

UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF OHIO  
WESTERN DIVISION

STATE OF OHIO, <i>ex rel.</i>	:	CASE NO.: 3:15-cv-00009-WHR
MICHAEL DEWINE	:	
OHIO ATTORNEY GENERAL	:	JUDGE WALTER H. RICE
	:	
Plaintiff.	:	
	:	
v.	:	
	:	
	:	CONSENT DECREE FOR
	:	PLUME DELINEATION/
HONEYWELL INTERNATIONAL, Inc.	:	CHARACTERIZATION (PDC) AND
	:	FOCUSED FEASIBILITY STUDY (FFS)
Defendant.	:	

Plaintiff, State of Ohio, (“Plaintiff”), having filed the Complaint in this action against Defendant, Honeywell International, Inc., to enforce Ohio’s hazardous waste, solid waste, water pollution and nuisance laws found in Ohio Revised Code Chapters 3734, 6111 and 3767, and the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. § 9601, *et seq.* (“CERCLA”); and Plaintiff and Defendant having consented to the entry of this Consent Decree for Plume Delineation/Characterization and Focused Feasibility Study (“Consent Decree”);

Now therefore, without trial of any issue of law or fact, without admission of any issues of law or fact, and upon consent of the Parties hereto, it is hereby ORDERED, ADJUDGED, and DECREED as follows:

**I. JURISDICTION AND VENUE**

1. The Court has both personal jurisdiction over the Parties to this action and subject matter jurisdiction over the case pursuant to CERCLA, 28 U.S.C. § 2201, 28 U.S.C. § 1367, and

Ohio Rev. Code Chapters 3734, 6111 and 3767. The Complaint states a claim upon which relief can be granted against the Defendant under those statutes. Venue is proper in this Court.

## **II. PERSONS BOUND**

2. The terms and provisions of this Consent Decree shall apply to and be binding upon Plaintiff, Defendant, and Defendant's agents, officers, employees, assigns, successors in interest, and any other person acting in concert and/or privity with any of them pursuant to Federal Rule of Civil Procedure 65(d).

3. No change in ownership or corporate status of the Defendant including, but not limited to, any transfer of assets or real or personal property shall in any way alter the Defendant's obligations under this Consent Decree.

## **III. DEFINITIONS**

4. Unless otherwise expressly provided herein, all terms used in this Consent Decree or in any appendices shall have the same meaning as defined in CERCLA, Ohio Rev. Code Chapters 3734, 6111, and 3767, and any rules promulgated thereunder. Whenever the terms listed below are used in this Consent Decree or in any appendices, attached hereto and incorporated herein, the following definitions shall apply:

- a) "**CERCLA**" means the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. 9601 *et seq.*
- b) "**Contaminant(s)**" means Volatile Organic Compounds (VOCs).
- c) "**Day**" means a calendar day unless expressly stated to be a business day. "Business day" means a day other than a Saturday, Sunday, or state holiday. In computing any period of time under this Consent Decree, where the last day would fall on a Saturday, Sunday, or state holiday, the period shall run until the close of the next business day.
- d) "**Defendant**" means Honeywell International, Inc.

- e) **“Focused Feasibility Study”** or **“FFS”** means the document submitted pursuant to Section V of this Consent Decree, PDC/FFS, and as further described in Appendix A to this Consent Decree, which presents the methodology and results of the feasibility analysis of potential actions for remediation of any VOC ground water contamination which originated at the North Russell Street facility or which originated at and has emanated from the North Russell Street facility.
- f) **“Future Response Costs”** means all costs, not inconsistent with the NCP, related to the Site that are incurred by Ohio EPA December 30, 2013, including, but not limited to, payroll costs, contractor costs, travel costs, direct costs, overhead costs, legal and enforcement related costs, oversight costs, laboratory costs, and the costs of reviewing or developing plans, reports, and other items pursuant to this Consent Decree, verifying the Work, or otherwise implementing or enforcing this Consent Decree.
- g) **“NCP”** means the National Oil and Hazardous Substances Pollution Contingency Plan, codified at 40 C.F.R. Part 300 (1990), as amended.
- h) **“North Russell Street facility”** means the Grimes Aerospace Company facility located at 515 North Russell Street in Urbana, Champaign County, Ohio, which is owned by Defendant Honeywell International, Inc.
- i) **“Ohio EPA”** means the Ohio Environmental Protection Agency and its designated representatives.
- j) **“Paragraph”** means a portion of this Consent Decree identified by an arabic numeral or an uppercase or lowercase letter.
- k) **“Parties”** means the Defendant and the State.
- l) **“Past Response Costs”** means costs incurred by Ohio EPA through December 30, 2013 in the amount \$107,318.64 which Defendant has agreed to pay as required by this Consent Decree.
- m) **“Plume Delineation”** or **“PD”** means the definition, based on the ground-water remediation goals, of the horizontal and vertical extent of any VOC groundwater contamination that originated at the North Russell Street facility or that originated at and has emanated from the North Russell Street facility. Plume delineation shall be confirmed through sampling, supplemented by other techniques approved by Ohio EPA.
- n) **“Plume Delineation and Characterization/Focused Feasibility Study Work Plan”** or **“PDC/FFS Work Plan”** means the documents submitted pursuant to Section V of this COPI, PDC/FFS, and as further described in Appendix A to this Consent Decree, that

describe the tasks necessary to perform the Work required by this Consent Decree for plume delineation and feasibility study.

- o) **“Plume Delineation and Characterization/Focused Feasibility Study Statement of Work”** or **“PDC/FFS SOW”** means the statement of work for the implementation of plume delineation and feasibility study as set forth in Appendix A to this Consent Decree.
- p) **“Response Costs”** means all costs related to the Site that are incurred by Ohio EPA including, but not limited to, payroll costs, contractor costs, travel costs, direct costs, overhead costs, legal and enforcement related costs, oversight costs, laboratory costs, and the costs of reviewing or developing plans, reports, and other items pursuant to this Consent Decree, verifying the Work, or otherwise implementing or enforcing this Consent Decree.
- q) **“Section”** means a portion of this Consent Decree identified by a Roman numeral.
- r) **“Site”** means the North Russell Street facility, and any locations where VOC contamination that originated at or resulted from activities conducted at the North Russell Street facility is present, including any such contamination that has emanated from the North Russell Street facility.
- s) **“State”** means the State of Ohio by and through its Attorney General on behalf of the Ohio Environmental Protection Agency.
- t) **“Volatile Organic Compounds”** or **“VOCs”** means those compounds listed in U.S. EPA’s publication SW 846, Test Methods for Evaluating Solid Waste, Method 8260, Target Compound List.
- u) **“Work”** means all activities the Defendant is required to perform under the PDC/FFS (Section V) and Additional Work (Section VI) Sections of this Consent Decree.

#### **IV. STATEMENT OF PURPOSE**

5. In entering into this Consent Decree, the mutual objectives of the Parties include: (1) completion of a PDC/FFS by the Defendant; (2) payment of Response Costs by the Defendant as required by this Consent Decree; and (3) good faith efforts to negotiate a final Consent Decree, after this Consent Decree is terminated.

**V. PLUME DELINEATION/CHARACTERIZATION, AND FOCUSED FEASIBILITY STUDY (PDC/FFS)**

6. The Defendant shall perform the Work in accordance with this Consent Decree including, but not limited to, the PDC/FFS SOW, all relevant guidance documents, and all standards, specifications, and schedules set forth therein or developed and approved by Ohio EPA.

7. Compliance With Law

a. All activities undertaken by Defendant pursuant to this Consent Decree shall be performed in accordance with the requirements of all applicable federal, State and local laws and regulations, and in a manner not inconsistent with the NCP.

b. Ohio EPA has determined that activities conducted pursuant to this Consent Decree, if approved by Ohio EPA, would be considered necessary and consistent with the NCP.

c. Where any portion of the Work requires a permit, license or other authorization from Ohio EPA or any other State, federal or local government agency, Defendant shall submit applications in a timely manner and take all other actions necessary to obtain such permit, license or other authorization. This Consent Decree is not, and shall not be construed to be, a permit, license or other authorization issued pursuant to any statute, rule or regulation.

8. Supervising Contractor

All Work performed pursuant to this Consent Decree shall be under the direction and supervision of a contractor with expertise in hazardous substance or waste site investigation and remediation. Prior to the initiation of the Work, Defendant shall notify Ohio EPA in writing of the name of the supervising contractor and any subcontractor to be used in performing the Work

under this Consent Decree.

9. Submittal of Consent Decree to those persons hired to perform the Work

The Defendant shall provide a copy of the Consent Decree to each key employee, engineer, facility operator, general contractor, laboratory, agent, and/or other key person hired or employed to perform any and all Work or services itemized herein. In any agreement with any person that the Defendant employs to conduct any activities or remedial activity at or upon the Site, the Defendant shall ensure that the services or Work to be performed must be in accordance with the terms and conditions of this Consent Decree.

10. Within fourteen (14) days of the Effective Date of this Consent Decree, Defendant shall meet with Ohio EPA to discuss the requirements of the Work Plans required under this Consent Decree, unless otherwise mutually agreed to by the Parties.

11. Plume Delineation and Characterization/Focused Feasibility Study Work Plan and Schedule.

a. Within sixty (60) days of the Effective Date of this Consent Decree, unless otherwise specified in writing by Ohio EPA, Defendant shall submit to Ohio EPA a Work Plan for PDC/FFS.

b. The PDC/FFS Work Plan shall include a schedule which begins with the date of Ohio EPA's approval of the PDC/FFS Work Plan and includes the specified duration for completion of each task to be accomplished.

c. The PDC/FFS Work Plan shall be developed in conformance with the PDC/FFS SOW, Appendix A, and the guidance documents listed in Appendix B to this Consent Decree, attached hereto and incorporated herein.

d. In the PDC/FFS Work Plan, Defendant shall present the technical justification for the proposed omission of any of the tasks of the PDC/FFS SOW because of work that has already been performed or work that is not appropriate to the Site. Any omission proposed by the Defendant is subject to the review and approval of Ohio EPA. Defendant may rely upon existing data and/or information to the extent that Defendant can demonstrate that field and laboratory QA/QC procedures acceptable to Ohio EPA were followed in the generation of the data and/or information. Defendant shall include all supporting documentation in the PDC/FFS Work Plan for existing data and/or information and clearly identify the intended use(s) and data quality objectives for such data and/or information. Ohio EPA will evaluate the adequacy of supporting QA/QC documentation and determine the acceptability of all existing data and/or information during review of the draft PDC/FFS Work Plan.

12. If Ohio EPA determines that any additional or revised guidance documents affect the Work to be performed under this Consent Decree, Ohio EPA will timely notify Defendant in writing and, subject to the Dispute Resolution Section of this Consent Decree, if invoked, the Work Plan(s) and other affected documents shall be modified accordingly.

13. Should Defendant identify an inconsistency between any of the laws, regulations, guidance documents, and/or the PDC/FFS SOW which Defendant is required to follow by this Consent Decree, Defendant shall notify Ohio EPA in writing of each inconsistency and the effect of the inconsistencies upon the Work to be performed. Defendant shall also recommend, along with a supporting rationale justifying each recommendation, the requirement Defendant believes should be followed. Defendant shall implement the affected Work as directed in writing by Ohio EPA.

14. Ohio EPA will review all Work Plans pursuant to the procedures set forth in the Review of Submittals Section of this Consent Decree. Upon approval of any Work Plan by Ohio EPA, Defendant shall implement the Work Plan in accordance with the schedules contained therein. Defendant shall submit all plans, reports, or other deliverables required under the approved Work Plan, in accordance with the approved schedule, for review and approval by Ohio EPA pursuant to the Review of Submittals Section of this Consent Decree.

15. Health and Safety Plan

Within sixty (60) days of the Effective Date of this Consent Decree, the Defendant shall submit to Ohio EPA for review and comment a health and safety plan developed in conformance with the guidance listed in Appendix B.

**VI. ADDITIONAL WORK**

16. Ohio EPA or the Defendant may determine that in addition to the tasks defined in the approved PDC/FFS Work Plan, Additional Work may be necessary to accomplish the mutual objectives of the Parties as provided in the Statement of Purpose Section of this Consent Decree and the PDC/FFS SOW, Appendix A. Based on information currently available for the Site, the Work to be performed by the Defendant is the PDC/FFS as defined herein.

17. Within thirty (30) days of receipt of written notice from Ohio EPA that Additional Work is necessary, unless otherwise specified in writing by Ohio EPA, Defendant shall submit a Work Plan and schedule for the performance of the Additional Work. In addition, Defendant shall submit revisions to any other schedules impacted by the Additional Work. If the Defendant disputes the necessity of Additional Work, Defendant shall initiate the procedures for dispute resolution set forth in the Dispute Resolution Section of this Consent Decree within fourteen (14)

days after receipt of Ohio EPA's notification of the need for Additional Work. The Additional Work Plan shall conform to the standards and requirements set forth in the documents attached to this Consent Decree as Appendices A (PDC/FFS SOW) and B (list of relevant guidance documents). Upon approval of the Additional Work Plan and schedule by Ohio EPA pursuant to the Review of Submittals Section of this Consent Decree, Defendant shall implement the approved Additional Work Plan in accordance with the revised schedules contained therein.

18. If the Defendant determines that Additional Work is necessary, the Defendant shall submit a proposal to Ohio EPA to explain what the Additional Work is, why the Additional Work is necessary, and what impact, if any, the Additional Work will have on the PDC/FFS Work Plan and schedule. If Ohio EPA concurs with the request to perform Additional Work, the Defendant shall submit an Additional Work Plan and schedule for the performance of Additional Work. The Additional Work Plan shall conform to the standards and requirements set forth in the documents attached to this Consent Decree as Appendices A and B. Upon approval of the Additional Work Plan and schedule by Ohio EPA pursuant to the Review of Submittals Section of this Consent Decree, the Defendant shall implement the approved Additional Work Plan in accordance with the schedules contained therein.

#### **VII. SAMPLING AND DATA AVAILABILITY**

19. Unless otherwise agreed to by the Site Coordinators, the Defendant shall notify Ohio EPA not less than seven (7) days in advance of all sample collection activity. Upon request, the Defendant shall allow split and/or duplicate samples to be taken by Ohio EPA or its designated contractor. Ohio EPA shall also have the right to take any additional samples it

deems necessary. Upon request, Ohio EPA shall allow the Defendant to take split and/or duplicate samples of any samples Ohio EPA takes as part of its oversight of the Defendant's implementation of the Work.

20. Within fifteen (15) days of the Defendant's receipt of a request for sampling, test information or data by Ohio EPA, the Defendant shall submit to Ohio EPA copies of the results of all sampling and/or tests or other data, including raw data and original laboratory reports, generated by or on behalf of the Defendant with respect to the Site and/or the implementation of this Consent Decree. An electronic copy shall also be provided in a format approved by Ohio EPA. The Defendant may submit to Ohio EPA any interpretive reports and written explanations concerning the raw data and original laboratory reports. Such interpretive reports and written explanations shall not be submitted in lieu of original laboratory reports and raw data. Should the Defendant subsequently discover an error in any report or raw data, the Defendant shall promptly notify Ohio EPA of such discovery and provide the correct information.

#### **VIII. ACCESS**

21. Ohio EPA and its contractors shall have access at all reasonable times to the Site and any other property to which access is required for the implementation of this Consent Decree, to the extent access to the property is controlled by the Defendant. Access under this Consent Decree shall be for the purposes of conducting any activity related to this Consent Decree including but not limited to the following:

- a. Monitoring the Work;
- b. Conducting sampling;

- c. Inspecting and copying records, operating logs, contracts, and/or other documents related to the implementation of this Consent Decree;
- d. Conducting investigations and tests related to the implementation of this Consent Decree; and
- e. Verifying any data and/or other information submitted to Ohio EPA.

22. To the extent that the Site or any other property to which access is required for the implementation of this Consent Decree is owned or controlled by persons other than the Defendant, Defendant shall use its best efforts to secure from such persons access for the Defendant and Ohio EPA and their contractors as necessary to effectuate this Consent Decree. Best efforts shall include holding persons or businesses in control of other properties harmless for and against claims related to Defendant's actions undertaken as required by this Consent Decree and/or, if necessary, payment of a reasonable sum by Defendant to obtain an access agreement for implementation of this Consent Decree. Copies of all access agreements obtained by the Defendant shall be provided to Ohio EPA upon request. If any access required to implement this Consent Decree is not obtained within ninety (90) days of the Effective Date of this Consent Decree, or within sixty (60) days of the date Ohio EPA notifies the Defendant in writing that additional access beyond that previously secured is necessary, Defendant shall promptly notify Ohio EPA in writing of the steps Defendant has taken to attempt to obtain access. Ohio EPA may, as it deems appropriate, assist Defendant in obtaining access.

23. Notwithstanding any provision of this Consent Decree, the State retains all of its access rights and authorities, including enforcement authorities related thereto, under any

applicable statute or regulation including but not limited to Ohio Rev. Code §§ 3734.07, 3734.20, and 6111.05.

**IX. DESIGNATED SITE COORDINATORS**

24. The Defendant has designated the following person as Site Coordinator for the Defendant:

Chuck Gadelmann  
Remediation Manager – Corporate HSE  
Honeywell International  
1985 Douglas Drive  
MN10-182A  
Golden Valley, MN 55422

Ohio EPA has designated the following persons Site Coordinators for Ohio EPA:

Chuck Mellon, Site Coordinator	Mark Allen, Alternate Site Coordinator
Ohio EPA DERR	Ohio EPA DERR
Southwest District Office	Southwest District Office
401 East Fifth Street	401 East Fifth Street
Dayton, OH 45402-2911	Dayton, OH 45402-2911

An Alternate Site Coordinator will be designated by the Defendant within seven (7) days of the entry of this Consent Decree. If the designated Site Coordinator or Alternate Site Coordinator is changed, the identity of the successor will be given to the other Party at least seven (7) days before the changes occur, unless impracticable, but in no event later than the actual day the change is made.

25. To the maximum extent practicable, except as specifically provided in this Consent Decree, communications between the Defendant and Ohio EPA concerning the implementation of this Consent Decree shall be made between the Site Coordinators. The

Defendant's Site Coordinator shall be available for communications with Ohio EPA regarding the implementation of this Consent Decree, for the duration of this Consent Decree. The Defendant's Site Coordinator or Alternate Site Coordinator shall be present on the Site or on call during all hours of Work at the Site.

26. Without limitation of any authority conferred on Ohio EPA by statute or regulation, the Ohio EPA Site Coordinator's authority includes but is not limited to the following:

- a. Directing the type, quantity and location of samples to be collected by Defendant pursuant to an approved Work Plan;
- b. Collecting samples pursuant to any Work Plan and in compliance with the requirements of this Consent Decree;
- c. Observing, taking photographs, or otherwise recording information related to the implementation of this Consent Decree, including the use of any mechanical or photographic device;
- d. Directing that the Work stop whenever the Site Coordinator for Ohio EPA determines that the activities at the Site may create or exacerbate a threat to public health or safety, or threaten to cause or contribute to air or water pollution or soil contamination;
- e. Conducting investigations and tests related to the implementation of this Consent Decree;
- f. Inspecting and copying records, operating logs, contracts and/or other documents related to the implementation of this Consent Decree; and
- g. Assessing the Defendant's compliance with this Consent Decree.

#### **X. PROGRESS REPORTS AND NOTICE**

27. Unless otherwise directed by Ohio EPA, the Defendant shall submit a written

progress report to the Ohio EPA by the tenth (10<sup>th</sup>) day of every month, except upon mutual agreement of the Site Coordinators allowing reports to be submitted quarterly during any period of insignificant activity. At a minimum, the progress reports shall include:

- a. A description of the Work performed during the reporting period including an estimate of the percentage of the PDC/FFS completed;
- b. A list of all target and actual completion dates for each element of activity including project completion;
- c. An explanation for any deviation from any applicable schedule;
- d. Summaries of all findings and sampling during the reporting period;
- e. Summaries of all changes made in the PDC/FFS Work Plan during the reporting period, evidencing consultation with Ohio EPA and the date of approval by Ohio EPA for those changes, when necessary;
- f. Summaries of all contacts with representatives of the local community, public interest groups or government agencies during the reporting period related to the performance of Work;
- g. Summaries of all problems or potential problems encountered during the reporting period, including those which delay or threaten to delay completion of project milestones with respect to the approved work plan schedule;
- h. Summaries of actions taken or planned to rectify such problems;
- i. Changes in key personnel during the reporting period;
- j. Projected Work for the next reporting period;
- k. Upon request, copies of daily reports, inspection reports, sampling data, and laboratory/monitoring data, etc.;
- l. The quantity of media treated, removed, or contained pursuant to the reporting requirements, if any, set forth in the PDC/FFS SOW;
- m. The disposition of contaminated soil, sediments, and waste material that was

treated on or off site, or the disposal location for any quantity of contaminated ground water and/or surface water that was pumped and treated or disposed, if any.

28. Progress reports (one copy only) shall be sent either by e-mail or by U.S. Mail to the person at the address listed below. All other documents (two copies) required to be submitted pursuant to this Consent Decree to Ohio EPA shall be sent by U.S. mail to the following agency address:

Chuck Mellon  
Ohio EPA DERR  
Southwest District Office  
401 East Fifth Street  
Dayton, OH 45402-2911  
[chuck.mellon@epa.ohio.gov](mailto:chuck.mellon@epa.ohio.gov)

All written correspondence to Defendant shall be directed to:

Chuck Geadelmann  
Remediation Manager – Corporate HSE  
Honeywell International  
1985 Douglas Drive, MN10-182A  
Golden Valley, MN 55422

Ohio EPA and Defendant may designate an alternative contact name or address, upon written notification to the other Party and in accordance with the Designated Site Coordinators Section of this Consent Decree, if applicable.

#### **XI. REVIEW OF SUBMITTALS**

29. Ohio EPA shall review any work plan, report, or other item required to be submitted pursuant to this Consent Decree. Upon review for conformance with the PDC/FFS SOW, Appendix A, and the guidance list in Appendix B to this Consent Decree, Ohio EPA may

in its sole discretion (subject to the Dispute Resolution Section of this Consent Decree): (a) approve the submission in whole or in part; (b) approve the submission upon specified conditions; (c) modify the submission; (d) disapprove the submission in whole or in part, notifying Defendant of deficiencies; or (e) any combination of the above. The results of Ohio EPA's review shall be in writing and provided to the Defendant.

30. In the event of approval, approval upon condition, or modification (subject to Dispute Resolution) of any submission by the Ohio EPA, the Defendant shall proceed to take any action required by the submission as approved, conditionally approved, or modified by Ohio EPA. In the event that revisions to submissions requested by Ohio EPA delay the schedules set forth in the Work Plan, the schedules may be adjusted accordingly upon agreement between Ohio EPA and the Defendant.

31. In the event that Ohio EPA initially disapproves a submission, in whole or in part, and notifies the Defendant in writing of the deficiencies identified by Ohio EPA, the Defendant shall within thirty (30) days, or such longer period of time as specified by Ohio EPA in writing, correct the deficiencies and submit the revised submission to Ohio EPA for approval. The revised submission shall incorporate all of the changes, additions, and/or deletions specified by Ohio EPA in its notice of disapproval. Revised submissions shall be accompanied by a letter indicating how and where each of Ohio EPA's comments was incorporated into the submission. Any other changes made to the submission by the Defendant shall also be identified in the letter. To the extent that the Defendant disputes any changes, additions, and/or deletions specified by the Ohio EPA, the Defendant shall initiate the procedures for dispute resolution set forth in the Dispute Resolution Section of this Consent Decree, within fourteen (14) days after receipt of

Ohio EPA's disapproval of a submission. Notwithstanding the disapproval, the Defendant shall proceed to take any action required by a non-deficient portion of the submission.

32. In the event that Ohio EPA disapproves a revised submission, in whole or in part, and notifies the Defendant in writing of the deficiencies identified by Ohio EPA, the Defendant shall within thirty (30) days, or such longer period of time as specified by Ohio EPA in writing, correct the deficiencies and incorporate all changes, additions, and/or deletions, and submit the revised submission to Ohio EPA for approval. If the Defendant fails to submit a revised submission incorporating all changes, additions, and/or deletions within thirty (30) days, or such period of time as specified by Ohio EPA in writing, Plaintiff may assert to the Court that the Defendant should be found in breach and/or violation of this Consent Decree. If the Court determines that the Defendant is in breach and/or violation of this Consent Decree, the State retains the right to seek termination this Consent Decree, perform any additional investigation and seek Response Costs, including but not limited to, a complete or partial PDC/FFS and/or enforce the terms of this Consent Decree as provided in the Reservation of Rights Section of this Consent Decree.

33. All work plans, reports, or other items required to be submitted to Ohio EPA under this Consent Decree shall, upon approval by Ohio EPA, be deemed to be incorporated in and made an enforceable part of this Consent Decree. In the event that Ohio EPA approves a portion of a work plan, report, or other item, the approved portion shall be deemed to be incorporated in and made an enforceable part of this Consent Decree. Should Ohio EPA take more than thirty (30) days to review and approve any submission, and that period of time beyond thirty (30) days causes Defendant to violate any schedule for Work to be completed, that delay in

performance of Work shall not be considered a violation of this Consent Decree.

## **XII. DISPUTE RESOLUTION**

34. The Site Coordinators shall, whenever possible, operate by consensus. In the event that there is a dispute about the adequacy of any work plan, report, or other item required to be submitted pursuant to the Additional Work and Review of Submittals Sections of this Consent Decree, the Defendant's Site Coordinator shall have fourteen (14) days from the date the dispute arises to inform Ohio EPA of the dispute. Ohio EPA and the Defendant shall have fourteen (14) days for informal negotiations with respect to the dispute. This informal dispute resolution period may be extended by agreement of Ohio EPA for up to a maximum of thirty (30) additional days. At the end of the informal dispute resolution period, the Defendant will have fourteen (14) days to institute the formal dispute resolution procedures of this Section by notifying Ohio EPA's Site Coordinator in writing.

35. The Defendant's written notification instituting the formal dispute resolution procedure shall include the technical rationale supporting the Defendant's position. If the Defendant's written notice and technical rationale in support of the position are not received within fourteen (14) days from the end of the informal dispute resolution period, the formal dispute resolution procedures may not be invoked for the disputed issue(s), and the dispute will be considered resolved. Ohio EPA shall have thirty (30) days from the date the Defendant's formal written dispute position is received to respond to Defendant in writing. Ohio EPA's written response shall include the technical rationale supporting Ohio EPA's position. Following the exchange of written positions, the Site Coordinators shall have an additional fourteen (14) days to resolve the formal dispute. If Ohio EPA concurs with the position of the Defendant or an

alternate resolution is reached, then the work plan, report, or other items required to be submitted pursuant to this Consent Decree shall be modified accordingly.

36. If Ohio EPA does not concur with the Defendant, Ohio EPA's Site Coordinator shall notify the Defendant in writing. Upon receipt of such written notice, the Defendant shall have fourteen (14) days to forward a written statement of the dispute to the Division of Environmental Response and Revitalization ("DERR") Manager and request a review of the decision regarding the dispute. If the Defendant does not forward such a statement and request within fourteen (14) days, Ohio EPA will adopt the written position of its Site Coordinator and the work plan, report, or other item required to be submitted pursuant to this Consent Decree, or any other item subject to the dispute resolution procedures of this Section, shall be modified accordingly. If the Defendant forwards such a statement and request within fourteen (14) days, the DERR Manager will resolve the dispute based upon and consistent with this Consent Decree, the PDC/FFS SOW, the approved PDC/FFS Work Plan, and other applicable federal and State laws and regulations.

37. In the event the Defendant disputes the decision of the DERR Manager, the Parties will seek a settlement conference with the Court to reach a final decision.

38. The pendency of a dispute under this Section shall extend only the time period for completion of the tasks related to the matters in dispute, except that upon mutual agreement of Ohio EPA and the Defendant, any time period may be extended as is deemed appropriate under the circumstances. Elements of the Work not affected by the dispute shall be completed in accordance with applicable schedules and time frames. The opportunity to invoke dispute resolution under the Dispute Resolution Section shall not be available to Defendant unless

otherwise expressly provided in this Consent Decree.

### **XIII. REIMBURSEMENT OF COSTS**

39. The Defendant shall reimburse Ohio EPA for all agreed Past Response Costs incurred by Ohio EPA in connection with the Site in the amount of \$107,318.64 as of December 30, 2013. Within thirty (30) days of the Effective Date of this Consent Decree, this amount shall be paid to Ohio EPA as set forth in Paragraph 41.

40. For Future Response Costs incurred by Ohio EPA in connection with the Site after December 30, 2013, Ohio EPA will annually submit to the Defendant an itemized invoice of its Response Costs in connection with the Site for the previous year or years. If Ohio EPA fails to submit an annual invoice, Response Costs from any previous year will be added to the next annual invoice. Within sixty (60) days of receipt of such itemized invoice, the Defendant shall remit payment for all of Ohio EPA's Response Costs for the previous year or years, by certified mail, payable to "Treasurer, State of Ohio" at the address listed on the invoice. Should the Defendant contest the accuracy of the Response Costs set forth in an itemized statement, or require additional support for such costs, the Defendant may invoke the procedures of the Dispute Resolution Section within fourteen (14) days of receiving the itemized statement. Any Response Costs which the Defendant must pay as a result of dispute resolution shall be paid within thirty (30) days of the resolution of the dispute. In any calendar year, the Defendant may request, but not more frequently than quarterly, an estimate of Response Costs incurred to that date, and Ohio EPA shall provide such estimate, which in no way shall limit any later comprehensive statement of costs for that calendar year.

41. The Defendant shall remit the Past Response Costs required to be paid pursuant to

Paragraph 39 as follows:

- a. Payment shall be made by certified check payable to "Treasurer, State of Ohio" and shall be forwarded to Scott Hainer, or his successor, 30 East Broad Street, 25<sup>th</sup> Floor, Columbus, Ohio 43215.
- b. A copy of the transmittal letter and check shall be sent to the Fiscal Officer, DERR, Ohio EPA, P.O. Box 1049, Columbus, Ohio 43216-1049, and to the Site Coordinator and the Assistant Attorney General assigned to this case.

#### **XIV. ACCESS TO INFORMATION**

42. Upon request, the Defendant shall provide to Ohio EPA within thirty (30) days, copies of all documents and information within its possession or control, or that of its contractors or agents, relating to the implementation of this Consent Decree, including but not limited to, unless asserted as confidential and/or privileged pursuant to Paragraphs 43 and 44, manifests, reports, correspondence, or other documents or information. This provision shall not be a limitation on any request for information to the Defendant by Ohio EPA made under State or federal law for information relating to events or conditions at the Site.

43. The Defendant may assert a claim that documents or other information submitted to Ohio EPA pursuant to this Consent Decree are confidential under the provisions of Ohio Adm. Code 3745-49-03 or 3745-50-30(A), or Ohio Rev. Code § 6111.05(A). If no such claim of confidentiality accompanies the documents or other information when it is submitted to Ohio EPA, it may be made available to the public without notice to the Defendant.

44. The Defendant may assert that certain documents or other information are privileged under the attorney-client privilege or any other privilege recognized by State law. If the Defendant makes such an assertion, it shall provide Ohio EPA with the following: (1) the title of the document or information; (2) the date of the document or information; (3) the name

and title of the author of the document or information; (4) the name and title of each addressee and recipient; (5) a general description of the contents of the document or information; and (6) the privilege being asserted by the Defendant.

45. No claim of confidentiality shall be made with respect to any data or reports required to be submitted to Ohio EPA pursuant to this Consent Decree, including but not limited to laboratory reports, and all sampling, analytical, and monitoring data.

46. The Defendant shall preserve for the duration of this Consent Decree and for a minimum of seven (7) years after termination of this Consent Decree, all documents and other information within its possession or control, or within the possession or control of its contractors or agents, which in any way relate to the Work notwithstanding any document retention policy to the contrary. The Defendant may preserve such documents by electronic or photographic devices. At the conclusion of this document retention period, the Defendant shall notify Ohio EPA at least sixty (60) days prior to the destruction of these documents or other information; and upon request, shall deliver such documents and other information to Ohio EPA.

47. To the extent not prohibited by statute or regulation, upon request by the Defendant, Ohio EPA shall reasonably provide the Defendant access to public documents related to the Site or to the Work to be performed under this Consent Decree, including but not limited to any data or other information submitted to Ohio EPA by persons other than the Defendant.

#### **XV. STIPULATED PENALTIES**

48. In the event that Defendant violates any of the requirements of this Consent Decree, the Defendant shall immediately and automatically be liable for and shall pay a stipulated penalty according to the following payment schedule. For each day of each failure to

meet a requirement, up to thirty (30) days – One Hundred Dollars (\$100.00) per day. For each day of each failure to meet a requirement, from thirty-one (31) days to sixty (60) days – Two Hundred Dollars (\$200.00) per day. For each day of each failure to meet a requirement, from sixty-one (61) days to ninety (90) days – Four Hundred Dollars (\$400.00) per day. For each day of each failure to meet a requirement, over ninety (90) days – Eight Hundred Dollars (\$800.00) per day.

49 Stipulated Penalties shall continue to accrue during any dispute resolution period, but need not be paid until the following:

a. If the dispute is resolved by agreement or by a decision of the DERR Manager that is not appealed to this Court, accrued penalties determined to be owing shall be paid within 15 days of the agreement or the receipt of the decision;

b. If Defendant disputes the decision of the DERR Manager and seeks a settlement conference with the Court to reach a final decision Defendant shall pay all accrued penalties determined by the Court to be owed to the State within 60 days of receipt of the Court's decision or order; and

c. Except for the payment deadlines, the process of paying stipulated penalties shall be paid as set forth in Paragraph 50.

50. Any payment required to be made under the provisions of Paragraph 48 of this Consent Decree shall be made by delivering a certified check or checks for the appropriate amounts, within forty-five (45) days from the date of the failure to meet the requirement, and every thirty (30) days thereafter as necessary to comply with the requirements of Paragraph 48, payable to the order of “Treasurer, State of Ohio,” to Scott Hainer, or his successor, at the Office

of the Attorney General of Ohio, Environmental Enforcement Section, 30 East Broad Street, 25th Floor, Columbus, Ohio 43215. The payment of the stipulated penalty shall be accompanied by letter briefly describing the basis of the stipulated penalty and the relevant date(s) of non-compliance, type of violation, deadline or requirement not met and the date upon which the violation occurred. This penalty shall be deposited into the hazardous waste clean-up fund created by Ohio Rev. Code § 3734.28.

#### **XVI. MODIFICATIONS**

51. This Consent Decree may be modified by agreement of the Parties. Modifications shall be in writing, signed by counsel for each Party and the authorized representative of the Defendant and memorialized in an order executed and entered by the court. Any such modifications shall be effective on the date the court enters its order approving such modifications.

#### **XVII. INDEMNITY**

52. Defendant agrees to indemnify, save, and hold harmless the State from any and all claims or causes of action arising from, or related to, the implementation of this Consent Decree, including any acts or omissions of the Defendant, its officers, employees, receivers, trustees, agents, or assigns. Said indemnification shall not apply to acts or omissions of the State of Ohio, its employees, agents or assigns at, on, upon, or related to the Site if said acts or omissions are negligent, performed outside the scope of employment or official responsibilities, or performed with malicious purpose, in bad faith, or in a wanton or reckless manner. The State shall not be considered a party to and shall not be held liable under any contract entered into by the Defendant in carrying out the activities pursuant to this Consent Decree. The State agrees to

provide notice to the Defendant within thirty (30) days after receipt of any claim that may be the subject of indemnity as provided in this Section, and to cooperate with the Defendant in the defense of any such claim or action against the State.

#### **XVIII. OTHER CLAIMS**

53. Nothing in this Consent Decree shall constitute or be construed as a release from any claim, cause of action, or demand in law or equity against any person, firm, partnership, or corporation not a Party to this Consent Decree, for any liability arising from, or related to, events or conditions at the Site and/or events or conditions at and from facilities located in the Urbana area including, but not limited to, the Johnson Welded Products, Inc. facility located at 625 South Edgewood Avenue, the Q3 JMC facility located at 200 Beech Street, and the Hall Company facility located at 420 East Water Street.

#### **XIX. RESERVATION OF RIGHTS**

54. The State reserves the right to seek further relief from this or any Court including without limitation preliminary and/or permanent injunctive relief, civil penalties for the claims in the Complaint, and cost recovery for work beyond this Consent Decree. This reservation explicitly includes the State's right to file a new Complaint seeking an order for implementation of a remedy for contamination at the Site and to seek recovery of costs for such work. This reservation also explicitly includes the State's right to seek relief for claims for damages to natural resources. Except as provided in Paragraph 55, this Consent Decree does not waive any defenses which the Defendant may have as to such further relief.

55. The State also expressly reserves, and this Consent Decree shall be without prejudice to, any civil or criminal claims, demands, rights, or causes of action, judicial or administrative, the State may have or which may in the future accrue against the Defendant or others, regardless of whether such claim, demand, right or cause of action was asserted in the Complaint. This Consent Decree does not waive defenses that the Defendant may have as to such claims, demands, rights or causes of action set forth in this Paragraph and Paragraph 54, except that the Defendant shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, *res judicata*, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon any contention that the claims, demands, rights or causes of action raised by the State in the subsequent proceeding were or should have been brought in the instant case.

56. Nothing herein shall limit the authority of the State to undertake any action against any entity, including the Defendant, to eliminate or control conditions which may present a threat to the public health, safety, welfare or environment, and to seek cost reimbursement for any such action.

57. Entering into this Consent Decree, the Consent Decree itself, or the taking of any action in accordance with it does not constitute an admission by the Defendant of any factual or legal matters or opinions set forth herein. The fact that Defendant has agreed to this Consent Decree shall not constitute or be construed as creating, giving rise to, or otherwise asserting the existence of any claim, cause of action, or demand in law or equity in favor of any person, firm,

partnership, or corporation not a Party to this Consent Decree for any liability arising from or related to events or conditions at the Site.

58. Defendant reserves all rights that it may have against other persons under all federal, state and local laws, except as may be set forth in a separate agreement or agreements.

**XX. RETENTION OF JURISDICTION**

59. This Court shall retain jurisdiction of this matter for the purpose of overseeing compliance with and resolving disputes arising under this Consent Decree.

**XXI. CONTRIBUTION PROTECTION**

60. With respect to matters addressed in this Consent Decree, the Parties agree that the Defendant is entitled to contribution protection as of the Effective Date of this Consent Decree as to any persons who are not Parties to this Consent Decree as is provided by CERCLA Section 113(f)(2), 42 U.S.C. § 9613(f)(2), so long as the Defendant complies with this Consent Decree. The “matters addressed” in this Consent Decree are the PDC/FFS Work and all Response Costs paid as required by this Consent Decree.

61. For so long as the Defendant is in compliance with the terms of this Consent Decree, the State shall not (i) grant contribution protection to any persons who are not Parties to this Consent Decree for the Work performed by the Defendant under this Consent Decree, and (ii) shall not enter into a separate Consent Decree with any persons who are not Parties to this Consent Decree that otherwise constitutes a release, covenant not to sue, or other settlement whatsoever of such person(s)' liabilities for the Work the Defendant performed under this Consent Decree.

## **XXII. TERMINATION**

62. The Parties' obligations under this Consent Decree shall terminate upon a subsequent order of the Court. The Parties will jointly apply for termination upon Defendant's receipt of Ohio EPA's approval in writing of the Defendant's written certification to Ohio EPA that all Work required to be performed under this Consent Decree has been completed, and the requirement for the payment of Past and Future Response Costs to that date have been completed, and no Stipulated Penalties are owed. The Defendant's certification shall contain the following attestation: "I certify that the information contained in or accompanying this certification is true, accurate, and complete." This certification shall be submitted by the Defendant to Ohio EPA and shall be signed by responsible officials of the Defendant. The termination of the Defendant's obligations under this Consent Decree shall not terminate the Parties' obligations or entitlements under the Reservation of Rights, Access to Information, Indemnity, Other Claims, and Contribution Protection Sections of this Consent Decree.

## **XXIII. NEGOTIATION OF FINAL CONSENT DECREE**

63. Upon termination of this Consent Decree, the Parties agree to meet and confer in good faith concerning the negotiation of a consent decree which could include, but not necessarily be limited to, a permanent injunction implementing a remedial order for the selected remedy and the payment of Response Costs related to such remedial order. By entering into this Consent Decree, Defendant does not acknowledge that additional remedial work will be required, and nothing in this Consent Decree obligates Defendant to agree to enter into such a future order.

**XXIV. ENTRY OF CONSENT DECREE BY CLERK**

64. Upon signing of this Consent Decree by the Court, the clerk is directed to enter it upon the journal and the Parties will be served electronically. Within three (3) days of entering the judgment upon the journal, the clerk is directed to serve upon all Parties notice of the judgment and its Effective Date upon the journal, in the manner prescribed by Rule 5(b) of the Federal Rules of Civil Procedure and note the service in the appearance docket.

**XXV. AUTHORITY TO ENTER INTO THE CONSENT DECREE**

65. The signatory for the Defendant represents and warrants that he or she has been duly authorized to sign this document and so bind the Defendant to all terms and conditions thereof.

**XXVI. EFFECTIVE DATE**

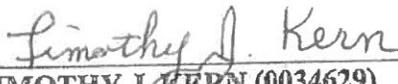
66. This Consent Decree shall be effective upon the date of its entry by the Court (the "Effective Date").

IT IS SO ORDERED AND AGREED.

  
\_\_\_\_\_  
**JUDGE WALTER H. RICE**  
**United States District Court**  
**Southern District of Ohio**

APPROVED:

**MICHAEL DEWINE**  
**OHIO ATTORNEY GENERAL**

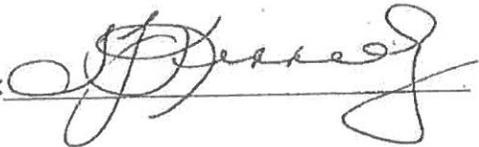
  
**TIMOTHY J. KERN (0034629)**  
Assistant Attorney General  
Environmental Enforcement Section  
30 East Broad Street, 25th Floor  
Columbus, Ohio 43215  
(614) 466-5261  
Timothy.Kern@OhioAttorneyGeneral.gov

*Counsel for State of Ohio*

  
**MICHAEL E. BORN (0040595)**  
**SHUMAKER, LOOP & KENDRICK, L**  
Huntington Center  
41 South High Street  
Suite 2400  
Columbus, Ohio 43215-6104  
(614) 463-4415  
mborn@slk-law.com

*Counsel for Defendant Honeywell  
International, Inc.*

**HONEYWELL INTERNATIONAL, INC.**

By: 

Print Name: Troy Kennedy

Title: Honeywell Remediation Director

## Appendix A

### STATEMENT OF WORK (SOW) FOR CONDUCTING GROUND-WATER PLUME DELINEATION AND FOCUSED FEASIBILITY STUDY FOR POTENTIAL PLUME REMEDIAL ACTIONS

#### PURPOSE:

The purpose of conducting the work described herein is to delineate and characterize any ground-water contaminant plumes which have resulted from the release of contaminants at the Site, and to evaluate any pathways of contaminant migration, including the soil vapor pathway, that may pose an unacceptable current and/or potential future risk to human health or the environment. Successful completion of the required work shall result in the vertical and horizontal delineation of groundwater contaminant plume(s), characterization of potential pathways of contaminant migration, and identification and evaluation of a range of potential plume remedial actions (PRAs) based on the criteria identified in this SOW.

Respondent shall conduct a Plume Delineation/Characterization (PDC) to determine the vertical and horizontal extent and physical and chemical characteristics of ground-water contaminant plumes, identify ground-water remediation goals, characterize and evaluate contaminant migration pathways, and obtain any other data necessary to support the identification and evaluation of potential PRAs for ground-water contaminant plumes and pathways of contaminant migration. Concurrent with the PDC, Respondent(s) shall conduct a Focused Feasibility Study (FFS) to evaluate potential PRAs. Respondent may propose the use of modeling and field screening techniques to guide the PDC and the FFS and to assist in evaluating contaminant migration pathways. Field analytical data meeting appropriate Data Quality Objectives will be required to verify field screening and modeling results.

The PDC and FFS are interactive and are to be conducted concurrently so that the data collected during the plume delineation and characterization influences the identification of and evaluation of the potential PRAs.

#### TASKS:

1. Develop Work Plan;
2. Conduct field investigations and obtain all other necessary data
3. Evaluate potential PRAs based on the evaluation criteria identified in this SOW.

#### DELIVERABLES:

1. Work Plan

2. Plume Delineation/Characterization Report
3. Pilot/Treatability Study Work Plan(s) and Report(s) (as appropriate)
4. Focused Feasibility Study Report
5. Monthly Progress Reports

## **1.0 DEVELOP WORK PLAN**

Respondent shall submit a PDC/FFS Work Plan, a Sampling and Analysis Plan (SAP) consisting of a Field Sampling Plan (FSP) and a Quality Assurance Project Plan (QAPP), and a Health and Safety Plan (HSP). The Work Plan and supporting documents (with the exception of the HSP) must be approved by Ohio EPA prior to the initiation of field activities.

### 1.1 Plume Delineation and Characterization/Focused Feasibility Study Work Plan

The PDC/FFS Work Plan (Work Plan) shall be developed in conjunction with the SAP and the HSP although each plan may be submitted under separate cover. The Work Plan shall describe in detail all tasks necessary to perform the work required by this SOW, provide a supporting rationale for performing each task in the manner described, identify the materials and procedures required for each task, and describe the work products to be submitted to the Ohio EPA, including required deliverables and meetings with Ohio EPA, and shall comply with federal, state and local laws and regulations which apply to the work to be performed. The Work Plan shall include a fixed date critical path schedule for accomplishing the required work which extends through and includes submittal of the PDC and FFS Reports.

Based on a review of existing information, Respondent shall include in the Work Plan a summary of the background information for the Site, including geographic location and describing the physiography, hydrogeology, and history of the Site with respect to the use, storage and disposal of contaminants. The Work Plan shall describe any previous response actions conducted by local, state, federal, or private parties; provide a summary of existing data in terms of the physical and chemical characteristics of identified contaminants; describe their distribution among the environmental media; identify known or potential contaminant Source Areas; and identify known or potential contaminant migration pathways and receptors, including any public or private water supply production wells that may potentially be at risk. Based on this information, Respondent shall develop and include in the Work Plan a Conceptual Site Model (CSM) which identifies known or suspected contaminant Source Areas, contaminants and affected media, known and potential routes of contaminant migration, and known or potential human and environmental receptors. Respondent shall use the CSM to assist in the identification

of locations where sampling is necessary and to support the evaluation of potential PRAs in the FFS.

The Work Plan shall include ground-water remediation goals for all contaminants previously identified at the Site. Ground-water remediation goals assist in plume delineation and support the evaluation of potential PRAs in the FFS. The Work Plan shall recognize that the identification of ground-water remediation goals is an iterative process which is repeated throughout the investigation if contaminants are detected which are not known to be present at the time of Work Plan preparation. Ground-water remediation goals shall be developed using the following procedures:

- A. Identify contaminants of Concern (COC). COCs are those contaminants detected in ground water and soil at the Site and their associated degradation products. Low relative concentration and infrequent occurrence are insufficient reasons to eliminate contaminants from the COC list.
- B. For each COC, identify the corresponding Maximum Contaminant Level (MCL) if one exists, and calculate the residential water carcinogenic effects remediation goal ( $10^{-5}$ ) and the residential water noncarcinogenic effects remediation goal (HI=1) using equations 1' and 2' on pages 21 and 22 of RAGS Part B (see Appendix C). When using equation 1', substitute a target excess individual lifetime cancer risk value of  $10^{-5}$  into the equation. If trichloroethylene is a COC, use the CAL-EPA slope factor of  $1.3 \times 10^{-2}$  mg/kg/day for calculation of the residential water carcinogenic effects remediation goal ( $10^{-5}$ ).
- C. For each COC, select the lowest concentration from among the MCL, the carcinogenic risk-based remediation goal, and the noncarcinogenic risk-based remediation goal.
- D. For each COC, compare the value obtained in item C above with the practical quantitation limit (PQL) for the contaminant when analyzed using U. S. EPA method 8260 with a 25 ml. purge (or equivalent method). The value obtained in item C becomes the ground-water remediation goal unless the PQL is higher, in which case the PQL becomes the ground-water remediation goal.

The Work Plan shall also identify general ground-water response actions which address the following ground-water response objectives:

1. Prevent exposure to contaminated ground water;
2. Protect uncontaminated ground and surface water for current and future use; and
3. Restore contaminated ground water for future use.

General ground-water response actions shall be identified which not only address preliminary ground-water remediation goals, but the time frame within which the remediation goals might be achieved. The range of general ground-water response actions shall include actions which

actively remediate ground-water contaminant plume(s). The use of presumptive remedy guidance, as appropriate, may provide an immediate focus to the identification of general ground-water response actions at this stage. Presumptive remedies involve the use of remedial technologies that have been consistently selected at similar sites or for similar contamination. Data collection and analysis activities necessary to support the detailed analysis of potential PRAs shall be included in the Work Plan.

Following Ohio EPA approval of the Work Plan and supporting documents, Respondent(s) shall implement the work in accordance with the schedules described therein.

### 1.2 Sampling and Analysis Plan (SAP)

Respondent shall prepare a SAP consisting of the following:

#### A. *Field Sampling Plan (FSP)*

The FSP shall specify and detail all activities necessary to obtain data for the Site and provide detailed standard operating procedures (SOPs) for those activities. The FSP shall describe sampling objectives; equipment and procedures; sample types, locations, and frequencies; and parameters of interest; and shall be tied to the schedules contained in the Work Plan.

#### B. *Quality Assurance Project Plan (QAPP)*

The QAPP shall address all investigations to be conducted at the Site, including but not limited to the following:

1. A project description;
2. Analytical methods and laboratory procedures;
3. Data Quality Objectives (DQOs) tied to the intended use(s) for all pre-existing and all data proposed for collection;
4. Quality assurance objectives for data such as the required precision, accuracy, completeness, representativeness, and comparability of data;
5. Chain of custody procedures during sample collection and in the laboratory;
6. The type and frequency of calibration procedures during sample collection and in the laboratory;

7. Preventative maintenance procedures and schedule and corrective action procedures for field and laboratory instruments;
8. Specific procedures to assess data precision, representativeness, comparability, accuracy, and completeness of specific measurement parameters; and
9. Data documentation and tracking procedures.
10. The modeling section of the QAPP shall apply to all models used in the conduct of the PDR and shall be consistent with the U.S. EPA document "*Guidance for Quality Assurance Project Plans for Modeling*" referenced in Appendix C.

C. *Health and Safety Plan (HSP)*

Respondent shall submit a HSP which complies with the requirements of applicable federal, state, and local laws. The HSP shall identify problems or hazards that may be encountered at the Site and describe in detail each related mitigation procedure. The HSP shall include procedures for protecting third parties such as visitors and the surrounding community. Ohio EPA may provide comment on the HSP, however the HSP is not subject to formal agency approval. The HSP should be consistent with:

1. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
2. Section 111(c)(6) of CERCLA;
3. U.S. EPA Order 1440.3 -- Respiratory Protection;
4. EPA Order 1440.2 -- Health and Safety Requirements for Employees Engaged in Field Activities;
5. U.S. EPA Occupational Health and Safety Manual;
6. U.S. EPA Standard Operating Safety Guides (Publication 9285.1-03, PB92-963414, June 1992);
7. OSHA regulations, particularly in 29 CFR 1910 and 1926;
8. State and local regulations; and
9. Facility and Site conditions.

## **2.0 PLUME DELINEATION AND CHARACTERIZATION**

Respondent shall collect sufficient data on the physical and chemical characteristics of the Site to characterize and delineate any ground-water contaminant plumes and any pathways of contaminant migration. Respondent shall also collect such data as may be required to support the analysis of potential PRAs in the FFS.

### 2.1 Hydrogeologic Study

Respondent shall perform a hydrogeologic study throughout the Site to evaluate the subsurface geology and water bearing formations, and to delineate/characterize ground-water contamination and pathways of contaminant migration. The study shall determine the location of water bearing formations, confining layers, bedrock, and other subsurface geologic features, and shall support the determination of the vertical and horizontal extent of contaminant plumes and distribution of plume contaminants. Efforts shall begin with a survey of previous hydrogeologic studies and other existing data.

A detailed technical description of all methods to be used in gathering data for this task shall be included in the Work Plan and supporting documents. This shall include a diagrammatic representation of proposed field survey, monitoring well, and piezometer locations, monitoring well and piezometer design and construction details, drilling techniques, well development and sampling methods.

The hydrogeologic investigation shall provide the following information for the Site:

- A. A representative and accurate classification and description of the hydrogeologic units which may be part of the contaminant plume or pathways of contaminant migration (i.e., the aquifers and any intervening saturated and unsaturated units) including but not limited to:
  1. Hydraulic conductivity (vertical and horizontal) and porosity (total and effective);
  2. Storativity and transmissivity;
  3. Lithology, grain size, sorting, and degree of cementation;
  4. A determination of hydraulic interconnections between saturated zones; and
  5. The retardation potential and composition of native aquifer materials (e.g., organic carbon content, clay content, clay mineralogy, etc.).

- B. Hydrogeologic cross-sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may influence the contaminant plume or pathways of contaminant migration, identifying:
1. Sand, gravel, and other unconsolidated deposits;
  2. Zones of higher or lower permeability that might direct or restrict the flow of contaminants;
  3. Aquifers: geologic formations, groups of formations, or parts of formations capable of yielding usable amounts of ground water to wells or springs; and
  4. Water-bearing zones that may serve as a pathway for contaminant migration including perched zones of saturation.
- C. A representative description of water level or fluid pressure monitoring including:
1. Potentiometric surface maps;
  2. Hydrogeologic cross sections showing vertical gradients and interconnection between water bearing zones; and
  3. Temporal changes in hydraulic gradients and flow directions.
- D. A description of man-made influences that may affect the hydrogeology of the Site or act as pathways of contaminant migration identifying:
1. Local water supply and production wells with an approximate schedule of pumping; and
  2. Man-made hydraulic structures (*e.g.*, pipe-lines, french drains, ditches, unlined ponds, septic tanks, wastewater outfalls, retention areas, utility lines, etc.).

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

## 2.2 Soil and Sediments Investigation

Respondent shall conduct a program to characterize the soil and unconsolidated deposits in the vicinity of the Site. This process may overlap with certain aspects of the hydrogeologic study. A survey of existing data on soils and sediments may be useful. The characterization shall include as appropriate the following information:

- A. Soil classification using the Unified Soil Classification System;
- B. Surface soil distribution;
- C. Soil profile;
- D. Transects of soil stratigraphy;
- E. Hydraulic conductivity;
- F. Relative permeability;
- G. Bulk density;
- H. Porosity;
- I. Soil sorptive capacity;
- J. Soil organic content;
- K. Particle size distribution;
- L. Depth to water table and any perched zones;
- M. Moisture content;
- N. Effect of stratification on unsaturated flow;
- O. Infiltration rate;
- P. Storage capacity; and
- Q. Clay mineralogy.

Respondent shall describe in detail the procedures used in making the above determinations.

### 2.3 Contamination Characterization

Respondent shall identify and characterize ground-water contamination to the extent necessary to define contaminant plumes and pathways of contaminant migration, and complete the

determination of ground-water remediation goals. Data collected shall be sufficient to define the magnitude, origin, direction, and rate of contaminant migration.

A. Ground-water Contamination

Respondent shall conduct an investigation to delineate/characterize ground-water contamination which shall at a minimum provide the following information:

1. A characterization of any immiscible or dissolved phase contaminant plumes including non-aqueous phase liquids (NAPL);
2. The velocity of contaminant movement;
3. The horizontal and vertical concentration profiles of contaminants within ground-water contaminant plumes;
4. An evaluation of factors influencing contaminant movement;
5. Background conditions in areas upgradient of and unaffected by Site related contamination; and
6. Identification of any public or private water supply wells potentially affected by ground-water contaminant plumes and the concentration of contaminants in such wells.

Respondent shall document the procedures used in making the above determinations. Respondent shall refer to the guidance identified in Appendix C for well design, construction, development, purging, sampling, geophysics, modeling, etc

B. Soil Vapor Contamination

Consistent with the guidance included in Appendix C, Respondent shall evaluate the soil vapor intrusion pathway. If the soil vapor intrusion pathway evaluation indicates that an unacceptable threat to human health exists, Respondent shall promptly mitigate the threat. The evaluation shall at a minimum provide the following information:

1. A survey of representative inhabitable structures in the area overlying the ground-water contaminant plume. For the purposes of this task, "inhabitable structures" shall mean residential dwellings and commercial/industrial buildings that have been built for, and are suitable for, occupancy by humans;

2. A screening evaluation of the soil vapor intrusion pathway to determine whether the soil vapor intrusion pathway presents a potential threat to human health;
3. A proposal for soil vapor and/or indoor air sampling to verify the results of the screening evaluation.

#### 2.4 Potential Plume Remedial Action Array

Respondent(s) began the development and evaluation of a limited number of potential PRAs during preparation of the PDC/FFS Work Plan. Based on the data collected during the PDC, Respondent(s) shall refine the potential PRAs as described below.

##### 2.4.1 Development and Screening of Potential Plume Remedial Actions

#### A. Refine Potential PRAs

Concurrent with Site characterization activities, Respondent(s) shall refine the initial identification of general ground-water response actions performed in the PDC/FFS Work Plan as additional data from the Site become available. All potential response actions under consideration must at a minimum ensure protection of human health and the environment. Refined potential PRAs shall be described with respect to treatment, pumping, containment, or other actions, singly or in combination, to meet the ground-water response objectives identified in 1.1 above.

#### B. Identify Areas and/or Volumes of Media

Respondent(s) shall identify areas or volumes of media to which the potential general ground-water response actions apply, taking into account the preliminary ground-water remediation goals, site conditions, and the nature and extent of contamination. (Section 4.2.3 of the RI/FS Guidance).

#### C. Identify, Screen, and Document Remedial Technologies

Respondent(s) shall screen and evaluate remedial technologies associated with the general ground-water response actions in order to eliminate those that cannot be technically implemented at the Site based on contaminant types and concentrations and Site characteristics. Decisions made during the screening of remedial technologies and supporting rationale shall be documented in the PDC Report.

#### D. Evaluate and Document Process Options

Process options for each technology type shall be identified and evaluated on the basis of

effectiveness, implementability, and cost as those criteria are defined in Section 4.2.5 of U.S. EPA's RI/FS Guidance. The intent shall be to select and retain wherever possible one or, if necessary, more representative process options for each implementable technology type. Evaluation should typically focus on effectiveness factors at this stage with less effort directed at the implementability and cost factors. The identification and screening of technology types and process options shall be documented for inclusion in the PDC Report, including the rationale for screening technologies and process options from further consideration.

#### 2.4.2 Assembly of Representative Technologies into Potential Plume Remedial Actions

Respondent(s) shall assemble the selected representative technologies into potential PRAs, each of which comprehensively addresses the delineated contaminant plume(s). A potential PRA shall be included for ground water that is a current or potential source of drinking water which achieves the preliminary ground-water remediation goals throughout the delineated plume(s) within the shortest time frame technically practicable. A limited number of additional PRAs shall be developed that attain the ground-water cleanup goals within different restoration time periods using one or more different technologies. Natural attenuation to the preliminary ground-water remediation goals shall serve as a baseline for comparison with other potential PRAs. Each potential PRA shall be described with respect to the locations and areas of the Site affected, approximate volumes of media to be removed or treated, and any other information needed to adequately describe the PRA and document the logic behind the assembly of general response actions and representative remedial technologies into specific potential PRAs.

#### 2.4.3 Post-Assembly Considerations

At the conclusion of the assembly of potential PRAs, Respondent(s) shall determine if the amount and type of data existing for the Site will support the detailed analysis of the PRAs. Respondent(s) shall consider whether any additional field investigation or treatability testing is necessary prior to proceeding with the detailed analysis of the potential PRAs. If Respondent(s) determines that additional site data or treatability testing is needed, Respondent(s) shall document that determination, identify the specific types of data needed, the time frame for obtaining the data, and the effect on the overall project schedule. If Ohio EPA concurs with Respondent(s)' determinations, Respondent(s) shall submit for Ohio EPA review and approval such work plans or treatability study plans as may be needed to obtain the additional data. Should Ohio EPA determine, based on review of the PDC Report, that additional data is needed in order to perform the detailed analysis of potential PRAs, Ohio EPA shall notify Respondent(s) of the need for and types of additional data needed. Respondent(s) shall submit for Ohio EPA review and approval such work plans or treatability study plans as may be needed to obtain the additional data.

### 2.5 Plume Delineation/Characterization Report

Respondent(s) shall summarize all investigations and their results to ensure that the investigation data are sufficient in quality and quantity to delineate groundwater contaminant plume(s), define contaminant migration pathways, and support the identification and evaluation of potential PRAs. Any data gaps shall be identified and their impact upon the work shall be fully described.

The analysis and summary shall be presented in a written PDC Report which shall at a minimum include the following:

- A. Data on the physical characteristics of the Site (soils, geology, hydrogeology, etc.), including summary tables of relevant results.
- B. Data on contaminant source characteristics describing:
  - 1. The contaminant source location(s).
  - 2. The type and integrity of any existing contaminant source containment.
- C. Data on ground-water contaminant plumes including a description and diagrammatic representation (planar and cross section) of the vertical and horizontal extent of contamination in ground water based on the identified ground-water remediation goals.
- D. An evaluation of the soil vapor migration pathway including data and information supporting the evaluation;
- E. A revised Conceptual Site Model identifying all potential or suspected sources of contamination, types and concentrations of contaminants, potential exposure pathways, and all potential receptors. description and diagrammatic representation of actual and potential contaminant migration pathways; and
- F. Ground-water remediation goals and supporting calculations for all contaminants identified during the investigation, including potential breakdown products.
- G. Potential Plume Remedial Action Array, including documentation of the methods, rationale, and results of the technology, process option, and potential PRA development process.

Based upon the PDC Report, the Ohio EPA shall identify and provide to Respondent(s) ARARs for the range of potential PRAs presented. ARARs are subject to revision throughout the PDC/FFS process and are finalized by Ohio EPA at the time of remedy selection.

### **3.0 FOCUSED FEASIBILITY STUDY**

#### 3.1 Detailed Analysis of Potential PRAs

Once it has been determined that sufficient data exist to proceed, Respondent(s) shall conduct the detailed analysis of potential PRAs to provide the Ohio EPA with the information needed for remedy selection. The detailed analysis shall consist of an individual analysis of each potential PRA against the eight evaluation criteria described below and a comparative analysis of all potential PRAs using the same evaluation criteria as a basis for comparison.

The detailed analysis shall consist of the following elements:

##### 3.1.1. Detailed Description

The detailed narrative description of each potential PRA shall include as a minimum:

- A. Description of appropriate treatment and disposal technologies;
- B. Refinement of the volumes and/or areas of contaminated media to be addressed;
- C. Special engineering considerations required to implement the potential PRA, *e.g.*, pilot treatment facility or additional studies needed to proceed with final remedial design;
- D. Operation, maintenance and monitoring requirements of the completed remedy;
- E. Temporary storage requirements;
- F. Safety requirements for implementation, including both on-site and off-site health and safety considerations;
- G. An analysis of how potential PRAs could be phased into individual operations and a discussion of how these operations could best be implemented (individually or in groups) to produce significant environmental improvement;
- H. A review of any off-site treatment or disposal facilities and transportation needs to ensure compliance with RCRA, TSCA and state requirements; and
- I. An analysis of the projected performance and expected results of the potential PRA.

##### 3.1.2 Environmental Impact of potential PRAs

An assessment of the environmental impact of each potential PRA shall be performed, including the impacts of residual contamination, if any, and the impact of physical/habitat alterations (eg: loss of wetlands or riparian habitat due to filling or grading, destruction of benthic substrate, nesting areas, etc). Include any proposals for damage mitigation. Assess in comparison to other potential PRAs.

3.1.3. Apply Eight Criteria and Document Individual Potential PRA Analysis

Respondent(s) shall apply the eight evaluation criteria described below to each individual potential PRA. Respondent(s) shall document the decision making process and the results of the individual analysis of potential PRAs for inclusion in the FFS.

A. Overall Protection of Human Health and the Environment.

Potential PRAs shall be assessed as to whether they can adequately protect human health and the environment from unacceptable risks posed by contaminants present at the Site by eliminating, reducing or controlling exposures to levels established during development of the ground-water remediation goals. This is a threshold requirement and the primary objective of the remediation effort.

B. Compliance with Applicable or Relevant and Appropriate Requirements.

The potential PRAs shall be assessed as to whether they attain applicable or relevant and appropriate standards, criteria and requirements of state and federal environmental and public health laws.

C. Long-term Effectiveness and Permanence.

Potential PRAs shall be assessed for the long-term effectiveness and permanence they afford, along with the degree of certainty that the potential PRA will prove successful. Factors that shall be considered, as appropriate, include the following:

1. Nature and magnitude of residual risk following implementation, including an assessment of the potential risk to human and environmental receptors based on the concentrations of contaminants remaining following implementation.
2. The type, degree and adequacy of long-term management required for untreated contaminants and treatment residuals, including engineering controls (such as

containment technologies), institutional controls, monitoring and operation and maintenance;

3. Long-term reliability of the engineering and institutional controls, including uncertainties associated with land disposal of untreated contaminants, as well as treatment residuals, and;
4. Potential need for replacement of the remedy, as well as the continuing need for repairs to maintain the performance of the remedy.

D. Reduction of Toxicity, Mobility or Volume.

The degree to which potential PRAs employ treatment that reduces toxicity, mobility or volume of contaminants shall be assessed. Potential PRAs which, at a minimum, address the principal threats posed by the Site through treatment shall also be identified. Factors that shall be considered, as appropriate, include the following:

1. The treatment or recycling processes employed and materials they will treat;
2. The amount of contaminants destroyed, or treated, or recycled;
3. The degree of expected reduction in toxicity, mobility or volume of the contaminants due to treatment or recycling and the specifications of which reduction(s) are occurring;
4. The degree to which the treatment is irreversible;
5. The type and quantity of residuals that will remain following treatment, considering the persistence, toxicity, mobility and propensity to bioaccumulate;
6. The degree to which treatment will reduce the inherent hazards posed by the principal threats at the Site; and
7. The degree to which the treatment processes employed reduce the transfer of contaminants between environmental media.

E. Short-term Effectiveness.

The short-term impacts of the potential PRAs during the construction and implementation phase, and until the objectives of the remedial action have been met, shall be assessed considering the following:

1. Short-term risks that may be posed to the community during construction and implementation of a potential PRA and until the remedial action objectives have been met;
2. Potential impacts on workers during implementation of the potential PRA including the effectiveness and reliability of protective measures;
3. Potential environmental impacts that may result from implementation of the potential PRA and the effectiveness and reliability of mitigative measures during implementation and until the objectives of the remedial action have been met; and
4. Time until preliminary ground-water remediation goals are achieved.

F. Implementability.

The technical and administrative feasibility of implementing the potential PRAs shall be assessed by considering the following types of factors, as appropriate:

1. Technical Feasibility
  - Degree of difficulty or uncertainty associated with construction and operation;
  - Expected operational reliability;
  - Ease of undertaking additional remedial action(s); and
  - Ability to monitor the effectiveness of the remedy.
2. Administrative Feasibility
  - Activities needed to coordinate state, local, and federal agencies (e.g., obtaining necessary approvals and permits, right-of-way for construction, etc.); and
  - Likelihood of property owner to enter into an environmental covenant.
3. Feasibility of Obtaining Services and Materials
  - Capacity and location of adequate treatment, storage, and disposal services;
  - Availability of necessary equipment and specialists and provisions to ensure any

necessary additional resources; and

-Availability of prospective technologies

G. Cost.

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

1. Direct and indirect capital costs, including contingency and engineering fees;
2. Annual operation and maintenance costs; and
3. Net present value of capital and O&M costs.

H. Community Acceptance.

This assessment includes determining which components of the potential PRAs interested persons in the community support, have reservations about, or oppose. This assessment, which will be completed by the Ohio EPA, occurs throughout the implementation of the PDC/FFS and is completed by Ohio EPA after public comment on the proposed PRA. Evaluation of community acceptance is not part of this Order or SOW.

3.1.4. Compare Potential PRAs Against Each Other and Document the Comparison of Potential PRAs

At the conclusion of the individual analysis of potential PRAs, Respondent(s) shall perform a comparative analysis of the potential PRAs. Each potential PRA shall be compared against the others using the eight evaluation criteria described above as a basis of comparison. Respondent(s) shall document the decision making process and the results of the comparative analysis of potential PRAs for inclusion in the FFS. Identification and selection of the preferred PRA is reserved for the Ohio EPA and is not part of the Orders or SOW.

3.15 Focused Feasibility Study Report

Respondent(s) shall submit a draft Focused Feasibility Study report to the Ohio EPA for review, comment, and approval. This report shall include the detailed analysis of potential PRAs, clearly documenting the decision making processes and the results. Respondent(s) shall refer to U.S. EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA for an outline of the report format and the required report content. Upon satisfactorily addressing Ohio EPA's comments, Respondent(s) will prepare and submit a final Focused Feasibility Study Report.

## Appendix B

### GUIDANCE DOCUMENTS

#### OHIO EPA POLICIES AND GUIDANCE DOCUMENTS

1. "Remediation Using Monitored Natural Attenuation", Ohio EPA, DERR, Policy No. DERR-00-RR-032, January, 2001
2. "Technical Guidance Manual for Hydrogeologic Investigations and Ground Water Monitoring Programs", Ohio EPA, Division of Drinking and Ground Waters, Final, February 1995 (various updates)
3. "Wastewater Discharges Resulting from Clean-Up of Response Action Sites Contaminated with Volatile Organic Compounds", Ohio EPA Policy No. DSW-DERR 0100.027, Final, September 22, 1994 (updated December 21, 2006)
4. "Sample Collection and Evaluation of Vapor Intrusion to Indoor Air", Ohio EPA, DERR, May 2010

#### U.S. EPA GUIDANCE DOCUMENTS AND OTHER USEFUL GUIDANCE

5. "Draft Guidance For Evaluating The Vapor Intrusion to Indoor Air Pathway From Groundwater And Soils (Subsurface Vapor Intrusion Guidance)" U.S. EPA, November 2002
6. "Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers," U.S. EPA, EPA 542-S-02-001, May 2002
7. "Compendium of ERT Soil Sampling and Surface Geophysics Procedures," U.S. EPA, OSWER 9360.4-02, January 1991
8. "Guidance for Quality Assurance Project Plans", U.S. EPA, EPA/240/R-02/009 (EPA QA/G-5), December 2002
9. "Guidance for the Data Quality Objective Process," U.S. EPA, EPA/600/R-96/055 (EPA QA/G-4), August 2000
10. "Data Quality Objectives Process for Hazardous Waste Site Investigations", U.S. EPA, EPA/600/R-00/007 (EPA QA/G-4HW), January 2000
11. "Statistical Methods for Evaluating the Attainment of Cleanup Standards, Volume 1: Soils and Solid Media," U.S. EPA, EPA 230/02-89-042. February 1989.

12. "Methods for Evaluating The Attainment Of Cleanup Standards, Volume 2: Ground Water," U.S. EPA, EPA 230-R-92-014 July 1992.
13. "Statistical Methods For Evaluating The Attainment Of Cleanup Standards, Volume 3: Reference-Based Standards For Soils And Solid Media," U.S. EPA, EPA 230-R-94-004, December 1992
14. "Data Quality Assessment: Statistical Methods for Practitioners," U.S. EPA, EPA/240/B-06/003 (EPA QA/G-9S), February 2006
15. "Data Quality Evaluation Statistical Toolbox (DATA Quest) Users Guide," U.S. EPA ORD, EPA/600/R-96/085 (EPA QA/G-9D), December 1997. No longer available. For a links to other free software for performing data quality assessment, see Quality-Related Resources – Software.
16. "Guidance for Quality Assurance Project Plans for Modeling" U.S. EPA OEI, EPA/240/R-02/007 (EPA QA/G-5M), December 2002
17. "Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites", OSWER Directive 9283.1-12, EPA 540/R-96/023, PB96-963508, October 1996.
18. "Presumptive Remedies: Site Characterization and Technology Selection for CERCLA Sites with Volatile Organic Compounds in Soil," U.S. EPA, OSWER 9355.4-048FS, September 1993
19. "User's Guide to the VOCs in Soils Presumptive Remedy," U.S. EPA, OSWER 9355.0-63FS; EPA 540/F-96/008; PB 96-963308, July, 1996
20. "Presumptive Remedy: Supplemental Bulletin Multi- Phase Extraction (MPE) Technology for VOCs in Soil and Groundwater," U.S. EPA, OSWER 9355.0-68F8, April 1997
21. "Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water," U.S. EPA, EPA/600/R-98/128, September 1998
22. "Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tanks," U.S. EPA, OSWER 9200.4-17, December 1, 1997
23. "Performance Monitoring of MNA Remedies for VOCs in Ground Water," U.S. EPA ORD, EPA/600/R-04/027, April 2004
24. "Region 5 Framework for Monitored Natural Attenuation Decisions for Ground Water," U.S. EPA Region 5, September 19, 2000
25. "Natural Attenuation for Groundwater Remediation," Committee on Intrinsic Remediation, National Academy of Sciences, 2000

26. "Pump-and-Treat Ground-Water Remediation," U.S. EPA ORD, EPA/625/R-95/005, July, 1996
27. "Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration," U.S. EPA, OSWER 9234.2-25, September 1993
28. "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA", EPA/540/G-89/004, OSWER Directive 9355.3-01, October, 1988.
29. "Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites", EPA/540/G-88/003, OSWER Directive 9283.1-2, December, 1988
30. "Data Quality Objectives Process for Superfund", Interim Final Guidance, OSWER Directive 9355.9-01, EPA540-R-93-071, September 1993
31. "Guide for Conducting Treatability Studies Under CERCLA", EPA/540/2-89/058, December 1989, interim final
32. "Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part B), Development of Risk-based Preliminary Remediation Goals," OSWER Directive 9285.7-01B, December 1991, Interim
33. "Integrated Risk Information System Data Base," (IRIS) U.S. EPA,
34. U.S. EPA Health Effects Assessment Summary Tables (HEAST), Office of Emergency & Remedial Response, published annually
35. "U.S. EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA-540/R-99-008, October 1999
36. "VLEACH: A One-Dimensional Finite Difference Vadose Zone Leaching Model, Version 2.2a, USEPA