construction Manager, detailed and complete documented verification of the Contractor's and any of its subcontractors' actual costs involved in the cost reimbursement Work. Such costs shall be submitted within 30 days after said Work has been performed.

The Construction Manager's request for quotations on alterations to the Work shall not be considered authorization to proceed with the Work prior to the issuance of a formal Change Order, nor shall such request justify any delay in existing Work. Quotations for alterations to the Work shall include substantiating documentation with an itemized breakdown of Contractor and subcontractor costs, including labor, material, rentals, approved services, overhead, and profit. Construction Manager may require detailed cost data in order to substantiate the reasonableness of the proposed costs.

Any compensation paid in conjunction with the terms of a Change Order shall comprise total compensation due the Contractor for the Work or alteration defined in the Change Order. By signing the Change Order, the Contractor acknowledges that the stipulated compensation includes payment for the Work or alteration plus all payment for the interruption of schedules, extended overhead, delay, or any other impact claim or ripple effect, and by such signing specifically waives any reservation or claim for additional compensation in respect to the subject Change Order.

67. PARTIAL PAYMENTS

A. GENERAL

Nothing contained in this Article shall be construed to affect the right, hereby reserved, to reject the whole or any part of the aforesaid Work, should such Work be later found not to comply with the provisions of the Contract Documents. All estimated quantities of Work for which partial payments have been made are subject to review and correction on the final estimate. Payment by the Construction Manager and acceptance by the Contractor of partial payments based on periodic estimates of quantities of Work performed shall not, in any way, constitute acceptance of the estimated quantities used as the basis for computing the amounts of the partial payments.
B. SCHEDULE OF VALUES

At least 10 days prior to submitting the first payment request, the Contractor shall submit a Schedule of Values of the Work, including quantities and unit prices aggregating the Contract Price. This schedule shall be satisfactory in form and substance to the Construction Manager and shall subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Upon approval of the Schedule of Values by the Construction Manager, it shall be incorporated into the payment request.

C. ESTIMATE

Before the 3rd working day of each calendar month, the Contractor shall submit to the Construction Manager a detailed estimate of the amount earned during the preceding month for the separate portions of the Work, and request payment. As used in this Article, the words "amount earned" means the value, on the date of the estimate for partial payment, of the Work completed in accordance with the Contract Documents, and the value of approved materials delivered to the project site suitably stored and protected prior to incorporation into the Work. The payment request will have backup documentation in the form of payrolls, subcontractor invoices, etc. for the amount earned as requested by the Construction Manager.

Construction Manager will, within 5 working days after receipt of each request for payment, either indicate in writing a recommendation of payment and present the request to EPA, or return the request to Contractor indicating in writing Construction Manager's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the request. The resubmitted payment request will not be processed until the following month.

Construction Manager may refuse to recommend the whole or any part of any payment if, in its opinion, it would be incorrect to make such representations to EPA. Construction Manager may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended to such extent as may be necessary in Construction Manager's opinion to protect EPA from loss because:

1. The Work is defective, or completed Work has been damaged requiring correction or replacement;
2. Written claims have been made against Construction Manager or Liens have been filed in connection with the Work;

3. The contract price has been reduced because of Change Orders;

4. Construction Manager has been required to correct defective Work or complete the Work in accordance with Article Construction Manager's RIGHT TO DO WORK;

5. Of Contractor's unsatisfactory prosecution of the Work in accordance with the Contract Documents; or

6. Contractor's failure to make payment to subcontractors or for labor, materials, or equipment.

D. DEDUCTION FROM ESTIMATE

Deductions from the estimate will be as described below:

1. The Construction Manager will deduct from the estimate, and retain as part security, 10 percent of the amount earned for Work satisfactorily completed. A deduction and retainage of 10 percent will be made on the estimated amount earned for approved items of material delivered to and properly stored at the jobsite but not incorporated into the Work. When the Work is 50 percent complete, the Construction Manager may reduce the retainage to 5 percent of the dollar value of all Work satisfactorily completed to date provided that the Contractor is making satisfactory progress and there is no specific cause for a greater retainage. The Construction Manager may reinstate the retainage up to 10 percent if the Construction Manager determines, at its discretion, that the Contractor is not making satisfactory progress or where there is other specific cause for such withholding.

E. QUALIFICATION FOR PARTIAL PAYMENT FOR MATERIALS DELIVERED

Qualification for partial payment for materials delivered but not yet incorporated into the Work shall be as described below:

1. Materials, as used herein, shall be considered to be those items which are fabricated and manufactured material and equipment. No consideration shall be given to individual purchases of less than $200 for any one item.
2. To receive partial payment for materials delivered to the site, but not incorporated in the Work, it shall be necessary for the Contractor to include a list of such materials on the Partial Payment Request. At its sole discretion, the Construction Manager may approve items for which partial payment is to be made. Partial payment shall be based on the Contractor's actual cost for the materials as evidenced by invoices from the supplier. Proper storage and protection shall be provided by the Contractor, and as approved by the Construction Manager. Final payment shall be made only for materials actually incorporated in the Work and, upon acceptance of the Work, all materials remaining for which advance payments had been made shall revert to the Contractor, unless otherwise agreed, and partial payments made for these items shall be deducted from the final payment for the Work.

3. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the project or not, will pass to Construction Manager at the time of payment free and clear of all liens, claims, security interests, and encumbrances.

4. If requested by the Construction Manager, the Contractor shall provide, with subsequent pay requests, invoices receipted by the supplier showing payment in full has been made.

F. PAYMENT

The Contractor shall be paid such amounts as are due it pursuant to the Contract Documents and in accordance with the payment guidelines established in EPA Form 1900-34A, "Guide for the Preparation of Contractor's Claims for Reimbursement of Costs and Fees Under Cost-Plus-Award-Fee Type Contracts".

Requests for payment that are received by the 3rd day of the month, and that are approved by the Construction Manager, will be processed for payment and funds will be released within 60 days following the 3rd day of the month. Retainages and the amount of all previous partial payments will be deducted from the total amount earned by the Contractor to determine the amount due.

68. CLAIMS FOR EXTRA WORK

In any case where the Contractor deems additional compensation will become due it, the Contractor shall notify the Construction Manager, in writing, of its intention to make claim for such
compensation before it begins the Work on which it bases the
claim, in order that such matters may be settled, if possible,
or other appropriate action promptly taken. If such
notification is not given or the Construction Manager is not
afforded proper facilities by the Contractor for keeping strict
account of actual cost, then the Contractor hereby agrees to
waive the claim for such additional compensation. Such notice
by the Contractor, and the fact that the Construction Manager
has kept account of the cost as aforesaid, shall not in any way
be construed as proving the validity of the claim. Claims for
additional compensation shall be made in itemized detail and
submitted, in writing, to the Construction Manager within
10 days following completion of that portion of the Work for
which the Contractor bases its claim. In case the claim is
found to be just, it shall be allowed and paid for as provided
in Article PAYMENT FOR CHANGE ORDERS.

69. NOTICE OF CLAIM FOR DELAY

If the Contractor intends to file a claim for extension of time
for a delay, the Contractor shall file a notice of claim with
the Construction Manager within 7 days of the beginning of the
occurrence. The notice of claim shall be in duplicate, in
writing, and shall state the circumstances and the reasons for
the claim. No claim for an extension of time will be considered
unless the provisions of Article DELAYS AND EXTENSION OF TIME
are complied with, and a notice of claim has been filed with the
Construction Manager in writing, as stated above.

70. RELEASE OF LIENS OR CLAIMS

The Contractor shall indemnify and hold harmless the
Construction Manager from all claims for labor and materials
furnished under the Contract Documents. Prior to the final
payment, the Contractor shall furnish to the Construction
Manager, as part of its final payment request, a certification
that all of the Contractor's obligations on the project have
been satisfied and that all monetary claims and indebtedness
have been paid. The Contractor shall furnish complete and legal
effective releases or waivers, satisfactory to the Construction
Manager, of all liens arising out of or filed in connection with
the Work.

71. FINAL PAYMENT

Upon completion of all of the Work under the Contract Documents,
the Contractor shall notify the Construction Manager, in
writing, that it has completed its part of the Contract
Documents and shall request final payment. Upon receipt of such
notice, the Construction Manager will inspect and, if
acceptable, submit to EPA its recommendation as to acceptance of
the completed Work and as to the final estimate of the amount
due the Contractor. Upon approval of this final estimate by the Construction Manager and compliance by the Contractor with provisions in Article RELEASE OF LIENS OR CLAIMS, and other provisions as may be applicable, the Construction Manager shall pay to the Contractor all monies due it under the provisions of these Contract Documents.

72. ACCEPTANCE OF FINAL PAYMENT CONSTITUTES RELEASE

The acceptance by the Contractor of the final payment shall release the Construction Manager from all claims and all liability to the Contractor for all things done or furnished in connection with the Work, and every act of the Construction Manager and others relating to or arising out of the Work except claims previously made in writing and still unsettled. No payment, however, final or otherwise, shall operate to release the Contractor or its Sureties from obligations under the Contract Documents and the Performance Bond, Payment Bond, and other bonds and warranties, as herein provided.

73. CUTTING AND PATCHING

The Contractor shall do all cutting, fitting, or patching of its Work that may be required to make its several parts come together properly and fit it to receive or be received by Work of other contractors shown upon or reasonably implied by the Drawings. Any defective Work or material, performed or furnished by the Contractor, that may be discovered by the Construction Manager before the final acceptance of the Work or before final payment has been made, shall be removed and replaced or patched, in a manner as approved by the Construction Manager at the expense of the Contractor.

74. CLEANING UP AND DECONTAMINATION

The Contractor shall, at all times, keep property on which Work is in progress and the adjacent property free from accumulations of waste material or rubbish caused by employees or by the Work. Upon completion of the construction, the Contractor shall remove all temporary structures, rubbish, and waste materials resulting from its operations. The Contractor shall properly decontaminate all personnel, equipment, material or vehicles which have been located or working in an area of potential hazardous materials.
GENERAL LEGAL PROVISIONS

75. RIGHT TO RETAIN IMPERFECT WORK

If any part or portion of the Work completed under the Contract Documents shall prove defective and not in accordance with the Drawings and Specifications, and if the imperfection in the same shall not be of sufficient magnitude or importance as to make the Work dangerous or unsuitable, or if the removal of such Work will create conditions which are dangerous or undesirable, the Construction Manager shall have the right and authority to retain such Work but will make such deductions in the final payment therefor as may be just and reasonable.

76. CONSTRUCTION MANAGER'S RIGHT TO DO WORK

Should the Contractor neglect to prosecute the Work in conformance with the Contract Documents or neglect or refuse at its own cost to remove and replace Work as shall have been rejected by the Construction Manager, then the Construction Manager may notify the Surety of the condition, and after 10 days' written notice to the Contractor and the Surety, or without notice if an emergency or danger to the Work or public exists, and without prejudice to any other right which the Construction Manager may have under the contract, take over that portion of the Work which has been improperly executed, and make good the deficiencies and deduct the cost thereof from the payments then or thereafter due the Contractor.

77. CONSTRUCTION MANAGER'S RIGHT TO TRANSFER EMPLOYMENT

If the Contractor should abandon the Work or if it should persistently or repeatedly refuse or should fail to make prompt payment to subcontractors for material or labor, or to persistently disregard laws, ordinances, or to prosecute the Work in conformance with the Contract Documents, or otherwise be guilty of a substantial violation of any provision of the Contract Documents or any laws or ordinance, then the Construction Manager may, without prejudice to any other right or remedy, and after giving the Contractor and Surety 10 days' written notice, transfer the employment for said Work from the Contractor to the Surety. Upon receipt of such notice, such Surety shall enter upon the premises and take possession of all materials, tools, and appliances thereon for the purpose of completing the Work included under the Contract Documents and employ, by contract or otherwise, any qualified person or persons to finish the Work and provide the materials therefor, in accordance with the Contract Documents, without termination of the continuing full force and effect of this contract. In case of such transfer of employment to such Surety, the Surety shall be paid in its own name on estimates according to the terms hereof without any right of the Contractor to make any claim for the same or any part thereof.
If, after the furnishing of said written notice to the Surety, the Contractor and the Surety still fail to make reasonable progress on the performance of the Work, the Construction Manager may terminate the employment of the Contractor and take possession of the premises and of all materials, tools, and appliances thereon and finish the Work by whatever method it may deem expedient and charge the cost thereof to the Contractor and Surety. In such case, the Contractor shall not be entitled to receive any further payment until the Work is finished. If the expense of completing the contract, including compensation for additional managerial and administrative services, shall exceed such unpaid balance, the Contractor and the Surety shall pay the difference to the Construction Manager.

78. CONFIDENTIALITY AND NONDISCLOSURE

Information, technical data, discussions, reference documents, and other materials involved in the performance of the Contract Documents are strictly confidential. Contractor agrees not to reproduce any such materials except as necessary to perform the Work, and not to distribute any such materials internally except on a strictly "need-to-know" basis, and not to divulge any such material either verbally or in writing to any third party without the written consent of the Construction Manager.

79. TREATMENT OF CONFIDENTIAL BUSINESS INFORMATION

The Construction Manager may receive confidential business information from EPA necessary to carry out the Work required under the Prime Contract. The Construction Manager may, in turn, disclose this information to the Contractor. The Contractor agrees to use the confidential information only under the following conditions:

A. The Contractor and Contractor's employees shall: (1) use the confidential information only for the purposes of carrying out the Work required by the contract; (2) not disclose the information to anyone other than Construction Manager or EPA employees without prior written approval; and (3) return to the Construction Manager all copies of the information, and any abstracts or excerpts therefrom whenever the information is no longer required by the Contractor for the performance of the Work required by the Contract Documents, or upon termination of the Contract Documents.

B. The Contractor shall obtain a written agreement to honor the above limitations from each of the Contractor's employees who will have access to the information before the employee is allowed access.
C. The Contractor agrees that these contract conditions concerning the use and disclosure of confidential information are included for the benefit of, and shall be enforceable by the Construction Manager and any affected business having a proprietary interest in the information.

D. The Contractor shall not use any confidential information supplied by the Construction Manager or EPA or obtained during performance hereunder to compete with any business to which the confidential information relates.

The Contractor shall obtain the written consent of the Construction Manager, prior to entering into any subcontract that will involve the disclosure of confidential business information by the Contractor to the subcontractor. The Contractor shall include this clause, including this paragraph, in all subcontracts awarded that require the furnishing of confidential business information to the subcontractor.

80. TERMINATION

A. TERMINATION FOR CONVENIENCE

The Contract Documents or Contractor's Work may be terminated in whole or in part by the Construction Manager for its convenience. In such event, settlement shall be made in accordance with the provisions set forth in FAR 52.249-006.

B. TERMINATION FOR DEFAULT

The Construction Manager may by written notice terminate the whole or any part of the Contract Documents for default in the event that the Contractor fails to perform any of the provisions of the Contract Documents, or fails to make progress as to endanger performance of the Contract Documents in accordance with its terms, and in either of these two circumstances, does not cure such failure to the Construction Manager's reasonable satisfaction within a period of 10 days after receipt of notice from the Construction Manager specifying such failure.

If, after notice of termination of the Contract Documents under the provisions of TERMINATION FOR DEFAULT, it is determined for any reason that the Contractor was not in default or that the default was excusable, the rights and obligations of the parties shall be the same as if the notice of termination had been issued pursuant to TERMINATION FOR CONVENIENCE.

In the event of termination, settlement shall be made in accordance with the provisions set forth in FAR 52.249-006.
C. RIGHTS ARE NOT EXCLUSIVE

The rights and remedies of the Construction Manager provided in this Article TERMINATION shall not be exclusive and are in addition to any other rights and remedies provided by law or equity or under the Contract Documents.

81. DELAYS AND EXTENSION OF TIME

If the Contractor is delayed in the progress of the Work by any act or neglect of the EPA or the Construction Manager, or by any separate contractor employed by the Construction Manager, or by strikes, lockouts, fire, adverse weather conditions not reasonably anticipated, or acts of Nature, and if the Contractor, within 48 hours of the start of the occurrence, gives written notice to the Construction Manager of the cause of the potential delay and estimates the possible time extension involved, and within 7 days after the cause of delay has been remedied, the Contractor gives written notice to the Construction Manager of any actual time extension requested as a result of the aforementioned occurrence, then the contract time may be extended by Change Order for such reasonable time as the Construction Manager determines. It is agreed that no claim shall be made or allowed for any damages which may arise out of any delay caused by the above referenced acts or occurrences, other than claims for the appropriate extension of time.

No extension of time will be granted to the Contractor for delays occurring to parts of the Work that have no measurable impact on the completion of the total Work under the Contract Documents.

No extension of time will be considered for weather conditions reasonably anticipated for the area in which the Work is being performed. Reasonably anticipated weather conditions will be based on official records of monthly precipitation and other historical data. Adverse weather conditions, if determined to be of a severity that would impact progress of the Work, may be considered as cause for an extension of contract completion time.

Delays in delivery of equipment or material purchased by the Contractor or its subcontractors, including Construction Manager-selected equipment, shall not be considered as a just cause for delay, unless the Construction Manager determines that for good cause the delay is beyond the control of the Contractor. The Contractor shall be fully responsible for the timely ordering, scheduling, expediting, delivery, and installation of all equipment and materials.
Within a reasonable period after the Contractor submits to the Construction Manager a written request for an extension of time, the Construction Manager will present its written opinion to the EPA as to whether an extension of time is justified, and, if so, its recommendation as to the number of days for time extension. Upon EPA approval, the Construction Manager will make the final decision on all requests for extension of time.

In no event shall the Contractor be entitled under this contract to collect or recover any damages, loss, or expense incurred by any delay other than as stipulated in Article NOTICE OR CLAIM FOR DELAY.

82. DIFFERING SITE CONDITIONS

The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Construction Manager of:

A. subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or

B. unknown physical conditions at the site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in the contract.

The Construction Manager shall investigate the site conditions promptly after receiving the notice. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the Work under this contract, whether or not changed as a result of the conditions, an equitable adjustment shall be made under this Article and the contract modified in writing accordingly.

No request by the Contractor for an equitable adjustment to the contract under this Article shall be allowed, unless the Contractor has given the written notice required; provided, that the time prescribed above for giving written notice may be extended by the Construction Manager.

No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.

83. LIQUIDATED DAMAGES

Should the Contractor fail to complete the Work, or any part thereof, in the time agreed upon in the Contract Documents or within such extra time as may have been allowed for delays by extensions granted as provided in the Contract Documents, the Contractor shall reimburse the Construction Manager for the
additional expense and damage for each calendar day, Sundays and legal holidays included, that the contract remains uncompleted after the contract completion date. It is agreed that the amount of such additional expense and damage incurred by reason of failure to complete the Work is the per-diem rate, as stipulated in the Bid. The said amount is hereby agreed upon as a reasonable estimate of the damages which will probably ensue or be incurred by EPA or the Construction Manager in the event that the Contractor fails to meet the completion date. It is expressly understood and agreed that this amount is not to be considered in the nature of a penalty, but as liquidated damages which have accrued against the Contractor. The Construction Manager shall have the right to deduct such damages from any amount due, or that may become due the Contractor, or the amount of such damages shall be due and collectible from the Contractor or Surety.

84. OTHER CONTRACTS

The Construction Manager reserves the right to let other contracts in connection with the Work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate its Work with theirs.

If any part of the Work under this contract depends upon proper execution or results from the work of any other contractor or utility service company, the Contractor shall inspect and promptly report to the Construction Manager in writing any patent or apparent defects or deficiencies in such work that render it unsuitable for such proper execution and results. The Contractor's failure to so report shall constitute an acceptance of the work by others as being fit and proper for integration with Work under this contract, except for latent or nonapparent defects and deficiencies in the work.

85. USE OF PREMISES

The Contractor shall confine its equipment, the storage of materials, and the operation of its workers to limits shown on the Drawings or indicated by law, ordinances, permits, or directions of the Construction Manager, and shall not unreasonably encumber the premises with its materials. The Contractor shall provide, at its own expense, the necessary rights-of-way and access to the Work which may be required outside the designated limits for construction and shall furnish the Construction Manager copies of permits and agreements for use of property outside that provided by the Construction Manager.
Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

86. SUBSTANTIAL COMPLETION DATE

The Construction Manager may issue a written notice of substantial completion for the purpose of establishing the starting date for specific equipment guarantees, and to establish the date that the Construction Manager will assume the responsibility for the cost of operating such equipment. Said notice shall not be considered as final acceptance of any portion of the Work or relieve the Contractor from completing the remaining Work within the specified time and in full compliance with the Contract Documents. See SUBSTANTIAL COMPLETION under DEFINITIONS of these General Conditions.

87. PERFORMANCE TESTING

Operating equipment and systems shall be performance tested in the presence of the Construction Manager to demonstrate compliance with the specified requirements. Performance testing shall be conducted under the specified design operating conditions or under such simulated operating conditions as recommended or approved by the Construction Manager. Schedule such testing with the Construction Manager at least 1 week in advance of the planned date for testing.

88. OWNER'S USE OF PORTIONS OF THE WORK

Following issuance of the written notice of Substantial Completion, the Construction Manager may initiate operation of the facility thereby establishing the starting date for specific equipment guarantees, and to establish the date that the Construction Manager will assume the responsibility for the cost of operating and maintaining such equipment. Such use shall not be considered as final acceptance of any portion of the Work, nor shall such use be considered as cause for an extension of the contract completion time, unless authorized by a Change Order issued by the Construction Manager.

89. PUBLICITY

No publicity or advertising, including releasing any information to the news media or publishing or delivering technical papers, regarding any Work under or relating to the Contract Documents shall be released by the Contractor without the prior approval of the Construction Manager.

The Contractor also agrees to acknowledge EPA support whenever the Work funded in whole or in part by the Contract Documents is
publicized in any media, subsequent to approval from the Construction Manager for such publicity.

90. EPA-FURNISHED DATA

The Construction Manager may deliver to the Contractor EPA-furnished data as required. Title to such data shall remain with EPA. The Contractor shall use the data only in connection with the Contract Documents.

91. ORGANIZATIONAL CONFLICT OF INTEREST

The Contractor warrants that, to the best of Its knowledge or belief, there are no relevant facts or circumstances which could give rise to an organizational conflict of interest as defined in FAR Subpart 9.5, or that the Contractor has disclosed all such relevant information.

The Contractor agrees that, if after the effective date of the Contract Documents, it discovers an organizational conflict of interest with respect to these Contract Documents or the Contractor's performance hereunder, it shall make an immediate and full disclosure in writing to the Construction Manager. Such disclosure shall include a description of the action that the Contractor has taken or proposes to take to avoid, eliminate, or neutralize the conflict. The Construction Manager may, however, terminate the Contract Documents in the event of any such conflict if such termination would be in the best interests of EPA, or if termination is required by EPA.

The Contractor agrees further that if a conflict of interest is identified prior to the execution of the Contract Documents, it will adequately avoid, eliminate, or neutralize the conflict in a manner satisfactory to the Construction Manager consistent with EPA requirements.

In the event the Contractor was aware of an organizational conflict of interest any time prior to or after the execution of the Contract Documents, and intentionally did not disclose the conflict to the Construction Manager, the Construction Manager may terminate the Contract Documents for default, and/or EPA may invoke such other remedies as may be authorized by law.

The Contractor further agrees to insert in any subcontract provisions which shall conform substantially to the language in this Article.
92. NOTIFICATION OF CONFLICT OF INTEREST REGARDING PERSONNEL

In addition to the requirements of the Article entitled ORGANIZATIONAL CONFLICTS OF INTEREST, the following provisions with regard to individual personnel performing under the Contract Documents shall apply for the duration of the Contract Documents.

The Contractor agrees to notify the Construction Manager of any actual, apparent, or potential conflict of interest with regard to any individual working under the Contract Documents or having access to information regarding the Contract Documents. Notification of any conflict of interest shall include both organizational conflicts of interest and personal conflicts of interest (which are defined as the same types of relationships as an organizational conflict of interest, but applicable to an individual).

In the event that a personal conflict of interest appears to exist, the individual who is affected shall be disqualified from taking part in any way in the performance of the assigned Work which created the conflict of interest situation.

93. NO WAIVER

No waiver by either party of any default by the other party in the performance of any provision of the Contract Documents shall operate as or be construed as a waiver of any future default whether like or different in character.

94. CERTIFICATES

The Contractor shall furnish to the Construction Manager any certificate required to be furnished by any provision of the Contract Documents and any certificate required by any future law, ordinance, or regulation with respect to the Contractor's compliance with the terms and provisions of such laws, ordinances, or regulations. As used in this Article, the word "certificate" shall include any plan or course of action or record keeping function.

95. AMENDMENTS IN WRITING

The Contract Documents and the Attachments hereto may be amended only by a further written agreement, duly executed, between the parties. The Contract Documents may not be changed orally.
96. GOVERNING LAW

The parties hereby agree that the Contract Documents, including its validity and interpretation, shall in all respects be governed by the laws of the Commonwealth of Virginia.

* * * * *
SUPPLEMENTARY CONDITIONS

LOCATION AND DRAWINGS

LOCATION

The location of the work is shown on the first sheet of the Drawings titled "Cover Sheet".

DRAWINGS

A site plan has been included to assist in the design and construction of the Remedial Action Soil Vapor Extraction System.

REVISIONS AND ADDITIONS TO THE GENERAL CONDITIONS

The General Conditions are hereby revised as follows:

ARTICLE "SUBSTANTIAL COMPLETION"

Delete the paragraph and replace with the following:

"Substantial completion" shall be that degree of completion of the project or a defined portion of the project, as evidenced by the Construction Manager's written notice of substantial completion. "Substantial completion" of the operating system shall be that degree of completion that has provided a minimum of 7 continuous days of successful, trouble-free operation, which period shall begin after all performance and acceptance testing has been successfully demonstrated to the Construction Manager. All equipment contained in the work, plus all other components necessary to operate the system in the manner that was intended, shall be completed on the substantial completion date.

ARTICLE "LINES AND GRADES"

Add the following:

The location and elevation of a bench mark is shown. The Contractor shall furnish the necessary labor and materials to accurately lay out the work and set the required elevations from the information shown on the site plan.

ARTICLE "SITE ACCESS"

Add the following:

Site access is currently available subject to the approval of the Construction Manager.
ARTICLE "INDEMNITY"

Add the following:

EPA THIRD-PARTY INDEMNIFICATION

Pursuant to the Construction Manager's Prime Contract, the Government will hold harmless and indemnify the Contractor against claims (including expenses of litigation or settlement) by third persons (including employees of the Contractor) for death, bodily injury, or loss of or damage to property arising out of the Contractor's performance of the Contract Documents, to the extent that such a claim is not compensated by insurance or otherwise. Any such claim within deductible amounts of the Contractor's insurance will not be covered under this paragraph. Reimbursement for such liabilities to third persons will not cover liabilities for which the Contractor has failed to insure as required or to maintain insurance as approved by the Construction Manager. If the insurance identified in Article INSURANCE AND LIABILITY is not available at a reasonable cost, as defined by EPA, the Government will hold harmless and indemnify the Contractor against claims to the extent such claims exceed $100,000. The Contractor shall not be reimbursed for liabilities (and the expenses incidental to such liabilities) that result from gross negligence, willful misconduct, or lack of good faith on the part of any of the Contractor's directors, managers, staff, representatives, or employees.

The Government may discharge its liability under this paragraph by making payments directly to the Contractor or directly to parties to whom the Contractor may be liable.

If insurance coverage required or approved by the Construction Manager is reduced without the Construction Manager's approval, the liability of the Government under this Article EPA THIRD-PARTY INDEMNIFICATION will not be increased by reason of such reduction.

The Contractor shall:

A. Promptly notify the Construction Manager of any claim or action against the Contractor or any subcontractor which reasonably may be expected to involve indemnification under this paragraph.

B. Furnish evidence or proof of any claim potentially covered by indemnification under this paragraph in the manner and form required by the Construction Manager.
C. Immediately furnish the Construction Manager copies of all pertinent papers related to the claim received by the Contractor. The Government or the Construction Manager may direct, control, or assist the settlement or defense of any such claim or action. The Contractor shall comply with the Government's or the Construction Manager's directions, and execute any authorizations required in regard to such settlement or defense.

Reimbursement for any liabilities under this paragraph will not exceed appropriations available at the time such liabilities are represented by final judgments or by settlements approved in writing by the Government. This agreement to reimburse the Contractor for certain liabilities will not be interpreted as implying that Congress will, at a later date, appropriate funds sufficient to meet deficiencies.

LIMITATION OF THE CONSTRUCTION MANAGER'S INDEMNIFICATION OF SUBCONTRACTOR

Nothing in the Article EPA THIRD-PARTY INDEMNIFICATION shall be construed to obligate the Construction Manager to indemnify the Contractor except to the extent that the Construction Manager is indemnified by the Government under the Prime Contract.

CONTRACT MODIFICATIONS

EPA may reopen the Prime Contract and renegotiate provisions that are affected by the Superfund Amendments and Reauthorization Act of 1986. The Construction Manager in turn reserves the right to reopen the Contract and renegotiate provisions that are affected by changes to the Prime Contract. Renegotiated provisions may, at the discretion of the Construction Manager, become retroactive to the start date of this Contract.

ARTICLE "TESTS, SAMPLES, AND OBSERVATIONS"

Revise Line 1, paragraph 2 as follows:

"The Construction Manager, EPA, MDNR, and their representatives shall".

ARTICLE "PARTIAL PAYMENTS"

Add the following:
PAYMENT SCHEDULE

Payment for unit price items will be made after completion of unit price work at the rates listed in the BID. For extended operation of the SVE system for up to an additional 24 months, payment will be made monthly, after each additional month of operation.

Payment of underground tank removal lump sum will be made after all underground tanks have been removed from the site.

Payment of the SVE lump sum amount will be made according to the following schedule:

<table>
<thead>
<tr>
<th>Percent of SVE Lump Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upon Substantial Completion</td>
</tr>
<tr>
<td>Monthly thereafter up to 24 months</td>
</tr>
<tr>
<td>Upon completion of Period of Operation (24 months from Substantial Completion or upon attaining the performance objective, whichever comes first)</td>
</tr>
</tbody>
</table>

* * * * * *

W68471.BA
SUPPLEMENTARY CONDITIONS 4
EXHIBIT G

CARBON REPLACEMENT REQUIREMENTS

1. The Contractor must be able to install the regenerated or virgin granular activated carbon within 14 consecutive calendar days notice from the Construction Manager, with the actual carbon removal and replacement not taking more than 5 calendar days.

2. Carbon exchanges shall be performed by one of the following methods:
   a. Filling the carbon vessels with water, then educting carbon out of each absorber into a truck.
   b. Vacuum carbon out of each adsorber into vacuum truck(s).
   c. Other similar method proposed by the Contractor provided that it is defined in sufficient detail for an assessment of its acceptability (e.g., dust control or other environmental considerations, etc.).

3. Elutriate from the carbon removal process shall be disposed of in an environmentally acceptable manner. Elutriate may be returned to the treatment system for discharge if it meets the following conditions:
   a. Shall not interfere with treatment plant operations; and,
   b. Shall not interfere with the treatment plant's ability to meet its discharge limitations set by state and federal standards.

Other disposal methods must be defined in sufficient detail for an assessment of its environmental acceptability.

4. Dust shall be controlled during the carbon changeout to avoid nuisance conditions.

5. The Contractor must supply all hoses, eductors, hoppers, and manlifts needed to perform the carbon exchange. Water from fire hydrants may be available near the site.

6. The carbon shipment, changeout, and regeneration must be in compliance with all applicable state and federal laws and regulations.

7. The Contractor must provide virgin coal-based carbon, 4x6-mesh, type Calgon BPL or equivalent as listed under the virgin carbon specifications in Section ACTIVATED CARBON SYSTEM.
8. The regenerated carbon must be returned to the treatment facility in sturdy bags or drums not to exceed 1,000 pounds each. The Contractor must also be able to store the carbon up to 18 months after its removal from the carbon vessels.

9. The Contractor must provide personnel to remove the spent carbon from the adsorber vessels. Appropriate safety equipment must be worn by the Contractor's personnel.

10. After the first removal of carbon, the excess filter cloth located in each adsorber must be permanently attached to the side of the adsorbers. (Approximately 2 feet of 3-1/2-inch polypropylene pallrings sit on the bottom of each adsorber with filter cloth located on top with a perimeter ring to keep the cloth in place.) Placement of bolts through the filter cloth and adsorber is advised. Other methods of permanent attachment may be proposed by the Bidder in sufficient detail for review of adequacy.

The adsorbers are made out of fiberglass reinforced plastic. The approximate thickness is from 0.574 inch to 1.148. All bolts should be 316 stainless steel or equivalent. All gaskets should be 1/8-inch thick neoprene or equivalent. All grommets should be nonreactive.

Contractor shall follow its Site Safety Plan during all phases of carbon replacement.

This task should be completed in 1 day. This task MUST be completed in 2 days.

11. The Contractor must also provide supervision and labor to install reactivated and virgin carbon. This carbon must be installed by the end of the 5th calendar day after the carbon changeout is initiated and within 14 calendar days of the date in which the Contractor is notified of the need to provide the carbon changeout.

The replacement carbon for the first changeout will be contained in either 1,000-pound sacks or 200-pound drums stored at the treatment site.

12. The carbon changeout must follow the procedures listed below:

   a. One or more of the adsorbers will be taken offstream at a time by a person authorized by the Construction Manager.

   b. Open the manway at the top of the adsorber.

   c. Using an eduction type system (or other approved system), educt the carbon from the adsorber to a dump truck or other
EXHIBIT F
DISPOSAL FACILITY INFORMATION
(EXAMPLE)

Facility Name, Address, and State Permit No.: __________________________

Facility Location: ______________________________________________________

Name of Responsible Contact for the Facility: ______________________________

Telephone Number of Contact: ____________________________________________

Specify Types, Quantity, and Concentration of Waste From the Project Site that shall be Handled by this Facility: ________________________________

A Certification that the Facility Holds Valid and Applicable Permits for all Activities Proposed for that Facility (Attach Copy):

____________________________________________________________________

Describe Method of Disposal: ____________________________________________

____________________________________________________________________

____________________________________________________________________
Unit of Measure and Method for Measuring Quantities Utilized at Facility for Accounting of all Deliveries, Disposal and/or Treatment: 

* * * * *
EXHIBIT D
DESIGN BASIS

1. AMBIENT CONDITIONS

- Dry Bulb Temperature Range: -20 to 110 degrees F
- Relative Humidity Range: Zero to 100 percent
- UBC Wind Zone: 70 mph
- Rainfall: Up to 6 inches per 24 hours
- Snow Load: 25 psf
- Elevation Above Sea Level: 835 feet msl
- UBC Seismic Zone: 1

2. SITE CONDITIONS

2.1 The following data are provided to allow the Bidder to determine a project approach. The Construction Manager does not guarantee their accuracy. Their presentation does not relieve the Bidder of its obligations set forth under Bidder's Understanding in Instructions to Bidders.

- Approximate Area of Contamination: 10,000 square feet
- Depth of Contamination: 0 to 25 feet
- Water Table (See Site Plan for Discussion): 18 to 25 feet below grade
- Nature of Contamination (See SUMMARY OF SITE/WASTE CHARACTERISTICS for listing): Volatile organic compounds
- Approximate Total Amount of Contamination in the Unsaturated Zone Soils: 1,700 lbs.
- Soil: Silty sand

* * * * *
EXHIBIT E
TRANSPORTER INFORMATION
(EXAMPLE)

Name and EPA Identification No. and Michigan License No.: ________________________

__________________________________________

__________________________________________

ICC License No. and Others as Applicable (For Example, Other State Waste Transport Licenses): ___________________________

__________________________________________

Address: __________________________________

__________________________________________

Telephone Number of Contact: ___________________________

Specify Types, Quantity, and Concentrations of Wastes to be Handled by This Transporter: __________________________________

__________________________________________

List of Types and Sizes of all Vehicles and Equipment Available for Use for the Duration of This Contract, for Each Type of Waste Material: __________________________________

__________________________________________

__________________________________________

* * * * *
3.2 HEALTH AND SAFETY RELATED TO SUBSTANCES OF CONCERN:

3.2.1 Chlorinated hydrocarbons are the most environmentally persistent contaminant group found at the Raymond Road Facility. These compounds are highly mobile, migrating easily through water, air, and soil. They are also persistent in the underground environment, although they may degrade at the surface under the influence of UV light. Many of the chlorinated hydrocarbons identified at the site are known or suspected carcinogens.

3.2.2 The aromatic compounds found at the site possess mobility characteristics similar to the chlorinated hydrocarbons. However, they are not nearly as persistent in the environment. As a result, they are not as widely distributed in the saturated zone of the site. With the exception of benzene, none of the identified aromatics are known to be carcinogenic.

3.2.3 Ketones possess mobility and persistence characteristics similar to those of the aromatic compounds. They are not generally considered to be carcinogenic.

3.3 HEALTH AND SAFETY HAZARDS ASSOCIATED WITH ONSITE ACTIVITIES:

3.3.1 Proposed onsite activities at the Raymond Road Facility will result in certain health and safety hazards to personnel. As discussed previously, contamination at the site extends from the surface into the subsurface. All onsite cleanup personnel will experience a high-risk of exposure (at varying levels) in all activities, and should therefore take necessary precautions.

3.3.2 Respiratory Hazards: All of the contaminants present represent an inhalation hazard as inhalation is the primary route of entry into the body. Symptoms range from dizziness, headache, eye irritation, mucous membrane irritation, and CNS depression (slows down response to stimuli), to respiratory fatigue and can lead to liver damage or kidney damage. Some of the compounds are classified by the U.S. EPA as potential carcinogens through inhalation. These are indicated with an asterisk in the above table.

3.3.3 Physical Hazards: Fire and explosion potential exists because of soil contamination. Potential ignition sources include active pole lamps, sparks from onsite drill rigs or other machinery, and sparks from automobiles or portable generators for traffic signs adjacent to the site.
3.3.4 There are at least twenty-one underground storage tanks at the site. These tanks may contain residual contaminants and hazardous sludge.

3.4 EMERGENCY INFORMATION/HELP SOURCES:

<table>
<thead>
<tr>
<th>Service</th>
<th>Contact Information</th>
<th>Phone Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire</td>
<td>Battle Creek Fire Dept.</td>
<td>616/965-7371</td>
</tr>
<tr>
<td>Police</td>
<td>Battle Creek Police Dept.</td>
<td>616/965-3911</td>
</tr>
<tr>
<td>Ambulance</td>
<td>Battle Creek Fire Dept.</td>
<td>616/965-8108</td>
</tr>
<tr>
<td>Emergency Room</td>
<td>Leila Hospital</td>
<td>616/963-5521</td>
</tr>
<tr>
<td>Poison Control</td>
<td>Leila Hospital</td>
<td>616/963-5521</td>
</tr>
<tr>
<td>Airport</td>
<td>Kellogg Airport</td>
<td>616/966-3010</td>
</tr>
<tr>
<td>Dr. Raymond</td>
<td>University of Arkansas, Toxicologist</td>
<td>501/661-5766</td>
</tr>
<tr>
<td></td>
<td></td>
<td>or 661-5767</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 hour—</td>
</tr>
<tr>
<td></td>
<td></td>
<td>501/370-8263</td>
</tr>
</tbody>
</table>

* * * * *
2.3 DESCRIPTION: The soil and groundwater are contaminated at the site. The contaminants are toxic and tend to be volatile and ignitable.

3. HAZARD EVALUATION

3.1 SUBSTANCES OF CONCERN: Three groups of contaminants have been observed repeatedly at the Raymond Road Facility. These include chlorinated hydrocarbons, aromatics and ketones. Specific compounds identified in each of these groups are listed in Table 1, below.

<table>
<thead>
<tr>
<th>Chlorinated Hydrocarbons:</th>
<th>TLV(ppm)</th>
<th>Potential Carcinogen</th>
<th>Maximum Concentration Identified in Site Soil (ppb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methylene chloride</td>
<td>100</td>
<td></td>
<td>60,000</td>
</tr>
<tr>
<td>Chloroform</td>
<td>10</td>
<td>X</td>
<td>2,400</td>
</tr>
<tr>
<td>Carbon tetrachloride</td>
<td>5</td>
<td>X</td>
<td>300</td>
</tr>
<tr>
<td>1,1-Dichloroethane</td>
<td>200</td>
<td>X</td>
<td>2,200</td>
</tr>
<tr>
<td>1,2-Dichloroethane (1,2-DCA)</td>
<td>10</td>
<td>X</td>
<td>27,000</td>
</tr>
<tr>
<td>1,1,1-Trichloroethane (1,1,1-TCA)</td>
<td>350</td>
<td>X</td>
<td>270,000</td>
</tr>
<tr>
<td>1,1,2,2-Tetrachloroethane (skin)</td>
<td>1</td>
<td>X</td>
<td>3,200</td>
</tr>
<tr>
<td>Vinyl chloride</td>
<td>5</td>
<td>X</td>
<td>[in groundwater]</td>
</tr>
<tr>
<td>1,1-Dichloroethylene (1,1-DCE)</td>
<td>5</td>
<td>X</td>
<td>[in groundwater]</td>
</tr>
<tr>
<td>Trans-1,2-Dichloroethylene (t-1,2,DCE)</td>
<td>200</td>
<td></td>
<td>15,000</td>
</tr>
<tr>
<td>Trichloroethylene (TCE)</td>
<td>50</td>
<td>X</td>
<td>550,000</td>
</tr>
<tr>
<td>Tetrachloroethylene (Perchloroethylene, PCE)</td>
<td>50</td>
<td>X</td>
<td>1,800,000</td>
</tr>
</tbody>
</table>
### TABLE 1 (Continued)

<table>
<thead>
<tr>
<th>Aromatics:</th>
<th>TLV(1) ppm(2)</th>
<th>mg/m3(3)</th>
<th>Potential Carcinogen</th>
<th>Maximum Concentration Identified in Site Soil (ppb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzene</td>
<td>10</td>
<td>.33</td>
<td>X</td>
<td>2,900</td>
</tr>
<tr>
<td>Toluene</td>
<td>100</td>
<td>383</td>
<td></td>
<td>730,000</td>
</tr>
<tr>
<td>Xylene</td>
<td>100</td>
<td>441</td>
<td></td>
<td>420,000</td>
</tr>
<tr>
<td>Ethyl Benzene</td>
<td>100</td>
<td>435</td>
<td></td>
<td>78,000</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>10</td>
<td>52</td>
<td></td>
<td>9,400</td>
</tr>
<tr>
<td>Styrene (highly flammable)</td>
<td>50</td>
<td>215</td>
<td></td>
<td>2,800</td>
</tr>
<tr>
<td>Ketones:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acetone</td>
<td>750</td>
<td>1,808</td>
<td></td>
<td>130,000</td>
</tr>
<tr>
<td>Methyl Ethyl Ketone (MEK)</td>
<td>200</td>
<td>588</td>
<td></td>
<td>17,000</td>
</tr>
<tr>
<td>Methyl Isobutyl Ketone (MIBK)</td>
<td>50</td>
<td>205</td>
<td></td>
<td>12,000</td>
</tr>
<tr>
<td>Semi-Volatiles:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bis(2-ethylhexyl) phthalate</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>64,000</td>
</tr>
<tr>
<td>Di-n-butyl phthalate</td>
<td>-</td>
<td>-</td>
<td></td>
<td>21,000</td>
</tr>
</tbody>
</table>

(1) Threshold Limit Value: Exposure concentration which a healthy person normally can tolerate for 8 hours a day, 5 days a week without harmful effects. Established by the American Conference of Governmental Industrial Hygienists.

(2) Parts per million used as a volumetric (molar) measure at 1 atm and 20 degrees C.

(3) Milligrams of contaminant per cubic meter of air at 1 atm and 20 degrees C.
1. GENERAL INFORMATION

1.1 The Verona Well Field provides potable water to approximately 35,000 residents and commercial and industrial establishments of the City of Battle Creek, Michigan. During August, 1981, it was discovered that a number of private and city wells in the well field were contaminated with volatile organic compounds (VOC's). Subsequent testing revealed that nearly 1/2 of the city's 30 potable water wells were contaminated. In November, 1981, the U.S. EPA began Phase I of a remedial investigation to evaluate the extent and potential sources of the well field contamination. As a result of this investigation, several sites were confirmed as major sources of contamination. The Thomas Solvent Company Raymond Road Facility was one of these sites. Refer to Appendix A for more detailed information regarding the nature and extent of VOC contamination at the Thomas Solvent Company Raymond Road Facility.

2. SITE CHARACTERISTICS

2.1 SITE DESCRIPTION:

2.1.1 The Thomas Solvent Company operated a solvent distribution business, which also handled a variety of liquid industrial wastes. The Raymond Road site is at the southeast corner of Raymond Road and Emmett Street. A gas station is located across the street, and there are residences adjacent to the site and nearby.

2.1.2 The facility was used for the storage, transfer, and packaging of chlorinated and nonchlorinated solvents until about March, 1984. Investigations at the site have identified that contamination resulted here from tank leakage and surface spillage.

2.1.3 The site is bordered on the north and west by major roadways. Traffic can be heavy; drivers must be regarded as potential receptors. Utilities are now in service to the Thomas Solvents office building and also to the monitoring building. Underground conduit and piping have been routed from the monitoring building to each extraction well onsite. Refer to the Site Plan for location of underground piping and conduit.
2.2 HISTORY:

2.2.1 The Thomas Solvent Company was licensed as a liquid waste hauler from 1970 to 1981. The facility was used for the storage, transfer, and packaging of chlorinated and nonchlorinated solvents until March, 1984.

2.2.2 It is believed that there were four primary solvent handling locations at the site:
   - Within the tank truck loading/unloading area
   - Within the warehouse
   - At the south dock
   - At the east dock

2.2.3 Groundwater sampling wells were installed during the site investigations, and extensive groundwater contamination was detected.

2.2.4 See the Drawings for a site map.

2.2.5 Installation of wells in Raymond Road intersection in October 1986 resulted in elevated HNu readings (600 ppm) during purging by air lift. Less active purging resulted in lower, acceptable readings. During the week of October 27, removal of the concrete loading dock resulted in elevated readings in the breathing zone (4 ppm), at ground level (100 ppm) and at the offsite monitoring station. Additionally, the Contractor foreman and SSC experienced breakthrough on APRs, and a strong MEK-like odor was noted at the site office, which was downwind. The area was covered with visqueen and the edges held down by sand. A 10-foot grid monitoring program was conducted beneath the plastic above the soils. Complete results are available at the site; initial readings in excess of 2,000 ppm on the OVA were obtained at ground level of the old loading dock.

2.2.6 Soil removed during the trenching of Raymond Road showed slight indications of contamination. The soil was brought onsite and spread over the site north of the demolished decontamination slab in a manner that did not cause any ambient air violations.

2.2.7 There are twenty-one known underground storage tanks onsite. During excavation for buried piping to extraction well No. 5, it was discovered that one of the buried tanks was oriented 90 degrees from the position shown on the Thomas Solvents drawings. Other buried tanks may not be located where the Site Plan shows them to be. The enclosed site plan has been updated to show the most current information on tank locations. However, the soil vapor extraction contractor will need to do some exploratory work to avoid drilling through buried tanks that may be located in a position different from that shown on the Drawings.
EXHIBIT B

RULES, REGULATIONS, AND GUIDELINES
APPLICABLE TO CONTRACTORS SAFETY PROGRAM

State OSHA Regulations on Construction Industry.

American National Standards Institute, 1430 Broadway, New York,
NY 10018.

National Oil and Hazardous Substances Pollution Contingency Plan,
40 CFR Part 300.

NIOSH, 1979 Criteria for a Recommended Standard: Working in
Confined Spaces. NIOSH No. 80-106. Also available from
U.S. Government Printing Office (#017-033-00353-0) and National
Technical Information Service (PB-80-183015).

NIOSH, 1985 Certified Equipment List as of October 1, 1984. DHHS
(NIOSH) No. 85-101. National Institute for Occupational Safety and
Health, Cincinnati, OH. Updated annually.

National Institute for Occupational Safety and Health (NIOSH 1986);
Occupational Safety and Health Administration (OSHA); U.S. Coast
Guard (USCG); U.S. Environmental Protection Agency (EPA);
Occupational Safety and Health Guidance Manual for Hazardous Waste
Site Activities.

Guidelines for the Selection of Chemical-Protective Clothing, Second
Edition. American Conference of Governmental Industrial Hygienists,
Inc., 6500 Lynnway Avenue, Building D-7, Cincinnati, OH 45211.

U.S. EPA, 1984 Standard Operating Safety Guides. EPA Office of
Emergency and Remedial Response, Hazardous Response Support
Division, Edison, NJ.

U.S. EPA, Office of Emergency and Remedial Response, Hazardous
Response Support Division, 1985. Field Standard Operating
Procedures for Site Entry, FSOP #4.


* * * * *

MAR 24, 1987
RULES, REGULATIONS, AND
GUIDELINES APPLICABLE TO
CONTRACTORS SAFETY PROGRAM
designated emergency signal _________ shall be sounded and all site personnel shall move to the decontamination line for further instructions. Activities onsite will stop until the added risk is removed or minimized.

Fire/Explosion: Upon notification of a fire or explosion onsite, the designated emergency signal ^_^______ shall be sounded and all site personnel assembled at the decontamination line. The fire department shall be alerted and all personnel moved to a safe distance from the involved area.

Personal Protective Equipment Failure: If any site worker experiences a failure or alteration of protective equipment that affects the protection factor, that person and his/her buddy shall immediately leave the exclusion zone. Reentry shall not be permitted until the equipment has been repaired or replaced.

Other Equipment Failure: If any other equipment onsite fails to operate properly, the project team leader and site safety officer shall be notified and then determine the effect of this failure on continuing operations onsite. If the failure affects the safety of personnel or prevents completion of the work plan tasks, all personnel shall leave the exclusion zone until the situation is evaluated and appropriate actions taken.

The following emergency escape routes are designated for use in those situations where egress from the exclusion zone cannot occur through the decontamination line (describe alternate routes to leave area in emergencies):

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

In all situations, when an onsite emergency results in evacuation of the exclusion zone, personnel shall not reenter until:

a. The conditions resulting in the emergency have been corrected
b. The hazards have been reassessed

c. The site safety plan has been reviewed

d. Site personnel have been briefed on any changes in the site safety plan

5. Personal Monitoring

The following personal monitoring will be in effect onsite:

Personal Exposure Sampling: (Describe any personal sampling programs being carried out onsite personnel. This would include use of sampling pumps, air monitors, etc.).

Medical Monitoring: The expected air temperature will be [degrees F]. If it is determined that heat stress monitoring is required (mandatory if over 70 degrees F) the following procedures shall be followed (describe procedures in effect, i.e., monitoring body temperature, body weight, pulse rate):

---

All site personnel have read the above plan and are familiar with its provisions.

Site safety officer ________________________________ (name) ________________________________ (signature)

Project team leader ______________________________ (name) ______________________________ (signature)
minutes. Whenever possible, arrangements should be made for onsite standby.

First-aid equipment is available onsite at the following locations:

First-aid kit
Emergency eyewash
Emergency shower
Other

Emergency medical information for substances present:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Exposure Symptoms</th>
<th>First-Aid Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

List of emergency phone numbers:

<table>
<thead>
<tr>
<th>Agency/Facility</th>
<th>Phone #</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Police</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airport</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Health Advisor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Environmental Monitoring

The following environmental monitoring instruments shall be used onsite (cross out if not applicable) at the specified intervals.
Combustible Gas - continuous/hourly/daily/other
Indicator

02 Monitor - continuous/hourly/daily/other

Colorimetric Tubes - continuous/hourly/daily/other

(type)

HNU/OVA - continuous/hourly/daily/other

Other - continuous/hourly/daily/other

4. Emergency Procedures (should be modified as required for incident)

The following standard emergency procedures will be used by onsite personnel. The site safety officer shall be notified of any onsite emergencies and be responsible for ensuring that the appropriate procedures are followed.

Personnel Injury in the Exclusion Zone: Upon notification of an injury in the exclusion zone, the designated emergency signal _____ shall be sounded. All site personnel shall assemble at the decontamination line. The rescue team will enter the exclusion zone (if required) to remove the injured person to the hotline. The site safety officer and project team leader should evaluate the nature of the injury, and the affected person should be decontaminated to the extent possible prior to movement to the support zone. The onsite EMT shall initiate the appropriate first-aid, and contact should be made for an ambulance and with the designated medical facility (if required). No persons shall reenter the exclusion zone until the cause of the injury or symptoms is determined.

Personnel Injury in the Support Zone: Upon notification of an injury in the support zone, the project team leader and site safety officer will assess the nature of the injury. If the cause of the injury or loss of the injured person does not affect the performance of site personnel, operations may continue, with the onsite EMT initiating the appropriate first-aid and necessary followup as stated above. If the injury increases the risk to others, the
The work party(s) were briefed on the contents of this plan at

H. COMMUNICATION PROCEDURES

Channel ___ has been designated as the radio frequency for personnel in the exclusion zone. All other onsite communications will use Channel ___.

Personnel in the exclusion zone should remain in constant radio communication or within sight of the project team leader. Any failure of radio communication requires an evaluation of whether personnel should leave the exclusion zone.

(Horn blast, siren, etc.) is the emergency signal to indicate that all personnel should leave the exclusion zone. In addition, a loud hailer is available if required.

The following standard hand signals will be used in case of failure of radio communications:

- Hand gripping throat: Out of air, can't breathe
- Grip partner's wrist or both hands around waist: Leave area immediately
- Hands on top of head: Need assistance
- Thumbs up: OK, I am all right, I understand
- Thumbs down: No, negative

Telephone communication to the command post should be established as soon as practicable. The phone number is __________.

I. DECONTAMINATION PROCEDURES

Personnel and equipment leaving the exclusion zone shall be thoroughly decontaminated. The standard level decontamination protocol shall be used with the following decontamination stations:

(1) _________ (2) _________ (3) _________
(4) _________ (5) _________ (6) _________
(7) _________ (8) _________ (9) _________
(10) _________ Other _______________________

W68471.BA
GENERIC SITE SAFETY PLAN
Emergency decontamination will include the following stations:

________________________________________________________________________

________________________________________________________________________

The following decontamination equipment is required:

________________________________________________________________________

________________________________________________________________________

(Normally detergent and water) will be used as the decontamination solution.

J. SITE SAFETY AND HEALTH PLAN

1. _______________ is the designated site safety officer (name)
   and is directly responsible to the project team leader for safety recommendations onsite.

2. Emergency Medical Care

   _______________ are the qualified (names of qualified personnel)
   EMTs onsite. _______________ (medical facility names), at
   _______________ (address), phone _______________ is located ___ minutes from this location. (name of person)
   was contacted at ___ and briefed on the situation, the ___ (time) potential hazards, and the substances involved. A map of alternative routes to this facility is available at _______________. (normally command post)

Local ambulance service is available from _______________
at phone _______________. Their response time is
Specific protective equipment for each level of protection is as follows:

<table>
<thead>
<tr>
<th>Level A</th>
<th>Fully-encapsulating suit</th>
<th>Level C</th>
<th>Splash gear (type)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SCBA</td>
<td></td>
<td>Full-face canister</td>
</tr>
<tr>
<td></td>
<td>(disposable coveralls)</td>
<td></td>
<td>resp.</td>
</tr>
</tbody>
</table>

Level B

<table>
<thead>
<tr>
<th>Level B</th>
<th>Splash gear (type)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SCBA</td>
</tr>
</tbody>
</table>

Level D

Other

The following protective clothing materials are required for the involved substances:

<table>
<thead>
<tr>
<th>Substance (Chemical Name)</th>
<th>Material (Material Name, e.g., Viton)</th>
</tr>
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<tbody>
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<td></td>
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</table>

If air-purifying respirators are authorized, (filtering medium) is the appropriate canister for use with the involved substances.
and concentrations. A competent individual has determined that all criteria for using this type of respiratory protection have been met.

NO CHANGES TO THE SPECIFIED LEVELS OF PROTECTION SHALL BE MADE WITHOUT THE APPROVAL OF THE SITE SAFETY OFFICER AND THE PROJECT TEAM LEADER.

G. ONSITE WORK PLANS

Work party(s) consisting of ___ persons will perform the following tasks:

<table>
<thead>
<tr>
<th>Name</th>
<th>(Function)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Team Leader</td>
<td></td>
</tr>
<tr>
<td>Work Party #1</td>
<td></td>
</tr>
<tr>
<td>Work Party #2</td>
<td></td>
</tr>
<tr>
<td>Rescue Team</td>
<td></td>
</tr>
<tr>
<td>(required for entries to IDLH environments)</td>
<td></td>
</tr>
<tr>
<td>Decontamination Team</td>
<td></td>
</tr>
</tbody>
</table>
established at (distance or description of controlled area)

No unauthorized person should be within this area.
The onsite command post and staging area have been established at

The prevailing wind conditions are ________. This location is upwind from the exclusion zone.

Control boundaries have been established, and the exclusion zone (the contaminated area), hotline, contamination reduction zone, and support zone (clean area) have been identified and designated as follows (describe boundaries and/or attach map of controlled area):

These boundaries are identified by (marking of zones, i.e., red boundary tape - hotline; traffic cones - support zone; etc.):

E. HAZARD EVALUATION

The following substance(s) are known or suspected to be onsite. The primary hazards of each are identified.
<table>
<thead>
<tr>
<th>Substances Involved (Chemical Name)</th>
<th>Concentrations (If Known)</th>
<th>Primary Hazards (e.g., toxic on inhalation)</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

The following additional hazards are expected onsite (i.e., slippery ground, uneven terrain, etc.):

Hazardous substance information form(s) for the involved substance(s) have been completed and are attached.

F. PERSONAL PROTECTIVE EQUIPMENT

Based on evaluation of potential hazards, the following levels of personal protection have been designated for the applicable work areas or tasks:

<table>
<thead>
<tr>
<th>Location</th>
<th>Job Function</th>
<th>Level of Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusion Zone</td>
<td></td>
<td>A B C D Other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A B C D Other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A B C D Other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A B C D Other</td>
</tr>
</tbody>
</table>

Contamination Reduction Zone

|                                  |              | A B C D Other       |
|                                  |              | A B C D Other       |
|                                  |              | A B C D Other       |

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GENERIC SITE SAFETY PLAN
B. ENTRY OBJECTIVES

The objective of the initial entry to the contaminated area is to (describes actions, tasks to be accomplished; i.e., identify contaminated soil; monitor conditions, etc.):

________________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________

C. ONSITE ORGANIZATION AND COORDINATION

The following personnel are designated to carry out the stated job functions onsite. (Note: One person may carry out more than one job function.)

PROJECT TEAM LEADER_______________________________________

SCIENTIFIC ADVISOR___________________________________________

SITE SAFETY OFFICER__________________________________________

PUBLIC INFORMATION OFFICER______________________________

SECURITY OFFICER___________________________________________

RECORDKEEPER______________________________________________

FINANCIAL OFFICER___________________________________________

FIELD TEAM LEADER__________________________________________

FIELD TEAM MEMBERS_________________________________________
FEDERAL AGENCY REPS (i.e., EPA, NIOSH)


STATE AGENCY REPS


LOCAL AGENCY REPS


CONTRACTOR(S)


All personnel arriving or departing the site should log in and out with the recordkeeper. All activities onsite must be cleared through the project team leader.

D. ONSITE CONTROL

(Name of individual or agency) has been designated to coordinate access control and security onsite. A safe perimeter has been
3.1.2.2 If a random sample fails to meet the Specifications, the Contractor has the option of removing the lot of carbon from the site within 48 hours of notification or of retesting another random sample at the Contractor's expense. If the retest fails, the lot of carbon must be removed within 48 hours of notification. Under no circumstances will more than one retest be allowed.

3.2 REMOVAL AND REPLACEMENT OF CARBON:

3.2.1 When notified by the Construction Manager that a change of carbon is required, the Contractor shall promptly remove the exhausted carbon and immediately replace it with fresh or regenerated carbon in compliance with Exhibit G.

3.2.2 Spills of carbon shall be immediately and thoroughly cleaned up. Carbon removed from the system shall be assumed to be a hazardous waste and shall be handled in accordance with all federal, state, and local hazardous waste regulations.

4. PAYMENT

4.1 GENERAL: Payment for the work in this section will be included as part of the lump sum bid amount stated in the Bid except as stated below.

4.2 ACTIVATED CARBON: Payment for activated carbon will be on the basis of the unit price stated in the Bid. This unit price shall be the total price per pound of carbon. The unit price shall be the total cost to the Construction Manager of carbon and shall include, but not be limited to, all costs for carbon and for removal, transport, storage, regeneration or disposal of spent carbon in accordance with all federal, state, and local regulations, including hazardous waste regulations, and including all required permits and fees.

4.3 EXTENDED OPERATION: Payment for operation beyond the maximum 2-year period of operation or after the performance objective is met will be on the basis of the unit price as stated in the Bid. This unit price shall be for 1 month of operating time and shall include all materials and work included in the lump sum bid. The unit price shall apply to extended operation of up to twenty-four 1-month periods. Operation beyond that time will be subject to negotiation.

* * * * *
NOTE: This attachment provides a generic plan based on a plan developed by the U.S. Coast Guard for responding to hazardous chemical releases (Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. National Institute for Occupational Safety and Health; Occupational Safety and Health Administration; U.S. Coast Guard; U.S. Environmental Protection Agency. October 1985.). This generic plan can be adapted for designing a Site Safety Plan for hazardous waste site cleanup operations. It is not all inclusive and should only be used as a guide, not a standard.

EXHIBIT A

GENERIC SITE SAFETY PLAN

A. SITE DESCRIPTION

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
</table>

| Hazards | |
|---------| |

| Area Affected | |
|---------------| |

| Surrounding Population | |
|------------------------| |

| Topography | |
|------------| |

| Weather Conditions | |
|--------------------| |

| Additional Information | |
|------------------------| |
|                       | |
|                       | |
|                       | |

W68471.A-CVOM
2.2.9 The top of the stack shall be a minimum of 30 feet above grade. An exit velocity of at least 2,500 ft./min. shall be maintained at normal airflow. The stack shall be a vertical, self-supporting fiberglass-reinforced polyester resin-based cylindrical stack complete with flanged connection, gasket, and lifting lugs. Stack shall be located as shown on Drawings.

2.2.10 Stack resin and construction shall be the same as the adsorber vessel. The stack will be bolted to the adsorber vessel in the field. Certification label and lifting lugs shall be similar to those specified for the adsorber vessel.

2.2.11 The stack material shall conform to the same codes and standards as the adsorber vessel, as applicable. If guy wires must be used for supporting the stack, they shall be self-supporting to the ground and so stated in the Proposal.

2.2.12 Acceptable manufacturers are:

A. Ceilcote Company
B. Heil Process Equipment Company
C. Ershigs, Inc.
D. Chemical Proof Corporation
E. Western Industrial Fiberglass, Inc.
F. Corrosion Controllers
G. Norcon Industrial Plastics
H. Or approved equal

2.2.13 As an alternative, prefabricated carbon canisters, as manufactured by Calgon, or equal, will be considered acceptable for suitably low flows.

2.3 ACTIVATED CARBON REQUIREMENTS:

2.3.1 Activated carbon shall be virgin, granular, derived from either bituminous coal or coconut shells, vapor phase type, suitable for removing organic vapors from air. The carbon shall have the following performance specifications:

- CC14 number, percent by weight minimum (per ASTM D 3467) as performed on substrate carbon
  - 60
- Hardness number, minimum (per ASTM D 3802)
  - 95
- Maximum moisture content, as packed percent by weight (per ASTM D 2867)
  - 2
- Apparent density, minimum (per ASTM D 2854)
  - 0.47 g/cc
Maximum head loss through bed at 1.9
50 fps linear velocity, in.
water/ft bed depth (1)

Mesh Size 4 x 6

(1) Pressure drop shall be determined by passing dry air at 70 degrees F and 1 atmosphere pressure through a 2-inch diameter by 12-inch deep bed of carbon placed in a dense-packed arrangement per ASTM D 2854.

2.3.2 The carbon shall be manufactured by Calgon, Westvaco, Union Carbide, Witco, or approved equal.

2.3.3 If Contractor chooses to regenerate spent carbon from the absorbers, it is to be regenerated to the following specifications:

Carbon tetrachloride adsorption, 60 weight minimum, %

Apparent density, g/cc minimum 0.47

Mesh size (screen analysis shall retain 30-50% with no 4x6 and 6x8 U.S. Sieve Series)

Moisture, as packed, maximum, 5 % by weight

2.4 Sufficient carbon shall be kept onsite at all times to allow complete replacement of spent carbon with fresh carbon in at least one vessel.

3. WORKMANSHIP

3.1 CARBON TESTING AND VERIFICATION PROCEDURE:

3.1.1 Preliminary Verification: The Contractor shall furnish, within 20 days after Contract execution, a certificate certifying that his proposed activated carbon will meet the above specifications.

3.1.2 Testing of Delivered Carbon:

3.1.2.1 Each lot of activated carbon delivered to the jobsite shall be accompanied by an analysis sheet of the measured characteristics of the carbon in that lot. Random samples of the delivered carbon will be selected by the Construction Manager for testing to ensure product quality. If a tested carbon sample fails to meet the Specifications, each subsequently delivered lot will be tested at the Contractor's expense.
1.8 TESTING OF DISCHARGE: The Construction Manager will periodically test the system discharge and will inform the Contractor when the carbon shall be replaced.

1.9 CARBON REMOVAL: Upon notification from the Construction Manager, it shall be the responsibility of the Contractor to remove, transport, and dispose of the exhausted carbon at a RCRA-approved hazardous waste treatment, storage, or disposal facility in accordance with all federal, state, and local hazardous waste regulations and at no additional cost to the Construction Manager. Contractor also has the option of removing, transporting, and regenerating exhausted carbon at a fully licensed regeneration facility at no additional cost to the Construction Manager. It shall be the responsibility of the Contractor to obtain all permits and pay all fees required to accomplish this work. Contractor shall also follow carbon replacement requirements in Exhibit G.

1.10 DISMANTLING SYSTEM: The Construction Manager will notify the Contractor when the Activated Carbon System is no longer required. The Contractor shall promptly dismantle and remove the system from the site and restore the site to its original condition or better.

2. MATERIALS

2.1 COMPLETE SYSTEM: Furnish and install all materials necessary to provide a complete and workable Activated Carbon System including, but not limited to, the following components:

A. At least one granular activated carbon (GAC) adsorption vessel

B. Piping or ductwork to deliver the contaminated air to the carbon adsorption vessel

C. A contaminated air preheater to increase removal efficiency in colder weather

D. A stack for discharge of the treated air to atmosphere

E. Instrumentation as required to monitor the system operation for conformance with operating conditions indicated in the Contractor's Technical Proposal and also in Section GENERAL REQUIREMENTS

F. Sampling ports in the inlet piping or ductwork and in the stack suitable for determining the flow rate and the concentration of VOC's in the air before and after treatment by the Activated Carbon System

2.2 ACTIVATED CARBON VESSEL(S): Provide activated carbon vessel(s) as required to meet the following minimum requirements:
2.2.1 The diameter and number of the vessels shall be sufficient to provide that the air superficial velocity through the carbon bed be no greater than 75 ft/min. at the highest anticipated airflow.

2.2.2 Each vessel shall be a fiberglass-reinforced plastic unit, cylindrically shaped, dished top and flat bottom, with upflow air passage. Unit shall be complete with flanges, nozzles, manways, viewing ports, lifting lugs, anchor lugs, and other appurtenances.

2.2.3 Each vessel shall be equipped with a support mechanism to provide a plenum below the carbon bed at least 2 feet high and covering the entire cross-sectional area of the adsorption vessel.

2.2.4 Access manway covers shall be airtight at the pressure equal to or higher than the corresponding fan static pressure.

2.2.5 Each adsorber vessel shall be furnished to accommodate a minimum depth of 3 feet of activated carbon. The beds are to be supported on a polypropylene screen and fiberglass grating.

2.2.6 The grating and its support ledge shall be capable of supporting 400 pounds per square foot minimum load. Each activated carbon bed shall be grounded with a 316 stainless steel rod to prevent static electricity from accumulating. A predrilled and tapped copper grounding connection shall be located on external vessel walls. Connection to grounding system will be by others.

2.2.7 Each vessel shall be provided with a permanently attached, noncorrosive equipment identification label or plate. The label shall state the following:

A. Equipment identification (tag) number (e.g., AC-1) and vessel name (e.g., Activated Carbon Vessel)
B. Resin type
C. Date of manufacture
D. Location of manufacture
E. Manufacturer

2.2.8 Each vessel shall include the following appurtenances:

A. Manhole of minimum 24-inch diameter
B. Temperature alarm to indicate high temperature in the exit air for use in early detection of combustion in the carbon bed should such combustion occur
C. A bottom 2-inch minimum drain valve
conditions to which they will be exposed. Components exposed to the VOC's shall have demonstrated resistance to chemical attack at the concentrations expected.

3. WORKMANSHIP

3.1 INSTALLATION AND MAINTENANCE OF SYSTEM COMPONENTS: Contractor shall install, operate, and maintain the system components in a safe and efficient manner in accordance with manufacturer's recommendations and all applicable standards of the appropriate trades or professions.

4. PAYMENT

4.1 GENERAL: Payment for the work in this section will be included as part of the Total Lump Sum Amount stated in the Bid.

4.2 EXTENDED OPERATION: Payment for operation beyond the maximum 2-year period of operation or after the performance objective is met, will be on the basis of the unit price as stated in the Bid. This unit price shall be for 1 month of operating time and shall include all materials and work included in the lump sum bid. The unit price shall apply to extended operation of up to twenty-four 1-month periods. Operation beyond that time will be subject to negotiation.

4.3 Following Contract completion, the EPA or MDNR will retain ownership of all SVE System components except for the Activated Carbon System.

* * * * *
1. SCOPE

1.1 WORK INCLUDED: This section covers the work necessary to design, construct, operate, and dismantle the Activated Carbon System, complete. This work includes provision, removal, transportation and disposal of spent carbon as hazardous waste. It is anticipated that the Activated Carbon System will be operated for a maximum of 2 years after substantial completion, 7 days per week, 24 hours per day. However, there is a possibility the Activated Carbon System could be operated for an additional 24 months following the initial period of operation.

1.2 GENERAL: See CONDITIONS OF THE CONTRACT and Division 1, GENERAL REQUIREMENTS, which contain information and requirements that apply to the work specified herein and are mandatory for this project.

1.3 SUBMITTALS DURING CONSTRUCTION: Submittals during construction shall be made in accordance with Division 1, GENERAL REQUIREMENTS.

1.4 SYSTEM PERFORMANCE OBJECTIVE:

1.4.1 It shall be the responsibility of the Contractor to design, construct, maintain and operate the Activated Carbon System so that the following concentrations from the stack shall not be exceeded:

<table>
<thead>
<tr>
<th>Stack Concentration (μg/m3)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrachloroethane</td>
<td>2,400</td>
</tr>
<tr>
<td>Trichloroethene</td>
<td>7,300</td>
</tr>
<tr>
<td>Methylene Chloride</td>
<td>40,600</td>
</tr>
<tr>
<td>Chloroform</td>
<td>800</td>
</tr>
<tr>
<td>Carbon Tetrachloride</td>
<td>1,600</td>
</tr>
<tr>
<td>Vinyl Chloride</td>
<td>16,200</td>
</tr>
<tr>
<td>Benzene</td>
<td>5,700</td>
</tr>
</tbody>
</table>

1.5 COORDINATION WITH VAPOR COLLECTION SYSTEM: It shall be the responsibility of the Contractor to design, construct, install and operate the Activated Carbon System to be compatible in all respects with the Vapor Collection System.

1.6 STARTUP: The Contractor shall be responsible for startup of the System.

1.7 SUPPLIER'S SERVICES: The Contractor shall arrange for the suppliers to provide onsite representatives and services as needed to train MDNR personnel, operate, supervise or troubleshoot at no extra cost to the Construction Manager.
1.8.1 Soil sampling program shall be specified and directed by Construction Manager. Labor and materials required to conduct the sampling program will be provided by others. Soil borings will be installed at locations designated by Construction Manager.

1.8.2 Sampling and analytical costs will be paid by others for the first round of sampling. The Contractor may split samples for independent verification. Contractor shall pay for both sampling and analysis costs for subsequent soil samplings if the initial sampling round fails to verify compliance with the performance objective.

1.8.3 The performance objective will be considered to have been met if:

A. No more than 15 percent of the samples analyzed have concentrations above 1 mg of total VOC's per kg of dry soil and

B. No samples analyzed have concentrations greater than 10 mg of total VOC's per kg of dry soil

1.9 PERIOD OF OPERATION:

1.9.1 The Period of Operation of the Vapor Collection System shall consist of a period of 2 years beyond Substantial Completion or until the Performance Objective is met, whichever comes first.

1.9.2 Contractor shall operate and maintain the system throughout the Period of Operation.

1.9.3 The Construction Manager may elect to extend the Period of Operation by selecting the option as offered by Contractor in the Contractor's Bid.

2. MATERIALS

2.1 MINIMUM REQUIREMENTS OF THE SYSTEM: It shall be the responsibility of the Contractor to design, furnish, and install all components necessary to provide a complete, workable, and efficient Vapor Collection System that is capable of achieving the Performance Objective as specified herein. The Vapor Collection System shall include, but not be limited to, the following minimum requirements:

A. Wells complete with well screen, casing, well head, and transition to piping system in accordance with these Specifications and Contractor's Technical Proposal

B. No less than five soil vapor extraction wells
C. Vacuum pumping equipment as required to induce the desired flow of air from each well

D. Air piping to collect the contaminated air and deliver the air to the Activated Carbon System

E. Each extraction well transfer pipe shall contain a throttling valve to regulate and optimize airflow rate

F. Provide adequate freeze and moisture protection on all exposed piping, vacuum equipment, and instrumentation and controls

G. Instrumentation as required to monitor the system operation for conformance with operating conditions indicated in the Contractor's Technical Proposal and to:
   - Provide weekly average airflow rate from each extraction well transfer pipe and daily average total airflow rate from all extraction wells combined
   - Provide weekly total airflow from each extraction well transfer pipe and daily total of the combined airflow rate from all extraction wells combined
   - Provide daily average vacuum pressure at the inlet of the vacuum pump
   - Provide daily average pressure at the outlet of the vacuum pump
   - Provide weekly average vacuum at each extraction well

H. Sampling ports suitable for determining the concentration of VOC's in the air extracted from each well and from the combined airflow prior to activated carbon treatment

I. All electrical work including materials, installation, and testing shall be performed in strict accordance with the latest applicable rules and regulations, requirements, and specifications of the following:
   - Local laws and ordinances
   - State and federal laws
   - National Electrical Code
   - State Fire Marshal
   - Underwriters' Laboratories

2.2 MATERIALS OF CONSTRUCTION: System components shall be constructed of materials suitable for long life in the environmental
Contractor shall renovate and reseed the Class A or unsatisfactory portions thereof immediately, or, if after October 10, during the next planting season. If a satisfactory stand of Class A seeding develops by July 1 of the following year, it will be accepted. If it is not accepted, a complete replanting will be required during the planting season meeting all of the requirements specified under CONSTRUCTION METHODS.

3.4.2 A satisfactory stand is defined as follows:

A. No bare spots larger than 1 square foot

B. Not more than 10 percent of total area with bare spots larger than 6 inches square

3.5 INSPECTION FOR ACCEPTANCE: Eight weeks after the start of maintenance on the last section of completed Class A seeding and on written notice from the Contractor, the Construction Manager will, within 15 days of such written notice, make an inspection to determine if a satisfactory stand has been produced. If a satisfactory stand has not been established, another inspection will be made after written notice from the Contractor that the Class A seeding is ready for inspection following the next growing season.

4. PAYMENT

4.1 GENERAL: Payment for the work in this section will be included as part of the lump sum bid amount stated in the Bid.

* * * * *
1. SCOPE

1.1 WORK INCLUDED: This section covers the work necessary to design, construct, and operate the Vapor Collection System, complete. It is anticipated that the Vapor Collection System will be operated for a maximum of 2 years, 7 days per week, 24 hours per day. However, there is a possibility the Vapor Collection System could be operated for an additional 24 months following the initial period of operation.

1.2 GENERAL: See CONDITIONS OF THE CONTRACT and Division 1, GENERAL REQUIREMENTS, which contain information and requirements that apply to the work specified herein and are mandatory for this project.

1.3 SUBMITTALS DURING CONSTRUCTION: Submittals during construction shall be made in accordance with Division 1, GENERAL REQUIREMENTS.

1.4 PERFORMANCE OBJECTIVE:

1.4.1 It shall be the responsibility of the Contractor to design, install, maintain, and operate the Vapor Collection System so that no samples analyzed have concentrations greater than 10 mg of total VOC's per kg of soil (dry soil basis) and no more than 15 percent of the samples analyzed have concentrations above 1 mg of total VOC's per kg of soil (dry soil basis).

1.4.2 For purposes of meeting this objective, total VOC's shall be defined as the sum of the concentrations of all constituents determined by EPA SW 846, EPA Method 5030, Methods 8010 (halogenated volatile organics), 8015 (nonhalogenated volatile organics), and 8020 (aromatic volatile organics).

1.5 COORDINATION WITH ACTIVATED CARBON SYSTEM: It shall be the Contractor's responsibility to design, construct, install and operate the Vapor Collection System to be compatible in all respects with the Activated Carbon System.

1.6 STARTUP: The Contractor shall be responsible for startup of the system.

1.7 SUPPLIERS' SERVICES: The Contractor shall arrange for suppliers to provide onsite representatives and services as needed to train MDNR personnel, operate, supervise or troubleshoot, at no extra cost to the Construction Manager.

1.8 PERFORMANCE TESTING: Contractor shall notify Construction Manager when they believe they have attained the performance objective, and they want to begin the soil sampling program.

W68471.BA  MAR 25, 1987
11001 VAPOR COLLECTION SYSTEM
1. SCOPE

1.1 WORK INCLUDED: This section covers the work necessary for the Class A seeding establishment, complete, including furnishing and delivery of material, leveling and smoothing of the ground, seedbed preparation, seeding, and maintenance of Class A seeding.

1.2 GENERAL: See CONDITIONS OF THE CONTRACT and Division 1, GENERAL REQUIREMENTS, which contain information and requirements that apply to the work specified herein and are mandatory for this project.

1.3 STANDARD SPECIFICATIONS: Where the term "Standard Specifications" is used, such reference shall mean the current edition of Michigan Department of Transportation Standard Specifications for Construction. Where reference is made to a specific part of the Standard Specifications, such applicable part shall be considered as part of this section of the Specifications. In case of a conflict in the requirements of the Standard Specifications and the requirements stated herein, the requirements herein shall prevail.

1.4 RELATIVE COMPACTION: Relative compaction is defined as the ratio, in percent, of the as-compacted field dry density to the laboratory maximum dry density as determined by corrections for oversized material may be applied to either the as-compacted field dry density or the maximum dry density, as determined by the Construction Manager.

2. MATERIALS

2.1 TOPSOIL: Topsoil shall conform to Section 6.53.02 of the Standard Specifications.

2.2 FERTILIZER: Chemical fertilizer for seeding shall conform to Section 8.21.10 of the Standard Specifications.

2.3 MULCH: . Mulching materials shall conform to Section 8.21.11 of the Standard Specifications.

2.4 SEED:

2.4.1 General: Certified, blue tag, clean, delivered in original, unopened packages and bearing an analysis of the contents, conforming to Section 8.21.09 of the Standard Specifications.

2.4.2 Seed Mix: Seed mix shall conform to Section 8.21.09 of the Standard Specifications.
3. WORKMANSHIP

3.1 PROJECT SCHEDULE: Within 20 calendar days of the scheduled time for seedbed preparation, submit to the Construction Manager a proposed time schedule indicating dates for beginning and completion of the following operations:

   A. Delivery of materials
   B. Preparation of seedbed
   C. Planting Class A seeding
   D. Maintenance

3.2 CONSTRUCTION METHODS:

3.2.1 Site Grading: Slope finish grade to be compatible with surrounding terrain. Provide positive drainage and minimize any change to existing drainage paths. Site shall be graded to 6 inches in elevation above east curb of Raymond Road. Obtain Construction Manager's approval of site grading prior to seedbed preparation.

3.2.2 Methods for Seeding: Workmanship in preparation, planting, and maintenance shall strictly conform to the applicable portions of Section 6.53 of the Standard Specifications.

3.3 MAINTENANCE:

3.3.1 Seeded Area: Protect new seeded area from pedestrian traffic by erecting a fence of 2-inch by 2-inch posts 4 feet high spaced 10 feet on center and strung with a single strand of No. 12-gauge wire marked with cloth strips at 3-foot intervals between posts.

3.3.2 Maintenance Period: Begin maintenance immediately after each portion of Class A seeding is planted and continue for 8 weeks after all planting is completed.

3.3.3 Maintenance Operations: Water to keep surface soil moist. Repair washed out areas by filling with topsoil, fertilizing, and seeding. Replace mulch on banks when washed or blown away. Repair fence, mow to 2 inches after roadside seeding reaches 3 inches in height, and mow frequently enough to keep roadside seeding from exceeding 3-1/2 inches. Weed by local spot application of selective herbicide only after first planting season when roadside seeding is established.

3.4 GUARANTEE:

3.4.1 If, at the end of the 8-week Class A maintenance period, a satisfactory stand of Class A seeding has not been produced, the
3.3.8 Complete the excavation, and remove the tank, placing it in a secure location with relief hole at the top of the tank. Block the tank to prevent movement. Notify Construction Manager immediately after tank is removed from ground.

3.3.9 If the tank is moved from the site in one-piece, plug or cap all holes. Use screwed (boiler) plugs to plug any corrosion leak holes. One plug should have a 1/8-inch vent hole to prevent the tank from being subjected to an excessive pressure differential caused by extreme temperature changes. The tank should be secured so that the 1/8-inch vent hole is located at the uppermost point on the tank. The outside surface of the tank should be free of debris and oil.

3.3.10 If a tank remains at the site overnight, or longer, additional vapor may be released from liquid held in the scale or sediment in the tank. Consequently, tanks should be removed from the premises as promptly as possible.

3.4 STOCKPILING EXCAVATED MATERIALS: During tank excavation, place the excavated soil within the approved working area. Stockpiled material shall be covered daily with 4-mil visqueen, or equivalent, if VOC concentrations exceed MDNR Air Quality Criteria.

3.5 TANK DISPOSAL:

3.5.1 Contractor shall notify Construction Manager prior to cutting up each tank.

3.5.2 Metal tanks and piping shall be cut up and thoroughly cleaned prior to selling them as scrap metal. Contractor shall be responsible for identifying all preparation requirements and for obtaining any required permits to sell tanks as scrap metal prior to starting tank removal project. Contractor shall inform Construction Manager of the name and location of company purchasing tanks and piping for reuse as scrap metal.

3.6 DISPOSAL OF TANK SLUDGES: Contaminated tank sludges will be collected and contained in 55-gallon drums. Drums shall be stored onsite no more than 90 days and then shall be disposed of at a RCRA-compliant, licensed hazardous waste landfill at the sole expense of the Contractor.

3.7 DISPOSAL OF CONTAMINATED WATER: All water used for decontamination of tank, equipment, and personnel shall be disposed of in the Exclusion Zone (Zone 1), with no runoff permitted.

3.8 PERMITS, APPROVALS, AND REGULATIONS: The Contractor shall be responsible for complying with any applicable state, federal, and local regulations applicable to the activities described herein. This includes securing the necessary permits and approvals, and proper notification of the local fire department.
3.9 BACKFILL: Backfill shall be brought up to original grade with not less than 90 percent relative compaction. Refer to Section CLASS A SEEDING for definition of relative compaction.

3.10 SHORING, SHEETING, AND BRACING OF TRENCHES: Sheet and brace the trench when necessary to prevent cave-in during excavation of unstable material, or to protect adjacent structures, property, workers, and the public. Maintain sheeting in place until the tank has been removed and the excavation backfilled. Shoring and sheeting shall be removed, as the backfilling is done, in a manner that will not permit voids in the backfill. All sheeting, shoring, and bracing of trenches shall conform to the safety requirements of the federal, state, or local public agency having jurisdiction. The most stringent of these requirements shall apply.

4. PAYMENT

4.1 GENERAL: Payment for the work in this section will be included as part of the lump sum bid amount stated in the Bid.

* * * * *
1. SCOPE

1.1 WORK INCLUDED:

1.1.1 This section covers the work necessary to excavate, remove, clean, and dispose of the estimated 21 abandoned underground storage tanks at the Thomas Solvents Raymond Road site. The Contractor shall be responsible for:

A. Excavation and removal of underground storage tanks (the approximate locations and capacities of these tanks are shown on the site map). "Underground storage tank", by definition, includes the tank, associated piping, fittings, fill line, and vent line.

B. Transport offsite and disposal of removed tanks as scrap metal.

C. Disposal of any contaminated sludge found in the tanks.

D. Backfill and restoration of excavation area.

E. Compliance with all applicable state, federal, city, and county ordinances and regulations, including necessary permits and approvals. It is suggested Contractor follow the American Petroleum Institute (API) Bulletin 1604, "Recommended Practice for Abandonment or Removal of Used Underground Service Station Tanks", March 1981.

1.1.2 Contractor shall complete all work herein contained no later than 24 months from substantial completion.

2. MATERIALS

2.1 BACKFILL: Excavated sandy material, free from roots, organic material, rubble, debris, rocks larger than 2-1/2 inches, clay, and other deleterious material.

3. WORKMANSHIP

3.1 SAFETY REQUIREMENTS:

3.1.1 The Contractor shall follow safety procedures outlined in its Site Safety Plan during all phases of underground tank removal to ensure the health and safety of all persons and property in the vicinity of the project site. Contractor's procedures shall also follow rules, regulations, and guidelines listed in Exhibit B.
3.1.2 The Contractor shall at all times provide for safe access to the work for the Construction Manager, MDNR, and EPA representatives.

3.1.3 The Contractor shall be responsible for barricading off any excavation area and conspicuously placing markers to prevent the unknowing entry onto the work site.

3.2 UTILITIES: If utility lines are exposed by excavation, further excavation shall stop until the Construction Manager is notified of the situation.

3.3 TANK REMOVAL: The safe removal of underground tanks should include the steps described below. Alternative procedures may be employed subject to prior approval from the Construction Manager.

3.3.1 Remove all liquid and sludge from the tank.

3.3.2 Dig down to the top of the tank.

3.3.3 Remove the fill (drop) pipe. Disconnect the fill, gauge, sludge, and vent lines.

3.3.4 Steam clean or hydroblast tank exterior and interior onsite.

3.3.5 Remove flammable vapors. The tank should be conditioned as described below, or as required by local codes, to ensure that no flammable vapors remain. To minimize air emissions when removing the tank of flammable vapors, the limit for residual liquid is 0.001 gallons of liquid organic compound per gallon of tank capacity unless emissions of organic compounds to the atmosphere are reduced by at least 90 percent. Therefore, for a 1,000-gallon tank, no more than 1 gallon of residual liquid may remain in the tank before it is purged.

3.3.6 The vapors in the tank may be made inert by adding solid carbon dioxide (dry ice) in the amount of 1.5 pounds per 100 gallons of tank capacity. The dry ice should be crushed and distributed evenly over the greatest possible area to secure rapid sublimation. Avoid skin contact with dry ice, because it may produce burns. As the dry ice vaporizes, flammable vapors will flow out of the tank and may surround the area. Hence, observe all normal safety precautions regarding flammable vapors. Make sure that all of the dry ice has vaporized.

3.3.7 After flammable vapors have been removed, the Contractor shall arrange for a tank inspection and approval by the local fire department, Emmett Township Fire Department 616/968-9303, prior to tank removal.
8.9.3 Samples also shall be taken during the course of the work, as required by the Construction Manager.

8.9.4 Laboratory tests and examinations that the Construction Manager elects to make in its own laboratory will be made at no cost to the Contractor, except that, if a sample of any material or equipment proposed for use by the Contractor fails to meet the Specifications, the cost of testing subsequent samples shall be borne by the Contractor.

8.9.5 Material used in the work shall conform with the submitted samples and test certificates as approved by the Construction Manager.

8.10 SUPPLIERS'/MANUFACTURERS' SPECIAL SERVICES:

8.10.1 Functional Testing: Where functional testing services are called for in the Technical Specifications, or when technical assistance is necessary to resolve performance problems that may become apparent during the performance test, a manufacturer's representative shall provide such assistance as necessary to demonstrate the specified performance.

8.10.2 The Contractor shall furnish all labor, materials, tools, equipment, instruments, and services necessary to perform the functional and performance testing.

8.10.3 Contractor shall provide at the jobsite a minimum of 2 days of training for two of the Construction Manager's personnel in the operation and maintenance of the soil vapor extraction system. Satisfactory completion of this requirement shall be determined by the Construction Manager.

9. PAYMENT

9.1 GENERAL: Payment for the work in this section will be included as part of the lump sum bid or applicable unit prices stated in the Bid.
TYPICAL MAINTENANCE SUMMARY FORM

1. EQUIPMENT ITEM____________________________________________________

2. MANUFACTURER____________________________________________________

3. EQUIPMENT IDENTIFICATION NUMBER(S)________________________________

4. WEIGHT OF INDIVIDUAL COMPONENTS (OVER 100 POUNDS)________________

5. NAMEPLATE DATA (hp, voltage, speed, etc.)______________________________

6. MANUFACTURER'S LOCAL REPRESENTATIVE
   Name__________________________________________Telephone No.____
   Address________________________________________

7. MAINTENANCE REQUIREMENTS

<table>
<thead>
<tr>
<th>Maintenance Operation</th>
<th>Frequency</th>
<th>Lubricant (If Applicable)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>List briefly each maintenance operation req'd. &amp; refer to specific information in mfr's. std. maintenance manual, if applicable.</td>
<td>List req'd frequency of each maintenance operation.</td>
<td>Refer by symbol to lubricant list req'd.</td>
<td></td>
</tr>
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</tr>
</tbody>
</table>

8. LUBRICANT LIST

<table>
<thead>
<tr>
<th>Reference Symbol</th>
<th>Shell</th>
<th>Std. Oil</th>
<th>Gulf</th>
<th>Arco</th>
<th>Or Equal</th>
</tr>
</thead>
<tbody>
<tr>
<td>List symbols used in Item 7. above.</td>
<td>List equivalent lubricants, as distributed by each manufacturer for the specific use recommended.</td>
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9. SPARE PARTS. Include your recommendations regarding what spare parts, if any, should be kept on the job.

* * * * *
8.7.3 Each instruction manual shall include, but not be limited to, the following:

A. Diagrams and illustrations
B. Detailed description of the function of each principal component of the system
C. Performance and nameplate data
D. Installation instructions
E. Procedure for starting
F. Proper adjustment
G. Test procedures
H. Procedure for operating
I. Shutdown instructions
J. Emergency operating instructions and troubleshooting guide
K. Safety precautions, including, but not limited to, use of respiratory protection by operators
L. Maintenance and overhaul instructions which shall include detailed assembly drawings with part numbers, parts list, instructions for ordering spare parts, and complete preventive maintenance instructions required to ensure satisfactory performance and longevity of the equipment
M. Lubrication instructions, which shall list points to be greased or oiled, shall recommend type, grade, and temperature range of lubricants, and shall recommend frequency of lubrication
N. List of electrical relay settings and control and alarm contact settings
O. Electrical interconnection wiring diagram for equipment furnished, including all control and lighting systems

8.7.4 Manuals shall be complete in all respects for all equipment, controls, accessories, and associated appurtenances.

8.7.5 Manuals shall be assembled in one or more binders, each with title page, typed table of contents, and heavy section dividers with numbered plastic index tabs. Binders shall be three-ring, hard-back type. All data shall be punched for binding and composition and printing shall be arranged so that punching does not obliterate any
data. The project title, division designation, and manual title printed thereon shall be as furnished by the Construction Manager.

8.7.6 Each O & M Manual shall be transmitted to the Construction Manager prior to installation of the equipment and all equipment shall be serviced in accordance with the manufacturer's recommendations prior to operation. A service record shall be maintained on each item of equipment and shall be delivered to the Construction Manager prior to final acceptance of the project.

8.8 MAINTENANCE SUMMARY FORMS:

8.8.1 In addition to the O & M Manuals, provide MAINTENANCE SUMMARIES in the format of the form bound at the end of this section and described below. The timing of submission of these forms shall be the same as prescribed above for the Operation and Maintenance Manuals.

8.8.2 An individual MAINTENANCE SUMMARY for each equipment item shall be compiled following the outline provided; and six copies submitted for review by the Construction Manager. The manufacturer's standard form will not be acceptable as a substitute for the MAINTENANCE SUMMARY.

8.8.3 The term "Maintenance Operation" as used in the MAINTENANCE SUMMARY bound at the end of this section is understood to mean any routine operation required to ensure the satisfactory performance and longevity of the equipment. Examples of some typical Maintenance Operations are lubrication, belt tensioning, adjustment of pump packing glands, routine adjustments, etc.

8.8.4 The MAINTENANCE SUMMARY may take as many pages as required. However, the order and format shown must be adhered to. Only 8-1/2-inch by 11-inch paper will be accepted.

8.9 SAMPLES AND TEST SPECIMENS:

8.9.1 Where required in the Specifications, and as determined necessary by the Construction Manager test specimens or samples of materials, appliances, and fittings to be used or offered for use in connection with the work shall be submitted to the Construction Manager at the Contractor's expense, with information as to their sources, with all cartage charges prepaid, and in such quantities and sizes as may be required for proper examination and tests to establish the quality or equality thereof, as applicable.

8.9.2 All samples and test specimens shall be submitted in ample time to enable the Construction Manager to make any tests or examinations necessary, without delay to the work. The Contractor will be held responsible for any loss of time due to its neglect or failure to deliver the required samples to the Construction Manager as specified.
8.2.5 The review of such shop drawings and catalog cuts by the Construction Manager shall not relieve the Contractor from responsibility for correctness of dimensions, fabrication details, and space requirements, or for deviations from the Contract Drawings or Specifications, unless the Contractor has called attention to such deviations in writing by a letter accompanying the shop drawings and the Construction Manager approves the change or deviation in writing at the time of submission; nor shall review by the Construction Manager relieve the Contractor from the responsibility for errors in the shop drawings.

8.2.6 The Contractor agrees that shop drawing submittals processed by the Construction Manager do not become Contract Documents and are not Change Orders; that the purpose of the shop drawing review is to establish a reporting procedure and is intended for the Contractor's convenience in organizing his work and to permit the Construction Manager to monitor the Contractor's progress and understanding of the design.

8.3 SHOP DRAWING REQUIREMENTS:

8.3.1 Shop drawings referred to herein shall include shop drawings and other submittals for both shop and field-fabricated items. The Contractor shall submit, as applicable, the following for all prefabricated or manufactured structural, mechanical, electrical, plumbing, process systems, and equipment:

A. Shop drawings or equipment drawings, including dimensions, size and location of connections to other work, and weight of equipment

B. Catalog information and cuts

C. Installation or placing drawings for equipment, drives, and bases

D. Wiring and control diagrams of systems and equipment

E. Complete manufacturer's specifications, including materials description and paint system

F. List of all requested exceptions to the Contract Documents

G. Suggested spare parts list with current price information

H. List of special tools required for checking, testing, parts replacement, and maintenance (special tools are those which have been specially designed or adapted for use on parts of the equipment, and which are not customarily and routinely carried by maintenance mechanics)
I. List of special tools furnished with the equipment

8.3.2 The submittals shall include satisfactory identification of items, units, and assemblies in relation to the Specification section number if applicable.

8.3.3 Should the Contractor propose any item on his shop drawings, or incorporate an item into the Work, and that item should subsequently prove to be defective or otherwise unsatisfactory, (regardless of the Construction Manager's preliminary review), the Contractor shall, at his own expense, replace the item with another item that will perform satisfactorily.

8.4 FINAL SHOP DRAWINGS TO BE SUBMITTED TO THE Construction Manager: Complete sets of reproducible final shop drawings shall be submitted to the Construction Manager before or at the time of delivery of equipment to the site.

8.5 SEISMIC LOADING DESIGN PROVISIONS: All equipment supports specified to be designed by equipment manufacturers or suppliers shall be designed by a structural engineer registered in the State of Michigan and shall be designed in accordance with the seismic provisions of the latest edition of the Uniform Building Code, in addition to all other loading conditions.

8.6 RECORD DRAWINGS: The Contractor shall submit a complete set of as-built record drawings to the Construction Manager no later than 7 calendar days after the scheduled completion of the work.

8.7 OPERATION AND MAINTENANCE (O & M) MANUALS:

8.7.1 The Contractor shall furnish ten copies of a complete instruction manual for installation, operation, maintenance, and lubrication requirements for each component of mechanical, instrumentation and control, and electrical equipment or system. All equipment manufacturers and/or suppliers shall be made aware of these requirements and all associated costs shall be included in the costs for furnishing the equipment or system. Each instruction manual furnished shall be fixed in hard-back cover or file folder which is clearly labeled to designate the system or equipment for which it is intended with reference to the building and equipment number, and the Specification Section where the item is specified. The Construction Manager will assemble the instruction manuals for all mechanical and electrical equipment into one main Operation and Maintenance (O & M) Manual for the entire project.

8.7.2 The manuals shall be furnished at least 7 calendar days prior to the scheduled completion of the work. Any deficiencies found by the Construction Manager to exist in the manuals submitted shall be corrected by the Contractor within 30 calendar days following notification by the Construction Manager of the deficiencies.
7.4 FINISHING OF SITE AND STORAGE AREAS: Upon completion of the project, all areas used by the Contractor shall be properly cleared of all temporary structures, rubbish, and waste materials.

7.5 STREET CLEANUP DURING CONSTRUCTION: Thoroughly clean all spilled dirt, gravel, or other foreign material caused by the construction operations from all streets and roads at the conclusion of each day's operation.

7.6 SECURITY FENCE: Contractor's security fence must be constructed for the protection of materials, tools, and equipment of the Contractor and subcontractors and to prevent contact with potentially harmful materials by the public. At completion of the work, remove fence from the site and restore the area.

8. SUBMITTALS DURING CONSTRUCTION

8.1 GENERAL:

8.1.1 Requirements in this section are in addition to any specific requirements for submittals specified in other sections of these Contract Documents.

8.1.2 Submittals to the Construction Manager shall be addressed to: CH2M HILL, INC., 2300 N.W. Walnut Blvd., (P.O. Box 428,) Corvallis, Oregon 97339, Attn: Alan Amoth.

8.1.3 Submitted data shall be fully sufficient in detail for determination of compliance with the Contract Documents.

8.1.4 Review, acceptance, or approval of substitutions, schedules, shop drawings, lists of materials, and procedures submitted or requested by the Contractor shall not add to the Contract amount, and all additional costs which may result therefrom shall be solely the obligation of the Contractor.

8.1.5 The Construction Manager is not precluded, by virtue of review, acceptance, or approval, from obtaining a credit for construction savings resulting from allowed concessions in the work or materials therefor.

8.1.6 It shall not be the responsibility of the Construction Manager to provide engineering or other services to protect the Contractor from additional costs accruing from such approvals.

8.1.7 No equipment or material for which listings, drawings, or descriptive material is required shall be installed until the Construction Manager has on hand copies of such approved lists and the appropriately stamped final shop drawings.
8.1.8 The review of drawings by the Construction Manager will be limited to general design requirements only, and shall in no way relieve the Contractor from responsibility for errors or omissions contained therein.

8.1.9 Submittals will be acted upon by the Construction Manager as promptly as possible, and returned to the Contractor not later than the time allowed for review in SHOP DRAWING SUBMITTAL PROCEDURE. Delays caused by the need for resubmittals shall not constitute reason for an extension of Contract time.

8.2 SHOP DRAWING SUBMITTAL PROCEDURE:

8.2.1 The Contractor shall submit five copies, to the Construction Manager for its review, of such shop drawings, electrical diagrams, and catalog cuts for fabricated items and manufactured items (including mechanical and electrical equipment) required for the construction. Shop drawings shall be submitted in sufficient time to allow the Construction Manager not less than 5 regular working days for examining the shop drawings.

8.2.2 These shop drawings shall be accurate, distinct, and complete, and shall contain all required information, including satisfactory identification of items, units, and assemblies in relation to the Contract Drawings and Specifications.

8.2.3 Unless otherwise approved by the Construction Manager shop drawings shall be submitted only by the Contractor, who shall indicate by a signed stamp on the shop drawings, or other approved means, that it (the Contractor) has checked and approved the shop drawings, and that the work shown is in accordance with Contract requirements and has been checked for dimensions and relationship with work of all other trades involved. The practice of submitting incomplete or unchecked shop drawings for the Construction Manager to correct or finish will not be acceptable, and shop drawings which, in the opinion of the Construction Manager clearly indicate that they have not been checked by the Contractor will be considered as not complying with the intent of the Contract Documents and will be returned to the Contractor for resubmission in the proper form.

8.2.4 When the shop drawings have been reviewed by the Construction Manager two sets of submittals will be returned to the Contractor appropriately stamped. If major changes or corrections are necessary, the shop drawing may be rejected and one set will be returned to the Contractor with such changes or corrections indicated, and the Contractor shall correct and resubmit the shop drawings in the same manner and quantity as specified for the original submittal, unless otherwise directed by the Construction Manager. If changes are made by the Contractor (in addition to those requested by the Construction Manager) on the resubmitted shop drawings, such changes shall be clearly explained in a transmittal letter accompanying the resubmitted shop drawings.
5.3.9.2 The Contractor shall maintain a log of the location, time, type, and value of each reading. Copies of daily log sheets shall be included in a daily report to the Construction Manager. Daily log sheets shall be provided to the Construction Manager within 24 hours.

5.3.9.3 Contractor's Site Safety Plan shall indicate air monitoring readings or indications that will be used to initiate protective actions including, but not limited to, use of personal protective devices and site evacuation. Contractor shall provide justification for such action levels included in their Site Safety Plan.

5.3.9.4 Oxygen levels of less than 19.5 percent in any storage tanks or other enclosed spaces (cisterns, vaults, etc.) shall necessitate the use of self-contained breathing apparatus or the positive ventilation of the space until oxygen levels above 19.5 percent are achieved before commencing Work in the enclosed space.

5.3.9.5 In the event wind direction places the support area in a downwind condition and the total organic vapor level exceeds 5 ppm above background levels for any 5-minute reading, personnel in the support area shall immediately evacuate the area to an upwind position. Reentry into the area shall not be allowed until the conditions that prompted the evacuation have abated.

5.3.9.6 Several wind sock(s) or surveyor's tapes shall be provided for quick wind direction determination, and shall be visible from all areas of the site, especially active Work areas.

5.4 WORK LIMITATIONS DUE TO SITE HEALTH AND SAFETY CIRCUMSTANCES:
Prior to the execution of any site work the Contractor shall review the final Summary of Site/Waste Characteristics to be provided by the Construction Manager. A draft Summary of Site/Waste Characteristics is attached as Exhibit C.

5.5 ACCIDENT REPORTS:

5.5.1 If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone to the Construction Manager. In addition, the Contractor must promptly report in writing to the Construction Manager all accidents whatsoever arising out of, or in connection with, the performance of the Work whether on, or adjacent to, the site, giving full details and statements of witnesses.

5.5.2 If a claim is made by anyone against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Construction Manager, giving full details of the claim.

5.6 SAFE ACCESS BY FEDERAL, STATE, AND LOCAL GOVERNMENT OFFICIALS:
Authorized and properly trained representatives of the United States
Environmental Protection Agency, and Michigan Department of Natural Resources shall have access to the Work when such access is considered by the Contractor to be safe, and the Contractor shall provide proper facilities for such access and inspection.

5.7 PROTECTION OF PRIVATE PROPERTY: Protect stored materials, cultivated trees and crops, and other items located adjacent to the proposed work. Notify property owners affected by the construction at least 48 hours in advance of the time construction begins. During construction operations, construct and maintain such facilities as may be required to provide access by all property owners to their property. No person shall be cut off from access to his residence or place of business for a period exceeding 8 hours, unless the Contractor has made special arrangements with the affected persons.

5.8 FIRE PREVENTION AND PROTECTION: The Contractor shall perform all work in a fire-safe manner. It shall supply and maintain on the site adequate fire-fighting equipment capable of extinguishing incipient fires. The Contractor shall comply with applicable federal, state, and local fire-prevention regulations. Where these regulations do not apply, applicable parts of the National Fire Prevention Standard for Safeguarding Building Construction Operations (NFPA No. 241) shall be followed.

5.9 NIGHT EMERGENCY NUMBER: The Contractor shall leave a night emergency telephone number or numbers with the police department, so that contact may be made easily at all times in case of barricade and flare trouble or other emergencies.

6. SITE SECURITY

6.1 GENERAL: Site security from trespass, vandalism and public contact with potentially harmful material shall be the responsibility of the Contractor.

7. SITE MAINTENANCE AND CLEANUP

7.1 GENERAL: At all times during the work, keep the work areas clean and orderly, and upon completion of the work, repair all damage caused by equipment and leave the project free of rubbish or excess materials of any kind.

7.2 CLEANUP OF CONSTRUCTION AREAS: Clean all equipment as directed in Paragraph HEALTH AND SAFETY REQUIREMENTS prior to removal from the site. Replace or repair any facility which has been damaged during the construction work. Restore the site as nearly as possible to its original condition.

7.3 CONTAMINATION PRECAUTIONS: Avoid contamination of the project area. Do not dump waste oil, rubbish, or other similar materials on the ground.
5.3.6.6 The support zone (Zone 3) shall be provided by the Contractor with 20-pound ABC type dry chemical fire extinguishers. Fire extinguishers of this size and type shall also be Contractor provided at any other site locations where flammable materials present a fire risk, including work areas within Zone 1.

5.3.7 Personal Hygiene and Decontamination:

5.3.7.1 The Contractor shall be responsible for, and ensure that all Contractor, subcontractor, and service personnel performing or supervising remedial work within the exclusion zone (Zone 1) or contamination reduction zone (Zone 2), or exposed or subject to exposure to hazardous chemical vapors, liquids, or contaminated solids, observe and adhere to the personal hygiene-related provisions of this section, the EPA STANDARD OPERATING SAFETY GUIDES, the OSHA GUIDANCE MANUAL, and all federal and OSHA regulations and guidance.

5.3.7.2 Contractor, subcontractor, and service personnel found to be consistently disregarding the personal hygiene-related provisions of this plan shall, at the request of the Construction Manager, be barred from the site.

5.3.7.3 The Contractor shall provide:

A. Suitable disposable outer wear, gloves, hard hats, and footwear on a daily basis for the use of onsite personnel

B. Appropriate MSHA/NIOSH certified respirators, if required, in sufficient quantities for onsite personnel

C. Canisters, cartridges, breathing grade air, spare parts, respirator repair tools, hoses, connectors, cascade and filling system and other respirator protection support items as directed by the Construction Manager

D. Contained storage and disposal of disposable outer wear

E. Handwashing facilities

F. A facility for changing into and out of and storing work clothing, separate from street clothing, including separate facilities for women

G. Sanitation facilities as specified in 29 CFR 1926

H. A lunch and/or break area

I. A smoking area well separated from Zones 1 and 2
5.3.7.4 Used disposable outer wear shall not be reused, and when removed, shall be placed inside disposal containers provided for the purpose.

5.3.7.5 Smoking, chewing, eating and drinking shall be prohibited in Zones 1 and 2.

5.3.7.6 Soiled disposable outer wear shall be removed prior to leaving Zone 2 to enter Zone 3, and prior to cleansing hands.

5.3.7.7 Contractor, subcontractor, and service personnel shall be required to thoroughly cleanse their hands and other exposed areas before entering the smoking or lunch area.

5.3.7.8 Prior to beginning any work in the potentially hazardous waste area, the Contractor shall submit a layout of the decontamination facilities on the site. The Contractor shall also indicate designated lunch and break areas.

5.3.8 Equipment Decontamination:

5.3.8.1 The Contractor shall provide an equipment decontamination station within the contamination reduction area for removing contaminants from all vehicles and equipment leaving the exclusion zone (Zone 1).

5.3.8.2 Washwater shall be disposed of onsite. No washwater shall be allowed to run off the site onto rights-of-way or adjacent property.

5.3.8.3 Personnel engaged in vehicle decontamination shall wear protective equipment including disposable clothing and respiratory protection as conditions require under the Contractor's Site Safety Plan.

5.3.8.4 The decontamination area shall be considered a hazardous work area.

5.3.8.5 Any item taken into the exclusion zone must be assumed to be contaminated and must be decontaminated when the item leaves the zone. Vehicles, equipment, and materials brought into the exclusion area (Zone 1) will remain in Zone 1 until no longer necessary for the project. All contaminated vehicles, equipment, and materials shall be cleaned prior to leaving the site.

5.3.9 Air Monitoring:

5.3.9.1 Contractor shall monitor the quality of the air in and around each active work location. On a regular periodic basis (continually when respiratory protection is worn; at least hourly at other times) in accordance with the requirements of Paragraph (h) of 29 CFR 1910.120.
name of the physician and evidence of examination of all onsite personnel shall be part of the Contractor's project records and logs.

5.3.4.6 All onsite personnel involved in this project shall be provided with medical surveillance prior to onset of work, at the conclusion of the project, and at any time there is suspected excessive exposure to toxic chemicals or physical agents.

5.3.4.7 The Contractor shall maintain all medical surveillance records and make these records available to regulatory agencies upon request by appropriate officials.

5.3.4.8 All personnel who, due to the location in which they work, may be required to wear an air-purifying respirator or air-supplied respirator, such as a self-contained breathing apparatus (SCBA), shall be fit tested and properly trained and experienced in their use. All respiratory protection equipment shall be properly decontaminated and sanitized at the end of each work day.

5.3.4.9 The Contractor shall provide all onsite personnel with appropriate personal safety equipment and protective clothing. The Contractor shall ensure that all safety equipment and protective clothing is kept clean and well-maintained. All personal protective equipment shall be decontaminated at the end of the work day.

5.3.5 Initial Onsite Training: The Contractor shall provide site specific training to all employees who will work in the hazardous waste area. This site specific training shall include, but not be limited to, all items listed below, including emergency procedures for chemical exposure or release, fire, or explosion, and personal injury:

A. Acute and chronic effects of any toxic chemicals identified at the site
B. Physical health hazards identified at the site
C. Personal hygiene
D. Safety equipment and procedures required for personal protection
E. Proper use and fitting of respirator to include drills in using emergency escape units
F. Work zones established at the site
G. Decontamination procedures
H. Prohibitions in contaminated areas:
1. Beards and long sideburns
2. Contact lenses
3. Eating, smoking, chewing
4. Personal articles, e.g., watches and rings
5. Working when ill
6. Working under the influence of alcohol or drugs

I. Buddy system explained
J. Medical surveillance
K. Emergency response

5.3.6 Emergency and First-Aid Requirements:

5.3.6.1 The Contractor shall arrange for emergency medical care services at a nearby medical facility and establish emergency routes. The Contractor shall establish communications links with health and emergency services to inform them of any emergency situations that may arise.

5.3.6.2 In the event of any emergency associated with or resulting from work at this site, the Contractor shall without delay: cease work activity on the site; take diligent action to remove or otherwise minimize the cause of the emergency; render full assistance to local authorities to remedy any impact on local residents or property; alert the Construction Manager, and institute whatever measures might be necessary to prevent any repetition of the conditions or actions leading to or resulting in the emergency.

5.3.6.3 The Contractor shall have at least one certified First-Aid Technician onsite at all times. This person may perform other duties, but must be immediately available to render first-aid when needed. Certification shall consist of successful completion of an American Red Cross course in Multi Media First-Aid and Cardio-Pulmonary Resuscitation (CPR).

5.3.6.4 The support zone (Zone 3) shall be provided with specially designated and approved emergency eyewash and shower units. These may be portable.

5.3.6.5 At least one "industrial" first-aid kit and stretcher shall be Contractor provided and maintained fully stocked at a manned location. First-aid kit locations shall be specially marked and provided with adequate water and other supplies necessary to cleanse and decontaminate burns, wounds, or lesions. First-aid kit requirements are specified in ANSI 2308.1-1978.
industry and/or chemical waste disposal industry. The Health and Safety Officer shall have a sound working knowledge of federal and state occupational safety and health regulations and formal educational training in occupational safety and health.

5.3.2.4 The Health and Safety Officer may implement requirements in addition to those specified herein.

5.3.2.5 Selection of appropriate levels of worker protection shall be in accordance with Contractor's Site Safety Plan based on actual site conditions.

5.3.2.6 Should any unforeseen or site specific safety related factor, hazard, or condition become evident during the performance of the Work, the Contractor shall take immediate and prudent action to establish and maintain safe working conditions and to safeguard site personnel, the public, and the environment. The Contractor shall also immediately inform the Construction Manager of such a condition.

5.3.3 Work Areas: The Contractor shall clearly lay out and identify Work areas or zones in the field and shall limit equipment, operations, and personnel in the areas as defined below:

5.3.3.1 Zone 1 - Exclusion Zone: The exclusion zone is the zone where contamination does (or could) occur. All people entering the exclusion zone shall wear prescribed levels of protection. Only one entry and exit check point shall be established at the periphery of the exclusion zone to regulate the flow of personnel and equipment into and out of the zone and to verify that the procedures established to enter and exit are followed. The Site Safety Plan developed by the Contractor shall describe the criteria that will be used to establish the extent of the exclusion zones based upon field monitoring.

5.3.3.2 Zone 2 - Contamination Reduction Zone:

5.3.3.2.1 Between the exclusion zone and the support zone is the contamination reduction zone, which provides a transition between contamination and clean zones. Zone 2 serves as a buffer to further reduce the probability of the clean or support zone becoming contaminated. It provides additional assurance that the physical transfer of contaminating substances on people, equipment, or in the air is limited through a combination of decontamination, distance between exclusion and support zones, air dilution, zone restrictions, and Work functions.

5.3.3.2.2 At the boundary between the exclusion and contamination reduction zones, decontamination station(s) shall be established, one for personnel and small equipment, and one for heavy equipment, if needed. Running water, spraying or washing facilities, concrete slab(s) and other such facilities shall be provided as required for
adequate decontamination of equipment and personnel and to maintain the cleanliness of the contamination reduction zone.

5.3.3.3 Zone 3 - Support Zone: This area is defined as being an area outside the zone of contamination. The support zone shall be clearly delineated and shall be secured against active or passive contamination from the exclusion zone. The function of the area includes:

A. An entry for personnel, material, and equipment to the Work areas
B. An exit for decontaminated personnel, materials, and equipment from the Work areas
C. The housing of site services; and
D. A storage area for clean safety and Work equipment

5.3.4 Personnel Protection Program/Site Safety Plan:

5.3.4.1 The Contractor shall establish and maintain a complete Personnel Protection Program for all personnel working in the potentially hazardous waste site area. The Contractor shall prepare a Site Safety Plan that describes the site and potential hazards and prescribes monitoring requirements, personal protection requirements and criteria for their selection, work practices and limitations, and emergency response.

5.3.4.2 The Contractor shall certify that all Contractor, subcontractor, or service personnel entering the exclusion zone (Zone 1) or contamination reduction zone (Zone 2) for the purpose of the Work; for health, safety, security, or administrative purposes; for maintenance; or for any other site-related function; have received medical examinations and safety training as defined in Paragraph (e) of 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response; Interim Final Rule".

5.3.4.3 The Contractor shall guarantee that personnel not successfully participating in a medical monitoring program or completing the required training are not permitted to enter Zones 1 and 2 for any reason.

5.3.4.4 The Contractor shall provide and require that all previously trained Contractor, subcontractor, or service personnel assigned to or entering Zones 1 and 2, referred to herein as onsite personnel, are capable of and familiar with the use of safety, health, respiratory, and protective equipment and with the safety and security procedures required for this Work.

5.3.4.5 The Contractor shall utilize the services of an occupational physician to provide at least the minimum medical examinations and surveillance specified in 29 CFR 1910.120. The
authorities. Upon completion of the Work, the sanitary facility shall be removed and the area restored to its original condition.

4.5 CONSTRUCTION MANAGER'S TEMPORARY FIELD OFFICE: The existing office building at the Thomas Solvents Site will be made available for use by the Contractor and Construction Manager. Construction Manager's office shall have a window, doors with locks, desk, chairs, file cabinet, water for testing, and heating, and electric lighting.

4.6 TEMPORARY TELEPHONE SERVICE: The Contractor shall furnish onsite telephone service for itself during the period of construction of the Contract. The cost of installation of the telephone service shall be borne by the Contractor.

4.7 STORAGE OF MATERIALS: Materials shall be so stored as to ensure the preservation of their quality and fitness for the Work. When considered necessary, they shall be placed on wooden platforms or other hard, clean surfaces, and not on the ground. Stored materials shall be located so as to facilitate prompt inspection.

5. SAFETY AND CONVENIENCE

5.1 CONSTRUCTION SAFETY PROGRAM: The Contractor shall develop and maintain for the duration of this Contract, a safety program that will effectively incorporate and implement all required provisions of federal, state, and local safety regulations for construction.

5.2 SAFETY EQUIPMENT:

5.2.1 The Contractor, as part of its safety program, shall maintain at its office or other well-known place at the jobsite, safety equipment applicable to the Work as prescribed by the governing safety authorities, all articles necessary for giving first-aid to the injured, and shall establish the procedure for immediate removal to a hospital or a doctor's care in the event one or more injured on the jobsite.

5.2.2 The Contractor shall do all Work and have all parts to the public from hazards, including, but not limited to, the irregularities or unramped grade changes in pedestrian sidewalk or walkway. Barricades, lanterns, and proper signs shall be furnished in sufficient amount to safeguard the public and the Work.

5.2.3 The performance of all Work and all completed construction, particularly with respect to ladders, platforms, structure openings, scaffolding, shoring, lagging, machinery guards and the like, shall be in accordance with the applicable governing safety authorities.

5.2.4 During construction, the Contractor shall construct and at all times maintain satisfactory and substantial temporary chain link fencing, solid fencing, railing, barricades or steel plates, as
applicable, at all openings, obstructions, or other hazards in streets, sidewalks, floors, roofs, and walkways. All such barriers shall have adequate warning lights as necessary, or required, for safety.

5.3 HEALTH AND SAFETY REQUIREMENTS:

5.3.1 General:

5.3.1.1 This section outlines the health and safety requirements to be followed by the Contractor during the performance of the Work specified in the exclusion zone and the contamination reduction zone.

5.3.1.2 These requirements do not supersede, but are in addition to any federal, OSHA, state, or local regulations. If a conflict occurs between these requirements and current regulations, the more stringent shall apply. These requirements are in accordance with and incorporate the current health and safety guidelines established in the STANDARD OPERATING SAFETY GUIDES, prepared by the EPA Office of Emergency and Remedial Response, Hazardous Response Support Division, September 1984, and the OCCUPATIONAL SAFETY AND HEALTH GUIDANCE MANUAL FOR HAZARDOUS WASTE SITE ACTIVITIES, October 1985, hereinafter called OSHA GUIDANCE MANUAL and 29 CFR 1910.120.

5.3.1.3 Exhibit A is an outline of a generic Site Safety Plan for the Contractor’s information. This outline may be used by the Contractor as a guide in preparing its site safety plan. However, it shall be the Contractor’s responsibility to provide a complete and workable site safety plan without regard to the completeness or workability of the outline presented in Exhibit A.

5.3.2 Contractor’s Responsibilities:

5.3.2.1 The Contractor is solely responsible for the health, safety, and protection of all onsite personnel during the performance of the Work. The Contractor shall perform the Work specified in these Contract Documents in accordance with the HEALTH AND SAFETY REQUIREMENTS specified herein, including the current edition of the STANDARD OPERATING SAFETY GUIDES and OSHA GUIDANCE MANUAL; and all federal, OSHA, state, and local health and safety regulations. It shall be the responsibility of the Contractor to be familiar with the required health and safety regulations in the performance of this Work.

5.3.2.2 Contractors in-house Health and Safety Program shall meet, as a minimum, all applicable state, local, and federal regulations including, but not limited to, those listed in Exhibit B.

5.3.2.3 The Contractor shall provide a Health and Safety Officer to implement, monitor, and enforce the Site Safety Plan. The Health and Safety Officer shall have working experience in the chemical
Contract time resulting from encountering utilities not shown will be considered as set forth in Item DIFFERING SUBSURFACE CONDITIONS.

3.6.2 The following is a list of the major utilities serving the Work area indicating the name and telephone number of the responsible authority of the various utilities which should be notified if conflicts or emergencies arise during the progress of the Work:

<table>
<thead>
<tr>
<th>Name of Utility</th>
<th>Responsible Authority</th>
<th>Telephone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battle Creek Water</td>
<td>Mr. Bob Ehredt</td>
<td>616/966-3496</td>
</tr>
<tr>
<td>Battle Creek Gas</td>
<td>Claude Wall</td>
<td>616/968-8111  ext. 273</td>
</tr>
<tr>
<td>Consumer Power</td>
<td>Jim Crowley</td>
<td>616/962-4051</td>
</tr>
</tbody>
</table>

3.7 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTIES AND SERVICE:

3.7.1 Where the Contractor's operations could cause damage or inconvenience to railway, telegraph, telephone, television, power, oil, gas, water, or sewer systems, the operations shall be suspended until all arrangements necessary for the protection of these utilities and services have been made by the Contractor.

3.7.2 Notify MISS DIG at 1-800-482-7171 at least 48 hours in advance of any new excavation. MISS DIG will notify all utilities, which will then field flag their lines. Under no circumstances expose any utility without first obtaining permission from the appropriate agency. Once permission has been granted, locate, expose, and provide temporary support for all existing underground utilities. Notwithstanding notification of MISS DIG, it shall be the responsibility of the Contractor to verify that appropriate utilities have been properly notified.

3.7.3 The Contractor shall protect all power poles from damage. If interfering power poles, telephone poles, guy wires, or anchors are encountered, notify the Construction Manager and the appropriate utility company at least 48 hours in advance of construction operations to permit the necessary arrangements for protection or relocation of the interfering structure.

3.7.4 The Contractor shall be solely and directly responsible to the Construction Manager and operators of such properties for any damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of any injuries or damage which may result from the construction operations under this Contract.
3.7.5 Neither the Construction Manager nor its officers or agents shall be responsible to the Contractor for damages as a result of the Contractor's failure to protect utilities encountered in the Work.

3.8 INTERFERING STRUCTURES: Take necessary precautions to prevent damage to existing structures whether on the surface, aboveground, or underground, especially piping and electrical conduit to existing groundwater extraction wells and existing MCC and Monitoring Building foundation. An attempt has been made to show major structures on the Site Plan. The completeness and accuracy of information shown cannot be guaranteed, and it is presented simply as a guide to avoid known possible difficulties.

3.9 FIELD RELOCATION: During the progress of construction, it is expected that minor relocations of the work will be necessary. Such relocations shall be made only by direction of the Construction Manager. If existing structures are encountered which prevent the construction, and which are not properly shown on the Drawings, notify the Construction Manager before continuing with the construction in order that the Construction Manager may make such field revisions as necessary to avoid conflict with the existing structures. If the Contractor shall fail to so notify the Construction Manager when an existing structure is encountered, and shall proceed with the construction despite this interference, he shall do so at his own risk.

4. TEMPORARY CONSTRUCTION UTILITIES AND FACILITIES

4.1 TEMPORARY WATER: Water may be obtained from the City of Battle Creek as required to accomplish the actual construction, decontamination, and testing required by the specifications. Temporary piping for transporting the water to the Work and proper removal of such temporary piping at the conclusion of the Work shall be the responsibility of the Contractor.

4.2 TEMPORARY ELECTRIC POWER: The Contractor shall be responsible for obtaining a source of electric power for construction and operation of the system. Cost of electric power shall be borne by the Contractor for the duration of the Contract.

4.3 SAFETY REQUIREMENTS FOR TEMPORARY ELECTRIC POWER: Temporary electric power installation shall meet the construction safety requirements of OSHA, state, and other governing agencies.

4.4 SANITARY FACILITIES: The Contractor shall provide a mobile sanitary facility which, as a minimum, shall include running water for washing of hands and face and toilet facilities. The Contractor shall maintain the facility in a sanitary condition at all times. The sanitary facility shall be of watertight construction so that no contamination of the area can result from its use. The facility shall conform to code requirements and be acceptable to the sanitary
of equipment and facilities needed preliminary to and during the prosecution of the Work, and all other matters which can in any way affect the Work or the cost thereof under this Contract.

3.1.2 The Contractor further acknowledges satisfaction as to character, quality, and quantity of surface and subsurface materials to be encountered from its inspection of the site and from reviewing any available records of exploratory work furnished by the Construction Manager or included in these Documents. Failure by the Contractor to become acquainted with the physical conditions of the site and all the available information will not relieve the Contractor from responsibility for properly estimating the difficulty or cost of successfully performing the Work.

3.1.3 The Contractor warrants that as a result of examination and investigation of all the aforesaid data, the Contractor can perform the Work in a good and workmanlike manner and to the satisfaction of the Construction Manager. The Construction Manager assumes no responsibility for any representations made by any of its officers or agents during or prior to the execution of this Contract, unless (1) such representations are expressly stated in the Contract, and (2) the Contract expressly provides that the responsibility therefor is assumed by the Construction Manager.

3.2 INFORMATION ON SITE CONDITIONS:

3.2.1 General: Any information obtained by the Construction Manager regarding site conditions, subsurface information, groundwater elevations, existing construction of site facilities as applicable, and similar data is contained in Appendix A. Such information is offered as supplementary information only. The Construction Manager does not assume any responsibility for the completeness or interpretation of such supplementary information.

3.3 SUBSURFACE INVESTIGATION:

3.3.1 Test holes have been drilled to indicate subsurface materials at particular locations. The Construction Manager does not assume any responsibility whatever in respect to the sufficiency or accuracy of borings made, or of the log of test borings, or of other investigations, or of the interpretations made thereof, and there is no warranty or guarantee, either expressed or implied, that the conditions indicated by such investigations are representative of those existing throughout such area, or any part thereof, or that unforeseen developments may not occur.

3.3.2 Since the startup of the groundwater extraction system in March 1987, groundwater elevation has dropped onsite due to the operation of the depression pumps. It is recommended that the Contractor make arrangements with the Construction Manager for permission to conduct such additional subsurface investigation as may be necessary to verify existing conditions; i.e., water surface...
elevations, tank locations, and vadose zone VOC concentrations.

3.4 DIFFERING SUBSURFACE CONDITIONS:

3.4.1 In the event subsurface or latent physical conditions are found materially different from those indicated in these Documents, and differing materially from those ordinarily encountered and generally recognized as inherent in the character of Work covered in these Contract Documents, the Contractor shall promptly, and before such conditions are disturbed, notify the Construction Manager in writing of such changed conditions.

3.4.2 The Construction Manager will investigate such conditions promptly and following this investigation, the Contractor shall proceed with the Work, unless otherwise instructed by the Construction Manager. If the Construction Manager finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for performing the Work, the Construction Manager will make a final decision on all Change Orders to the Contract regarding any adjustment in cost or time for completion before the Contractor resumes his Work.

3.5 PERMITS:

3.5.1 The Contractor shall obtain any and all permits required to perform the necessary Work. As a minimum, the following permits will be required:

   A. Emmett Township - Electrical Permit
   B. Utility Permits - as necessary

3.5.2 The Construction Manager will obtain the soil erosion and sedimentation permit from Calhoun County if necessary, and the well drilling permit from Calhoun County Health Department. The EPA will obtain the air quality permit. All other permits shall be the responsibility of the Contractor including, but not limited to, filing of applications, payment of fees, and monitoring the Work for permit compliance.

3.6 UTILITIES:

3.6.1 Known utilities and structures adjacent to or expected to be encountered in the Work are shown on the Drawings. The locations shown are taken from existing records; however, it is expected that there may be some discrepancies and omissions in the locations and quantities of utilities and structures shown. Those shown are for the convenience of the Contractor only, and no responsibility is assumed by the Construction Manager for their accuracy or completeness. Contractor's request for additional compensation or
I. Prepare a monthly report summarizing all collected data listed herein and/or collected, including VOC data analysis collected by others.

2.2.5.2 Report also shall indicate project name, job number, Contractor's name, report number, and date. Each report shall be signed by the Contractor's superintendent.

2.3 COORDINATION:

2.3.1 Contractors shall cooperate in the coordination of their separate activities in a manner that will provide the least interference with the Construction Manager's operations and other contractors and utility companies working in the area, and in the interfacing and connection of the separate elements of the overall project Work.

2.3.2 If any difficulty or dispute should arise in the accomplishment of the above, the problem shall be brought immediately to the attention of the Construction Manager.

2.3.3 All contractors working on this site are subject to this requirement for cooperation, and all shall abide by the Construction Manager's decision in resolving project coordination problems without additional cost to the Construction Manager.

2.4 EQUIPMENT MAINTENANCE DURING CONSTRUCTION: All equipment installed shall be provided with the manufacturer's recommended oil and lubricants by the Contractor and shall be maintained and operated by the Contractor throughout the period of operation and any option period of operation.

2.5 SUBMITTALS: The Contractor shall submit a written description of its proposed Work including the pipe installation, well construction, decontamination techniques and approach for the Work in the hazardous Work area. The submittal(s) are due within 10 days following Contract execution, and will be examined by the Construction Manager for conformance to the Contract Documents. Notice to Proceed will be issued when the submittals are found to be in conformance with the Contract Documents or federal standards. At the sole discretion of the Construction Manager, Notice to Proceed may be issued prior to final acceptance of submittals. Issuance of Notice to Proceed shall not relieve the Contractor of its responsibility to provide acceptable submittals in a timely manner. The Construction Manager may require the Contractor to stop Work on all or portions of the Work that are not covered by proper submittals until such time as proper submittals are received and reviewed. Such stoppage of Work will not be a basis for increased compensation nor extensions of time for performance of the Work. Any information concerning alternatives to the specified requirements herein will be encouraged, provided sufficient detail
is included to allow a proper evaluation. The following items, as a minimum, shall be addressed by the Contractor:

A. The anticipated number of onsite personnel and their job functions in performing the Work.

B. Submission of a Site Safety Plan and a description of the Contractor's Health and Safety Program.

C. Identify the Health and Safety officers and present their education and experience.

D. A decontamination plan including physical layouts, location, equipment, and operation procedures for Contractor's personnel and equipment decontamination facilities.

E. Number, type, location, calibration, and operation and maintenance procedures for all monitoring equipment.

F. An Emergency Response Plan in accordance with paragraph (L) of 29 CFR 1910.120.

G. Provide offsite transportation and disposal plan including proposed approach and equipment. The attached Transporter Information and Disposal Facility Information forms are to be completed by Contractor. These forms are to be completed for both hazardous and nonhazardous materials.

The forms are attached as Exhibits E and F, respectively. Names and addresses of RCRA-compliant disposal facilities may be obtained from William Muno, USEPA Hazardous Waste Branch Chief, RCRA Enforcement Section, telephone: 312/886-4434. Mail Code 5#E-12.

2.6 MANIFESTS AND DISPOSAL OF HAZARDOUS WASTE: The EPA will have an onsite representative to sign all manifests for all hazardous materials disposal.

3. SITE CONDITIONS

3.1 SITE INVESTIGATION AND REPRESENTATION:

3.1.1 The Contractor acknowledges satisfaction as to the nature and location of the Work, the amount, detail and accuracy of the information provided by the Construction Manager regarding the nature and requirements of the Work, the general and local conditions, particularly those bearing upon availability of transportation, access to the site, disposal, handling and storage of materials, availability of labor, water, electric power, roads, and uncertainties of weather or other physical conditions at the site, the conformation and conditions of the ground, the character
I. Shop drawing submittals

J. Permit requirements

K. Site Safety Requirements

2.2.1.4 In addition to the administrative procedures indicated above, time and order of Work requirements under the Contract will be reviewed and will consist of, but not be limited to, the following items:

A. Time of Contract

B. Schedules required, including update and approvals

C. Jobsite management meeting

D. Contractor's safety program

2.2.1.5 The Contractor shall submit the name, address, and phone number, of a responsible individual or individuals who will be available on a 24-hour basis to handle all emergency problems in connection with this project.

2.2.2 Project Meetings:

2.2.2.1 Construction progress meetings shall be scheduled at a frequency as defined herein by the Construction Manager for the purpose of discussing the execution of the Work. The Contractor shall attend and shall require representatives and direct employees of all subcontractors to attend regularly scheduled meetings.

2.2.2.2 Meetings will be held at the time and place designated by the Construction Manager. All decisions, instructions, and interpretations given by the Construction Manager at these meetings shall be conclusive and binding on the Contractor. The proceedings of these meetings will be recorded by the Construction Manager. The Contractor and each subcontractor will be furnished a copy for its use.

2.2.2.3 The Construction Manager will conduct regular construction coordination meetings with the Contractor and its subcontractors during the construction period until Substantial Completion is achieved. The purpose of the weekly meeting will be to (1) review the Contractor's scheduled progress; (2) to identify potential delays and actions required to maintain Work in accordance with the schedule; (3) to establish and/or reconfirm the Work schedule for the next 3 weeks; and (4) to coordinate the various aspects of the Work with other contractors and agencies on the project.
2.2.3 Project Correspondence: Any request in writing by the Construction Manager to the Contractor must be answered in sufficient detail in writing within 14 calendar days unless an earlier answer is required by the Construction Manager to maintain job progress.

2.2.4 Daily Reports During Construction:

2.2.4.1 The Contractor shall furnish daily construction reports satisfactory to the Construction Manager covering both its own activities and its subcontractors' activities until Substantial Completion is achieved. Reports will clearly indicate the number of persons by trade designation, number of administrative and supervisory personnel, major equipment being used, description and status of all Work in progress as well as all new Work started, location of Work and which Contractor is performing described activity. Completed daily report shall be given to the Construction Manager within 24 hours.

2.2.4.2 Report also shall indicate project name, job number, Contractor's name, report number and date, day of week, and weather conditions. Each report shall be signed by the Contractor's Superintendent.

2.2.5 Monthly Reports During Operation:

2.2.5.1 The Contractor shall furnish monthly reports satisfactory to the Construction Manager covering operation of the system during the Period of Operation. Reports will clearly indicate operating conditions of the system, including, but not limited to:

A. Weekly average airflow rate from each extraction well and daily average total airflow rate from all extraction wells combined

B. Weekly total airflow from each extraction well and daily total of the combined airflow rate from all extraction wells

C. Daily average vacuum at the inlet of the vacuum pump

D. Daily average pressure at the outlet of the vacuum pump

E. Weekly average vacuum at each extraction well

F. On a weekly basis, list percent run time for each soil vapor extraction well

G. Listing of downtime and corrective action taken

H. Documentation of all carbon changes including pounds of carbon removed
1. PROJECT DESCRIPTION

1.1 GENERAL:

1.1.1 A brief description of the Work is stated in the Invitation to Bid. To determine the full scope of the project or any particular part of the project, coordinate the applicable information in the several parts of these Contract Documents.

1.1.2 The following additional information, though not all-inclusive, is given to assist Contractors in their evaluation of the Work required to meet the project objectives.

1.1.3 This project is being implemented to remove volatile organic compounds (VOC's) from the unsaturated soil zone of the Thomas Solvents site. Contaminated soil vapor will be extracted from the unsaturated zone through new wells and treated with activated carbon before discharge to the atmosphere. The Vapor Collection System and the Activated Carbon System will be designed, constructed, and operated by the Contractor. The Contractor shall remove all underground storage tanks from the site. Related work at the same site is being performed under another contract. The related project draws groundwater contaminated with VOC's from the aquifer and pumps the contaminated groundwater through a pipeline to treatment system about one mile away. It shall be the responsibility of the Contractor to coordinate Work with other contractors or MDNR to avoid interference during construction.

1.1.4 Components of this project include but are not limited to:

A. Design of the Soil Vapor Extraction System, including the vapor phase, Activated Carbon System
B. Submittal of the design for review followed by completion of the final design
C. Vapor extraction well installation
D. Provision and installation of all equipment, piping, and other materials furnished under this Contract
E. Provision and installation of the instrumentation, controls, and electrical equipment as needed to provide a fully operational system
F. Operation of the system throughout the Period of Operation, which shall extend for a maximum period of 2 years after Substantial Completion or until the Performance Objective is achieved

G. Excavating and removing all underground storage tanks at the site

H. As an option, operation of the system beyond the Period of Operation for up to an additional 24 months

I. Site restoration including grading and reseeding the entire site

2. SEQUENCE OF OPERATIONS

2.1 SCHEDULING: Prior to starting the Work, the Contractor shall submit a Work schedule which includes requirements stated in the General Conditions.

2.2 PROJECT ADMINISTRATION:

2.2.1 Preconstruction Conference:

2.2.1.1 Before issuance of a Notice to Proceed, the Construction Manager, the Contractor, and the Contractor's Superintendent shall attend a preconstruction conference.

2.2.1.2 The purpose of this conference will be to introduce key personnel and define authority and responsibility of each and establish the administrative procedures to be followed during the construction period.

2.2.1.3 Procedures that will be discussed and established at this meeting for implementation during the construction period will include, but not be limited to, the following:

A. Contractor's submittals
B. Sampling and testing
C. Construction surveys
D. Inspection by outside agencies
E. Payment requests
F. Procedures for claims and disputes
G. Unforeseen job conditions
H. Change order requests
Whenever in these Contract Documents the following abbreviations are used, the intent and meaning shall be interpreted as follows:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>AA</td>
<td>Aluminum Association</td>
</tr>
<tr>
<td>AAMA</td>
<td>Architectural Aluminum Manufacturers' Association</td>
</tr>
<tr>
<td>AASHTO</td>
<td>American Association of State Highway and Transportation Officials</td>
</tr>
<tr>
<td>ACI</td>
<td>American Concrete Institute</td>
</tr>
<tr>
<td>AFSMA</td>
<td>Anti-Friction Bearing Manufacturers' Association</td>
</tr>
<tr>
<td>AGA</td>
<td>American Gas Association</td>
</tr>
<tr>
<td>AGMA</td>
<td>American Gear Manufacturers' Association</td>
</tr>
<tr>
<td>AISC</td>
<td>American Institute of Steel Construction</td>
</tr>
<tr>
<td>AISI</td>
<td>American Iron and Steel Institute</td>
</tr>
<tr>
<td>AITC</td>
<td>American Institute of Timber Construction</td>
</tr>
<tr>
<td>AMCA</td>
<td>Air Moving and Conditioning Association</td>
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<tr>
<td>ANSI</td>
<td>American National Standards Institute</td>
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<tr>
<td>APA</td>
<td>American Plywood Association</td>
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<tr>
<td>API</td>
<td>American Petroleum Institute</td>
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<tr>
<td>AREA</td>
<td>American Railway Engineering Association</td>
</tr>
<tr>
<td>ASAE</td>
<td>American Society of Agricultural Engineers</td>
</tr>
<tr>
<td>ASCE</td>
<td>American Society of Civil Engineers</td>
</tr>
<tr>
<td>ASHRAE</td>
<td>American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.</td>
</tr>
<tr>
<td>ASME</td>
<td>American Society of Mechanical Engineers</td>
</tr>
<tr>
<td>ASTM</td>
<td>American Society for Testing and Materials</td>
</tr>
<tr>
<td>AWI</td>
<td>Architectural Woodwork Institute</td>
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<tr>
<td>AWS</td>
<td>American Welding Society</td>
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<tr>
<td>AWPA</td>
<td>American Wood Preservers' Association</td>
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<tr>
<td>AWPB</td>
<td>American Wood Preservers Bureau</td>
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<tr>
<td>AWWA</td>
<td>American Water Works Association</td>
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<tr>
<td>BHMA</td>
<td>Builders Hardware Manufacturers' Association</td>
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<tr>
<td>CBMA</td>
<td>Certified Ballast Manufacturers' Association</td>
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<tr>
<td>CDA</td>
<td>Copper Development Association</td>
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<tr>
<td>CISPI</td>
<td>Cast Iron Soil Pipe Institute</td>
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<tr>
<td>CMAA</td>
<td>Crane Manufacturers' Association of America</td>
</tr>
<tr>
<td>CRSI</td>
<td>Concrete Reinforcing Steel Institute</td>
</tr>
<tr>
<td>HI</td>
<td>Hydraulic Institute</td>
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<tr>
<td>HMI</td>
<td>Hoist Manufacturers' Institute</td>
</tr>
<tr>
<td>ICBO</td>
<td>International Conference of Building Officials</td>
</tr>
<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers, Inc.</td>
</tr>
<tr>
<td>ICEA</td>
<td>Insulated Cable Engineers' Association</td>
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<tr>
<td>ISA</td>
<td>Instrument Society of America</td>
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<tr>
<td>JIC</td>
<td>Joint Industry Conferences of Hydraulic Manufacturers</td>
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<tr>
<td>MSHA</td>
<td>Mine Safety and Health Administration</td>
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<tr>
<td>MMA</td>
<td>Monorail Manufacturers' Association</td>
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<tr>
<td>NBHA</td>
<td>National Builders' Hardware Association</td>
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</tbody>
</table>
Unless a particular issue is designated, all references to the above specifications, standards, or methods shall, in each instance, be understood to refer to the issue in effect (including all amendments) on the first published date of the Invitation to Bid.

* * * * *
PART 4

SPECIFICATIONS
CLASS 1 - Truck Drivers (less than 8 cubic yards capacity).
CLASS 2 - Truck Drivers (8 cubic yards capacity & over.)
CLASS 3 - Drivers (Euclid type equipment.)

Zone 10:
CLASS 1 - Truck Drivers & General Warehouse Combination.
CLASS 2 - Tandem Trucks & Trucks capacity 8 cubic yards or over.
CLASS 3 - Semis, Double Bottoms, Low Boys, Pitman Operators and/or related equipment.
CLASS 4 - Euclid type, Bottom & End Dump Drivers.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR, 5.5(a)(1)(11)).
larger - gas or diesel powered or powered by generator of 300 amps or more inclusive of generator), Side Boom Tractor (smaller than type D-4 or equivalent), Sweeper (Wayne type and similar equipment), Tractor (pneu-tired, other than backhoe or front end loader), Trencher (8 ft. digging capacity)

Class III: Air Compressors (600 cfm or larger), Air Compressors (two or more - less than 600 cfm), Boom Truck (non-swinging, non-powered type boom), Concrete Breaker (self-propelled or truck mounted - includes compressor), Concrete Paver (one drum 1-1/2 yd. or larger), Elevator (other than passenger), Maintenance Man, Mechanic Helper, Pump (two or more - 4 in. up to 6 in. discharge - gas or diesel powered - excluding submersible pumps, Pumpcrete Machine (and similar equipment), Wagon Drill (multiple), Welding Machine or Generator (two or more 300 amp. or larger/gas or diesel powered)

Class IV: Boiler, Concrete Saw (40 h.p. or over), Curing Machine (self-propelled), Farm Tractor (with attachment), Finishing Machine (concrete), Firefighter, Hydraulic Pipe Pushing Machine, Mulching Equipment, Oilier, Pumps (two or more up to 4 in. discharge if used three hours or more a day - gas or diesel powered excluding submersible pumps), Roller (other than asphalt), Stump Remover, Trencher (service), Vibrating Compaction Equipment (self-propelled, 6 ft. wide or over)

POWER EQUIPMENT OPERATORS:
STEEL ERECTION
ZONE 1:
CLASS 1 - Crane Operator when operating combination of Boom and Jib 200' or longer.
CLASS 2 - Crane Operator when operating combination of Boom and Jib 220' or longer on a Crane that requires an Oilier.
CLASS 3 - Crane Operator when operating combination of Boom and Jib 140' or longer.
CLASS 4 - Crane Operator when operating combination of Boom and Jib 140' or longer on a Crane that requires an Oilier.
CLASS 5 - Crane Operator when operating combination of Boom and Jib 120' or longer.
CLASS 6 - Crane Operator when operating combination of Boom and Jib 120' or longer on a Crane that requires an Oilier.
CLASS 7 - Crane Operator and Job Mechanic.
CLASS 8 - Crane Operator on a Crane that requires an Oilier.
CLASS 9 - Hoisting Operator.
CLASS 10 - Compressor and/or Welder Operator.
CLASS 11 - Oilier.

ZONE 2:
CLASS A - Crane Operator with main Boom & Jib 220' or longer.
CLASS B - Crane Operator with main Boom & Jib 140' or longer.
CLASS C - Regular Equipment Operator, Crane, Dozer, Loader.
CLASS D - Air Tugger (single drum), Material Hoist, Pump (6' or over).
CLASS E - Air Compressor, Welder, Generators, Conveyors.
CLASS F - Oiler and Firefighter.

ZONE 3:
CLASS 1 - Operator
CLASS 2 - Compressor and welder
CLASS 3 - Oiler and firefighter

SIGN INSTALLERS:
Zone 1 & 2:
CLASS A - Performs all necessary labor
uses all tools required to construct &
set concrete forms required in the
installation of highway & street signs
CLASS B - Performs all miscellaneous
labor, uses all hand and power tools,
& operates all other equipment, mobile
or otherwise, required for the
installation of highway & street signs

TRUCK DRIVERS: HIGHWAY, AIRPORT, & BRIDGE CONSTRUCTION
AIRPORT, BRIDGE & HIGHWAY CONSTRUCTION:
Zones 1 & 2:
CLASS 1 - Truck Drivers (less than 8 cyd capacity).
CLASS 2 - Truck Drivers (8 cyd Capacity or over).
CLASS 3 - Drivers (Euclid type equipment).

TRUCK DRIVERS:
UNDERGROUND CONSTRUCTION:
Zones 1 & 2:
CLASS 1 - Truck Drivers on all trucks (EXCEPT dump trucks of
8 cubic yards capacity or over, pole trailers, semis, low
boys, euclid, double bottom or fuel trucks.)
CLASS 2 - Truck Drivers of Dump Trucks of 8 cubic yards
capacity or over, Pole Trailers, Semis & Fuel Trucks.
CLASS 3 - Truck Drivers on Low Boys, Euclid & Double Bottoms

Zone 4:
CLASS 1 - Truck Drivers (Straight & dump trucks less than 8
cubic yards capacity.)
CLASS 2 - Dump Trucks (8 cubic yards capacity & over),
Tandem Axle & Semis.

Zone 5:
CLASS 1 - Truck Drivers on all trucks (EXCEPT dump trucks of
8 cubic yards capacity or over, pole trailers & double
bottoms.)
CLASS 2 - Truck Drivers on Dump Trucks of 8 cubic yards
capacity or over & Pole Trailers.
CLASS 3 - Low Boys & Double Bottoms.
CLASS 4 - Structural Steel Driver.

Zone 7:
CLASS 1 - Truck Drivers.
CLASS 2 - Yard
CLASS 3 - Truck Drivers on trucks 8 cubic yards capacity or
over, Mechanics.
CLASS 4 - Semi Driver.

Zone 8:
CLASS 1 - Straight or Dump Drivers.
CLASS 2 - Semi &/or Double Bottoms.

Zone 9:

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LABORERS: LANDSCAPE LABORERS:
CLASS A: Landscape specialist, including air, gas, diesel, electric tool and/or equipment
CLASS B: Landscape laborer, truck driver, materials haulers, and small power equipment

LABORERS: OPEN CUT CONSTRUCTION
CLASS 1 - Construction Laborers
CLASS 2 - Mortar and Material Mixer, Concrete Form, Signal, Well Point, Manhole, Headwall and Catch Basin Builder, Guard Rail Builder and Fence Erector
CLASS 3 - Air, Gasoline and Electric Tool Operator, Vibrator Operator, Driller Pump, Tar Kettle Operator, Bracers, Rodders, Reinforced Steel or Mesh (e.g. wire mesh, steel mats, dowel bars, etc.), Cement Finisher, Pipe Jacking and Boring, Wagon Drill and Air Track Operator and Concrete Saw Operator (under 40 h.p.), Windlass and Tugger.
CLASS 4 - Trench or Excavating Grade.
CLASS 5 - Pipe Layer (including crotch, metal pipe, multi-plate or other conduits).

LABORERS: TUNNEL, SHAFT & CAISSON CONSTRUCTION
CLASS 1 - Tunnel, Shaft and Caisson Laborer, Dump, Shanty, Hog House Tender, Testing (on gas).
CLASS 2 - Manhole, Headwall, Catch Basin Builder, Bricklayer Tender, Mortar Machine, Material Mixer, Fence Erector and Guard Rail Builder
CLASS 3 - Air Tool Operator (jackhammer, bush hammer & grinding), First bottom, Second Bottom, Cage Tender, Car Pusher, Carrier, Concrete, Concrete Form, Concrete Repair, Cement Invert Laborer, Cement Finisher, Concrete Shoveler, Conveyor, Floor, Gasoline and Electric Tool Operator, Gunnite, Grout Operator, Pump, Outside Lock Tender, Scaffold, Top Signal, Switch, Track, Tugger, Vibrator, Winch Operator, Pipe Jacking, Boring, Wagon Drill, Air Track Operator and Concrete Saw Operator, (under 40 h.p.).
CLASS 4 - Tunnel, Shaft and Caisson Mucker, Bracer, Liner Plate, Long Haul Dinky Driver and Well Point.
CLASS 5 - Tunnel, Shaft and Caisson Miner, Drill runner, Key Board Operator, Power Knife Operator, Reinforced Steel or Mesh (e.g. wire mesh steel dowel bars, etc.).
CLASS 6 - Dynamite and Powder.

PAINTERS:
Group 1: Brush
Group 2: Paperhanging - wall coverings, bridges over highways or railroads and drywall finishers
Group 3: Swing stage, window jack, window belts; bridge work over rivers or lakes
Group 4: Spray - pressure roller; steam cleaning, sandblasting, waterblast
Group 5: Spray decks
Group 6: Steeple jack or high work - 40 feet

POWER EQUIPMENT OPERATORS:
AIRPORT, BRIDGE & HIGHWAY CONSTRUCTION
ZONES 1, 2, & 3:

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CLASS 1 - Asphalt Plant Operator, Crane Operator, Dragline, Shovel Operator, Locomotive Operator, Paver (5 bags or more), Elevating Grader Operator, Pile Driving Operator, Roller (asphalt), Blade Grader Operator, Trenching Machine, (ladder or wheel type), Auto-Grader, Slip Form Paver, Self-Propelled or Tractor Drawn Scraper, Conveyor Loader Operator (euclid type), Endloader Operator, (1 yd. capacity or over), Bulldozer, Concrete Pump (3" and over), Swing Boom Truck (up to 12 ton capacity), Hoisting Engineer, Tractor Operator, Finishing Machine, Asphalt Mechanic, Pump Operator (6" discharge or over, gas, diesel powered or generator of 300 amp or over), Shoulder or Gravel Distributing, Machine Operator (self-propelled), Backhoe (with over 3/8 yard bucket), Side Boom Tractor (type D-4 equivalent or larger), Tube Finisher (slip form paving), Gradall (and similar type machines), Asphalt Paver (self-propelled), Asphalt Planer (self-propelled), Batch Plant (Concrete-central mix, transit mix, shrink mix), Slurry Machine (asphalt), Roto Mill.

CLASS 2 - Sweeper (Wayne type & similar equipment), Screening Plant Operator, Washing Plant Operator, Crusher, Backhoe (with 3/8 yard bucket or less), Side Boom Tractor (smaller than D-4 type or equivalent), Batch Plant (Concrete-dry mix).

CLASS 3 - Air Compressor Operator (600 cfm or more), Air Compressor (2 or more, less than 600 cfm), Wagon Drill Operator, Concrete Breaker, Tractor Operator (Farm type w/ attachments).

CLASS 4 - Boiler Firefighter, Oilier, Firefighter, Mechanic's Helper, Trencher (service Flexplane Operator, Cleftplane Operator, Grader (Self-propelled Fine Grade or Form (Concrete)), Finishing Machine (Concrete), Boom or Winch Truck Operator, Concrete Pump (under 3"), Mesh Installer (self-propelled), Endoarer (under 1 yard capacity), Roller Operator (other than asphalt), Curing Equipment (self-propelled), Concrete Saw Operator (40 h.p. or over), Power Bin Operator, Plant Drier (asphalt), Vibratory Compaction Equipment (6 ft. wide or over), Guard Post Driver (power driven), All Mulching Equipment, Stump Remover, Farm Type Tractor Operator.

POWER EQUIPMENT OPERATORS: UNDERGROUND CONSTRUCTION
UNDERGROUND CONSTRUCTION:

ZONES 1 & 2:

Class I: Backfiller Tamper, Backhoe, Batch Plant Operator (Concrete), Clamshell, Concrete Paver (two drum or larger), Conveyor Loader (euclid type), Crane (crawier, truck type or pile driving), Dozer (9 ft. blade and over), Dragline, Elevating Grader, Endoarer (over 1 1/2 cubic yds. capacity), Gradall (and similar type equipment), Mechanic, Power Shovel, Roller (asphalt, Scraper (self-propelled or tractor drawn), Side Boom Tractor (type D-4 or equivalent and larger), Slip Form Paver, Slope Paver, Trencher (over 8 ft. digging capacity), Well Drilling Rig

Class II: Boom Truck (power swing type boom), Crusher, Dozer (less than 9 ft. blade), Endoarer (1 1/2 cubic yds. capacity and smaller), Hoist, Pump (one or more - 6 in. discharge or

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LINE CONSTRUCTION:
AREA 1: Huron County, Ingham County (Twp.s of Leroy, Locke, Wheatfield, White Oak and Williamson), Lapeer County, Lenawee County (Twp.s of Clinton and Macon), Livingston County (Except the Twp.s of Conoctah, Deerfield, Tyrone, and Unadilla), Macomb County, Monroe County (Except the Twp.s of Bedford, Erie, Lasalle, and Whiteford), Oakland County (Except the Twp. of Holly), St. Clair, Sanilac, and Tuscola Counties, Washtenaw County (Except the Twp.s of Lyndon, Manchester, Sharon, and Sylvan), and Wayne County
AREA 2: Remainder of State

PAINTERS:
AREA 1: Allegan County (Twp.s of Dorr, Fillmore, Heath, Hopkins, Laketown, Leighton, Manlius, Monterey, Overisel, Salem, Saugatuck and Wayland); Ionia County (Twp.s of Berlin, Boston, Campbell, Easton, Ionia, Keene, Okemos, Orange, Orleans, Otisco, Ronald and Sebewa), Kent, Mecosta and Montcalm Counties; Newaygo County (Twp.s of Barton, Big Prairie, Brooks, Crotum, Ensign, Everett, Goodwell, Grant, Home, Monroe, Northwest and Wilcos); Osceola County (Except the Twp.s of Merrion and the northeastern corners of Highland and Middle Branch); Ottawa County (Twp.s of Allegan, Blendenone, Chester, Georgetown, Holland, Jamestown, Olive, Park, Polkton, Port Sheldon, Tallmadge, Wright and Zeeland)

POWER EQUIPMENT OPERATORS:
AIRPORT, BRIDGE & HIGHWAY CONSTRUCTION:
ZONE 1: Genesee, Macomb, Monroe, Oakland, Washtenaw, and Wayne Counties
ZONE 2: Remainder of State
ZONE 3: Alger, Baraga, Chippewa, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon and Schoolcraft Counties

POWER EQUIPMENT OPERATORS:
UNDERGROUND CONSTRUCTION:
Zone 1: Bay, Branch, Calhoun, Clinton, Eaton, Genesee, Gratiot, Hillsdale, Huron, Ingham, Jackson, Lapeer, Lenawee, Livingston Macomb, Midland, Monroe, Oakland, Saginaw, Sanilac, Shiawasse, St. Clair, Tuscola, Washtenaw, Wayne Counties
Zone 2: Remainder of State

POWER EQUIPMENT OPERATORS:
STEEL ERECTION:
Zone 1: Lenawee, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne Counties
Zone 2: Remainder of State
Zone 3: Alger, Baraga, Chippewa, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon and Schoolcraft Counties

SIGN INSTALLER:
Zone 1: Genesee, Macomb, Monroe, Oakland, Washtenaw and Wayne Counties
Zone 2: Remainder of State

TRUCK DRIVERS:

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AIRPORT, BRIDGE & HIGHWAY CONSTRUCTION:
Zone 1: Genesee, Livingston, Macomb, Monroe, Oakland, Washtenaw, and Wayne Counties
Zone 2: Remainder of State

TRUCK DRIVERS:

UNDERGROUND CONSTRUCTION:
Zone 1: Genesee and Huron Counties, Livingston County (east half), Macomb, Monroe, Oakland, Sanilac, St. Clair, Washtenaw and Wayne Counties
Zone 2: Lapeer and Shiawassee Counties
Zone 3: Hillsdale, Jackson and Lenawee Counties
Zone 4: Branch and Calhoun Counties, and Eaton County (south half)
Zone 5: Benzie, Lake, Manistee, Mason, Muskegon, Newaygo and Oceana Counties
Zone 6: Clinton County, Eaton County (north half), Ingham County, Ionia County (east half), and Livingston County (west half)
Zone 7: Antrim, Charlevoix, Emmet and Grand Traverse Counties, Ionia County (west half), Kalkaska, Kent, Leelanau, Mecosta, Missaukee, Montcalm, Oscoda, Ottawa and Wexford Counties
Zone 8: Allegan, Berrien, Cass, Kalamazoo, St. Joseph and Van Buren Counties
Zone 9: Alger, Barry, Chippewa, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon and Schoolcraft Counties
Zone 10: Remainder of State

DEFINITION OF GROUPS

LABORERS: AIRPORT, BRIDGE, & HIGHWAY CONSTRUCTION
CLASS A - Line-Form Setter for curb or pavement
CLASS B - Pipe Layer, Oxygen Gun
CLASS B-1 - Asphalt Raker
CLASS B-2 - Asphalt Tamper and Asphalt Raker Helper
CLASS C - Tunnel Miner (highway work only), Finishers Tender, Guard Rail Builder, Highway and Median Barrier Installer (including sound barrier and crash barrier), Fence Erector, Bottom, Powder, Wagon Drill and Air Track Operators, Curb and Side Rail Setters' Helpers, Diamond and Core Drill
CLASS D - Mixer Operator (less than 5 sacks), Air or Electric tool operators (jackhammer, etc.), Spreader, Box (asphalt, stone, gravel etc.) Concrete Paddler, Power Chain Saw Operator, Paving Batch Truck Dumper, Asphalt Screed Checker, Grade Checker and Tunnel Mucker (highway work only), Concrete Saw (under 40 h.p.), and Dry Pack Machine
CLASS E - Cement Handler or Dock. Top. Asphalt Dust Handler
CLASS F - Asphalt Shoveler or Loader, Asphalt Plant Misc. Axe, Batch Bin (no power), Burlap, Carpenter's Helper, Subgrade Labor (hand tools), Yard, Guard Rail Builder's Helper, Highway and Median Barrier Installer's Helper, Fence Erector's Helper, Dumper (wagon, truck, etc.), Jetting Labor, Joint Filling Labor, Misc. Unskilled Labor, Powder Monkey (helper), Sprinkler Labor, Form Setting Labor, Pavement Reinforcing, Handling and placing (e.g. wire mesh, steel mats, dowel bars, etc.), Mason's or Bricklayer's Tender on Manholes, Headwalls, etc., Water proofing, seal coating and Slurry Mix.

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C. $125.00 per week per employee
D. $65.00 per week per employee
E. $89.50 per week per employee
F. $76.50 per week per employee
G. $98.50 per week per employee
H. $80.50 per week per employee

AREA DESCRIPTIONS

CARPENTERS:
AREA 1: Livingston County (Twp. of Brighton, Deerfield, Genoa, Hartland, Osceola, and Tyrone), Macomb, Monroe, Oakland, and St. Clair Counties, Sanilac County (That part east of a line projected north and continuing to east Lapeer County and west St. Clair County lines and to South Huron County Line), and Wayne County
AREA 2E: Arenac, Bay, Clare, and Clinton Counties, Eaton County (Except for the Twp. of Bellevue, Kalam, Vermontville, and Walton), Genesee, Gladwin, Gratiot, Huron and Ingham Counties, Ionia County (Twp. of Danby, Orange, Portland, and Sebewa), Isabella, Iosco, Jackson, Lapeer, and Lenawee Counties; Livingston County (Remainder of County), Midland, Ogemaw and Saginaw Counties, Sanilac County (Remainder of County), Shiawassee, Tuscola and Washtenaw Counties
AREA 2W: Allegan and Barry Counties, Benzie County (Twp. of Blaine, Colfax, Crystal Lake, Gilmore, Joyfield, and Weldon), Berrien County (Except the Twp. of Chickaming, New Buffalo, and Three Oaks), Branch, Calhoun, and Cass Counties; Eaton County (Remainder of County), Hillsdale County, Ionia County (Remainder of County), Kalamazoo, Kent, Lake, Manistee, Mason, Mecosta, Montcalm, Muskegon, Newaygo, Oceana, Ottawa, St. Joseph and Van Buren Counties
AREA 3LP: Alcona, Alpena, Antrim, Benzie County (Remainder of County), Charlevoix, Cheboygan, Crawford, Emmet, Grand Traverse, Kalkaska, Leelanau, Missaukee, Montmorency, Oscoda, Osceola, Presque Isle, Roscommon, and Wexford Counties
AREA 3UP: Alger, Baraga, Chippewa, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Lu。 Mackinac, Marquette, Menominee, Ontonagon, and Schoolcraft Counties
AREA 4: Berrien County (Remainder of County)

CEMENT MASONS:
AREA 1: Genesee, Livingston, Macomb, Monroe, Oakland, Saginaw, Washtenaw, and Wayne Counties
AREA 2: Remainder of State

IRONWORKERS:
AREA 1: Alger, Baraga, Chippewa, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Lu。 Mackinac, Marquette, Menominee, Ontonagon, and Schoolcraft Counties
AREA 2: Allegan, Antrim, Barry, Benzie, Branch, Calhoun,
LABORERS: AIRPORT, BRIDGE & HIGHWAY CONSTRUCTION
AREA 1: Genesee, Macomb, Monroe, Oakland, Washtenaw, and Wayne Counties
AREA 2: Allegan, Barry, Bay, Berrien, Branch, Calhoun, Cass, Clinton, Eaton, Gratiot, Hillsdale, Huron, Ingham, Jackson, Kalamazoo, Lapeer, Lenawee, Livingston, Midland, Muskegon, Saginaw, Shiawassee, St. Clair, St. Joseph, Tuscola, and Van Buren Counties
AREA 2A: Ionia, Kent, Montcalm, and Ottawa Counties
AREA 3: Alcona, Alger, Alpena, Antrim, Arenac, Baraga, Benzie, Charlevoix, Cheboygan, Chippewa, Clare, Crawford, Delta, Dickinson, Emmet, Gladwin, Gogebic, Grand Traverse, Houghton, Iosco, Iron, Isabella, Kalkaska, Keweenaw, Lake, Leelanau, Luce, Mackinac, Manistee, Marquette, Mason, Manistee, Missaukee, Montmorency, Newaygo, Oceana, Ogemaw, Ontonagon, Oscoda, Otsego, Presque Isle, Roscommon, Schoolcraft, and Wexford Counties
AREA 4: Macosta and Osceola Counties
AREA 5: Remainder of State

LABORERS: LANDSCAPE LABORERS
AREA 1: Genesee, Lapeer, Livingston, Macomb, Monroe, Oakland, St. Clair, Shiawassee, Washtenaw and Wayne Counties
AREA 2: Remainder of State

LABORERS: OPEN CUT CONSTRUCTION:
Area 1: Macomb, Oakland and Wayne Counties
Area 2: Livingston County (southeast part) and Washtenaw County
Area 3: Monroe, Sanilac and St. Clair Counties
Area 4: Hillsdale, Jackson and Lenawee Counties
Area 5: Clinton, Eaton, Ingham Counties; Ionia County (City of Portland), Livingston County (western part)
Area 6: Genesee, Lapeer and Shiawassee Counties
Area 7: Arenac, Bay, Clare, Gladwin, Gratiot, Huron, Isabella, Midland, Ogemaw, Roscommon, Saginaw and Tuscola Counties
Area 8: Allegan, Barry, Berrien, Branch, Calhoun, Cass, Eaton County (southwest part to City of Olivet), Kalamazoo, Lake County (eastern part), Muskegon, Newaygo, Oceana, St. Joseph and Van Buren Counties
Area 9: Ionia County (except the City of Portland), Kent, Mecosta, Montcalm, Oceana, and Ottawa Counties
Area 10: Alcona, Alpena, Antrim, Benzie, Charlevoix, Cheboygan, Crawford, Emmet, Grand Traverse, Iosco, Kalkaska, Lake County (western part), Leelanau, Manistee, Mason, Missaukee, Montmorency, Oscoda, Otsego, Presque Isle, Wexford Counties
Area 11: Entire Upper Peninsula

LABORERS: TUNNEL, SHAFT & CAISSON CONSTRUCTION:
Area 1: Macomb, Oakland and Wayne Counties
Area 2: Genesee, Lapeer & Shiawassee Counties
Area 3: Remainder of State

454 (May 16, 1986)
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<th>Zone 2</th>
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<td>Class 4</td>
<td>12.73</td>
<td>11.41</td>
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</table>

Contracts $400,000 or less:

### Zone 1:
- **Class 1**: 14.58 + 13%
- **Class 2**: 14.19 + 13%
- **Class 3**: 13.55 + 13%
- **Class 4**: 13.04 + 13%

### Zone 2:
- **Class 1**: 12.62 + 13%
- **Class 2**: 12.10 + 13%
- **Class 3**: 11.65 + 13%
- **Class 4**: 11.41 + 13%

### POWER EQUIPMENT OPERATORS:

#### STEEL ERECTION:

##### ZONE 1:
- **CLASS 1**: 17.37 + 13%
- **CLASS 2**: 16.26 + 13%
- **CLASS 3**: 16.17 + 13%
- **CLASS 4**: 15.96 + 13%
- **CLASS 5**: 15.96 + 13%
- **CLASS 6**: 15.65 + 13%
- **CLASS 7**: 15.04 + 13%
- **CLASS 8**: 11.82 + 13%
- **CLASS 9**: 11.82 + 13%
- **CLASS 10**: 11.82 + 13%
- **CLASS 11**: 11.82 + 13%

##### ZONE 2:
- **CLASS A**: 16.95 + 4.35
- **CLASS B**: 16.70 + 4.35
- **CLASS C**: 16.10 + 4.35
- **CLASS D**: 15.35 + 4.35
- **CLASS E**: 13.25 + 4.35
- **CLASS F**: 11.90 + 4.35

##### ZONE 3 - ALL COUNTIES IN UPPER PENINSULA:
- **CLASS 1**: 14.17 + 4.30
- **CLASS 2**: 12.44 + 4.30
- **CLASS 3**: 11.34 + 4.25

#### SIGN INSTALLERS:

##### ZONE 1:
- **CLASS A**: 12.5222 + B
- **CLASS B**: 12.2725 + B

##### ZONE 2:
- **CLASS A**: 11.6725 + B
- **CLASS B**: 11.4225 + B

#### TRUCK DRIVERS:

##### AIRPORT, BRIDGES, & HIGHWAY CONSTRUCTION:

Contracts over $400,000

##### Zone 1:
- **CLASS 1**: 14.14 + .50 + C
- **CLASS 2**: 14.24 + .50 + C
- **CLASS 3**: 14.39 + .50 + C

##### Zone 2:
- **CLASS 1**: 14.04 + .50 + C
- **CLASS 2**: 14.14 + .50 + C

451 (May 16, 1986)
### Table: Contract $400,000 or less:

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<tr>
<th>Zone</th>
<th>Class</th>
<th>Rate</th>
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### Truck Drivers:

#### Underground Construction:

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<tr>
<td></td>
<td>CLASS 4</td>
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**Footnotes:**

A. **SEVEN PAID HOLIDAYS:** New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Day After Thanksgiving, and Christmas Day (Provided the employee worked the scheduled work day preceding and following the day observed)

B. **$99.50 per week per employee**
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LABORERS: TUNNEL, SHAFT & CAISSON CONSTRUCTION:

Contracts over $400,000:

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Contracts $400,000 or less:

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### POWER EQUIPMENT OPERATORS:

#### AIRPORT, BRIDGE & HIGHWAY CONSTRUCTION:

**ZONE 1:**

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**Contracts $400,000 or less:**

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**ZONE 2:**

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**POWER EQUIPMENT OPERATORS:**

#### UNDERGROUND CONSTRUCTION:

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450 (May 16, 1986)
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447 (May 16, 1986)
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448 (May 16, 1986)
### Basic Fringe Hourly Benefits Rates

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<td>General Contracts $7 million or greater</td>
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<td>Bridges, Dams, Locks, and Power Plants</td>
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<td>All other Construction</td>
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<td>Combination Equipment Operator and Ground</td>
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<td>Combination Driver - Ground</td>
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<td>Cable Splicer</td>
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<td>Combination Digger Operator or Tractor Operator</td>
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<td>Light Equipment Operator, Ground, Distribution Line Truck Driver/Operator, Ground</td>
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<td>Combination Winch Truck Driver/Ground</td>
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LANDSCAPE LABORERS - HIGHWAY CONSTRUCTION
ORNAMENTAL PROJECTS ONLY (for sodding and seeding. See Class F Laborer - Misc. Unskilled Labor)

AREA 1:
Class A 8.60
Class B 6.56

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ATTACHMENT C

GENERAL WAGE DECISION NO. MI86-7

Supersedes General Wage Decision No. MI84-5026

State: MICHIGAN

County(ies): STATEWIDE

Construction Type: AIRPORT, BRIDGE, HIGHWAY AND SEWER

Construction Description: AIRPORT, BRIDGE, HIGHWAY, AND SEWER CONSTRUCTION (Exclusive of Buildings) (does not include TV/Grout work).

Modification Record:

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<td>446-448</td>
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<td>2</td>
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444 (May 16, 1986)
ATTACHMENT B
CERTIFICATION OF TRAINING, MEDICAL, AND SAFETY REQUIREMENTS

(To be completed by Bidder and submitted with Technical Proposal)

The Contractor hereby certifies that the Contractor and its employees who will be engaged in working on or near the Thomas Solvents Site, located in Battle Creek, Michigan, under (Construction Manager to fill in Subcontract No. after award), meet the requirements of 29 CFR 1910.120, as published in the Federal Register on December 19, 1986, and the provisions of American National Standards Institute Standard 288.2 and 2288.6 for training, respiratory protection, medical surveillance programs and safety guidelines. These requirements include, but are not limited to, the following items:

A. The Contractor’s employees have been examined by a licensed physician within the last 12 months and have been determined to be physically able to perform the Work, and use the respiratory and other protective equipment required for this assignment;

B. An adequate number of the Contractor’s employees have been trained according to the provisions of 29 CFR 1910.120.

C. The Contractor’s employees have been trained in the proper use of respirators and their limitations;

D. The employees have received health and safety training for working in environments with known and unknown hazards;

E. The Contractor has established and is maintaining a respiratory protection program that complies with the provisions of 29 CFR 1910.134; and

F. The Contractor maintains appropriate surveillance of the Work area conditions and degree of employee exposure or stress.

The Contractor further certifies that only respirators approved or accepted by NIOSH/MSHA will be used by the Contractor’s employees; that each of the Contractor’s employees has been properly fitted to the respirators provided by the Contractor, including a test of the face-to-face piece seal; that the Contractor has provided its employees with written procedures covering safe use of respirators in dangerous atmospheres; and that the Contractor has established a program for inspection, maintenance, and care of the respirators.
These Contract Documents incorporate the following clauses by reference. These clauses have the same force and effect as if they were given in full text. Clauses from the Federal Acquisition Regulation (48 CFR Chapter I) are identified with the prefix "52" in the clause number. Clauses from the Environmental Protection Agency Regulations Manual (EPAAR) are identified with the prefix "1552."

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<td>*52. 215-001</td>
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<td>Audit – Negotiation (APR 1984)</td>
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NOTE: *These clauses contain terms and conditions that the Subcontractor may be required to flow down to lower-tier subcontractors.

* * * * *
suitable vehicle. The entire carbon bed can and must be removed after the first carbon exchange without entering the vessel or otherwise disturbing the adsorber internals.

d. When the entire bed of spent carbon is removed, fresh granular activated (regenerated carbon) carbon is to be added manually by pouring it through the top manway. When the proper amount of carbon is added, the top of the bed must be leveled and the manway closed.

13. When the changeout is complete, the adsorber(s) will be put back on line by a person authorized by the Construction Manager.

* * * * *
PART 5

DRAWINGS