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KENNETH J. MURPHY, Clerk
DAYTON, OHIO

IN THE
UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF OHIO
WESTERN DIVISION

FILED
MONTGOMERY
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DAYTON, OHIO

STATE OF OHIO, ex rel.
BETTY D. MONTGOMERY
ATTORNEY GENERAL OF OHIO,

Plaintiff,

and

CHERYL HOPKINS, et al.,

Plaintiff-Intervenors,

v.

ELANO CORPORATION,

Defendant.

CASE NO.

C 8-96-238-

JUDGE WALTER HERBERT RICE

CONSENT ORDER

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INTRODUCTION

The State of Ohio, on the relation of its Attorney General, Betty D. Montgomery, has commenced an action at the request of the Director of the Ohio Environmental Protection Agency ("Ohio EPA"), against Elano Corporation [including the former Enlo, Inc., and Acme Screw Products Corporation which were merged with the Elano Corporation] (hereinafter "Defendant") alleging that the Defendant has violated Ohio Revised Code Chapters 3734., 3767., and 6111. and the Resource Conservation and Recovery Act as amended ("RCRA"), and that the Defendant is jointly and severally liable for the clean-up of the Elano Sites, as defined in Section I, paragraph E., and for the reimbursement to the State of Ohio for its response costs incurred by the State of Ohio under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended, 42 U.S.C. §9601, et seq. ("CERCLA") due to Defendant's actions and omissions at the Elano Sites defined infra.

Certain private residents (including Cheryl Hopkins, Joshua E. Kipp Boone, William Dean Hopkins, Robert Eugene Downey, Patricia Downey, Deborah Downey, Elsie Hill (deceased), Jack Horstman, Bonnie Horstman, Donald McWhirter (deceased), Patricia McWhirter, William F. O'Brien, Alta O'Brien, William K. Walker, Lois E. Walker, Elizabeth Walker, Mary Ann K. (Barbre) Atkinson, William Robert Barbre, Gertrude Wyatt and Willie Wyatt), named as Plaintiffs in Case No. C-3-88-0067 and Citizen Plaintiff-Intervenors (hereinafter "Citizen Plaintiffs") alleged similar causes of action against the Defendant under CERCLA, state common law, the Resource Conservation and Recovery Act (hereinafter "RCRA"), and O.R.C. §3734.101 in the case styled Hopkins et al. v. Elano Corp., et al., Case No. C-3-88-0067. The Citizen Plaintiffs' action against the Defendant has been resolved by separate agreement,

and the Citizen Plaintiffs shall intervene in this action.

The State of Ohio and the Citizen Plaintiffs recognize the significant contribution, assistance and information shared with each other in their investigation and pursuit of this Consent Order regarding releases and disposal of hazardous substances, hazardous wastes, industrial wastes, solid wastes and other wastes at the Elano Sites. The State and Citizen Plaintiffs assert that a privileged and confidential relationship exists between them regarding the enforcement of environmental law against the Defendant. The Defendant denies all liability and denies that any privileged or confidential relationship exists between the Plaintiffs.

In entering into this Consent Order, the mutual objectives of the State of Ohio, Citizen Plaintiffs, and Defendant are to: (1) complete a full remedial investigation in order to determine the nature and extent of contamination at the Elano Sites caused by the disposal of Hazardous Substances, Hazardous Waste, Industrial Waste, and/or Other Waste, and (2) develop, evaluate, design, implement, and monitor a program of appropriate remedies which are protective of human health and the environment and which shall be consistent with federal, state and local law.

This Consent Order is intended to require the completion of a Remedial Investigation/Feasibility Study (RI/FS), Interim Action, Remedial Design/Remedial Action (RD/RA), and Operation and Maintenance (O & M) of the Elano Sites as provided in this Consent Order.

Accordingly, Defendant and Plaintiffs have each agreed to this settlement, and the making and entry of this Consent Order, without trial, and without any admission of liability or fault by or through this Consent Order as to any allegation or matter arising out of any allegation of the Complaint.

NOW, THEREFORE, the Court having considered this matter, being duly advised, and solely for the purposes of settlement of certain claims in this action, and upon the consent of the parties hereto, it is ADJUDGED, ORDERED, and DECREED as follows:

I. DEFINITIONS

Whenever the following terms are used in this Consent Order or the Appendices attached hereto, the following definitions shall apply:

- A. "Contract" means collectively all of the following:
1. The "Contract for Completion of Phase II Remedial Investigation and Feasibility Studies in Greene County, Ohio, between Defendant and the Independent Contractor", also referred to as the "Phase II RI/FS Contract".
 2. The "Contract for Remedial Design between Defendant and the Independent Contractor", also referred to as the "RD Contract".
 3. The "Contract for Remedial Action between Defendant and its own contractor" which takes effect following Ohio EPA approval of the Remedial Design, also referred to as the "RA Contract".
 4. The "Contract for Operation and Maintenance between Defendant and its own contractor, if required" which takes effect following Ohio EPA approval of the Operation and Maintenance Plan, also referred to as the "O & M Contract."
 5. Any other contract necessary to complete full remediation at the Elano Sites.
- B. "Days" means calendar days where not otherwise described.
- C. "Decision Document for Remedial Action" means the document identifying the remedy selected by Ohio EPA.
- D. "Defendant" means Elano Corporation, and the former Enlo, Inc., and

Acme Screw Products Corporation which were merged with the Elano Corporation.

E. "Elano Sites" means at least the two plumes of contamination located at or which have migrated from the physical facilities owned and/or operated by Defendant in Greene County, Ohio, located at Elano Plant 1, 2455 Dayton-Xenia Road and Elano Plant 2, formerly operated by Enlo, Inc., Corporation, and Acme Screw Products, Inc., located at 530 South Orchard Lane, including the physical facilities owned and operated at these addresses and any soil, water, air and biota contaminated by any Hazardous Waste, Hazardous Substance, Industrial Waste and Other Wastes located at or which have migrated from these properties.

F. "Guarantor" means the General Electric Company.

G. "Hazardous Substance" shall mean (1) any substance designated pursuant to section 311(b)(2)(A) of the Federal Water Pollution Control Act, (2) any element, compound, mixture, solution or substance designated pursuant to section 102 of CERCLA; (3) any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act (but not including any waste the regulation of which under the Solid Waste Disposal Act has been suspended by act of Congress) and any hazardous constituents listed at 40 CFR 264 Appendix IX; (4) any toxic pollutant listed under section 307(a) of the Federal Water Pollution Control Act; (5) any hazardous air pollutant listed under section 112 of the Clean Air Act; (6) any imminently hazardous chemical substance or mixture with respect to which the administrator of U.S. EPA has taken action pursuant to section 7 of the Toxic Substances Control Act; (7) any waste or combination of wastes which the director of Ohio EPA has determined to be a hazardous waste pursuant to O.R.C. §3734.01(J); and (8) any Industrial Waste or Other Waste, including but not limited to

oil and gas; and (9) any Solid Waste.

H. "Hazardous Waste" means any substance as defined in O.R.C. §3734.01(J), and the regulations promulgated thereunder, O.A.C. Rule 3745-51-03, and any substance defined by 42 U.S.C. §§6903(5), 6921 and the regulations promulgated thereunder.

I. "Independent Contractor" means the contractor selected by Ohio EPA from a list of potential contractors provided by Defendant and after interviews of the potential contractors conducted jointly by the Parties and which contractor has been retained under contract with the Defendant to complete the work as set forth in this Consent Order for the RI/FS and RD, including successors to the Independent Contractor.

J. "Industrial Wastes" and "Other Wastes" shall be used as defined in O.R.C. §§6111.01(C) and (D) respectively.

K. "Interim Action" means any limited, accelerated response action taken to prevent, minimize, or mitigate a substantial threat to the public health or safety or to the environment resulting from a release or threat of release of hazardous waste, industrial wastes, and/or other wastes as defined under Ohio law. Interim Action does not include emergency action nor is it meant to be a substitute for the final remedy; provided however, nothing in this Consent Order shall preclude incorporation of any Interim Action into the final remedy, as appropriate. The action specified in the Administrative Order attached hereto as Appendix A, or any other Interim Action that may be required and approved by Ohio EPA pursuant to this order, are Interim Actions as described, herein.

L. "Interim Contractor" means the Contractor selected by the Defendant to

conduct the Interim Action.

M. "National Contingency Plan" or "NCP" shall be used as that term is used in §101(31) of CERCLA, 42 U.S.C. §9601 and 40 C.F.R. Part 300.

N. "O.A.C." means Ohio Administrative Code.

O. "Ohio EPA" means the Ohio Environmental Protection Agency.

P. "Operation and Maintenance" means those activities which shall be conducted to maintain and operate the constructed remedial action(s).

Q. "Oversight Costs" means all costs incurred by the State, subject to the provisions set forth in Section X., FISCAL RESPONSIBILITIES, Paragraphs B. 1 through 6, in overseeing the work required by this Consent Order. Such costs include and are not limited to costs incurred by the State or contractor(s) hired by Ohio EPA in monitoring the activities performed by the Defendant, and/or their contractors and/or independent contractors pursuant to this Consent Order, or in implementing any requirement of this Consent Order, including attorneys fees, as long as such activities or requirements, as approved by Ohio EPA, are not inconsistent with the NCP.

R. "Parties" means collectively the State of Ohio, Citizen Plaintiffs, and Defendant.

S. "Plaintiffs" means collectively the State of Ohio on the relation of its Attorney General who brought this action upon the written request of the Director of the Ohio EPA, and/or the Citizen Plaintiffs whose names are stated in the Introduction unless otherwise indicated.

T. "Primary Documents" means those documents which represent the final documentation of data and reflect decisions on how to proceed with the project. All work plans submitted in response to the requirements of this Consent Order shall be

considered primary documents. Primary documents are subject to revision based upon review and comment by Ohio EPA. An approval letter from Ohio EPA will signify completion of a primary document.

U. "Remedial Investigation/Feasibility Study" (RI/FS) shall, for the purposes of this Consent Order, be used as defined in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Part 300).

V. "Remedial Design/Remedial Action" (RD/RA) shall, for the purposes of this Consent Order, be used as defined in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Part 300).

W. "Response Costs" means any costs incurred by the State pursuant to 42 U.S.C. §9601, et seq., which are not inconsistent with the NCP in connection with the Elano Sites. For purposes of this Consent Order, "Response Costs" does not include "Oversight Costs."

X. "Secondary Documents" means those documents which represent an interim step in the decision making process, or are used for information only and may not reflect decisions. Secondary documents are intended to provide a tracking mechanism to assist in monitoring the progress of the project during its execution. Secondary documents are always incorporated into primary documents and are not revised and resubmitted based upon review and comment. Comments prepared during review of secondary documents will be addressed as the secondary document is incorporated into the corresponding primary documents.

Y. "Shall" when used to require an action by a Party to this Consent Order means the same as "ordered and enjoined."

Z. "Solid Waste" shall have the meaning provided in 42 U.S.C. §6901(27),

and any regulations promulgated thereunder and in O.R.C. §3734.01(E) and the regulations promulgated thereunder.

II. JURISDICTION AND VENUE

A. This Court has jurisdiction over the subject matter of this action. The Complaint states a claim upon which relief can be granted. This Court has jurisdiction over the parties hereto. Venue is proper in this Court.

B. From the entry of this Consent Order until one year after the Defendant has completed all remedial action, operation and maintenance, and ensuing responsibilities as required by this Consent Order or otherwise established by law, the Court shall retain jurisdiction of this suit.

III. PARTIES BOUND

A. This Consent Order applies to and is binding upon the undersigned Parties, their assigns, and successors in interest, and to the extent provided by Rule 65 (D) of the Federal Rules of Civil Procedure, their officers, agents, employees, and those acting in concert, privity or participation with them who receive actual notice of this Consent Order, whether by personal service or otherwise. Unless agreed upon by Ohio EPA, no change in ownership or corporate status of Defendant shall alter Defendant's responsibilities under this Consent Order. Defendant shall provide a copy of this Consent Order to any subsequent owner(s) or successor(s) before ownership rights are transferred.

B. Defendant shall require all contractors (except for the Independent Contractor), subcontractors, and consultants, engaged to perform work under this Consent Order, to sign an acknowledgment that they have read this Consent Order and understand that the work they are doing is necessary for Defendant to comply with

this Consent Order. Notwithstanding the terms of any contract, Defendant shall be responsible for ensuring that all employees, agents, directors, officers, and all contractors (except for the Independent Contractor), firms, and other persons acting for them comply with the terms of this Consent Order, as such terms apply to them.

C. General Electric acknowledges that it is bound, as Guarantor pursuant to Appendix E to this Consent Order, by all terms and conditions of this Consent Order that Defendant is unable to perform, including but not limited to conducting any work which is not performed by Defendant and paying any penalties or costs not paid by Defendant and that it is bound to comply with the prohibitions on communications with the Independent Contractor as set forth in Section XI. Further, General Electric acknowledges that this Court has jurisdiction to enforce the terms and conditions of the Consent Order against General Electric its assigns, and successors in interest.

IV. DISCLAIMER OF LIABILITY

This Consent Order shall not constitute an admission or adjudication with respect to any allegation of the Complaint, or any admission of any wrongdoing or misconduct or liability on part of Defendant or Guarantor or any director, officer, employee, contractor or person affiliated with Defendant or Guarantor.

V. DISPUTE RESOLUTION

A. The Parties shall use their best efforts to resolve in good faith any dispute or difference of opinion concerning performance of their respective obligations. Except as otherwise provided in this Consent Order, the Parties agree that at such time as it becomes apparent to any Party that a dispute or difference of opinion has developed, the Party desirous of initiating dialogue shall so notify the other affected Parties in writing within seven (7) days of the dispute arising. Notwithstanding the foregoing

sentence, disputes of secondary documents shall be deemed ripe for resolution at such time of Ohio EPA's approval of a primary document which incorporates the secondary document. The written notice shall identify the specific issues concerning the dispute and state the disputing Party's position. All responding parties shall address issues so identified in writing within 14 days of receipt of the letter of notification. Thereafter, the Parties shall meet within 10 days and attempt in good faith to resolve their differences. If these informal efforts fail, Ohio EPA shall provide the other Parties with its written decision on the dispute and then any Party may apply to the Court for resolution of the controversy.

B. Except as set forth in paragraph C, below, the Court shall affirm the Ohio EPA's action unless the disputing party demonstrates to the Court by a preponderance of the evidence that the Ohio EPA's decision in the disputed matter is "unreasonable or unlawful" as that phrase is used in O.R.C. Section 3745.05, as interpreted under Ohio law.

C. The Parties do not agree whether the "unlawful or unreasonable" standard should apply to the resolution of a dispute regarding Ohio EPA's selection of the remedy. Therefore, in the event a dispute regarding Ohio EPA's selection of the remedy memorialized in the Decision Document for Remedial Action is submitted to the Court, the Court shall decide the appropriate standard of review for a challenge to Ohio EPA's selection of the remedy and the Party bearing the burden of proof. The Parties agree to seek an expedited briefing schedule not to exceed thirty days in which to file briefs regarding the appropriate standard of review and burden of proof for the Court's review of a dispute regarding the Decision Document for Remedial Action. The Parties shall seek such an expedited briefing and hearing schedule from

this Court after the dispute is submitted to the Court.

D. Except as identified below, the pendency of dispute resolution set forth in this Section shall not affect the time period for completion of work to be performed under this Consent Order. The pendency of dispute resolution will toll the time period for completion of work under this Consent Order in the following circumstances:

1. Dispute of Ohio EPA's selection of the remedy memorialized in the Decision Document for Remedial Action; or
2. A dispute concerning the Ohio EPA requirements for Remedial Design provided that the disputed aspects of the Remedial Design will result in a cost differential of at least Two Hundred and Fifty Thousand Dollars (\$250,000).

Ohio EPA may extend the time period for completion of other work to be performed under this Consent Order as appropriate under the circumstances. Such agreement shall not be unreasonably withheld by Ohio EPA. Elements of work not affected by the dispute shall be completed in accordance with the schedules contained in the SOWs and approved workplans.

VI. MEDIATION

A. The provisions of this Section recognize that the Parties, without admitting any fact, responsibility, fault or liability in connection with the Elano Sites, desire to freely discuss, through non-binding, confidential Mediation ("Mediation") and without prejudice, any issues related to the alternatives to be included in the Alternative Arrays Document (as set forth in Section 9.5.2 of the RI/FS Statement of Work attached to the Consent Order as Appendix B) including but not limited to a determination of which alternatives should be included for detailed analysis by the Independent Contractor.

B. Nature of the Mediation. The Parties agree to be bound by the provisions

of this Section and to cooperate with one another and their representatives to effectuate the purposes of the Mediation. This Mediation is for the exclusive benefit of the Parties to effectuate the purposes stated herein and shall not be deemed to give or imply any legal or equitable right, interest, remedy, benefit or claim to any other entity or person. The Mediation shall not be binding and shall not impede Ohio EPA's authority to approve the Feasibility Study Report or to select a remedy as set forth in the Decision Document for Remedial Action. The Parties may modify the procedures of this Section by unanimous written agreement.

C. Purposes of the Mediation. The purposes of the Mediation are as follows:

1. to provide a formal, voluntary and non-binding mechanism involving the services of an independent third-party neutral person to expedite free discussion of the issues set forth herein;
2. to freely discuss, without prejudice, any issues related to the alternatives to be included in the Alternatives Array Document (as set forth in Section 9.5.2 of the RI/FS Statement of Work attached to the Consent Order as Appendix B), including but not limited to a determination of which alternatives should be included for detailed analysis by the Independent Contractor; and
3. to freely exchange ideas relative to the draft alternatives array document prepared by the Independent Contractor including but not limited to the identification and evaluation of technologies and process options, their assembly into alternatives, and the initial screening of alternatives.

D. Mediator. The Mediator shall be an independent, and impartial individual, experienced in mediation techniques, who shall perform the functions stated as follows in this Section and incidental actions necessary for carrying out these

functions:

1. Working with the Parties to establish reasonable procedures necessary to carry out the purposes of this Section, including successfully meeting established deadlines.
2. Gathering and/or disseminating information from the Parties as needed to clarify issues raised during the process of mediation.
3. Meeting with any or all of the Parties or their counsel, or their experts in joint or individual meetings as he or she deems appropriate in order to further mutual understanding of the issues.
4. Issuing, at his or her discretion, confidential opinions and evaluations to any and all of the Parties as he or she deems appropriate in accordance with the procedures established by the Parties and the Mediator pursuant to paragraph 3 (a) above.
5. Facilitating discussions among the Parties in a manner which encourages open and productive sharing of ideas, and taking appropriate measures to discourage counterproductive behaviors such as positioning or posturing.
6. Preparing written reports relative to the Mediation, upon mutual request of the Parties, including meeting agendas and meeting content summaries.

The Mediator may retain an assistant as required to facilitate the Mediation.

E. Conflict of Interest. The Parties and the candidates for Mediator shall immediately disclose to each other any circumstances which may cause justifiable doubt as to the independence or impartiality of any individual or firm under consideration. Following the selection, the Parties and the Mediator shall have a continuing duty to immediately disclose to each other any circumstances which may cause justifiable doubt as to the independence or impartiality of the selected Mediator. These same conflict of interest rules shall apply to any assistant retained by the

Mediator for this Mediation.

F. Materials, Documents and Facts Provided to Mediator. The Parties shall work with the Mediator to agree upon the form, type and timing of materials, documents and facts to be submitted to the Mediator by the Parties and/or developed under the supervision of the Mediator. The issue of what materials may be submitted by the Mediator to the other Parties and what materials may be exchanged among the Parties is left for agreement of the Parties with the assistance of the Mediator during the mediation process. The Parties shall comply with requests from the mediator for the materials, documents and facts relevant to the issues presented to the Mediator. If a Party provides the Mediator with any privileged or confidential information, or if the Mediator provides such information to any Party pursuant to an agreed upon process, such act shall not waive any claim of privilege or confidentiality. Unless the Mediator directs otherwise, each Party that provides any materials, documents or facts to the Mediator shall provide written notice of the nature of such production to all other Parties at the same time such materials, documents or facts are made available to the Mediator. The Mediator may request additional information at any point during the Mediation process.

G. Mediation Contract. Upon selection of the Mediator, the Parties shall enter into a contract which outlines the agreements between the Parties and the Mediator as to fees, schedules, duties, payments and confidentiality. The Mediation Contract shall reflect that Defendant shall bear responsibility for payment of all Mediation costs, except that each Party shall bear the costs of their own attorney fees related to the Mediation.

H. State's Participation In The Mediation Is A Response Cost. The

participation of the Ohio EPA and contractors hired by Ohio EPA in the Mediation is a Response Cost or Oversight Cost which Defendant shall pay to the State as required by Section X., Paragraphs B. 1 through 6 of this Consent Order. The costs of Ohio EPA shall be submitted to Defendant and paid by Defendant as set forth in Section X., Paragraph B. 1.

I. Mediator Held Harmless. The Mediator shall not be liable for any act or omission in connection with his or her role in the Mediation process.

J. Limitation on Additional Issues. This Mediation shall be limited to freely discussing those issues identified in paragraph C. herein.

K. Mediation Schedule. The selection of the Mediator by the Parties and the Mediation shall be conducted in accordance with the following schedule:

1. Within thirty (30) days of the date Ohio EPA notifies the Parties that it has received the draft Remedial Investigation report from the Independent Contractor, each Party may each propose no more than three (3) candidates to interview for Mediator and inform all other Parties of the proposals in writing.
2. Within sixty (60) days of the date Ohio EPA notifies the Parties that it has received the draft Remedial Investigation report from the Independent Contractor, the Parties shall select the Mediator by mutual agreement. Each candidate shall be interviewed jointly by representatives of each Party.
3. Within ninety (90) days of the date Ohio EPA notifies the Parties that it has received the draft Remedial Investigation report from the Independent Contractor, the Parties shall enter into the Mediation contract with the selected Mediator.
4. Within thirty (30) days of receipt of the Independent Contractor's draft Alternatives Array Document, the Defendants and Citizen Plaintiffs shall review the document and exchange written comments with all other Parties. Ohio EPA shall subsequently forward

to the other Parties and the Independent Contractor a draft comment letter containing any proposed revisions, additions, or deletions to the draft Alternatives Array Document and shall attach a copy of the comments that have been received from the Citizen Plaintiffs and Defendants.

5. Within thirty (30) days of receipt of Ohio EPA's draft Alternatives Array comment letter to the Independent Contractor, the Parties shall schedule and conduct a meeting to discuss the Alternatives Array Document and the comments to the Alternatives Array Document.
6. Within forty-five (45) days of receipt of Ohio EPA's draft Alternatives Array comment letter to the Independent Contractor, the Parties shall schedule and conduct the first Mediation session. If all the Parties determine that Mediation is not necessary, the Parties may mutually agree to forego Mediation.
7. Within ninety (90) days of the first Mediation session the Mediation shall be complete. Upon completion of the Mediation, Ohio EPA shall finalize the comment letter to the Independent Contractor containing any revisions, additions, or deletions to the draft Alternatives Array Document. The Independent Contractor shall incorporate all comments, additions, and deletions as directed by Ohio EPA. Ohio EPA shall provide a copy of the comment letter to Citizen Plaintiffs and Defendants.
8. Upon request by any party and the agreement of the State, any of the deadlines in subparagraphs 1. through 7. may be extended.
9. The draft Alternatives Array Document is a Secondary Document as defined in paragraph X. of Section I., DEFINITIONS and described in Section XIII., WORK TO BE PERFORMED of this Consent Order. The draft Alternatives Array Document and Ohio EPA's draft and finalized comment letters to the Independent Contractor about the draft Alternatives Array Document, shall be subject to dispute resolution procedures set forth in Section V., DISPUTE RESOLUTION of this Consent Order at the

time they are incorporated into and approved as part of the final Feasibility Study.

L. Location. Mediation sessions will be held in Dayton, Ohio unless otherwise agreed by all Parties.

M. Cooperation and Good Faith. The Parties shall cooperate in good faith with each other to effectuate the purposes of the Mediation, shall attempt to make decisions by consensus, and shall attempt to resolve any disputes among them through good faith discussion.

N. Confidentiality. The Mediation is an attempt to provide a formal process to freely discuss the draft alternatives array document. Any statements and conduct occurring as part of the Mediation are inadmissible and non-discoverable in any action regarding the implementation of this Consent Order. Any technical information submitted to or obtained from the Mediation may be admissible in any action by any Party. The Mediator shall be disqualified as a witness, consultant, or expert for any person or entity on any matter relating to the Elano Sites, and the Mediator's oral and written opinions, statements, findings, or recommendations, relating to the Elano Sites, if any, shall be inadmissible for all purposes in this or any other dispute involving any of the Participants.

O. Denial of Liability. The provisions of this Section and participation in the Mediation shall not constitute or be interpreted, construed or used as (1) evidence of any admission of liability, law or act fact; (2) a waiver of any right or defense; or (3) an estoppel against any party among themselves or by any other person not a party. However, nothing in this section is intended or should be construed to limit, bar, or otherwise impede the enforcement of any term or condition of this Section or the Consent Order against any Party.

P. Insurance. This Mediation is not intended to impair any Party's environmental insurance coverage litigation with its insurers.

Q. Reservation of Rights. Except as otherwise provided herein, nothing contained in this Section shall prevent the assertion of any right, claim, interest, or cause of action of any party, including, without limitation, claims for contribution and indemnity against persons not parties to this Consent Order.

VII. SELECTION OF REMEDY

Upon completion of the Mediation as set forth in Section VI. above or if no Party requests Mediation after submission of the draft Alternatives Array Document, Ohio EPA shall select the remedy for the Elano Sites in accordance with the procedures set forth below:

- a. The Independent Contractor shall utilize the draft Alternatives Array Document and the final comment letter as a basis to write a draft Feasibility Study.
- b. The Parties shall have the right to comment on and hold a meeting to discuss the draft Feasibility Study pursuant to Section XI. of this Consent Order.
- c. The Independent Contractor shall finalize the Feasibility Study and Ohio EPA shall approve the final Feasibility Study at which time the Feasibility Study shall be subject to dispute resolution.
- d. In selecting a remedy Ohio EPA will follow the procedures set forth in the Procedures for Preferred Plan/Decision document-Appendix C and any applicable requirements of state or federal law, including the NCP. As set forth in Appendix C, Ohio EPA shall first propose a remedy in a Proposed Plan. The Parties and the public shall be provided the opportunity to comment on the Proposed Plan. Ohio EPA may resubmit the Proposed Plan for comments by the Parties and the public if Ohio EPA makes significant changes to the Proposed Plan after consideration of the comments.

- e. Following consideration of comments received from the Parties and the public, Ohio EPA shall finalize the remedy selection in a Decision Document for Remedial Action which shall be incorporated by reference into this Consent Order. Ohio EPA agrees to select a remedy that is not inconsistent with the National Contingency Plan (40 C.F.R., Part 300), state law and guidances referred to in Appendix F. This document is subject to dispute resolution.

VIII. RESPONSIBILITY FOR WASTES MANAGED

All Hazardous Substances managed in performance of any of the work plans approved by Ohio EPA shall be disposed by Defendant as required by applicable law and this Consent Order. Nothing in this Section shall preclude another person or entity from disposing such wastes as required by applicable law and this Consent Order. Furthermore, nothing in this Consent Order precludes or affects any right of Defendant to bring an action against any person or entity under any applicable law for recovery of its costs against any person or entity not a party to this Consent Order.

IX. LIABILITY OF DEFENDANT, SATISFACTION OF SPECIFIED CLAIMS, RESERVATION OF RIGHTS, AND WAIVER OF APPEALS

A. Payment of the civil penalty and past Oversight and Response Costs, as required by Section X., shall constitute a settlement and discharge between and among the Parties and Guarantor to this Consent Order, and shall be construed to include Defendant's and Guarantor's past or current officers, directors and employees. Except as provided in Paragraph B. of this Section, the State of Ohio's discharge is for (1) all civil claims which have been asserted by the State against Defendant in the Complaint regarding the Elano Sites, including all claims for civil penalties and all claims for past Oversight and Response Costs of Ohio EPA and its contractors through

December 31, 1994 and all claims for past Oversight and Response Costs of the Office of the Attorney General through date of entry of this Consent Order which were raised against Defendant in the Complaint as to said Sites and (2) all criminal and civil claims for acts or violations known by the State upon the date of entry of this Consent Order and occurring prior to June 17, 1993 which could have been brought under RCRA, CERCLA, FWPCA and Chapters 3734., 3767., and 6111. of the Ohio Revised Code. All such claims known by the State have been alleged in the Complaint and (3) all civil claims, through December 31, 1994, for Oversight and Response Costs incurred in connection with the September 5, 1990 Director's Final Findings and Orders for Interim Action. The Citizen Plaintiff's discharge has been set forth in a separate release and settlement agreement.

B. The claims of the State which shall survive, notwithstanding Defendant's full compliance with each and every term of this Consent Order shall include, but not be limited to, the following:

1. Claims for natural resource damages which may be claimed by the State of Ohio under CERCLA, O.R.C. Title 15, common law or other law.
2. Any claims or action, to eliminate or control conditions which may harm or pose a threat of harm to public health, welfare or the environment.
3. Any claims or action, administrative or judicial, to require Interim Action in addition to that required in Appendix A.
4. Any claims to seek cost reimbursement for any action described above.
5. The State of Ohio's claims for future response and other costs incurred after the execution of this Consent Order to the extent not reimbursed pursuant to this Consent Order.

6. All criminal and civil claims for acts or violations occurring after June 17, 1993, except for the civil claims alleged in the Complaint.
7. All criminal and civil claims for acts or violations unknown to the State upon the date of entry of this Consent Order and occurring prior to June 17, 1993.

C. The State of Ohio reserves the right to perform all or any portion of the work or any other obligation required by this Order in the event that the requirements of this Order are not wholly complied with within the time frames required by this Order.

D. The Parties waive any right to contest or appeal any O.R.C. Chapter 119 action of the Director taken in pursuit of the clean-up of the Elano Sites, except for rulemaking or permitting or an order for work not otherwise required by this Consent Order.

E. Except as stated in this Consent Order, nothing contained herein shall affect the rights or liabilities of any person who is not a party to this order.

F. Except as specifically provided in this paragraph, the State of Ohio shall not assert that Elano or the Elano Sites are hazardous waste treatment, storage or disposal facilities (TSDF's) as defined under O.R.C. Chapter 3734. or under the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq., as amended, and applicable regulation's promulgated thereunder due to the allegations of hazardous waste storage and disposal set forth in Counts Two through Twenty-Four of the Complaint, and Defendant, based on the allegations set forth in Counts Two through Twenty-Four of the Complaint, shall not be subject to TSDF requirements. However, nothing in this paragraph shall diminish the applicability of, or the State of Ohio's

authority to require compliance with, TSDf requirements applicable to actions taken to complete work required by this Consent Order, including the lawful incorporation of TSDf requirements as properly applicable or relevant and appropriate requirements ("ARARs") in Ohio EPA's selection of the remedy for the Elano Sites. Nothing herein shall diminish or alter Defendant's responsibilities as a generator of Hazardous Waste set forth in O.A.C. Chapter 3734-52, including but not limited to, the storage facility requirements set forth in O.A.C. Rule 3745-52-34. The Parties further agree that nothing herein shall preclude or limit Defendant's right to contest or appeal the applicability of any TSDf requirement pursuant to the terms of this Consent Order and state law.

X. FISCAL RESPONSIBILITIES

A. CIVIL PENALTY AND PARTIAL PAST OVERSIGHT AND RESPONSE COSTS

1. Defendant shall pay to the State of Ohio a civil penalty, pursuant to O.R.C. Section 3734.13(C), of One Million Dollars (\$1,000,000.00) within ten (10) days of the entry of this Consent Order. Defendant is further ordered and enjoined to pay past Oversight and Response Costs of the collective sum of Two Hundred Sixty-Two Thousand, Nine Hundred Forty-Eight Dollars and Fifty-Two Cents (\$262,948.52) within ten (10) days after the entry of this Consent Order, which includes Seventy-Five Thousand Dollars (\$75,000.00) through the date of entry of this Consent Order, for the Office of the Attorney General, and One Hundred Eighty-Seven Thousand, Nine Hundred Forty-Eight Dollars and Fifty-Two Cents (\$187,948.52) through December 31, 1994, for the Ohio EPA.

2. All payments required herein shall be made by cashier's or certified check, payable to the order of the "Treasurer, State of Ohio". The civil penalty and the

Oversight and Response Costs for the Attorney General should be delivered to the following address:

Matthew A. Sanders, Administrative Assistant (or his successor)
Office of the Attorney General of Ohio
Environmental Enforcement Section
State Office Tower, 25th Floor
30 East Broad Street
Columbus, Ohio 43215-3428

The Oversight and Response Costs for Ohio EPA should be delivered to the following address:

Ohio Environmental Protection Agency
Fiscal Office
Division of Emergency and Remedial Response
1800 WaterMark Drive
P.O. Box 163669
Columbus, Ohio 43216-3669

The civil penalty and Ohio EPA Oversight and Response Costs shall be deposited into the Hazardous Waste Clean-up Account created pursuant to O.R.C. Section 3734.28 unless otherwise indicated by Ohio EPA. The Attorney General Oversight and Response Costs shall be deposited into an Attorney General account unless otherwise indicated by the Attorney General.

3. The civil penalty and Oversight and Response Costs may also be paid by an electronic wire transfer which is acceptable to both Defendant and the State.

B. OTHER OVERSIGHT AND RESPONSE COSTS

1. Subject to the provisions set forth in paragraphs B. 2 through 4, below, Defendant shall pay all Oversight and Response Costs, as defined in Section I., DEFINITIONS, paragraphs Q. and W., incurred by Ohio EPA after December 31, 1994, including the costs of contractor(s) hired by Ohio EPA, and Oversight and Response Costs incurred by the Office of the Attorney General, except the Attorney General's

costs incurred in the Mediation, after the date of entry of this Consent Order. Ohio EPA and the Office of the Attorney General will submit an itemized bill to Defendant setting forth the basis for the demand for reimbursement annually, or as may be deemed appropriate by Ohio EPA. Undisputed demands shall be paid within thirty (30) days. In the event of a dispute, Defendant shall deposit the disputed sum into an interest-bearing escrow account chosen by written agreement of the Attorney General, Ohio EPA, and the Defendant. If the Parties are unable to mutually agree upon the disbursement of disputed funds within ninety (90) days following deposit, then either Party may seek relief as set forth in Section V. Litigation costs of the Office of the Attorney General resulting from any dispute of the obligations of this Consent Order shall be paid by Defendant if the State prevails in the dispute. If the State does not prevail in the dispute, Defendant is not required to pay the litigation costs of the Office of the Attorney General.

2. Within ten (10) days of entry of this Consent Order, Defendant shall pay to Ohio EPA Three Hundred Thousand Dollars (\$300,000.00). This payment shall be made by cashier's or certified check, payable to the order of the "Treasurer, State of Ohio", delivered to Ohio Environmental Protection Agency, Fiscal Office, Division of Emergency and Remedial Response (at the address set forth in paragraph A. 2, above) or by mutually acceptable wire transfer. Ohio EPA shall use this money to pay contractor(s) which Ohio EPA may hire to monitor some of the work performed pursuant to this Consent Order from the date of its entry through completion of Remedial Design. Any Oversight Costs incurred by an Ohio EPA contractor which are related to a dispute as set forth in Section V., DISPUTE RESOLUTION, or mediation as set forth in Section VI., MEDIATION, are additional Oversight Costs and shall be

paid by the Defendant in addition to the Three Hundred Thousand Dollars (\$300,000.00) and shall be paid as set forth in paragraph B. 1, above. Except for Oversight Costs related to a dispute or mediation, Defendant shall not be required to pay Ohio EPA any additional Oversight Costs for contractor(s) hired by Ohio EPA to monitor any work performed pursuant to this Consent Order from the date of its entry through completion of Remedial Design.

3. At the completion of Remedial Design, if any money remains from the Three Hundred Thousand Dollars (\$300,000.00), Ohio EPA shall use the remaining money to pay contractor(s) which Ohio EPA may hire to monitor some of the work performed pursuant to this Consent Order during Remedial Action and Operation and Maintenance. If money remains from the Three Hundred Thousand Dollars (\$300,000.00) at the completion of Operation and Maintenance, such money shall be returned to Defendant.

4. If the Three Hundred Thousand Dollars (\$300,000.00) is depleted before or during Remedial Action or Operation and Maintenance, Defendant shall pay Ohio EPA as set forth in paragraph B. 1, above for all additional Oversight Costs incurred by contractor(s) which Ohio EPA may hire.

5. As set forth in paragraph B. 1, above, in addition to paying the Three Hundred Thousand Dollars (\$300,000.00) for Ohio EPA contractor expenses as set forth in Paragraphs B. 2 and 3, above, Defendant shall pay all Oversight Costs incurred for oversight performed by employees of Ohio EPA and the Office of the Attorney General.

6. Defendant shall pay all Response Costs, except as otherwise provided in this Consent Order, incurred by Ohio EPA, by contractor(s) hired by Ohio EPA, and by

the Office of the Attorney General.

C. HEALTH ASSESSMENT

The Citizen Plaintiffs may submit data and an application for performance of a health assessment to the Ohio EPA. In the event Citizen Plaintiffs submit data and an application, Ohio EPA may select a state or federal agency and/or private consultant to review the information and determine whether an assessment is necessary and to perform an assessment if necessary. In the event that a private consultant is selected to perform a health assessment, Ohio EPA shall require the private consultant to provide a scope of work and a cost estimate of the work. Before any work is performed by the private consultant, Defendant may dispute any costs related to the health assessment as provided by Section V. DISPUTE RESOLUTION of this Consent Order. Failure to dispute those costs referenced in the cost estimate at such time will constitute a waiver of Defendant's right to dispute the costs. The health assessment by a private consultant shall not be performed until the dispute is resolved. Defendant shall pay all the costs of private consultants associated with the health assessment referenced in this paragraph. Nothing in this paragraph shall preclude any state or federal agency from seeking reimbursement, from Defendant, of all costs associated with the health assessment referenced in this paragraph. Nothing in this paragraph shall preclude Defendant from challenging such reimbursement costs.

XI. PROTOCOL OF COMMUNICATIONS AND REVIEW OF SUBMITTALS

A. Pursuant to Section XII. of this Consent Order, an Independent Contractor will be retained to perform all work required pursuant to this Consent Order through Remedial Design, including but not limited to: assuming the activities required pursuant to the Director's Final Findings and Orders for Interim Action

(Appendix A) as described at Paragraph F of Section XII., CONTRACTS; the Phase II RI/FS; and RD (Remedial Design). The Independent Contractor shall conduct work in accordance with Appendix A (Director's Final Findings and Orders for Interim Action), Appendix B (RI/FS Statement of Work); Appendix D (RD/RA Statement of Work); and the approved Workplans for the Phase II RI/FS and RD/RA.

B. The Defendant, Guarantor, and the Citizen Plaintiffs shall not make any oral or written communications with the Independent Contractor, related to the work performed under this Consent Order, except as otherwise specifically provided herein. The State and any contractor(s) hired by Ohio EPA may communicate with the Independent Contractor at any time and for any reason. Correspondence and other written documents generated as a result of communications between Ohio EPA and the Independent Contractor shall be placed in the agency's file and made available pursuant to O.R.C. Section 149.43.

C. The Independent Contractor shall prepare and disseminate to all Parties copies of all draft workplans, reports, or other documents in accordance with Paragraph B. of Section XIII., WORK TO BE PERFORMED; the Director's Final Findings and Orders issued September 5, 1990 (Appendix A); the RI/FS and RD/RA Statements of Work (Appendices B and D, respectively); and any other provision of this Consent Order. Within forty-five (45) days after entry of this Consent Order, the Independent Contractor will meet with the Parties to review the available information regarding the Elano Sites and the tasks anticipated to be performed as part of the RI/FS.

D. The Independent Contractor may contact the Ohio EPA within sixty (60) days after the entry date of this Order to discuss the requirements for a Data Collection

Quality Assurance Plan.

E. Upon receipt of any draft workplan, report, or document that is a Primary Document or Secondary Document as defined in Section I., DEFINITIONS Paragraphs T. and X., and described at Section XIII., WORK TO BE PERFORMED, the Citizen Plaintiffs and Defendant shall have thirty (30) days to forward their comments, with supporting technical rationale, to the Ohio EPA Site Coordinator for the Elano Sites and the other Parties. Ohio EPA shall subsequently forward any revisions, additions or deletions that it may have to the draft workplan, report, or document to the Independent Contractor, and shall provide a copy of said comments simultaneously to the Defendant and Citizen Plaintiffs. Included in any such comments will be a supporting rationale for the revisions, additions or deletions required by Ohio EPA. Ohio EPA shall attach a copy of the comments that have been received from the Citizen Plaintiffs and Defendant to the comment letter sent to the Independent Contractor.

F. Meetings shall be conducted between all Parties and the Independent Contractor to discuss comments that have been submitted to the Ohio EPA Site Coordinator as part of the review process of the draft Primary Documents listed under Section XIII., WORK TO BE PERFORMED and the draft Scoping Document, which is a Secondary Document listed under Section XIII., WORK TO BE PERFORMED. Such meetings shall be scheduled by the Ohio EPA and shall occur no later than thirty (30) days after all Parties have received a copy of Ohio EPA's comment letter that was distributed pursuant to paragraph E., above. The Citizen Plaintiffs and Defendant may discuss, with the Independent Contractor and any other Party at the meeting, any issue related to the Independent Contractor's performance of the requirements of the

Consent Order only at these meetings. Any Party may request an extension of any scheduled meeting, however, in no event shall an extension of greater than fourteen (14) days be granted. Ohio EPA shall not unreasonably deny a request for an extension. All meetings will be conducted at the Ohio EPA Southwest District Office unless an alternate location is mutually agreed upon by all parties and the Independent Contractor. A meeting may be canceled upon mutual agreement of all Parties.

G. After conductance of a meeting as described in Paragraph F above, Ohio EPA shall either approve the Primary Document or submit to the Independent Contractor revisions, additions, or deletions to be incorporated into the Primary Document. Ohio EPA shall provide a copy of such approval or comments simultaneously to the Defendant and Citizen Plaintiffs. Included in any such comments will be a supporting rationale for the revisions, additions or deletions required by Ohio EPA.

H. The Independent Contractor shall incorporate into the Primary Document all revisions, additions, or deletions contained within the Ohio EPA's comment letter, and submit the revised Primary Document to all Parties within thirty (30) days of receipt of Ohio EPA's comment letter submitted pursuant to paragraph G. above. The Independent Contractor may request an extension of no greater than fourteen (14) days in which to submit the revised Primary Document. Ohio EPA shall approve the revised Primary Document upon incorporation of its revisions, additions, or deletions. In the event the Independent Contractor fails to incorporate the Ohio EPA's revisions, additions, or deletions, Ohio EPA may modify the revised Primary Document and subsequently approve the modified Primary Document. Such approval shall be

simultaneously submitted to the Independent Contractor, the Defendant and Citizen Plaintiffs.

I. If Defendant or Citizen Plaintiffs desire to communicate or meet with the Independent Contractor in addition to the meetings set forth in Paragraph F. above, Defendant or Citizen Plaintiffs shall so notify all Parties in writing and identify the purpose of the communication or meeting and the specific issues they wish to discuss. The Parties shall mutually agree on the time and type of communication with the Independent Contractor.

J. Notwithstanding any other provision of this Consent Order, Defendant and its employees shall respond to and comply with any inquiries posed by the Independent Contractor that relate to the Independent Contractor's duties set forth in this Consent Order. Such inquiries may include, but not be limited to, requests to review documents and requests to interview employees at reasonable times. Furthermore, Defendant and its employees shall use their best efforts to advise the Independent Contractor of any safety precautions and warn the Independent Contractor of any dangers posed by site conditions.

K. Notwithstanding any other provision of this Consent Order, Defendant may request that the Independent Contractor submit annual budget forecasts in reasonable detail to permit financial planning and initiate ministerial contacts regarding billings. Any disputes regarding billing, other than requests for supporting documentation, shall be governed by paragraph B of this Section.

XII. CONTRACTS

A. Pursuant to the procedures set forth in paragraph E. of this Section, the firm of Brown & Caldwell has been selected as an Independent Contractor to perform

the work through Remedial Design, as required pursuant to this Consent Order. Brown & Caldwell, or another Independent Contractor chosen pursuant to the procedures set forth in paragraph E. below, shall perform the Phase II RI/FS (Remedial Investigation/Feasibility Study) and RD (Remedial Design). Contractor(s) chosen by Defendant shall conduct RA (Remedial Action). Defendant or its contractor(s) shall conduct O & M (Operation and Maintenance).

B. The Defendant shall enter into approved contract(s) with Independent Contractor(s) to perform the work through Remedial Design. The Phase II RI/FS Contract shall take effect simultaneously with entry of this Consent Order.

C. The approved RD Contract for the Independent Contractor shall take effect not more than forty-five (45) days after Ohio EPA's selection of the remedy for the Elano Sites. The RA Contract shall take effect not more than forty-five days after Ohio EPA's approval of the Remedial Design. The final O & M plan shall be submitted ninety (90) days prior to completion of RA. The Ohio EPA approved O & M plan shall be implemented immediately following completion of RA. The Ohio EPA approved O & M plan shall be part of any O & M contract and shall take effect immediately following completion of RA. Any other contract with the Independent Contractor shall take effect immediately upon approval of Ohio EPA.

D. If a Party to this Consent Order wishes to expand, reduce, suspend, or terminate any contract entered into between the Defendant and the Independent Contractor for the purpose of conducting work pursuant to this Consent Order, such Party shall so notify all other Parties in writing. Such written notification shall specify the reasons for seeking the expansion, reduction, suspension, or termination of the contract with the Independent Contractor. The contract shall be expanded, reduced,

suspended, or terminated only upon mutual agreement of all Parties. If the Parties cannot agree upon the expansion, reduction, suspension, or termination of the contract, such disagreement shall be subject to the dispute resolution procedures set forth in Section V. of this Consent Order.

E. At such time as it may be necessary for selection of an Independent Contractor(s) to be made, Defendant shall submit to the State a list of six (6) contractors from which it desires the Independent Contractor to be selected. The State may require Defendant to submit lists of additional Independent Contractors whom Defendant desires to conduct the work required under this Consent Order. Defendant shall also supply general information regarding the qualifications and work history of the potential Independent Contractors submitted to the State. The State will then select, from the list of contractors submitted by Defendant and with the input of the Parties, the Independent Contractor.

F. Under the Phase II RI/FS contract the Independent Contractor shall assume the activities and requirements which have been implemented by Interim Contractor pursuant to the September 5, 1990 Directors Findings and Orders for Interim Action at the Elano Sites, pursuant to paragraph A. of Section XV.

G. All contracts shall contain at a minimum the relevant terms and conditions set forth in this Consent Order and Appendices, which are attached hereto and incorporated herein by reference. Defendant may add other terms and/or select a different format for said contract(s). However, all contracts with the Independent Contractor are subject to the review and final approval of the Director of the Ohio EPA. Defendant shall provide a copy of this Consent Order to the Independent Contractor.

XIII. WORK TO BE PERFORMED

A. Defendant, through the Independent Contractor(s), its own contractor, or itself, as provided for in Section XII., CONTRACTS, paragraph A., shall perform all work required by this Consent Order in accordance with the schedule set forth in paragraph B., below and the Phase II RI/FS Workplan, RD Workplan and RA Workplan (these workplans, as approved by Ohio EPA, and any other Ohio EPA approved workplans shall be incorporated by reference into this Consent Order). Work performed under this Consent Order shall consist of, but not be limited to, the items contained in the following documents:

1. PRIMARY DOCUMENTS

- a. Workplan for Additional Studies to Evaluate Project Scoping (Optional)
- b. RI/FS Work Plan
 - i. Sampling and Analysis Plan
 1. Field Sampling Plan
 2. Quality Assurance Project Plan
 - ii. Health and Safety Plan
 - iii. Community Relations Plan
 - iv. Project Management Plan
- c. Treatability Study Work Plan(s) (as required).
- d. Remedial Investigation Report
 - i. Investigation of Site Physical Characteristics
 - ii. Source Characterization
 - iii. Determination of the Nature and Extent of Contamination
 - iv. Data Analysis
 - v. Human Health Baseline Risk Assessment
 - vi. Environmental Baseline Risk Assessment
- e. Feasibility Study Report
 - i. Development of Final Remediation Goals

- ii. Treatability Studies (as required)
 - iii. Detailed Analysis of Alternatives
 - iv. Detailed Description of Alternatives
 - v. Presentation of Individual Analysis
- f. Sections 2.0 and 3.0 of the RD/RA Statement of Work
 - g. RD/RA Work Plan
 - h. Final Design Documents
 - i. Final Construction Shop Drawings
 - j. Final Operation and Maintenance Plan
 - k. Final Contractor Quality Control Plan

2. SECONDARY DOCUMENTS

- a. Monthly Progress Reports
- b. Scoping Document (draft)
 - i. Description of Current Situation
 - ii. Preinvestigation Evaluation of Remedial Action Technologies
- c. Treatability Studies Evaluation Report (as required)
- d. Screening of Preliminary Remedial Technologies
 - i. Statement of Purpose
 - ii. Action Objectives
 - iii. General Response Actions
- e. Screening of Technology Process Options
- f. Technical memos associated with the Risk Assessment Components
- g. Alternatives Array Document
 - i. Development of ARARs
- h. Preliminary Design Submittals (30% Design) (as required)

- i. Intermediate Design Submittals (50% Design) (as required)
- j. Prefinal Design Submittals (90% Design)

B. The Independent Contractor(s) and Defendant's contractors shall submit the following documents, which are listed in paragraph A., above, to all the Parties in accordance with the schedule provided below:

1. The draft Scoping Document for the Phase II RI/FS shall be submitted to all Parties no later than sixty (60) days after the entry date of this Consent Order.
2. The draft Phase II RI/FS Workplan shall be submitted to all Parties no later than one hundred and twenty (120) days after the date of entry of this Consent Order, unless an approved workplan for additional studies establishes an alternate schedule.
3. Completion of Sections 2.0 and 3.0 of the RD/RA Statement of Work shall be submitted to all the Parties no later than seven (7) days after finalization of the Decision Document for Remedial Action. Upon approval by Ohio EPA, Sections 2.0 and 3.0 of the RD/RA Statement of Work which shall be incorporated by reference into this Consent Order.
4. The draft RD/RA Workplan shall be submitted to all the Parties no later than sixty (60) days after finalization of the Decision Document for Remedial Action.
5. The final O & M Plan shall be submitted to all Parties no later than ninety (90) days prior to the estimated completion of RA.

XIV. NOTICES

All document(s) required to be submitted under this Consent Order shall be submitted to the following unless the Consent Order specifically provides otherwise:

- (1) Ohio Environmental Protection Agency
Southwest District Office
40 South Main Street
Dayton, Ohio 45402
Attn: Elano Site Coordinator, Division Of Emergency

and Remedial Response
FAX # (513) 285-6404
(3 COPIES)

- (2) Ohio Environmental Protection Agency
P.O. Box 1049
1800 WaterMark Drive
Columbus, Ohio 43266-0149
Attn: Manager, Technical & Support Section, DERR
FAX # (614) 728-3898
(1 COPY)
- (3) The Office of the Ohio Attorney General
30 East Broad Street - 25th Floor
Columbus, Ohio 43266-0410
Attn: Environmental Enforcement Section
FAX # (614) 752-2441
(1 COPY)
- (4) Joseph Lonardo, Esq.
Vorys, Sater, Seymour & Pease
52 East Gay Street
P.O. Box 1008
Columbus, Ohio 43216-1008
FAX # (614) 464-6350
(1 COPY)
- (5) William V. Killoran, Jr., Esq.
Counsel-Environmental Affairs
G.E. Aircraft Engines
Legal Operation
One Neumann Way, MD T165A
Cincinnati, Ohio 45215
FAX # (513) 672-3675
(1 COPY)
- (6) Elano Plant Manager
2455 Dayton-Xenia Road
Xenia, Ohio 45305
FAX # (513) 427-7178
(1 COPY)
- (7) D. David Altman, Esq.
Altman and Calardo, L.P.A.
Suite 1006
414 Walnut Street

Cincinnati, Ohio 45202
FAX # (513) 721-2299
(1 COPY)

Any Party may change the name and/or address of its contact person(s) by sending written notice of the change(s) to the other Parties.

XV. INTERIM ACTION MONITORING AND SAMPLING

Through the Independent Contractor(s), Defendant shall perform the activities described in Appendix A (the September 5, 1990 Director's Final Findings and Orders for Interim Action) of this Consent Order. The Independent Contractor shall assume the activities and requirements of Appendix A upon entry of this Consent Order with the exception of any capture zone undergoing construction or performance verification on the date of entry of this Consent Order. For any capture zone undergoing construction or performance verification on the date of entry of this Consent Order, the Interim Contractor shall complete construction and verify performance of the capture zone. At such time the Independent Contractor shall assume responsibility for any work related to the capture zone.

XVI. REMEDIAL INVESTIGATION/FEASIBILITY STUDY AND REMEDIAL DESIGN/REMEDIAL ACTION

A. All submittals required by this Consent Order shall be prepared pursuant to the specifications set forth in Appendices B and D and paragraph D of this Section which are hereby fully incorporated by reference herein.

B. Scope of Work. The Defendant, through the Independent Contractor(s) and its own contractors, shall supply all necessary personnel, services, equipment, materials, and facilities required to complete the Phase II RI/FS, the RD/RA, and all operation and maintenance projects, in accordance with the work plans which are

incorporated by reference into this Consent Order. The Independent Contractor and Ohio EPA will use their best efforts to avoid duplication of work which has been performed by other persons at the Elano Sites by relying, where practicable, on existing data, verified as accurate by the Independent Contractor, in order to cost effectively complete the work required by this Consent Order.

C. **Work Plan(s).** The Defendant through the Independent Contractor(s) shall prepare the work plans as set forth in detail in Appendices B and D and incorporated herein:

1. Upon Ohio EPA's approval of the work plans, the Independent Contractor(s) and Defendant's contractors shall mobilize such personnel, equipment and other resources necessary to provide the services required under this Consent Order in accordance with the approved schedules contained in the work plans.
2. The Independent Contractor(s) and/or Defendant's contractors shall provide Ohio EPA, the Citizen Plaintiffs, and Defendant at least fourteen (14) days written advance notice to the representatives identified in Section XIV., paragraphs (1) and (7) of any sampling event except in the case of emergencies. In the event of an emergency, the Independent Contractor shall take whatever samples are necessary as part of the emergency sampling event. Sampling in an emergency shall consist of filling two (2) containers, one container for the Independent Contractor and one container for the Ohio EPA. In non-emergencies the Independent Contractor(s) shall provide the opportunity to take samples to any Party at the time of sampling or on the next appropriate business day following the scheduled day.
3. In the event of an emergency sampling, the Independent Contractor(s) and/or Defendant's contractor(s) shall notify both the Ohio EPA and the Citizen Plaintiffs as soon as the decision to sample is made. Ohio EPA may perform an inspection at this

time and specify additional samples.

4. Ohio EPA, the Citizen Plaintiffs, and Defendant shall make available to each other the results of sampling, tests or other data, including raw data, generated by any of them, or on their behalf, with respect to the implementation of this Consent Order.
5. At the request of Defendant and/or Citizen Plaintiffs, Ohio EPA shall allow Defendant and/or Citizen Plaintiffs to take split samples and/or duplicates of samples collected by Ohio EPA, or its contractor(s), related to fulfilling the purpose and objectives of this Consent Order.

D. All work required of Defendant by this Consent Order shall be developed in conformance with this Consent Order, the RI/FS and RD/RA Statements of Work attached hereto as Appendices B and D, state law including O.R.C. chapters 3734. and 6111. and the regulations promulgated thereunder, the NCP, and the most current version of the guidance documents set forth in Appendix F. The Independent Contractor's or Defendant's contractor's preparation of and any Party's review of any workplan, report, or document shall be consistent with the version of the guidance documents set forth in Appendix F that are in effect at the time the preparation of the workplan is initiated. The RI/FS and RD/RA Statements of Work, attached to this Consent Order as Appendices B and D, are not specific to the Elano Sites and are to be used as an outline in developing Site specific workplans. In the workplans, the Independent Contractor shall present the technical justification for the proposed omission of any of the tasks of the Statements of Work because of work that has already been adequately performed or work that is not appropriate to the Elano Sites. Any omission proposed by the Independent Contractor is subject to review and approval of Ohio EPA. If Ohio EPA determines that any additional guidance

documents affect the work to be performed under this Consent Order, Ohio EPA will notify all Parties and the Independent Contractor. The affected workplan shall be modified by the Independent Contractor or Defendant as applicable to the Elano Sites.

E. To the extent that portions of the Elano Sites or areas where work is to be performed are presently owned by parties other than Defendant, Defendant shall use its best efforts to obtain access agreements from the owner(s), including any agreements necessary to provide access to Ohio EPA and its authorized representatives. Such efforts may include, if necessary, payment of a reasonable sum by Defendant to obtain a temporary or permanent easement to perform work on such areas.

F. If Defendant is unable to obtain such access, Defendant shall notify Ohio EPA promptly in writing regarding both the lack of access agreements and the efforts to obtain such access agreements. In the event Ohio EPA agrees that Defendant has used its best efforts, Ohio EPA will contact the landowner(s) and consider a range of options to facilitate implementation of this Consent Order.

G. Defendant and Ohio EPA shall each designate a Site Coordinator and an alternate for the purpose of overseeing the implementation of this Consent Order. To the maximum extent possible, except as specifically provided in this Consent Order, communications between Defendant and Ohio EPA concerning the terms and conditions of this Consent Order shall be made between the Site Coordinators and/or alternates. Ohio EPA and Defendant each has the right to change their respective Site Coordinator and/or alternates. Such a change shall be accomplished by notifying the other Parties in writing prior to the change.

XVII. RIGHT OF ENTRY AND ACCESS TO RECORDS AND EMPLOYEES

The Ohio EPA, any contractor(s) hired by Ohio EPA, the Independent Contractor(s), and their employees and subcontractors shall have full access without notice and without warrant to the Elano Site(s) for inspection, sampling, or any other purpose related to the Consent Order (1) at any time between 7:30 A.M. and 4:30 P.M. when the plant is operating, (2) at any time work required by this Consent Order is being conducted at the Site(s), and (3) at any time that systems, which are part of the investigation or remediation, are operating or should be operating. Ohio EPA shall provide a list of its contractors to Defendant which may need access to the Elano Site(s). Furthermore, Defendant shall (1) make all records, as defined by Section XXII, Records Retention, related to the Elano Sites available for inspection, (2) make all present employees available for interviews, and (3) use all reasonable means to encourage past employees to be available for interviews for those persons listed above. Nothing in this Consent Order shall be construed to limit the right of access to the Elano Sites as provided by O.R.C. Sections 3734.07 and 6111.05 or any other provision of State or Federal law. A representative of the Citizen Plaintiffs shall also be permitted to accompany the Ohio EPA and conduct inspection and/or sampling, provided, where appropriate, that such representative is qualified pursuant to the requirements of 29 CFR 1910.120 et seq. and at the Citizen Plaintiffs' expense.

XVIII. STIPULATED PENALTIES

A. In the event that any Ohio EPA approved deadline for completing the RA (Remedial Action) and/or conducting O & M (operation and maintenance) is not met, Defendant is ordered and enjoined to pay stipulated penalties which shall accrue in the amount of \$500 per day for the first seven days of non-compliance; 1,000 per day

for the 8th through 14th day of noncompliance; \$2,500 per day, for the 15th day through the 30th; and \$5,000 per day, per violation for violations lasting beyond 30 days.

B. Any payment of stipulated penalties accrued under the provisions of paragraph A above shall be made by delivering to the Environmental Enforcement Section of the Ohio Attorney General, at the address set forth in Section X., paragraph A. 2, a certified check(s) for the appropriate amount(s), within fourteen (14) days from the date the default is cured, made payable to "Treasurer, State of Ohio" to be deposited into the Hazardous Waste Clean-up Account, created pursuant to O.R.C. Section 3734.28.

XIX. INDEMNITY

A. Defendant agrees to indemnify, save, and hold harmless the State from any and all claims or causes of action arising from, or related to, events or conditions at the Elano Sites, except where the claims or causes of action result from negligent, reckless or intentionally tortious conduct by the State occurring outside of the State's exercise of its discretionary functions. Discretionary functions of the state include, but are not limited to, the State's review, approval, or disapproval of work performed pursuant to this Consent Order. The State shall not be considered a party to and shall not be held liable under any contract entered into by Defendant in carrying out the activities pursuant to this Consent Order.

B. The State agrees to provide notice to Defendant within 30 days of receipt of any claim which may be the subject of the indemnity in paragraph A. above, and to cooperate with Defendant in the defense of any such claim or action against the State.

XX. EXCUSES FOR NONPERFORMANCE

A. In any action to enforce the provisions of this Consent Order, Defendant may raise at that time the question of whether they are entitled to a defense that the conduct at issue was caused by reasons beyond their control such as, by way of example and not limitation, acts of God, unusually severe weather conditions, strikes, acts of war, civil disturbances, or orders of any judicial body or regulatory agency. While Plaintiffs do not agree that such a defense may be available or meritorious, it is, however, agreed by the Parties that it is premature at this time to raise and adjudicate the existence of such a defense and that the appropriate point at which to adjudicate the efficacy of any such defense is when an enforcement action, if any, is commenced.

B. Notwithstanding the provisions of paragraph A. above, any violation of the Consent Order caused solely by the Independent Contractor shall not constitute a violation of the Consent Order by the Defendant.

XXI. COMMUNITY RELATIONS PLAN

A. The Ohio EPA has committed to prepare a Community Relation Plan for the Elano Sites. Defendant is ordered and enjoined to cooperate in providing information to the Ohio EPA to assist the Ohio EPA in the preparation of that Plan and, upon the request of the State of Ohio, attend any public meeting(s) or hearing(s) held by the State regarding the Elano Sites.

B. Meetings shall be scheduled as needed at the discretion of the State. Public meetings will be scheduled within thirty (30) days after the following events: 1) commencement of the Phase II RI; 2) approval of the remedial investigation; 3) approval of the risk assessment (if separate from the remedial investigation); 4) issuance of the feasibility study; and 5) commencement of the remedial action. If the

State, Citizen Plaintiffs, and the Defendant agrees in writing that there are no issues requiring a meeting, no meeting will be held.

C. Other public meetings may be held, at the discretion of the Ohio EPA, upon the request of a significant number of citizens (at least eight (8) individuals).

XXII. RECORDS RETENTION

A. Upon request of the State, Defendant shall make available any records regarding the Elano Sites which are in the control or the custody of Defendant and which would otherwise be discoverable in this suit or in an action to enforce this Consent Order. Examples of these records (hereinafter "Records"), by way of illustration and not limitation, include: Records relating to the history of the uses of the Elano Sites; Records relating to the purchase of materials which upon use became Hazardous Substances at the Elano Sites; Records relating to the generation, handling and/or disposal of Hazardous Substances at the Elano Sites; facility maps, drawings, and construction, rearrangement, or demolition plans; contracts, billing statements, reports, and other Records relating to actions performed by the Defendant; Defendant's contractor(s) and/or the Independent Contractor(s) pursuant to this Consent Order or concerning an investigation or remediation of the Sites before the Consent Order was entered; and personnel Records or any other Records identifying past and present employees. "Records" as used herein shall include all documents, diagrams and recordings of any kind, whether visual or auditory, and shall include computer records and indices of records. In addition to any right of access to past and present employees of Defendant otherwise conferred by law, the State upon request to Defendant's counsel shall also be permitted to interview current employees of the Defendant without the need to issue a subpoena or formal discovery device. These

interviews shall be arranged through Defendant's counsel. Citizen Plaintiff's counsel shall be permitted to participate in such interviews. The State and Citizen Plaintiffs shall also be provided with the names, identifying information, last known whereabouts, and telephone number of any former employee, upon request by the State. Nothing in this Consent Order shall be construed to limit the rights of the State of Ohio or the Citizen Plaintiffs to otherwise seek to obtain records, seek names and identifying information of former employees of the Defendant.

B. From the date of entry of this Consent Order until completion of the RI/FS workplan and completion of the requirements set forth in paragraph C. below, the Defendant shall retain all Records, as defined in paragraph A., above, which have been generated or are in existence regarding the Elano Sites and those which will be generated regarding the Elano Sites.

C. Ten (10) days after entry of this Consent Order, Defendant shall provide to all Parties and the Independent Contractor a descriptive index of all categories of Records in existence regarding the Elano Sites. Ten (10) days after approval of the RI/FS workplan, Defendant shall provide to all Parties and the Independent Contractor a list, based on the descriptive index, setting forth which Records Defendant proposes to be destroyed. Within thirty (30) days of Defendant's submission of the list which proposes Record destruction, a meeting shall be conducted at the Southwest District Office between all Parties and the Independent Contractor to discuss the retention and destruction of Records regarding the Elano Sites. At this meeting the Parties shall mutually agree on the following issues: what Records may be destroyed, what Records shall be retained by Defendant, and the time period(s) for Record retention. If the Parties cannot agree on the destruction and retention of Records, such

disagreement shall be subject to the dispute resolution procedures set forth in Section VI. of this Consent Order.

D. Ten (10) days after approval of the RD/RA workplan, Defendant shall provide to all Parties and the Independent Contractor a list, based on an updated descriptive index of all categories of Records in existence regarding the Elano Sites, setting forth which Records Defendant proposes to be destroyed. Within thirty (30) days of Defendant's submission of the list which proposes Record destruction, a meeting shall be conducted at the Southwest District Office between all Parties and the Independent Contractor to again discuss the retention and destruction of Records regarding the Elano Sites. At this meeting the Parties shall mutually agree on the following issues: what Records may be destroyed, what Records shall be retained by Defendant, and the time period(s) for Record retention. If the Parties cannot agree on the destruction and retention of Records, such disagreement shall be subject to the dispute resolution procedures set forth in Section VI. of this Consent Order.

E. Two (2) years after initiation of Operation and Maintenance at the Elano Sites, Defendant shall provide to all Parties and the Independent Contractor a list, based on an updated descriptive index of all categories of Records in existence regarding the Elano Sites, setting forth which Records Defendant proposes to be destroyed. Within thirty (30) days of Defendant's submission of the list which proposes Record destruction, a meeting shall be conducted at the Southwest District Office between all Parties and the Independent Contractor to again discuss the retention and destruction of Records regarding the Elano Sites. At this meeting the Parties shall mutually agree on the following issues: what Records may be destroyed, what Records shall be retained by Defendant, and the time period(s) for Record retention. If

the Parties cannot agree on the destruction and retention of Records, such disagreement shall be subject to the dispute resolution procedures set forth in Section V. of this Consent Order.

F. Ohio EPA may request the Records which the Parties agree may be destroyed as provided by paragraphs C. and D. above. Upon such request, Defendant shall provide the requested Records to Ohio EPA.

G. Defendant may assert a claim of business confidentiality covering the information requested by this Consent Order, except for analytical data, pursuant to Ohio Administrative Code (OAC) rule 3745-50-30(a) and ORC 6111.05(a). If no such claim accompanies the information when it is submitted to Ohio EPA, contractors hired by Ohio EPA, or the Independent Contractor, it may be made available to the public by Ohio EPA without further notice to Defendant.

H. Defendant reserves any rights they may have pursuant to law to claim that they may withhold from disclosure those Records protected by attorney-client communication or attorney work product privilege. Defendant shall not withhold as privileged any analytical data or technical Records that are created, generated, or collected pursuant to the requirements of this Consent Order, regardless of whether the Record has been generated in the form of attorney-client communication or other generally privileged manner.

XXIII. COUNTERPARTS

This Consent Order shall be executed in counterparts. Copies of the Consent Order entered by the Court can be used as originals. The State of Ohio will provide copies of the Consent Order entered by the Court to all the Parties.

XXIV. APPENDICES ARE FULLY INCORPORATED BY REFERENCE INTO THIS CONSENT ORDER

Appendices A through F, attached hereto, are fully incorporated by reference into this Consent Order.

XXV. INTERPRETATION OF CONSENT ORDER

If agreement concerning the legal interpretation of this Consent Order cannot be achieved informally between the State and Defendant, either may petition this Court for a determination of such issues. The State and Defendant agree to move for an expedited hearing of such petition. No such petition will be cause for any delay in prosecuting the remediation of the Elano Sites, nor will any petition excuse Defendant from performing the obligations undertaken herein.

XXVI. OBLIGATIONS OF THE STATE

Nothing in this Consent Order shall be construed to create any liability of any kind at any time on the part of the State of Ohio or its employees, officials or attorneys.

XXVII. AUTHORITY TO ENTER INTO THE CONSENT ORDER

A. By signing this Consent Order, each of the undersigned Parties and Guarantor represents and warrants that he/she has completely read the foregoing, fully understands its contents, and intends to be bound thereby.

B. In addition, in the case of corporations, each signatory represents and warrants that he/she has been duly authorized to sign this document and so bind the corporation to all terms and conditions thereof, and that he/she submits with this Consent Order an authenticated and certified resolution from the corporation establishing that he/she is so empowered.

C. In addition, as it relates to the Citizen Plaintiffs, D. David Altman represents and warrants that he has been duly authorized by each and every client

who appears as Plaintiff in the case Hopkins, et al. v. Elano Corp., et al., U.S.D.C., S.D., Ohio, W. Div. Case No. C-3-88-0067, to sign this Consent Order on their behalf and in their stead and that each and every one of them intend to be fully bound by all terms and conditions of this Consent Order, and that he is possessed of documentation which establishes such authority.

XXVIII. AMENDING THE CONSENT ORDER

The Parties by agreement and subject to Court approval may amend any provision of this Consent Order or the incorporated Appendices. If agreement is reached on such an amendment, the Parties shall sign the document setting forth the amendment and submit such document to this Court for approval.

XXIX. COSTS

The Defendant shall pay all court costs.

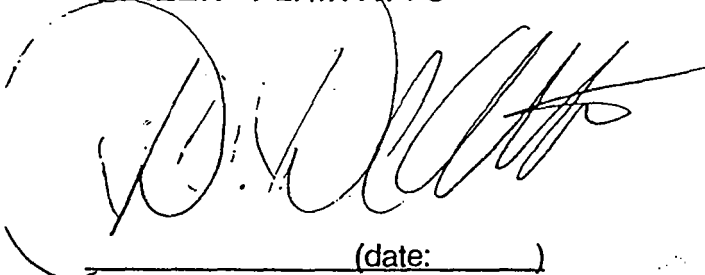
XXX. EFFECTIVE DATE

This Consent Order shall be effective upon the date of its entry by the Court.

ENTERED THIS 26th DAY OF June, 199~~5~~⁶. wnc

Walter H. H. H.
UNITED STATES DISTRICT JUDGE

CITIZEN PLAINTIFFS



(date: _____)

D. DAVID ALTMAN (0021457)

Trial Attorney

Counsel for Citizen Plaintiffs

CHERYL HOPKINS

JOSHUA E. KIPP BOONE

WILLIAM DEAN HOPKINS

ROBERT EUGENE DOWNEY

PATRICIA DOWNEY

DEBORAH DOWNEY

ELSIE HILL (deceased)

JACK HORSTMAN

BONNIE HORSTMAN

DONALD MCWHIRTER (deceased)

PATRICIA MCWHIRTER

WILLIAM F. O'BRIEN

ALTA O'BRIEN

WILLIAM K. WALKER

LOIS E. WALKER

ELIZABETH WALKER

MARY ANN K. (BARBRE) ATKINSON

WILLIAM ROBERT BARBRE

GERTRUDE WYATT

WILLIE WYATT

STATE OF OHIO, ex rel.
BETTY D. MONTGOMERY
ATTORNEY GENERAL OF OHIO

(date: _____)

TIMOTHY KERN (0034629)

Trial Attorney

Assistant Attorney General

Environmental Enforcement Section

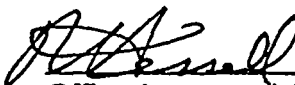
30 East Broad Street, 25th Floor

Columbus, Ohio 43266-0410

(614) 466-2766

Counsel for the State

ELANO CORPORATION

By:  (date: 2/12/90)
Officer's name (signature)

Robert Hessell

Officer's name (typed)

President

Officer's title (typed)

By: _____ (date: _____)

JOSEPH LONARDO (0016135)

Trial Attorney

Counsel for Defendant and Guarantor

VORYS, SATER, SEYMOUR & PEASE

52 East Gay Street

Columbus, Ohio 43215

CITIZEN PLAINTIFFS

STATE OF OHIO, ex rel.
BETTY D. MONTGOMERY
ATTORNEY GENERAL OF OHIO

(date: _____)
D. DAVID ALTMAN (0021457)
 Trial Attorney
 Counsel for Citizen Plaintiffs
CHERYL HOPKINS
JOSHUA E. KIPP BOONE
WILLIAM DEAN HOPKINS
ROBERT EUGENE DOWNEY
PATRICIA DOWNEY
DEBORAH DOWNEY
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WILLIAM F. O'BRIEN
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WILLIAM K. WALKER
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ELIZABETH WALKER
MARY ANN K. (BARBRE) ATKINSON
WILLIAM ROBERT BARBRE
GERTRUDE WYATT
WILLIE WYATT

Timothy Kern (date: 5/3/94)
TIMOTHY KERN (0034629)
 Trial Attorney
 Assistant Attorney General
 Environmental Enforcement Section
 30 East Broad Street, 25th Floor
 Columbus, Ohio 43266-0410
 (614) 466-2766

Counsel for the State

ELANO CORPORATION

By: *Robert Hessel* (date: 2/12/94)
 Officer's name (signature)

Robert Hessel

 Officer's name (typed)

President

 Officer's title (typed)

By: *Joseph Lonardo* (date: 3/4/96)
JOSEPH LONARDO (0016135)
 Trial Attorney
 Counsel for Defendant and Guarantor
VORYS, SATER, SEYMOUR & PEASE
 52 East Gay Street
 Columbus, Ohio 43215

4. At the present time, the ground water contamination at the Elano site appears to be contained within the upper aquifer of a two aquifer system. Contaminants in the upper aquifer include 1,1,1-Trichloroethane, Trichloroethene, Tetrachloroethene, 1,2-Dichloroethene and 1,1-Dichloroethane.
5. The aquifers at the Elano Site are comprised of sand and gravel deposits with ground water flow in a southerly direction from the Elano plant.
6. The lower aquifer supplies the South Beavercreek Municipal Well Field.
7. The upward pressure from the lower aquifer has helped to prevent contaminants in the upper aquifer from migrating to the lower aquifer. Water (.8 MGD) is being removed from the lower aquifer by the South Beavercreek well field resulting in the lessening of this artesian (upward) pressure.
8. The predominant contaminants at both the Elano Site and the Orchard Lane Site are volatile organic compounds (VOCs). The VOCs present at the Sites include:

1,1, Dichloroethane	1,1 Dichloroethene
1,1,1 Trichloroethane	trans 1,2 Dichloroethane
Trichloroethene	Tetrachloroethene
9. 1,1,1 Trichloroethane, 1,1 Dichloroethene, Trichloroethene, and Tetrachloroethane, 1,1 Dichloroethane, trans 1,2 Dichloroethene detected at the Elano and Orchard Land Sites became "industrial wastes" and/or "other wastes" as defined in ORC 6111.11(C) and (D), and/or "hazardous wastes" as defined in ORC Section 3734.01(J).
10. The migration and threatened migration of these industrial wastes

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Environmental Protection Agency Date 9/5/90

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and/or other wastes, into the soil, ground water, and surface water at or from the Site constitutes a discharge of industrial and/or other wastes into "waters of the State," as that term is defined in ORC Section 6111.01(H).

11. The discharge of industrial waste and/or other wastes into "waters of the State" is prohibited by ORC Section 6111.04 without a valid unexpired permit or renewal issued pursuant to ORC Sections 6111.01 - 6111.08. No permit was issued to Respondent.
12. The conditions at the Elano Site may constitute a threat to public health or safety or the environment or is causing or contributing to or threatening to cause or contribute to water pollution or soil contamination within the meaning of Section 3734.20(B).
13. Ground water contamination has been detected in the vicinity of the Orchard Lane Site south to the Little Miami River. The most probable source area of contamination appears to be the leachfield area. The direction of ground water flow in the upper aquifer at this Site is north to south towards the Little Miami River. The contamination at Orchard Lane Site appears to be confined to the upper aquifer.
14. The migration and threatened migration of these industrial wastes and/or other wastes, into the ground water, and/or surface water at or from the Orchard Lane site constitutes a discharge of industrial waste and/or other wastes into "waters of the state" as that term is defined in ORC Section 6111.01(H).
15. The discharge of industrial waste and other wastes into "waters of the state" is prohibited by ORC Section 6111.04 without a valid, unexpired permit or renewal issued pursuant to ORC Sections 6111.01 to 6111.08. No permit was issued to Respondent.

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PUBLIC SAFETY
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By: Carolyn P. ... Date 7/5/90

16. The conditions at the Orchard Lane Site may constitute a threat of public health or safety or the environment or is causing or contributing to or threatening to cause or contribute to water pollution or soil contamination within the meaning of 3734.20(B).
17. Respondent is a "person" as defined in ORC Sections 6111.01(I) and 3734.01(G).
18. As a result of hydrogeologic investigations conducted in 1989 (described in Northeast Beavercreek Trunk Sewer report of December 4, 1989), a potential mechanism for the migration of contaminated ground water from the upper aquifer to the lower aquifer has been suggested.
19. A plume of contaminants has been identified as moving in a southerly direction in the upper aquifer. If the contaminants move to the lower aquifer, the municipal well field may be threatened. These interim measures are necessary, in part, to evaluate and control this threat.
20. The Director has determined that the work required by the Orders, set forth below, is in the nature of interim measures only, designed to contain, abate, and mitigate contamination at or from the Sites. Interim activities required under these Orders are limited and not in lieu of and do not supercede or replace any Remedial Investigation/Feasibility Study to be otherwise performed at the Sites. The Director previously referred this entire matter to the Ohio Attorney General for enforcement. These Final Findings and Orders do not supercede or alter any aspect of that referral but only deal with administrative aspects of implementing these interim measures. Additional or supplemental orders may be negotiated or ordered in the future with respect to these matters.

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By Barbara M. Neidermeyer Date 9/5/90

21. The Director has given consideration to, and based his determination on evidence relating to the technical feasibility of complying with these Orders and on evidence relating to conditions calculated to result from compliance with these Orders, and its relation to the benefits to the people of the State of Ohio to be derived from such compliance in accomplishing the purpose of ORC Chapters 6111 and 3734.
22. A Phase I Remedial Investigation was conducted by Respondent during March 1987 to April 1988, with a Phase II Remedial Investigation and Feasibility Study tasked to the Elano Corporation pending an executed Consent Order. All activities in these Director's Findings and Orders shall be consistent with any future and/or ongoing Remedial Investigation/Feasible Study.
23. Respondent has agreed to voluntarily undertake action to implement interim measures to prevent the flow of contamination, to protect public health, and to protect the environment.

IV. ORDERS

Respondent shall perform the following work:

- 1: Within twenty five (25) calendar days of the effective date of these Orders, Respondent shall deliver to OEPA an Addendum to the Work Plan (which Work Plan is attached hereto as Attachment A). The addendum to the Work Plan shall include activities to be performed at each of the areas identified below as "Capture Areas" in the Phase I and Phase II activities. Such Work Plan and Addendum must receive OEPA approval and shall implement the following tasks:
 - a. establish a hydrogeologic gradient control to prevent further migration of contaminants from the facilities

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- at those areas now identified as "Capture" areas;
 - b. conduct hydrogeologic investigation and modeling which shall include, but need not be limited to, identifying all probable gradient influences that may affect the ground water gradient control action;
 - c. determine the appropriate method of discharge of contaminated ground water pumped from the Capture areas;
 - d. design, construct and install a ground water recovery and monitoring system.
2. These Orders shall be conducted in a phased approach. Phase I activities are immediately implementable. The necessity of Phase II activities will be determined from information gained in the Phase I activities and from information gained in the Northwest Beavercreek Trunk sewer investigation being conducted on behalf of or by Greene County, Ohio. The timing of Phase II Interim Actions, if any are necessary, will be determined by OEPA based upon submittals which will be subject to OEPA approval.
- a. The following Phase I Interim Actions already being initiated by respondent will continue until completion.
 - i. Creation of a capture zone south of the building at the 2455 Dayton-Xenia Road facility (Capture Area #1) to intercept and treat the flow of contaminated ground water leaving the Elano facility.
 - ii. Creation of a capture zone south of the leach field at the 530 Orchard Lane facility to intercept and treat contaminated ground water leaving the Orchard

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Date 9/5/70

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Lane (Enlo/Acme) facility (Capture Area #2).

- iii. Definition of the Elano contaminant plume south of U.S. 35. Both aquifers will require monitoring wells. The impact on the South Beaver creek well field will need to be determined.
 - iv. Definition of the contaminant plume on both sides of the Little Miami River in the vicinity of Orchard Lane. Both aquifers may require monitoring wells, depending on the results received from the investigation outlined above in paragraph 2.a.iii of this Article. The impact on the South Beaver creek well field will need to be determined.
 - v. Development of a regional ground water flow and particle transport model to help determine the impacts upon the Beaver creek well fields by the contaminant plumes.
- b. Anticipated Phase II Interim Actions include:
- i. Creation of a capture zone of the Elano contaminant plume near the intersection of Beaver Creek and Factory Road (Capture Area #3). Input from the Northeast Beaver creek Trunk Sewer investigation will help in determining the need for and timing of this Interim Action.
 - ii. Creation of a capture zone in the deep aquifer at the 2455 Dayton-Xenia Road facility (Capture Area #4). Contamination was detected in the PW-1 well at Elano in 1987. Interim Action should begin if the June 7, 1990 sampling detects volatile organics over the

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- iii. Creation of a capture zone south of U.S. 35 (Capture Area #5). The necessity for implementation of this Interim Action will be determined by OEPA based upon the Phase I monitor well results done south of U.S. 35, the ground water flow and particle transport model, and the Northeast Beaver Creek Trunk Sewer investigation. Additional Work Plans for phased activities shall be subject to conditions of this paragraph.
 - iv. Creation of a capture zone north of the Little Miami River in the vicinity of Dave Martin Oil (Capture Area #6).
 - v. Creation of a capture zone south of the Little Miami River, south of Capture Area #6 (Capture Area #7). The necessity of this Interim Action will be determined by OEPA based upon the monitor well results south of the river and based upon a determination that a plume is found to threaten any well field.
3. Within thirty (30) calendar days following receipt of OEPA's comments on the Work Plan and Addendum Respondent shall revise, if necessary, and resubmit the Work Plan addressing OEPA's comments. Within thirty (30) calendar days following OEPA approval or modification of any Work Plan Respondent shall begin to implement the Work Plan in accordance with the schedule contained therein.
 4. The Work Plans shall contain site safety and health plans previously submitted by Geraghty & Miller to OEPA and

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Subject to the date 9/5/90

incorporating OEPA's comments in connection with the remedial investigation/feasibility study work plan.

5. Respondent shall prepare and deliver to OEPA all reports required in these Orders or the Work Plans according to the schedules contained therein.
6. Beginning the month following the effective date of this Order and every month thereafter until termination of these Orders, Respondent shall provide to OEPA monthly progress reports by the 15th of each month, covering the previous month, that shall include, to the extent applicable and technically feasible:
 - a. A description and estimate of the percentage of the interim measures completed;
 - b. Summaries of all findings, including flow maps, and when appropriate, pumping rates and treatment efficiency;
 - c. Summaries of all changes made in the interim measures during the reporting period;
 - d. Summaries of all contacts with representatives of the local community, public interest groups or State government during the reporting period concerning work being done as a result of these Orders;
 - e. Summaries of all problems or potential problems encountered during the reporting period;
 - f. Actions being taken to rectify problems;
 - g. Changes in key personnel during the reporting period; and
 - h. Projected work for the next reporting period;
7. Respondent shall submit all raw data and all original reports of

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By: Carolyn Nicodinus Date 9/5/90

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analytical procedures and results to OEPA within fifteen (15) business days. After Respondent receives such raw data and reports from each laboratory involved in the analyses of any samples collected at or near the Site. Respondent may submit to OEPA any interpretive reports and written explanations concerning raw data and original laboratory reports. Such interpretive reports may not be submitted in lieu of original laboratory reports and raw data. Should Respondent subsequently discover any error in any report or raw data, it shall promptly notify OEPA of such discovery and provide the correct information.

V. ADMISSION

Nothing contained herein, nor the execution of this Administrative Order by Elano nor the performance of any act in compliance with the terms of this Administrative Order shall constitute an admission expressly or by implication, by Elano to the State of Ohio or any third-party, of any of the matters contained herein or of any violation of law or regulation or liability therefore. It is acknowledged that respondent has consented to perform the interim measures required by this Order without admission of the facts, statements or conclusions herein. Accordingly, this Administrative Order, its findings, statements and orders are in settlement of disputed claims.

VI. OTHER CLAIMS

Nothing in these Orders shall constitute or be construed as a release of Respondent from any claim of action or demand in law or equity or from any liability.

VII. OTHER APPLICABLE LAWS

All work required to be taken pursuant to these Orders shall comply with the requirements of applicable local, state, and federal laws and

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By: Carolyn M. Neidermeyer Date 9/5/90

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regulations and shall be consistent with the National Contingency Plan ("NCP") 40 CFR Part 300, as amended. Nothing in these Orders shall be construed as waiving or compromising in any way the applicability and enforcement of any other statutes or regulations applicable to Respondent's operation of its facilities. OEPA reserves all rights and privileges except as specified herein.

VIII. REIMBURSEMENT OF COSTS

OEPA has incurred and continues to incur oversight and response costs in connection with these interim measures. These costs are separate from those incurred in the general investigation of the site and surrounding area. Within thirty (30) days of the receipt of the first accounting of the costs incurred up to the effective date of the Order, Respondent shall pay to OEPA the amount of all oversight and response costs directly related to the interim remedial measures described in these Orders. At the termination of these Orders for interim action, OEPA shall submit to Respondent an itemized statement of such costs incurred by OEPA for the duration of these Orders. Following receipt of the itemized statement, Respondent shall, within thirty (30) calendar days, pay the oversight and response costs related to the interim remedial measures described in these Orders. Payment to OEPA shall be made to the Ohio Hazardous Waste Clean-up Special Account created by ORC Section 3734.28, by check, payable to "Treasurer, State of Ohio" and shall be forwarded to Counsel for Director of Environmental Protection, P. O. Box 1049, 1800 WaterMark Drive, Columbus, Ohio 43266-0149. A copy of the transmittal letter shall be sent to Ms. Patricia Campbell or successor, Fiscal Officer, Ohio EPA, Division of Emergency and Remedial Response, at the address listed above. OEPA or the State of Ohio may not collect under any separate

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By: Carolyn M. McCool Date 9/5/90

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consent decree, order, action or suit any costs related to interim measures paid pursuant to this Order.

IX. NOTICE

All documents demonstrating compliance with these Orders and other documents required under these Orders to be submitted to OEPA shall be addressed to:

Ohio Environmental Protection Agency
Southwest District Office
Attn: Greg Buttker (2 Copies)
40 South Main Street
Dayton, Ohio 45402

and

Ohio Environmental Protection Agency
1800 WaterMark Drive
P. O. Box 1049 (2 Copies)
Columbus, Ohio 43266-1049
Attn: Removal Coordinator, DERR

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unless otherwise specified in these Orders, or to such persons and addresses as may hereafter be otherwise specified in writing.

X. RESERVATION OF RIGHTS

Nothing contained herein shall be construed to prevent OEPA from (1) seeking legal or equitable relief to enforce the terms of these Orders including penalties against Respondents for noncompliance; (2) claims for natural resources damages; or (3) completing any work described in these Orders. OEPA reserves the right to take any enforcement action, or any action to recover costs. OEPA also reserves its rights to seek damages for injury to natural resources pursuant to any available legal authority. OEPA also reserves its rights to bring actions for past, present, or future violations of CRC Chapters 3734 or 6111, conditions at the facility, or releases of hazardous substances, hazardous wastes, industrial wastes or other wastes.

OEPA reserves the right to perform or require Respondent to perform

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By Carolyn Nicodemos Date 9/5/90

additional investigation, removal, or remediation pursuant to Chapters 3734 and/or 6111 of the Ohio Revised Code or other authority for these or any other conditions. While these Orders release not even the signatories hereto, they are specifically referenced. Nothing in these Orders shall constitute or be construed as a release from any claim or action or demand in law or equity against any person, firm, partnership or corporation not a signatory to these Orders for any liability arising out of or relating to these facilities.

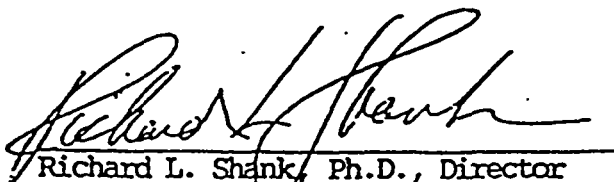
XI. TERMINATION

These Orders shall terminate upon Respondent's receipt of written notice from OEPA that Respondent has demonstrated to the satisfaction of OEPA, completion of all obligations of these Orders. These Orders may also be terminated by incorporation into the RI/FS being or to be conducted by Respondent under U.S. District Court Consent Order.

XII. SIGNATORIES

Each undersigned representative of a signatory to these Orders has certified that (s)he is fully authorized to enter into the terms and conditions of these Orders and to legally bind such signatory to this document.

IT IS SO ORDERED:


Richard L. Shank, Ph.D., Director
Ohio Environmental Protection Agency

SEP 5 1990
Date

OHIO E.P.A.

SEP -5 90

ENHANCED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: C. G. [Signature] Date 9/5/90

XIII. WAIVER AND AGREEMENT

These Orders resolve no claims, make no admission of fact, violation, or liability. Respondent agrees that these Findings and Orders are

lawful and reasonable, that the schedule provided for compliance herein is reasonable and that Respondent agrees to comply with these Orders.

Respondent hereby waives its right to appeal the issuance, terms, and service of these Orders, and hereby waives any and all rights they might have to seek judicial review of said Findings and Orders either in law or equity.

Notwithstanding the preceding, the Director and Respondent agree that in the event that these Findings and Orders are appealed by a third party, Respondent retains the right to intervene and participate without limitation in the third party's appeal. In such event, Respondent shall continue to comply with these Orders notwithstanding such appeal and intervention unless said Orders are stayed, vacated, or modified.

IT IS SO AGREED:

ELANO CORPORATION

By *Michael J. [Signature]*
Name and Title

Date *Aug 27, 1990*

OHIO E.P.A.

SEP -5 90

ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By *Carolee [Signature]* Date *9/5/90*

APPENDIX B

STATEMENT OF WORK FOR A REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) ELANO CORPORATION SITES IN GREENE COUNTY, OHIO

INTRODUCTION

The Independent Contractor shall develop and submit a Work Plan proposing work sufficient to complete a Remedial Investigation (RI) and a Feasibility Study (FS) of the Elano Corporation Sites in Greene County, Ohio (the Elano Sites). The objectives of the RI work shall be to characterize the Elano Sites for all Hazardous Substances that potentially pose a threat to human health and/or the environment. For the purposes of this RI/FS Statement of Work (RI/FS SOW), the term "Hazardous Substances" shall include all materials defined in Section I. Definitions, paragraph G. of this Consent Order. The RI work shall be sufficient to address and define state and federal requirements and identify general response actions and preliminary remediation goals. The FS work shall be sufficient to develop and evaluate Remedial Action alternatives for each proposed interim or final Remedial Action and/or identified operable unit which will effectively mitigate actual or potential threat(s) to human health and/or the environment resulting from the release or potential release of Hazardous Substances at or originating from the Elano Sites.

It is recognized that Elano has previously performed portions of the work outlined in this RI/FS SOW. While Ohio EPA recognizes the value of this work for indicating the course of future work, Ohio EPA has taken issue with the scope of the investigations and the conclusions contained in the investigative reports. The RI/FS Work Plan shall provide for investigative tasks sufficient to verify the data collected during these previous investigations using Ohio EPA approved methods.

The Independent Contractor shall furnish all personnel, materials and services necessary for, or incidental to, performing the RI/FS for the Elano Sites.

REMEDIAL INVESTIGATION

PURPOSE

The purpose of the RI shall be to determine the nature and extent of releases or potential releases of Hazardous Substances at or emanating from the Elano Sites and to gather all necessary data to support the Feasibility Study (FS) and the base-line Risk Assessment (RA). It is recognized that the RI and FS are interdependent and that it will be necessary to conduct portions of the RI and FS concurrently and in an iterative manner.

1.0 SCOPING

The Independent Contractor shall collect and analyze existing data so as to develop a conceptual model of the Elano Sites that can be used to assess both the nature and the extent of contamination, identify potential exposure pathways and potential human and environmental receptors, and develop general response actions and preliminary remedial alternatives. Data analyzed shall include but not be limited to:

1.1 Description of Current Conditions

The Independent Contractor shall submit for Ohio EPA approval a report providing the background information pertinent to the Elano Sites as set forth below. The data gathered during any previous investigations or inspections and other relevant data shall be included. Available references shall be used as appropriate.

1.1.1 Review and Analysis of Past Studies, Reports, and State's Comments

The Independent Contractor shall include within the Description of the Current Conditions an independent assessment of past studies, reports and state comments as part of the evaluation of current conditions at the Elano Sites. The Independent Contractor's review and assessment shall include but not necessarily be limited to the following information and documents:

- A. Reports generated during the investigation of contamination found in the Alpha area, including:
 - 1. Geraghty and Miller, 1988, Assessment of Hydrogeologic and Environmental Conditions in the Alpha, Ohio Area;
 - 2. Geraghty and Miller, 1988, Assessment of Hydrogeologic and Environmental Conditions at the Orchard Lane Area, Alpha, Ohio and
 - 3. Geraghty and Miller, 1990, Assessment of Ground-Water Flow and Quality in the Alpha, Ohio Area.
- B. Evaluation of the state's comment correspondence dated August 26, 1988 and June 9, 1989 relative to A.1. and A.2. above and the Geraghty and Miller Draft Phase II RI Work Plan;
- C. Evaluation of the reports prepared for Greene County, Ohio regarding the

installation of the Northeast Beaver creek trunk sewer, including:

1. Shaw, Weiss, and De Naples, 1989, Aquifer Tests Along the Northeast Beaver creek Trunk Sewer Project. Phase I.
 2. Shaw, Weiss, and De Naples, 1989, Aquifer Tests Along the Northeast Beaver creek Trunk Sewer Project. Phase II; and
 3. Shaw, Weiss, and De Naples, 1992, Aquifer Tests Along the Northeast Beaver creek Trunk Sewer Project. Phase III.
- D. Review of information contained in Ohio EPA's public files relative to the Elano Sites.
- E. Interviews with employees, officers and agents (past and present) of the Elano Corporation.

1.1.2 Site Background

The Independent Contractor shall prepare and include within the Description of the Current Conditions a summary of the regional location, pertinent area boundary features, and physical geography at and near the Elano Sites. The summary shall include characteristics such as surface hydrology, hydrogeology, and geology, and define the total area of the Elano Sites and the general nature of the problem, particularly the history relative to the use of the Elano Sites for Hazardous Substance disposal. The Independent Contractor shall assemble and discuss background information on land use, natural resources and climatology. The site background may reference applicable existing reports. The Independent Contractor shall, at a minimum, provide the following:

A. Map(s) depicting:

1. General geographic location;
2. Property lines, with the owners of all adjacent property clearly indicated;
3. Topography and surface drainage with appropriate contour interval and scale depicting all waterways, wetlands, flood plains, water features, drainage patterns, and surface water containment areas;
4. All tanks, buildings, utilities, paved areas, easements,

rights-of-way, and other features;

5. All known active or past Hazardous Substance treatment, storage or disposal areas and the dates of their operation;
6. All known past and present product and waste underground tanks or piping;
7. Surrounding land uses (residential, commercial, agricultural, recreational); and
8. The location of all wells. These wells shall be clearly labeled and ground and top of casing elevations and construction details shall be included (elevations and construction details may be included as an attachment). The Independent Contractor shall determine whether any of the identified wells are currently being used, particularly as a source of potable water.

All maps shall be consistent with the requirements set forth in 40 CFR 270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed at the Elano Sites.

- B. A history and description of ownership and operation (past and current), including: Hazardous Substance generation, treatment, storage and disposal activities at the Elano Sites;
- C. Approximate dates or periods of past product and Hazardous Substance spills or discharges, identification of the materials spilled or discharged, the amount spilled or discharged, the location where spilled or discharged, and a description of the response actions conducted (local, state, or federal response units or private parties), including any inspection reports or technical reports generated as a result of the response;
- D. A summary of past and present permits requested and/or received, any enforcement actions and their subsequent responses and a list of permit related documents and studies prepared for the Elano Sites;
- E. A summary of known or suspected source areas and areas of existing contamination referencing studies or sampling events leading to the confirmation of contamination;
- F. A summary of any previous response actions conducted by either local,

state, federal, or private parties, including inspection and other technical reports, and their results; and

- G. Plat maps of the Elano Sites and properties around the Elano Sites.

1.1.3 Nature and Extent of Contamination

The Independent Contractor shall prepare and include within the Description of the Current Conditions a summary of the actual and potential human health and environmental effects resulting from the release or threatened release of Hazardous Substances at or emanating from the Elano Sites. The summary shall include, but not be limited to, the types, physical states, and amounts of Hazardous Substances, the existence and conditions of drums, affected media and pathways of exposure, releases such as leachate or runoff, and any human and/or environmental exposure. Emphasis should be placed on describing the threat or potential threat to public health and/or the environment. Existing information should be referenced to the extent possible, with source references to be provided where existing data is used.

The summary shall include:

- A. All possible sources of contamination, including identification of all regulated units, solid waste management units, and any other suspected Hazardous Substance source areas. For each area, the following shall be identified:
1. Location of unit/area (which shall be depicted on a map);
 2. Quantities of Hazardous Substances and/or affected media;
 3. Hazardous Substances to the extent known; and
 4. Areas where additional information is necessary.
- B. An assessment and description of the existing degree and extent of Hazardous Substance contamination for the Elano Sites, including:
1. Available monitoring data for all media sampled and information on locations and levels of contamination at the Elano Sites;
 2. All potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and

3. The potential impact(s) on human health and the environment, including demography, ground-water and surface water use, and land use.

1.1.4 Review and Integration of Interim Actions

The Independent Contractor shall review and analyze the Interim Actions which are being undertaken at the Elano Sites under the September 5, 1990 Director's Final Findings and Orders. The purpose of the review shall be to ensure that the Interim Actions taken are consistent with the conceptual model for the sites and to identify any need for additional monitoring to ensure that response objectives for the systems are being met. The Independent Contractor shall include within the Description of Current Conditions identification of any problems with the Interim Actions and suggestions for any corrections.

1.1.5 Annotated Bibliography

The Independent Contractor shall include within the Description of Current Conditions an annotated bibliography of existing reports for the Elano Sites, including reports relevant to the RI/FS. Upon request, the Independent Contractor shall provide copies of the reports to Ohio EPA.

1.2 Preinvestigation Evaluation of Remedial Action Technologies

Once the existing information for the Elano Sites has been analyzed, the Independent Contractor shall prepare a Preinvestigation Evaluation report for the Elano Sites and for any identified Operable Units. The report shall identify potential Remedial Action objectives (including preliminary remediation goals) for each contaminated medium, a preliminary range of potential remedial technologies and associated process options, and broadly defined remedial alternatives. The Independent Contractor shall also specify data that will need to be collected in order to evaluate identified technologies and process options. A preliminary identification of Federal ARARs, State requirements, and To Be Considered (TBC) information which may influence selection of the technologies and process options under consideration shall also be included.

The Remedial Action objectives, technologies, process options and alternatives shall be based upon the initially identified potential routes of exposure and associated receptors. The purpose of the Preinvestigation Evaluation shall be to ensure that 1) the data needed to evaluate potential remedial technologies, process options and alternatives during the FS are collected during the RI, and 2) Federal ARARs, State requirements, and To Be Considered (TBC) information which may influence remediation of the Elano Sites have been considered. Due to the iterative nature of the

RI/FS process, Federal ARAR, State requirement and TBC identification will continue throughout the process.

- A. Technologies that may be appropriate for treating, containing, or disposing of wastes shall be identified, along with sources of literature on the technologies' effectiveness, applications, and cost. Innovative technologies and resource recovery options are to be included if they appear feasible.
- B. The Independent Contractor shall develop and include within the Pre-Investigation Evaluation Report a preliminary list of broadly defined remedial alternatives which reflect the goal of preserving a range of alternatives in which treatment that significantly reduces the toxicity, mobility, or volume of waste is a principal element; one or more alternatives that involve containment with little or no treatment; a limited number of ground-water alternatives that attain site-specific remediation levels within different time frames, and a no action alternative.
- C. For those remedial alternatives involving treatment, the Independent Contractor shall evaluate the need for treatability studies as early in the RI/FS process as possible. The need for such studies shall be included in the Pre-Investigation Evaluation Report.

1.2.1 Limited Additional Studies to Facilitate Project Scoping

The Independent Contractor may propose limited studies as interim scoping tasks for those areas of the Elano Sites where the understanding of potential contamination is poor and the collection of site-specific data would enhance the scoping effort. Such studies shall be limited to the collection of readily obtainable data where results can be achieved in a short time, and shall be undertaken prior to or concurrent with the development of the RI/FS Work Plan. Based on the results of these studies, potential release sites will either be eliminated from further investigation or carried forward into the RI/FS. This evaluation will be documented in the RI/FS Work Plan. The need to conduct limited additional studies must be concurred upon by Ohio EPA. Work plans for such work must be approved by Ohio EPA prior to implementation.

1.2.2 Identification of Data Needs and Data Usage

Based on the objectives of the RI, the review of existing information, and the development of the initial alternatives, the Independent Contractor shall identify data

which needs to be collected during the RI, the intended uses for the data, and the associated data quality objectives (DQOs). At a minimum, data shall be collected which will:

- A. Define source areas of contamination;
- B. Define the nature and vertical and horizontal extent of contamination;
- C. Define potential pathways of contaminant migration;
- D. Define potential receptors;
- E. Allow a determination of whether and to what extent a threat to human health or the environment exists (sufficient to support the Risk Assessments); and
- F. Allow development and evaluation of the Remedial Action alternatives.

The identification of data needs shall be coordinated with the expected uses for the data and the DQOs. The Independent Contractor shall identify the intended uses for the data, and its adequacy in meeting the objectives of the RI/FS.

The Independent Contractor shall submit the Pre-Investigation Evaluation Report as a Technical Memorandum to Ohio EPA for review and comment prior to beginning RI field work. Following Ohio EPA review and comment, the Independent Contractor shall incorporate the Pre-Investigation Evaluation Report into the RI/FS Work Plan in order to document the RI/FS project scoping.

2.0 PROJECT MANAGEMENT PLAN, RI/FS WORK PLAN AND SUPPORTING DOCUMENTS

Prior to starting the RI field work, the Independent Contractor shall concurrently develop and submit for Ohio EPA review and approval a Project Management Plan, RI/FS Work Plan (Work Plan), Sampling and Analysis Plan (SAP), Health and Safety Plan (HSP) and Community Relations Plan (CRP) for the Elano Sites and, as appropriate, for any identified Operable Units.

2.1 Project Management Plan

The Independent Contractor shall prepare a Project Management Plan which will

include a discussion of the technical approach, schedules, and personnel. The Project Management Plan will also include a description of qualifications of personnel directing or performing the RI, including contractor and subcontractor personnel. This plan shall also document the overall management approach to the RI, including project file requirements and project-related progress reporting procedures and documents. The Project Management Plan may be incorporated into the RI/FS Work Plan.

2.2 RI/FS Work Plan

The Work Plan shall incorporate the decisions and evaluations made during the scoping process and detail the specific RI investigative tasks and FS evaluation procedures which will be utilized. The Work Plan shall provide schedules fixed in real time for accomplishing the RI/FS work. Following Ohio EPA approval of the RI/FS Work Plan and supporting documents, the Independent Contractor shall implement the work in accordance with the schedules described therein. The Work Plan shall at a minimum include the following elements which are further described in Sections 3 through 8:

A. Introduction

A general explanation of the reasons for the RI/FS and the presentation of the expected results or goals of the RI/FS process;

B. Site Background and Physical Setting

A description of the current understanding of the physical setting of the Elano Sites, the history of the Elano Sites, and the existing information on the condition of the Elano Sites;

C. Initial Evaluation

A presentation of the conceptual site model developed during scoping, including descriptions of the potential migration and exposure pathways and the preliminary assessment of human health and environmental impacts;

D. Work Plan Rationale

A documentation of the data requirements for the human health and environmental risk assessments and the alternatives evaluation based on the Data Quality Objectives, and the work plan approach illustrating how the activities will satisfy data needs; and

E. RI/FS Tasks

A presentation of the tasks to be performed during the RI/FS which incorporates RI site characterization tasks identified in the SAP, data evaluation methods identified during scoping, and a description of the tasks to be conducted following site characterization. At a minimum, RI/FS tasks shall include the following:

1. Project Planning (Scoping);
2. Community Relations (Ohio EPA PIC to take lead);
3. Field Investigation (to include provisions for collecting, storing, testing and disposing of project generated wastes);
4. Sample Analysis/Validation;
5. Data Evaluation;
6. Assessment of Risks;
7. Treatability Study/Pilot Testing;
8. Remedial Investigation (RI) Reports;
9. Remedial Alternatives Development/Screening;
10. Detailed Analysis of Remedial Alternatives;
11. Feasibility Study (FS) Reports;
12. Post RI/FS Support; and
13. Miscellaneous Support.

2.3 Sampling and Analysis Plan (SAP)

The Independent Contractor shall prepare a Sampling and Analysis Plan to document all monitoring, investigative, and analytical procedures: sampling, field measurements, sample analysis, toxicity testing, bioassays, and all modeling performed during the investigation to characterize the environmental setting, source(s), contamination, and human and biological receptors to ensure that all information, data and resulting decisions are technically sound, statistically valid and properly documented. The SAP shall consist of two basic parts: (1) the Quality Assurance Project Plan (QAPP); and (2) the Field Sampling Plan (FSP). The Independent Contractor shall schedule a meeting with Ohio EPA to discuss the requirements of this plan.

2.3.1 Quality Assurance Project Plan (QAPP)

The QAPP shall describe the policy, organization, functional activities, and quality assurance and quality control protocols necessary to achieve Data Quality Objectives dictated by the intended use of the data, and shall comport with Ohio EPA's Guidelines and Specifications for Preparing Quality Assurance Project Plans.

A. Data Collection Strategy

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

1. Description of the types and intended uses for the data, relevance to remediation or restoration goals, and the necessary level of precision, accuracy, and statistical validity for these intended uses;
2. Description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data;
3. Description of the rationale used to assure that the data accurately and precisely represent a characteristic of a population, variation of physical or chemical parameters throughout the Elano Sites, a process condition or an environmental condition. Factors which shall be considered and discussed include, but are not limited to:
 - a. Environmental conditions at the time of sampling;
 - b. Sampling design (including number, location and distribution);
 - c. Representativeness of selected media, exposure pathways, or receptors;
 - d. Representativeness of selected analytical parameters;
 - e. Representativeness of testing procedures and conditions; and
 - f. Independence of background or baseline from site influences.

4. Description of the measures to be taken to assure that the following data sets can be compared quantitatively or qualitatively to each other:
 - a. RI data collected by the Independent Contractor over some time period;
 - b. RI data generated by an outside laboratory or consultant employed by the Independent Contractor versus data collected by the Independent Contractor; and
 - c. Data generated by separate consultants or laboratories over some time period not necessarily related to the RI effort; and
 - d. Data generated by Ohio EPA or by an outside laboratory or consultant employed by Ohio EPA.

5. Details relating to the schedule and information to be provided in quality assurance reports. These reports should include but not be limited to:
 - a. Periodic assessment of measurement data accuracy, precision and completeness;
 - b. Results of performance audits;
 - c. Results of system audits;
 - d. Significant quality assurance problems and recommended solutions; and
 - e. Resolutions of previously stated problems.

B. Sample Analysis

The Sample Analysis section of the QAPP shall specify the following:

1. Chain-of-custody procedures, including:

- a. Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment and verify the data entered onto the sample custody records;
 - b. Provision for a laboratory sample custody log consisting of serially numbered lab-tracking report sheets; and
 - c. Specification of laboratory sample custody procedures for sample handling, storage and dispersment for analysis.
2. Sample storage procedures and storage times;
 3. Sample preparation methods;
 4. Analytical procedures, including:
 - a. Scope and application of the procedure;
 - b. Sample matrix;
 - c. Potential interferences;
 - d. Precision and accuracy of the methodology;
 - e. Method detection limits;
 - f. Special analytical services required to ensure contract required detection limits do not exceed known toxicity criteria; and
 - g. Verification and reporting of tentatively identified compounds.
 5. Calibration procedures and frequency;
 6. Data reduction, validation and reporting;
 7. Internal quality control checks, laboratory performance and system audits and frequency, including:

- a. Method blanks(s);
 - b. Laboratory control sample(s);
 - c. Calibration check sample(s);
 - d. Replicate sample(s);
 - e. Matrix-spiked sample(s);
 - f. "Blind" quality control sample(s);
 - g. Control charts;
 - h. Surrogate samples;
 - i. Zero and span gases; and
 - j. Reagent quality control checks.
8. Preventative maintenance procedures and schedules;
 9. Corrective action (for laboratory problems); and
 10. Turnaround-time.

C. Modeling

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

1. Model assumptions and operating conditions;
2. Input parameters; and
3. Verification and calibration procedures.

D. In Situ or Laboratory Toxicity Tests

The Toxicity Test section of the QAPP shall apply to all tests or bioassays

used to predict or describe impacts of contaminants on a population, community, or ecosystem level.

E. Data Record

The QAPP shall also provide the format to be used to present the raw data and the conclusions of the investigation, as described in 1, 2, and 3 below:

1. The data record shall include the following:
 - a. Unique sample or field measurement code;
 - b. Sampling or field measurement location and sample or measurement type;
 - c. Sampling or field measurement raw data;
 - d. Laboratory analysis ID number;
 - e. Property or component measured; and
 - f. Result of analysis (e.g., concentration).
2. Tabular Displays
 - a. Unsorted (raw) data;
 - b. Results for each medium, organism, or for each constituent measured;
 - c. Data reduction for statistical analysis;
 - d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography, vegetation form);
 - e. Summary data (i.e., mean, standard deviation, min/max values, and sample number); and
 - f. Comparisons with background or reference data.

3. Graphical Displays

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

- a. Display sampling locations and sampling grid;
- b. Indicate boundaries of sampling area, and areas where more data is required;
- c. Display levels of contamination at each sampling location or location from which organism was taken;
- d. Display geographical extent of contamination;
- e. Display contaminant levels, averages and maxima;
- f. Illustrate changes in concentration in relation to distance from the source, time, depth, or other parameters;
- g. Indicate features affecting intramedia transport and show potential receptors;
- h. Compare nature and extent of contamination with the results of ecological or biological sampling or measurements; and
- i. Display comparisons with background or reference analyses or measurements.

2.3.2 Field Sampling Plan (FSP)

The FSP shall provide guidance for all proposed fieldwork by defining in detail the sampling and data-gathering methods to be employed.

A. Sampling

The sampling section of the FSP shall discuss:

1. Sufficient preliminary sampling to ensure the proper planning of 2 through 15 below;
2. Selecting appropriate sample locations, depths, vegetation strata, organism age, etc. and rationale for same;
3. Providing a sufficient number of samples to meet statistical or other data usability objectives;
4. Measuring all necessary ancillary data such as ambient conditions, baseline monitoring, etc.;
5. Determining environmental conditions under which sampling should be conducted;
6. Determining which media, pathways, or receptors are to be sampled (e.g., ground water, air, soil, sediments, biota, etc.);
7. Determining which parameters are to be measured and where;
8. Selecting the frequency and length of sampling period;
9. Selecting the sample design (e.g., composites, grabs, random, repeated, etc.);
10. Selecting the number, location, media or organisms for determining background conditions or reference conditions (refer to Appendix B, Background Sampling Guidance, of Ohio EPA's How Clean Is Clean Policy);
11. Measures to be taken to prevent contamination of the sampling equipment and cross contamination between sampling points;
12. Documenting field sampling operations and procedures, including:
 - a. Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters, adsorbing reagents);
 - b. Procedures and forms for recording the exact location and specific considerations associated with sample acquisitions;

- c. Documentation of specific sample preservation method;
 - d. Calibration of field devices;
 - e. Collection of replicate and field duplicate samples;
 - f. Submission of field-biased and equipment blanks where appropriate;
 - g. Potential interferences present at the site or facility;
 - h. Construction materials and techniques associated with monitoring wells and piezometers;
 - i. Field equipment listing and sample containers;
 - j. Sampling order; and
 - k. Decontamination procedures.
13. Selecting appropriate sample containers;
14. Sample preservation; and
15. Chain of custody, including:
- a. Standardize field tracking reporting forms to establish sample custody in the field prior to and during shipment;
 - b. Sample sealing, storage and shipping procedures to protect the integrity of the sample; and
 - c. Pre-prepared sample labels containing all information necessary for effective sample tracking.

B. Field Measurements

The field measurement section of the FSP shall discuss:

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

2. Providing a sufficient number of field measurements that meet statistical or data usability objectives;
3. Measuring all necessary ancillary data such as ambient or baseline environmental conditions;
4. Determining conditions under which field measurement should be conducted;
5. Determining which media, pathways, or receptors are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, biota, etc.);
6. Determining which physical, chemical, or biological parameters are to be measured and where;
7. Selecting the frequency and duration of field measurement; and
8. Documenting field measurement operations and procedures, including:
 - a. Procedures and forms for recording raw data and the exact location, time and site or facility specific considerations associated with the data acquisition;
 - b. Calibration of field devices;
 - c. Collection of replicate measurements;
 - d. Submission of field-biased blanks, where appropriate;
 - e. Potential interferences present at the site or facility;
 - f. Construction materials and techniques associated with monitoring wells and piezometers used to collect field data;
 - g. Field equipment listing;
 - h. Order in which field measurements were made; and
 - i. Decontamination procedures.

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

The FSP must be written so that a sampling team unfamiliar with the Elano Sites would be able to gather the samples and field information required.

2.4 Health and Safety Plan (HSP)

The Independent Contractor shall develop a Health and Safety plan (HSP) to protect the health and safety of personnel involved in the site investigations and the surrounding community.

A. Major elements of the HSP shall include:

1. Facility or site description including availability of resources such as roads, water supply, electricity and telephone service;
2. Description of known hazards with an evaluation of the risks associated with the release(s) and with each activity conducted;
3. Listing of key personnel (including the site safety and health officer) and alternates responsible for site safety, response operations, and for protection of public health;
4. Delineation of work area, including a map;
5. Description of levels of protection to be worn by personnel in the work area;
6. Description of the medical monitoring program for on-site responders;
7. Description of standard operating procedures established to assure the proper use and maintenance of personal protective equipment;
8. The establishment of procedures to control site access;
9. Description of decontamination procedures for personnel and equipment;
10. Establishment of site emergency procedures;

11. Availability of emergency medical care for injuries and toxicological problems;
12. Description of requirements for an environmental monitoring program. (This should include a description of the frequency and type of air and personnel monitoring, environmental sampling techniques and a description of calibration and maintenance of the instrumentation used.);
13. Specification of any routine and special training required for responders; and
14. Establishment of procedures for protecting workers from weather related problems.

B. The HSP shall be consistent with:

1. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
2. Section 111(c)(6) of CERCLA;
3. EPA Order 1440.3 – Respiratory Protection;
4. EPA Order 1440.2 – Health and Safety Requirements for Employees Engaged in Field Activities;
5. EPA Occupational Health and Safety Manual;
6. EPA Interim Standard Operating Safety Procedures and other EPA guidance as developed by EPA;
7. OSHA regulations particularly in 29 CFR 1910 and 1926;
8. State and local regulations; and
9. Site or facility conditions.

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

2.5 Community Relations Plan (CRP)

Under the direction of Ohio EPA's Public Interest Center (PIC), the Independent Contractor shall develop a Community Relations Plan for the Elano Sites for dissemination of information to the public regarding investigation activities and results. The CRP shall be based on interviews with interested people in the community and will provide the guidelines for future community relations at the Elano Sites. The CRP shall follow U.S. EPA's guidance Community Relations in Superfund, (U.S. EPA, Interim, June 1988) and shall be submitted to Ohio EPA for review and approval.

At a minimum, the CRP must provide for:

- A. Establishment of conveniently located community information repository(ies);
- B. A mailing list;
- C. Preparation and dissemination of news releases, fact sheets, and exhibits and materials designed to apprise the community of current or proposed activities;
- D. Arrangements for conducting formal and informal public meetings, project review meetings, and other meetings as necessary;
- E. A summary of public comments on the RI/FS reports and proposed plans along with responses to those comments; and
- F. The means of coordination between the parties to this agreement when disseminating public information (e.g., prior notice, interagency review, etc.).

Under the direction of Ohio EPA PIC, the Independent Contractor shall perform the specific community relations requirements for each phase of the RI/FS as outlined in Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, (U.S. EPA, Interim Final, October, 1988).

3.0 INVESTIGATION OF SITE PHYSICAL CHARACTERISTICS

The Independent Contractor shall collect data on the physical characteristics of the Elano Sites and surrounding areas to the extent necessary to define potential transport

pathways and receptor populations and to provide sufficient engineering data for development and screening of Remedial Action alternatives. Needed information can be categorized as surface features (including natural and artificial features), geology, soils, surface water hydrology, hydrogeology, meteorology, human populations, land use(s) and ecology.

3.1 Surface Features

Surface features may be described using aerial photography, surveying and mapping, and site inspection. These features are to include but are not limited to:

- A. Surface disposal areas;
- B. Facility dimensions and locations (buildings, tanks, piping, etc.);
- C. Fencing
- D. Property lines and utility lines;
- E. Roadways and railways;
- F. Drainage ditches;
- G. Leachate springs;
- H. Surface water bodies;
- I. Vegetation;
- J. Topography;
- K. Residences; and
- L. Commercial buildings.

The Independent Contractor shall document the procedures used in making the above determinations.

3.2 Geology

The investigation of site geology should be tailored to ensure the identification of those features that will affect the fate and transport of Hazardous Substances. This investigation shall include but not be limited to:

- A. A determination of the regional geology from available information;
- B. A reconnaissance mapping of the area, which may include geophysical investigations on site;
- C. Subsurface exploration;
- D. A characterization of the unconsolidated overburden and soil deposits

(thickness and aerial extent of units, lithology, mineralogy, particle size, sorting, porosity, etc.); and

- E. A characterization of the bedrock (type, lithology, petrology, structure, discontinuities, unusual features, such as dikes, karst, etc.).

The Independent Contractor shall document the procedures used in making the above determinations.

3.3 Hydrogeology

The Independent Contractor shall perform a site-wide hydrogeologic study to evaluate the subsurface geology, water bearing formations, and the nature and extent of ground-water contamination. The study shall determine the location of water bearing formations, confining lenses, bedrock, and other subsurface geologic features, and shall support the determination of the vertical and horizontal distribution of Hazardous Substances. The study shall also support the prediction of the long term disposition of any identified Hazardous Substances. Efforts should begin with a survey of previous hydrogeologic studies and other existing data.

A detailed technical description of all methods to be used in gathering data for this task shall be included in the RI/FS Work Plan. This shall include a diagrammatic representation of proposed monitoring well locations, monitoring well design and construction, information on construction materials, drilling techniques, and well development methods.

The hydrogeologic investigation shall provide the following information for the region, for the Elano Sites, and as appropriate, for localized areas within the Elano Sites:

- A. A description of the geologic and hydrogeologic features affecting ground-water flow beneath the Elano Sites, including:
 - 1. Stratigraphy: description of strata including strike and dip identification of stratigraphic contacts;
 - 2. Structural geology: description of local and regional features (e.g., folding, faulting, jointing, etc.);
 - 3. Depositional history;

4. Identification and characterization of areas and amounts of recharge and discharge;
 5. Ground-water flow patterns; and
 6. Seasonal variations in the ground-water flow regime.
- B. An analysis of any topographic features that might influence the ground-water flow system.
- C. Based on field data, tests, and cores, a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the Elano Sites (i.e., the aquifers and any intervening saturated and unsaturated units), including but not limited to:
1. Hydraulic conductivity (vertical and horizontal) and porosity (total and effective), permeability, and bulk density;
 2. Storativity and transmissivity;
 3. Lithology, grain size, sorting, degree of cementation;
 4. A determination of hydraulic inter-connections between saturated zones;
 5. The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content, etc.); and
 6. A chemical analysis of the natural earth materials.
- D. Based on field data and cores, structural geology and hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways, identifying:
1. Sand, gravel, and other unconsolidated deposits;
 2. Zones of fracturing or channeling in consolidated or unconsolidated deposits;

3. Zones of higher permeability or lower permeability that might direct and restrict the flow of contaminants;
 4. Aquifers: geologic formations, groups of formations, or parts of formations capable of yielding usable amounts of ground water to wells or springs;
 5. Springs and seeps; and
 6. Water bearing zones above the first confining layer that may serve as a pathway for contaminant migration including perched zones of saturation.
- E. Based on data obtained from ground-water monitoring wells and piezometers installed upgradient and downgradient of potential contaminant sources, a representative description of water level or fluid pressure monitoring including:
1. Water level contour and/or potentiometric maps reflecting seasonal fluctuations;
 2. Hydrologic cross sections showing vertical gradients;
 3. Flow nets, including the vertical and horizontal components of flow and the interconnection between water bearing strata; and
 4. Any temporal changes in hydraulic gradients and flow directions, for example, due to seasonal influences.
- F. A description of man-made influences that may affect the hydrogeology of the Elano Sites, identifying:
1. Active and inactive local water supply and production wells with an approximate schedule of pumping; and
 2. Man-made hydraulic structures (pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas, utility lines, etc.).

The Independent Contractor shall document the procedures used in making the above determinations.

3.4 Residential Well Investigation

The Independent Contractor shall collect all available data pertinent to the residential and municipal wells within a two mile radius of the Elano Sites. This shall include but not be limited to previous analyses, well logs, methods of installation and depths. The Independent Contractor shall determine whether any of the identified wells are currently being used, particularly as a source of potable water. The Independent Contractor shall then prepare a sampling plan (to be included in the RI/FS Work Plan) to analyze samples collected from residential wells in the immediate vicinity of the Elano Sites and additional residential wells downgradient of the Elano Sites. Water samples shall be analyzed for all TCL parameters.

The Independent Contractor shall document the procedures used in making the above determinations.

3.5 Soil and Sediments Investigations

The Independent Contractor shall conduct a program to characterize the soil and rock units in the vicinity of the contaminant release(s). This process may overlap with certain aspects of the hydrogeologic study (e.g., characteristics of soil strata are relevant to both the transport of contaminants by ground water and to the locations of contaminants in the soil). A survey of existing data on soils and sediments may be useful. The characterization may include, but not be limited to, the following information:

- A. Soil classification (Unified Soil Classification System);
- B. Surface soil distribution;
- C. Soil profile, including ASTM classification of soils;
- D. Transects of soil stratigraphy;
- E. Hydraulic conductivity (saturated and unsaturated);
- F. Relative permeability;
- G. Bulk density;
- H. Porosity;
- I. Soil sorptive capacity;
- J. Cation exchange capacity (CEC);
- K. Soil organic content;
- L. Soil pH;
- M. Particle size distribution;
- N. Depth to water table;
- O. Moisture content;
- P. Effect of stratification on unsaturated flow;
- Q. Infiltration;

- R. Evapotranspiration;
- S. Storage capacity;
- T. Vertical flow rate; and
- U. Mineral content.

The Independent Contractor shall document the procedures used in making the above determinations.

3.6 Surface Water Investigation

The Independent Contractor shall include a program to characterize site surface water bodies. This investigation may overlap with the soils and sediments investigation as data from stream and pond sediment samples may be relevant to surface water quality. Surface water characterization may include, but not be limited to, the following activities and information:

- A. A description of the temporal and permanent surface water bodies including:
 - 1. For lakes and estuaries: location, elevation, surface area, inflow, outflow, depth, temperature stratification and volume;
 - 2. For impoundments: location, elevation, surface area, depth, volume, freeboard, and purpose of impoundment;
 - 3. For streams, ditches, drains, swamps, and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (i.e., 50 and 100 year events);
 - 4. Drainage patterns;
 - 5. Evapotranspiration; and
 - 6. Any other known discharges including those permitted by NPDES.
- B. A description of the chemistry of the surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients, chemical oxygen demand, and total and dissolved organic carbon.

C. A description of sediment characteristics including:

1. Deposition area, patterns, and rates;
2. Thickness profile; and
3. Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, pH, etc.).

The Independent Contractor shall document the procedures used in making the above determinations.

3.7 Meteorologic Investigation

The Independent Contractor shall conduct a program to characterize meteorologic conditions in the vicinity of the Elano Sites for purposes of evaluating atmospheric contaminant transport mechanisms, contaminant dispersion, and potential areas of contaminant deposition.

A. The Independent Contractor shall provide information characterizing the climate in the vicinity of the Elano Sites. The characterization shall include, but not be limited to, the following information:

1. Annual and monthly rainfall averages, along with maximum and minimum values;
2. Monthly temperature averages and extremes;
3. Wind speed and direction; average, maximum and minimum monthly and annual values;
4. Relative humidity/dew point;
5. Atmospheric pressure;
6. Evaporation data;
7. Development of inversions; and
8. Climate extremes that have been known to occur in the vicinity of the Elano Sites, including frequency of occurrence.

B. The Independent Contractor shall also include a description of topographic and man-made features which affect air flow and emission patterns, including:

1. Ridges, hills or mountain areas;
2. Canyons or valleys;
3. Surface water bodies (e.g., rivers, lakes, bays, etc.);
4. Wind breaks and forests; and
5. Buildings.

The Independent Contractor shall document the procedures used in making the above determinations.

3.8 Human Populations and Land Use

The Independent Contractor shall collect such data as is necessary to sufficiently identify, enumerate, and characterize human populations potentially exposed to contaminants released from the Elano Sites. For each potentially exposed population, information shall be collected on population size and location. Special consideration is to be given to identification of potentially sensitive subpopulations (e.g., pregnant women, infants, elderly) to better facilitate the characterization of risks posed by contaminants exhibiting specific effects (e.g., irritants, carcinogens, mutagens, etc.). Census and other survey data may be used to identify and describe the population potentially exposed to contaminated media. Data describing the type and extent of human contact with contaminated media shall also be collected, including but not limited to:

A. Location and use of surface waters, including:

1. Drinking water intakes;
2. Recreational (swimming, fishing) areas; and
3. Connections between surface water bodies.

B. Local use of ground water as a drinking water source, including:

1. Number and location of wells; and
2. Population served.

C. Human use or access to the Elano Sites and adjacent areas, including:

1. Residential use;
2. Commercial use;
3. Recreational use;
4. Agricultural use; and
5. Industrial use.

D. Location of population with respect to the Plant, including proximity, prevailing wind direction, and surface waters.

The Independent Contractor shall document the procedures used in making the above determinations.

3.9 Ecological Investigations

The Independent Contractor shall conduct an investigation to characterize any adverse effects to flora and fauna, at the population, community or ecosystem level, that is or has been caused or influenced by contamination from the Elano Sites. The activities described in this section may be performed iteratively and/or in a phased approach as more data is gathered during other portions of the RI.

A. Site Characterization

Based on the review of existing data and limited field work as appropriate, the Independent Contractor shall consider the following:

1. See Section 1, Scoping, above;
2. Identification of potential and probable exposure points for ecological receptors; and
3. Additional data needs for site characterization and the rationale for its necessity.

B. Additional Site Characterization (to be performed during the RI)

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

1. Habitat identification and evaluation;
2. Semiquantitative surveys of flora and fauna which shall include, but not be limited to:
 - a. All vegetative strata;
 - b. Flora and fauna in all contaminated media;
 - c. Population parameters (e.g., density, frequency, age distribution); and
 - d. Community parameters (e.g., diversity, structure, stability)
3. Identification of background or reference area for each exposed population, community or ecosystem;
4. Additional sampling of media and biota for determination of contaminant concentrations or intakes; and
5. Toxicity tests.

C. Initial Toxicity Assessment (to be performed in conjunction with B. above)

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

D. Preliminary Ecological Assessment

The Independent Contractor shall combine the results of A, B and C above in order to define or evaluate the following on a site-specific basis:

1. Initial identification of exposure pathways and ecological receptors;
2. The potential for current or adverse effects to occur on a population, community or ecosystem level; and
3. Determine the need for further ecological studies.

E. Phase II Ecological Assessment

The Independent Contractor shall prepare an amendment to the RI/FS work plan that shall include the following:

1. Study objectives and relevance to risk assessment objectives;
2. Identification of ecological measurement endpoints, assessment endpoints and endpoint selection criteria;
3. Semiquantitative and quantitative survey of flora and fauna;
4. Chemical sampling in potentially exposed habitats and reference sites;
5. Laboratory and in situ toxicity testing; and
6. Tissue analysis.

F. Ecological Assessment Technical Memorandum

The Independent Contractor shall prepare a Technical Memorandum which includes the results of A through E above for incorporation into the Environmental Risk Assessment.

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

4.0 SOURCE CHARACTERIZATION

The Independent Contractor shall collect such data as is necessary to adequately characterize the sources of Hazardous Substances. Special attention shall be paid to the areas where wastes have been placed, collected, or removed including: type, quantity, physical form, disposition (containment or nature of deposit), site characteristics affecting release (e.g., facility security and engineered barriers), and chemical composition of contaminants. The investigation shall identify the locations and probable quantities of subsurface wastes, such as buried drums, through the use of appropriate geophysical methods. Wherever feasible, the Independent Contractor shall

also propose intrusive sampling methods for collecting the required data. The following specific information shall be collected for each source area:

- A. Location;
- B. Type of source area;
- C. Design features;
- D. Operating practices (past and present);
- E. Period of operation;
- F. Age of source area;
- G. General physical conditions;
- H. Method used to close the source area; and
- I. Waste characterization.

The Independent Contractor shall document the procedures used in making the above determinations.

5.0 DETERMINATION OF THE NATURE AND EXTENT OF CONTAMINATION

The Independent Contractor shall identify and characterize contamination of site ground water, surface water, soils, sediment, subsurface gases, and air. Data collected shall be sufficient to define the extent, origin, direction, and rate of contaminant migration. The Independent Contractor shall as appropriate collect the following information:

- A. Type of contaminants present, including:
 - 1. Hazardous properties;
 - 2. Quantity; and
 - 3. Chemical composition.

- B. Physical and chemical characteristics of contaminants, including:
 - 1. Physical form (solid, liquid, gas);
 - 2. Temperature;
 - 3. pH;
 - 4. General chemical class (e.g., acid, base, solvent);
 - 5. Molecular weight;
 - 6. Density;
 - 7. Boiling point;
 - 8. Viscosity;
 - 9. Solubility in water;

10. Cohesiveness of the waste;
11. Vapor pressure;
12. Flash point;
13. Identification of all degradation products;

C. Migration and dispersal characteristics of contaminants, including:

1. Sorption;
2. Biodegradability, bioconcentration, and biotransformation;
3. Photodegradation rates;
4. Hydrolysis rates; and
5. Chemical transformations.

The Independent Contractor shall document the procedures used in making the above determinations.

5.1 Ground-water Contamination

The Independent Contractor shall conduct a ground-water investigation to characterize ground-water contamination which may be present at the Elano Sites. The investigation shall address the degree of hazard, the mobility of Hazardous Substances considered (from contaminant characterizations), the soils' attenuation capacity and mechanism of attenuation, discharge/recharge areas, regional and site-specific flow directions, (including both vertical and horizontal flow components), and effects of any local ground-water pumping. This investigation shall at a minimum provide the following information:

- A. A characterization of the horizontal and vertical extent of any immiscible or dissolved Hazardous Substance plume(s) originating from the Elano Sites;
- B. The horizontal and vertical components of contaminant movement;
- C. The velocity of contaminant movement;
- D. The horizontal and vertical concentration profiles of Hazardous Substances in identified plume(s);
- E. An evaluation of factors influencing plume movement;

- F. An extrapolation of future contaminant movement; and
- G. Background sampling in the area upgradient from the contaminant source.

The Independent Contractor shall follow the guidance outlined in U.S. EPA'S Technical Enforcement Guidance Document, (September, 1986) for well design, construction, development, purging, sampling, geophysics, modeling, etc. and shall document the procedures used in making the above determinations.

5.2 Soil Contamination

The Independent Contractor shall conduct an investigation to characterize the horizontal and vertical extent of surface and subsurface soil contamination at the Elano Sites. The investigation shall be designed to collect the following information:

- A. A description of the vertical and horizontal extent of soil contamination;
- B. A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes, as appropriate, contaminant solubility, sorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation and other factors that might affect contaminant migration and transformation. Degradation products shall be identified;
- C. Identification of Hazardous Substances present;
- D. The velocity and direction of contaminant movement;
- E. An extrapolation of future contaminant movement; and
- F. Background sampling in an area unaffected by the contaminant source(s).

The Independent Contractor shall document the procedures used in making the above determinations.

5.3 Surface Water and Sediment Contamination

The Independent Contractor shall conduct an investigation to determine the location and extent of site surface water and sediment contamination including any ponds and drainage ditches. The investigation shall include, but not be limited to, the following information:

- A. A characterization of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Elano Sites or activities conducted at the Elano Sites, and the extent and concentration of contamination in underlying sediments and surface water;
- B. The horizontal and vertical direction of contaminant movement in sediment and surface water;
- C. The contaminant velocity in sediments and surface water;
- D. An evaluation of the physical, biological and chemical factors influencing contaminant movement in sediment and surface water;
- E. An extrapolation of future contaminant movement in sediment and surface water;
- F. A characterization of the chemical properties of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, and specific contaminant concentrations; and
- G. Background sampling in an area upstream from the contaminant source.

The Independent Contractor shall document the procedures used in making the above determinations.

5.4 Air Contamination

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

- A. A characterization of the horizontal and vertical direction and velocity of contaminant movement;
- B. The rate and amount of the release;
- C. Chemical and physical nature of contaminated particulates including respirable portion, source emission rates, and contaminant concentrations in respirable portions;

- D. Existing or potential human or biological receptors of air contaminants, including respirable contaminant concentrations at known or potential receptors;
- E. The chemical and physical composition of the contaminants released including vertical and horizontal concentration profiles; and
- F. Environmental factors that alter or mitigate fate and transport of contaminants in the atmosphere.

The Independent Contractor shall document the procedures used in making the above determinations.

5.5 Subsurface Gas Contamination

The Independent Contractor shall conduct an investigation to characterize the nature and extent of subsurface gases emitted from Hazardous Substances in the soils and/or ground water. The investigation shall include the following:

- A. A description of the horizontal and vertical extent of subsurface gas migration;
- B. The chemical composition of the gases being emitted from the subsurface or surface;
- C. The rate, amount, and density of the gases being emitted; and
- D. Horizontal and vertical concentration profiles of the subsurface gases being emitted.

The Independent Contractor shall document the procedures used in making the above determinations.

6.0 DATA ANALYSES

The Independent Contractor shall prepare an analysis and summary of all investigations and their results. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support the Feasibility Study. The analyses shall be prepared in accordance with appropriate Ohio EPA and U.S. EPA guidance.

- A. The analyses of the data collected should focus on the development or refinement of the conceptual site model by presenting and analyzing data on:
1. The nature and extent of contamination;
 2. The contaminated transport pathways and fate; and
 3. The effects on human health and the environment.
- B. Data collection and analysis is complete when:
1. The Data Quality Objectives (DQOs) are met;
 2. The need (or lack thereof) for Remedial Action is documented; and
 3. The data necessary for the development and evaluation of remedial alternatives have been obtained.
- C. The evaluation of site characteristics should focus on the current extent of contamination and estimating the travel time to, and predicting contaminant concentrations at, potential exposure points.
1. Data on site physical characteristics shall be analyzed to describe:
 - a. Environmental setting (surface features, soils, geology, hydrology, meteorology, and ecology).
 2. Data on source characteristics shall be analyzed to describe:
 - a. The source location;
 - b. The type and integrity of any existing waste containment; and
 - c. The types, quantities, chemical, and physical properties, and concentrations of Hazardous Substances found.
 3. An analysis of data collected concerning the Elano Sites shall be performed to describe the nature and extent of contaminant concentrations found in environmental media. This analysis should include the horizontal and vertical extent of contamination in:

- a. Soil;
 - b. Ground water;
 - c. Surface water;
 - d. Sediment;
 - e. Air; and
 - f. Biota.
4. The results of the analyses of site physical characteristics, source characteristics, and nature and extent of contamination shall be combined in the analyses of contaminant fate and transport.

Where information on the contaminant release is available, the observed extent of contamination shall be used in assessing the transport pathway's rate of migration and the fate of contaminants over the period between release and monitoring. Where such data is not available, contaminant fate and transport must be estimated (modeled) utilizing site physical characteristics and source characteristics.

Data shall be arranged in graphical or tabular form for clarity. The Independent Contractor shall document the procedures used in making the above determinations.

7.0 HUMAN HEALTH AND ENVIRONMENTAL BASELINE RISK ASSESSMENTS

The Independent Contractor shall prepare human health and environmental baseline risk assessments for the Elano Sites that identify and characterize the toxicity and levels of Hazardous Substances present, contaminant fate and transport, the potential for human or environmental exposure, and the risk of potential impacts or threats on human health and the environment. The assessments shall provide the basis for determining whether Remedial Actions are necessary, and justification for performing Remedial Actions. Procedures for performing the human health baseline risk assessment are outlined in U.S. EPA's Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002, December 1989. Procedures for performing the environmental baseline risk assessment are outlined in U.S. EPA's Risk Assessment Guidance for Superfund, Volume II, Environmental Evaluation Manual, Interim Final, EPA 540/1-89/001A, 1989. These procedures are outlined below and shall be followed by the Independent Contractor. In performing the risk assessments, the Independent Contractor shall utilize other appropriate guidance documents listed in Section XI paragraph G. of the Consent Order.

7.1 Potential Receptor Identification

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

- A. Local current and potential future uses of ground water:
 - 1. Type of use (e.g., municipal or residential, agricultural, domestic/non-potable and industrial, non-agricultural use by flora and fauna); and
 - 2. Location for ground water users including wells and discharge areas.

- B. Local current and potential uses of surface waters in the vicinity of the Elano Sites:
 - 1. Type of use (e.g., municipal or residential, agricultural, domestic/non-potable and industrial, non-agricultural use by flora and fauna); and
 - 2. Location of surface water users or use areas.

- C. Use or access by humans or biota to the Elano Sites and adjacent lands, including but not limited to:
 - 1. Recreational;
 - 2. Hunting;
 - 3. Residential;
 - 4. Commercial;
 - 5. Zoning;
 - 6. Nonagricultural use by flora and fauna; and
 - 7. Future land use or access.

- D. A description of biological receptors adjacent to or affected by the Elano Sites for all contaminated media;

- E. A description of any endangered or threatened species on or near the Elano Sites;
- F. A description of sensitive or unique habitats or natural resources; and
- G. A demographic profile of the people who use or who have access to the Elano Sites and adjacent land including, but not limited to, age, sex and sensitive subgroups.

7.2 Human Health Baseline Risk Assessment

A. Risk Assessment Scoping Technical Memorandum

During the scoping of the risk assessment, the Independent Contractor will submit to Ohio EPA for review and comment a Technical Memorandum which updates the conceptual site model based on the results of the RI and contains goals for the assessments, outlines (formats) of the risk assessment reports, types and sources of information or data that will be used in the assessments, criteria for selecting chemicals of concern, exposure pathways and scenarios, receptors which will be considered, any assumptions that will be made in order to perform the assessment, and a list of any references which will be utilized to conduct the assessment.

B. Human Health Risk Assessment

The risk assessment process is divided into the four components listed below:

1. Contaminant Identification

The Independent Contractor shall screen the information available on Hazardous Substances present at the Elano Sites to identify contaminants of concern and to focus subsequent efforts in the risk assessment process. Contaminants of concern shall be selected based on their intrinsic toxicological properties, and/or because they are present in large quantities, or because they are presently in or may move into critical exposure pathways (e.g., drinking water supply). The Independent Contractor shall also consider the additive effects of risks. The Independent Contractor shall list all Hazardous Substances present at the Elano Sites and their range

of detected concentrations. The Independent Contractor shall identify contaminants of concern to be used in assessing risk and provide the rationale for their selection. The contaminants of concern shall be selected to represent the most toxic, persistent, and/or mobile substances among those identified that are likely to significantly contribute to the overall risk posed by the Elano Sites. The list developed shall be reexamined by the Independent Contractor during the remedy selection and the Remedial Action phase to ensure that the waste management strategies being implemented address risks posed by the range of contaminants found at the Elano Sites.

2. Exposure Assessment

The objectives of the exposure assessment shall be to identify actual or potential exposure pathways, to characterize the potentially exposed population, to determine the extent of exposure, and to estimate exposure point concentrations. Exposure point concentrations shall then be compared to remediation goals (requirements, standards, and criteria). The Independent Contractor shall follow the detailed guidance on exposure assessments that is provided in the Superfund Exposure Assessment Manual, EPA/540/1-88/001, April, 1988.

3. Estimate of Chemical Intakes

The Independent Contractor shall provide estimates of chemical intakes from each of the following media:

- a. Air
- b. Ground water
- c. Surface water
- d. Other exposure pathways (soils, foodstuffs, recreation, etc.)

The Independent Contractor shall combine pathway-specific intakes to yield a total oral route, a total inhalation route, a total dermal absorption route, etc.

4. Toxicity Assessment

The Independent Contractor shall evaluate critical toxicity values (i.e., numerical values describing a chemical toxicity) and review general toxicological information for the contaminants of concern. Information reviewed shall include:

- a. The types of adverse health or environmental effects associated with individual and multiple chemical exposure;
- b. The relationship between magnitude of exposures and adverse effects; and
- c. Related uncertainties such as the weight of evidence for a chemical's potential carcinogenicity in humans. This data shall be used by the Independent Contractor to prepare both qualitative and quantitative estimates of risks associated with the chemicals found at the Elano Sites.

5. Risk Characterization

The Independent Contractor shall develop and summarize a characterization of the potential risks of adverse human health effects for each of the exposure scenarios derived in the exposure assessment. Estimates of risks shall be obtained by integrating information developed during the exposure and toxicity assessments to characterize the potential or actual risk, including carcinogenic risks and noncarcinogenic risks.

The final analysis should include a summary of the risks to human health associated with the Elano Sites including each projected exposure route for contaminants of concern and the distribution of risk across various sectors of the population. In addition, such factors as the weight-of-evidence associated with exposure assumptions must be discussed. The risk characterization shall include the following elements:

- a. Noncarcinogenic effects using the Hazard Index approach, where:

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

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

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

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

$$\text{Risk} = \text{CDI} \times \text{Carcinogenic Potency Factor}$$

CDI = Chronic Daily Intake

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

$$\text{Carcinogenic risk for chemical X} = [\text{CDI (inhalation)} \times \text{PF (inhalation)}] + [\text{CDI (oral)} \times \text{PF (oral)}]$$

$$\text{Total carcinogenic risk} = (\text{carcinogenic risk for chemical 1} + \text{carcinogenic risk for chemical 2} + \dots + \text{carcinogenic risk for chemical (i)})$$

- c. **Uncertainties:** The Independent Contractor shall provide a discussion of uncertainties and assumptions made in the assessment process.

The Independent Contractor shall document the procedures used in making the above determinations.

7.3 Environmental Baseline Risk Assessment

The Independent Contractor shall prepare a risk assessment which shall contain a description of present and future potential risk to ecosystems and populations exposed to contamination; information necessary to evaluate the environmental impact of proposed remedial alternatives; and information that can be utilized for the development of subsequent environmental criteria in the tasks outlined below:

A. Risk Assessment Scoping Technical Memorandum

The Independent Contractor shall prepare an interim Technical Memorandum for the environmental risk assessment as defined in 7.1 A above with emphasis on site ecology and biological receptors.

B. Environmental Risk Assessment

1. Briefly describe the Elano Sites and study areas:

- a. describe physical and chemical factors that impact site ecology (e.g., fate and transport of contaminants, bioavailability, etc.);
- b. Describe past or current practices, disturbances or stresses that impact(ed) site ecology;
- c. Describe the areal extent of environmental assessment;
- d. Provide a full account of ecosystems and populations potentially exposed to contamination; and
- e. Describe current and projected land use in and around the Elano Sites as relevant to site ecology.

2. Describe contaminants and ecological endpoints of concern:

- a. Select contaminants of concern (see 7.1, B. 1.).
- b. Specifically, consider contaminants that pose toxicity or bioaccumulation potential to biological receptors and/or are available for exposure to populations and ecosystems; and
- c. Measurement and assessment endpoints and indicator species and rationale for their selection.

3. Characterize Exposure:

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

1. Identify exposure pathways;
 2. Estimate exposure point concentrations by species, habitat and exposure scenario; and
 3. Identify site specific fate and transport processes.
- b. Verify exposure to populations or ecosystems:
1. Show correlations between concentrations and effects data (e.g., toxicity tests and population studies) along likely exposure pathways; and
 2. Compare data from other toxicity tests, population studies, modeled intakes, or reference areas to show exposure has occurred.
4. Characterize Risk or Threat

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

- a. Identifying requirements, standards and criteria;
- b. Identifying relevant, peer reviewed literature toxicity values or toxicological effects where the above are lacking;
- c. Comparison of exposure concentrations to a. and b. above;
- d. Presenting the number and magnitude of exceedances of a. and b. above; and
- e. Presenting support evidence of risk from:
 1. Contaminant concentrations in biota;
 2. Toxicity test results;

3. Supporting literature;
 4. Field surveys of receptor populations;
 5. Measures of community structure and ecosystem function; and
 6. Comparison with reference or background data.
- f. Discussing adverse or potential adverse effects under future use conditions.
5. Summary and Conclusions:
 - A. Summarize effects or potential effects of contamination to populations or ecosystems under current and future use conditions;
 - B. Describe future effects in absence of Remedial Actions; and
 - C. Describe populations or ecosystem characteristics that may impact the nature of Remedial Actions.
 6. Assessment of Uncertainties and Limitations:
 - A. Describe all sources of uncertainty (e.g., variation estimates, underlying model estimates, lack of toxicity information, unexpected influences on ecological assessment, etc.), their magnitude and direction of impact on estimation of risk; and
 - B. Describe assessment limitations (e.g., deviations from intended goals, data gaps, etc.).

8.0 TREATABILITY STUDIES

The Independent Contractor shall conduct any necessary bench or pilot scale treatability studies required by the Ohio EPA. The Independent Contractor may also propose treatability studies subject to Ohio EPA's approval. Treatability studies shall be deemed necessary where there is insufficient data to: 1) allow treatment alternatives to be fully developed and evaluated, 2) support the Remedial Design of a selected alternative, or 3) to reduce cost and performance uncertainties for treatment alternatives to acceptable levels.

A. Treatability Study Work Plan

When treatability studies are required or approved by the Ohio EPA, the Independent Contractor shall develop and submit for approval a work plan identifying the goals of the study, level of effort needed, experimental design, and procedures to be used in data management, validation, and interpretation. This work plan shall include the following elements:

1. Establishing data quality objectives;
2. Selecting a contracting mechanism;
3. Issuing the Work Assignment;
4. Complying with regulatory requirements;
5. Executing the study;
6. Analyzing and interpreting the data;
7. Reporting the results;
8. Sampling and analysis plan; and
9. Health and safety plan.

The Independent Contractor shall perform the treatability study in accordance with the approved work plan. Upon completion of the treatability study, the Independent Contractor shall prepare a treatability study evaluation report for review by Ohio EPA. The Independent Contractor shall follow U.S. EPA's guidance document, Guide for Conducting Treatability Studies Under CERCLA (Interim Final) EPA/540/2-89/058, when conducting treatability studies and preparing study reports.

FEASIBILITY STUDY

PURPOSE

The purpose of the Feasibility Study(s) (FS) is to develop and evaluate Remedial Action alternatives for each interim or final Remedial ction and/or identified operable unit in order to recommend those alternative(s) which will effectively mitigate actual or potential threat(s) to human health, welfare or the environment resulting from the release or potential release of Hazardous Substances at or originating from the Elano sites. The FS shall utilize the procedures and terminology identified in the U.S. EPA document Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final, OSWER 9355.3-01, October, 1988, EPA/540/G-89/004 as amended.

9.0 IDENTIFICATION AND DEVELOPMENT OF REMEDIAL ALTERNATIVES

Based on the results of the Remedial Investigation (RI), consideration of the Preliminary Remedial Technologies identified as part of the RI, and identified State and Federal requirements, the Independent Contractor shall identify, screen and develop remedial alternatives for removal, containment, treatment and/or other remediation of identified contamination. The list of Preliminary Remedial Technologies identified during the RI scoping process will likely be modified based on the results of the RI.

9.1 Description of Current Situation

The Independent Contractor shall update the information describing the current situation at the Elano Sites and the known nature and extent of contamination based on the results of the RI. The Independent Contractor shall also update the information presented in the RI regarding previous response activities and any Interim Remedial Actions which have been or are being implemented. This information shall be presented in the FS Report.

9.2 Statement of Purpose and Establishment of Remedial Action Objectives, and General Response Actions

Based on the results of the RI report and in conjunction with Ohio EPA, the Independent Contractor shall develop a specific statement of purpose which shall include identification of Remedial Action objectives. Remedial Action objectives shall address specific Hazardous Substances and media of interest, actual and potential exposure pathways, and preliminary remediation goals so as to permit a range of treatment and containment alternatives to be developed. The objectives shall be based on public health and environmental criteria, U.S EPA and Ohio EPA guidance and practices, Section 300.430 of the National Contingency Plan (NCP), and the requirements of any other applicable Federal and State environmental standards, guidance and advisories as defined under SARA, Section 121 and State law. The Independent Contractor shall then further develop the general response actions identified during project scoping to ensure that they satisfy the Remedial Action objectives. Final remediation goals will be determined by Ohio EPA at or after the time the remedy is selected and are not part of this order. The Independent Contractor shall prepare a Technical Memorandum for Ohio EPA review and comment which contains the statement of purpose and identifies the Remedial Action objectives, preliminary remediation goals, and general response actions.

9.3 Initial Screening of Preliminary Remedial Technologies

The Independent Contractor shall review the results of the RI and further develop the list of remedial technologies and process options identified during project scoping in order to incorporate any additional technologies which are applicable to site problems. Both on-site and off-site remedial technologies are to be included as appropriate.

The Independent Contractor shall screen the revised list of preliminary remedial technologies based on technical implementability, using site and waste characteristics as the screening criteria. Technologies that prove extremely difficult to implement, require unreasonable time periods, or rely on insufficiently developed technology are to be eliminated. Emerging technologies which may have application to site problems are to be carried through the screening process if there is a reasonable belief that the technologies offer significant advantages. The Independent Contractor shall document the reasons for excluding or carrying forward technology types.

This initial screening process shall focus on eliminating those technologies which have severe limitations for a given set of waste and site-specific conditions. Site, contaminant, waste, and technology characteristics used to screen inappropriate technologies are described in more detail below:

A. Site Characteristics

Site characteristics shall be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics shall be eliminated from further consideration.

B. Waste Characteristics

Waste characteristics that limit the implementability of a given technology shall be identified. Areas and volumes of contaminated media as identified in the RI shall be refined as necessary and used in the initial screening. The areas and volumes are to be defined by risk levels or contaminant concentrations depending on the nature of the Hazardous Substances. Technologies whose use is clearly limited by waste characteristics are to be eliminated from further consideration.

C. Technology Limitations

The Independent Contractor shall identify the level of technology development, performance record, and inherent construction, operation, and maintenance problems for each technology being considered during the screening process. Technologies that are unreliable or perform poorly are to be eliminated from further consideration. Surviving technologies shall be protective of human health and the environment.

9.4 Screening of Technology Process Options

Upon approval by Ohio EPA of the Technical Memorandum identified in 9.3 above, the Independent Contractor shall screen the process options associated with the surviving technology types based on the short and long term aspects of effectiveness, implementability and cost effectiveness. The Independent Contractor shall submit a Technical Memorandum containing the results of the process options screening to Ohio EPA for review and comment before proceeding with the alternatives development process. The screening criteria to be used in the evaluation of process options are further defined below:

A. Effectiveness

The Independent Contractor shall evaluate: (1) the potential effectiveness of the process options in handling the estimated areas or volumes of contaminated media and meeting the remediation goals identified in the Remedial Action objectives; (2) the potential impact to human health and the environment during the construction and implementation phase; and (3) the degree to which the process options are proven and reliable with respect to the Hazardous Substances and site conditions.

B. Implementability

The Independent Contractor shall evaluate both the technical and administrative feasibility of implementing each one of the technology options. As the technical implementability has been previously considered during the preliminary screening of technology types (9.3 above), this more detailed evaluation shall place greater emphasis on the institutional aspects of implementability such as the ability to obtain required permits, availability of treatment storage and disposal services (including capacity), and the availability of necessary equipment and skilled workers necessary to implement the process option.

C. Cost

The Independent Contractor shall evaluate the costs of the various process options within a given technology type. The evaluation shall recognize that costs play a limited role at this point in the screening process. Relative capital and O&M costs are to be used as opposed to detailed cost estimates. The cost evaluation shall be made based on best engineering judgment, with each process option evaluated as to whether costs are high, low, or medium relative to other process options within the same technology type.

9.5 Development and Preservation of Remedial Alternatives

The Independent Contractor shall assemble ranges of alternatives for the Elano Sites and for each operable unit using the general response actions and process options chosen to represent the various technology types for each media. Alternatives shall be developed for each of two broad categories of Remedial Actions: source control actions and ground-water actions. Appropriate ranges of alternatives for each of these categories are further described below:

A. Source Control Alternatives

The Independent Contractor shall develop a number of treatment alternatives ranging from one that would eliminate the need for long-term management (including monitoring) at the Elano Sites to one that would employ treatment as a primary component of an alternative to address the principal threats at the Elano Sites. Alternatives developed within this range will differ in the type and extent of treatment used and the management requirements of treatment residuals or untreated wastes.

One or more alternatives shall be developed that involve containment of waste with little or no treatment but protect human health and the environment by preventing exposure and/or reducing the mobility of the Hazardous Substances.

B. Ground-water Alternatives

The Independent Contractor shall develop alternatives for contaminated ground-water remediation which address not only cleanup levels but also the time frame within which the ground-water restoration might be achieved. Alternatives are to be developed which achieve a maximum life

time risk of 10E-6 for carcinogens and a hazard index of less than one for noncarcinogens within varying time frames using different methodologies. For aquifers currently being used as a drinking water source, at least one alternative is to be developed which achieves Federal and State requirements and risk and/or health based levels as rapidly as possible. Where feasible, one alternative shall be developed that would restore ground water to a 10E-6 cumulative maximum lifetime cancer risk level and a hazard index of less than one within five years.

9.5.1 Initial Screening of Alternatives

Following the development of alternatives, the Independent Contractor shall evaluate each alternative against the short- and long-term aspects of three broad criteria: effectiveness, implementability, and cost. The purpose of the screening evaluation shall be to reduce the number of alternatives that will undergo detailed analysis while preserving a range of treatment and containment technologies from the list initially developed. Evaluation criteria for the initial screening of alternatives are further described below:

A. Effectiveness

Each alternative shall be evaluated as to its effectiveness in providing protection to human health and the environment and the reductions in toxicity, mobility, or volume that it will achieve. Both the short-term (during construction and implementation) and the long-term (period after the Remedial Action is completed) components of effectiveness shall be evaluated.

B. Implementability

Each alternative shall be evaluated for both the technical and administrative feasibility of constructing, operating and maintaining the alternative. Technical feasibility refers to the ability to construct, reliably operate, and meet technology-specific regulations for process options until the Remedial Action is complete; it also includes operation, maintenance, replacement, and monitoring of the technical components of the alternative. Administrative feasibility refers to the ability to obtain regulatory approvals as necessary, availability of treatment, storage, and disposal services and capacities, and the requirements for, and availability of, specific equipment and technical specialists.

C. Cost

The focus of the cost evaluation shall be to make comparative estimates of alternatives with relative accuracy, so that cost decisions between alternatives will be sustained as the accuracy of cost estimates improves beyond the initial screening process. Both capital and O&M costs shall be considered. The evaluation shall include those O&M costs that will be incurred for as long as necessary, even after the initial Remedial Action is complete. Present worth analyses shall be used to evaluate expenditures that occur over different time periods. All costs shall also be discounted to a common base year so alternatives can be compared on the basis of a single figure for each alternative. The Independent Contractor shall rely on U.S. EPA's Cost Compendium for Remedial Actions for those technologies covered by the compendium. The Independent Contractor shall document sources of cost information used for those technologies which are not covered by the compendium.

9.5.2 Alternatives Array Document

The Independent Contractor shall prepare an Alternatives Array Document (AAD) which incorporates the above referenced Section 9 technical memoranda as modified by Ohio EPA comment. The AAD shall also contain a detailed description of each alternative surviving the initial screening, including extent of remediation, contaminant levels to be achieved, and methods of treatment used. The AAD shall also include a brief history and site background, a site characterization indicating Hazardous Substances, pathways, receptors, other pertinent site features, and proposed Federal ARARs and State requirements for each alternative. The decision-making process employed in the initial screening shall be fully documented. The AAD shall be submitted to Ohio EPA for review and approval prior to proceeding with the detailed analysis of alternatives.

9.6 Post-Screening Phase

If not already underway as part of the RI, the Independent Contractor shall initiate treatability testing for those process options that will require additional data for detailed analysis. Additional site characterization work for purposes of better defining the effect of site conditions on the performance of the technologies of greatest interest shall be undertaken as appropriate.

A. Bench and Pilot Scale Studies

The Independent Contractor may propose bench and pilot scale studies. Ohio EPA shall determine the need for such studies. If the need for bench and pilot scale studies has been determined, the Independent Contractor shall prepare a work plan to be submitted to Ohio EPA for review and approval, based on the suggested format for bench and pilot scale work plans (Tables 5-5 and 5-6) identified in the RI/FS Guidance. The work plan shall contain adequate quality assurance and quality control procedures for conducting the studies and employ uniform testing procedures approved by Ohio EPA. The studies shall be conducted and documented in such a manner as to facilitate use of the information when conducting similar studies at other sites (see Chapter 5 of the RI/FS Guidance).

B. Post-Screening Field Investigation

The Independent Contractor may propose additional field studies for purposes of refining site characteristics and alternatives. Ohio EPA shall determine the need for such studies.

If the need for additional field studies has been determined, the Independent Contractor shall prepare a work plan for these studies to be submitted to Ohio EPA for review and approval. Additional quality assurance and quality control procedures and additional health and safety requirements shall be identified in the work plan as appropriate.

C. Refine Remedial Action Objectives

The Independent Contractor shall refine the media- and operable unit-specific Remedial Action Objectives developed during project scoping based on the initial screening of alternatives (9.5 above) and any new information obtained from additional studies (9.6 above). At this point in the process, the Remedial Action Objectives and remediation goals are to be as specific as possible.

10.0 DETAILED ANALYSIS OF ALTERNATIVES

The Independent Contractor shall conduct a detailed analysis of the alternatives remaining after the initial screening as documented in the approved Alternatives Array

Document. The Independent Contractor shall identify and describe Federal ARARs, State requirements, and other criteria, advisories and guidance to be used in the alternative analysis. Alternatives shall be analyzed in sufficient detail so as to allow Ohio EPA to select remedy(s) from a set of defined and discrete Hazardous Waste management approaches.

The Independent Contractor shall develop and use the information necessary to evaluate each alternative. The specific statutory requirements for Remedial Actions that must be supported in each FS report are listed below. Remedial Actions must:

- A. Be protective of human health and the environment;
- B. Attain Federal ARARs and State requirements (or provide grounds for invoking the appropriate waiver);
- C. Be cost effective, where more than one remedial alternative will attain cleanup standards;
- D. Utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and
- E. Satisfy the preference for treatment that reduces toxicity, mobility, or volume as a principal element, or provide an explanation as to why it does not.

In addition, the NCP places an emphasis on evaluating the long-term effectiveness and related considerations for each of the alternative Remedial Actions. These considerations include:

1. The long-term uncertainties associated with land disposal;
2. The goals, objectives, and requirements of the Solid Waste Disposal Act;
3. The persistence, toxicity, and mobility of substances and their constituents, and their propensity to bioaccumulate;
4. Short- and long-term potential for adverse health effects from human exposure;
5. Long-term maintenance costs;

6. The potential for future Remedial Action costs if the alternative Remedial Action in question were to fail; and
7. The potential threat to human health and the environment associated with excavation, transportation, and redispisal, or containment.

The detailed analysis of alternatives shall consist of the following elements:

10.1 Detailed Description

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

- A. Description of appropriate treatment and disposal technologies;
- B. Special engineering considerations required to implement the alternative, e.g., pilot treatment facility or additional studies needed to proceed with final Remedial Design;
- C. Operation, maintenance and monitoring requirements of the completed remedy;
- D. Off-site disposal needs and transportation plans;
- E. Temporary storage requirements;
- F. Safety requirements for remedial implementation, including both on-site and off-site health and safety considerations;
- G. An analysis of how the alternatives could be phased into individual operations and a discussion of how these operations could best be implemented (individually or in groups) to produce significant environmental improvement;
- H. A review of any off-site treatment or disposal facilities to ensure compliance with RCRA, TSCA and State requirements, both current and proposed; and
- I. An analysis of the projected performance and expected results of the alternative with emphasis on potential for further future release of Hazardous Substances.

10.2 Environmental Assessment

An Environmental Assessment (EA) shall be performed for each alternative including, at a minimum, an evaluation of each alternative's environmental effects, physical or legal constraints and compliance with Federal and State regulatory requirements.

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

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

10.3 Application of the Eight Criteria and Document Analysis

The Independent Contractor shall perform a detailed analysis of the alternatives surviving the initial screening in order to provide the basis for identifying the preferred alternative and preparing the Proposed Plan. The analysis shall evaluate each alternative in detail using the eight evaluation criteria listed below, incorporating any treatability study data and additional site characterization data that may have been collected.

1. Overall Protection of Human Health and the Environment The Independent Contractor shall assess each alternative as to whether it can adequately protect human health and the environment from unacceptable risks posed by Hazardous Substances, pollutants or contaminants present at the Elano Sites by eliminating, reducing or controlling exposures to levels established during the development of remediation goals. This is a threshold requirement and the primary objective of the remediation of the Elano Sites.
2. Compliance with Federal ARARs and State Requirements The Independent Contractor shall assess each alternative as to whether it attains or exceeds applicable or relevant and appropriate standards, criteria and requirements of state and federal environmental and public health laws and regulations.
3. Long-term Effectiveness and Permanence The Independent Contractor shall assess each alternative for the long-term effectiveness and permanence it affords along with the degree of certainty that the alternative will prove successful. Factors that shall be considered, as appropriate, include the following:

- a. Nature and magnitude of total residual risks in terms of amounts; potential for exposure of human and environmental receptors; concentrations of Hazardous Substances, pollutants or contaminants remaining following implementation of remedy, considering the persistence, toxicity, mobility and propensity to bioaccumulate of such Hazardous Substances and their constituents;
 - b. The type, degree and adequacy of long-term management required for untreated substances and treatment residuals, including engineering controls (such as containment technologies), institutional controls, monitoring and Operation and Maintenance;
 - c. Long-term reliability of the engineering and institutional controls, including uncertainties associated with land disposal of untreated Hazardous Substances, pollutants and contaminants, as well as treatment residuals, and;
 - d. Potential need for replacement of the remedy as well as the continuing need for repairs to maintain the performance of the remedy.
4. Reduction of Toxicity, Mobility, and/or Volume Through Treatment The Independent Contractor shall assess the degree to which each alternative employs treatment technologies that permanently and significantly reduce the toxicity, mobility or volume of site related Hazardous Substances. Alternatives which employ treatment technologies to address principal threats at the Elano Sites shall be identified. Factors that shall be considered include the following:
- a. The treatment or recycling processes the alternatives employ and the materials they will treat;
 - b. The amount of Hazardous Substances that will be destroyed, treated or recycled;
 - c. The degree of expected reduction in toxicity, mobility or volume of the waste due to treatment or recycling and the specifications of which reduction(s) are occurring;
 - d. The degree to which the treatment process is irreversible;
 - e. The type and quantity of residuals that will remain following treatment, considering the persistence, toxicity, mobility and propensity to bioaccumulate;

- f. The degree to which treatment will reduce the inherent hazards posed by the principal threats at the Elano Sites; and
- g. The degree to which the treatment processes employed reduce the transfer of contaminants between environmental media.

5. Short-term Effectiveness The Independent Contractor shall assess the short term impacts of each alternative during the construction and implementation phase and until the objectives of the Remedial Action have been met. The Independent Contractor shall consider the following:

- a. Short term risks posed to the community during construction and implementation of each alternative and until the Remedial Action objectives have been met;
- b. Potential impacts on workers during construction and implementation of each alternative and until the Remedial Action objectives have been met, and the effectiveness and reliability of protective measures;
- c. Potential environmental impacts that may result from the construction and implementation of each alternative and the effectiveness and reliability of mitigative measures; and
- d. The period of time needed until Remedial Action objectives have been met.

6. Implementability The Independent Contractor shall assess the technical and administrative feasibility of implementing each alternative considering the following factors:

a. Technical feasibility

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

-Expected operational reliability of each alternative;

-Ease of undertaking additional Remedial Actions should they be required; and

-Ability to monitor the effectiveness of the remedy.

b. Administrative feasibility

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

c. Feasibility of obtaining services and materials

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

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

-Availability of prospective technologies.

7. Cost The Independent Contractor shall assess the types of costs associated with each alternative including:

a. Direct and indirect capital costs including contingency and engineering fees;

b. Annual Operation and Maintenance costs; and

c. Net present value of capital and O&M costs.

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

(Note: Ohio EPA will incorporate criteria 8 into the FS as the Responsiveness Summary after the RI/FS has been released to the public for comment.)

10.4 Presentation of Individual Analyses

For each alternative, the Independent Contractor shall provide:

A) A description of the alternative which details the waste management strategy involved and identifies associated Federal ARARs and State requirements;

- B) A narrative discussion of the application of each of the evaluation criteria; and
- C) A comparison of the alternative to each of the other alternatives with respect to the evaluation criteria identified in 11.1 above.

Identification and selection of the preferred alternative are reserved by Ohio EPA and are not part of this order. The Independent Contractor shall submit the detailed alternative descriptions, and the results of the detailed analysis and comparison of alternatives as a Technical Memorandum to Ohio EPA for review and approval.

Following regulatory approval of the submittal discussed above, the Independent Contractor shall incorporate the detailed analysis and comparison of individual alternatives into the draft FS report as a narrative discussion accompanied by a summary table.

11.0 FEASIBILITY STUDY REPORT

The Independent Contractor shall present the results of 9.0 and 10.0 in the FS report. The FS report shall follow the suggested FS report format (Table 6-5) identified in the RI/FS Guidance. Support data, information, and calculations are to be included in appendices to the report. The Independent Contractor will prepare and submit a draft FS report to Ohio EPA for review and approval. Once comments have been received, the Independent Contractor shall prepare a final FS report reflecting regulatory comments.

12.0 MONTHLY PROGRESS REPORTS

The Independent Contractor shall prepare monthly progress reports for submittal to Ohio EPA. Each report shall be submitted no later than the 10th of the month following the month being reported. The monthly progress reports will contain the following elements:

- A. Identification of site and activity;
- B. Status of work at the site and progress to date;
- C. Percentage completion of each task underway;
- D. Data generated during the reporting period, including submittal of all raw

and validated data received during the reporting period;

- E. Difficulties encountered during the reporting period;
- F. Identification of any delay(s) that have occurred or may occur which impact project schedules including an estimate of the duration of such delays and an explanation as to why the delays were unavoidable;
- G. Actions being taken to rectify problems;
- H. Activities planned for next month; and
- I. Changes in personnel.
- J. Summary of significant communications with Ohio EPA or other persons.

Each monthly progress report will list target and actual completion dates for each activity including project completion and provide an explanation for any deviation from the milestones in the RI/FS or RD/RA work plan schedule.

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SUBJECT: PREFERRED PLANS AND DECISION DOCUMENTS

PURPOSE:

This policy describes Preferred Plans and Decision Documents which are used by the Ohio Environmental Protection Agency (OEPA) to meet the statutory requirements of Chapter 3734 of the Ohio Revised Code (ORC) and to facilitate public participation in the identification of the preferred alternative for cleanup at a state lead site. This policy also sets forth the roles and responsibilities of the Division of Emergency and Remedial Response (DERR), the Public Information Center (PIC), and the Legal staff in preparing, distributing and issuing Preferred Plans and Decision Documents.

BACKGROUND:

Section 3734.20 of the ORC provides that the Director of OEPA has the authority to initiate appropriate action under Chapters 3704, 3734, or 6111 of the ORC to abate pollution or contamination or to protect public health or safety if the Director determines that condition at a hazardous waste facility, solid waste facility, or other location where waste was treated, stored, or disposed of constitute a substantial threat to public health or safety or are causing or contributing to or threatening to cause or contribute to air or water pollution or soil contamination.

According to Section 3734.21 (B) of the ORC, prior to beginning the cleanup of a hazardous waste facility, the Director shall develop a plan for the cleanup which includes those measures necessary to abate conditions at the facility that are causing or contributing to pollution or contamination or that constitute a substantial threat to public health or safety.

Section 3734.22 of the ORC provides that before OEPA begins the cleanup of a facility, the Director shall endeavor to enter into an agreement with the owner of the land on which the facility is located, or the owner of the facility. The agreement shall specify the measures to be taken and provide authorization to the Director and OEPA employees to enter upon the land and perform the specified measures. The costs of performing the measures shall also be included in the agreement. Preferred

SUBJECT: PREFERRED PLANS AND DECISION DOCUMENTS

Plans and Decision Documents explain to the public the evaluation of alternatives that has taken place in the development of measures and plans that will result in cleanup at a state lead site.

According to Section 3745.04 of the ORC, any person may appeal an action of the Director to the Environmental Board of Review. An "action" includes the issuance, modification, or revocation of any lawful order. The development and distribution of Preferred Plans and Decision Documents does not constitute an action of the Director. However, administrative orders for cleanups, which include the Decision Document, are issued to govern action at state lead sites. Administrative orders are actions of the Director that may be appealed to the Environmental Board of Review.

DEFINITIONS:

As used in this policy, the term Preferred Plan shall mean a document prepared by DERR which presents to the public DERR's preferred alternative for cleanup at a site. This document includes a brief summary of the alternatives evaluated in the detailed analyses of the Feasibility Study, highlighting the key factors that led to the identification of the preferred alternative.

Decision Document shall mean the report which evidences DERR's cleanup plan for a site. Any comments received on the preferred plan are taken into consideration during preparation of this document.

PROCEDURES:

The following are the requirements that shall be followed by DERR in the development of Preferred Plans and Decision Documents. The Public Participation Policy shall be consulted to insure efficient coordination of public participation activities with PIC.

- (A) Preferred Plans
- (1) The Preferred Plan shall be drafted by the Site Coordinator and

SUBJECT: PREFERRED PLANS AND DECISION DOCUMENTS

approved by the District Office Group Leader and Unit Supervisor. The Preferred Plan shall include at a minimum the following information:

- (a) Environmental conditions at the site as determined by the Remedial Investigation (RI);
 - (b) Remedial alternatives evaluated in the Feasibility Study (FS);
 - (c) OEPA's preferred alternative;
 - (d) Identification and summarization of statutory requirements and any proposed waivers of those requirements; and
 - (e) A brief analysis of the preferred alternatives discussed in terms of the eight evaluation criteria.
- (2) The draft Preferred Plan shall be distributed to the Manager, Technical and Program Support Section, Central Office, the assigned DERR attorney for the Site and PIC for review. Comments on the Preferred Plan shall be coordinated through the Manager, Technical and Program Support Section, Central Office, to the Site Coordinator for revision.
- (3) The final Preferred Plan shall be routed to the Chief, DERR, with attached sign-off sheet through the following individuals: District Office Unit Supervisor; Manager, Technical and Program Support Section, Central Office; and Assistant Chief, DERR.
- (4) A copy of the final Preferred Plan shall be distributed by the District office to the following individuals: Manager, Technical and Program Support Section, Central Office; Manager, Investigation and Field Support Section, Central Office; and DERR assigned attorney.
- (5) Once approved by the Chief, DERR, the Preferred Plan shall be routed to PIC for newspaper notification in a newspaper of general circulation.
- (6) The public notice shall provide sufficient information to provide

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a reasonable explanation of the Preferred Plan. The notice shall emphasize that the agency is soliciting public comment on all of the alternatives evaluated in the detailed analysis of the FS as well as the preferred alternative. The notice shall inform the public of its role in the remedy selection process and shall provide the following information:

- (a) The location of the information repositories and administrative record file (see the Public Participation Policy for information on establishing the document repository and administrative record files);
 - (b) The methods by which the public may submit comments; and
 - (c) The dates of the public comment period, which shall not be shorter than thirty (30) calendar days.
- (7) During the public comment period, PIC shall schedule a public meeting. The first portion of the meeting shall be used to explain the Preferred Plan and answer questions. The Site Coordinator and other agency staff (as required) shall participate. The second half of the meeting shall be a formal hearing conducted by an OEPA attorney or hearing officer to record comments on the Preferred Plan. A transcript shall be taken of the hearing and made available to the public in the information repository. A news release shall be prepared and issued by PIC to announce the public meeting.
- (8) After the public comment period ends, a final remedial alternative shall be selected by DERR. The remedy shall be selected on the basis of analysis presented in the Preferred Plan and RI/FS report, comments received from the public and any other new and significant information received or generated.
- (9) DERR may reevaluate the preferred alternative in light of comments and any new information received. DERR may change a component of the preferred remedy or choose to implement a remedy other than the preferred alternative. If a change is made in the Preferred Plan, the change shall be explained in the Decision Document. Significant changes may

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warrant issuance of a revised Preferred Plan and additional public comment. Significant changes include those changes that modify the selected alternative or change the preferred alternative to another. Changes to the preferred alternative shall be coordinated among the District Office, Central Office, and Legal staff. The final decision regarding any changes to the preferred alternative shall be made by the Chief, DERR.

(B) Decision Documents

- (1)** The Decision Document shall be drafted by the Site Coordinator in the District Office. It shall consist of three components:
 - (a)** The Declaration, which shall be an abstract of the key information;
 - (b)** The Decision Summary, which shall provide an overview of the site characteristics, the alternatives evaluated, and an analysis of the options considered, including a comparison of the costs of each of the alternatives; and
 - (c)** The Responsiveness Summary, which shall address public comments received on the Preferred Plan, RI/FS report, and other information in the administrative record.

- (2)** The draft Decision Document shall be forwarded to the Manager, Technical and Program Support Section, and the assigned DERR attorney for review and comment. The Manager, Technical and Program Support Section, shall communicate comments received back to the District Office.

- (3)** The Site Coordinator, District Office, shall make necessary revisions to the Decision Document and forward a final draft to the Chief, DERR after sign-off by the following individuals: District Office Unit Supervisor; Manager, Technical and Program Support Section; Assistant Chief, DERR.

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- (4) A copy of the final Decision Document shall be distributed to the following individuals by the District Office: Manager, Technical and Program Support Section; Manager, Investigation and Field Support Section; and the DERR assigned attorney.
- (5) The final Decision Document shall be placed in the Administrative Record Files (see the Public Participation Policy for information on establishing the document repository, the administrative record files and communication of the contents of the Decision Document to the public) and a copy shall be incorporated into any administrative orders for remedial action issued by DERR.

APPENDIX D

STATEMENT OF WORK FOR THE REMEDIAL DESIGN/REMEDIAL ACTION (RD/RA) AT ELANO CORPORATION SITES IN GREENE COUNTY

1.0 PURPOSE

The purpose of conducting Remedial Design and Remedial Action (RD/RA) activities at the Elano Corporation Sites on 2455 Dayton Xenia Road and 530 Orchard Lane is to design and construct the approved remedial action(s) in order to adequately protect the public health and the environment from the presence of Elano managed Hazardous Substances discovered in the Alpha area of Greene County, Ohio. For the purposes of this RD/RA Statement of Work (RD/RA SOW), the term "Hazardous Substances" shall include all materials defined in Section I. Definitions, Paragraph G. of this Consent Order. This RD/RA Statement of Work (RD/RA SOW) outlines the procedures the Independent Contractor shall follow in order to implement the selected remedies for the Elano Sites. The Consent Order, this RD/RA SOW, U.S. EPA's Superfund Remedial Design and Remedial Action Guidance, (June, 1986 or more recent version) and other guidances as approved or provided by Ohio EPA shall be followed in designing and implementing selected remedial actions. Cleanup standards shall be required to meet performance criteria whenever such criteria are identified in the Ohio EPA approved Decision Document for Remedial Action.

2.0 REMEDIAL RESPONSE OBJECTIVES

(Following Ohio EPA's finalization of the Decision Document for Remedial Action, Sections 2.0 and 3.0 of this SOW are to be filled in by the Independent Contractor using information from the Ohio EPA approved Feasibility Study and Decision Document for Remedial Action.)

The following remedial response objectives have been identified:

[Relate each of the remedial response objectives to the identified exposure pathways and indicate how the proposed remedial action(s) will eliminate each risk or threat or potential risk or threat.]

3.0 DESCRIPTION OF THE REMEDIAL ACTION(S)

[In narrative form, describe in detail all components of the remedial action(s).]

4.0 OFF-SITE ACCESS

Elano shall obtain all off-site access agreements required to implement the remedial design and remedial actions within sixty (60) days of Ohio EPA's finalization of the Proposed Plan. Off-site access shall extend for the duration of the remedial design and remedial action(s) and include allowances for all operation and maintenance considerations.

5.0 RD/RA WORK PLAN

Within sixty (60) days of Ohio EPA's finalization of the Decision Document for Remedial Action, the Independent Contractor shall submit to Ohio EPA for review and approval a Work Plan for RD/RA response action(s) which includes all of the elements described in this SOW. The Work Plan shall include schedules fixed in real time for the development of the remedial design and implementation of the remedial action(s), including milestones for the submittal of document packages for Ohio EPA review and meetings for discussion of the submittals. The Work Plan shall provide a detailed discussion of the specific RD/RA tasks necessary to implement the approved remedy, including a description of the technical approach, personnel requirements, and plans and specifications as described in this SOW. Following Ohio EPA approval of the RD/RA Work Plan, the Independent Contractor shall implement the work described therein according to the Ohio EPA approved schedules.

Should Ohio EPA determine that additional studies are necessary to supplement the technical data available from the RI/FS activities so that optimum treatment or disposal methods may be determined, Ohio EPA shall notify the Independent Contractor in writing, of the need for such additional studies. The Independent Contractor shall schedule and detail the work necessary to accomplish the additional studies in the RD/RA Work Plan. The Independent Contractor shall include a Sampling and Analysis Plan (SAP) consisting of a Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP) for any such additional studies with the RD/RA Work Plan submittals.

The Independent Contractor shall provide the results of any additional studies and describe their affect upon the work in technical memoranda submitted to Ohio EPA for review and comment. After making any required corrections or modifications based on Ohio EPA comment, the Independent Contractor shall incorporate the information contained in these technical memoranda into the prefinal design submittals required in section 6.3 below.

6.0 PLANS AND SPECIFICATIONS

Following Ohio EPA approval of the RD/RA Work Plan, the Independent Contractor shall prepare final construction plans and specifications to accomplish the selected remedy as described in the Ohio EPA approved Decision Document for Remedial Action. The

construction plans and specifications shall comply with the standards and requirements outlined below. All design documents shall be organized and clear. Technical specifications for preliminary and intermediate design phases shall be outlined in a manner which anticipates the scope of the final specifications. Design calculations shall be completed to the same degree as the design they support. Supporting data and documentation sufficient to define the functional aspects of the remedial action(s) shall be provided. Subject to Ohio EPA's approval, the Independent Contractor may propose modifications to the following procedures as may be appropriate for each approved remedial action being designed.

The Independent Contractor shall prepare and include in the technical specifications governing any treatment systems, the contractor requirements for providing appropriate service visits by qualified personnel to supervise the installation, adjustment, startup and operation of the treatment systems, and appropriate operational procedures training once startup has been successfully accomplished. Any required certification for operators of any treatment systems shall be obtained by the operators.

6.1 Preliminary Design

In accordance with the RD/RA Work Plan schedule(s), the Independent Contractor shall submit preliminary (30%) design plans and specifications to Ohio EPA for review and comment. A meeting shall be held with the Independent Contractor to ensure the direction of the project is meeting the stated goals of the project. At this stage of the design process, the Independent Contractor shall have verified existing conditions at the Elano Sites which may have an influence on the design or implementation of the approved remedial actions. If bench and pilot studies were required, the interim report for those studies shall be included with this submittal. The Independent Contractor shall ensure that the basic technical requirements of the remedial action(s) and any required permits are addressed in the preliminary design. The intent shall be to provide information sufficient to allow Ohio EPA to determine if the final design will provide for an operable and usable remedy that will meet the remedial response objectives and comply with the technical requirements of any required permits.

6.2 Intermediate Design

Complex project designs may necessitate preparation and regulatory review of design documents between the preliminary and prefinal design phases. The RD/RA Work Plan shall identify those remedial action(s) for which intermediate design phases are warranted and provide schedules for submittal of design documents. If intermediate design documents are called for in the RD/RA Work Plan, the Independent Contractor shall submit such plans and specifications to Ohio EPA for review and comment when the design of the remedial action(s) is approximately 60% complete. All plans, specifications, design analyses and design calculations submitted to Ohio EPA shall reflect this degree of

completion. The Independent Contractor shall ensure that any modifications required by Ohio EPA's review of the preliminary design are incorporated into the intermediate design submittals. The intermediate design submittal shall include the first draft of the Sampling and Analysis Plan (SAP), and the Health and Safety Plan (HSP) and Quality Assurance Project Plan (QAPP).

[NOTE: If the intermediate design phase is not appropriate for a given remedial action, the RD/RA Work Plan shall call for submittal of the draft SAP and HSP with the preliminary design documents.]

6.3 Prefinal Design

The prefinal design submittal shall reflect a design effort that is at least 90% complete. The Independent Contractor shall include detailed schedules fixed in real time for the implementation of the designed remedial action(s). The draft O&M plan shall be included with the prefinal design submittals. The Independent Contractor shall ensure that any modifications required by Ohio EPA's review of related technical memoranda and the preliminary and intermediate designs are incorporated into the prefinal design. The Independent Contractor shall also ensure that all of the information presented in the prefinal design documents has been fully coordinated, cross checked, and verified. The Independent Contractor shall then submit the revised plans, drawings, specifications, calculations and design analysis to Ohio EPA for review and comment in accordance with the RD/RA Work Plan schedule.

6.4 Final Design

Following incorporation of any modifications required by Ohio EPA's review of the prefinal design submittal and in accordance with the RD/RA Work Plan schedule(s), the Independent Contractor shall submit to Ohio EPA final design documents which are 100% complete. The final design document package shall include, but not be limited to, the final construction drawings, specifications and plans, the final design analysis with calculations, and the final SAP and HSP. As evidence that the plans and specifications have been completely checked, the Independent Contractor shall return to Ohio EPA any marked-up prints or drawings which Ohio EPA may have provided by way of comment on previous design submittals. After making any required corrections or modifications based on Ohio EPA comment, and after these corrections or modifications are approved by Ohio EPA, the typed original specifications, design analysis, design calculations and plans shall be provided to Ohio EPA as the completed remedial design.

7.0 BENCH AND PILOT SCALE STUDIES

If bench and pilot scale testing have been undertaken as part of the remedial design, the Independent Contractor shall submit to Ohio EPA for review and comment interim reports as technical memoranda. The interim reports shall present the results of the testing along with the Independent Contractor's recommendations regarding the affected treatment or disposal system(s), including any options under consideration. After making any required modifications based on Ohio EPA comment, the Independent Contractor shall incorporate the results of the bench and pilot scale testing into the prefinal design submittal required in section 6.3 above.

8.0 PROJECT-SPECIFIC SAMPLING AND ANALYSIS PLAN(S) (SAPs)

The Independent Contractor shall prepare project-specific Sampling and Analysis Plan(s) (SAPs) as required for any sampling and analysis activities conducted during the RD/RA. The SAP consists of two parts, a quality assurance project plan (QAPP) and a field sampling plan (FSP). Requirements for the preparation of any RD/RA SAP(s) shall be identical to those described in the RI/FS Statement of Work included with these Orders. If a RI/FS approved QAPP is still in place, it can be referenced. The SAP(s) will be used by the Independent Contractor to develop a Contractor Quality Control Plan (CQCP) which will detail procedures the Independent Contractor or its subcontractors will follow to ensure that the remedial action(s) will be constructed as specified in the approved design documents and will meet all of the identified remedial response objectives. The CQCP must be approved by Ohio EPA before a mobilization order is given for construction activities. Draft SAP(s) shall be submitted by the Independent Contractor to Ohio EPA with the intermediate design documents or with the preliminary design documents if intermediate design is not called for. After making any required corrections or modifications based on Ohio EPA comment, the Independent Contractor shall submit the final SAP(s) and the draft CQCP with the prefinal design documents.

9.0 HEALTH AND SAFETY PLAN

The Independent Contractor shall review the remedial design information and develop specifications for a Health and Safety Plan (HSP) that are sufficient to protect the local community and on-site personnel from the physical, chemical or biological hazards at the Elano Sites. The specifications shall describe the minimum health, safety and emergency response requirements for which the construction contractor will be made responsible. The Independent Contractor shall submit the draft HSP to Ohio EPA for review and comment with the appropriate preliminary or intermediate design submittals. After making any corrections or modifications as required by Ohio EPA's comments, the Independent Contractor shall submit the final HSP with the prefinal design documents. The final HSP

shall be approved in writing by a Certified Health Professional or a Certified Industrial Hygienist retained by the Independent Contractor prior to submittal to Ohio EPA.

To help ensure consistency with appropriate Federal and State health and safety requirements, the following reference list may be used as guidance in developing the HSP:

- o CERCLA sections 104 (f) and 111 (c) (6)
- o EPA Order 1440.2 - Health and Safety Requirements for Employees Engaged in Field Activities
- o EPA Order 1440.1 - Respiratory Protection
- o EPA Occupational Health and Safety Manual
- o EPA Interim Standard Operating Safety Guide (September 1982)
- o Part 1910 of 29 CFR revised 1 July 1982, OSHA Standards for General Industry
- o NIOSH, (National Institute for Occupational Safety and Health) Manual of Analytical Methods, Volumes I-VII
- o Threshold Limit Values (TLV) for Chemical Substances and Physical Agents in the Work Environment with Intended Changes Adopted by ACGIH (American Conference of Governmental Industrial Hygienists), latest edition
- o ANSI Z 88.2 - 1980, American National Standard, Practices for Respiratory Protection
- o Air Sampling Instruments for Evaluation of Atmospheric Contaminants, 6th edition, 1983, American Conference of Governmental Industrial Hygienists
- o Appropriate State health and safety statutes

10.0 SELECTION OF RESOURCE CONSERVATION AND RECOVERY ACT FACILITY

If off-site treatment or disposal of Hazardous Substances is a necessary part of the selected remedy, the Independent Contractor shall meet all provisions of the current CERCLA off-site policy unless specifically instructed to do otherwise by Ohio EPA. These provisions include but are not limited to criteria for selection of RCRA treatment, storage or disposal facilities and compliance with RCRA land disposal restrictions.

11.0 COMPLIANCE WITH THE REQUIREMENTS OF OTHER ENVIRONMENTAL LAWS

The Independent Contractor shall analyze and incorporate into the Remedial Design all applicable regulatory requirements pertaining to the selected remedy. The Independent Contractor shall identify the following information and provide such information the Ohio EPA at the preliminary design stage of the Remedial Design:

1. the permitting authority
2. required construction/operating permits
3. time required by the permitting authority to process the application(s)
4. fee schedule including filing/application fees, certification testing, etc.
5. monitoring and/or compliance testing requirements
6. reporting requirements
7. agency regulations governing applications, exemptions, variances, etc.

Copies of all correspondence from permitting authorities which either detail permit requirements or indicate that no permits are necessary shall also be furnished to Ohio EPA with the preliminary design documents.

The Independent Contractor shall obtain all required application forms, complete all forms, and provide the completed forms to the appropriate permitting authorities.

12.0 REMEDIAL ACTION

Following Ohio EPA's approval of the final design submittals, the contractor(s) chosen by the Defendants shall implement the designed remedial actions in accordance with the Ohio EPA approved schedules. At a minimum, the contractor(s) chosen by the Defendants will need to address the following during construction of the approved Remedial Action(s):

13.0 OPERATION AND MAINTENANCE PLAN

Remedial Actions vary greatly in scope. However, in most instances, there is a requirement for some degree of regular Operation and Maintenance (O&M) activity associated with the completed Remedial Action. The purpose of developing the O&M plan is to detail those activities which will need to be conducted in order to maintain and operate the constructed Remedial Action(s). Where O&M activities have been identified in the RI/FS documents and/or the approved Decision Document for Remedial Action, the Independent Contractor shall prepare and submit to Ohio EPA for review and comment a draft O&M plan as part of the prefinal design submittal (see section 6.3). After making any corrections or modifications required based on Ohio EPA comment, the Defendants or their contractor(s) shall submit the final O&M plan to Ohio EPA for review and approval prior

to the completion of construction activities for the approved Remedial Action(s). The Independent Contractor shall incorporate the submittal of the draft and final O&M plans into the schedules contained in the RD/RA Work Plan and the final design, as appropriate.

Various elements of typical O&M plans are identified below and are to be referred to by the Independent Contractor or Defendants and their contractor(s) as appropriate, during the preparation of site-specific O&M plan(s). These plan elements are delineated for illustrative purposes and should not be construed so as to limit the content of the O&M plan.

- A. Description of Normal Operation and Maintenance
 - 1. Description of the tasks for operation;
 - 2. Description of the tasks for maintenance;
 - 3. Description of prescribed treatment or operating conditions; and
 - 4. Schedules showing the frequency of each O&M task.

- B. Description of Potential Operating Problems
 - 1. Description and analysis of potential operating problems;
 - 2. Sources of information regarding operating problems; and
 - 3. Common remedies for operating problems.

- C. Description of Routine Monitoring and Laboratory Testing
 - 1. Description of monitoring tasks;
 - 2. Description of required laboratory tests and their interpretation;
 - 3. Required QA/QC procedures to be followed; and
 - 4. Schedule of monitoring frequency and when, if so provided, to discontinue.

- D. Description of Alternative O&M
 - 1. Should systems fail, alternate procedures to prevent undue hazard; and
 - 2. Analysis of the vulnerability and additional resource requirements should a failure occur.

- E. Safety Plan
 - 1. Description of precautions, of necessary equipment, etc., for site personnel; and
 - 2. Safety tasks required in event of systems failure (may be linked to the Health and Safety Plan developed during remedial response).

- F. Description of Equipment
 - 1. Equipment necessary to the plan;
 - 2. Installation of monitoring components;

3. Maintenance of site equipment; and
 4. Replacement schedule for equipment and installed components.
- G. Records and Reporting Mechanisms Required
1. Daily reporting logs;
 2. Laboratory records;
 3. Mechanism for reporting of emergencies;
 4. Personnel and maintenance records; and
 5. Monthly/annual reports to State agencies.

14.0 DEFENDANT'S CONTRACTOR(S) SERVICES DURING CONSTRUCTION

14.1 Review of Construction Shop Drawings

The contractor(s) chosen by the Defendants shall check all shop drawings and calculations generated during construction activities for compliance with the requirements of the Contract plans and specifications before submitting them to Ohio EPA for approval. If submittals are incomplete or are insufficient to perform review, Ohio EPA shall notify the contractor(s) chosen by the Defendants of the deficiencies identified and modifications or corrections required. After making any required corrections or modifications based on Ohio EPA's comments, the contractor(s) chosen by the Defendants shall resubmit the corrected shop drawings to Ohio EPA for approval.

14.2 Attend Conferences and Visit Project Sites

The Contractor(s) chosen by the Defendants shall furnish technically qualified representatives to attend conferences and/or visit the Remedial Action sites before or during construction. These services will include writing of reports and/or preparation of other information as may be required for the project.

14.3 Provide Field Representative

The contractor(s) chosen by the Defendants shall make available a Field Representative in order to provide the following general services:

- o Advise Ohio EPA on engineering interpretation of the facility plans and specifications.
- o Assist Ohio EPA in interpreting impact on the design of proposed changes.
- o Prepare sketches and/or revised drawings in a timely manner to aid in the preparation of construction Contract modifications.

- Document design field changes that occur during construction.
- Facility start-up, testing and shakedown
- Operator training

APPENDIX E

GUARANTY

THIS GUARANTY ("Guaranty") is made and given as of December ____, 1995, by the GENERAL ELECTRIC COMPANY ("GE") to and for the benefit of the STATE OF OHIO and CITIZEN PLAINTIFFS.

WHEREAS, the Elano Corporation ("Elano"), a wholly-owned subsidiary of GE, has negotiated the terms of a Consent Order with the State of Ohio (the "Consent Order") in connection with claims asserted against it under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. 9601, et seq., the Resource Conservation Recovery Act, as amended, 42 USC. 6901 et seq., and the Ohio Revised Code Chapter 3734., 3767., and 6111.; and

WHEREAS, by the terms of the Consent Order, Elano is obligated to complete a remedial investigation, to undertake the preparation of a feasibility study, and to perform environmental remediation at the "Elano Sites" as that term is defined in the Consent Order; and

WHEREAS, the State of Ohio has sought assurances that Elano will fulfill its obligations under the Consent Order and has conditioned settlement of its claims against Elano on obtaining GE's agreement to guarantee the performance of all obligations of Elano under the Consent Order; and

WHEREAS, GE denies any liability based on its own action or inaction in connection with the Elano Sites and/or the Elano Corporation and the former Acme Screw Products Corporation and Enlo, Inc. facilities; and

WHEREAS, GE denies any liability for its wholly-owned subsidiary, Elano,

arising out of its corporate relationship; and

WHEREAS, the State of Ohio, Citizen Plaintiffs, and GE have agreed that GE will not be a signatory to the Consent Order, but will provide this Guaranty and that this Guaranty is an enforceable part of the Consent Order.

NOW THEREFORE, in consideration of the execution of the Consent Order by /and the inclusion of GE in the settlement and discharge contained the State of Ohio, Citizen Plaintiffs, and Elano contemporaneously herewith/ GE does in Section IX of the Consent Order/

HAH/wd

hereby guaranty to and for the benefit of the State of Ohio and Citizen Plaintiffs as follows:

1. GE guarantees the performance by Elano of those obligations of Elano created pursuant to the Consent Order including, but not limited to the payment of the costs and/or the performance of remedial investigation, feasibility study, remedial design, remedial action, and operational and maintenance; the payment of any civil penalties and stipulated penalties, and the payment of past and future "Response Costs" and "Oversight Costs" as those terms are defined in the Consent Order.

2. Upon knowledge of the occurrence of any event considered by the State to be a default or failure by Elano to perform any act or make any payment required by the terms of the Consent Order, the State of Ohio may provide Elano and GE with written notice by certified mail of Elano's failure to perform its obligations under the Consent Order. Upon receipt of such written notice, Elano and GE shall have ten (10) business days to cure the default or failure. Notice of demand shall be mailed by certified U.S. mail, postage prepaid, shall state the specific amount of money or the specific performance demanded, and shall be delivered as follows:

Original To: William V. Killoran, Jr., Esq.
Counsel-Environmental Affairs
GE Aircraft Engines
One Neumann Way
Mail Drop T-165A
Cincinnati, Ohio 45215

With A Copy To: Mr. Robert Hessel
President & CEO
Elano Corporation
2455 Dayton-Xenia Road
Dayton, Ohio 45434-7199

Failure to provide notice of Elano's failure to perform its obligations under the the Consent Order, shall not relieve Elano from its obligations to perform under the Consent Order.

3. GE shall make all payments and take any action required of Elano under the Consent Order to effect this guaranty of performance if Elano fails to cure such default within 20 days upon receipt of notice required by paragraph 2 from the State of Ohio that Elano has failed to perform its obligations under the Consent Order.

4. If demand is made pursuant to this Guaranty, GE shall be entitled to make and prosecute all defenses available to Elano under the Consent Order in accordance with applicable procedures under the Consent Order, and shall succeed to all rights of Elano under the Consent Order, including but not limited to the right to dispute resolution.

5. Any and all payments made, or performance effected, by GE pursuant to this Guaranty shall be credited against the obligations of Elano under the Consent Order as if Elano itself had made such payments or effected such performance.

6. GE shall comply with all restrictions and/or prohibitions on conduct set

forth in the Consent Order, including but not limited to restrictions on the communication with the Independent Contractor set forth in Section XI of the Consent Order.

7. GE shall not restrict or prohibit Elano from complying with the Consent Order.

8. All obligations and duties of GE shall survive any change in the operation or organization of Elano, including but not limited to the sale, liquidation or bankruptcy of Elano, and all obligations and duties of GE shall survive any change in the operation or organization of GE and/or any assignment of GE's obligations and duties under this Guaranty or Section III, paragraph C. of the Consent Order. Furthermore, all obligations and duties of GE under this Guaranty or Section III, paragraph C. of the Consent Order shall apply to and be binding upon (1) any successor in interest to substantially all of GE's assets or operations and (2) any assignee of GE's obligations and duties under this Guaranty or Section III, paragraph C. of the Consent Order.

9. This Guaranty shall be governed by and construed in accordance with the laws of the State of Ohio.

IN WITNESS WHEREOF, GE has executed this Guaranty as of the date of the last set forth below.

GENERAL ELECTRIC COMPANY

By: Henry A. Huberman

Title: VICE PRESIDENT

Date: 15 JANUARY 1996

Appendix F

OHIO EPA and U.S. EPA POLICY AND GUIDANCE DOCUMENTS

OHIO EPA POLICIES AND GUIDANCE DOCUMENTS

1. Background Sampling Guidance, Final, Ohio EPA, Division of Emergency and Remedial Response, July 26, 1991
2. Best Available Treatment Technologies (BATT) for Remedial Response Program Sites, Ohio EPA Policy No. DERR-00-RR-016, Final, October 23, 1992
3. Guidelines and Specifications for Preparing Quality Assurance Project Plans, Ohio EPA, Division of Emergency and Remedial Response, Policy No. DERR-00-RR-008, March 1990
4. How Clean is Clean, Final, Ohio EPA, Division of Emergency and Remedial Response, Policy No. DERR-00-RR-009, July 26, 1991
5. Procedures for Evaluation of Response Action Alternatives and Remedy Selection for Remedial Response Program Sites, Ohio EPA Policy No. DERR-00-RR-019, Final, October 23, 1992
6. Technical Guidance Manual for Hydrogeologic Investigations and Ground Water Monitoring Programs, Ohio EPA, Division of Drinking and Ground Waters, Final, February 1995
7. Wastewater Discharges Resulting from Clean-Up of Response Action Sites Contaminated with Volatile Organic Compounds, Ohio EPA Policy No. DSW-DERR 0100.027, Final, September 22, 1994

Also, if there are any aquatic ecological concerns for the site under investigation please consult the following Biological Criteria documents:

- 8a. Biological Criteria for the Protection of Aquatic Life: Volume I. The Role of Biological Data in Water Quality Assessment. Ohio EPA, Division of Surface Water, 1987
- 8b. Biological Criteria for the Protection of Aquatic Life: Volume II. Users Manual for Biological Field Assessment of Ohio Surface Waters. Ohio EPA, Division of Surface Water, 1987
- 8c. Addendum to Biological Criteria for the Protection of Aquatic Life: Volume II. Users Manual for Biological Field Assessment of Ohio Surface Waters. Ohio EPA, Division of Surface Water, 1989

- 8d. Biological Criteria for the Protection of Aquatic Life: Volume III. Standardized Biological Field Assessment of Ohio Surface Waters. Ohio EPA, Division of Surface Water, 1989
- 8e. Rankin, E.T. 1989. The Qualitative Habitat Evaluation Index (QHEI): Rationale, Methods, and Application. Ohio EPA, Division of Surface Water, 1990

U.S. EPA GUIDANCE DOCUMENTS AND OTHER USEFUL GUIDANCE

- 9. CERCLA Compliance with Other Laws Manual - Part I, OSWER Directive 9234.1-01, EPA/540/G-89/006, August 1988, interim final
- 10. CERCLA Compliance with Other Laws Manual - Part II, OSWER 9234.1-01, EPA/540/G-89/006, August 1988, interim final
- 10. A Compendium of Technologies Used in the Treatment of Hazardous Wastes, EPA/625/8-87/014, September 1987
- 12. A Rationale for the Assessment of Errors in the Sampling of Soils, EPA/600/4-90/013, July 1990
- 13. Assessment of Technologies for the Remediation of Radioactively Contaminated Superfund Sites, EPA/540/2-90/001, January 1990
- 14. Closure of Hazardous Waste Surface Impoundments, SW-873, September 1980
- 15. Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites, OSWER Directive 9355.3-11, EPA/540/P-91/001, February 1991
- 16. Data Quality Objectives Process for Superfund, Interim Final Guidance, OSWER Directive 9355.9-01, EPA/540-R-93-071, September 1993
- 17. Ecological Assessments of Hazardous Wastes Sites: A Field and Laboratory Reference, EPA/600/3-89/013, March 1989
- 18. Exposure Factors Handbook, EPA/600/8-89/043, March 1990
- 19.* Guidance for Remedial Actions for Contaminated Ground Water at Superfund Sites, OSWER Directive 9283.1-2, EPA/540/G-88/003, December 1988, interim final

20. Guidance for Conducting Remedial Investigation and Feasibility Studies under CERCLA, Interim Final, OSWER 9355.3-01, EPA/540/G-89/004, October 1988
- 21.* Guidance on Remedial Actions for Superfund Sites with PCB Contamination, OSWER Directive 9355.4-01, EPA/540/G-90/007, August 1990
22. Guidance Document on the Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities, EPA, 1989
23. Guidance on Applying the Data Quality Objectives Process for Ambient Air Monitoring Around Superfund Sites (Stages 1 & 2), EPA/450/4-89/015, August 1989
24. Guidance for Data Usability in Risk Assessment, OSWER Directive 9285.7-05, EPA/540/G-90/008, October 1990, interim final
- 25.* Guide for Decontaminating Buildings, Structures, and Equipment at Superfund Sites, EPA/600/2-85/028, March 1985
26. Guide for Conducting Treatability Studies Under CERCLA: Soil Vapor Extraction, EPA/540/2-91/019A, September 1991, interim guidance
27. Guide for Conducting Treatability Studies Under CERCLA: Aerobic Biodegradation Remedy Screening, EPA/540/2-91/013A, July 1991, interim guidance
28. Guide for Conducting Treatability Studies Under CERCLA, EPA/540/2-89/058, December 1989, interim final
29. Handbook - Permit Writer's Guide to Test Burn Data - Hazardous Waste Incineration, EPA/625/6-86/012, September 1986
- 30.* Handbook - Quality Assurance/Quality Control (QA/QC) Procedures for Hazardous Waste Incineration, EPA/625/6-89/023, January 1990
31. Handbook - Dust Control at Hazardous Waste Sites, EPA/540/2-85/003, November 1985
- 32.* Handbook - Guidance on Setting Permit Conditions and Reporting Trial Burn Results - Volume II of the Hazardous Waste Incineration Guidance Series, EPA/625/6-89/019, January 1989

33. Handbook on In Situ Treatment of Hazardous Waste-Contaminated Soils, EPA/540/2-90/002, January 1990,
34. Handbook for Stabilization/Solidification of Hazardous Wastes, EPA/540/2-86/001, June 1986
35. Handbook - Hazardous Waste Incineration Measurement Guidance Manual - Volume III of the Hazardous Waste Incineration Guidance Series, EPA/625/6-89/021, June 1989
36. Leachate Plume Management, EPA/540/2-85/004, November 1985
37. Preparation Aids for the Development of Category 1 Quality Assurance Project Plans, EPA/6008-91-003, February 1991
38. Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures, Interim Final, EPA/540/G-90/004, April 1989
39. RCRA Ground Water Monitoring Technical Enforcement Guidance Document (TEGD), OSWER Directive 9950.1, September 1986
40. Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002, December 1989
41. Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part B), "Development of Risk-based Preliminary Remediation Goals," OSWER Directive 9285.7-01B, December 1991, Interim
42. Risk Assessment Guidance for Superfund: Volume II - Environmental Evaluation Manual, OSWER Directive 9285.7-01, EPA/540/1-89/001A, March 1989, interim final
43. Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors," OSWER Directive 9285.6-03, March 1991, interim final
44. Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part C); "Risk Evaluation of Remedial Alternatives," OSWER Directive 9285.7-01C, December 1991, Interim
- 45.* Seminar Publication - Requirements for Hazardous Waste Landfill Design, Construction, and Closure, EPA/625/4-89/022, August 1989

46. Stabilization/Solidification of CERCLA and RCRA Wastes - Physical Tests, Chemical Testing Procedures, Technology Screening and Field Activities, EPA/625/6-89/022, May 1989
47. Standard Methods for the Examination of Water and Wastewater, American Public Health Association, 18th Edition, 1992
- 48.* Superfund Remedial Design and Remedial Action Guidance, OSWER 9355.0-4A, June 1986
49. Superfund Exposure Assessment Manual, OSWER Directive 9285.5-1, EPA/540/1-88/001, April 1988
50. Superfund Ground Water Issue: Ground Water Sampling for Metals, EPA/540/4-89/001, March 1989
- 51.* Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments, EPA/530-SW-89-047, July 1989
- 52.* Technical Guidance Document: Inspection Techniques for the Fabrication of Geomembrane Field Seams, EPA/530/SW-91/051, May 1991
53. Technical Guidance for Corrective Measures - Subsurface Gas, EPA/530-SW-88-023, March 1985
54. Technical Guidance Document: Construction Quality Assurance and Quality Control for Waste Containment Facilities, EPA/600/R-93/182, September 1993
55. U.S. EPA Integrated Risk Information System (IRIS) Data Base
56. U.S. EPA Health Effects Assessment Summary Tables, Office of Emergency & Remedial Response, published annually
57. U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA-540/R-94-013, February 1994
58. U.S. EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA-540/R-94-012, February 1994
59. U.S. EPA, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," 3rd Edition, as amended by Updates I, II, and IIa.

Notes:

- 1) Documents and guidances denoted by an asterisk (*) are those which may be important to the Remedial Design/Remedial Action phase of a project but generally will have limited relevance to the Remedial Investigation/Feasibility Study process.
- 2) This list of guidance documents is updated periodically. You should check with Ohio EPA to verify that this list is the most current available.
- 3) All guidance documents listed above include all subsequent addenda.