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UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 4

IN THE MATTER OF:
B. F. Goodrich Superfund Site
Calvert City, Marshall County, Kentucky

Goodrich Corporation and PolyOne
Corporation, Respondents.

ADMINISTRATIVE SETTLEMENT
AGREEMENT AND ORDER ON
CONSENT FOR FOCUSED REMEDIAL
INVESTIGATION/FEASIBILITY STUDY

U.S. EPA Region 4
CERCLA Docket No. 04-2008-3775

Proceeding Under Sections 104, 107 and
122 of the Comprehensive Environmental
Response, Compensation, and Liability Act,
as amended, 42 U.S.C. §§ 9604, 9607 and
9622.



10621014

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ADMINISTRATIVE SETTLEMENT AGREEMENT
FOR FOCUSED REMEDIAL INVESTIGATION/FEASIBILITY STUDY

I. JURISDICTION AND GENERAL PROVISIONS

1. This Administrative Settlement Agreement and Order on Consent ("Settlement Agreement") is entered into voluntarily by the United States Environmental Protection Agency, ("EPA") Goodrich Corporation and PolyOne Corporation, ("Respondents"). The Settlement Agreement concerns the preparation and performance of a focused Remedial Investigation and Feasibility Study ("Focused RI/FS") at the B.F. Goodrich Superfund Site located in Calvert City, Marshall County, Kentucky and the reimbursement of future response costs incurred by EPA in connection with the Focused RI/FS.

2. This Settlement Agreement is issued under the authority vested in the President of the United States by Sections 104, 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §§ 9604, 9607 and 9622 ("CERCLA"). This authority was delegated to the Administrator of EPA on January 23, 1987, by Executive Settlement Agreement 12580, 52 Fed. Reg. 2926 (Jan. 29, 1987), and further delegated to Regional Administrators on May 11, 1994, by EPA Delegation Nos. 14-14-C and 14-14-D and further redelegated by Regional Delegation 14-14-C, through the Director, Waste Management Division, to the Chiefs of the Superfund Remedial and Site Evaluation and Superfund Remedial and Technical Services Branches.

3. In accordance with Sections 104(b)(2) and 122(j)(1) of CERCLA, 42 U.S.C. §§ 9604(b)(2) and 9622(j)(1), EPA notified the Kentucky Department of Environmental Protection (KYDEP) on November 15, 2007, of negotiations with potentially responsible parties regarding the release of hazardous substances that may have resulted in injury to the natural resources under Federal trusteeship.

4. EPA and Respondents recognize that this Settlement Agreement has been negotiated in good faith and that the actions undertaken by Respondents in accordance with this Settlement Agreement do not constitute an admission of any liability. Respondents do not admit, and retain the right to controvert in any subsequent proceedings other than proceedings to implement or enforce this Settlement Agreement, the validity of the findings of fact, conclusions of law and determinations in Sections V and VI of this Settlement Agreement. Respondents agree to comply with and be bound by the terms of this Settlement Agreement and further agree that they will not contest the basis or validity of this Settlement Agreement or its terms.

II. PARTIES BOUND

5. This Settlement Agreement applies to and is binding upon EPA and upon Respondents and their successors and assigns. Any change in ownership or corporate status of a Respondent including, but not limited to, any transfer of assets or real or personal property shall not alter such

Respondent's responsibilities under this Settlement Agreement.

6. Respondents are jointly and severally liable for carrying out all activities required by this Settlement Agreement. In the event of the insolvency or other failure of any one or more Respondents to implement the requirements of this Settlement Agreement, the remaining Respondents shall complete all such requirements.

7. Respondents shall ensure that their contractors, subcontractors, and representatives receive a copy of this Settlement Agreement and comply with this Settlement Agreement. Respondents shall be responsible for any noncompliance with this Settlement Agreement.

8. Each undersigned representative of Respondents certifies that he or she is fully authorized to enter into the terms and conditions of this Settlement Agreement and to execute and legally bind Respondents to this Settlement Agreement.

III. STATEMENT OF PURPOSE

9. In entering into this Settlement Agreement, the objectives of EPA and Respondents are: (a) to determine the nature and extent of NAPL contamination and any threat to the public health, welfare, or the environment caused by the release or threatened release of hazardous substances, pollutants or contaminants associated with NAPL at or from the Site, by conducting a Focused Remedial Investigation as more specifically set forth in the Focused Remedial Investigation/Feasibility Study Work Plan (Volume I) ("Focused RI/FS Work Plan") attached as Appendix A to this Settlement Agreement; (b) to identify and evaluate remedial alternatives to prevent, mitigate or otherwise respond to or remedy any release or threatened release of hazardous substances, pollutants, or contaminants associated with NAPL at or from the Site, by conducting a Focused Feasibility Study as more specifically set forth in the Focused RI/FS Work Plan in Appendix A to this Settlement Agreement; and to recover response and oversight costs incurred by EPA with respect to activities taken pursuant this Settlement Agreement.

10. The Work conducted under this Settlement Agreement is subject to approval by EPA and shall provide all appropriate and necessary information to revise, update or select information to assess Site conditions and evaluate alternatives to the extent necessary to select a remedy that will be consistent with CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300 ("NCP"). Respondents shall conduct all Work under this Settlement Agreement in compliance with CERCLA, the NCP, and all applicable EPA guidances, policies, and procedures.

IV. DEFINITIONS

11. Unless otherwise expressly provided herein, terms used in this Settlement Agreement that are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are

used in this Settlement Agreement or in the appendices attached hereto and incorporated hereunder, the following definitions shall apply:

- a. "ACLs" shall mean alternate concentration limits used as cleanup goals for the Site as defined in the 1988 ROD.
- b. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601, *et seq.*
- c. "CD" shall mean the Consent Decree, Civil Action No. C-89-0005-P(CS), dated June 29, 1992 between the United States, Goodrich Corporation and Linde (f.k.a. AIRCO).
- d. "Day" shall mean a calendar day. In computing any period of time under this Settlement Agreement, where the last day would fall on a Saturday, Sunday, or federal holiday, the period shall run until the close of business of the next working day.
- e. "Effective Date" shall be the effective date of this Settlement Agreement as provided in Section XXIX.
- f. "EPA" shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States.
- g. "Engineering Controls" shall mean constructed containment barriers or systems that control one or more of the following: downward migration, infiltration or seepage of surface runoff or rain; or natural leaching migration of contaminants through the subsurface over time. Examples include caps, engineered bottom barriers, immobilization processes, and vertical barriers.
- h. "Focused RI/FS Work Plan" shall mean the Focused RI/FS Work Plan as set forth in Appendix A to this Settlement Agreement. The Focused RI/FS Work Plan is incorporated into this Settlement Agreement and is an enforceable part of this Settlement Agreement as are any modifications made thereto in accordance with this Settlement Agreement.
- i. "Future Response Costs" shall mean all costs, not inconsistent with the NCP including, but not limited to, direct and indirect costs, that the United States incurs in connection with implementing this Settlement Agreement reviewing or developing plans, reports and other items pursuant to this Settlement Agreement, verifying the Work, or otherwise implementing, overseeing, or enforcing this Settlement Agreement, including but not limited to, payroll costs, contractor costs, travel costs, laboratory costs, Agency for Toxic Substances and Disease Registry ("ATSDR") costs, the costs incurred pursuant to Paragraph 60 (costs and attorneys fees and any monies paid to secure access, including the amount of just compensation) Paragraph 46 (emergency response) and Paragraph 89 (Work takeover).
- j. "Institutional controls" shall mean non-engineered instruments, such as

administrative and/or legal controls, that help to minimize the potential for human exposure to contamination and/or protect the integrity of a remedy by limiting land and/or resource use. Examples of institutional controls include easements and covenants, zoning restrictions, special building permit requirements, and well drilling prohibitions.

k. "Interest" shall mean interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year.

l. "KYDEP" shall mean the Kentucky Department of Environmental Protection and any successor departments or agencies of the Commonwealth of Kentucky.

m. "NCP" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.

n. "Paragraph" shall mean a portion of this Settlement Agreement identified by an Arabic numeral.

o. "Parties" shall mean EPA and Respondents.

p. "RCRA" shall mean the Resource Conservation and Recovery Act, also known as the Solid Waste Disposal Act, as amended, 42 U.S.C. §§ 6901, *et seq.*

q. "Respondents" shall mean Goodrich Corporation and PolyOne Corporation.

r. "ROD" shall mean the Record Of Decision for the B.F. Goodrich Superfund Site dated June 24, 1988.

s. "Section" shall mean a portion of this Settlement Agreement identified by a Roman numeral.

t. "Settlement Agreement" shall mean this Administrative Settlement Agreement on Consent, the Focused RI/FS Work Plan, all appendices attached hereto (listed in Section XXVII) and all documents Corporation by reference into this document including without limitation EPA-approved submissions. EPA-approved submissions (other than progress reports) are Corporation into and become a part of the Settlement Agreement upon approval by EPA. In the event of conflict between this Settlement Agreement and any appendix or other Corporation documents, this Settlement Agreement shall control.

u. "Site" shall mean the B.F. Goodrich Superfund Site encompassing approximately 2 acres and includes the aerial extent of contamination from the B.F. Goodrich

Superfund Site and the area of SWMU 3 which is subject to the RCRA permit administered by KYDEP in Calvert City, Marshall County, Kentucky and depicted generally on the map attached as Appendix B.

v. "State" shall mean the Commonwealth of Kentucky.

w. "Waste Material" shall mean (1) any "hazardous substance" under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (2) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); (3) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27).

y. "Work" shall mean all activities Respondents are required to perform under this Settlement Agreement, except those required by Section XIV (Retention of Records).

V. FINDINGS OF FACT

12. The Site consists of approximately 2 acres and includes the B.F. Goodrich Superfund Site, the aerial extent of contamination from the B.F. Goodrich Superfund Site and the area of SWMU 3 which is subject to the RCRA permit administered by KYDEP in Calvert City, Marshall County, Kentucky. The main disposal areas at the B. F. Goodrich Superfund Site are a former landfill and burn pit. The Site is located near the southern bank of the Tennessee River and the eastern portion of the B.F. Goodrich Superfund Site is contiguous with another landfill known as the AIRCO Superfund Site. The B.F. Goodrich Superfund Site and the AIRCO Superfund Site have historically been addressed together because they shared a contiguous disposal area (collectively, "Superfund Site"). However, the nature of the substances disposed of in the landfill and the associated contamination, as well as, the potentially responsible parties differ between the two landfills. The western portion of the property is contiguous with a current RCRA facility known as the Westlake Vinyl Incorporation's plant;

13. The B.F. Goodrich disposed of wastes at the landfill for a period of six to twelve months from 1969 to 1972;

14. The 1988 RI that characterized groundwater and soil were contaminated with volatile organic compounds (VOCs) including ethylene dichloride (EDC), benzene, toluene and other related compounds;

15. Some sediments in an on-Site drainage ditch were contaminated with polynuclear aromatic hydrocarbons (PAHs). In accordance with EPA's selected remedy, the contaminated soil and sediments were excavated and disposed of in the burn pit area on the B.F. Goodrich Superfund Site beneath a RCRA-type cover system.

16. The initial RI/FS and baseline risk assessment were conducted for the Site in 1988. The results from the study documented extensive soil and groundwater contamination. Although

there were some limited detections of inorganic compounds, pesticides and polychlorinated biphenyls, the primary contaminants detected were VOCs and PAHs. The most widely detected VOC was EDC, which is consistent with the large volume of EDC disposed of in the Superfund burn pit. EDC was detected at elevated levels in soil and groundwater;

17. Historic soil samples collected from subsurface borings and groundwater samples collected from monitoring wells indicated the presence of non-aqueous phase liquids (NAPL) with elevated levels of EDC and other VOCs. The 1988 FS and Record of Decision (ROD) identified this contamination as concentrated source material;

18. The primary threat associated with the release of contaminants from the Site is to the underlying groundwater and the subsequent potential discharge of impacted groundwater to surface water. Some VOCs in groundwater in the interior of the Site are present at levels in excess of ACLs. There are no current potable well uses in proximity to the Site. Institutional controls are also in place which restricts the use of groundwater at the Site for drinking purposes and engineering controls are in place and contain the portion of the plume above ACLs;

19. Because the Site is located adjacent to the Tennessee River, the direction of groundwater flow is predominately towards the river. The Tennessee River, after the confluence with the Ohio River, serves as a source of drinking water for the City of Paducah, Kentucky. A containment system between the Superfund Site and the river has prevented discharge of groundwater to the river;

20. The B.F. Goodrich Site was listed on the National Priorities List ("NPL") pursuant to CERCLA Section 105, 42 U.S.C. § 9605, in 1983;

21. Respondent Goodrich Corporation, (formerly The B.F. Goodrich Company), a New York corporation is the former owner and operator of the Site and former owner and operator of the adjacent RCRA facility property at the time of disposal;

22. Respondent, PolyOne Corporation, an Ohio corporation (formerly Geon Company) is the current owner of the former Goodrich portion of the Site.

23. A ROD was issued for the Superfund Site in 1988 and provided for the collection, treatment and discharge of contaminated groundwater; excavation and placement of contaminated soils in an on-site landfill; installation of an organic vapor recovery system; improvements to flood protection controls; installation of a RCRA cap over the B.F. Goodrich Superfund Site landfill; installation of a leachate collection system; for the landfill; and deed restrictions to protect the remedy and prevent residential exposures. Construction of the remedy was completed and brought on-line for the various elements in 1996 and 1997 respectively.

24. A Five-Year Review of the remedy was conducted in 2001 and concluded that the remedy had been implemented in accordance with the ROD and Consent Decree and that the

remedy was protective of human health and the environment. The United States, Linde and Goodrich Corporation entered into a CD in 1992. Attachment I of the 1992 Consent Decree addressed numerous items relating to the Remedial Design/Remedial Action(RD/RA) and deleted the planned schedules for completion of the RD/RA activities originally set forth in the ROD for completion of the RD/RA.

25. A Second Five-Year Review was conducted in 2006 and concluded that the remedy is protective in the short-term. Deficiencies identified include deed restrictions (i.e. institutional controls) to prevent residential use and installation of private wells; groundwater cleanup goals have not been achieved within the estimated time frame; no further decrease of EDC levels in the shallow plume; limited effectiveness of the source groundwater extraction wells; and uncertainty regarding the extent of the principal source of EDC contamination.

VI. CONCLUSIONS OF LAW AND DETERMINATIONS

Based on the Findings of Fact set forth above, EPA has determined that:

26. The B.F. Goodrich Site is a "facility" as defined in Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

27. The contamination volatile organic compounds (VOCs) including ethylene dichloride (EDC), benzene, toluene and other related compounds found at the Superfund Site, as identified in the Findings of Fact above, include "hazardous substances" as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

28. The conditions described in the Findings of Fact above constitute an actual and/or threatened "release" of a hazardous substance from the facility as defined in Section 101(22) of CERCLA, 42 U.S.C. § 9601(22).

29. Each Respondent, B.F. Goodrich Corporation and PolyOne Corporation is a "person" as defined in Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

30. Respondents are responsible parties under Sections 104, 107 and 122 of CERCLA, 42 U.S.C. §§ 9604, 9607 and 9622.

a. Respondent, PolyOne Corporation is the current owner of the facility, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the meaning of Section 107(a)(1) of CERCLA, 42 U.S.C. § 9607(a)(1).

b. Respondent, Goodrich Corporation, was the owner and/or operator of the facility at the time of disposal of hazardous substances at the facility, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the meaning of Section 107(a)(2) of CERCLA, 42 U.S.C. § 9607(a)(2).

31. The actions required by this Settlement Agreement are necessary to protect the public health, welfare or the environment, are in the public interest, 42 U.S.C. § 9622(a), are consistent with CERCLA and the NCP, 42 U.S.C. §§ 9604(a)(1), 9622(a), and will expedite effective remedial action and minimize litigation, 42 U.S.C. § 9622(a).

32. EPA has determined that Respondents are qualified to conduct the Focused RI/FS within the meaning of Section 104(a) of CERCLA, 42 U.S.C. § 9604(a), and will carry out the Work properly and promptly, in accordance with Sections 104(a) and 122(a) of CERCLA, 42 U.S.C. §§ 9604(a) and 9622(a), if Respondents comply with the terms of this Settlement Agreement.

VII. SETTLEMENT AGREEMENT

33. Based upon the foregoing Findings of Fact and Conclusions of Law and Determinations, it is hereby Ordered and Agreed that Respondents shall comply with all provisions of this Settlement Agreement, including, but not limited to, all appendices to this Settlement Agreement and all documents incorporated by reference into this Settlement Agreement.

VIII. DESIGNATION OF CONTRACTORS AND PROJECT COORDINATORS

34. Selection of Contractors, Personnel. All Work performed under this Settlement Agreement shall be under the direction and supervision of qualified personnel. Within 30 days of the Effective Date of this Settlement Agreement, and before the Work outlined below begins, Respondents shall notify EPA in writing of the names, titles, and qualifications of the personnel, including contractors, subcontractors, consultants and laboratories to be used in carrying out such Work. With respect to any proposed contractor, Respondents shall demonstrate that the proposed contractor has a quality system which complies with ANSI/ASQC E4-1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs," (American National Standard, January 5, 1995, or most recent version), by submitting a copy of the proposed contractor's Quality Management Plan ("QMP"). The QMP should be prepared in accordance with "EPA Requirements for Quality Management Plans (QA/R-2)," (EPA/240/B-01/002, March 2001 or subsequently issued guidance) or equivalent documentation as determined by EPA. The qualifications of the persons undertaking the Work for Respondents shall be subject to EPA's review, for verification that such persons meet minimum technical background and experience requirements. This Settlement Agreement is contingent on Respondents' demonstration to EPA's satisfaction that Respondents are qualified to perform properly and promptly the actions set forth in this Settlement Agreement. If EPA disapproves in writing of any person's technical qualifications, Respondents shall notify EPA of the identity and qualifications of the replacements within 30 days of the written notice. If EPA subsequently disapproves of the replacement, EPA reserves the right to terminate this Settlement Agreement and to conduct a complete Focused RI/FS, and to seek reimbursement for costs and

penalties from Respondents. During the course of the Focused RI/FS, Respondents shall notify EPA in writing of any changes or additions in the personnel used to carry out such Work, providing their names, titles, and qualifications. EPA shall have the same right to disapprove changes and additions to personnel as it has hereunder regarding the initial notification.

35. Within 30 days before Work begins, Respondents shall designate a Project Coordinator who shall be responsible for administration of all actions by Respondents required by this Settlement Agreement and shall submit to EPA the designated Project Coordinator's name, address, telephone number, and qualifications. To the greatest extent possible, the Project Coordinator shall be present on Site or readily available during Site Work. EPA retains the right to disapprove of the designated Project Coordinator. If EPA disapproves of the designated Project Coordinator, Respondents shall retain a different Project Coordinator and shall notify EPA of that person's name, address, telephone number and qualifications within 14 days following EPA's disapproval. Respondents shall have the right to change their Project Coordinator, subject to EPA's right to disapprove. Respondents shall notify EPA 20 days before such a change is made. The initial notification may be made orally, but shall be promptly followed by a written notification. Receipt by Respondents' Project Coordinator of any notice or communication from EPA relating to this Settlement Agreement shall constitute receipt by Respondents.

36. EPA has designated Brad Jackson of the Superfund Remedial Branch, Remedial Project Manager. EPA will notify Respondents of a change of its designated Project Coordinator. Except as otherwise provided in this Settlement Agreement, Respondents shall direct all submissions required by this Settlement Agreement to the Project Coordinator at

Brad Jackson
U.S. Environmental Protection Agency, Region 4
Superfund Remedial Branch
61 Forsyth Street, N.W.
Atlanta, Georgia 30303
Jackson.Brad@epa.gov

37. EPA's Project Coordinator shall have the authority lawfully vested in a Remedial Project Manager ("RPM") by the NCP. In addition, EPA's Project Coordinator shall have the authority consistent with the NCP, to halt any Work required by this Settlement Agreement, and to take any necessary response action when s/he determines that conditions at the Site may present an immediate endangerment to public health or welfare or the environment. The absence of the EPA Project Coordinator from the area under study pursuant to this Settlement Agreement shall not be cause for the stoppage or delay of Work.

38. EPA shall arrange for a qualified person to assist in its oversight and review of the conduct of the Focused RI/FS, as required by Section 104(a) of CERCLA, 42 U.S.C. Section 9604(a). Such person shall have the authority to observe Work and make inquiries in the absence of EPA, but not to modify the Focused RI/FS Work Plan.

IX. WORK TO BE PERFORMED

39. Respondents shall conduct the Focused RI/FS and a Focused Risk Assessment in accordance with the provisions of this Settlement Agreement, the Focused RI/FS Work Plan, CERCLA, the NCP and EPA guidance, including, but not limited to the "Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (OSWER Directive # 9355.3-01, October 1988 or subsequently issued guidance), "Guidance for Data Useability in Risk Assessment" (OSWER Directive #9285.7-05, October 1990 or subsequently issued guidance), and guidance referenced therein, as may be amended or modified by EPA. The Focused Remedial Investigation (" Focused RI") shall consist of collecting data to characterize Site conditions, determining the nature and extent of the NAPL contamination at or from the Site, assessing risk to human health and the environment and conducting treatability testing as necessary to evaluate the potential performance and cost of the treatment technologies that are being considered. The Focused Feasibility Study (" Focused FS") shall determine and evaluate (based on treatability testing, where appropriate) alternatives for remedial action to prevent, mitigate or otherwise respond to or remedy the release or threatened release of hazardous substances, pollutants, or contaminants related to NAPL at or from the Site. The alternatives evaluated must include, but shall not be limited to, the range of alternatives described in the NCP, and shall include remedial actions that utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In evaluating the alternatives, Respondents shall address the factors required to be taken into account by Section 121 of CERCLA, 42 U.S.C. § 9621, and Section 300.430(e) of the NCP, 40 C.F.R. § 300.430(e). Upon request by EPA, Respondents shall submit in electronic form all portions of any plan, report or other deliverable Respondents are required to submit pursuant to provisions of this Settlement Agreement.

40. Respondents shall conduct the Focused RI/FS in accordance with the Focused RI/FS Work Plan attached as Appendix A. The Focused RI/FS Work Plan was developed by EPA and Respondents during negotiation of this Settlement Agreement. Pursuant to Section X (EPA Approval of Plans and Other Submissions), the Focused RI/FS Work Plan shall be incorporated into and become enforceable under this Settlement Agreement.

The following is a summary of the tasks set forth in the Focused RI/FS Work Plan which Respondents must perform:

Task 1 (Section 5.1) Scoping. Scoping was conducted prior to the Effective Date of this Settlement Agreement.

Task 2 (Section 5.2) Community Relations Plan. The U.S. EPA will take the lead in planning and implementation of a community involvement program. The Respondents will provide support to U.S. EPA during the planning and implementation of the community involvement program.

Task 3 (Section 5.3) Site Characterization. Respondents shall implement the provisions of Focused RI/FS Work Plan, including the Sampling Analysis Plan, Quality Assurance Project Plan and Health and Safety Plan, to characterize the Site. The Site characterization task consists of implementing the field activities of the Focused RI/FS, including environmental sampling and analysis, followed by analysis, data interpretation and field reporting. Respondents shall complete Site characterization and submit all plans, reports and other deliverables in accordance with the schedules and deadlines established in the EPA-approved Focused RI/FS Work Plan.

Task 4 (Section 5.4) Treatability Studies. Respondents shall conduct treatability studies for remedial alternatives as determined by EPA and based upon results of the Site characterization study.

Tasks 5 (Section 5.5) Focused Risk Assessment. A Focused Risk Assessment may be performed to evaluate potential risks to human health and the environment based upon results of the Site characterization study.

41. The Focused Feasibility Study shall determine and evaluate alternatives to revise, update or select a new remedial action to prevent, mitigate or otherwise respond to or remedy the release or threatened release of hazardous substance, pollutants or contaminants related to NAPL at or from the Site. The Focused FS will consist of two tasks:

Task 6 (Section 5.6) Development and Screening of Remedial Action

Task 7 (Section 5.7) Analysis of Remedial Action Alternatives

The schedule for deliverables is referenced in Section 6 and Table 3 of the Focused RI/FS Work Plan.

42. Modification of the RI/FS Work Plan.

a. If at any time during the Focused RI/FS process, Respondents identify a need for additional data, Respondents shall submit a memorandum documenting the need for additional data to the EPA Project Coordinator within 30 days of identification. EPA in its discretion will determine whether the additional data will be collected by Respondents and whether it will be incorporated into plans, reports and other deliverables.

b. In the event of unanticipated or changed circumstances at the Site, Respondents shall notify the EPA Project Coordinator by telephone within 24 hours of discovery of the unanticipated or changed circumstances. In the event that EPA determines that the immediate threat or the unanticipated or changed circumstances warrant changes in the Focused RI/FS Work Plan, EPA shall modify or amend the Focused RI/FS Work Plan in writing accordingly. Respondents shall perform the Focused RI/FS Work Plan as modified or amended.

c. EPA may determine that in addition to tasks defined in the initially approved Focused RI/FS Work Plan, other additional Work may be necessary to accomplish the objectives of the Focused RI/FS. Respondents agree to perform these response actions in addition to those required by the initially approved Focused RI/FS Work Plan, including any approved modifications, if EPA determines that such actions are necessary for a complete Focused RI/FS.

d. Respondents shall confirm their willingness to perform the additional Work in writing to EPA within 7 days of receipt of the EPA request. If Respondents object to any modification determined by EPA to be necessary pursuant to this Paragraph, Respondents may seek dispute resolution pursuant to Section XV (Dispute Resolution). The Focused RI/FS Work Plan shall be modified in accordance with the final resolution of the dispute.

e. Respondents shall complete the additional Work according to the standards, specifications, and schedule set forth or approved by EPA in a written modification to the Focused RI/FS Work Plan or written Focused RI/FS Work Plan supplement. EPA reserves the right to conduct the Work itself at any point, to seek reimbursement from Respondents, and/or to seek any other appropriate relief.

f. Nothing in this Paragraph shall be construed to limit EPA's authority to require performance of further response actions at the Site.

43. Off-Site Shipment of Waste Material. Respondents shall, prior to any off-site shipment of Waste Material from the Site to an out-of-state waste management facility, provide written notification of such shipment of Waste Material to the appropriate state environmental official in the receiving facility's state and to EPA's Designated Project Coordinator. However, this notification requirement shall not apply to any off-site shipments when the total volume of all such shipments will not exceed 10 cubic yards.

a. Respondents shall include in the written notification the following information: (1) the name and location of the facility to which the Waste Material is to be shipped; (2) the type and quantity of the Waste Material to be shipped; (3) the expected schedule for the shipment of the Waste Material; and (4) the method of transportation. Respondents shall notify the state in which the planned receiving facility is located of major changes in the shipment plan, such as a decision to ship the Waste Material to another facility within the same state, or to a facility in another state.

b. The identity of the receiving facility and state will be determined by Respondents following the award of the contract for the remedial investigation and feasibility study. Respondents shall provide the information required by Subparagraph 43.a and 43.c as soon as practicable after the award of the contract and before the Waste Material is actually shipped.

c. Before shipping any hazardous substances, pollutants, or contaminants from the Site to an off-site location, Respondents shall obtain EPA's certification that the proposed receiving facility is operating in compliance with the requirements of CERCLA Section 121(d)(3), 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Respondents shall only send hazardous substances, pollutants, or contaminants from the Site to an off-site facility that complies with the requirements of the statutory provision and regulation cited in the preceding sentence.

44. Meetings. Respondents shall make presentations at, and participate in, meetings at the request of EPA during the initiation, conduct, and completion of the Focused RI/FS. In addition to discussion of the technical aspects of the Focused RI/FS, topics will include anticipated problems or new issues. Meetings will be scheduled at EPA's discretion.

45. Progress Reports. In addition to the plans, reports and other deliverables set forth in this Order, Respondents shall provide to EPA monthly progress reports by the 15th day of the following month. At a minimum, with respect to the preceding month, these progress reports shall (1) describe the actions which have been taken to comply with this Order during that month, (2) include all results of sampling and tests and all other data received by Respondents to the extent QA/QC is completed, (3) describe Work planned for the next two months with schedules relating such Work to the overall project schedule for Focused RI/FS completion, and (4) describe all problems encountered and any anticipated problems, any actual or anticipated delays, and solutions developed and implemented to address any actual or anticipated problems or delays.

46. Emergency Response and Notification of Releases.

a. In the event of any action or occurrence during performance of the Work which causes or threatens a release of Waste Material from the Site that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, Respondents shall immediately take all appropriate action. Respondents shall take these actions in accordance with all applicable provisions of this Order, including, but not limited to, the Health and Safety Plan, in order to prevent, abate or minimize such release or endangerment caused or

threatened by the release. Respondents shall also immediately notify the EPA Project Coordinator or, in the event of his/her unavailability, the On Scene Coordinator ("OSC") or the Regional Duty Officer (404) 562-8700 of the incident or Site conditions. In the event that Respondents fail to take appropriate response action as required by this Paragraph, and EPA takes such action instead, Respondents shall reimburse EPA all costs of the response action not inconsistent with the NCP pursuant to Section XVIII (Payment of Response Costs).

b. In addition, in the event of any release of a hazardous substance from the Site, Respondents shall immediately notify the EPA Project Coordinator, the OSC or Regional Duty Officer at (404) 562-8700 and the National Response Center at (800) 424-8802. Respondents shall submit a written report to EPA within 7 days after each release, setting forth the events that occurred and the measures taken or to be taken to mitigate any release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release. This reporting requirement is in addition to, and not in lieu of, reporting under Section 103(c) of CERCLA, 42 U.S.C. § 9603(c), and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. § 11004, *et seq.*

X. EPA APPROVAL OF PLANS AND OTHER SUBMISSIONS

47. After review of any plan, report or other item that is required to be submitted for approval pursuant to this Settlement Agreement, in a notice to Respondents EPA shall: (a) approve, in whole or in part, the submission; (b) approve the submission upon specified conditions; modify the submission to cure the deficiencies; (d) disapprove, in whole or in part, the submission, directing that Respondents modify the submission; or (e) any combination of the above. However, EPA shall not modify a submission without first providing Respondents at least one notice of deficiency and an opportunity to cure within 30 days, except where to do so would cause serious disruption to the Work or where previous submission(s) have been disapproved due to material defects.

48. In the event of approval, approval upon conditions, or modification by EPA, pursuant to Subparagraph 47(a), (b), or (e), Respondents shall proceed to take any action required by the plan, report or other deliverable, as approved or modified by EPA subject only to their right to invoke the Dispute Resolution procedures set forth in Section XV (Dispute Resolution) with respect to the modifications or conditions made by EPA. Following EPA approval or modification of a submission or portion thereof, Respondents shall not thereafter alter or amend such submission or portion thereof unless directed by EPA. In the event that EPA modifies the submission to cure the deficiencies pursuant to Subparagraph 47 and the submission had a material defect, EPA retains the right to seek stipulated penalties, as provided in Section XVI (Stipulated Penalties).

49. Resubmission.

a. Upon receipt of a notice of disapproval, Respondents shall, within 30 days or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the plan, report, or other deliverable for approval. Any stipulated penalties applicable to the submission, as provided in Section XVI, shall accrue during the 30-day period or otherwise specified period but shall not be payable unless the resubmission is disapproved or modified due to a material defect as provided in Paragraphs 50 and 51.

b. Notwithstanding the receipt of a notice of disapproval, Respondents shall proceed to take any action required by any non-deficient portion of the submission, unless otherwise directed by EPA. Implementation of any non-deficient portion of a submission shall not relieve Respondents of any liability for stipulated penalties under Section XVI (Stipulated Penalties).

c. Respondents shall not proceed further with any subsequent activities or tasks until receiving EPA approval, approval on condition or modification of the following deliverables: Focused RI/FS Work Plan and Sampling and Analysis Plan, Draft Focused Remedial Investigation Report and Treatability Testing Work Plan and Sampling and Analysis Plan and Draft Focused Feasibility Study Report. While awaiting EPA approval, approval on condition or modification of these deliverables, Respondents shall proceed with all other tasks and activities which may be conducted independently of these deliverables, in accordance with the schedule set forth under this Settlement Agreement.

d. For all remaining deliverables not listed above in subparagraph 49.c., Respondents shall proceed with all subsequent tasks, activities and deliverables without awaiting EPA approval on the submitted deliverable. EPA reserves the right to stop Respondents from proceeding further, either temporarily or permanently, on any task, activity or deliverable at any point during the Focused RI/FS.

50. If EPA disapproves a resubmitted plan, report or other deliverable, or portion thereof, EPA may again direct Respondents to correct the deficiencies. EPA shall also retain the right to modify or develop the plan, report or other deliverable. Respondents shall implement any such plan, report, or deliverable as corrected, modified or developed by EPA, subject only to Respondents' right to invoke the procedures set forth in Section XV (Dispute Resolution).

51. If upon resubmission, a plan, report, or other deliverable is disapproved or modified by EPA due to a material defect, Respondents shall be deemed to have failed to submit such plan, report, or other deliverable timely and adequately unless Respondents invoke the dispute resolution procedures in accordance with Section XV (Dispute Resolution) and EPA's action is revoked or substantially modified pursuant to a Dispute Resolution decision issued by EPA or superceded by an agreement reached pursuant to that Section. The provisions of Section XV (Dispute Resolution) and Section XVI (Stipulated Penalties) shall govern the implementation of

the Work and accrual and payment of any stipulated penalties during Dispute Resolution. If EPA's disapproval or modification is not otherwise revoked, substantially modified or superceded as a result of a decision or agreement reached pursuant to the Dispute Resolution process set forth in Section XV, stipulated penalties shall accrue for such violation from the date on which the initial submission was originally required, as provided in Section XVI.

52. In the event that EPA takes over some of the tasks, but not the preparation of the Focused RI Report or the Focused FS Report, Respondents shall incorporate and integrate information supplied by EPA into the final reports.

53. All plans, reports, and other deliverables submitted to EPA under this Settlement Agreement shall, upon approval or modification by EPA, be incorporated into and enforceable under this Settlement Agreement. In the event EPA approves or modifies a portion of a plan, report, or other deliverable submitted to EPA under this Settlement Agreement, the approved or modified portion shall be incorporated into and enforceable under this Settlement Agreement.

54. Neither failure of EPA to expressly approve or disapprove of Respondents' submissions within a specified time period, nor the absence of comments, shall be construed as approval by EPA. Whether or not EPA gives express approval for Respondents' deliverables, Respondents are responsible for preparing deliverables acceptable to EPA.

XI. QUALITY ASSURANCE, SAMPLING, AND ACCESS TO INFORMATION

55. Quality Assurance. Respondents shall assure that Work performed, samples taken and analyses conducted conform to the requirements of the Focused RI/FS Work Plan, the QAPP and guidances identified therein. Respondents will assure that field personnel used by Respondents are properly trained in the use of field equipment and in chain of custody procedures. Respondents shall only use laboratories which have a documented quality system that complies with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001) or equivalent documentation as determined by EPA.

56. Sampling.

a. All results of sampling, tests, modeling or other data that has undergone QA/QC review generated by Respondents, or on Respondents' behalf, during the period that this Settlement Agreement is effective, shall be submitted to EPA in the next monthly progress report as described in Paragraph 45 of this Settlement Agreement. EPA will make available to Respondents validated data generated by EPA unless it is exempt from disclosure by any federal or state law or regulation.

b. Respondents shall verbally notify EPA at least 14 days prior to conducting significant field events as described in the Focused RI/FS Work Plan or Sampling and Analysis Plan. At EPA's verbal or written request, or the request of EPA's oversight assistant, Respondents

shall allow split or duplicate samples to be taken by EPA (and its authorized representatives) of any samples collected in implementing this Settlement Agreement. All split samples of Respondents shall be analyzed by the methods identified in the QAPP.

57. Access to Information.

a. Respondents shall provide to EPA and the State, upon request, copies of all documents and information within their possession or control or that of their contractors or agents relating to activities at the Site or to the implementation of this Settlement Agreement, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Work. Respondents shall also make available to EPA and the State, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

b. Respondents may assert business confidentiality claims covering part or all of the documents or information submitted to EPA and the State under this Settlement Agreement to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Documents or information determined to be confidential by EPA will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies documents or information when it is submitted to EPA and the State, or if EPA has notified Respondents that the documents or information are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2, Subpart B, the public may be given access to such documents or information without further notice to Respondents. Respondents shall segregate and clearly identify all documents or information submitted under this Settlement Agreement for which Respondents assert business confidentiality claims.

c. Respondents may assert that certain documents or records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Respondents assert such a privilege in lieu of providing documents, they shall provide EPA with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the contents of the document, record, or information; and 6) the privilege asserted by Respondents. However, no documents or reports created or generated pursuant to the requirements of this Settlement Agreement shall be withheld on the grounds that they are privileged.

d. No claim of confidentiality shall be made with respect to any data, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, or engineering data, or any other documents or information evidencing conditions at or around the Site.

58. In entering into this Settlement Agreement, Respondents waive any objections to any data gathered, generated, or evaluated by EPA, the State or Respondents in the performance or oversight of the Work that has been verified according to the quality assurance/quality control ("QA/QC") procedures required by the Settlement Agreement or any EPA-approved Focused RI/FS Work Plans or Sampling and Analysis Plans. If Respondents object to any other data relating to the Focused RI/FS, Respondents shall submit to EPA a report that specifically identifies and explains its objections, describes the acceptable uses of the data, if any, and identifies any limitations to the use of the data. The report must be submitted to EPA within 15 days of the monthly progress report containing the data.

XII. SITE ACCESS AND INSTITUTIONAL CONTROLS

59. If the Site, or any other property where access is needed to implement this Settlement Agreement, is owned or controlled by any of Respondents, such Respondents shall, commencing on the Effective Date, provide EPA, and its representatives, including contractors, with access at all reasonable times to the Site, or such other property, for the purpose of conducting any activity related to this Settlement Agreement.

60. Where any action under this Settlement Agreement is to be performed in areas owned by or in possession of someone other than Respondents, Respondents shall use their best efforts to obtain all necessary access agreements within 60 days after the Effective Date, or as otherwise specified in writing by the EPA Project Coordinator. Respondents shall immediately notify EPA if after using their best efforts they are unable to obtain such agreements. For purposes of this Paragraph, "best efforts" includes the payment of reasonable sums of money in consideration of access. Respondents shall describe in writing their efforts to obtain access. If Respondents cannot obtain access agreements, EPA may either (i) obtain access for Respondents or assist Respondents in gaining access, to the extent necessary to effectuate the response actions described herein, using such means as EPA deems appropriate; (ii) perform those tasks or activities with EPA contractors; or (iii) terminate the Settlement Agreement. Respondents shall reimburse EPA for all costs and attorney's fees incurred by the United States in obtaining such access, in accordance with the procedures in Section XVIII (Payment of Response Costs). If EPA performs those tasks or activities with EPA contractors and does not terminate the Settlement Agreement, Respondents shall perform all other tasks or activities not requiring access to that property, and shall reimburse EPA for all costs incurred in performing such tasks or activities. Respondents shall integrate the results of any such tasks or activities undertaken by EPA into its plans, reports and other deliverables.

61. Notwithstanding any provision of this Settlement Agreement, EPA retains all of its access authorities and rights, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

a. If the Site or any other areas where associated soil and groundwater contamination exists in relation to the Site, is owned, controlled or operated by persons other than

Respondents, Respondents shall secure from such persons an agreement to provide access thereto for Respondents, as well as for EPA and the State and its representatives (including contractors) for the purpose of conducting any activity related to this Settlement Agreement.

XIII. COMPLIANCE WITH OTHER LAWS

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

XIV. RETENTION OF RECORDS

63. During the pendency of this Settlement Agreement and for a minimum of 10 years after commencement of construction of any remedial action, each Respondent shall preserve and retain all non-identical copies of documents, records, and other information (including documents, records, or other information in electronic form) now in its possession or control or which come into its possession or control that relate in any manner to the performance of the Work or the liability of any person under CERCLA with respect to the Site, regardless of any corporate retention policy to the contrary. Until 10 years after commencement of construction of any remedial action, Respondents shall also instruct their contractors and agents to preserve all documents, records, and other information of whatever kind, nature or description relating to performance of the Work.

64. At the conclusion of this document retention period, Respondents shall notify EPA at least 90 days prior to the destruction of any such documents, records or other information, and, upon request by EPA, Respondents shall deliver any such documents, records, or other information to EPA. Respondents may assert that certain documents, records, and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Respondents assert such a privilege, they shall provide EPA with the following: 1) the title of the document, record, or other information; 2) the date of the document, record, or other information; 3) the name and title of the author of the document, record, or other information; 4) the name and title of each addressee and recipient; 5) a description of the subject of the document, record, or other information; and 6) the privilege asserted by Respondents. However, no documents, records or other information created or generated pursuant to the requirements of this Settlement Agreement shall be withheld on the grounds that they are privileged.

65. Each Respondent hereby certifies individually that to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed or otherwise disposed of any records, documents or other information (other than identical copies) relating to its potential liability regarding the Site since notification of potential liability by EPA or the filing of suit against it regarding the Site and that it has fully complied with any and all EPA requests for information pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927.

XV. DISPUTE RESOLUTION

66. Unless otherwise expressly provided for in this Settlement Agreement, the dispute resolution procedures of this Section shall be the exclusive mechanism for resolving disputes arising under this Settlement Agreement. The Parties shall attempt to resolve any disagreements concerning this Settlement Agreement expeditiously and informally.

67. If Respondents object to any EPA action taken pursuant to this Settlement Agreement, including billings for Future Response Costs, they shall notify EPA in writing of their objection(s) within 30 days of such action, unless the objection(s) has/have been resolved informally. EPA and Respondents shall have 30 days from EPA's receipt of Respondents' written objection(s) to resolve the dispute (the "Negotiation Period"). The Negotiation Period may be extended at the sole discretion of EPA. Such extension may be granted verbally but must be confirmed in writing.

68. Any agreement reached by the Parties pursuant to this Section shall be in writing and shall, upon signature by the Parties, be incorporated into and become an enforceable part of this Settlement Agreement. If the Parties are unable to reach an agreement within the Negotiation Period, an EPA management official at the Superfund Division Director level or higher will issue a written decision. EPA's decision shall be incorporated into and become an enforceable part of this Settlement Agreement. Respondents' obligations under this Settlement Agreement shall not be tolled by submission of any objection for dispute resolution under this Section. Following resolution of the dispute, as provided by this Section, Respondents shall fulfill the requirement that was the subject of the dispute in accordance with the agreement reached or with EPA's decision, whichever occurs, and regardless of whether Respondents agree with the decision.

XVI. STIPULATED PENALTIES

69. Respondents shall be liable to EPA for stipulated penalties in the amounts set forth in Paragraphs 70 and 71 for failure to comply with any of the requirements of this Settlement Agreement specified below unless excused under Section XVII (Force Majeure). "Compliance" by Respondents shall include completion of the Work under this Settlement Agreement or any

activities contemplated under any Focused RI/FS Work Plan or other plan approved under this Settlement Agreement identified below, in accordance with all applicable requirements of law, this Settlement Agreement, the Focused RI/FS Work Plan, and any plans or other documents approved by EPA pursuant to this Settlement Agreement and within the specified time schedules established by and approved under this Settlement Agreement.

70. Stipulated Penalty Amounts - Work.

a. The following stipulated penalties shall accrue per day for any noncompliance identified in Subparagraph 68(b):

<u>Penalty Per Violation Per Day</u>	<u>Period of Noncompliance</u>
\$ 500	1 st through 14 th day
\$ 1,500	15 th through 30 th day
\$ 2,500	31 st day and beyond

b. Failure to adhere to General Schedule for Major Deliverables as outlined in the Focused RI/FS Work Plan.

71. Stipulated Penalty Amounts - Reports.

a. The following stipulated penalties shall accrue per violation per day for failure to submit timely or adequate reports pursuant to Paragraph 45:

<u>Penalty Per Violation Per Day</u>	<u>Period of Noncompliance</u>
\$ 250	1 st through 14 th day
\$ 500	15 th through 30 th day
\$ 750	31 st day and beyond

72. In the event that EPA assumes performance of a portion or all of the Work pursuant to Paragraph 89 of Section XX (Reservation of Rights by EPA), Respondents shall be liable for a stipulated penalty in the amount of \$50,000.

73. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the final day of the correction of

the noncompliance or completion of the activity. However, stipulated penalties shall not accrue: (1) with respect to a deficient submission under Section X (EPA Approval of Plans and Other Submissions), during the period, if any, beginning on the 31st day after EPA's receipt of such submission until the date that EPA notifies Respondents of any deficiency; and (2) with respect to a decision by the EPA Management Official designated in Paragraph 68 of Section XV (Dispute Resolution), during the period, if any, beginning on the 21st day after the Negotiation Period begins until the date that the EPA Management Official issues a final decision regarding such dispute. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Settlement Agreement.

74. Following EPA's determination that Respondents have failed to comply with a requirement of this Settlement Agreement, EPA shall give Respondents written notification of the same and describe the noncompliance. EPA shall send Respondents a written demand for the payment of the penalties. However, penalties shall accrue as provided in the preceding Paragraph regardless of whether EPA has notified Respondents of a violation.

75. All penalties accruing under this Section shall be due and payable to EPA within 30 days of Respondents' receipt from EPA of a demand for payment of the penalties, unless Respondents invoke the dispute resolution procedures in accordance with Section XV (Dispute Resolution). All payments to EPA under this Section shall be paid by certified or cashier's check(s) made payable to "EPA Hazardous Substances Superfund," shall be mailed to U.S. Environmental Protection Agency, Cincinnati Accounting Operations, Mellon lockbox 371099M, Pittsburgh, Pa. 15251-7099, shall indicate that the payment is for stipulated penalties, and shall reference the EPA Region and Site/Spill ID Number 0461, the EPA Docket Number _____, and the name and address of the party(ies) making payment. Copies of check(s) paid pursuant to this Section, and any accompanying transmittal letter(s) shall be sent to EPA as provided in Paragraph 34, and to Paula Painter, U.S. EPA, 61 Forsyth Street, N.W., Atlanta, Georgia 30303.

76. The payment of penalties shall not alter in any way Respondents' obligation to complete performance of the Work required under this Settlement Agreement.

77. Penalties shall continue to accrue as provided in Paragraph 75 during any dispute resolution period, but need not be paid until 15 days after the dispute is resolved by agreement or by receipt of EPA's decision.

78. If Respondents fail to pay stipulated penalties when due, EPA may institute proceedings to collect the penalties, as well as Interest. Respondents shall pay Interest on the unpaid balance, which shall begin to accrue on the date of demand made pursuant to Paragraph 75.

79. Nothing in this Settlement Agreement shall be construed as prohibiting, altering, or in any way limiting the ability of EPA to seek any other remedies or sanctions available by virtue of Respondents' violation of this Settlement Agreement or of the statutes and regulations upon

which it is based, including, but not limited to, penalties pursuant to Section 122(l) of CERCLA, 42 U.S.C. § 9622(l), and punitive damages pursuant to Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3). Provided, however, that EPA shall not seek civil penalties pursuant to Section 122(l) of CERCLA or punitive damages pursuant to Section 107(c)(3) of CERCLA for any violation for which a stipulated penalty is provided herein, except in the case of willful violation of this Settlement Agreement or in the event that EPA assumes performance of a portion or all of the Work pursuant to Section XX (Reservation of Rights by EPA), Paragraph 89. Notwithstanding any other provision of this Section, EPA may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this Settlement Agreement.

XVII. FORCE MAJEURE

80. Respondents agree to perform all requirements of this Settlement Agreement within the time limits established under this Settlement Agreement, unless the performance is delayed by a *force majeure*. For purposes of this Settlement Agreement, *force majeure* is defined as any event arising from causes beyond the control of Respondents or of any entity controlled by Respondents, including but not limited to their contractors and subcontractors, which delays or prevents performance of any obligation under this Settlement Agreement despite Respondents' best efforts to fulfill the obligation. *Force majeure* does not include financial inability to complete the Work or increased cost of performance.

81. If any event occurs or has occurred that may delay the performance of any obligation under this Settlement Agreement, whether or not caused by a *force majeure* event, Respondents shall notify EPA orally within seven days of when Respondents first knew that the event might cause a delay. Within 10 days thereafter, Respondents shall provide to EPA in writing an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Respondents' rationale for attributing such delay to a *force majeure* event if they intend to assert such a claim; and a statement as to whether, in the opinion of Respondents, such event may cause or contribute to an endangerment to public health, welfare or the environment. Failure to comply with the above requirements shall preclude Respondents from asserting any claim of *force majeure* for that event for the period of time of such failure to comply and for any additional delay caused by such failure.

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

length of the extension, if any, for performance of the obligations affected by the *force majeure* event.

XVIII. PAYMENT OF RESPONSE COSTS

83. Payments of Future Response Costs.

a. Respondents shall pay EPA all Future Response Costs not inconsistent with the NCP. On a periodic basis, EPA will send Respondents a bill requiring payment that includes a standard Regionally-prepared cost summary, which includes direct and indirect costs incurred by EPA and its contractors and a DOJ-prepared cost summary, which would reflect costs incurred by DOJ and its contractors, if any. Respondents shall make all payments within 30 days of receipt of each bill requiring payment, except as otherwise provided in Paragraph 85 of this Settlement Agreement. Respondents shall make all payments required by this Paragraph by a certified or cashier's check or checks made payable to "EPA Hazardous Substance Superfund," referencing the name and address of the party(ies) making payment and EPA Site/Spill ID number 0461. Respondents shall send the check(s) to:

U.S. Environmental Protection Agency
Superfund Payments
Cincinnati Finance Center
P.O. Box 979076
St. Louis, MO. 63197-9000

b. At the time of payment, Respondents shall send notice that payment has been made to both Brad Jackson and Paula Painter, U.S. Environmental Protection Agency, Region 4, Superfund Division, 61 Forsyth Street, Atlanta, Georgia , 30303.

c. The total amount to be paid by Respondents pursuant to Subparagraph 83.a. shall be deposited in the B.F. Goodrich Superfund Site Special Account within the EPA Hazardous Substance Superfund to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund.

84. If Respondents do not pay Future Response Costs within 30 days of Respondents' receipt of a bill, Respondents shall pay Interest on the unpaid balance of Future Response Costs. The Interest on unpaid Future Response Costs shall begin to accrue on the date of the bill and shall continue to accrue until the date of payment. If EPA receives a partial payment, Interest shall accrue on any unpaid balance. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to the United States by virtue of Respondents' failure to make timely payments under this Section, including but not limited to,

payments of stipulated penalties pursuant to Section XVI. Respondents shall make all payments required by this Paragraph in the manner described in Paragraph 83.

85. Respondents may contest payment of any Future Response Costs under Paragraph 83 if they determine that EPA has made an accounting error or if they believe EPA incurred excess costs as a direct result of an EPA action that was inconsistent with the NCP. Such objection shall be made in writing within 30 days of receipt of the bill and must be sent to the EPA Project Coordinator. Any such objection shall specifically identify the contested Future Response Costs and the basis for objection. In the event of an objection, Respondents shall within the 30 day period pay all uncontested Future Response Costs to EPA in the manner described in Paragraph 83. Simultaneously, Respondents shall establish an interest-bearing escrow account in a federally-insured bank duly chartered in the State of Kentucky and remit to that escrow account funds equivalent to the amount of the contested Future Response Costs. Respondents shall send to the EPA Project Coordinator a copy of the transmittal letter and check paying the uncontested Future Response Costs, and a copy of the correspondence that establishes and funds the escrow account, including, but not limited to, information containing the identity of the bank and bank account under which the escrow account is established as well as a bank statement showing the initial balance of the escrow account. Simultaneously with establishment of the escrow account, Respondents shall initiate the Dispute Resolution procedures in Section XV (Dispute Resolution). If EPA prevails in the dispute, within 5 days of the resolution of the dispute, Respondents shall pay the sums due (with accrued interest) to EPA in the manner described in Paragraph 83. If Respondents prevail concerning any aspect of the contested costs, Respondents shall pay that portion of the costs (plus associated accrued interest) for which they did not prevail to EPA in the manner described in Paragraph 83. Respondents shall be disbursed any balance of the escrow account. The dispute resolution procedures set forth in this Paragraph in conjunction with the procedures set forth in Section XV (Dispute Resolution) shall be the exclusive mechanisms for resolving disputes regarding Respondents' obligation to reimburse EPA for its Future Response Costs.

XIX. COVENANT NOT TO SUE BY EPA

86. In consideration of the actions that will be performed and the payments that will be made by Respondents under the terms of this Settlement Agreement, and except as otherwise specifically provided in this Settlement Agreement, EPA covenants not to sue or to take administrative action against Respondents pursuant to Sections 106 and 107(a) of CERCLA, 42 U.S.C. §§ 9606 and 9607(a), for the Work performed under this Settlement Agreement and for recovery of Future Response Costs. This covenant not to sue shall take effect upon the Effective Date and is conditioned upon the complete and satisfactory performance by Respondents of all obligations under this Settlement Agreement, including, but not limited to, payment of Future Response Costs pursuant to Section XVIII. This covenant not to sue extends only to Respondents and does not extend to any other person.

XX. RESERVATIONS OF RIGHTS BY EPA

87. Except as specifically provided in this Settlement Agreement, nothing herein shall limit the power and authority of EPA or the United States to take, direct, or Settlement Agreement all actions necessary to protect public health, welfare, or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants or contaminants, or hazardous or solid waste on, at, or from the Site. Further, nothing herein shall prevent EPA from seeking legal or equitable relief to enforce the terms of this Settlement Agreement, from taking other legal or equitable action as it deems appropriate and necessary, or from requiring Respondents in the future to perform additional activities pursuant to CERCLA or any other applicable law.

88. The covenant not to sue set forth in Section XIX above does not pertain to any matters other than those expressly identified therein. EPA reserves, and this Settlement Agreement is without prejudice to, all rights against Respondents with respect to all other matters, including, but not limited to:

- a. claims based on a failure by Respondents to meet a requirement of this Settlement Agreement;
- b. liability for costs not included within the definitions of Future Response Costs;
- c. liability for performance of response action other than the Work;
- d. criminal liability;
- e. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;
- f. liability arising from the past, present, or future disposal, release or threat of release of Waste Materials outside of the Site; and
- g. liability for costs incurred or to be incurred by the Agency for Toxic Substances and Disease Registry related to the Site.

89. Work Takeover. In the event EPA determines that Respondents have ceased implementation of any portion of the Work, are seriously or repeatedly deficient or late in their performance of the Work, or are implementing the Work in a manner which may cause an endangerment to human health or the environment, EPA may assume the performance of all or any portion of the Work as EPA determines necessary. Respondents may invoke the procedures set forth in Section XV (Dispute Resolution) to dispute EPA's determination that takeover of the Work is warranted under this Paragraph. Costs incurred by EPA in performing the Work pursuant to this Paragraph shall be considered Future Response Costs that Respondents shall pay pursuant

to Section XVIII (Payment of Response Costs). Notwithstanding any other provision of this Settlement Agreement, EPA retains all authority and reserves all rights to take any and all response actions authorized by law.

XXI. COVENANT NOT TO SUE BY RESPONDENTS

90. Respondents covenant not to sue and agree not to assert any claims or causes of action against the United States, or its contractors or employees, with respect to the Work, Future Response Costs, or this Settlement Agreement, including, but not limited to:

a. any direct or indirect claim for reimbursement from the Hazardous Substance Superfund established by 26 U.S.C. § 9507, based on Sections 106(b)(2), 107, 111, 112, or 113 of CERCLA, 42 U.S.C. §§ 9606(b)(2), 9607, 9611, 9612, or 9613, or any other provision of law;

b. any claim arising out of the Work or arising out of the response actions for which the Future Response Costs have or will be incurred, including any claim under the United States Constitution, the [State] Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, as amended, or at common law; or

c. any claim against the United States pursuant to Sections 107 and 113 of CERCLA, 42 U.S.C. §§ 9607 and 9613, relating to the Work or payment of Future Response Costs.

91. Nothing in this Agreement shall be deemed to constitute approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. § 300.700(d).

XXII. OTHER CLAIMS

92. By issuance of this Settlement Agreement, the United States and EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondents.

93. Except as expressly provided in Section XIX (Covenant Not to Sue by EPA), nothing in this Settlement Agreement constitutes a satisfaction of or release from any claim or cause of action against Respondents or any person not a party to this Settlement Agreement, for any liability such person may have under CERCLA, other statutes, or common law, including but not limited to any claims of the United States for costs, damages and interest under Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607.

94. No action or decision by EPA pursuant to this Settlement Agreement shall give rise to

any right to judicial review except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).

XXIII. CONTRIBUTION PROTECTION

95. The Parties agree that Respondents are entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Sections 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4), for "matters addressed" in this Settlement Agreement. The "matters addressed" in this Settlement Agreement are the Work and Future Response Costs. Except as provided in Section XXI (Covenant Not to Sue by Respondents) nothing in this Settlement Agreement precludes the United States or Respondents from asserting any claims, causes of action, or demands against any person not parties to this Settlement Agreement for indemnification, contribution, or cost recovery.

XXIV. INDEMNIFICATION

96. Respondents shall indemnify, save and hold harmless the United States, its officials, agents, contractors, subcontractors, employees and representatives from any and all claims or causes of action arising from, or on account of negligent or other wrongful acts or omissions of Respondents, their officers, directors, employees, agents, contractors, or subcontractors, in carrying out actions pursuant to this Settlement Agreement. In addition, Respondents agree to pay the United States all costs incurred by the United States, including but not limited to attorneys fees and other expenses of litigation and settlement, arising from or on account of claims made against the United States based on negligent or other wrongful acts or omissions of Respondents, their officers, directors, employees, agents, contractors, subcontractors and any persons acting on their behalf or under their control, in carrying out activities pursuant to this Settlement Agreement. The United States shall not be held out as a party to any contract entered into by or on behalf of Respondents in carrying out activities pursuant to this Settlement Agreement. Neither Respondents nor any such contractor shall be considered an agent of the United States.

97. The United States shall give Respondents notice of any claim for which the United States plans to seek indemnification pursuant to this Section and shall consult with Respondents prior to settling such claim.

98. Respondents waive all claims against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States, arising from or on account of any contract, agreement, or arrangement between any one or more of Respondents and any person for performance of Work on or relating to the Site. In addition, Respondents shall indemnify and hold harmless the United States with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between any one or more of Respondents and any person for performance of Work on or relating to the Site.

XXV. INSURANCE

99. At least 30 days prior to commencing any On-Site Work under this Settlement Agreement, Respondents shall secure, and shall maintain for the duration of this Settlement Agreement, commercial general liability insurance and automobile insurance with limits of \$1,000,000 million dollars, combined single limit, naming the EPA as an additional insured. Within the same period, if requested, Respondents shall provide EPA with certificates of such insurance and a copy of each insurance policy. Respondents shall submit such certificates and copies of policies each year on the anniversary of the Effective Date, only if requested. In addition, for the duration of the Settlement Agreement, Respondents shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Work on behalf of Respondents in furtherance of this Settlement Agreement. If Respondents demonstrate by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering some or all of the same risks but in an equal or lesser amount, then Respondents need provide only that portion of the insurance described above which is not maintained by such contractor or subcontractor.

XXVI. FINANCIAL ASSURANCE

100. Within 30 days of the Effective Date, Respondents shall establish and maintain financial security for the benefit of EPA in the amount of \$500,000 in one or more of the following forms, in Settlement Agreement to secure the full and final completion of Work by Respondents:

- a. a surety bond unconditionally guaranteeing payment and/or performance of the Work;
- b. one or more irrevocable letters of credit, payable to or at the direction of EPA, issued by financial institution(s) acceptable in all respects to EPA equaling the total estimated cost of the Work;
- c. a trust fund administered by a trustee acceptable in all respects to EPA;
- d. a policy of insurance issued by an insurance carrier acceptable in all respects to EPA, which ensures the payment and/or performance of the Work;
- e. a corporate guarantee to perform the Work provided by one or more parent corporations or subsidiaries of Respondents, or by one or more unrelated corporations that have a substantial business relationship with at least one of Respondents; including a demonstration that any such company satisfies the financial test requirements of 40 C.F.R. Part 264.143(f); and/or
- f. a corporate guarantee to perform the Work by one or more of Respondents,

including a demonstration that any such Respondent satisfies the requirements of 40 C.F.R. Part 264.143(f).

101. Any and all financial assurance instruments provided pursuant to this Section shall be in form and substance satisfactory to EPA, determined in EPA's sole discretion. In the event that EPA determines at any time that the financial assurances provided pursuant to this Section (including, without limitation, the instrument(s) evidencing such assurances) are inadequate, Respondents shall, within 30 days of receipt of notice of EPA's determination, obtain and present to EPA for approval one of the other forms of financial assurance listed in Paragraph 96, above. In addition, if at any time EPA notifies Respondents that the anticipated cost of completing the Work has increased, then, within 30 days of such notification, Respondents shall obtain and present to EPA for approval a revised form of financial assurance (otherwise acceptable under this Section) that reflects such cost increase. Respondents' inability to demonstrate financial ability to complete the Work shall in no way excuse performance of any activities required under this Settlement Agreement.

102. If Respondents seek to ensure completion of the Work through a guarantee pursuant to Subparagraph 100.e. or 100.f. of this Settlement Agreement, Respondents shall (i) demonstrate to EPA's satisfaction that the guarantor satisfies the requirements of 40 C.F.R. Part 264.143(f); and (ii) resubmit sworn statements conveying the information required by 40 C.F.R. Part 264.143(f) annually, on the anniversary of the Effective Date, to EPA. For the purposes of this Settlement Agreement, wherever 40 C.F.R. Part 264.143(f) references "sum of current closure and post-closure costs estimates and the current plugging and abandonment costs estimates," the current cost estimate of \$500,000 for the Work at the Site shall be used in relevant financial test calculations.

103. If, after the Effective Date, Respondents can show that the estimated cost to complete the remaining Work has diminished below the amount set forth in Paragraph 100 of this Section, Respondents may, on any anniversary date of the Effective Date, or at any other time agreed to by the Parties, reduce the amount of the financial security provided under this Section to the estimated cost of the remaining Work to be performed. Respondents shall submit a proposal for such reduction to EPA, in accordance with the requirements of this Section, and may reduce the amount of the security after receiving written approval from EPA. In the event of a dispute, Respondents may seek dispute resolution pursuant to Section XV (Dispute Resolution). Respondents may reduce the amount of security in accordance with EPA's written decision resolving the dispute.

104. Respondents may change the form of financial assurance provided under this Section at any time, upon notice to and prior written approval by EPA, provided that EPA determines that the new form of assurance meets the requirements of this Section. In the event of a dispute, Respondents may change the form of the financial assurance only in accordance with the written decision resolving the dispute.

XXVII. INTEGRATION/APPENDICES

105. This Settlement Agreement and its appendices and any deliverables, technical memoranda, specifications, schedules, documents, plans, reports (other than progress reports), etc. that will be developed pursuant to this Settlement Agreement and become incorporated into and enforceable under this Settlement Agreement constitute the final, complete and exclusive agreement and understanding among the Parties with respect to the settlement embodied in this Settlement Agreement. The parties acknowledge that there are no representations, agreements or understandings relating to the settlement other than those expressly contained in this Settlement Agreement. The following appendices are attached to and incorporated into this Settlement Agreement:

“Appendix A” is the Focused RI/FS Work Plan.

“Appendix B is the map of the Site.

XXVIII. ADMINISTRATIVE RECORD

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

XXIX. EFFECTIVE DATE AND SUBSEQUENT MODIFICATION

107. This Settlement Agreement shall be effective immediately upon signature by the Regional Administrator or his/her delegate.

108. This Settlement Agreement may be amended by mutual agreement of EPA and Respondents. Amendments shall be in writing and shall be effective when signed by EPA. EPA Project Coordinators do not have the authority to sign amendments to the Settlement Agreement.

109. No informal advice, guidance, suggestion, or comment by the EPA Project Coordinator or other EPA representatives regarding reports, plans, specifications, schedules, or any other writing submitted by Respondents shall relieve Respondents of their obligation to obtain any formal approval required by this Settlement Agreement, or to comply with all requirements of

XXX. NOTICE OF COMPLETION OF WORK

110. When EPA determines that all Work has been fully performed in accordance with this Settlement Agreement, with the exception of any continuing obligations required by this Settlement Agreement, including but not limited to payment of Future Response Costs or record retention, EPA will provide written notice to Respondents. If EPA determines that any such Work has not been completed in accordance with this Settlement Agreement, EPA will notify Respondents, provide a list of the deficiencies, and require that Respondents modify the Focused RI/FS Work Plan if appropriate in Settlement Agreement to correct such deficiencies, in accordance with Paragraph 42 (Modification of the Work Plan). Failure by Respondents to implement the approved modified Focused RI/FS Work Plan shall be a violation of this Settlement Agreement.

Under state, local or other federal authorities relating to selection of the response action, and all communications between Respondents and state, local or other federal authorities concerning selection of the response action. At EPA's discretion, Respondents shall establish a community information repository at or near the Site, to house one copy of the administrative record.

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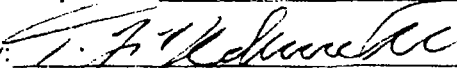

109. No informal advice, guidance, suggestion, or comment by the EPA Project Coordinator or other EPA representatives regarding reports, plans, specifications, schedules, or any other writing submitted by Respondents shall relieve Respondents of their obligation to obtain any formal approval required by this Settlement Agreement, or to comply with all requirements of this Settlement Agreement, unless it is formally modified.

XXX. NOTICE OF COMPLETION OF WORK

110. When EPA determines that all Work has been fully performed in accordance with this Settlement Agreement, with the exception of any continuing obligations required by this Settlement Agreement, including but not limited to payment of Future Response Costs or record retention, EPA will provide written notice to Respondents. If EPA determines that any such Work has not been completed in accordance with this Settlement Agreement, EPA will notify Respondents, provide a list of the deficiencies, and require that Respondents modify the Focused RI/FS Work Plan if appropriate in Settlement Agreement to correct such deficiencies, in accordance with Paragraph 42 (Modification of the Work Plan). Failure by Respondents to implement the approved modified Focused RI/FS Work Plan shall be a violation of this Settlement Agreement.

Agreed this 29 day of July, 2008.

For Respondent PolyOne Corporation

By:  
Thomas Kedrowski

Title: Senior VP Operations

Agreed this th 28 day of July, 2008.

For Respondent Goodrich Corporation

By: B. C. Amig
Bruce C. Amig

Title: Director Global Remediation Services

It is so ORDERED AND AGREED this 28th day of August, 2008.

BY: Carol J. Monpell DATE: 8/28/08

Name

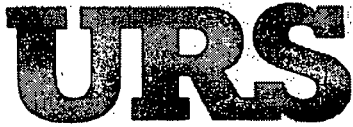
Carol J. Monpell

Chief, Superfund Remedial Branch

Region 4

U.S. Environmental Protection Agency

EFFECTIVE DATE: 8/28/08



FOCUSED REMEDIAL
INVESTIGATION/FEASIBILITY STUDY
WORK PLAN, REVISION 3

BFGoodrich Superfund Site
Calvert City, KY

Prepared for:

RESPONDENTS
JULY 16, 2008

JOB NO: 14947717

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(CD only)**

EXECUTIVE SUMMARY

This work plan describes the scope of work for a Focused Remedial Investigation/Feasibility Study (Focused RI/FS) of the BFGoodrich Superfund Site and Resource Conservation and Recovery Act (RCRA) Solid Waste Management Unit (SWMU) 3 area located in Calvert City, Marshall County, Kentucky. The Respondents prepared this work plan in support of a Good Faith Offer (GFO) submitted to United States Environmental Protection Agency Region 4 (U.S. EPA) on April 23, 2008. Upon execution of the accompanying Administrative Settlement Agreement and Order on Consent (Settlement Agreement) and approval of this work plan, the scope of work is anticipated to be implemented over 18 months. The Focused RI/FS will be conducted in accordance with 40 CFR § 300.430.

Background and Study Area

The BFGoodrich (BFG) Superfund Site consists of two main disposal areas, a landfill, and a burn pit. The eastern portion of the BFG Superfund Site is contiguous with another landfill known as the AIRCO Superfund Site. The BFG/AIRCO Superfund Sites (collectively, Superfund Site) were historically addressed together based on proximity and overlapping disposal history.

A full-scale RI/FS of the Superfund Site was conducted from 1985-1988, and it led to two similar Records of Decision (RODs) for a comprehensive site remedy for the BFG and AIRCO properties. Thirteen chemicals were identified as indicators of potential risk from the Superfund Site, and 1,2-dichloroethane (EDC) was identified as the primary chemical of interest. Cleanup standards were established for soil and groundwater through risk assessment and the applicable or relevant and appropriate requirements (ARAR) process. A single 1992 Consent Decree (CD) for the Superfund Site further refined the remedy and was followed by remedial design and remedial action (RD/RA) construction. A groundwater extraction and treatment system was installed in 1992. The remaining engineering controls (landfill capping, flood protection dike, RCRA-type cover over the burn pit, soil vapor extraction (SVE) system, soil and sediment removal, leachate collection system, and long-term monitoring system), and institutional controls were completed in 1997.

The study area (Site) for the Focused RI/FS described in this work plan encompasses portions of the BFG Superfund Site as well as the vicinity of a former waste disposal area at the adjacent RCRA facility known as SWMU 3.

Focus

The Second Five-Year Review (United States Army Corps of Engineers (USACE) 2006) identifies questions related to the efficiency and long-term protectiveness of the existing remediation system, including uncertainty regarding the extent of the source zone with respect to non-aqueous phase liquids (NAPL). The efficiency of the current remedy for addressing NAPL, and the potential commingling of groundwater impacts from the BFG Superfund Site and the nearby SWMU 3 were identified as limitations in establishing a successful long-term remedy.

In accordance with the Settlement Agreement and consistent with recent discussions since the completion of the Second Five-Year review, the objectives of the Focused RI/FS are to:

1. Further characterize the nature and extent of NAPL at the BFG Superfund Site and at SWMU 3;
2. Update the Conceptual Site Model (CSM);
3. Conduct a Focused Risk Assessment; and
4. Evaluate the feasibility of and necessity for remedial alternatives for improving the performance of source zone and groundwater plume treatment, including the evaluation of remedial measures that address NAPL in the source zone.

Based on these objectives and in consideration of remedial action systems already constructed and in operation at the Site, the preliminary remedial action objectives (RAOs) for the Site are to:

- Maintain institutional controls and current land use;
- To the extent practicable, maintain integrity of existing remedy elements;
- Avoid mobilizing NAPL through stratigraphic controls that provide natural containment;
- To the extent that is practicable, reduce the mass flux of constituents of concern (COC) from the NAPL source zones to a level that results in achievement of alternate concentration limits (ACLs), and identify natural attenuation processes that may reduce groundwater concentrations;
- Evaluate the need to optimize the current active remediation systems (dual-phase extraction (DPE) and groundwater containment) through expansions or augmentations to reduce mass flux and to contain groundwater that does not yet achieve ACLs; and
- Identify and evaluate remedial alternatives for NAPL remediation through treatment that results in the reduction in volume, toxicity, and mobility of NAPL within a reasonable timeframe.

Scope of Work

The scope of work will follow the RI/FS process with a focus on NAPL and within the context of the existing Site remedy. The study question for the Focused RI/FS is to determine how the nature and extent of NAPL affects the long-term protectiveness of the remedy. The study will be framed by: 1) evaluating the characteristics of the NAPL source zone and the downgradient groundwater plume; 2) evaluating the influence of the source zone on the downgradient groundwater plume; and 3) by compliance with applicable regulations.. The outcome of the study will lead to selection of a practicable remedial action alternative that is protective of human health and the environment and in compliance with Applicable or Relevant and Appropriate Requirements (ARARs).

The Focused RI tasks and deliverables are:

- Site Characterization: A field sampling program to screen for NAPL using Cone Penetrometer Test (CPT) with Membrane-Interface Probe (MIP) and Rapid Optical Scanning Tool (ROST); NAPL characterization for chemical and fluid properties; and expanded groundwater chemical characterization;
- Focused Treatability Studies, if warranted by the Site Characterization findings;
- Focused Risk Assessment to assess potential risk to human health and the environment; and
- Draft and Final RI Report.

The Focused FS will involve two primary tasks:

- Development and Screening of Remedial Action Alternatives: This task will be performed to select an appropriate range of remedial action options to be evaluated. The range of options will include alternatives in which treatment is used to reduce the toxicity, mobility, or volume of the waste, alternatives that involve containment and treatment components, alternatives that involve containment with little or no treatment, and a no-action alternative.
- Analysis of Remedial Action Alternatives: The alternative analysis will include an evaluation of each alternative; and assessment and summary profile of each alternative with respect to the established evaluation criteria; and a comparative analysis among the alternatives to assess the relative performance of each.

1.0 INTRODUCTION

This work plan outlines the rationale, technical approach, and tasks to conduct a Focused remedial investigation/feasibility study (Focused RI/FS) at the Site in Calvert City, Marshall County, Kentucky. The Focused RI/FS will be conducted in accordance with § 40 CFR § 300.430. This work plan is submitted in compliance with an Administrative Settlement Agreement and Order on Consent (Settlement Agreement) entered into by the United States Environmental Protection Agency (U.S. EPA) Region 4, Goodrich Corporation, and PolyOne Corporation. In this document, the Respondents are Goodrich Corporation and PolyOne Corporation. The organization and content of this work plan is in general accordance with the Statement of Work (SOW) provided to the Respondents by U.S. EPA on March 7, 2008, and with the relevant elements of *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (U.S. EPA 1988, amended 2001).

A full-scale remedial action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) has been operating at the Superfund Site for more than a decade. As documented by the First and Second Five-Year Review Reports (URS, 2001; United States Army Corps of Engineers [USACE], 2006), the remedy is currently protective of human health and the environment. Over 10 consecutive years of monitoring, operations and maintenance (O&M) reports, and two detailed 5-year inspections have documented that past chemical releases associated with the Site are: 1) reducing in mass; 2) hydraulically contained; and 3) not migrating off-site. Furthermore, no new releases have been reported at the Site.

On April 23, 2008, Respondents submitted a Good Faith Offer (GFO) in response to the U.S. EPA's March 7, 2008 Special Notice Letter (SNL). In accordance with the GFO and consistent with recent discussions since the completion of the Second Five-Year review, the Site Objectives of the Focused RI/FS are to:

1. Further characterize the nature and extent of non-aqueous phase liquids (NAPL) at the BFGoodrich (BFG) Superfund Site and at SWMU 3;
2. Update the Conceptual Site Model (CSM);
3. Conduct a Focused Risk Assessment; and
4. Evaluate the feasibility of and necessity for remedial alternatives for improving the performance of source zone and groundwater plume treatment, including the evaluation of remedial measures that address NAPL in the source zone.

These objectives form the basis of subsequent decision-making at the Site and are used to guide the data quality objectives (DQO) process presented in Section 4.0.

1.1 ORGANIZATION OF WORK PLAN

The Focused RI/FS Work Plan contains a summary of background and historical information, the current CSM, and the approach and scope of work for the proposed investigation. The Sampling and Analysis Plan (SAP), Quality Assurance Project Plan (QAPP), and Health and Safety Plan (HASP) will be submitted separately. Together, submittals for the Focused RI/FS Work Plan comprise the deliverable for *Task 1 – Scoping* listed in the draft SOW of the SNL, dated March 7, 2008. A compact disc (CD) is attached to the Work Plan that contains copies of key documents that are relevant to the Focused RI/FS.

The content and scope of work in this work plan follow the systematic planning principles that result in a project's logical development, efficient use of resources, transparency of intent and direction, soundness of conclusions, and proper documentation as set forth in U.S. EPA's Guidance on Systematic Planning Using the DQOs Process (2006) and mandated by U.S. EPA's Quality System (2000).

Following this introduction, this work plan is organized into the sections listed below.

- Section 2.0 **Site Background and Physical Setting** presents a brief background of the Site history.
- Section 3.0 **Initial Evaluation** describes the questions raised from the Second Five Year Review that are the focus of the RI/FS, the current CSM, the Site Objectives and preliminary remedial action objectives (RAOs), and preliminary remedial concepts to be considered during the Focused RI/FS.
- Section 4.0 **Work Plan Rationale** describes the DQOs for the project, and the approach to address the Site Objectives for the Focused RI/FS.
- Section 5.0 **RI/FS Tasks** describes the activities to be conducted that are consistent with the Settlement Agreement, including the general fieldwork and data analyses to be conducted during the project.
- Section 6.0 **Schedule and Reporting** describes the project schedule, milestones, and deliverables to be generated.
- Section 7.0 **Project Management** describes the key staff and organization of the project and subcontractors anticipated to be involved with the RI/FS.
- Section 8.0 **References** lists the references used to prepare this work plan.

2.0 SITE BACKGROUND AND PHYSICAL SETTING

This section references previously-submitted documents that describe the history of the Site, a summary of the environmental setting of the Site, a summary of the 1988 RI/FS approach and findings to date relative to the groundwater plume and NAPL, and the status of the ongoing remedial action (Figures 1 and 2).

2.1 SITE HISTORY

The Site contains a landfill, a flood protection dike, and a former burning and burial area referred to as the Burn Pit Area. The Superfund Site refers to two separate but adjacent Superfund sites, the BFGoodrich Superfund Site and the AIRCO Superfund Site. The BFGoodrich Site and AIRCO Site were named on the National Priorities List (NPL) in 1983 and 1984, respectively. The landfills operated as solid waste landfills during the same general time frame (late 1950s to late 1970s), and both were closed with state-approved closure plans in the early 1980s. Because of their similar histories and close proximity, the NPL sites were managed as one for subsequent investigations, design, and remedial activities although separate Record of Decisions (RODs) were signed for each site.

2.1.1 AIRCO Landfill

The AIRCO Landfill is located at the southern limit of the floodplain, and it is situated between the BFGoodrich Landfill on the west and a remnant of the slough on the east (Figure 2). The history of the AIRCO Landfill is described in numerous previously-submitted documents, including the 1988 RI/FS (Dames & Moore 1988), the First Five-Year Review Report (URS 2001), the Second Five-Year Review Report (USACE 2006), and the Updated Data Analysis (URS 2007b).

2.1.2 BFGoodrich Landfill

The BFGoodrich Landfill occupies approximately 1 acre directly west of the AIRCO Landfill (Figure 2). The history of the BFGoodrich Landfill is described in numerous previously-submitted documents, including the 1988 RI/FS (Dames & Moore 1988), the First Five-Year Review Report (URS 2001), the Second Five-Year Review Report (USACE 2006), and the Updated Data Analysis (URS 2007b).

2.1.3 BFGoodrich Burn Pit Area

A 1.4-acre area south of the BFGoodrich Landfill was used for the burning and burial of wastes (Burn Pit Area), (Figure 2). The history of the Burn Pit Area is described in numerous

previously-submitted documents, including the 1988 RI/FS (Dames & Moore 1988), the First Five-Year Review Report (URS 2001), the Second Five-Year Review Report (USACE 2006), , and the Updated Data Analysis (URS 2007b). Previous documents (A.T. Kearney 1987, TechLaw 2002) indicate that approximately 2.6 million gallons (Mgal) of liquid organic waste was burned in the BFGoodrich Burn Pit and Solid Waste Management Unit (SWMU) 3 burn pit area, combined.

2.1.4 SWMU 3 Burn Pit Area

SWMU 3 is an unlined disposal area covered with approximately 10-20 feet of fill located east of the current barge slip (Figure 2). The location of SWMU 3 presented in Figure 2 has been changed from that presented in previously-submitted documents based on newly-discovered historical drawings (Appendix A). These drawings are dated at the time that disposal at SWMU 3 was active. The drawings show the position and layout of the former slough, and they show a "dump area" located in the channel of the former slough. In combination with anecdotal descriptions of the SWMU 3 activities, the indicated "dump area" is considered to be the primary location of SWMU 3 disposal activities. Historical records indicate SWMU 3 was located between 310 and 320 feet above mean sea level (feet, msl) elevation (Appendix A).

Burning and disposal activities at SWMU 3 began at the start of the Ethylene Plant construction and were discontinued as a result of construction of the Chlorine Plant.

The SWMU 3 unit was used to burn a variety of plant wastes, including: 1,727 cubic yards of plant refuse, 403 cubic yards of carbon catalyst tubes, and 2,307 cubic yards of non-chlorinated organics (A.T. Kearney 1987, TechLaw 2002). These references indicate that approximately 2.6 Mgal of liquid organic waste was burned in the BFGoodrich Burn Pit and SWMU 3. The SWMU 3 burn pit unit was active from 1962 until 1965. Disposal activities at SWMU 3 were discontinued as a result of construction of the chlorine plant, and in 1966, noncombustible residues from SWMU 3 were bulldozed to the BFGoodrich Landfill. During the construction of the Chlorine Plant, earth work was conducted in the SWMU 3 area involving re-grading of the flood plain. At this time, native soil with clay was spread over the area of SWMU 3. Between the early 1960s and 1991, surplus concrete, concrete foundations, and soil excavated from new construction was disposed in an area between the Salt dock road and the current ditch draining to Outfall 004, and this area is identified under Resource Conservation and Recovery Act (RCRA) as SWMU 6. Disposal of this material resulted in 10 to 20 feet of fill being placed on top of the SWMU 3 vicinity.

The release history for SWMU 3 supported the design and installation of a soil vapor extraction/air sparge (SVE/AS) system in 1998 with the objective of treating the vadose zone

and upper portion of the shallow aquifer (Weston 1999). Activation of the SVE/AS systems did not occur because an operational agreement between the property owner (Westlake) and the Permittee was not established.

2.2 ENVIRONMENTAL SETTING

The environmental setting description in this section is summarized from more detailed descriptions provided previously in the 1988 RI/FS.

2.2.1 Topography

The terrain in the vicinity of the Site is characterized by an alluvial floodplain and river bank along the Tennessee River and a broad terrace capped by lacustrine deposits (Figure 1). The elevation of the active floodplain ranges from the normal pool elevation of the Tennessee River at 302 feet, msl to about 320 feet, msl at the edge of the floodplain. The river bank rises abruptly at the edge of the active floodplain to the terrace level typically between 340 to 350 feet, msl.

As shown in Figure 2, a former slough ran from east to west along the southern portion of the floodplain. The location of the former slough shown in Figure 2 has been revised from previous documents submitted for the Site, and the revised location is based on historical Site maps of the area provided in Appendix A. Spot elevations shown in Appendix A indicate the slough channel had a bottom elevation of approximately 310 feet, msl. During the mid-1960s construction activities, the slough was blocked and drained adjacent to the landfill areas, and the landfill areas were regraded. A remnant of the slough terminates at the eastern boundary of the flood protection dike constructed around the BFGoodrich and AIRCO Landfills (Figure 2).

2.2.2 Stratigraphy and Hydrogeology

Detailed descriptions of the stratigraphy and hydrogeology have been provided previously in the 1988 RI/FS. Cross sections through the Site are presented in Figure 3.

2.3 1988 REMEDIAL INVESTIGATION / FEASIBILITY STUDY (RI/FS)

A comprehensive RI/FS was conducted at the Combined Site between 1986 and 1988 and was reported in the 1988 RI/FS Report (Dames & Moore, 1988). Concern over potential groundwater releases from the Superfund Site landfills and Burn Pit Area was a principal focus of the RI/FS. Between 1986 and 1987, 38 monitoring wells were installed and sampled around the landfills and Burn Pit Area; 14 soil borings were drilled and sampled in the burn pit area

(including six monitoring wells); and hydrologic studies were conducted to determine the potential for groundwater contaminants to migrate to potential receptors.

Groundwater cleanup-levels for the plume constituents in groundwater (alternative concentration levels [ACLs]), were established to protect the Tennessee River from exceeding applicable or relevant and appropriate requirements (ARARs) using an U.S. EPA-approved mass-balance approach (Dames & Moore 1988). The ACLs were specified in the ROD as the endpoints for active remediation (pump and treat).

2.4 REMEDIAL ACTION (RA)

The Superfund Site remedy, as documented in the respective ROD and Consent Decree (CD) documents, included the following elements:

- Groundwater monitoring;
- Deed restrictions preventing residential development;
- Flood protection dike around the landfills;
- Upgraded landfill clay caps and leachate collection system;
- Groundwater plume extraction and above-ground treatment;
- Excavation of surface soil and sediments and disposal in the burn pit area; and
- RCRA cover and vapor extraction of the burn pit area.

Descriptions of the RA components are provided in the Remedial Action Report, (Dames & Moore 1997c).

3.0 INITIAL EVALUATION

This part of the work plan summarizes the current CSM from previous submittals, and it describes the understanding of how NAPL relates to the dissolved-phase groundwater plume in the Site. Preliminary RAOs are identified along with the rationale of the Focused RI/FS in consideration of the other ongoing remedy elements, current property owners, and anticipated plans for the Site.

3.1 CONCEPTUAL SITE MODEL (CSM)

A CSM was developed during the 1988 RI/FS and used to support the remedial design. Following U.S. EPA approval of, construction of, and activation of the RA systems for the Site in 1992 and expansion in 2003, the Respondents have accumulated 15 years of groundwater monitoring and operational data.

Appendix B presents selected cross sections from the 1988 RI/FS illustrating the hydrogeology beneath the Burn Pit. The unconsolidated sediments consist of stratified lacustrine and alluvial deposits, with sandy clay and silty clay at the surface grading downward to silty sand and to medium and coarse sand and gravel over bedrock. Groundwater occurs in the interbedded sand and clay unit within 30 feet of ground surface under semi-confined conditions. Cross sections through the Site are presented in Figure 3.

In the absence of pumping, normal groundwater flow is to the north-northeast toward the Tennessee River and to the northwest in the vicinity of the Barge Slip.

NAPL source areas are described in the 1988 RI/FS (Dames & Moore 1988), the First Five-Year Review Report (URS 2001), the Second Five-Year Review Report (USACE 2006), and the Updated Data Analysis (URS 2007b). The physical properties of the disposed organic liquids include characteristics of both light non-aqueous phase liquids (LNAPL) and dense non-aqueous phase liquids (DNAPLs).

3.1.1 Potential NAPL Indicators

A preliminary analysis of potential NAPL indicator locations was conducted to provide a conservative estimate of the current NAPL extent. This analysis involved the development of a database of visual observations, which indicate possible NAPL presence, including observations noted on borehole logs such as staining, visible contamination, burn layers, sheen, oily liquid, product, etc. Visual observations are historical in nature, and may not reflect current conditions.

Figure 3 presents north-south cross sections through the Burn Pit Area and through the SWMU 3 vicinity, including the elevations of visual observations based on inspection of the boring records. Figure 4 shows the locations of potential NAPL indicators at the Site based on the minimum elevation of visual observations at each location. Figure 4 groups visual observations into three horizons for visualization purposes: shallow (>321 feet, msl), intermediate (between 300 and 320 feet, msl), and deeper (<300 feet, msl) portions of the subsurface. These three zones generally correspond to the fill zone and upper portion of the silty clay unit; the lower portion of the silty clay unit and upper portion of the interbedded unit; and the lower portion of the interbedded unit and upper portion of the sand and gravel unit.

This conservative delineation of potential NAPL extent was used for identifying areas where data coverage can be improved in the development of the approach and scope of work for this work plan.

For illustration purposes, the approximate extent of groundwater where EDC exceeds the EDC ACL of 8.5 mg/L is presented on Figure 4. This groundwater extent is based on the maximum EDC concentration observed at monitoring and extraction wells in the study area between the period of 2005 and 2007.

3.1.2 Chemical Analytical Data

Soil sample analytical data from 1988 RI and from the 1998 SVE/AS installation are presented in Appendix C. These data will be utilized as part of soil data evaluations during the Focused RI/FS.

Cumulative soil vapor and leachate (i.e., liquid phase) analytical data from dual phase extraction (DPE) system operation are presented in Table 1. EDC mass removal data are presented in URS (2007a) and will be utilized as part of contaminant mass removal evaluations during the Focused RI/FS.

Groundwater monitoring EDC trends, since inception of the monitoring program in 1992, are charted in Appendix D. These data will be utilized as part of groundwater data evaluations during the Focused RI/FS.

3.1.3 Pathway Analysis

A comprehensive site remedy is operating at the Site. The Second Five-Year Review included a review of chemical-specific ARARs and receptors and concluded that there were no changes in conditions that affect the protectiveness of human health and the environment. Furthermore,

environmental monitoring has not documented any change in conditions beyond the Site boundaries that would trigger action. The SWMU 3 portion of the Site is regulated under an active RCRA corrective action permit, and it has been undergoing groundwater extraction and treatment since 1992 as a RCRA Interim Measure.

Figure 5 presents a diagram of the sources at the Site and SWMU 3 Burn Pits with the potential exposure pathways and corresponding engineering and institutional controls in place to maintain protection of human health and the environment. Direct contact to contaminated surface soil and ditch sediment is an incomplete pathway because this material was excavated and placed under the RCRA cap in accordance with the ROD/CD. Human exposure to groundwater is an incomplete pathway because of deed restrictions that are in place. The groundwater to surface discharge pathway is controlled by the existing extraction well system between the groundwater plume and the Tennessee River. A network of shallow and deep groundwater monitoring wells and regular sampling is performed and reported to monitor the position of the plume relative to the Site boundaries.

3.2 PRELIMINARY REMEDIAL ACTION OBJECTIVES (RAOS)

As part of the Project Planning task in the draft SOW (Task 1b), the Respondents and U.S. EPA have developed the following Site Objectives for the Focused RI/FS, based on issues originating with the Second Five-Year Review:

Issue From Second Five-Year Review (USACE 2006, Executive Summary)	Additional Issues from SNL 3/7/08	Site Objectives, from GFO 4/23/08
1) Deed restrictions		
5) Uncertainty regarding the extent of the principal EDC contaminant source zone.	Current remedy not effective for NAPL below water table NAPL has migrated to/from adjacent property	1) Further characterize the nature and extent of NAPL released at the Site and at SWMU 3 2) Update CSM 3) Conduct a Focused Risk Assessment
2) Groundwater cleanup goals not achieved in 10-year ROD estimate.		4) Evaluate the feasibility of and necessity for remedial alternatives for improving the performance of source zone and groundwater plume remediation
3) No decreasing EDC groundwater trend.		
4) Limited effectiveness of wells SW-1942 and SW-1943		

These objectives form the basis of subsequent decision-making at the Site and are used to guide the DQO process presented in Section 4.1. In accordance with 40 CFR § 300.430 (e)(2)(i) and in consideration of RA systems already constructed and in operation at the Site, the preliminary RAOs for the Site are to:

- Maintain institutional controls and current land use;
- Maintain integrity of existing remedy elements;
- Avoid mobilizing NAPL through stratigraphic controls that provide natural containment;
- To the extent that is practicable, reduce the mass flux of constituents of concern (COCs) from the NAPL source zones to a level that results in achievement of ACLs, and identify natural attenuation processes that may reduce groundwater concentrations;
- Evaluate the need to optimize the current active remediation systems (DPE and groundwater containment) through expansions or augmentations to reduce mass flux and to contain groundwater that exceeds ACLs; and
- Identify and evaluate remedial alternatives for NAPL remediation through treatment that results in the reduction in the volume, toxicity, and mobility of NAPL within a reasonable timeframe.

It is important to recognize that this Focused RI/FS for NAPL is being conducted within the context of an existing remedy with established cleanup standards for soil and groundwater that are designed to be protective of surface water. Groundwater use at the Site is restricted from potable or non-potable use by human receptors. Therefore, the final RAOs for NAPL will be developed to meet the same ARARs in accordance with those specified in the ROD: ACLs for groundwater, and leaching-based cleanup standards for soil. Furthermore, the RAOs will be developed to be consistent with the provisions of CD Attachment I with respect to RCRA corrective actions at the Site.

3.3 PRELIMINARY REMEDIAL ACTION ALTERNATIVES

The following general RA alternatives will be considered for the source zone(s) and downgradient groundwater plume as part of the Focused FS:

- No action;
- Treatment;
- Containment;
- Treatment and Containment; and

- Technical Impracticability waiver for source zone treatment with continued restoration of the downgradient groundwater plume via natural or active means.

A number of technologies have been developed to facilitate at least partial treatment of NAPL and DNAPL source zones. These treatment technologies are used to treat DNAPL using one or more of the following mechanisms:

- Enhanced mass transfer by dissolution and/or volatilization;
- Displacement and extraction of DNAPL;
- Excavation;
- Destruction via chemical or biological processes; and
- Immobilization.

These types of treatment technologies will be included in the FS evaluation of source zone remediation alternatives.

4.0 WORK PLAN RATIONALE

4.1 DATA QUALITY OBJECTIVES (DQOS)

A systematic planning process was used to develop the scope of work for this Focused RI/FS work plan. This process, as established in U.S. EPA's Guidance on Systematic Planning Using the DQOs Process (U.S. EPA 2006), is designed to ensure that environmental data are of the appropriate type and quality for the intended use, and lead to logical conclusions and defensible decisions or estimates.

DQOs are developed through a seven-step process that is both sequential and iterative, depending upon the complexity of the problem. The steps involve both qualitative and quantitative criteria and are described below.

4.1.1 Step 1 – Problem Statement

The Focused RI/FS is intended to address certain issues raised in the Second Five-Year review. The problem statement is to conduct a Focused RI/FS of NAPL nature and extent at the Site. The CSM can be summarized as:

- NAPL burning at SWMU 3 ended in 1965, and NAPL burning at the Burn Pit Area ended in 1967; NAPL at the Site occurs in the surficial clay unit and in the interbedded unit of clay, silt, and sand; in a limited part of the Site, NAPL may also occur in the upper portion of the underlying sand and gravel unit. The minimum elevation of visible observations, which indicate possible NAPL presence is 280 feet, msl (SW-1942). All other visible observations are higher than 280 feet, msl.
- A CERCLA remedial action and a RCRA interim corrective measure were activated in 1992 and have served to contain contaminated groundwater from discharging to the Tennessee River. Elements of the CERCLA remedial action are serving to contain groundwater above ACLs and to reduce contaminant mass in the Site source zone.
- No new releases, exposure pathways, or potential receptors have been identified.
- Additional NAPL data are needed to perform a Focused FS.
- Groundwater concentrations in the plume core exceed ACLs after operation of pump and treat and DPE systems.

The planning team consists of the U.S. EPA, Kentucky Department of Environmental Protection (KDEP), Respondents, and Contractors. Further details on the planning team and management of the project are presented in Section 7 of this work plan. The duration for implementation of the Focused RI/FS is anticipated to be approximately 18 months. Details of this schedule are presented in Section 6 of this work plan.

4.1.2 Step 2 – Goal of the Study

The goal of the study for the Focused RI/FS is to characterize the nature and extent of the NAPL source zone and to evaluate alternatives for RA that are protective of human health and the environment. In accordance with 40 CFR § 300.430 (e)(2), alternatives will be developed that protect human health and the environment by recycling waste or by eliminating, reducing, and/or controlling risks posed through each pathway at the site. The study will evaluate the characteristics of the NAPL source zones and the downgradient groundwater plume. Evaluation criteria for comparing alternatives will focus on the nine criteria in 40 CFR § 300.430 (e)(9)(iii). The outcome of the study will lead to identification of a practicable RA alternative that is protective in the long term of human health and the environment and in compliance with ARARs.

4.1.3 Step 3 – Information Inputs

The types and sources of information needed to produce the desired estimates and to address the study question consist of the following:

- *Existing Data* – Data, findings, and conclusions of historical investigations and engineering analyses conducted at the Superfund Site and the adjoining RCRA site since 1967 and summarized in Sections 2 and 3 of this work plan; historical aerial photographs, topographic surveys, and site drawings identifying surface features; and underground utility drawings;
- *New Data* – Potential NAPL indicators distributed across the Site; NAPL chemical and physical properties; soil, vapor, and groundwater chemical concentrations; soil hydraulic and petrophysical properties; and groundwater, NAPL, and soil vapor hydraulic monitoring data;
- *ARARs and ACLs* – Regulatory standards at the endpoints on exposure pathways;
- *Risk Assessment* – Required for RA alternative evaluation;
- *Standard Methods* – Laboratory methods, e.g. SW-846, American Society for Testing and Materials (ASTM), API, etc.; and
- *Guidance* – U.S. EPA guidance; also policy and technical literature as applicable to the investigation issue.

4.1.4 Step 4 – Boundaries of the Study

The target population for the Focused RI/FS consists of soil and groundwater beneath the Superfund Site and SWMU 3 source zones that are subject to investigation activities. The geographic boundaries of the Focused RI/FS sample collection activities consist of the following:

- Minimum lateral boundary: defined by 1988 EDC isopleths of the ACL; may be extended laterally during subsequent fieldwork event if NAPL indicators are declared present;
- Vertical boundary: approximately 280 feet, msl will be extended deeper during subsequent fieldwork event if NAPL indicators are declared present near this vertical boundary;
- Soil analytical, hydraulic, and petrophysical samples: from select intervals based on borehole screening;
- Groundwater analytical: from select existing wells in conjunction with monitoring programs;
- Soil vapor analytical: from select existing wells at the Site; and
- NAPL analytical and physical: from existing wells and from new borings (if NAPL is present).

Factors that will be considered in planning the data collection schedule and approach include the following:

- Field crew health and safety;
- Potential for vertical cross contamination;
- Existing structures, including underground utilities, on operating facility property;
- Topography (steep slopes);
- Existing remedy elements (e.g., wells, RCRA cap, Landfill cover improvements, Flood Protection dike);
- Seasonal flooding of Tennessee River;
- Subsurface conditions (e.g. heaving sands, drilling obstructions); and
- Current operating systems (DPE and Plantwide Corrective Action Program [PCAP]).

Additional consideration and planning will be necessary to manage these or other potential issues that may arise during sample collection.

The time frame for collecting data and performing the study evaluations is anticipated to be 18 months. The following field sampling events will be performed for the Focused RI/FS:

- NAPL analytical and physical: quarterly sampling from DPE system for one year;
- NAPL nature and extent assessment borings;

- Landfill leachate samples collected from existing landfill sumps: quarterly sampling for one year;
- Soil vapor sampling from existing soil vapor monitoring wells that are still operational in the SWMU 3 area;
- Groundwater samples collected under routine annual CERCLA monitoring program, CERCLA O&M program, and routine semiannual RCRA program events; and
- Groundwater samples collected for natural attenuation indicators analysis during two semi-annual events (high and low potentiometric elevations, winter-summer).

Details of this schedule are presented in Section 6 of this work plan.

4.1.5 Step 5 – Analytic Approach

The study question from Step 2 will be evaluated using an analytical approach incorporating the following elements:

- NAPL from the Burn Pit Area and from SWMU 3 will be characterized for chemical and physical properties in order to evaluate potential “fingerprints” of NAPL derived from the two separate source areas.
- The lateral and vertical extents of the Superfund Site and SWMU 3 source zones will be delineated based on new field data and re-evaluation of existing data. Additional lateral or vertical delineation may be necessary, based on the new data findings. In regards to source zone characterization beneath the RCRA cap, if drilling around the outside of the RCRA cap does not indicate the presence of NAPL that can be remediated practicably, then the placement of borings inside the Burn Pit Area will be considered.
- The “architecture” of the respective source zones will be evaluated based on existing and new field data to assess the relative portion of the source zone occurring in more permeable soil materials versus those portions of the source zone that are in less permeable soils. The degree to which the respective source zones occur above and below the water table will also be evaluated.
- Source zone stability (i.e., whether the source zone is stable, expanding, or receding in time) will be evaluated by a weight-of-evidence approach considering groundwater, soil, soil vapor, and leachate concentration trends and other lines of evidence. Source zone stability will be utilized in the Focused FS during protectiveness evaluations.
- Mass flux of constituents between the unsaturated and saturated portions of the source zone, and between the source zone and downgradient groundwater plume will be estimated.
- Natural attenuation capacity of the aquifer will be estimated based on chemical and hydraulic parameters.

- The effectiveness of the current operating RA systems will be evaluated based on existing and new field data in order to evaluate protectiveness and efficiency of the current system.
- Remedial alternatives, including technical impracticability (TI) waiver, will be evaluated during the Focused FS.

4.1.6 Step 6 – Estimation Acceptance Criteria

In order to define the lateral and vertical extent of source zones, the definition of what type of material constitutes a "source zone" needs to be established. A source zone is defined as the volume of subsurface soils where NAPL is present, or high aqueous concentrations are present in finer grained materials. The metrics for declaring the potential presence of NAPL at a location include:

- Downhole screening using a variety of field screening instrumentation (e.g., Membrane-Interface Probe [MIP] or Rapid Optical Scanning Tool [ROST]).
- Core sample collection and confirmation at depth intervals displaying the maximum screening responses.
- Visual observations of collected core samples recorded on new and historical boring logs.
- Visual observations of NAPL in effluent from existing DPE and other wells.
- Soil and groundwater EDC concentrations exceeding a media-specific threshold.
- Dean Stark analysis on core samples indicating NAPL saturation.

The criteria for declaring potential NAPL presence from these metrics will depend on the type of observation or result. Visual observations of organic liquids are a straightforward indicator, for example. For soil analytical data, the criterion will be developed from a partitioning calculation approach. For groundwater analytical data, the criteria will be based on 1 percent of the EDC aqueous solubility as an indicator of potential upgradient NAPL presence and 10 percent of the EDC effective solubility as an indicator of potential proximal NAPL presence. These data will be combined using a weight of evidence approach to declare the presence or absence of NAPL source material at a sampling location. Historical NAPL indicators, which are based on visual-only observations, will be re-evaluated as part of the current NAPL source material extent characterization.

The estimations under the analytical approach in Step 5 will be made from data collected from a judgmental sampling design. A judgmental sampling design is appropriate for this study because of the Focused nature of the RI/FS and the fact that the existing Superfund Site

remedial action has generated a wealth of existing Site data. Acceptance of findings and conclusions of this study will therefore be based on the use of validated data in the evaluations; peer review of work products by technical experts, and agency review by U.S. EPA, USACE, and additional technical experts.

4.1.7 Step 7 – Plan for Obtaining Data

The scope of work for the Focused RI/FS field investigation will consist of the following tasks:

- NAPL properties characterization;
- Source zone delineation;
- Groundwater sampling at existing wells;
- Landfill leachate sampling;
- Soil vapor sampling; and
- Surface water and sediment sampling to the extent necessary to evaluate potential ecological risks.

A judgmental sampling design is used to propose soil boring locations for the NAPL source zone delineation study, based on existing data collected under the CERCLA program since 1986 and based on investigation boundaries from Step 4. The term “judgmental sampling design” means that the proposed sampling locations are biased toward areas with suspected or known NAPL indicators, as opposed to a random sampling design in which each proposed location has an equal probability of encountering contamination (EPA 1997). The delineation steps will consist of borehole screening and soil core sample collection. Borehole screening technologies will be compared at three locations to evaluate the feasibility and reliability of each method at the Site. Borehole screening will then be conducted at the proposed locations to select target soil core sample collection intervals. Soil core sampling will be performed to evaluate the presence or absence of NAPL source material and to obtain data.

Field data from existing wells will be collected for baseline groundwater equilibrium studies. Data and information will be collected for alternatives screening.

At the completion of the field data collection and analysis tasks, preliminary findings will be transmitted to U.S. EPA for review and comment in accordance with the Settlement Agreement. Contingency field data collection may be warranted as a result of NAPL source material data evaluations. Additional data and information collection needs under the remaining Focused RI/FS Tasks are described in the applicable subsections in Section 5, below.

5.0 RI/FS TASKS

The following tasks will be implemented for the project.

5.1 TASK 1 – SCOPING

The scoping and project planning phase focus on achieving the Site Objectives listed in Section 1.0. The planning content is also based on numerous meetings and communications with U.S. EPA between 2006 and 2008.

Task 1 (a) – Site Background, was completed in Sections 1 and 2. Task 1 (b) Project Planning, is being conducted as part of this work plan preparation. The Site objectives and preliminary RAOs and alternatives are presented in Section 3. Task 1 (c) Deliverables, is represented by the submission of this work plan and the SAP, QAPP, and HASP deliverables.

The preliminary identification of potential ARARs will be conducted during Task 4 – Focused Risk Assessment by reviewing the ARARs from the Second Five Year Review and the ROD/CD, with consideration of any new contaminants or conditions that are encountered during the Focused RI. ARAR identification shall continue as conditions and contaminants at the Site and remedial action alternatives are better defined.

Project and task management by the Respondents, U.S. EPA, and consultants is described in Section 6, and quality control procedures are described in the QAPP.

5.2 TASK 2 – COMMUNITY RELATIONS

U.S. EPA will take the lead in the planning and implementation of a community involvement program. The Respondents will provide support to U.S. EPA during the planning and implementation of the community involvement program, if such a program is developed.

5.3 TASK 3 – SITE CHARACTERIZATION

This task consists of implementing the field activities of the Focused RI/FS, including environmental sampling and analysis, followed by office analysis, data interpretation, and reporting. The Respondents will notify U.S. EPA at least 2 weeks in advance of the planned dates of the field activities.

Specific activities of the site characterization task are:

- Preliminary investigation tasks;
- Borehole screening method evaluation;

- Source zones nature and extent field investigation;
- Sample analyses and validation;
- Three-dimensional graphical representation of site conditions;
- Remedial performance evaluation;
- Data management;
- Preliminary site characterization summary;
- Contingency fieldwork decision; and
- Draft Focused RI Report.

5.3.1 Preliminary Investigation Tasks

The preliminary tasks discussed below will include a review of existing information and previously completed investigations at the site. Findings of these preliminary investigation tasks may be used to adjust proposed soil boring locations shown in Figure 6.

5.3.1.1 Request and Review Available Documents and Data

The Respondents will request and review available documents and data with relevance to the Site from regulatory and governmental agencies, companies, and other sources. A literature and data search will be conducted for relevant subsurface investigation, surface water investigation, surface sediment investigation, ecological assessment submittals, and NAPL remediation case studies related to the Site. Information contained within these reports will be incorporated with the currently available data for the Superfund Site and SWMU 3.

5.3.1.2 Review of Historic Aerial Photographs

A further review of available aerial photographs of the Site will be completed to supplement and refine the revised delineation of the former burn pit at SWMU 3 and slough, as described in Section 2.2.1.

5.3.1.3 Review Relevant Underground Utility Drawings

A review of current and former underground utility drawings will be conducted to evaluate the potential for preferential pathways in the vicinity of SWMU 3.

5.3.1.4 Non-Aqueous Phase Liquid (NAPL) Sample Collection

Samples of NAPL will be collected from the existing remediation system components, (e.g., the knock out tank, the transfer tank, and selected DPE wells identified in the SAP), and submitted for characterization. The characterization will include chemical analysis and fluorescence testing.

5.3.1.5 Estimate the Effective Solubility of EDC and the Corresponding Threshold Concentrations

A desktop study will be performed to develop EDC threshold concentrations for soil and groundwater analytical data that will be used to define NAPL indicators. This will be based on the composition analysis of NAPL samples, a ratio analysis of available groundwater analytical data, and an analysis of the maximum EDC concentrations measured in groundwater at the Site.

5.3.1.6 Baseline Groundwater Monitoring

Groundwater samples will be collected from all of the monitoring wells and extraction wells at the Site where EDC concentrations in groundwater have exceeded 1 percent of the aqueous EDC solubility between 2005 and 2008. These samples will be analyzed for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) for evaluation of potential fingerprints associated with Superfund Site and SWMU 3 source zones. Samples collected from these wells will also be analyzed for select inorganic parameters to facilitate a fingerprinting and natural attenuation analysis. An oil-water interface probe will be used at all monitoring wells at the Site that are screened across the water table to investigate the potential presence of LNAPL.

5.3.1.7 Chemical Signature Analysis

This desktop task will evaluate potential differences in chemical signatures associated with the Superfund Site and SWMU 3 source zones. The assessment will utilize documented historic release information, existing and new VOC/SVOC groundwater analytical data, and composition analysis of the NAPL samples.

5.3.1.8 Integrity of Soil Vapor Extraction and Air Sparge Wells in the SWMU-3 Vicinity

A remediation system consisting of SVE and AS wells was installed in the SWMU 3 vicinity in 1998 but was never activated. This task will involve the evaluation of the current condition of

these wells to assess rehabilitation potential for use in future remediation activities, and the collection of soil vapor samples where feasible to assist with source zone delineation.

5.3.2 Screening Method Evaluation

A screening method evaluation program will be performed to assess the effectiveness of various screening technologies for organic contaminants and assessing the physical characteristics of the subsurface. A cone penetrometer test (CPT) rig will serve as the platform technology. The screening technologies to be assessed include a MIP and a ROST. The method evaluation program will advance a CPT-MIP and a CPT-ROST soil boring at the following locations:

- North of the Burn Pit Area (adjacent to GA-1) to test for instrument response in an area where NAPL may be present below the water table downgradient of the Burn Pit Area;
- In vicinity of SWMU-3 (near BS-4) to test for instrument response in the SWMU 3 Area where NAPL may be present above and below the water table; and
- West of the Burn Pit Area (near P-B) to test for instrument response near the Burn Pit Area where NAPL may be present above the water table.

An adjacent boring will be advanced by a dedicated direct push technology (DPT) drill rig at each of these three locations to confirm the MIP/ROST results. The DPT will retrieve a continuous soil core with photoionization (PID) analysis and soil sample collection and analysis at select intervals to evaluate, which of the two technologies is most appropriate for the remainder of the source zone nature and extent field investigation.

5.3.3 Source Zones Nature and Extent Field Investigation

Up to 34 soil boring locations will be investigated during the Focused RI/FS (Figure 6). The currently proposed locations may be adjusted based on the findings of the preliminary investigation tasks, surface obstructions, or underground utilities. A field investigation approach will be used consisting of: 1) flexibility in sampling locations based on the findings of the airphoto review; and 2) flexibility in the delineation boring locations based on field findings of the nature and extent of NAPL in the previously-installed borings. Specific objectives of source zone nature and extent field investigation are to:

Specific objectives of source zone nature and extent field investigation are to:

- Characterize lithological, physical, and structural composition of the subsurface deposits;
- Characterize NAPL from the Burn Pit Area and SWMU 3 vicinity in terms of chemical and physical characteristics including fluid properties that affect mobility, solubility, and migration; NAPL analytes will include density, viscosity, NAPL-water interfacial tension, pH, and composition fraction of VOCs and SVOCs;

- Delineate the lateral extent of NAPL originating from the Burn Pit Area, SWMU 3, and the BFGoodrich Landfill;
- Delineate the vertical extent of the NAPL originating from the Burn Pit Area, SWMU 3, and the BFGoodrich Landfill; and
- Delineate portions of the source zone where NAPL is absent but high aqueous concentrations are present in fine-grained materials.

The rationale for each of the proposed boring locations is presented in Table 3. Based on the results from the field investigation, additional soil borings may be needed to complete the investigation.

5.3.3.1 Screening (MIP or ROST)

Borehole screening will be conducted at the proposed locations using the appropriate technologies from the method evaluation program in order to select target soil core sample collection intervals. A depth-to-water measurement will be collected from an existing monitoring well near each proposed boring location to confirm water table elevation prior to drilling.

5.3.3.2 Soil Core Sample Collection

Soil core sampling will be performed in an offset boring adjacent to each screening boring in order to confirm the presence or absence of NAPL source material and to evaluate physico-chemical NAPL and soil properties. In general, the core collection task will include advancing of borings adjacent to each previously-screened location and collecting soil core samples at two selected intervals for analysis of solid and liquid physical and chemical properties. The SAP will allow for the collection of additional samples from boreholes based on field screening results and field observations. A depth-to-water measurement will be collected from an existing monitoring well near each boring location to confirm water table elevation prior to drilling. In general, one interval from the vadose zone and one interval from the phreatic zone will be selected for soil core sampling, per boring. The sample interval selection criterion will include screening instrument response (including PID readings) above and below the water table. In the event that no significant response or observations are reported, one soil interval immediately above the water table and one soil interval 5 to 10 feet below the water table will be selected.

5.3.4 Sample Analysis and Validation

Depth intervals selected at each boring location will be analyzed for VOCs, for physical/hydraulic properties of the soil, and for physical/chemical properties of the NAPL, where present. SVOC analyses may be conducted on a smaller subset of soil samples at

select boring locations if it is determined during the preliminary investigation tasks that there is likely to be a distinct difference in SVOC content in respective source zones at the Superfund Site and SWMU 3. A table detailing the analyses to be completed will be provided in the SAP. Data validation and peer review will be performed on the analytical laboratory reports in accordance with the QAPP.

5.3.5 Remedial Performance Evaluation

The evaluation of current remedial system performance will include the following:

- Review of historical physical and chemical monitoring data.
- Review of the cumulative rates of source zone mass removal from the vadose and saturated zones.
- Temporary shutdown of the existing DPE system, with vapor monitoring to be conducted before and after the shutdown to assess the change in vapor concentration at each well. This will assist in the evaluation of where NAPL may continue to persist in the source zone after long-term DPE.
- Temporary shutdown of the SW-1942 groundwater extraction well, with transducer monitoring in one nearby pair of shallow and deep groundwater monitoring wells to evaluate the hydraulic response after the shutdown. These data will be used to confirm estimates of hydraulic conductivity and to assist with the capture zone analysis.
- Collection of groundwater samples during two routine sampling events for analysis of natural attenuation indicator parameters.
- Pumping well performance evaluation to evaluate the current mass removal trends and combined capture zone of the pumping wells and identify preliminary options to optimize performance of the system at the Site and Barge Slip area.

Another task will involve the complete or partial shutdown of the pumping well system within the Superfund Site and Barge Slip areas for a period of one year to monitor ambient groundwater chemistry and potentiometry. This task is contingent on receiving the required regulatory approval. A separate work plan for this shutdown event that describes the objectives, monitoring procedures, performance measures, schedule, and contingency actions to maintain protectiveness to the Tennessee River will be submitted to U.S. EPA and KYDEP for approval a minimum of 60 days in advance of the shut down. The Respondents will coordinate the pumping system shutdown with the CERCLA monitoring program.

5.3.6 Data Management

All data collected during the Focused RI/FS will be organized, stored, and managed from origin through validation and independent technical review using a database management system (DBMS) and geographic information system (GIS). Details regarding data management requirements are provided in the QAPP.

5.3.7 Three-Dimensional Graphical Representation of Site Conditions

Cumulative data collected for the Site will be evaluated and combined to prepare a three-dimensional graphical illustration of Site surface features, geologic units, source zone extent, downgradient groundwater plume, and the water table surface (minimum and maximum elevations). The graphical illustration will comprise a three-dimensional visualization model of the CSM. NAPL indicator locations and elevations will also be portrayed in the three-dimensional visualization.

5.3.8 Preliminary Site Characterization Summary

At the completion of the field data collection and analysis tasks, preliminary findings will be transmitted to U.S. EPA in a Preliminary Site Characterization Summary Report for review and comment. The Preliminary Site Characterization Summary Report will include refinement of the CSM, a listing of data gaps, refinement of the RAOs and ARARs, and initial screening of RAOs.

5.3.9 Draft RI Report

A draft Focused RI Report will be submitted after completion of the field investigation. The report will contain a description of Site activities, characterization of the nature and extent of contamination, and characterization of the contaminant fate and transport behavior. Following completion of the U.S. EPA review and comment, a final RI report will be prepared and submitted for approval.

5.4 TASK 4 – TREATABILITY STUDIES

Treatability studies for remedial alternatives will be performed if warranted by the source area investigation results. Following the completion of the Site Characterization data analyses, the need for treatability studies will be determined and documented in a technical memorandum for U.S. EPA review and comment. The technical memorandum will propose candidate technologies for one or more treatability studies. The data requirements for the treatability studies program will be outlined in the technical memorandum. Following review and comment by U.S. EPA, a separate Treatability Studies Work Plan will be prepared.

5.5 TASK 5 – FOCUSED RISK ASSESSMENT

The Second Five Year Review (USACE) states:

“There have been no changes in the physical conditions of the [Superfund] Site since the last five-year review that would affect the protectiveness of the remedy. The exposure assumptions used to develop the Human Health Risk Assessment included both current exposures and potential future exposures. No change to these assumptions is warranted. There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy.”

Consistent with the Second Five Year Review, recent discussions with U.S. EPA and KDEP, and the Settlement Agreement, the Focused Risk Assessment will be customized to the conditions at the Superfund Site and SWMU 3. The Focused Risk Assessment will use the results of Task 3 in conjunction with the Superfund Site RI/FS data, the 1988 Endangerment Assessment (EA), and the current Site remedy to evaluate the following key conditions:

- If new COCs are identified that are releases from the Superfund Site or SWMU 3; or
- If a new potential pathway is identified; or
- If a new potential receptor is identified.

Each key condition will be based upon a comparison to the conditions and scenarios already addressed in the 1988 EA and controlled by the current remedy. There are no data at this time that change assumptions regarding criteria or potential releases from the Site to the river or the protectiveness of the onsite remedy for human health or ecological receptors.

Technical Memorandum (Tech Memo #1) of the Focused Risk Assessment will document the status of the key conditions, identify additional data needed to address gaps, and recommend the next steps in the risk assessment process, as appropriate, to supplement the existing risk-based decisions for the Site. This memorandum will clarify the focus of any Site-Specific Risk Assessment to be performed in consideration of potential human health and/or ecological receptors, U.S. EPA guidance to be followed, and specific assumptions that will be used to estimate risks.

A Site-Specific Risk Assessment would be based upon continued industrial land use. Potential receptor populations for the Site will reflect institutional and engineering controls that are in effect under the existing CERCLA remedial action and RCRA permit.

5.6 TASK 6 – DEVELOPMENT AND SCREENING OF REMEDIAL ACTION (RA) ALTERNATIVES

The Focused FS will consist of a series of assessments, which occur throughout the focused RI/FS program to evaluate suitable technologies for achieving the established remediation goals. Task 6 will be performed to select an appropriate range of waste management options to be evaluated. In accordance with 40 CFR § 300.430 (e)(3) the range of options will include alternatives in which treatment is used to reduce the toxicity, mobility, or volume of the waste, alternatives that involve containment and treatment components, alternatives that involve containment with little or no treatment, and a no-action alternative. The following activities will be performed as part of the development and screening of remedial action alternatives:

- Refine and Document RAOs;
- Develop General Response Actions;
- Identify Areas and Volumes of Media;
- Identify, Screen, and Document Remedial Technologies;
- Assemble and Document Alternatives; and
- Conduct and Document Screening Evaluation of Each Alternative.

The development and screening of RA alternatives will be implemented concurrently with the Focused RI Site characterization activities. Periodically during the Site characterization, the site-specific RAOs and general response actions will be reviewed and modified, if necessary. If modifications are warranted, they will be documented in a technical memorandum describing the reasons for the change and associated modifications to the scope of the Focused RI characterization activities.

Following completion of the Focused RI Site characterization, a more detailed evaluation of the identified RA alternatives will be performed. This evaluation will concentrate on the screening of technology process options associated with each retained general response action. The technology process options will be evaluated on the basis of effectiveness, implementability, and relative cost to identify one or more representative technology process options that should be retained for each appropriate general response action.

Upon completion of the detailed technology process option screening, the remaining process options will be assembled into a number of possible alternatives to address the general response actions. The identified alternatives shall represent a range of treatment and containment combinations that address the Site as a whole. The intent of this activity is to define a broad range of alternatives, including no action, which partially attain, attain, or exceed

the identified RAOs. These alternatives will subsequently be evaluated in more detail as described in Task 7.

The decisions and results associated with the development and screening of RA alternatives shall be documented in a technical memorandum (Tech Memo #2) that will be submitted to U.S. EPA for review and comment. This document will discuss the previously identified RAOs, general response actions, and technology process option screenings. In addition, it will address the reasons that each non-retained response action or process option was eliminated. The technical memorandum will also include detailed descriptions of the proposed RA alternatives developed for the Site, including a discussion of related and site-specific ARARs for each.

5.7 TASK 7 –ANALYSIS OF REMEDIAL ACTION ALTERNATIVES

Following U.S. EPA review and comment on the RA alternative screening technical memorandum, an alternatives evaluation will be performed. The objective of this analysis is to evaluate each alternative with respect to established criteria in order to provide the basis for selecting an appropriate final remedy for the site. The alternative analysis will include an evaluation of each alternative; and assessment and summary profile of each alternative with respect to the established evaluation criteria; and a comparative analysis among the alternatives to assess the relative performance of each. The results of these activities will be described and documented in a Focused FS report.

The alternatives defined during the screening phase will be defined further, if necessary, in order to permit uniform assessment of the evaluation criteria and permit the development of order of magnitude cost estimates.

Following this more detailed alternative definition, each alternative will be evaluated with respect to the nine evaluation criteria of 40 CFR § 300.430 (e)(9) that have been established for the Focused FS process. These include:

- Overall protection of human health and the environment;
- Compliance with ARARs;
- Long-term effectiveness and performance;
- Reduction of toxicity, mobility, and volume through treatment;
- Short-term effectiveness;
- Implementability; and
- Cost.

The two remaining criteria, state acceptance and community acceptance, will be addressed by U.S. EPA following the public review and comment period for the Focused FS report.

A detailed analysis of the alternatives carried forward from the screening process will be conducted in accordance with Chapter 6 (Detailed Analysis of Alternatives) of EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final, 1988. For each alternative, the Respondent shall provide:

- A description of the alternative that outlines the waste management strategy involved and identifies the key ARARs associated with each alternative; and
- A discussion of the individual criterion assessment.

Once the identified alternatives have been individually assessed, a comparative analysis will be performed to evaluate the relative performance of each in relation to specific evaluation criteria. The comparative analysis will be presented in a narrative form, which discusses the strengths and weaknesses of the alternatives in relation to each other, and how anticipated variations and/or uncertainties may affect the anticipated performance. The assessment will include quantitative measures where possible, and qualitative assessments where not.

The decisions and results of the individual and relative alternative evaluations will be presented in a draft Focused FS report. The report will present descriptions of the individual alternatives, discussions of the individual and comparative alternative evaluations, and supporting information for the quantitative information considered in the estimates (estimates of time to remediation completion, cost estimates, etc.). Following completion of the U.S. EPA review and comment, a final Focused FS report will be prepared and submitted for approval.

6.0 SCHEDULE AND REPORTING

This section describes the report or work plan deliverables and the overall project schedule for the Focused RI/FS. Table 3 presents a listing of the major deliverables required by the AOC and the associated 18-month schedule. A Gantt chart showing the relationship of the project tasks, activity duration, milestones, and a tentative schedule with constraints is presented in Figure 7. The schedule will be updated upon execution of the Settlement Agreement, and then periodically throughout the project to reflect progress and changes, as appropriate.

6.1 MONTHLY PROGRESS REPORTS

The Respondents will prepare and submit monthly progress reports to U.S. EPA beginning with the first month following the effective date of the AOC. Each report will be submitted on or before the 15th of each month and document progress made during the preceding month. At a minimum, the progress reports will include:

- Descriptions of actions taken to comply with the AOC during that month;
- All results of sampling and tests and all other data received by the Respondents;
- Work planned for the next 2 months with schedules relating such work to the overall Focused RI/FS schedule;
- Problems encountered and any anticipated problems;
- Actual or anticipated delays; and
- Solutions developed and implemented to address any problems or delays.

6.2 FOCUSED REMEDIAL INVESTIGATION (TASK 3) TREATABILITY STUDIES (TASK 4), AND RISK ASSESSMENT (TASK 5) DELIVERABLES

The following Focused RI and Focused Risk Assessment deliverables will be submitted to U.S. EPA:

Preliminary Site Characterization Summary – a concise summary of the field sampling and analysis activities. The summary will discuss the investigative activities that were conducted and samples that were collected and analyzed.

Tech Memo #1: Focused Risk Assessment: the first deliverable of the risk assessment, will be submitted to U.S. EPA concurrently with the Preliminary Site Characterization Summary.

Technical Memorandum Documenting need for Treatability Studies: a summary of candidate technologies based upon a literature survey of performance, relative costs, applicability, removal efficiencies, operation and maintenance (O&M) requirements, and implementability of candidate technologies.

Draft Focused RI Report.

The draft Focused RI report will be submitted to U.S. EPA after submittal of the Preliminary Site Characterization Summary and Tech Memo #1: Focused Risk Assessment. The Respondents will not proceed with further RI activities until receipt of approval from U.S. EPA. Activities on the Focused FS that are independent of the RI will proceed according to the project schedule.

Final Focused RI.

The final Focused RI report will be revised, as necessary, based on U.S. EPA's comments and submitted to U.S. EPA for approval.

6.3 FOCUSED FEASIBILITY STUDY (TASKS 6 AND 7) DELIVERABLES

The following deliverables will be submitted to U.S. EPA as part of Task 5 – Development and Screening of Remedial Action Alternatives:

Technical Memorandum Documenting Revised RA Objectives (if necessary).

Tech Memo #2 on Remedial Technologies, Alternatives, and Screening.

The Respondents may continue to work on the Focused FS while U.S. EPA reviews this technical memorandum.

The culmination of the FS is Task 7 – Detailed Analysis of RA Alternatives. The only deliverable of Task 7 is the Draft Focused Feasibility Study Report. The final Focused FS report will be prepared following receipt of U.S. EPA comments.

Five hardcopies and one electronic copy of all deliverables will be submitted to the agencies listed below:

EPA Remedial Project Manager
U.S. EPA Region IV
Atlanta Federal Center, 11th Floor
100 Alabama Street, N.W.
Atlanta, Georgia 30303

Director
Kentucky Division of Waste Management
18 Reilly Road
Frankfort, Kentucky 40601

7.0 PROJECT MANAGEMENT

The Respondents have assembled a technical team to work with U.S. EPA in the performance of the Focused RI/FS. Figure 8a is a diagram showing the relationship between the Respondents, U.S. EPA and the various technical support contractors and agencies involved with the project. Figure 8b depicts the project organization structure and staff broken down by discipline. The primary lines of communication and responsibility are indicated in the chart. The roles of key Contractor personnel are outlined below.

URS Project Manager/ Principal in Charge

The URS Project Manager (PM) and Principal-in-Charge is Anthony Limke, P.G., of the Cincinnati, Ohio office. As PM, Mr. Limke will be responsible for technical, financial, and scheduling aspects of the project. A Registered Professional Geologist in Kentucky, Mr. Limke has been involved with the BFGoodrich Site since the early 1990s. Mr. Limke will lead the URS technical team, interface with other members of the Respondents technical team, and support the Project Coordinator with communications between the Respondents and U.S. EPA.

URS Project Advisor

Ms. Jennifer Krueger, P.G., in the Cincinnati, Ohio office, will serve as Project Advisor to the technical team. Ms. Krueger was project manager during the 1988 RI/FS and portions of the RD/RA from 1992-1998.

URS Quality Assurance (QA) Team

Three URS staff will provide QA during the RI/FS and report to the Project Manager. Mr. Nigel Goulding, P.E. will provide QA oversight for technical aspects of the project involving NAPL. Mr. Goulding is a NAPL remediation specialist with over 20 years of experience with a variety of NAPL mixtures.

Ms. Jo Ann Bartsch and Ms. Peggy Schuler of the URS Cleveland, Ohio office will provide QA oversight in the areas of risk assessment and data validation.

URS Health and Safety Officer

Mr. Ben Mignery, Health and Safety Officer for the Cincinnati, Ohio office, will coordinate and provide oversight for health and safety issues at the Site. Mr. Mignery is responsible for development of the HASP for the RI/FS Work Plan, which will be provided in a separate submittal.

URS RI Field Operations Leader

The URS Field Operations Leader, Jason Lach, will be responsible for implementing the field activities described in this work plan and detailed in the FOP.

URS Risk Assessment Team

Mr. Carl Crane of the URS Nashville, Tennessee office will serve as the ecological risk assessor (ERA). Ms. Dana McCue of URS Atlanta, Georgia will lead the human health risk assessment (HHRA).

URS FS Team

The FS team will be lead by Raymond Vaské, a remediation engineer in the URS Cincinnati, Ohio office. Mr. Vaske designed the expansion for the DPE system at the Site in 2003. Mr. John Priebe, P.E., of the Cincinnati, Ohio office will also be involved with the FS. Mr. Priebe is a Registered Professional Engineer in Kentucky and was involved with the RD/RA at the Site from 1992 through construction in 1997.

URS Data Management Team

URS will store and manage data using a DBMS and GIS systems that were developed for the Site. The database manager, Bob Boudra, will be responsible for maintaining the electronic records of all validated analytical data collected as a part of the RI/FS. Records and data will be maintained as required by of the Settlement Agreement.

8.0 REFERENCES

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TABLE 1

**CUMULATIVE BURN PIT SVE SYSTEM LIQUID AND VAPOR SAMPLES
FOCUSED RI/FS WORK PLAN**

BFGOODRICH SUPERFUND SITE - CALVERT CITY, KENTUCKY

Analyte	Sample Collection Date	Liquid Samples Method 8260 (mg/L)			Vapor Samples Method TO-14 (ppm)
		BP-1 to -13	BP-14 to -23	Total BP Wells	BP-1 to -23
1,2-Dichloroethane	3/19/2003	392	NS	2170	1,500
1,2-Dichloroethane	4/28/2003	233	877	NS	3,500
1,2-Dichloroethane	7/8/2003	NS	NS	NS	2,700
1,2-Dichloroethane	8/7/2003	NS	651	NS	2,400
1,2-Dichloroethane	9/1/2003	NS	NS	NS	2,200
1,2-Dichloroethane	9/19/2003	NS	NS	NS	1,900
1,2-Dichloroethane	11/14/2003	NS	1,190	1000	1,800
1,2-Dichloroethane	12/19/2003	NS	652	694	NS
2003 Average:		313	843	1,288	2,286
1,2-Dichloroethane	1/20/2004	NS	1,000	518	1,500
1,2-Dichloroethane	2/11/2004	NS	885	679	1,900
1,2-Dichloroethane	3/16/2004	NS	590	778	1,200
1,2-Dichloroethane	4/23/2004	NS	899	768	1,100
1,2-Dichloroethane	5/11/2004	NS	628	754	990
1,2-Dichloroethane	6/15/2004	NS	498	371	840
1,2-Dichloroethane	7/8/2004	NS	576	681	780
1,2-Dichloroethane	8/13/2004	NS	937	812	1,300
1,2-Dichloroethane	9/1/2004	NS	571	585	1,000
1,2-Dichloroethane	10/12/2004	NS	537	382	790
1,2-Dichloroethane	11/16/2004	NS	862	511	NS
1,2-Dichloroethane	12/3/2004	NS	NS	394	
2004 Average:			726	603	1,140
1,2-Dichloroethane	1/26/2005	NS	370	387	140-E
1,2-Dichloroethane	2/15/2005	NS	231	237	790
1,2-Dichloroethane	3/23/2005	NS	479	385	510
1,2-Dichloroethane	4/12/2005	NS	480	440	870
1,2-Dichloroethane	5/10/2005	NS	309	276	950
1,2-Dichloroethane	6/7/2005	NS	342	308	370
1,2-Dichloroethane	7/12/2005	NS	279	206	940
1,2-Dichloroethane	8/2/2005	NS	650	438	NS
1,2-Dichloroethane	8/23/2005	NS	NS	NS	1,500
1,2-Dichloroethane	9/6/2005	NS	330	270	840
1,2-Dichloroethane	10/12/2005	NS	495	443	NS
1,2-Dichloroethane	11/1/2005	NS	309	261	NS
1,2-Dichloroethane	12/12/2005	NS	162	195	1,200
2005 Average:				321	886

TABLE 1 (continued)

Analyte	Sample Collection Date	Liquid Samples Method 8260 (mg/L)			Vapor Samples Method TO-14 (ppm)
		BP-1 to -13	BP-14 to -23	Total BP Wells	BP-1 to -23
1,2-Dichloroethane	1/4/2006	NS	423	349	1200
1,2-Dichloroethane	2/13/2006	NS	182	178	1600
1,2-Dichloroethane	3/7/2006	NS	430	484	1200
1,2-Dichloroethane	4/4/2006	NS	378	472	2100
1,2-Dichloroethane	5/1/2006	NS	457	336	1000
1,2-Dichloroethane	6/6/2006	NS	613	492	2800
1,2-Dichloroethane	7/31/2006	NS	599	633	NS
1,2-Dichloroethane	8/30/2006	NS	520	454	160
1,2-Dichloroethane	9/13/2006	NS	368	317	89
1,2-Dichloroethane	10/2/2006	NS	376	396	NS
1,2-Dichloroethane	10/16/2006	NS	NS	NS	18
1,2-Dichloroethane	11/13/2006	NS	388	396	290
1,2-Dichloroethane	12/12/2006	NS	365	344	710
2006 Average:				404	1,015
1,2-Dichloroethane	1/4/2007				1,200
1,2-Dichloroethane	1/12/2007			349	
1,2-Dichloroethane	1/22/2007			237	
1,2-Dichloroethane	1/16/2007	NS			790
1,2-Dichloroethane	2/7/2007			179	
1,2-Dichloroethane	2/12/2007	NS		212	460
1,2-Dichloroethane	2/13/2007				1600
1,2-Dichloroethane	3/6/2007			484	
1,2-Dichloroethane	3/7/2007				1200
1,2-Dichloroethane	3/13/2007	NS		460	250
1,2-Dichloroethane	4/4/2007			179	2100
1,2-Dichloroethane	4/10/2007			472	
1,2-Dichloroethane	4/16/2007	NS		484	940
1,2-Dichloroethane	4/17/2007	NS	427	472	
1,2-Dichloroethane	5/1/2007			366	1000
1,2-Dichloroethane	5/15/2007			311	
1,2-Dichloroethane	6/6/2007			384	2800
1,2-Dichloroethane	6/12/2007	NS			950
1,2-Dichloroethane	6/14/2007			279	
1,2-Dichloroethane	6/26/2007			597	
1,2-Dichloroethane	7/6/2007			709	
1,2-Dichloroethane	7/10/2007	NS	597	464	
1,2-Dichloroethane	7/11/2007			810	
1,2-Dichloroethane	7/16/2007	NS			210
1,2-Dichloroethane	7/19/2007			480	
1,2-Dichloroethane	7/31/2007			535	
1,2-Dichloroethane	8/7/2007			467	

TABLE 1 (continued)

Analyte	Sample Collection Date	Liquid Samples Method 8260 (mg/L)			Vapor Samples Method TO-14 (ppm)
		BP-1 to -13	BP-14 to -23	Total BP Wells	BP-1 to -23
1,2-Dichloroethane	8/13/2007	NS		381	720
1,2-Dichloroethane	8/23/2007			442	4.4**
1,2-Dichloroethane	8/27/2007	82	262	177	
1,2-Dichloroethane	8/30/2007			444	160 **
1,2-Dichloroethane	9/6/2007			317	
1,2-Dichloroethane	9/13/2007				89 **
1,2-Dichloroethane	9/17/2007	NS		160	90
1,2-Dichloroethane	10/2/2007			396	
1,2-Dichloroethane	10/16/2007				18 **
1,2-Dichloroethane	11/13/2007				290
1,2-Dichloroethane	11/14/2007			219	
1,2-Dichloroethane	12/12/2007			344	710
2007 Average:				394	957

U = Below quantitation limit

NS = Not sampled

E = Estimated result. Sample concentration exceeds calibration range

TABLE 2
ENDANGERMENT ASSESSMENT SUMMARY
BFGOODRICH SITE
CALVERT CITY, KENTUCKY

EXPOSURE MEDIUM	TOTAL CARCINOGENIC RISK		HAZARD INDEX		CONCLUSION
	Most Probable	Worst Case	Most Probable	Worst Case	
Current Use:					
Drainage ditch- surface water	2.40E-07	2.20E-05	0	0	Within target risk range; no action required
sediment	2.00E-09	1.80E-06			Within target risk range; no action required; however remediation of PCB-contaminated sediments will be performed
Slough- surface water	0	0	0	0	No indicator chemicals detected; no action required
Sediment	0	0	0	0	No indicator chemicals detected; no action required
Tennessee River- surface water	0	0	0	0	No indicator chemicals detected; no action required
Sediment	1.06E-08	6.40E-06	0	0	Within target risk range; no action required
Surface soil	9.90E-07	2.20E-03	5.50E-07	6.30E-04	Worst case exceeds target risk range; remediation required
Subsurface soil	0	0	0	0	No human exposure to sub- surface soils
Future Use:					
Groundwater	0.8	1	3.2	5.8	Both cases exceed target risk range; remediation required

Endangerment Assessment: BFGoodrich/AIRCO Site, Calvert City, Kentucky. Report date March 14, 1988.

TABLE 3
RATIONALE FOR PROPOSED SOIL BORINGS
BFGOODRICH SUPERFUND SITE
CALVERT CITY, KENTUCKY

Proposed Soil Boring ID*	Rationale
SB-15	Burn Pit Characterization
SB-16	Burn Pit Characterization
SB-17	Pilot Area 1/Downgradient Landfill
SB-18	Burn Pit Characterization
SB-19	Pilot Area 2/ Comingling Characterization
SB-20	Delineation
SB-21	Burn Pit Characterization/Upgradient Landfill
SB-22	Burn Pit Characterization/Upgradient Landfill
SB-23	Comingling Characterization
SB-24	SWMU 3 Characterization
SB-25	SWMU 3 Characterization
SB-26	Downgradient Landfill Characterization
SB-27	SWMU 3 Characterization
SB-28	Delineation
SB-29	SWMU 3 Characterization
SB-30	Downgradient Landfill Characterization
SB-31	Downgradient Landfill Characterization
SB-32	Downgradient Landfill Characterization
SB-33	Delineation
SB-34	SWMU 3 Characterization
SB-35	Burn Pit Characterization/Upgradient Landfill
SB-36	Pilot Area 3: Screening Method Pilot Location
SB-37	Burn Pit Characterization
SB-38	SWMU 3 Characterization
SB-39	SWMU 3 Characterization
SB-40	Downgradient Landfill Characterization
SB-41	Burn Pit Characterization
SB-42	Delineation
SB-43	SWMU 3 Characterization
SB-44	Comingling Characterization
SB-45	Delineation
SB-46	SWMU 3 Characterization
SB-47	SWMU 3 Characterization
SB-48	Delineation

*Proposed boring locations are shown on Figure 7

TABLE 4
SUMMARY OF THE MAJOR DELIVERABLES AND SCHEDULE
FOCUSED REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS)
AND RISK ASSESSMENT

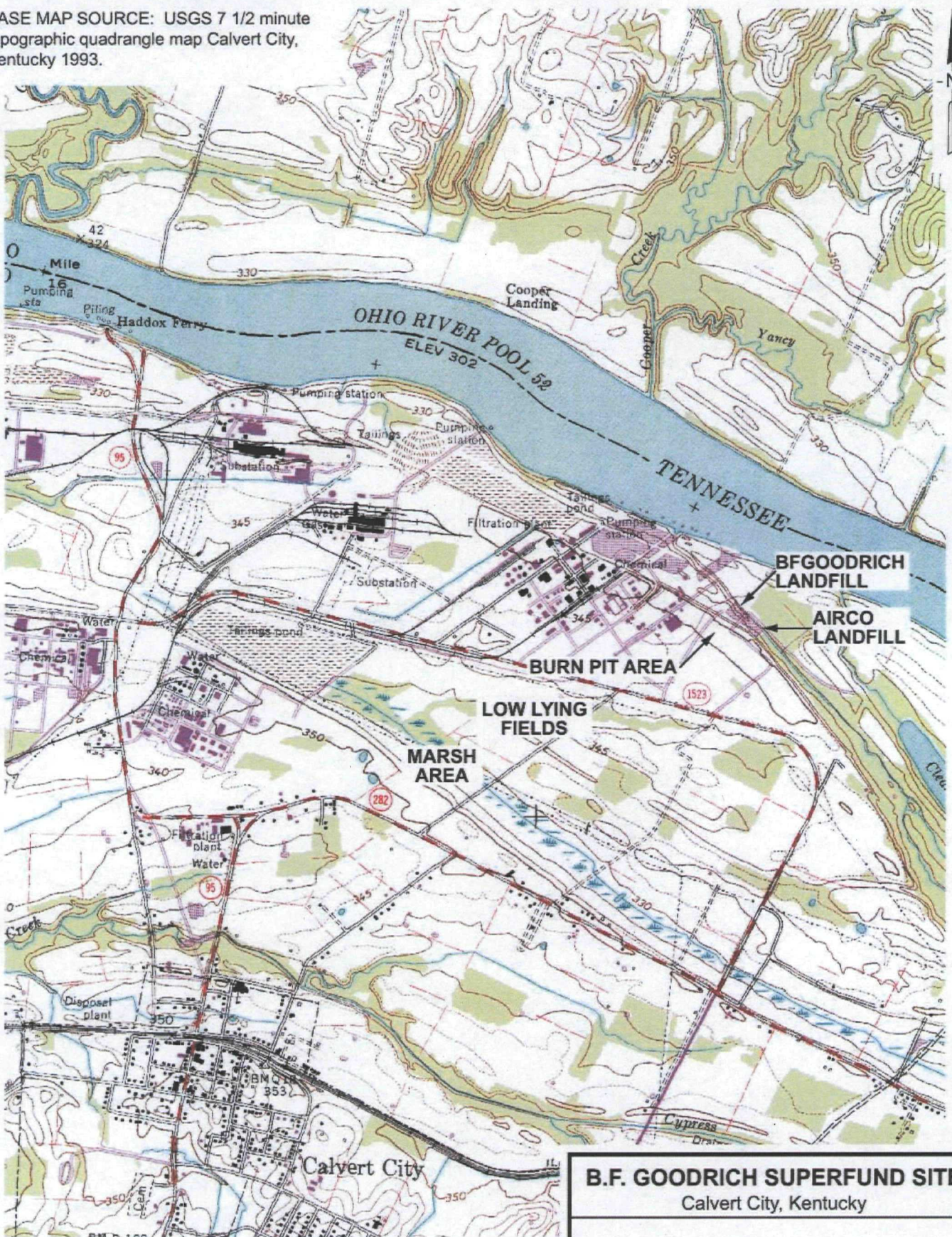
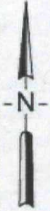
BFGOODRICH SUPERFUND SITE
CALVERT CITY, KENTUCKY

Task	Deliverable	Schedule		
		Days	Months	Date*
Task 1 – Scoping	▪ RI/FS Work Plan	0		July 21, 2008
	▪ Field Operations Plan (elements below)	30	1	August 21, 2008
	▪ Field Sampling and Analysis Plan			
	▪ Quality Assurance Project Plan			
	▪ Site Health and Safety Plan			
Task 3 – Site Characterization	▪ Preliminary Site Characterization Summary	360	12	July 21, 2009
	▪ Draft RI Report	450	15	October 21, 2009
	▪ Final RI Report	540	18	January 21, 2010
Task 4 – Treatability Studies	▪ Technical Memorandum Documenting Need for Treatability Studies (if necessary)	360	12	July 21, 2009
Task 5 – Focused Risk Assessment	▪ Technical Memorandum: Site-Specific Risk Assessment Determination	360	12	July 21, 2009
Task 6 – Development and Screening of Remedial Action (RA) Alternatives	▪ Technical Memorandum #1 Documenting Revised RA Objectives (if necessary)	360	12	July 21, 2009
	▪ Technical Memorandum #2 on Remedial Technologies, Alternatives, and Screening	390	13	August 21, 2009
Task 7 – Detailed Analysis of RA Alternatives	▪ Draft FS Report	480	16	November 13, 2009
	▪ Final FS Report	540	18	January 13, 2010

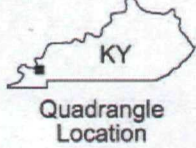
Notes: Task 2, Community Relations Plan, is conducted by EPA.

* Date assumes AOC is signed on July 21, 2008.

BASE MAP SOURCE: USGS 7 1/2 minute topographic quadrangle map Calvert City, Kentucky 1993.



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B.F. GOODRICH SUPERFUND SITE
Calvert City, Kentucky

FIGURE 1
SITE VICINITY MAP

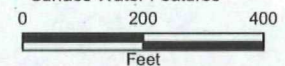
Job No. 14947717



X:\projects\small\projects\PolyOne\Polyone_14947717\draft_figures_052708\CERCLA_WP_draft_FIG_2_SITE_PLAN_11x17.mxd

LEGEND:

- ◆ RCRA PCAP Extraction Well
- Pumping Well Location (CERCLA)
- CERCLA SVE Wells at former Burn Pit (1-13 under cap, 14-23 northwest of cap)
- SVE Well Location
- ▶ CERCLA Monitoring Well
- ★ CERCLA Wells to be Transferred to RCRA Upon CERCLA Attainment
- Leachate Sump
- Soil Boring
- CERCLA Site Boundary
- Former Slough (dashed where inferred)
- Source: BF Goodrich DWG 6-8558 Ethylene Plant, 1963 (Appendix A)
- Former Road
- Cross Section Traverse
- Surface Water Features



BASE MAP SOURCE: Chase Environmental Group Inc.;
Former BFGoodrich - Industrial Complex,
Calvert City, Kentucky; April 06, 2000.

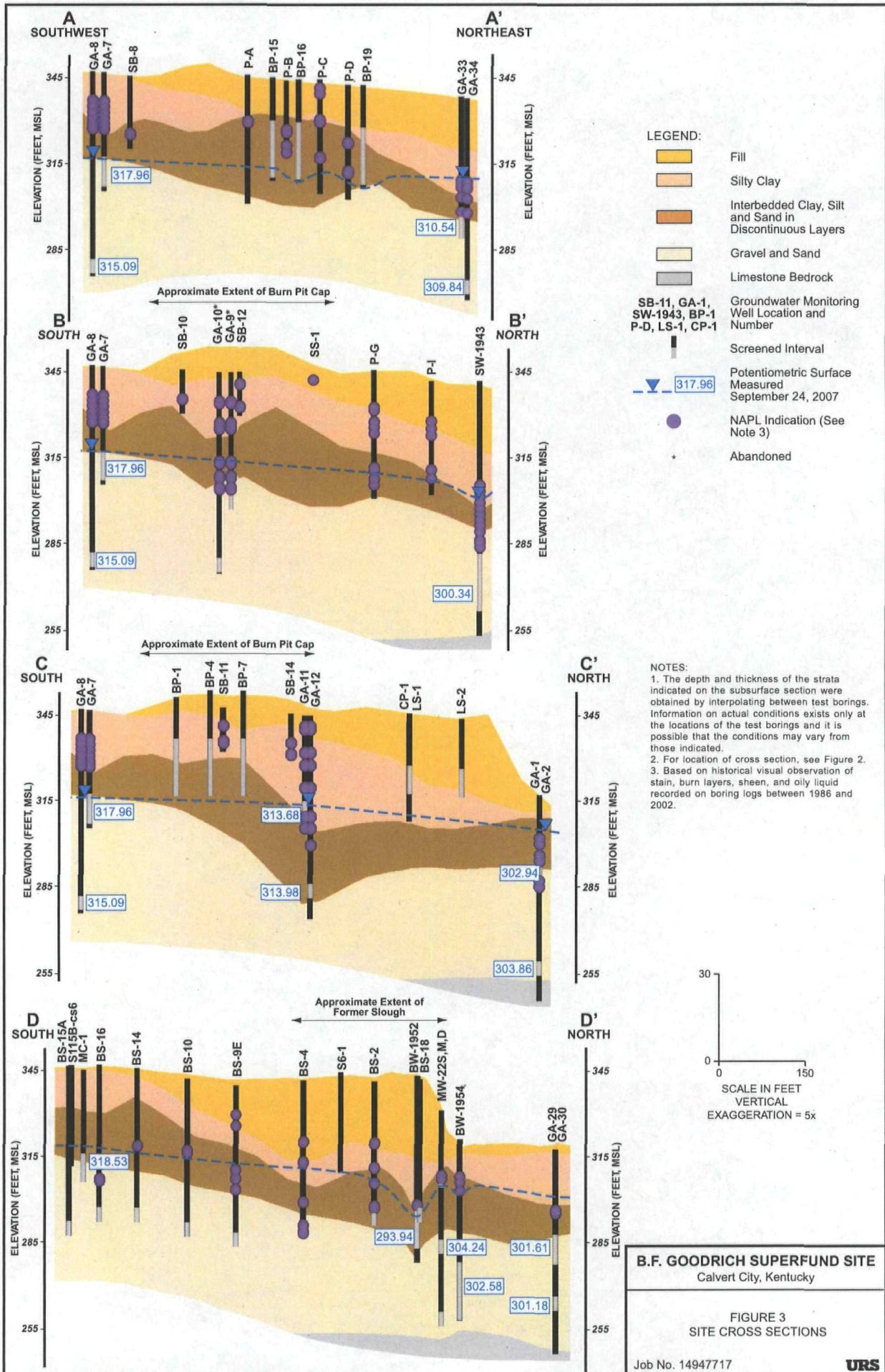


B.F. GOODRICH SUPERFUND SITE
CALVERT CITY, KENTUCKY

FIGURE 2
SITE PLAN

JOB NO. 14947717





X:\projects\149477\Drawings\149477.dwg FIG. 4 Composite GW ACL Extent and Shallow Intermediate and Deep NAPL Indicators

LEGEND:

- ⊕ RCRA PCAP Extraction Well
- Pumping Well Location (CERCLA)
- CERCLA SVE Wells at former Burn Pit (1-13 under cap, 14-23 northwest of cap)
- ⊕ CERCLA Monitoring Well
- ★ CERCLA Wells to be Transferred to RCRA Upon CERCLA Attainment
- Leachate Sump
- ⊕ Former Monitoring Well Location
- Boring Location

— Former Slough (dashed where inferred)
 Source: BF Goodrich DWG 6-8558
 Ethylene Plant, 1963 (Appendix A)

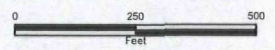
— Former Road

NAPL Indications
 (Based on historical visual observations of stain, burn layers, sheen, and oily liquid recorded on boring logs between 1986 and 2002)

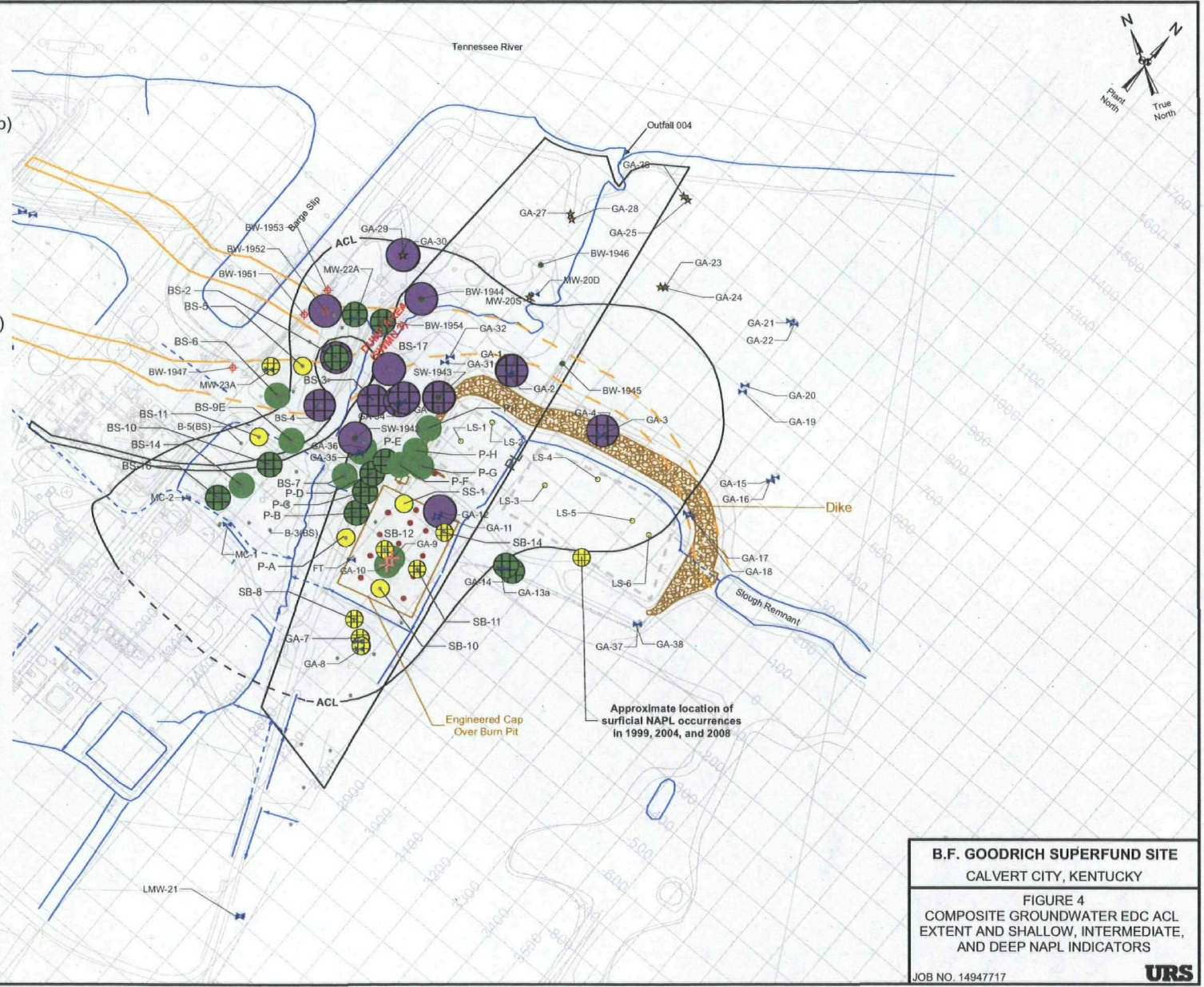
(279-300 ft msl)	● Liquid
	● Staining / Sheen
(301-320 ft msl)	● Liquid
	● Staining / Sheen
(321-surface ft msl)	● Liquid
	● Staining / Sheen

→ Surface Water Flow Path
 (underground where dashed)

—ACL— Maximum EDC ACL extent based on composite 8.5 mg/L isopleth from 2005 - 2007 groundwater data



BASE MAP SOURCE: Chase Environmental Group Inc.;
 Former BFGoodrich - Industrial Complex,
 Calvert City, Kentucky; April 06, 2000.

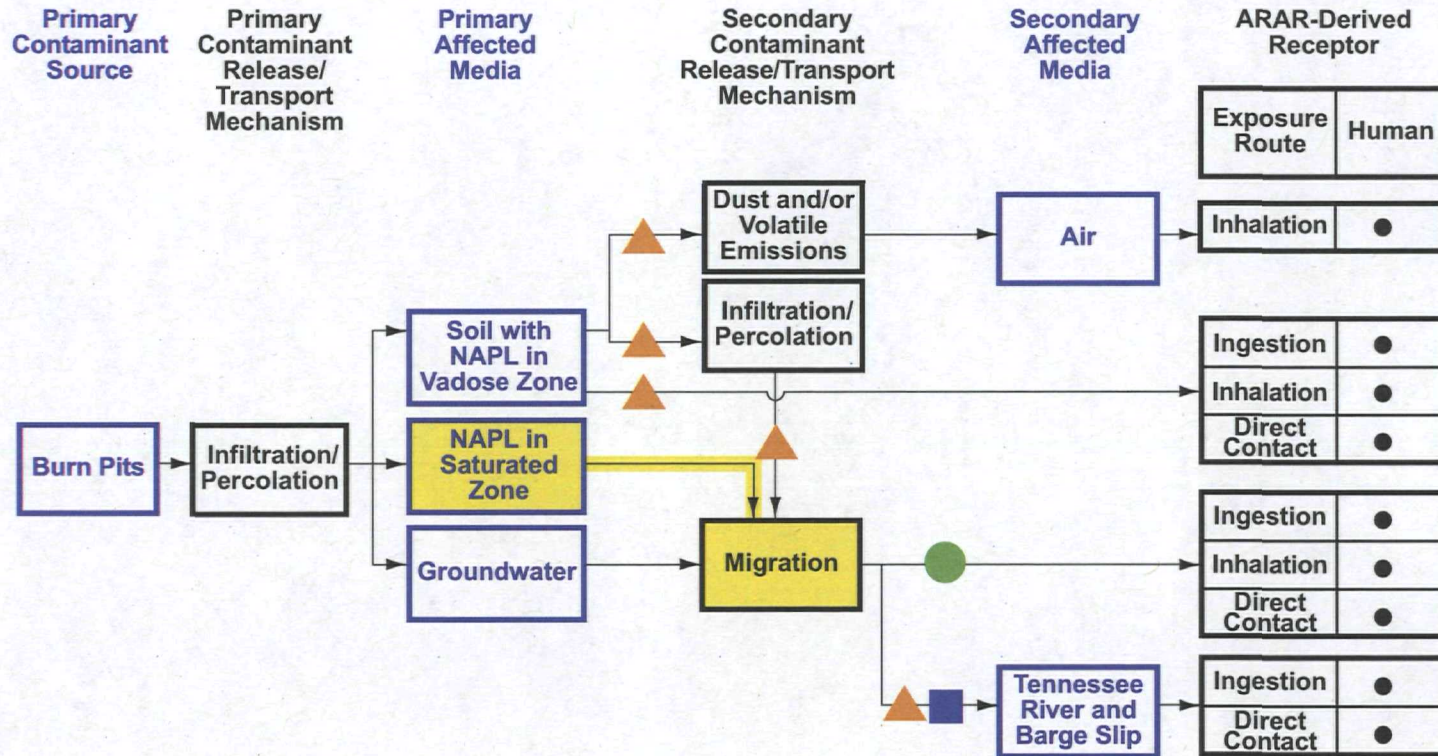


B.F. GOODRICH SUPERFUND SITE
 CALVERT CITY, KENTUCKY

FIGURE 4
 COMPOSITE GROUNDWATER EDC ACL
 EXTENT AND SHALLOW, INTERMEDIATE,
 AND DEEP NAPL INDICATORS

JOB NO. 14947717 **URS**

PATHWAY ANALYSIS



LEGEND:

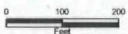
- Protected Receptor
- Pathway
- ▲ CERCLA Engineering Control (EC) In Place to Break Exposure Pathway
- CERCLA Institutional Control (IC) In Place to Break Exposure Pathway
- RCRA Engineering Control In Place to Break Exposure Pathway
- Focus of RI for NAPL Source Zone

B.F. GOODRICH SUPERFUND SITE
Calvert City, Kentucky

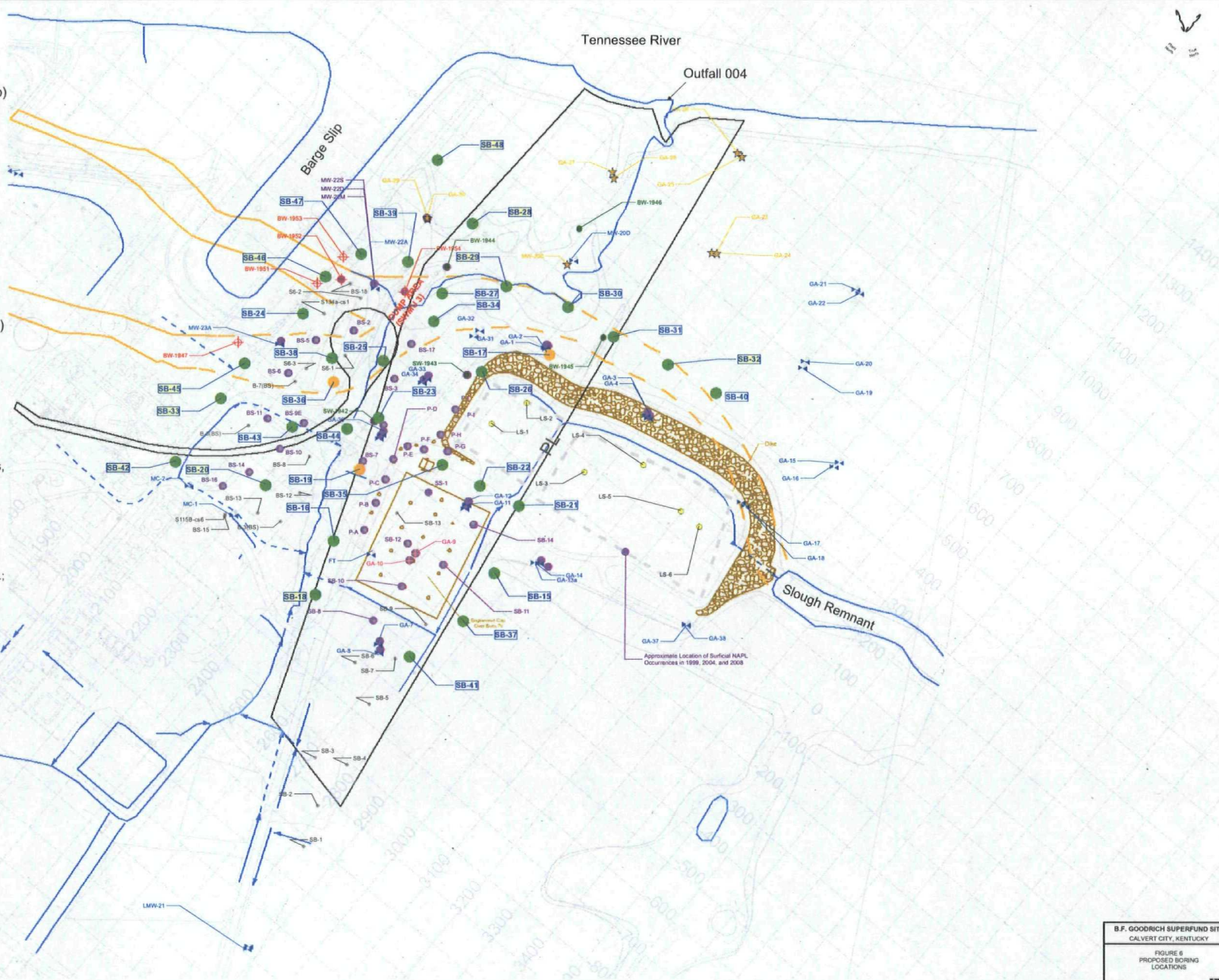
FIGURE 5
PATHWAY ANALYSIS

LEGEND:

- ▲ RCRA PCAP Extraction Well
- | Pumping Well Location (CERCLA)
- | CERCLA SVE Wells at former Burn Pit (1-13 under cap, 14-23 northwest of cap)
- * CERCLA Monitoring Well
- ▲ CERCLA Wells to be Transferred to RCRA Upon CERCLA Attainment
- (Leachate Sump
- G Former Monitoring Well Location
- Proposed NAPL Assessment Borings
- Proposed NAPL Assessment Borings Subject to Location Adjustments
- Proposed NAPL Assessment Boring / Screening Method Pilot Location
- Former Slough (dashed where inferred)
Source: BF Goodrich DWG 6-8558 Ethylene Plant, 1963 (Appendix A)
- Surface Water Flow Path (underground where dashed)
- Property Boundary
- | Boring Location
- | NAPL Indications based on historical visual observations of stain, burn layers, sheen, and oily liquid recorded on boring logs between 1986 and 2002
- Former Road

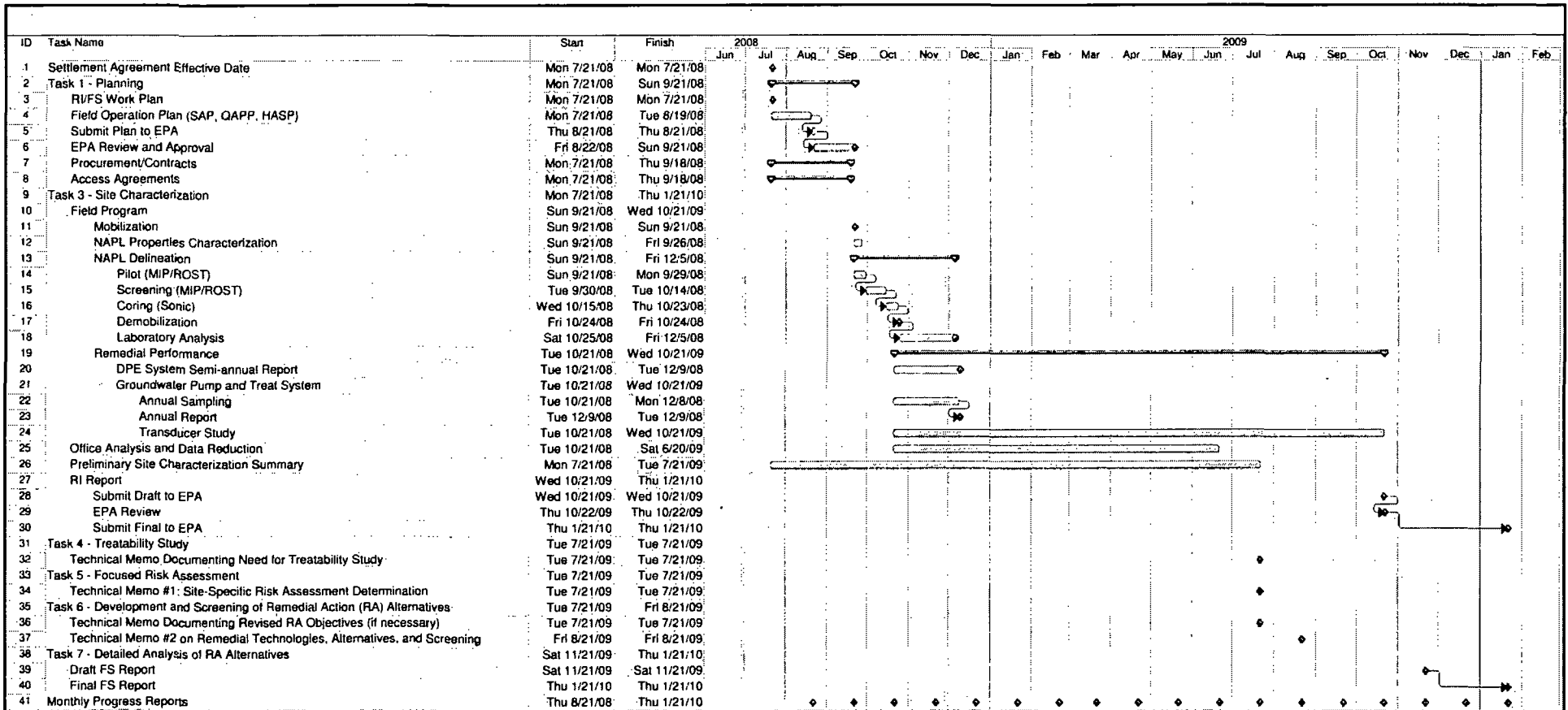


BASE MAP SOURCE: Chase Environmental Group Inc.;
Former BFGoodrich - Industrial Complex,
Calvert City, Kentucky; April 06, 2000.



B.F. GOODRICH SUPERFUND SITE
CALVERT CITY, KENTUCKY
FIGURE 6
PROPOSED BORING
LOCATIONS
UBS
12/16/14 14477.7

POLYONE - 14947717 30000 - CERCLA 2008 - CHECKED BY



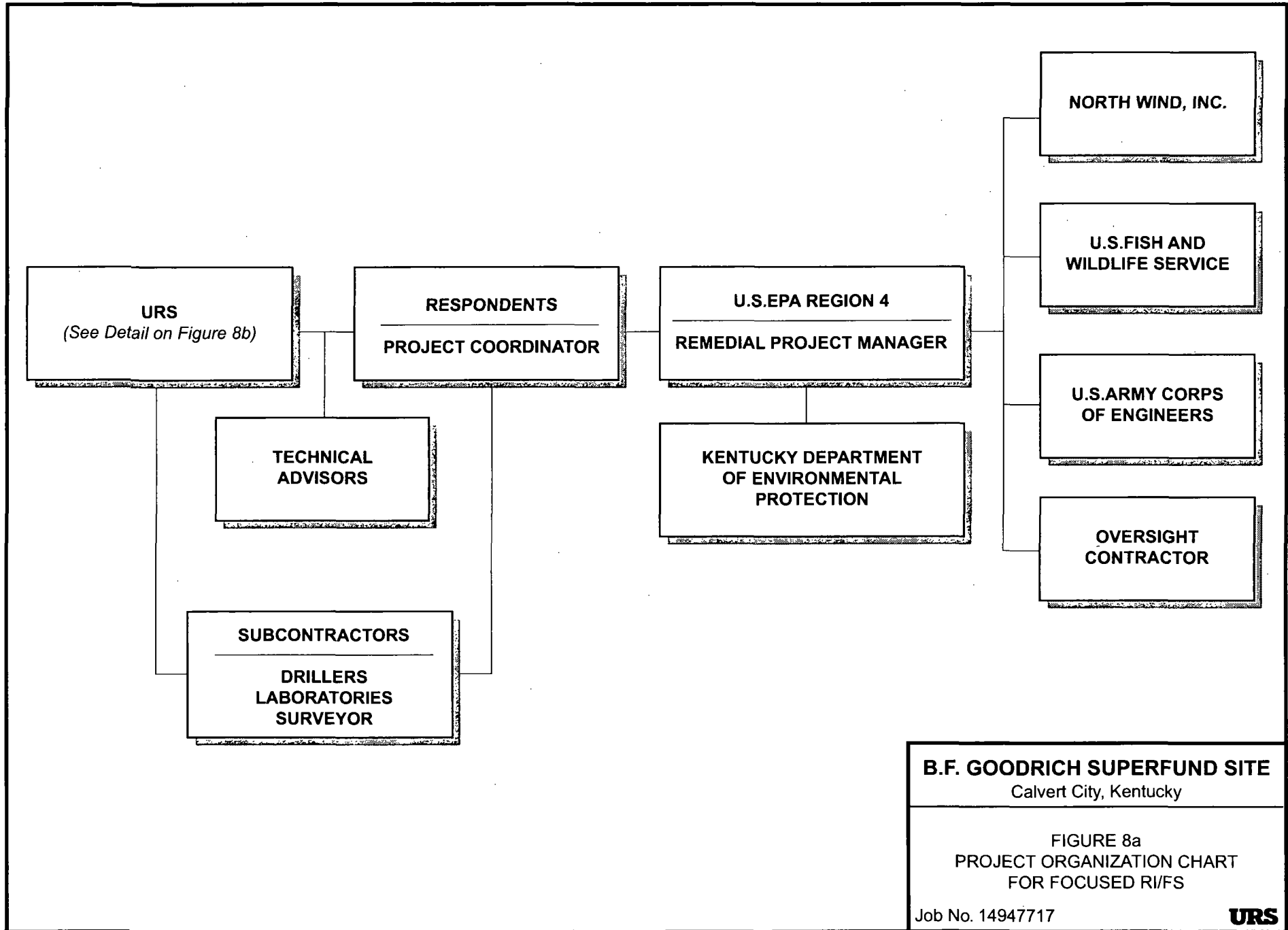
B.F. GOODRICH SUPERFUND SITE
Calvert City, Kentucky

FIGURE 7
PROJECT SCHEDULE

Project: PolyOne
Date: Wed 7/16/08

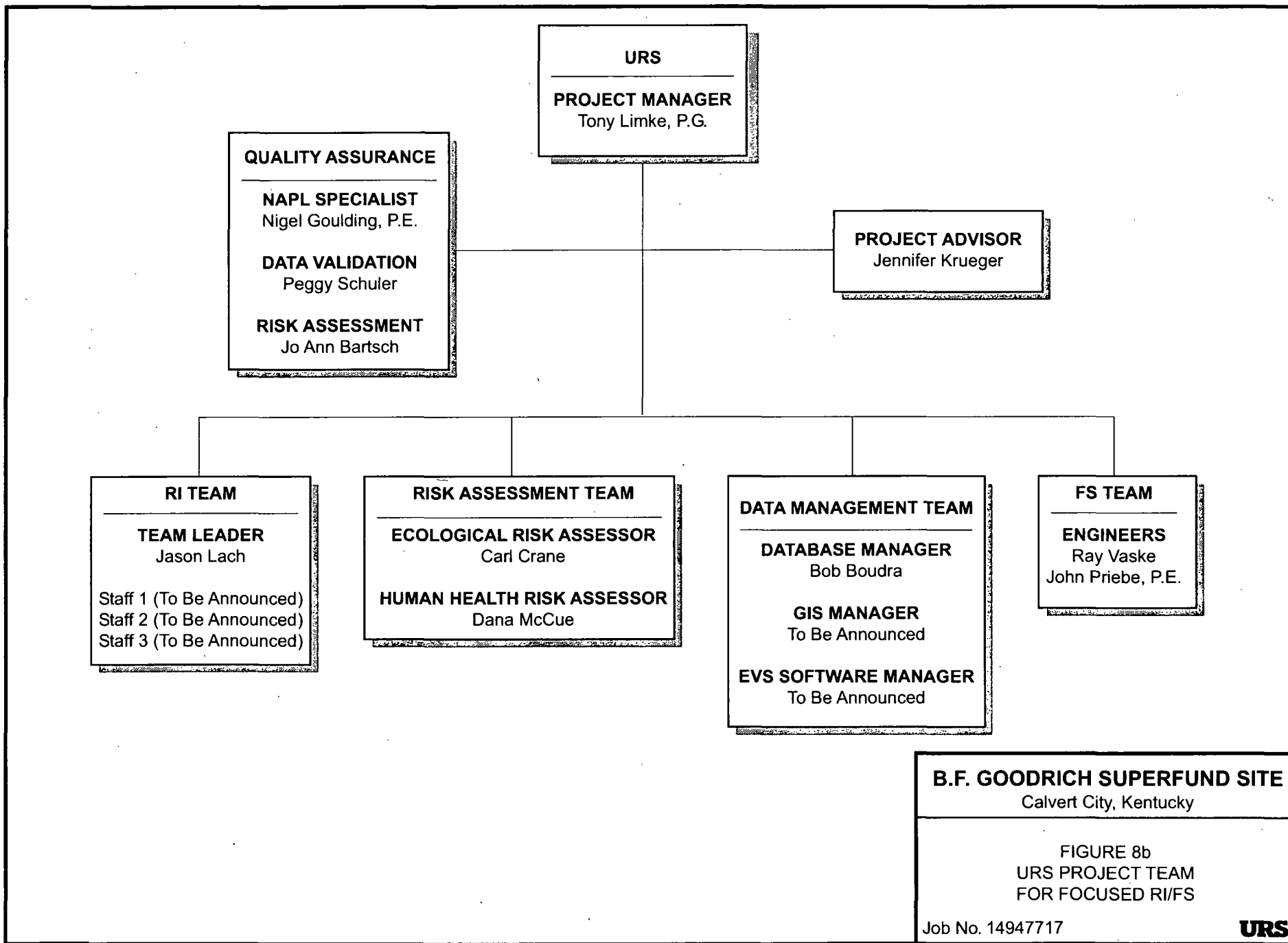
Task	Progress	Summary	External Tasks	Split
Split	Milestone	Project Summary	External MileTask	





B.F. GOODRICH SUPERFUND SITE
Calvert City, Kentucky

FIGURE 8a
PROJECT ORGANIZATION CHART
FOR FOCUSED RI/FS



APPENDIX A

FORMER SLOUGH INFORMATION

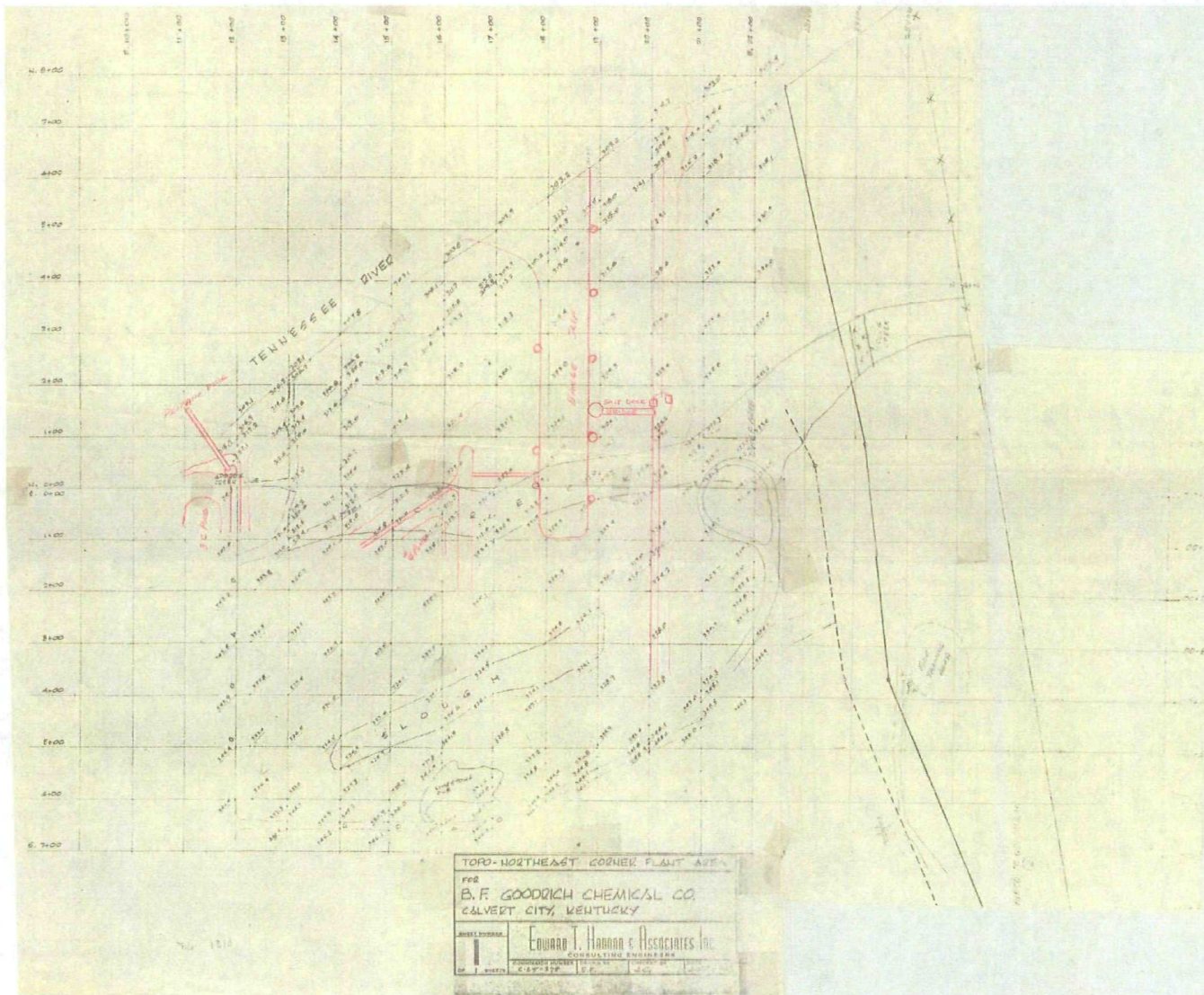
North Arrow



0 100 200
APPROXIMATE SCALE IN FEET

MAP SOURCE: B. F. Goodrich,
Drawing D-8538 Ethylene Plant 1903

BFGOODRICH SUPERFUND SITE
FIGURE A1
HISTORICAL SLOUGH DRAWING
1903
Map No. 14947717 **URS**



0 100 200
 APPROXIMATE SCALE IN FEET
 MAP SOURCE: Edward T. Hanna & Associates, Topd-Northeast Corner Plant Area, 1965.

BFGOODRICH SUPERFUND SITE

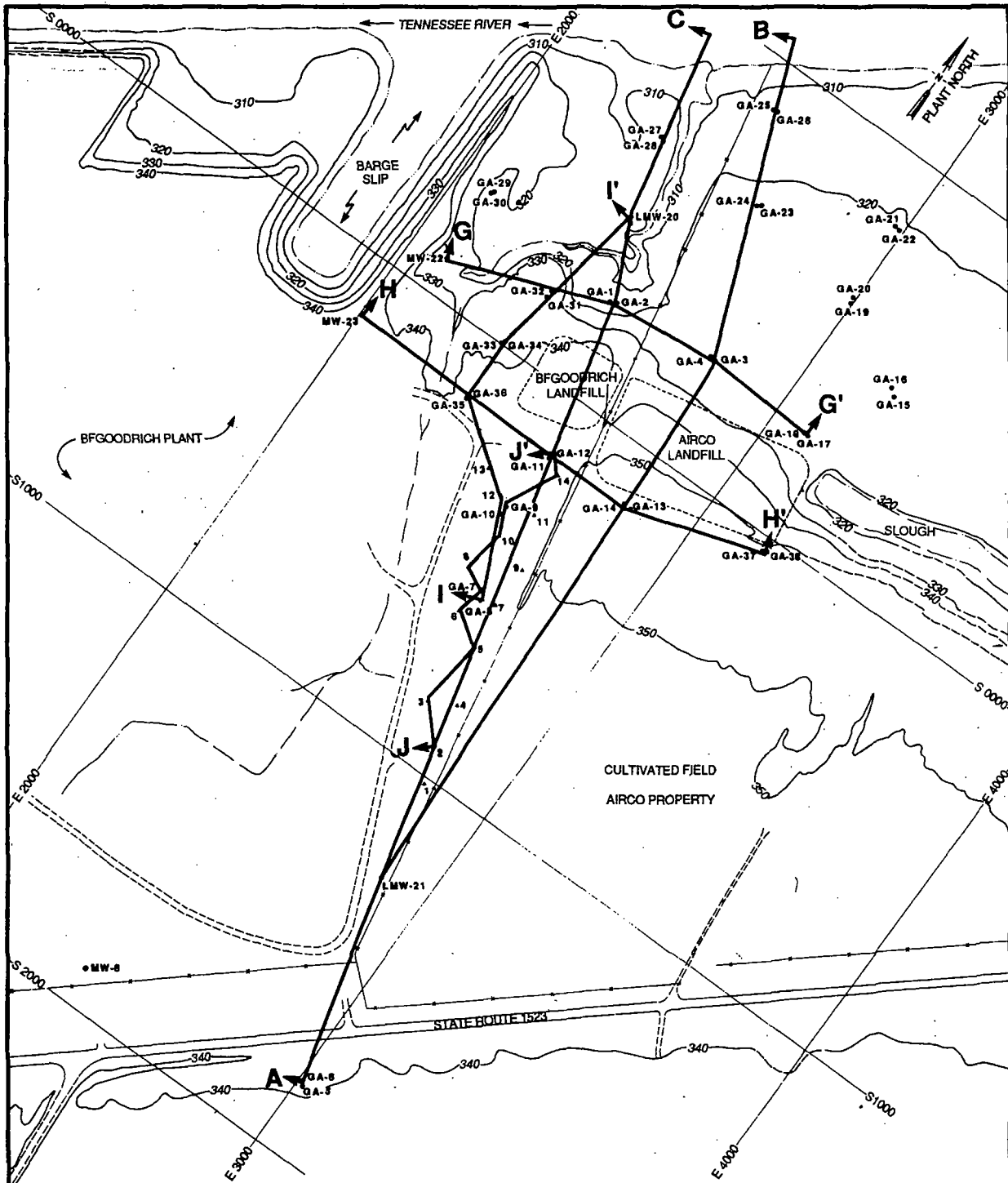
FIGURE A2
 HISTORICAL SITE PLAN DRAWING,
 1965

Job No. 14947717

URS

APPENDIX B

CONCEPTUAL SITE MODEL FROM 1988 RI/FS



LEGEND:

- GA-5 MONITOR WELL
- 1 SHALLOW BOREHOLE
- FENCE LINE
- DRAINAGE DITCH (Creek)
- A C LINE OF CROSS SECTION

CONTOUR INTERVAL = 10 FEET

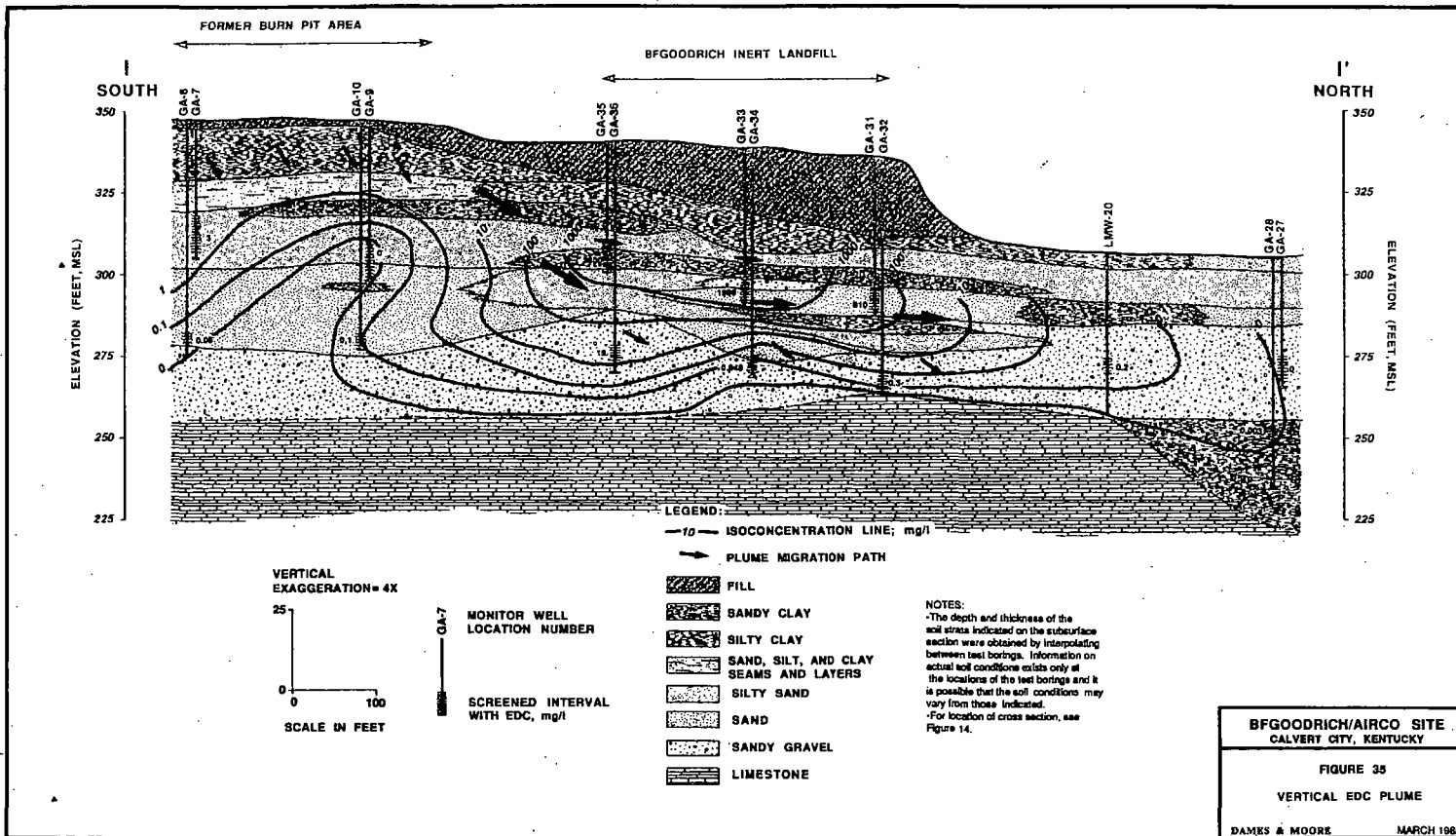
- NOTES:**
- Grid system shown based on BFGoodrich plant coordinate system.
 - Aerial mapping by Walker & Associates, Inc., January 7, 1986.
 - Ground control by Florence & Hutcheson, Inc.
 - Landfill boundaries approximate.



**BFGOODRICH/AIRCO SITE
CALVERT CITY, KENTUCKY**

**FIGURE 14
CROSS SECTION
LOCATION MAP**

DAMES & MOORE MARCH 1988



APPENDIX C

SOIL ANALYTICAL DATA FROM RI

**APPENDIX C
BARGE SLIP SOIL SAMPLE DATA
BFGOODRICH/AIRCO SUPERFUND SITE
CALVERT CITY, KENTUCKY**

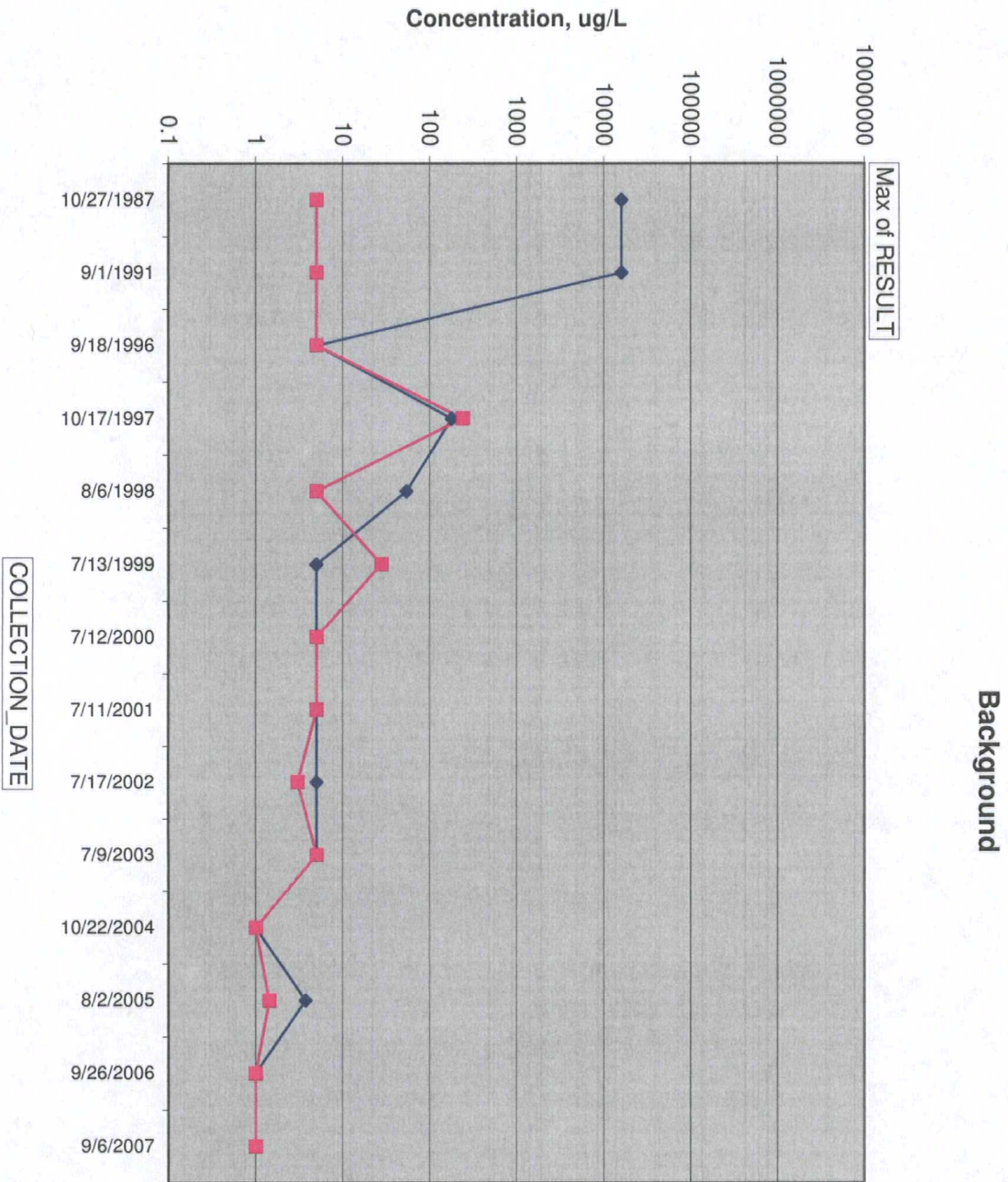
SAMPLE ID	Units	DATE	1,2-dichloroethane	benzene	vinyl chloride
B-7(9)	mg/kg	01-Apr-98	25	1 U	1 U
BS-1(25)	mg/kg	01-Apr-98	12	0.5 U	0.5 U
BS-1(33)	mg/kg	01-Apr-98	3500	111	10 U
BS-10(22)	mg/kg	01-Apr-98	3.2	0.049	0.005 U
BS-10(49)	mg/kg	01-Apr-98	0.08	0.005 U	0.005 U
BS-11(29)	mg/kg	01-Apr-98	2.9	0.5 U	0.5 U
BS-11(56)	mg/kg	01-Apr-98	0.01	0.005 U	0.005 U
BS-12(24)	mg/kg	01-Apr-98	11	0.5 U	0.5 U
BS-12(26)	mg/kg	01-Apr-98	7.4	0.5 U	0.5 U
BS-12(42)	mg/kg	01-Apr-98	6.7	0.5 U	0.5 U
BS-14(27)	mg/kg	01-Apr-98	1.9	0.5 U	0.5 U
BS-14(47)	mg/kg	01-Apr-98	4.9	0.5 U	0.5 U
BS-15A(29)	mg/kg	01-Apr-98	15	0.25 U	0.25 U
BS-15A(33)	mg/kg	01-Apr-98	76	0.25 U	0.25 U
BS-15A(56)	mg/kg	01-Apr-98	0.316	0.005 U	0.005 U
BS-16(30)	mg/kg	01-Apr-98	146	10 U	10 U
BS-16(38)	mg/kg	01-Apr-98	402	10 U	10 U
BS-16(51)	mg/kg	01-Apr-98	5.9	0.5 U	0.5 U
BS-2(25)	mg/kg	01-Apr-98	189	52	2.7
BS-2(43)	mg/kg	01-Apr-98	2092	103	10 U
BS-3(37)	mg/kg	01-Apr-98	6.6	0.6	0.5 U
BS-3(42)	mg/kg	01-Apr-98	166	10 U	10 U
BS-4(12)	mg/kg	01-Apr-98	8.6	0.5 U	0.5 U
BS-4(25)	mg/kg	01-Apr-98	29725	520	100 U
BS-4(38)	mg/kg	01-Apr-98	1122	5 U	5 U
BS-4(43)	mg/kg	01-Apr-98	5859	75	10 U
BS-5(27)	mg/kg	01-Apr-98	22	0.5 U	0.5 U
BS-6(30)	mg/kg	01-Apr-98	55		0.5 U
BS-7(22)	mg/kg	01-Apr-98	21	6.8	1 U
BS-7(38)	mg/kg	01-Apr-98	53	1 U	1 U
BS-7(43)	mg/kg	01-Apr-98	110	1.2	0.25 U
BS-7(51)	mg/kg	01-Apr-98	0.364	0.005 U	0.005 U
BS-8(18)	mg/kg	01-Apr-98	1 U	1 U	1 U
BS-8(4)	mg/kg	01-Apr-98	3.8	0.5 U	0.5 U
BS-8(46)	mg/kg	01-Apr-98	0.198	0.013	0.005 U
BS-9(21)	mg/kg	01-Apr-98	19	1 U	1 U
BS-9E(23)	mg/kg	01-Apr-98	306	1 U	1 U
BS-9E(25)	mg/kg	01-Apr-98	14	1 U	1 U
BS-9E(48)	mg/kg	01-Apr-98	1.1	0.005 U	0.005 U

APPENDIX C
BARGE SLIP SOIL SAMPLE DATA
BFGOODRICH/AIRCO SUPERFUND SITE
CALVERT CITY, KENTUCKY

SAMPLE_ID:	B-3(33)	B-5(31)	B-7(15)	B-7(25)	B-7(32)
Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DATE:	01-Apr-98	01-Apr-98	01-Apr-98	01-Apr-98	01-Apr-98
1,1,1-Trichloroethane	2 U	0.5 U	2 U	2 U	2 U
1,1,2,2-Tetrachloroethane	2 U	0.8	2 U	2 U	2 U
1,1,2-Trichloroethane	2 U	13.9	2 U	1.6	14
1,1-Dichloroethane	2 U	5.3	2 U	1.3	16
1,1-Dichloroethene	2 U	0.5 U	2 U	2 U	2 U
1,2-Dichlorobenzene	-	22.6	-	-	-
1,2-dichloroethane	37.5	96.6	12.5	189	668
1,2-Dichloropropane	2 U	0.5 U	2 U	2 U	2 U
2-Butanone	20 U	5 U	20 U	20 U	20 U
2-Chloroethyl vinyl ether	4 U	1 U	4 U	4 U	4 U
2-Hexanone	2 U	5 U	20 U	20 U	20 U
4-Methyl-2-pentanone	2 U	5 U	20 U	20 U	20 U
Acetone	20 U	5 U	20 U	20 U	20 U
benzene	2 U	2.8	2 U	1.7	4.9
Bromodichloromethane	2 U	0.5 U	2 U	2 U	2 U
Bromoform	2 U	0.5 U	2 U	2 U	2 U
Bromomethane	2 U	0.5 U	2 U	2 U	2 U
Carbon disulfide	20 U	5 U	20 U	20 U	20 U
Carbon tetrachloride	2 U	4.7	2 U	2 U	2 U
Chlorobenzene	2 U	15.2	2 U	3.9	11
Chloroethane	2 U	0.5 U	2 U	2 U	2 U
Chloroform	2 U	6.1	2 U	2 U	7
Chloromethane	2 U	0.5 U	2 U	2 U	2 U
cis-1,2-Dichloroethene	2 U	0.5 U	2 U	2 U	2 U
cis-1,3-Dichloropropene	2 U	0.5 U	2 U	2 U	2 U
Dibromochloromethane	2 U	0.5 U	2 U	2 U	2 U
Dichloromethane	2 U	0.5 U	2 U	2 U	2 U
Ethylbenzene	2 U	0.5 U	2 U	2 U	2 U
Styrene	2 U	0.5 U	2 U	2 U	2 U
Tetrachloroethene	2.6	11.6	2.7	1.7	3.6
Toluene	2 U	0.8	2 U	8.7	2 U
trans-1,2-Dichloroethene	2 U	0.5 U	2 U	2 U	2 U
trans-1,3-Dichloropropene	2 U	0.5 U	2 U	2 U	2 U
Trichloroethene	2 U	0.7	2 U	2 U	2 U
Trichlorofluoromethane	2 U	0.5 U	2 U	2 U	2 U
Vinyl acetate	20 U	5 U	20 U	20 U	20 U
vinyl chloride	2 U	0.5 U	2 U	2 U	2 U
Xylene (total)	6 U	1.5 U	6 U	6 U	6 U

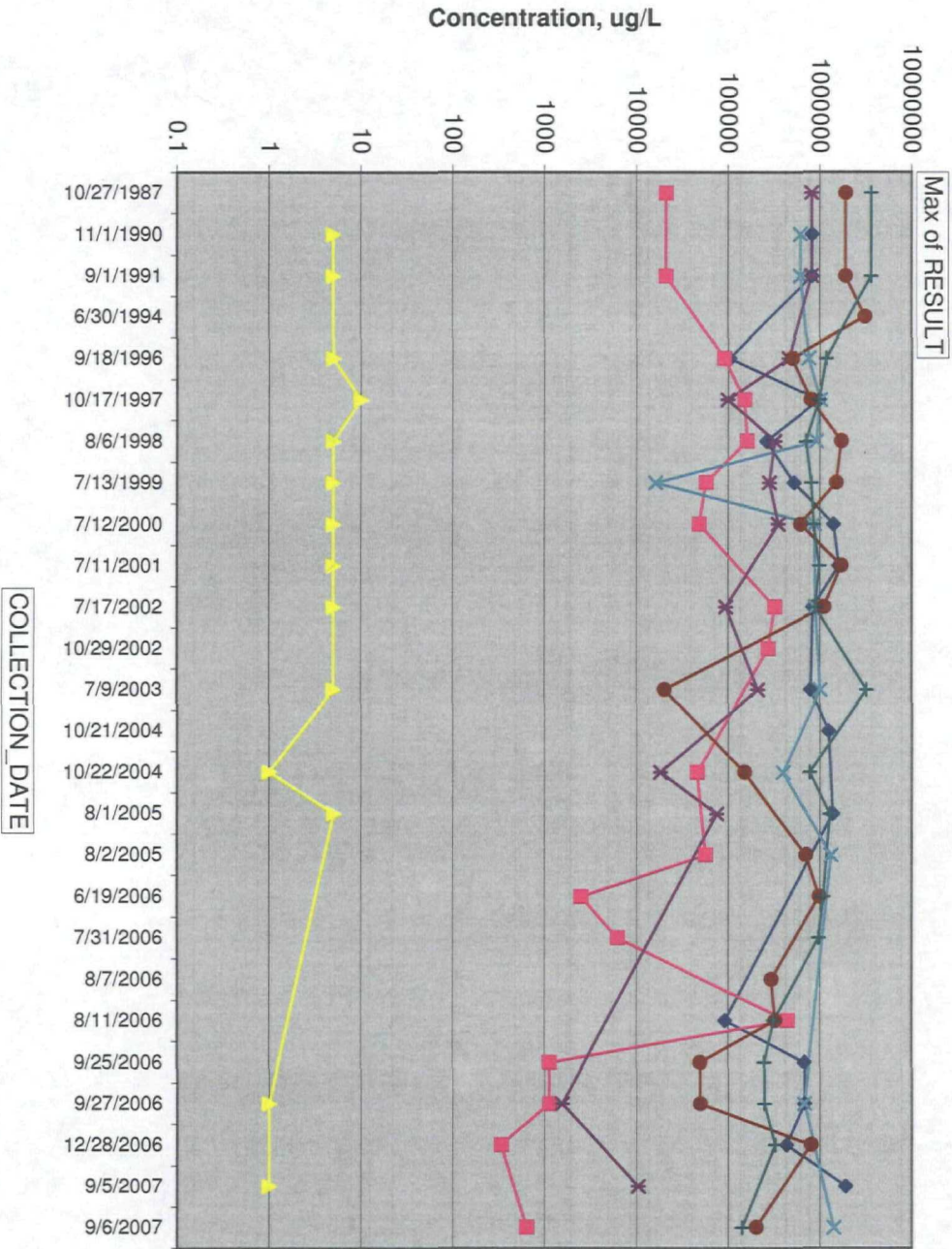
APPENDIX D

GROUNDWATER EDC TRENDS



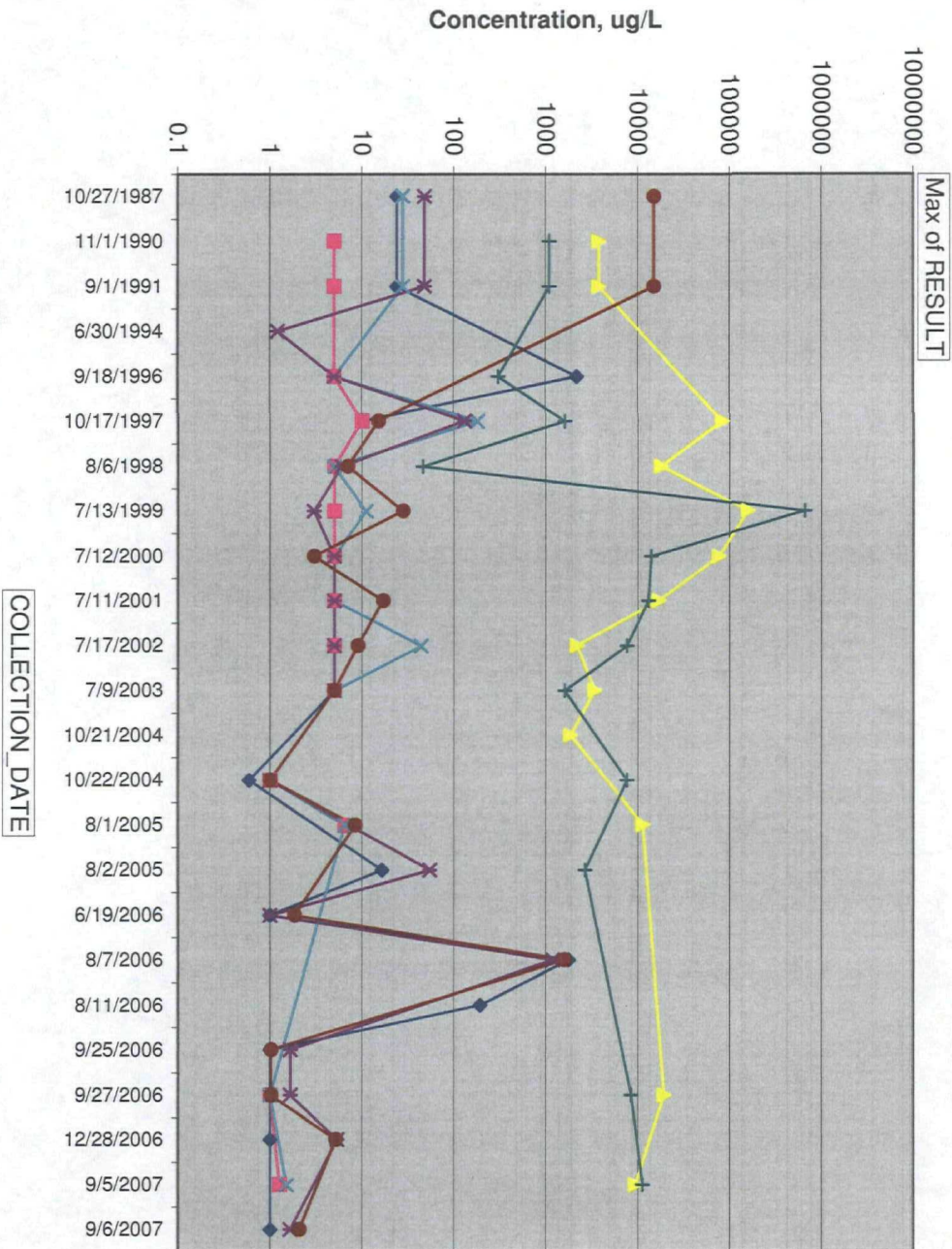
SAMPLE_ID
 ANALYTE
 GA-37 - 1,2-Dichloroethane
 GA-38 - 1,2-Dichloroethane

Effectiveness / Other (Shallow)

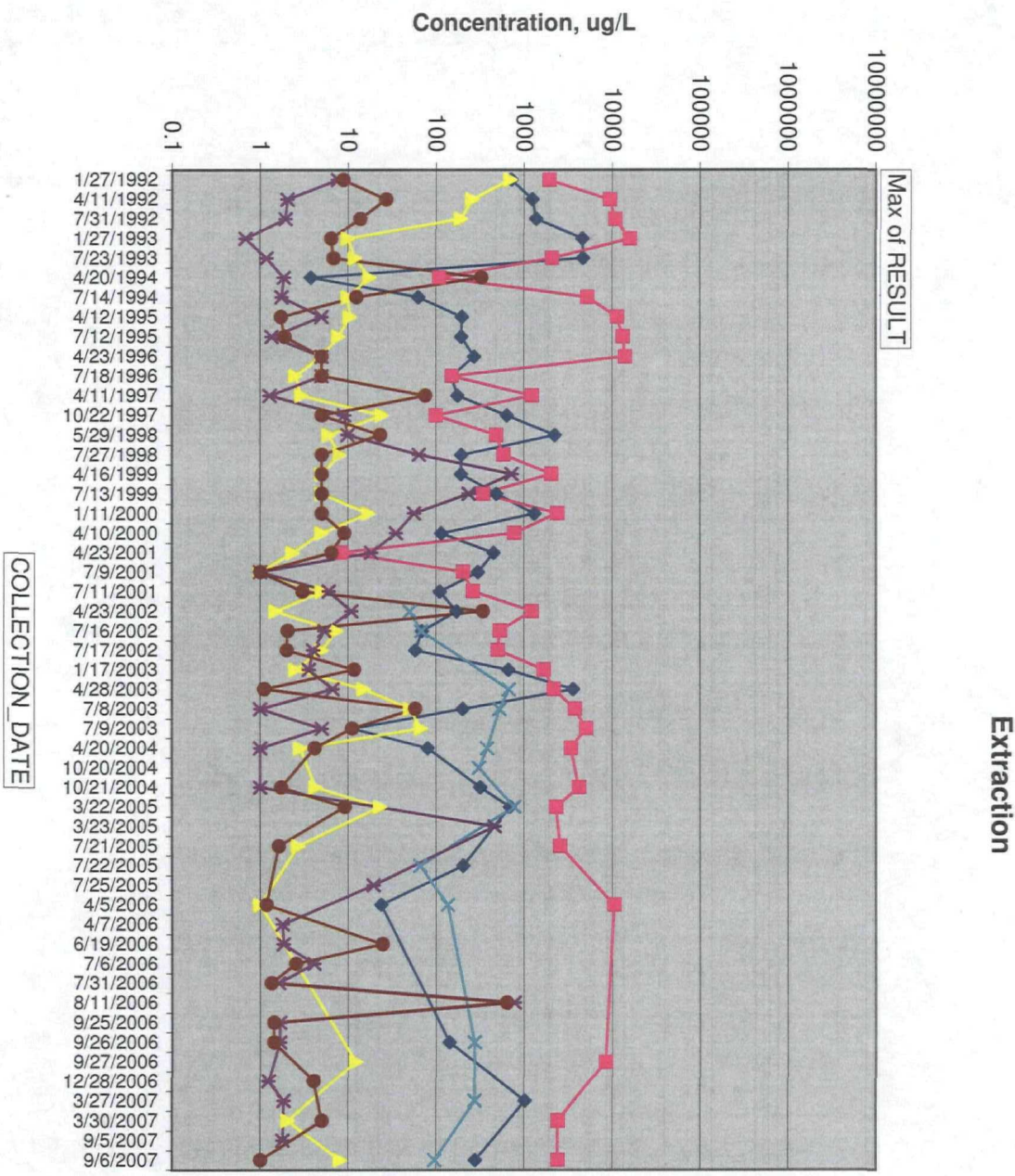


SAMPLE_ID	ANALYTE
GA-1	1,2-Dichloroethane
GA-11	1,2-Dichloroethane
GA-15	1,2-Dichloroethane
GA-3	1,2-Dichloroethane
GA-31	1,2-Dichloroethane
GA-33	1,2-Dichloroethane
GA-35	1,2-Dichloroethane

Effectiveness / Other (Deep)



SAMPLE_ID	ANALYTE
GA-12	1,2-Dichloroethane
GA-16	1,2-Dichloroethane
GA-2	1,2-Dichloroethane
GA-32	1,2-Dichloroethane
GA-34	1,2-Dichloroethane
GA-36	1,2-Dichloroethane
GA-4	1,2-Dichloroethane



SAMPLE_ID	ANALYTE
BW-1944	1,2-Dichloroethane
BW-1945	1,2-Dichloroethane
BW-1946	1,2-Dichloroethane
BW-1954	1,2-Dichloroethane
SW-1942	1,2-Dichloroethane
SW-1943	1,2-Dichloroethane