UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 4

IN THE MATTER OF:
Coronet Industries, Inc.
Plant City, Hillsborough County, Florida

Coronet Industries, Inc.,

Respondent

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

U.S. EPA Region 4
Docket No. CERCLA-04-2008-3755

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

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

I. JURISDICTION AND GENERAL PROVISIONS

1. This Administrative Settlement Agreement and Order on Consent ("Settlement Agreement") is entered into voluntarily by the United States Environmental Protection Agency ("EPA") and Coronet Industries, Inc. ("Respondent"). The Settlement Agreement concerns the preparation and performance of a remedial investigation and feasibility study ("RI/FS") at the Coronet Industries Site located at 4082 Coronet Road, Plant City, Florida 33566 ("Site") and the reimbursement for Future Response Costs incurred by EPA in connection with the RI/FS.

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

3. In accordance with Sections 104(b)(2) and 122(j)(1) of CERCLA, 42 U.S.C. §§ 9604(b)(2) and 9622(j)(1), EPA notified the United States Department of the Interior, the National Oceanic and Atmospheric Administration, and the Florida Department of Environmental Protection on January 29, 2007, of negotiations with potentially responsible parties regarding the release of hazardous substances that may have resulted in injury to the natural resources under Federal and State trusteeship.

4. EPA and Respondent recognize that this Settlement Agreement has been negotiated in good faith and that the actions undertaken by Respondent in accordance with this Settlement Agreement do not constitute an admission of any liability. Respondent does not admit, and retains the right to controvert in any subsequent proceedings other than proceedings to implement or enforce this Settlement Agreement, the findings of fact, conclusions of law and determinations in Sections V and VI of this Settlement Agreement, and the factual history recited in the RI/FS Work Plan. Respondent agrees to comply with and be bound by the terms of this Settlement Agreement and further agrees that it will not contest the basis or validity of this Settlement Agreement or its terms.

5. Respondent has conducted significant sampling and investigatory work at the Site pursuant to two separate Administrative Orders on Consent (Docket Nos. RCRA-04-2004-4250 and RCRA-04-2006-4250) issued pursuant to Section 3013(a) of the Resource Conservation and Recovery Act, as amended, 42 U.S.C. § 6934(a) ("RCRA"). Respondent has documented this

work in a Phase I Site Assessment Report, and a draft Phase II Site Assessment Report. EPA and Respondent acknowledge and agree that this Settlement Agreement shall supercede the existing Phase I and II Administrative Orders on Consent, and that Respondent's compliance with this Settlement Agreement shall be in lieu of compliance with the existing RCRA orders. In addition, completion of the Work under this Settlement Agreement shall fulfill Respondent's obligations under Docket Nos. RCRA-04-2004-4250 and RCRA-04-2006-4250 such that notice of completion of the Work pursuant to Section XXXI of this Settlement Agreement shall also serve as written notice from EPA that these prior orders are terminated.

6. The Florida Department of Environmental Protection ("FDEP") has been provided an opportunity to review and comment upon the RI/FS Work Plan, attached as Appendix A to this Settlement Agreement, and agrees with the Work required therein; however, FDEP is not a party hereto.

II. PARTIES BOUND

7. This Settlement Agreement applies to and is binding upon EPA and upon Respondent and its successors and assigns. Any change in ownership or corporate status of Respondent including, but not limited to, any transfer of assets or real or personal property shall not alter Respondent's responsibilities under this Settlement Agreement.

8. Respondent is liable for carrying out all activities required by this Settlement Agreement.

9. Respondent shall ensure that its contractors, subcontractors, and representatives receive a copy of this Settlement Agreement and comply with this Settlement Agreement. Respondent shall be responsible for any noncompliance with this Settlement Agreement.

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

III. STATEMENT OF PURPOSE

11. In entering into this Settlement Agreement, the objectives of EPA and Respondent are: (a) to further determine the nature and extent of contamination and potential contamination and any threat to the public health, welfare, or the environment caused by the release or threatened release of hazardous substances, pollutants or contaminants at or from the Site, by conducting a Remedial Investigation and Baseline Risk Assessment building upon the existing site characterization work performed during the RCRA Phase I and Phase II Site Assessments, as more specifically set forth in the RI/FS Work Plan attached as Appendix A to this Settlement Agreement; (b) to identify and evaluate remedial alternatives to prevent, mitigate or otherwise respond to or remedy any release or threatened release of hazardous substances, pollutants, or

contaminants at or from the Site, by conducting a Feasibility Study as more specifically set forth in the RI/FS Work Plan in Appendix A to this Settlement Agreement; and (c) to recover response and oversight costs incurred by EPA with respect to this Settlement Agreement.

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

IV. DEFINITIONS

13. Unless otherwise expressly provided herein, terms used in this Settlement Agreement that are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Settlement Agreement or in the appendices attached hereto and incorporated hereunder, the following definitions shall apply:

a. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601, *et seq.*

b. "Day" shall mean a calendar day. In computing any period of time under this Settlement Agreement, where the last day would fall on a Saturday, Sunday, or federal holiday, the period shall run until the close of business of the next working day.

c. "Effective Date" shall be the effective date of this Settlement Agreement as provided in Section XXX.

d. "EPA" shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States.

e. "FDEP" shall mean the Florida Department of Environmental Protection and any successor departments or agencies of the State of Florida.

f. "Engineering Controls" shall mean constructed containment barriers or systems that control one or more of the following: downward migration, infiltration or seepage of surface runoff or rain; or natural leaching migration of contaminants through the subsurface over time. Examples include caps, engineered bottom barriers, immobilization processes, and vertical barriers.

g. "Future Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States incurs after the Effective Date of this Settlement

Agreement, in reviewing or developing plans, reports and other items pursuant to this Settlement Agreement, verifying the Work, or otherwise implementing, overseeing, or enforcing this Settlement Agreement, including but not limited to, payroll costs, contractor costs, travel costs, laboratory costs, Agency for Toxic Substances and Disease Registry ("ATSDR") costs, the costs incurred pursuant to Paragraph 64 (costs and attorneys' fees and any monies paid to secure access, including the amount of just compensation), Paragraph 50 (emergency response), and Paragraph 94 (Work Takeover).

h. "Institutional controls" shall mean non-engineered instruments, such as administrative and/or legal controls, that help to minimize the potential for human exposure to contamination and/or protect the integrity of a remedy by limiting land and/or resource use. Examples of institutional controls include easements and covenants, zoning restrictions, special building permit requirements, and well drilling prohibitions.

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

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

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

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

m. "Parties" shall mean EPA and Respondent.

n. "Phase I Site Assessment" shall mean the work done pursuant to Administrative Order on Consent, Docket No. RCRA-04-2004-4250, proceeding under Section 3013(a) of the Resource Conservation and Recovery Act, as amended, 42 U.S.C. § 6934(a) (July 28, 2004).

o. "Phase II Site Assessment" shall mean the work done pursuant to Administrative Order on Consent, Docket No. RCRA-04-2006-4250, proceeding under Section 3013(a) of the Resource Conservation and Recovery Act, as amended, 42 U.S.C. § 6934(a) (October 17, 2005).

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

q. "RI/FS Work Plan" shall mean the work plan developed by Respondent for the completion of an RI/FS at the Site as set forth in Appendix A to this Settlement Agreement. The RI/FS Work Plan is incorporated into this Settlement Agreement and is an enforceable part of this Settlement Agreement as are any modifications made thereto in accordance with this Settlement Agreement.

r. "Respondent" shall mean Coronet Industries, Inc.

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

t. "Site" shall mean, for purposes of this Settlement Agreement, the Coronet Industries Superfund Alternative Site, encompassing the approximately 980 acre Coronet property at 4082 Coronet Road, Plant City, Hillsborough County, Florida (Appendix B) and the areal extent of any contamination that has emanated from the property.

u. "State" shall mean the State of Florida.

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

w. "Work" shall mean all activities Respondent is required to perform under this Settlement Agreement, including those activities that have been previously performed during the Phase I and Phase II Site Assessments that are specifically incorporated into and become a part of the approved RI, except those required by Section XIV (Retention of Records).

V. FINDINGS OF FACT

14. The Coronet Industries Site consists of approximately 980 acres, and is located at 4082 Coronet Road in Plant City, Florida. Historically, the 980-acre parcel was part of a larger 2,500-acre parcel that included a phosphate mine. The Site is bordered on the north and west by formerly mined land that is now generally used for agricultural purposes, and on the east and south by a mixture of residential and agricultural properties. During plant operations, the Site primarily consisted of the plant operational area (known as the main plant area), two process

ponds interconnected through a series of ditches to nine holding ponds that occasionally received overflows of process water. The onsite ponds cover approximately 350 acres. A pilot plant/research building is located west of the main plant area. Since approximately 1939, a golf course covering approximately 250 acres operated at the Site.

15. Phosphate mining and ore processing operations were conducted at the Coronet Site and the larger mining parcel from 1906 through 1940. Production of Coronet Defluorinated Phosphate ("CDP"), a nutritional supplement for animal feed, began in approximately 1946. Production of potassium fluoroborate ("KBF_4"), which is used in the aluminum alloy and electronics industries, was added around 1958. Respondent purchased the Site in 1993 and produced CDP and KBF_4 at the Site until approximately March 2004, when production operations ceased.

16. Former mining operations included the excavation of phosphate matrix that included a combination of phosphate ore, sand, and clay. Naturally occurring within this matrix are inorganic constituents such as arsenic, cadmium, chromium, and lead, along with radionuclides, such as radium (Ra^{226}) and uranium (U^{238}). The mining and processing of this ore has resulted in the redistribution and concentration of these inorganic constituents and radionuclides in the surface and subsurface soil, surface water, sediments in onsite ponds and wetland areas, and underlying groundwater.

17. CDP was produced using a combination of phosphate rock, phosphoric acid, and sodium hydroxide. CDP production involved three primary steps, including feed preparation, thermal defluorination, and product milling. Feed preparation involved the mixing, screening, and milling of dried phosphate rock into a uniformly sized feed. The feed was then defluorinated by heating in a rotary kiln or fluid bed reactor. The feed was then cooled, milled, and packaged for sale. Hydrofluoric acid was a byproduct of this defluorination process. Process streams from this operation contained elevated levels of cadmium, which has been detected in onsite surface water, sediment, and groundwater.

18. KBF_4 was produced through use of the hydrofluoric acid from the CDP defluorination process. Hydrofluoric acid was reacted with potassium chloride to produce potassium fluoride. Borax (sodium tetraborate pentahydrate) was then introduced to the mixture to form potassium fluoroborate (KBF_4). Potassium fluoroborate was marketed to the aluminum alloy and electronics industries. Process streams from this operation contained elevated levels of arsenic, cadmium, and chromium.

19. FDEP conducted a RCRA Inspection at the Site on July 23, 2003, during which FDEP identified several process streams that Coronet was managing in unlined ditches and ponds. Because of concerns regarding the potential effect of heavy rains on wastewater flows off the Site, FDEP issued an Immediate Final Order to Coronet on August 27, 2003. FDEP subsequently issued an agreed-upon Immediate Final Order for Interim Activities to Coronet on

May 11, 2004. FDEP issued the First Amendment to the Immediate Final Order for Interim Activities on October 1, 2004.

20. In 2003, the Florida Department of Health ("FDOH") instituted a semi-annual groundwater sampling program to monitor off-site private wells. Initial sampling results indicated elevated levels of contaminants, including, but not limited to, arsenic, boron, cadmium, sodium, thallium, and radium. Thirty-nine (39) residences were provided with bottled water as a result of FDOH sampling activities, and public water line installation to affected areas is ongoing.

21. On November 12-14, 2003, EPA and FDEP conducted a RCRA Case Development Inspection ("CDI") at the Site, with follow-up sampling conducted on January 17, 2004. Sample results indicated elevated levels of cadmium, arsenic, and chromium.

22. Respondent initiated a Phase I Site Assessment in 2004 pursuant to a July 28, 2004, Administrative Order on Consent with EPA, Docket No. RCRA-04-2004-4250. Respondent's Phase I Report indicated that surface impoundments at the Site had affected groundwater, but that additional data was needed to delineate the vertical and horizontal extent of contamination. As a result, Respondent conducted a Phase II Site Assessment in 2006 pursuant to a second Administrative Order on Consent with EPA, Docket No. RCRA-04-2006-4250, dated October 17, 2005.

23. Respondent is currently performing an interim response (removal) action at Pond 6 pursuant to an Administrative Settlement Agreement with FDEP, dated August 31, 2006.

24. The CDI and Phase I and II Site Assessments confirm that the disposal of process wastewater into unlined ponds and ditches at the Site, as well as other disposal practices, has resulted in the release of hazardous substances into soil, sediment, surface water, and groundwater at the Site. In addition, the Phase I and II Site Assessments show that the Site is also contaminated with elevated levels of Ra^{226} as a result of former mining operations.

25. Soil samples collected from the main plant area indicate the frequent presence of Ra^{226} at levels in excess of the federal criterion of 5 pCi/g for unrestricted use, with levels as high as 66 pCi/g. In addition, sediment samples collected from onsite ponds reveal levels of Ra^{226} and U^{238} as high as 87pCi/g and 97 pCi/g. Investigation of the presence of radiological isotopes in groundwater at the Site and in private wells south of the Site has been limited primarily to sampling for gross-alpha, which is an indicator of the presence of radiological isotopes that emit alpha particles. Groundwater samples in the vicinity of onsite Ponds 1, 2, and 6 contain gross-alpha levels that are twice the maximum contaminant level ("MCL") of 15 pCi/l. Gross-alpha and Ra^{226} have been detected in private wells at concentrations as high as 41 pCi/l and 30 pCi/l. The MCL for Ra^{226} is 5 pCi/l. Groundwater samples from wells installed in the main plant area have also been found to be contaminated with arsenic, cadmium, chromium, and fluoride at

levels above the MCLs. Arsenic, fluoride, and boron have also been detected in some off-site private wells.

26. Radium is a radiological isotope and emitter of gamma radiation. Gamma radiation is a known human carcinogen. The decay of Ra^{226} also results in the emission of radon gas. Radon gas is a known human carcinogen.

27. Inorganic constituents include arsenic, boron, chromium, cadmium, and fluoride. Arsenic can be carcinogenic if ingested in sufficient quantities over long periods of time and can cause dermal lesions when ingested in drinking water. Cadmium and chromium can be toxic to kidneys if ingested in sufficient quantities. Ingestion of sufficient quantities of fluoride can cause brittleness in teeth and can also negatively impact reproductive health. Based on testing in laboratory animals, arsenic can cause developmental effects in wildlife exposed to sufficient concentrations. Chromium can cause developmental effects and liver damage in wildlife exposed to sufficient concentrations. Cadmium can cause bone weakness, kidney damage, and behavioral abnormalities in wildlife exposed to sufficient concentrations. Fluoride can cause premature tooth wear in mammals and can exhibit aquatic toxicity at sufficient concentrations.

28. On January 18, 2007, ATSDR, in conjunction with FDOH, issued a Public Health Assessment for the Site. The assessment was based on an analysis of a variety of data collected by those agencies, including air, soil, groundwater, urine, and fish samples. The assessment concluded that the site currently poses "no apparent public health hazard." This conclusion was limited to observable health effects from acute exposure to contaminants, as well as epidemiological data from 1990 to 2000. Other than the consideration of ten years of cancer data, the assessment did not address potential cancer risks from long-term exposure to lower levels of contaminants.

29. This Site is not on the National Priorities List and is currently being treated as a Superfund Alternative Site.

30. Respondent, a Florida corporation, is the current owner of the Site and is a prior operator of the Site at the time of disposal of hazardous substances.

VI. CONCLUSIONS OF LAW AND DETERMINATIONS

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

31. The Coronet Industries Site is a "facility" as defined in Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

32. The contamination found at the Site, including, but not limited to, radium, arsenic, chromium, and cadmium, as identified in the Findings of Fact above, includes "hazardous substances" as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

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

34. Respondent is a "person" as defined in Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

35. Respondent is a responsible party under Sections 104, 107 and 122 of CERCLA, 42 U.S.C. §§ 9604, 9607 and 9622. Respondent is the current owner of the facility, and was a prior owner and operator of the facility for part of the time when disposal of hazardous substances occurred at the facility, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the meaning of Section 107(a)(2) of CERCLA, 42 U.S.C. § 9607(a)(2).

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

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

VII. SETTLEMENT AGREEMENT AND ORDER

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

VIII. DESIGNATION OF CONTRACTORS AND PROJECT COORDINATORS

39. Selection of Contractors, Personnel. All Work performed under this Settlement Agreement shall be under the direction and supervision of qualified personnel. Respondent has notified EPA that WSP Environmental Strategies, Environ Corporation, and Dr. John R. Frazier, CHP, shall serve as contractors at the Site, and EPA approves the use of such contractors. Within 30 days of the Effective Date of this Settlement Agreement, and before the Work outlined below begins, Respondent shall notify EPA in writing of the names, titles, and qualifications of any other personnel, including contractors, subcontractors, consultants and laboratories to be used in carrying out such Work. With respect to any proposed contractor, Respondent shall demonstrate

that the proposed contractor has a quality system which complies with ANSI/ASQC E4-1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs," (American National Standard, January 5, 1995, or most recent version), by submitting a copy of the proposed contractor's Quality Management Plan ("QMP"). The QMP should be prepared in accordance with "EPA Requirements for Quality Management Plans (QA/R-2)," (EPA/240/B-01/002, March 2001 or subsequently issued guidance) or equivalent documentation as determined by EPA. The qualifications of the persons undertaking the Work for Respondent shall be subject to EPA's review, for verification that such persons meet minimum technical background and experience requirements. This Settlement Agreement is contingent on Respondent's demonstration to EPA's satisfaction that Respondent is qualified to perform properly and promptly the actions set forth in this Settlement Agreement. If EPA disapproves in writing of any person's technical qualifications, Respondent shall notify EPA of the identity and qualifications of the replacements within 30 days of the written notice. If EPA subsequently disapproves of the replacement, EPA reserves the right to terminate this Settlement Agreement and to conduct a complete RI/FS, and to seek reimbursement for costs and penalties from Respondent. During the course of the RI/FS, Respondent shall notify EPA in writing of any changes or additions in the personnel used to carry out such Work, providing their names, titles, and qualifications. EPA shall have the same right to disapprove changes and additions to personnel as it has hereunder regarding the initial notification.

40. Respondent has designated, and EPA has approved, a Project Coordinator who shall be responsible for administration of all actions by Respondent required by this Settlement Agreement. To the greatest extent possible, the Project Coordinator shall be present on Site or readily available during Site Work. Respondent shall have the right to change its Project Coordinator, subject to EPA's right to disapprove. Respondent shall notify EPA 20 days before such a change is made, or as soon as practicable if 20 days advance notice is not possible. The initial notification may be made orally, but shall be promptly followed by a written notification. If EPA disapproves of a subsequent Project Coordinator, Respondent shall retain a different Project Coordinator and shall notify EPA of that person's name, address, telephone number and qualifications within 14 days following EPA's disapproval. Receipt by Respondent's Project Coordinator of any notice or communication from EPA relating to this Settlement Agreement shall constitute receipt by Respondent. Documents to be submitted to Respondent shall be sent to:

Project Coordinator	and	David Denner
Stephen J. Kretschman		CEO
Director of Engineering		Coronet Industries, Inc.
WSP Environmental Strategies LLC		4082 Coronet Road
750 Holiday Drive, Suite 410		Plant City, FL 33566
Pittsburgh, PA 15220		corininc@yahoo.com
skretschman@escpa.com		

41. EPA has designated Brad Jackson of the Superfund Division as its Project Coordinator. EPA will notify Respondent of a change of its designated Project Coordinator. Except as otherwise provided in this Settlement Agreement, Respondent shall direct all submissions required by this Settlement Agreement to the Project Coordinator at the following address:

Brad Jackson
U.S. Environmental Protection Agency, Region 4
Superfund Division
61 Forsyth Street, SW
Atlanta, GA 30303
jackson.brad@epa.gov

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

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

IX. WORK TO BE PERFORMED

44. Respondent shall conduct the RI/FS, including Baseline Risk Assessment, in accordance with the provisions of this Settlement Agreement, the RI/FS Work Plan (attached as Appendix A), CERCLA, the NCP and EPA guidance, including, but not limited to the "Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (OSWER Directive # 9355.3-01, October 1988 or subsequently issued guidance), "Guidance for Data Useability in Risk Assessment" (OSWER Directive #9285.7-05, October 1990 or subsequently issued guidance), and guidance referenced therein, and guidances referenced in the RI/FS Work Plan, as may be amended or modified by EPA.

a. The Remedial Investigation ("RI") shall build upon the existing site characterization work performed during the RCRA Phase I and Phase II Site Assessments, and shall consist of: (1) collecting data to characterize site conditions; (2) determining the nature and extent of the contamination at or from the Site; (3) assessing risk to human health and the environment; and (4) conducting treatability testing as necessary to evaluate the potential performance and cost of the treatment technologies that are being considered. Significant information on the nature and

extent of contamination at the Site has been gathered during Respondent's Phase I and II Site Assessments. To the extent this information is specifically incorporated into and becomes a part of the approved RI, it will be considered to be consistent with the NCP. Additional work not performed during the Phase I and II Site Assessments as set forth in the RI/FS Work Plan will be needed in order to fully evaluate and characterize the Site, including, but not limited to: (1) further investigating the extent of groundwater contamination; (2) further assessing the impacts of releases from the Site on downgradient private wells; (3) assessing the extent of radiological impacts at the Site; and (4) assessing and characterizing the contamination at the pilot plant/research facility. A groundwater model shall be developed based on site-specific hyrdologic and hyrdrogeologic conditions and used in the evaluation of various remedial alternatives.

b. The Baseline Risk Assessment, performed as part of the RI, shall evaluate those baseline risks existing immediately after the completion of the Pond 6 interim response (removal) action.

c. The Feasibility Study ("FS") shall determine and evaluate (based on treatability testing, where appropriate) alternatives for remedial action to prevent, mitigate or otherwise respond to or remedy the release or threatened release of hazardous substances, pollutants, or contaminants at or from the Site. The alternatives evaluated must include, but shall not be limited to, the range of alternatives described in the NCP, and shall include remedial actions that utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In evaluating the alternatives, Respondent shall address the factors required to be taken into account by Section 121 of CERCLA, 42 U.S.C. § 9621, and Section 300.430(e) of the NCP, 40 C.F.R. § 300.430(e). Any interim groundwater control measures implemented as part of the Pond 6 interim response (removal) action will be evaluated in conjunction with other remedial alternatives evaluated during the FS.

d. Within 30 days of a request by EPA, Respondent shall provide EPA with a Technical Assistance Plan ("TAP") for providing and administering up to $50,000 of Respondent's funds to be used by a qualified community group to hire independent technical advisers during the Work conducted pursuant to this Settlement Agreement. The TAP shall state that Respondent will provide and administer any additional amounts needed if EPA determines that the qualified community group has demonstrated that at least three of the following criteria are met prior to EPA's issuance of the ROD contemplated by this Settlement Agreement: (1) the RI/FS is particularly complex (for example, it will cost more than $2 million); (2) the Site public health assessment (or related activities) indicates the need for further health investigation and/or health promotion activities; (3) EPA has designated one or more additional operable units after selecting the community group; (4) a legislative or regulatory change has resulted in new Site information; (5) EPA expects the cleanup to last for more than eight years from the beginning of the RI/FS through the construction completion; (6) significant public concern exists, resulting in more meetings, copies, etc., than originally expected; and (7) other facts indicate that the Site is unusually complex. If EPA disapproves of or requires revisions to the TAP, in whole or in part,

Respondent shall amend and submit to EPA a revised TAP that is responsive to EPA's comments, within 30 days of receiving EPA's comments.

e. Respondent shall submit in electronic form all portions of any plan, report or other deliverable Respondent is required to submit pursuant to provisions of this Settlement Agreement.

45. Upon receipt of the draft FS report, EPA will evaluate, as necessary, the estimates of the risk to the public and environment that are expected to remain after a particular remedial alternative has been completed and will evaluate the durability, reliability and effectiveness of any proposed Institutional Controls.

46. Modification of the RI/FS Work Plan.

a. If at any time during the RI/FS process, Respondent identifies a need for additional data, or a need to modify the RI/FS Work Plan schedule, Respondent shall submit a memorandum documenting the need for additional data or change in schedule to the EPA Project Coordinator within 10 days of identification. EPA in its discretion will determine whether the additional data will be collected by Respondent and whether it will be incorporated into plans, reports and other deliverables, and/or whether a change in schedule is required.

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

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

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

e. Respondent shall complete the additional Work according to the standards, specifications, and schedule set forth or approved by EPA in a written modification to the RI/FS

Work Plan or written RI/FS Work Plan supplement. EPA reserves the right to conduct the Work itself at any point, to seek reimbursement from Respondent, and/or to seek any other appropriate relief.

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

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

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

b. The identity of the receiving facility and state will be determined by Respondent following the award of the contract for the remedial investigation and feasibility study. Respondent shall provide the information required by Subparagraphs 47(a) and 47(c) as soon as practicable after the award of the contract and before the Waste Material is actually shipped.

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

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

49. Progress Reports. In addition to the plans, reports and other deliverables set forth in this Settlement Agreement, Respondent shall provide to EPA monthly progress reports by the

15th day of the following month. At a minimum, with respect to the preceding month, these progress reports shall: (1) describe the actions which have been taken to comply with this Settlement Agreement during that month; (2) describe Work planned for the next two months with schedules relating such Work to the overall project schedule for RI/FS completion; and (3) describe all problems encountered and any anticipated problems, any actual or anticipated delays, and solutions developed and implemented to address any actual or anticipated problems or delays.

50. Emergency Response and Notification of Releases.

a. In the event of any action or occurrence during performance of the Work which causes or threatens a release of Waste Material from the Site that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, Respondent shall immediately take all appropriate action. Respondent shall take these actions in accordance with all applicable provisions of this Settlement Agreement, including, but not limited to, the Health and Safety Plan, in order to prevent, abate or minimize such release or endangerment caused or threatened by the release. Respondent shall also immediately notify the EPA Project Coordinator or, in the event of his/her unavailability, the Regional Duty Officer at (404) 562-8700, of the incident or Site conditions. In the event that Respondent fails to take appropriate response action as required by this Paragraph, and EPA takes such action instead, Respondent shall reimburse EPA all costs of the response action not inconsistent with the NCP pursuant to Section XIX (Payment of Response Costs).

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

X. EPA APPROVAL OF PLANS AND OTHER SUBMISSIONS

51. After review of any plan, report or other item that is required to be submitted for approval pursuant to this Settlement Agreement, in a notice to Respondent EPA shall: (a) approve, in whole or in part, the submission; (b) approve the submission upon specified conditions; (c) modify the submission to cure the deficiencies; (d) disapprove, in whole or in part, the submission, directing that Respondent modify the submission; or (e) any combination of the above. However, EPA shall not modify a submission without first providing Respondent at least one notice of deficiency and an opportunity to cure within 30 days, except where to do so

would cause serious disruption to the Work or where previous submission(s) have been disapproved due to material defects.

52. In the event of approval, approval upon conditions, or modification by EPA, pursuant to Subparagraphs 51(a), (b), (c) or (e), Respondent shall proceed to take any action required by the plan, report or other deliverable, as approved or modified by EPA subject only to its right to invoke the Dispute Resolution procedures set forth in Section XVI (Dispute Resolution) with respect to the modifications or conditions made by EPA. Following EPA approval or modification of a submission or portion thereof, Respondent shall not thereafter alter or amend such submission or portion thereof unless directed by EPA. In the event that EPA modifies the submission to cure the deficiencies pursuant to Subparagraph 51(c) and the submission had a material defect, EPA retains the right to seek stipulated penalties, as provided in Section XVII (Stipulated Penalties).

53. Resubmission.

a. Upon receipt of a notice of disapproval, Respondent shall, within 30 days or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the plan, report, or other deliverable for approval. Any stipulated penalties applicable to the submission, as provided in Section XVII, shall accrue during the 30-day period or otherwise specified period but shall not be payable unless the resubmission is disapproved or modified due to a material defect as provided in Paragraphs 54 and 55.

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

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

d. For all remaining deliverables not listed above in Subparagraph 53(c), Respondent shall proceed will all subsequent tasks, activities and deliverables without awaiting EPA approval on the submitted deliverable. EPA reserves the right to stop Respondent from proceeding further, either temporarily or permanently, on any task, activity or deliverable at any point during the RI/FS, but if EPA does so, Respondent shall not be liable for stipulated penalties for subsequent schedule delays that occur as a direct result of EPA's required work stoppage;

however, Respondent may be liable for stipulated penalties based upon the condition that necessitated the work stoppage.

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

55. If upon resubmission, a plan, report, or other deliverable is disapproved or modified by EPA due to a material defect, Respondent shall be deemed to have failed to submit such plan, report, or other deliverable timely and adequately unless Respondent invokes the dispute resolution procedures in accordance with Section XVI (Dispute Resolution) and EPA's action is revoked or substantially modified pursuant to a Dispute Resolution decision issued by EPA or superceded by an agreement reached pursuant to that Section. The provisions of Section XVI (Dispute Resolution) and Section XVII (Stipulated Penalties) shall govern the implementation of the Work and accrual and payment of any stipulated penalties during Dispute Resolution. If EPA's disapproval or modification is not otherwise revoked, substantially modified or superceded as a result of a decision or agreement reached pursuant to the Dispute Resolution process set forth in Section XVI, stipulated penalties shall accrue for such violation from the date on which the initial submission was originally required, as provided in Section XVII.

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

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

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

XI. QUALITY ASSURANCE, SAMPLING, AND ACCESS TO INFORMATION

59. Quality Assurance. Respondent shall assure that Work to be performed, samples to be taken and analyses to be conducted conform to the requirements of the QAPP and guidances identified therein. Respondent will assure that field personnel used by Respondent are properly trained in the use of field equipment and in chain of custody procedures. Respondent shall only

use laboratories which have a documented quality system that complies with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001) or equivalent documentation as determined by EPA.

60. Sampling.

a. EPA will make available to Respondent validated data generated by EPA unless it is exempt from disclosure by any federal or state law or regulation.

b. Respondent shall verbally notify EPA at least 14 days prior to conducting significant field events as described in the RI/FS Work Plan or Sampling and Analysis Plan. At EPA's verbal or written request, or the request of EPA's oversight assistant, Respondent shall allow split or duplicate samples to be taken by EPA (and its authorized representatives) of any samples collected in implementing this Settlement Agreement. All split samples of Respondent shall be analyzed by the methods identified in the QAPP.

61. Access to Information.

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

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

c. Respondent may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Respondent asserts such a privilege in lieu of providing documents, it shall provide EPA with the following: (1) the title of the document, record, or information, unless doing so would

reveal privileged information; (2) the date of the document, record, or information; (3) the name and title of the author of the document, record, or information; (4) the name and title of each addressee and recipient; (5) a description of the contents of the document, record, or information; and (6) the privilege asserted by Respondent. However, no documents, reports or other information created or generated pursuant to the requirements of this Settlement Agreement shall be withheld on the grounds that they are privileged.

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

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

XII. SITE ACCESS

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

64. Where any action under this Settlement Agreement is to be performed in areas owned by or in possession of someone other than Respondent, Respondent shall use its best efforts to obtain all necessary access agreements within 60 days after the Effective Date, or as otherwise specified in writing by the EPA Project Coordinator. Respondent shall immediately notify EPA if after using its best efforts it is unable to obtain such agreements. For purposes of this Paragraph, "best efforts" includes the payment of reasonable sums of money in consideration of access. Respondent shall describe in writing its efforts to obtain access. If Respondent cannot obtain access agreements, EPA may either (i) obtain access for Respondent or assist Respondent in gaining access, to the extent necessary to effectuate the response actions described herein, using such means as EPA deems appropriate; (ii) perform those tasks or activities with EPA contractors; (iii) modify the RI/FS Work Plan as necessary to effectuate the objectives of the RI/FS without obtaining access to particular areas; or (iv) terminate the Settlement Agreement, provided that obtaining access and performing the tasks or activities under (i)-(ii) above is not

feasible, and modifying the RI/FS Work Plan under (iii) above will not result in the achievement of the objectives of the RI/FS. Respondent shall reimburse EPA for all costs and attorney's fees incurred by the United States in obtaining such access, in accordance with the procedures in Section XIX (Payment of Response Costs). If EPA performs those tasks or activities with EPA contractors and does not terminate the Settlement Agreement, Respondent shall perform all other tasks or activities not requiring access to that property, and shall reimburse EPA for all costs incurred in performing such tasks or activities. Respondent shall integrate the results of any such tasks or activities undertaken by EPA into its plans, reports and other deliverables.

65. Notwithstanding any provision of this Settlement Agreement, EPA and the State retain all of their access authorities and rights, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

XIII. COMPLIANCE WITH OTHER LAWS

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

XIV. RETENTION OF RECORDS

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

68. At the conclusion of this document retention period, Respondent shall notify EPA at least 90 days prior to the destruction of any such documents, records or other information, and, upon request by EPA, Respondent shall deliver any such documents, records, or other information to EPA. Respondent may assert that certain documents, records, and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Respondent asserts such a privilege and if requested by EPA, it shall provide EPA

with the following: (1) the title of the document, record, or other information, unless doing so would reveal privileged information; (2) the date of the document, record, or other information; (3) the name and title of the author of the document, record, or other information; (4) the name and title of each addressee and recipient; (5) a description of the subject of the document, record, or other information; and (6) the privilege asserted by Respondent. However, no documents, records or other information created or generated pursuant to the requirements of this Settlement Agreement shall be withheld on the grounds that they are privileged.

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

XV. NATURAL RESOURCE DAMAGES

70. For the purposes of Section 113(g)(1) of CERCLA, the Parties agree that, upon issuance of this Settlement Agreement for performance of an RI/FS at the Site, remedial action under CERCLA shall be deemed to be scheduled and an action for damages (as defined in 42 U.S.C. § 9601(6)) must be commenced within 3 years after the completion of the remedial action.

XVI. DISPUTE RESOLUTION

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

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

73. Any agreement reached by the Parties pursuant to this Section shall be in writing and shall, upon signature by the Parties, be incorporated into and become an enforceable part of this Settlement Agreement. If the Parties are unable to reach an agreement within the Negotiation Period, an EPA management official at the Superfund Division Director level or higher will

issue a written decision. EPA's decision shall be incorporated into and become an enforceable part of this Settlement Agreement. Respondent's obligations under this Settlement Agreement shall not be tolled by submission of any objection for dispute resolution under this Section. Following resolution of the dispute, as provided by this Section, Respondent shall fulfill the requirement that was the subject of the dispute in accordance with the agreement reached or with EPA's decision, whichever occurs, and regardless of whether Respondent agrees with the decision.

XVII. STIPULATED PENALTIES

74. Respondent shall be liable to EPA for stipulated penalties in the amounts set forth in Paragraphs 75 and 76 for failure to comply with any of the requirements of this Settlement Agreement specified below unless excused under Section XVIII (Force Majeure). "Compliance" by Respondent shall include completion of the Work under this Settlement Agreement or any activities contemplated under any RI/FS Work Plan or other plan approved under this Settlement Agreement identified below, in accordance with all applicable requirements of law, this Settlement Agreement, the RI/FS Work Plan, and any plans or other documents approved by EPA pursuant to this Settlement Agreement and within the specified time schedules established by and approved under this Settlement Agreement.

75. Stipulated Penalty Amounts - Work.

a. The following stipulated penalties shall accrue per day for any noncompliance identified in Subparagraph 75(b):

Penalty Per Violation Per Day	Period of Noncompliance
$ 500	1st through 14th day
$ 1,250	15th through 30th day
$ 2,500	31st day and beyond

b. Compliance Milestones

The stipulated penalties contained in Subparagraph 75(a) shall accrue as a result of any of the following activities:

i. Failure to timely submit the Sampling and Analysis Plan, draft RI Report, draft Human Health Baseline Risk Assessment, draft Ecological Risk Assessment, and draft FS Report as required under this Settlement Agreement;

ii. Failure to timely submit any modifications requested by EPA or its representatives to the RI/FS Work Plan, the Sampling and Analysis Plan, draft RI Report, draft Human Health Baseline Risk Assessment, draft Ecological Risk Assessment, and draft FS Report as required under this Settlement Agreement;

iii. Failure to timely submit payment of future costs as provided in Section XIX;

iv. Failure to comply with the schedule set forth in the EPA-approved RI/FS Work Plan, other than failures to submit timely or adequate reports or other written documents pursuant to the RI/FS Work Plan, which failures are covered by Paragraph 76; and

v. Failure to establish or maintain a Performance Guarantee as provided in Section XXVII.

76. Stipulated Penalty Amounts - Reports.

a. The following stipulated penalties shall accrue per violation per day for failure to submit timely or adequate reports, or other written documents, pursuant to the RI/FS Work Plan, or pursuant to Paragraphs 44 and 49, other than those documents and reports specifically referenced in Subparagraph 75(b):

Penalty Per Violation Per Day	Period of Noncompliance
$ 250	1st through 14th day
$ 500	15th through 30th day
$ 1,250	31st day and beyond

77. In the event that EPA assumes performance of a portion or all of the Work pursuant to Paragraph 94 of Section XXI (Reservation of Rights by EPA), Respondent shall be liable for a stipulated penalty in the amount of $200,000.

78. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. However, stipulated penalties shall not accrue: (1) with respect to a deficient submission under Section X (EPA Approval of Plans and Other Submissions), during the period, if any, beginning on the 31st day after EPA's receipt of such submission until the date that EPA notifies Respondent of any deficiency; and (2) with respect to a decision by the EPA management official designated in Paragraph 73 of Section XVI (Dispute Resolution), during the period, if any, beginning on the 21st day after the Negotiation Period begins until the date that the EPA management official issues a final decision regarding

such dispute. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Settlement Agreement.

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

80. All penalties accruing under this Section shall be due and payable to EPA within 30 days of Respondent's receipt from EPA of a demand for payment of the penalties, unless Respondent invokes the dispute resolution procedures in accordance with Section XVI (Dispute Resolution). All payments to EPA under this Section shall be paid by certified or cashier's check(s) made payable to "EPA Hazardous Substance Superfund," shall be mailed to: U.S. Environmental Protection Agency, Superfund Payments, Cincinnati Finance Center, P.O. Box 979076, St. Louis, MO 63197-9000, shall indicate that the payment is for stipulated penalties, and shall reference EPA Region 4 and Site/Spill ID Number A4EN, the EPA docket number, and the name and address of the party(ies) making payment. Copies of check(s) paid pursuant to this Section, and any accompanying transmittal letter(s) shall be sent to EPA as provided in Paragraph 41, and to Paula V. Batchelor, U.S. EPA, 61 Forsyth St., SW, Atlanta, GA 30303, and the EPA Cincinnati Finance Office, 26 Martin Luther King Drive, Cincinnati, OH 45268.

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

82. Penalties shall continue to accrue as provided in Paragraph 78 during any dispute resolution period, but need not be paid until 15 days after the dispute is resolved by agreement or by receipt of EPA's decision.

83. If Respondent fails to pay stipulated penalties when due, EPA may institute proceedings to collect the penalties, as well as Interest. Respondent shall pay Interest on the unpaid balance, which shall begin to accrue on the date of demand made pursuant to Paragraph 80.

84. Nothing in this Settlement Agreement shall be construed as prohibiting, altering, or in any way limiting the ability of EPA to seek any other remedies or sanctions available by virtue of Respondent's violation of this Settlement Agreement or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Section 122(l) of CERCLA, 42 U.S.C. § 9622(l), and punitive damages pursuant to Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3). Provided, however, that EPA shall not seek civil penalties pursuant to Section 122(l) of CERCLA or punitive damages pursuant to Section 107(c)(3) of CERCLA for any violation for which a stipulated penalty is provided herein, except in the case of willful violation of this Settlement Agreement or in the event that EPA assumes performance of a

portion or all of the Work pursuant to Section XXI (Reservation of Rights by EPA), Paragraph 94. Notwithstanding any other provision of this Section, EPA may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this Settlement Agreement.

XVIII. FORCE MAJEURE

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

86. If any event occurs or has occurred that may delay the performance of any obligation under this Settlement Agreement, whether or not caused by a *force majeure* event, Respondent shall notify EPA orally within 7 days of when Respondent first knew that the event might cause a delay. Within 10 days thereafter, Respondent shall provide to EPA in writing an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Respondent's rationale for attributing such delay to a *force majeure* event if it intends to assert such a claim; and a statement as to whether, in the opinion of Respondent, such event may cause or contribute to an endangerment to public health, welfare or the environment. Failure to comply with the above requirements shall preclude Respondent from asserting any claim of *force majeure* for that event for the period of time of such failure to comply and for any additional delay caused by such failure.

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

XIX. PAYMENT OF RESPONSE COSTS

88. Payments of Future Response Costs.

a. Respondent shall pay EPA all Future Response Costs not inconsistent with the NCP. On a periodic basis, EPA will send Respondent a bill requiring payment that includes a SCORPIOS Report. Respondent shall make all payments within 30 days of receipt of each bill requiring payment, except as otherwise provided in Paragraph 90 of this Settlement Agreement. Respondent shall make all payments required by this Paragraph by a certified or cashier's check or checks made payable to "EPA Hazardous Substance Superfund," referencing the name and address of the party(ies) making payment and EPA Site/Spill ID number A4EN. Respondent shall send the check(s) to:

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

b. At the time of payment, Respondent shall send notice that payment has been made to both Brad Jackson and Paula V. Batchelor, U.S. Environmental Protection Agency, Region 4, Superfund Division, 61 Forsyth St., SW, Atlanta, GA 30303, and to the EPA Cincinnati Finance Office, 26 Martin Luther King Drive, Cincinnati, OH 45268;

c. The total amount to be paid by Respondent pursuant to Subparagraph 88(a) shall be deposited in the Coronet Industries Site Special Account within the EPA Hazardous Substance Superfund to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund.

89. If Respondent does not pay Future Response Costs within 30 days of Respondent's receipt of a bill, Respondent shall pay Interest on the unpaid balance of Future Response Costs. The Interest on unpaid Future Response Costs shall begin to accrue on the date of the bill and shall continue to accrue until the date of payment. If EPA receives a partial payment, Interest shall accrue on any unpaid balance. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to the United States by virtue of Respondent's failure to make timely payments under this Section, including but not limited to, payments of stipulated penalties pursuant to Section XVII. Respondent shall make all payments required by this Paragraph in the manner described in Paragraph 88.

90. Respondent may contest payment of any Future Response Costs under Paragraph 88 if it determines that EPA has made an accounting error, if it believes EPA incurred excess costs as a direct result of an EPA action that was inconsistent with the NCP, or if it believes that a cost

item is not within the definition of Future Response Costs under this Settlement Agreement. Such objection shall be made in writing within 30 days of receipt of the bill and must be sent to the EPA Project Coordinator. Any such objection shall specifically identify the contested Future Response Costs and the basis for objection. In the event of an objection, Respondent shall within the 30 day period pay all uncontested Future Response Costs to EPA in the manner described in Paragraph 88. Simultaneously, Respondent shall establish an interest-bearing escrow account in a federally-insured bank duly chartered in the State of Florida and remit to that escrow account funds equivalent to the amount of the contested Future Response Costs. Respondent shall send to the EPA Project Coordinator a copy of the transmittal letter and check paying the uncontested Future Response Costs, and a copy of the correspondence that establishes and funds the escrow account, including, but not limited to, information containing the identity of the bank and bank account under which the escrow account is established as well as a bank statement showing the initial balance of the escrow account. Simultaneously with establishment of the escrow account, Respondent shall initiate the Dispute Resolution procedures in Section XVI (Dispute Resolution). If EPA prevails in the dispute, within 5 days of the resolution of the dispute, Respondent shall pay the sums due (with accrued interest) to EPA in the manner described in Paragraph 88. If Respondent prevails concerning any aspect of the contested costs, Respondent shall pay that portion of the costs (plus associated accrued interest) for which it did not prevail to EPA in the manner described in Paragraph 88. Respondent shall be disbursed any balance of the escrow account. The dispute resolution procedures set forth in this Paragraph in conjunction with the procedures set forth in Section XVI (Dispute Resolution) shall be the exclusive mechanisms for resolving disputes regarding Respondent's obligation to reimburse EPA for its Future Response Costs.

XX. COVENANT NOT TO SUE BY EPA

91. In consideration of the actions that will be performed and the payments that will be made by Respondent under the terms of this Settlement Agreement, and except as otherwise specifically provided in this Settlement Agreement, EPA covenants not to sue or to take administrative action against Respondent pursuant to Sections 106 and 107(a) of CERCLA, 42 U.S.C. §§ 9606 and 9607(a) and Section 3013(a) of RCRA, 42 U.S.C. § 6934(a), for the Work performed under this Settlement Agreement and for recovery of Future Response Costs. This covenant not to sue shall take effect upon the Effective Date and is conditioned upon the complete and satisfactory performance by Respondent of all obligations under this Settlement Agreement, including, but not limited to, payment of Future Response Costs pursuant to Section XIX. This covenant not to sue extends only to Respondent and does not extend to any other person.

XXI. RESERVATIONS OF RIGHTS BY EPA

92. Except as specifically provided in this Settlement Agreement, nothing herein shall limit the power and authority of EPA or the United States to take, direct, or order all actions necessary to protect public health, welfare, or the environment or to prevent, abate, or minimize

an actual or threatened release of hazardous substances, pollutants or contaminants, or hazardous or solid waste on, at, or from the Site. Further, nothing herein shall prevent EPA from seeking legal or equitable relief to enforce the terms of this Settlement Agreement, from taking other legal or equitable action as it deems appropriate and necessary, or from requiring Respondent in the future to perform additional activities pursuant to CERCLA or any other applicable law.

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

a. claims based on a failure by Respondent to meet a requirement of this Settlement Agreement;

b. liability for costs not included within the definition of Future Response Costs;

c. liability for performance of response action other than the Work;

d. criminal liability;

e. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;

f. liability arising from the past, present, or future disposal, release or threat of release of Waste Materials outside of the Site; and

g. liability for costs incurred or to be incurred by ATSDR related to the Site.

94. Work Takeover. In the event EPA determines that Respondent has ceased implementation of any portion of the Work, is seriously or repeatedly deficient or late in its performance of the Work, or is implementing the Work in a manner which may cause an endangerment to human health or the environment, EPA may assume the performance of all or any portion of the Work as EPA determines necessary. Respondent may invoke the procedures set forth in Section XVI (Dispute Resolution) to dispute EPA's determination that takeover of the Work is warranted under this Paragraph. After commencement and for the duration of any Work Takeover, EPA shall have immediate access to and benefit of any Performance Guarantee provided pursuant to Section XXVII of this Settlement Agreement, in accordance with Paragraph 107 of that Section. Unless paid or reimbursed by the Performance Guarantee, costs incurred by EPA in performing the Work pursuant to this Paragraph shall be considered Future Response Costs that Respondent shall pay pursuant to Section XIX (Payment of Response Costs). Notwithstanding any other provision of this Settlement Agreement, EPA retains all authority and reserves all rights to take any and all response actions authorized by law.

XXII. COVENANT NOT TO SUE BY RESPONDENT

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

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

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

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

96. These covenants not to sue shall not apply in the event the United States brings a cause of action or issues an order pursuant to the reservations set forth in Subparagraphs 93(b), (c), and (e) - (g), but only to the extent that Respondent's claims arise from the same response action, response costs, or damages that the United States is seeking pursuant to the applicable reservation.

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

98. Respondent agrees not to seek judicial review of the final rule listing the Site on the NPL based on a claim that changed Site conditions that resulted from the performance of the Work, or the Pond 6 interim response (removal) action, in any way affected the basis for listing the Site.

XXIII. OTHER CLAIMS

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

100. Except as expressly provided in Section XX (Covenant Not to Sue by EPA), nothing in this Settlement Agreement constitutes a satisfaction of or release from any claim or cause of action against Respondent or any person not a party to this Settlement Agreement, for

any liability such person may have under CERCLA, other statutes, or common law, including but not limited to any claims of the United States for costs, damages and interest under Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607.

101. No action or decision by EPA pursuant to this Settlement Agreement shall give rise to any right to judicial review except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).

XXIV. CONTRIBUTION

102. a. The Parties agree that this Settlement Agreement constitutes an administrative settlement for purposes of Section 113(f)(2) of CERCLA, 42 U.S.C. 9613(f)(2), and that Respondent is entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Sections 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4), for "matters addressed" in this Settlement Agreement. The "matters addressed" in this Settlement Agreement are the Work and Future Response Costs.

b. The Parties agree that this Settlement Agreement constitutes an administrative settlement for purposes of Section 113(f)(3)(B) of CERCLA, 42 U.S.C. 9613(f)(3)(B), pursuant to which Respondent has, as of the Effective Date, resolved its liability to the United States for the Work and Future Response Costs.

c. Nothing in this Settlement Agreement precludes the United States or Respondent from asserting any claims, causes of action, or demands for indemnification, contribution, or cost recovery against any persons not parties to this Settlement Agreement. Nothing herein diminishes the right of the United States, pursuant to Sections 113(f)(2) and (3) of CERCLA, 42 U.S.C. § 9613(f)(2)(3), to pursue any such persons to obtain additional response costs or response action and to enter into settlements that give rise to contribution protection pursuant to Section 113(f)(2).

XXV. INDEMNIFICATION

103. Respondent shall indemnify, save and hold harmless the United States, its officials, agents, contractors, subcontractors, employees and representatives from any and all claims or causes of action arising from, or on account of negligent or other wrongful acts or omissions of Respondent, its officers, directors, employees, agents, contractors, or subcontractors, in carrying out actions pursuant to this Settlement Agreement. In addition, Respondent agrees to pay the United States all costs incurred by the United States, including but not limited to attorneys' fees and other expenses of litigation and settlement, arising from or on account of claims made against the United States based on negligent or other wrongful acts or omissions of Respondent, its officers, directors, employees, agents, contractors, subcontractors and any persons acting on its behalf or under its control, in carrying out activities pursuant to this Settlement Agreement. The United States shall not be held out as a party to any contract entered into by or on behalf of

Respondent in carrying out activities pursuant to this Settlement Agreement. Neither Respondent nor any such contractor shall be considered an agent of the United States.

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

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

XXVI. INSURANCE

106. At least 30 days prior to commencing any on-site Work under this Settlement Agreement, Respondent shall secure, and shall maintain for the duration of this Settlement Agreement, comprehensive general liability insurance with limits of two (2) million dollars, automobile insurance with limits of one (1) million dollars, and excess liability insurance with limits of two (2) million dollars, naming the EPA as an additional insured. Within the same period, Respondent shall provide EPA with certificates of such insurance and a copy of each insurance policy. Respondent shall submit such certificates and copies of policies each year on the anniversary of the Effective Date. In addition, for the duration of the Settlement Agreement, Respondent shall satisfy, or shall ensure that its contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Work on behalf of Respondent in furtherance of this Settlement Agreement. If Respondent demonstrates by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering some or all of the same risks but in an equal or lesser amount, then Respondent need provide only that portion of the insurance described above which is not maintained by such contractor or subcontractor.

XXVII. PERFORMANCE GUARANTEE

107. Within 60 days of the Effective Date, Respondent shall establish and maintain a Performance Guarantee for the benefit of EPA in the amount of $1,000,000 (hereinafter, "Estimated Cost of the Work") in one or more of the following forms, which must be satisfactory in form and substance to EPA, in order to secure the full and final completion of Work by Respondent:

a. a surety bond unconditionally guaranteeing payment and/or performance of the Work that is issued by a surety company among those listed as acceptable sureties on Federal bonds as set forth in Circular 570 of the U.S. Department of the Treasury;

b. one or more irrevocable letters of credit, payable to or at the direction of EPA, that is issued by one or more financial institution(s) (i) that has the authority to issue letters of credit; and (ii) whose letter-of-credit operations are regulated and examined by a U.S. Federal or State agency;

c. a trust fund established for the benefit of EPA that is administered by a trustee (i) that has the authority to act as a trustee and (ii) whose trust operations are regulated and examined by a U.S. Federal or State agency (for purposes of this Settlement Agreement, the Coronet Site RI/FS Trust Agreement attached as Appendix C is an acceptable trust fund for satisfying the Performance Guarantee requirement); or

d. a policy of insurance that (i) provides EPA with acceptable rights as a beneficiary thereof; and (ii) is issued by an insurance carrier (a) that has the authority to issue insurance policies in the applicable jurisdiction(s) and (b) whose insurance operations are regulated and examined by a State agency.

Respondent shall send all documents establishing its Performance Guarantee directly to the Superfund Records Program Manager at:

Superfund Records Program Manager
U.S. Environmental Protection Agency
Region 4
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303-8960

Such documents must contain notification or a cover letter identifying the Site name and EPA docket number for this action. A copy of the document and transmittal letter shall also be sent to Brad Jackson, U.S. Environmental Protection Agency, Region 4, Superfund Division, 61 Forsyth Street, SW, Atlanta, GA 30303.

108. In the event that EPA determines at any time that the Performance Guarantee provided by Respondent pursuant to this Section is inadequate or otherwise no longer satisfies the requirements set forth in this Section, whether due to an increase in the estimated cost of completing the Work or for any other reason, or in the event that Respondent becomes aware of information indicating that a Performance Guarantee provided pursuant to this Section is inadequate or otherwise no longer satisfies the requirements set forth in this Section, whether due to an increase in the estimated cost of completing the Work or for any other reason, Respondent, within 30 days of receipt of notice of EPA's determination or, as the case may be, within 30 days

of becoming aware of such information, shall obtain and present to EPA for approval a proposal for a revised or alternative form of Performance Guarantee listed in Paragraph 107 of this Settlement Agreement that satisfies all requirements set forth in this Section XXVII. In seeking approval for a revised or alternative form of Performance Guarantee, Respondent shall follow the procedures set forth in Subparagraph 110(b)(ii) of this Settlement Agreement. Respondent's inability to post a Performance Guarantee for completion of the Work shall in no way excuse performance of any other requirements of this Settlement Agreement, including, without limitation, Respondent's obligation to complete the Work in strict accordance with the terms hereof.

109. The commencement of any Work Takeover pursuant to Paragraph 94 of this Settlement Agreement shall trigger EPA's right to receive the benefit of any Performance Guarantee(s) provided pursuant to Paragraph 107, and at such time EPA shall have immediate access to resources guaranteed under any such Performance Guarantee(s), whether in cash or in kind, as needed to continue and complete the Work assumed by EPA under the Work Takeover. If for any reason EPA is unable to promptly secure the resources guaranteed under any such Performance Guarantee(s), whether in cash or in kind, necessary to continue and complete the Work assumed by EPA under the Work Takeover, Respondent shall immediately upon written demand from EPA deposit into an account specified by EPA, in immediately available funds and without setoff, counterclaim, or condition of any kind, a cash amount up to but not exceeding the estimated cost of the remaining Work to be performed as of such date, as determined by EPA.

110. Modification of Amount and/or Form of Performance Guarantee.

a. Reduction of Amount of Performance Guarantee. If Respondent believes that the estimated cost to complete the remaining Work has diminished below the amount set forth in Paragraph 107 above, Respondent may, on any anniversary date of the Effective Date of this Settlement Agreement, or at any other time agreed to by the Parties, petition EPA in writing to request a reduction in the amount of the Performance Guarantee provided pursuant to this Section so that the amount of the Performance Guarantee is equal to the estimated cost of the remaining Work to be performed. Respondent shall submit a written proposal for such reduction to EPA that shall specify, at a minimum, the cost of the remaining Work to be performed and the basis upon which such cost was calculated. In seeking approval for a reduction in the amount of the Performance Guarantee, Respondent shall follow the procedures set forth in Subparagraph 110(b)(ii) of this Consent Decree. If EPA decides to accept such a proposal, EPA shall notify Respondent of such decision in writing. After receiving EPA's written acceptance, Respondent may reduce the amount of the Performance Guarantee in accordance with and to the extent permitted by such written acceptance. In the event of a dispute, Respondent may reduce the amount of the Performance Guarantee required hereunder only in accordance with an agreement reached by the Parties or a decision by the EPA management official pursuant to Paragraph 73. No change to the form or terms of any Performance Guarantee provided under this Section, other than a reduction in amount, is authorized except as provided in Paragraph 108 or Subparagraph 110(b) of this Settlement Agreement. Notwithstanding the provisions of this Subparagraph (a), if

selected by Respondent, the Coronet Site RI/FS Trust Agreement will be a draw-down trust with the Trust Estate diminishing as payments for the Work are made.

b. Change of Form of Performance Guarantee.

(i) If, after the Effective Date of this Settlement Agreement, Respondent desires to change the form or terms of any Performance Guarantee(s) provided pursuant to this Section, Respondent may, on any anniversary date of the Effective Date of this Settlement Agreement, or at any other time agreed to by the Parties, petition EPA in writing to request a change in the form of the Performance Guarantee provided hereunder. The submission of such proposed revised or alternative form of Performance Guarantee shall be as provided in Subparagraph 110(b)(ii) of this Settlement Agreement. Any decision made by EPA on a petition submitted under this Subparagraph (b)(i) shall be made in EPA's sole and unreviewable discretion, and such decision shall not be subject to challenge by Respondent pursuant to the dispute resolution provisions of this Settlement Agreement or in any other forum.

(ii) Respondent shall submit a written proposal for a revised or alternative form of Performance Guarantee to EPA which shall specify, at a minimum, the estimated cost of the remaining Work to be performed, the basis upon which such cost was calculated, and the proposed revised form of Performance Guarantee, including all proposed instruments or other documents required in order to make the proposed Performance Guarantee legally binding. The proposed revised or alternative form of Performance Guarantee must satisfy all requirements set forth or incorporated by reference in this Section. EPA shall notify Respondent in writing of its decision to accept or reject a revised or alternative Performance Guarantee submitted pursuant to this Subparagraph. Within 10 days after receiving a written decision approving the proposed revised or alternative Performance Guarantee, Respondent shall execute and/or otherwise finalize all instruments or other documents required in order to make the selected Performance Guarantee(s) legally binding in a form substantially identical to the documents submitted to EPA as part of the proposal, and such Performance Guarantee(s) shall thereupon be fully effective. Respondent shall submit all executed and/or otherwise finalized instruments or other documents required in order to make the selected Performance Guarantee(s) legally binding to the EPA Superfund Records Program Manager, with a copy to Brad Jackson, as specified in Paragraph 107 above, within 30 days of receiving a written decision approving the proposed revised or alternative Performance Guarantee.

c. Release of Performance Guarantee. When Respondent receives written notice from EPA in accordance with Paragraph 116 hereof that the Work has been fully and finally completed in accordance with the terms of this Consent Decree, or if EPA otherwise so notifies Respondent in writing, Respondent may thereafter release, cancel, or discontinue the Performance Guarantee(s) provided pursuant to this Section. Respondent shall not release, cancel, or discontinue any Performance Guarantee provided pursuant to this Section except as provided in this Subparagraph. In the event of a dispute, Respondent may release, cancel, or discontinue the Performance Guarantee(s) required hereunder only in accordance with an

agreement reached by the Parties or a decision by the EPA management official pursuant to Paragraph 73.

XXVIII. INTEGRATION/APPENDICES

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

"Appendix A" is Respondent's RI/FS Work Plan.
"Appendix B" is the Map of the Site.
"Appendix C" is the Coronet Site RI/FS Trust Agreement.

XXIX. ADMINISTRATIVE RECORD

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

XXX. EFFECTIVE DATE AND SUBSEQUENT MODIFICATION

113. In consideration of the communications between Respondent and EPA concerning the terms of this Settlement Agreement, Respondent agrees that there is no need for a settlement conference prior to the Effective Date of this Settlement Agreement. Therefore, the Effective Date of this Settlement Agreement will be the date on which it is signed by EPA.

114. This Settlement Agreement may be amended by mutual agreement of EPA and Respondent. Amendments shall be in writing and shall be effective when signed by EPA. Except as otherwise provided in this Settlement Agreement, EPA Project Coordinators do not have the authority to sign amendments to the Settlement Agreement.

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

XXXI. NOTICE OF COMPLETION OF WORK

116. When EPA determines that all Work has been fully performed in accordance with this Settlement Agreement, with the exception of any continuing obligations required by this Settlement Agreement, including but not limited to payment of Future Response Costs or record retention, EPA will provide written notice to Respondent. As provided in Paragraph 5 of this Settlement Agreement, notice of completion of the Work pursuant to this Section shall also serve as written notice from EPA that the prior RCRA Administrative Orders on Consent (Docket Nos. RCRA-04-2004-4250 and RCRA-04-2006-4250) are terminated. If EPA determines that any such Work has not been completed in accordance with this Settlement Agreement, EPA will notify Respondent, provide a list of the deficiencies, and require that Respondent modify the RI/FS Work Plan if appropriate in order to correct such deficiencies, in accordance with Paragraph 46 (Modification of the RI/FS Work Plan). Failure by Respondent to implement the approved modified RI/FS Work Plan shall be a violation of this Settlement Agreement.

Agreed this 4th day of DECEMBER, 2007.

For Respondent Coronet Industries, Inc.

By: David K Denner

David K. Denner
President and Chief Executive Officer

In the matter of the Coronet Industries Site:

It is so ORDERED AND AGREED this 18th day of December, 2007.

BY: Carol J. Monell DATE: 12/18/07

Carol J. Monell, Chief
Superfund Remedial Branch
Region 4
U.S. Environmental Protection Agency

EFFECTIVE DATE: December 18, 2007

SITE: Coronet Industries
BREAK: 3.4
OTHER:

FINAL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN
CORONET INDUSTRIES, INC.
PLANT CITY, FLORIDA

10606623

CORONET INDUSTRIES, INC.

DECEMBER 4, 2007

List of Acronyms

ACO	Amended Consent Order
AOC	Administrative Order on Consent
ARAR	applicable or relevant and appropriate requirement
ASA	Administrative Settlement Agreement
ATSDR	Agency for Toxic Substances and Disease Registry
BERA	Baseline Ecological Risk Assessment
CDP	Coronet Defluorinated Phosphate
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMI	Consolidated Minerals, Inc.
COC	constituent of concern
COEC	constituent of ecological concern
COI	constituent of interest
COPC	constituent of potential concern
COPEC	constituent of potential ecological concern
CPAH	carcinogenic polynuclear aromatic hydrocarbon
CRP	Community Relations Plan
CSF	cancer slope factor
CSM	Conceptual Site Model
CTL	cleanup target level
C&D	construction and demolition
DOJ	Department of Justice
DQO	data quality objective
DRF	discharge release form
ENSO	El Niño-Southern Oscillation
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
ESV	ecological screening value
FDEP	Florida Department of Environmental Protection
FDOH	Florida Department of Health
FS	Feasibility Study
FSP	Field Sampling Plan
GWCTL	groundwater target cleanup level
HAL	health advisory level
HASP	Health and Safety Plan
HEAST	Health Effects Assessment Summary Tables
HHRA	human health risk assessment
HI	hazard index
HQ	hazard quotient
IFO	Immediate Final Order
IWFP	Industrial Wastewater Facility Permit
IWS	ionizing wet scrubber
KBF_4	potassium fluoroborate
LNAPL	light non-aqueous phase liquid
MCL	maximum contaminant level
NCDC	National Climatic Data Center
NCP	National Contingency Plan
NOAA	National Oceanic and Atmospheric Association
OSWER	Office of Solid Waste and Emergency Response

List of Acronyms
(continued)

PAH	polynuclear aromatic hydrocarbon
PCBs	polychlorinated biphenyls
PEC	probable effect concentration
PRG	preliminary remediation goal
PRG_I	PRG for the protection of human health in industrial settings
PRG_R	PRG for the protection of human health in residential settings
PRP	potentially responsible party
RA	(Site-specific) risk assessment
RAGS	Risk Assessment Guidance for Superfund
RBCA	FDEP global risk-based corrective action
RCRA	Resource Conservation and Recovery Act
RfD	reference dose
RGO	remedial goal option
RI	Remedial Investigation
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SCTL	soil cleanup target level
$SCTL_{CI}$	SCTL for the protection of human health in commercial/industrial settings
$SCTL_{GW}$	SCTL for the protection of groundwater quality
$SCTL_R$	SCTL for the protection of human health in residential settings
$SCTL_{SW}$	SCTL for the protection of surface water quality
SEPSWD	southeastern perimeter storm water ditch
SERCC	Southeast Regional Climate Center
SLERA	Screening-Level Ecological Risk Assessment
SMDP	scientific management decision point
SPLP	synthetic precipitation leaching procedure
SSL	soil screening level
SQAG	sediment quality assessment guideline
SQG	small quantity generator
SWCTL	surface water cleanup target level
SWFWMD	Southwest Florida Water Management District
TAP	Technical Assistance Plan
TBC	to be considered (factor)
TCL	target compound list
TCLP	toxicity characteristic leaching procedure
TDS	total dissolved solids
TEC	threshold effect concentration
TGS	tail gas scrubber
TRPH	total recoverable petroleum hydrocarbons
TRV	toxicity reference value
UCL	upper confidence limit
USDA	U.S. Department of Agriculture
VOC	volatile organic compound

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1.0 Introduction

This Remedial Investigation/Feasibility Study (RI/FS) Work Plan (Work Plan) describes the activities necessary to perform the RI/FS for the Coronet Industries, Inc. Site (Site). The RI/FS is being performed pursuant to the requirements of an Administrative Settlement Agreement and Order on Consent (Settlement Agreement) between Coronet and the U.S. Environmental Protection Agency (EPA) to which this Work Plan will be appended.

The Site, as defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), is comprised of the Coronet property at 4082 Coronet Road, Plant City, Hillsborough County, Florida (Figure 1-1) and the areal extent of any contamination that has emanated from the property. Primary areas of interest at the Site include the Main Plant Area, the Research Building Area, outparcels A, B, and C, a pond and ditch system historically used for process material and water management, and an area formerly leased for operation of a public golf course. Additional areas of interest include those beyond the Coronet property boundaries in which constituents are or may be present above EPA or Florida Department of Environmental Protection (FDEP) standards or screening criteria.

Coronet, the current owner of this property, conducted assessment activities including sampling and analysis of soil, groundwater, surface water, and sediments within and beyond the Coronet property boundaries. The assessments were performed in cooperation with the EPA and the FDEP pursuant to the Resource Conservation and Recovery Act (RCRA) Section 3013(a) orders (Section 2.3.5). The Phase I assessment characterized the plant's process and holding ponds, surface water and sediment quality in other areas of the Coronet property, and groundwater quality (outside of the Main Plant Area). The Phase II assessment included an evaluation of the Main Plant Area, supplemental characterization of pond sediments, and additional characterization of groundwater, surface water, and sediment conditions within and beyond the Coronet property boundaries. The findings of the Phase I and Phase II assessment activities were presented to the EPA and the FDEP in reports that included discussions of sampling methodology, laboratory analysis, quality assurance and quality control, and data analysis (Coronet 2005a and 2006). Collectively, data from the Phase I and Phase II assessments provided the foundation for the development of the RI/FS work presented herein.

The scope of the RI/FS activities presented in this Work Plan was prepared in accordance with EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (1988a) and other relevant guidance. The objective of the RI/FS is to provide a framework for fulfilling program requirements under the National Contingency Plan (NCP; 40 CFR Part 300) and CERCLA regulations and guidance such that a Record of Decision (ROD) can be issued for the final remedial action.

This Work Plan includes the following elements:

- Section 2 - Site Background
- Section 3 - Site Description
- Section 4 - Site Evaluation
- Section 5 - Conceptual Site Model
- Section 6 - RI/FS Planning
- Section 7 - Remedial Investigation
- Section 8 - Risk Assessment
- Section 9 - Feasibility Study
- Section 10 - RI/FS Reporting
- Section 11 - Project Schedule
- Section 12 - Project Management and Coordination

Sections 2, 3, and 4 of the Work Plan present a summary of investigation findings to date; these findings are more fully described in the Phase I and draft Phase II reports (Coronet 2005a and 2006). These sections and Section 5 provide a general understanding of conditions near the Site, meet the provisions for a "preliminary site characterization summary" consistent with RI/FS project planning requirements (EPA 1988a), and provide the foundation for development of the RI/FS activities described herein. The RI report will include a detailed analysis of data generated during these assessments in addition to providing a detailed analysis of data generated during the RI.

2.0 Site Background

The following sections describe historical operations, water management, and regulatory activities. Key features are shown in Figure 2-1; additional detail for the Main Plant Area is shown in Figure 2-2. Where appropriate, available information is provided for off-property areas.

2.1 Historical Operations

Section 2.1.1 summarizes general historical information for the Coronet and surrounding properties which historically comprised the 2,500-acre mine operated by Coronet Phosphate Company (not related to Coronet Industries, Inc.). Sections 2.1.2 through 2.1.5 discuss operations (exclusive of water management) primarily as conducted under its current ownership, Coronet Industries, Inc., relative to the two product lines and ancillary areas and activities. Section 2.1.6 discusses the Research Building Area. Water management practices are discussed in Section 2.2.

2.1.1 General Historical Information and Mining Operations

In approximately 1906, Coronet Phosphate Company began phosphate mining within a 2,500-acre tract of land which included the approximate 980 acres that now comprise the Coronet property. Mining operations, in which phosphate ore was mined from a subsurface horizon referred to as the Bone Valley Member, continued until approximately 1940. The approximate limits of the 2,500-acre mine tract in relation to the Coronet property are shown in Figure 2-1.

The aerial photographs from 1938, 1948, 1957, 1966, 1972, 1979, and 1985 suggest that during its 100-year history, a significant portion of the 2,500-acre mine tract was reworked or otherwise disturbed by mining-related activities (e.g., excavation, deposition, development of ponds and other waterways for handling water, clearing, grading).[1] Figure 2-1 illustrates areas that were mined or potentially mined based on the 1938 aerial photograph in which either the appearance of the ground surface or the presence of a pond[2] suggests that mining occurred; many of the ponds or pond remnants are discernable today.

The 1938 aerial photograph suggests that the Main Plant Area was developed for handling and shipping of the phosphate ore. Subsurface information generated during the Phase II assessment confirms this area was not mined. This photograph also suggests that the Research Building Area and outparcels

[1] Copies of these aerial photographs were provided in Appendix A of the Phase I report (Coronet 2005a).

[2] Mine pits were typically used, subsequent to retrieval of the phosphate ore, for settling of clays and sand separated from the ore. Overall, the distribution of clay within the ponds determined during the Phase I and Phase II assessments is consistent with areas identified as being mined based on the review of the historical aerial photographs.

A, B, and C were not mined, that outparcels A and C were used for company housing, and that Outparcel B had been cleared. The use of Outparcel B is not known; it was vacant in all subsequent aerial photographs. Although these areas were not mined, it is possible that mine tailings may have been placed in these areas as fill necessary for development or general grading. The 1938 photograph shows that the western portion of the Coronet property had been reclaimed and developed as a golf course (the golf course tract was leased and operated by various entities until it ceased operations in 2006). Surface and subsurface information to be generated during the RI should provide additional insight on historical activities in these areas.

Following cessation of mining activities, Coronet Phosphate Company began production of Coronet Defluorinated Phosphate (CDP), a nutritional supplement for animal feed, in 1946. In 1952, Smith-Douglass purchased the former 2,500-acre mine tract, including the CDP production area (i.e., the Main Plant Area). In approximately 1958, Smith-Douglass began producing potassium fluoroborate (KBF_4), used in the aluminum alloy and electronics industries. In 1964, Borden Inc. purchased the former 2,500-acre mine tract and operated it until 1980, when the tract was then purchased by Amax Phosphate, Inc. In 1986, Consolidated Minerals, Inc. (CMI) acquired the mine tract through a merger with Amax. Both of these companies also produced CDP and KBF_4.

In 1993, Coronet Industries, Inc. purchased an approximate 980-acre portion of the 2,500-acre mine tract from CMI, and continued CDP and KBF_4 production until operations ceased in March 2004. At the time Coronet purchased the approximate 980-acre property, the Research Building Area was leased back to CMI, which also retained ownership of the bulk of the remaining portion of the mine tract. Most of the CMI-owned property was purchased by Lakeside Station LLC in 2005. Figure 2-3 identifies the limits of the Lakeside property and other larger properties within and proximate to the former mine.

2.1.2 CDP Process

Three rotary kiln systems and a fluid bed reactor system were used to produce CDP:

- Nos. 1 and 2 fluid bed reactors (unknown start date and an end date of 2003)
- Nos. 3, 4, and 5 kilns (beginning circa 1946 and ending circa 1983)
- Nos. 6 and 7 kilns (beginning circa 1979 and ending in 2004)
- Paragon kiln (unknown start date and an end date of 2004)

The locations of the reactors and kilns and their appurtenances are shown in Figure 2-2. The figure also outlines the general limits of CDP production which is confined between the north and south access roads in the eastern half of the Main Plant Area (with the exception of the northern and southern rock storage areas) and the limits of the Mineral Acid Tanks Storage Area which was used to support CDP production.

The figure reflects information provided during the 2004 aerial survey and one engineering drawing; as a consequence, it does not illustrate the locations of all of the lines, conveyors, sumps, etc. discussed herein. The line used to supply water to various process operations within the plant is shown in the figure; its location is approximate. This line was part of a system that recirculated water through the plant, Ponds 1S and 6, and a series of ditches ("conveyance ditches"). A description of this system is presented in Section 2.1.5.

2.1.2.1 Feed Preparation and Production

The feedstock for the CDP process included phosphate rock, phosphoric acid, and soda ash (or less frequently liquid caustic or lime).

- Phosphate rock was received in bulk, usually by rail and emptied from the bottoms of the rail cars in the rock unloading area at the east end of the elevated rail. The rock was then conveyed by payloader to one of three storage areas (between the arms of the Emergency Ditch, east of the Instrument Building, or in the Foskor Storage Area).

- Phosphoric acid was gravity drained from rail or truck through a series of hoses to a pump that transferred the liquid aboveground to 1 of 11 tanks in the Mineral Acid Tanks Storage Areas (Tank Nos. 6 through 13 and 16, 17, and 18). The acid was transferred aboveground to a 20,000 gallon tank (Tank No. 5) where it was diluted with water before being transferred to two 50,000 gallon aboveground storage tanks (Tank Nos. 14 and 15).

- Soda ash typically was used in lieu of liquid caustic; lime was used for a period after 1993. Soda ash and lime were brought in bulk and transferred using a portable pneumatic blower to silos at the south end of the Feed Prep Area. The liquid caustic was transferred from truck to a 150,000 gallon tank in the Mineral Acid Tanks Storage Area (Tank No. 40).

The phosphate rock was conveyed to the rotary mixer in the Feed Prep Area; phosphoric acid was transferred to the mixer via overhead lines. The partially reacted slurry was transferred from the mixer to a pug mill overhead for additional mixing, addition of soda ash (or liquid caustic or lime), and blending. The soda ash and limestone were stored near the pug mill; the caustic was also transferred to this area from the Mineral Acid Tanks Storage Area via overhead lines.[3]

The lines that connected the mineral tanks and used to convey the phosphoric acid and caustic to the Feed Prep Area were backflushed approximately three times per week. The water was discharged to a sump (south of Tank 40, Figure 2-2) and pumped overhead to the Emergency Ditch. A sample of water from this ditch (CI-02-SW) was collected by the EPA during its 2003 inspection (Section 2.3.1); cadmium was detected at a concentration above the toxicity characteristic leaching procedure (TCLP) limit (EPA 2004a).

[3] The location of the pipe rack is shown in Figure 2-2; the conveyance lines paralleled the process water line to the Feed Prep Area.

The milled material was conveyed to a natural gas-fired rotary dryer in the Feed Prep area to reduce the moisture content and agglomerate the feed. This dried material ("green feed") was screened and crushed to provide a uniform feed size. Undersized material was returned to the pug mill; the product was transferred via conveyor to a silo north of Feed Prep or a silo south of the Nos. 6 and 7 kilns. Conveyors were also used to transport the feed from these silos to the appropriate kilns or reactors.

Within the kilns, the feed was heated to about 2,700 degrees Fahrenheit for approximately 1 hour. At the hot end of the kiln, water from the pond water recirculation system was injected at a rate of 1 gallon per ton of product. Product which adhered to the kiln walls was periodically removed using a shotgun; the shotgun shells were stored indoors west of Tank No. 29. The prepared feed for the fluid bed reactors was placed in surge bins and metered into the reactors using conveyors. A hot gas stream was passed through the feed bed for approximately 1 hour.

The product was transferred by conveyors to the craneway bulk storage area for cooling and blending. Cooled and blended product was transferred to the mill rooms for screening and grinding to meet grade requirements. The product was transferred via conveyors to storage silos and bins south of Nos. 3, 4, and 5 kilns. De-dusting oil from Tank Nos. 32 and 33 was transferred via inground lines to the silos for mixing with the product to reduce dust emissions. The finished product was conveyed for bagging and shipping or bulk storage loadout into trucks or railcars.

2.1.2.2 Emission Controls and Hydrofluoric Acid Production

Baghouses were used to control emissions in the rock unloading and feed preparation areas, specifically those associated with rock unloading, soda ash and lime unloading and storage, feed prep operations (e.g., screening/crushing, conveyors), and associated with the various conveyor systems and surge bins (used to control the feed rate); typically the dust was returned to the nearest conveyors for reprocessing.

In addition, emissions from the mixer, pug mill, and dryer were controlled with wet scrubbers (east and west scrubbers). The solids accumulated on the ground surface near the scrubbers. These solids and material from some baghouses were placed in a reclaim pile east of Feed Prep and were returned to the feed preparation process. Blowdown from these scrubbers was collected in the Paragon blowdown sump and pumped to the inground flume[4] in the KBF_4 Area (Figure 2-2) which discharged to the Main Ditch. Two samples of blowdown from these scrubbers (WS1 and ES1) were collected by the EPA during its 2003 inspection; cadmium concentrations in both samples were above the TCLP limit (EPA 2004a) and the approximate pH in both samples was 1 standard unit (s.u.) (EPA 2004b).

[4] The walls and bottom of the inground flume were constructed of poured and reinforced concrete; it was covered with metal grates. The flume was approximately 1.5 feet in width and approximately 9 inches in depth; the lateral limits of the flume are shown in Figure 2-2.

The emission controls for the fluid bed reactors included dry cyclones, spray towers, and tail gas and ionizing wet scrubbers (TGS and IWS). The dry cyclones removed coarse particles; fine particles were collected using a duct dust collector which also generated scale. The coarse and fine particles and scale were returned to the process. Exhaust gases entered the spray towers for removal of particulate, fluorine, and sulfur dioxide (during periods of oil firing). Water for the towers was obtained from the pond recirculation system. Gas from the spray tower flowed to a TGS. The TGS system included tellerets (plastic media filters) and demisters. The tellerets were periodically removed and placed on the ground surface south of the kilns; usable tellerets were cleaned for reuse. In 2003, a diked concrete pad with roof was constructed in this area for telleret storage and cleaning. The demisters were replaced approximately once every 45 days. Used tellerets and demisters were disposed of off site in a solid waste landfill. None of the TCLP limits were exceeded for the samples of telleret residue collected by the EPA (EPA 2004b).

Exhaust gas from the TGS was vented to the IWS to remove fine particulate using an electric field; solids from the electrical plates were discharged to the Main Ditch. Blowdown from the scrubbers accumulated in a sump below the IWS from which the water was pumped to the inground flume in the KBF_4 Production Area and discharged to the Main Ditch. Emissions from the scrubbers were then vented through a stack.

Emissions from each of the Nos. 6 and 7 kilns were captured by 3-stage emission control circuits that were each comprised of a dust chamber, packed hydrofluoric acid spray tower, and horizontal packed wet scrubbers. Specific information on the Nos. 3, 4, and 5 and Paragon kilns emission systems is not available, but the systems are believed to have been generally similar to those for the Nos. 6 and 7 kilns.

Quiescent settling was used to remove particulate to the base of the dust chambers; the dust was conveyed to a bin near the kilns for mixing with the feed and reprocessing. Exhaust gases from the dust chambers were vented to the spray towers to collect fluorine gas as hydrofluoric acid; water from the pond water recirculation system was used in this system. The acid was stored in sumps and returned to the towers until the appropriate strength (5 percent hydrofluoric acid) was attained. Six 3,000 gallon sumps were present in the Nos. 6 and 7 Kilns Area and two 3,000 gallon sumps were present near the Paragon kiln. Although the number of sumps in the Nos. 3, 4, and 5 Kilns Area is not known, the locations have been identified (Figure 2-2). Packed-bed scrubbers were then used to remove low levels of fluorine and removal of particulate and sulfur dioxide (during periods of oil firing) using tellerets. Demister pads were inline after the scrubbers; following the mist eliminator, the emissions were vented through stacks.

Once the acid recovered through the spray towers reached its desired strength, it was conveyed via overhead lines to storage tanks. One 14,000 gallon storage tank was present in the Nos. 6 and 7 Kilns

area; however, the majority of the acid was stored in one of four 45,000 gallon tanks in the Mineral Acid Tanks Storage Areas (Tank Nos. 1, 2, 3, and 4). Presumably, acid recovered at the Paragon kiln was also conveyed (via an overhead line) to the acid tanks area.

Blowdown from the Nos. 6 and 7 kilns and water generated during backflushing of the hydrofluoric acid sumps (approximately two times per week) was collected in a central sump beneath the spray towers and conveyed via an underground line to the Main Ditch. A sample of the scrubber blowdown from the No. 7 kiln (K7) was collected by the EPA during its inspection. The cadmium concentration in this sample was above the TCLP limit (EPA 2004a); the sample pH was between 1 s.u. and 2 s.u. (EPA 2004b).

Blowdown water from the Paragon kiln was collected in a sump south of the kiln then pumped (above the rock unloading area) to the inground flume in the KBF_4 Production Area and discharged to the Main Ditch. Blowdown from the Nos. 3, 4, and 5 kilns was conveyed via an inground pipe, across the Nos. 6 and 7 Kilns Ditch to the Main Ditch.

The Nos. 6 and 7 Kilns Ditch was used to accumulate storm water runoff from this area and from the vicinity of the fluid bed reactors. Storm water runoff from the reactor area and wash down water from the equipment in this area were conveyed to this ditch in a grate-covered concrete storm water drain.[5] A sample of water (CI-04-SW) was collected from this ditch by the EPA during its inspection; the cadmium concentration was above the TCLP limit (EPA 2004a).

2.1.3 KBF_4 Process

The KBF_4 Production Area and appurtenances are shown in Figure 2-4, which is between/overlaps the Mineral Acid Storage Tanks Area and the northwest limit of the CDP Production Area.

KBF_4 was produced through a series of chemical reactions, which used the hydrofluoric acid generated in the defluorinating kiln spray towers, potash (potassium chloride), and borax (sodium tetraborate pentahydrate).

- Hydrofluoric acid was stored in tanks within the Mineral Acid Tanks Storage Area (Nos. 1 through 4) or Tank No. 28 in the KBF_4 Area. Acid was also temporarily stored in a tank south of the Nos. 6 and 7 kilns. Transfer between these tanks was via overhead lines.

- Potash was brought in on rail, unloaded from a hopper and conveyed to the KBF_4 building by payloader, forklift or similar equipment.

[5] This drain was constructed in a manner identical to the "inground flume" (except for its length).

- Borax was historically brought in by rail/truck in bags and stored in the KBF_4 building. More recently borax was brought in by truck in bulk and transferred to a silo adjacent to the KBF_4 building using a pneumatic blower.

The acid was transferred via overhead lines to the mixing tanks (Tank Nos. 21 through 27) and mixed with potash and air to produce a sludge containing chloride, silica, and potassium silicofluoride and the potassium fluoride solution. The solution was clarified through quiescent settling then transferred aboveground to one of two reaction tanks (Tank Nos. R1 and R2), where borax was added. The mixture was then agitated mechanically with steam for approximately 1 hour. After approximately 24 hours, the crystallized KBF_4 was transferred to a holding tank (centrifuge settling tank) that flowed to a centrifuge where water was added to remove impurities. Following centrifuging and decanting, the crystalline KBF_4 was transferred on a conveyor to a natural gas-fired fluid bed dryer to remove the remaining moisture. Silica was then added and the mixture was transferred via conveyor to a storage bin that discharged finished product into drums or fabric bags. The packaged material was warehoused in the adjacent structure.

The inground flume received backflush from the lines conveying acid from the tank storage area to the KBF_4 Production Area, slurry generated during daily washing of the mixing tanks, sludge generated in the mixing tanks, liquid generated in the reaction tanks, and decanted liquid from the centrifuge. During the EPA inspection, samples were collected of wash water from the mixing tanks (T6A2 and TW1), from both reactors (R1 and R2), centrifuge rinsate (CW2), and pooled water beneath the centrifuge (CW1). Concentrations above the TCLP were reported in each of these samples for cadmium, chromium, arsenic or a combination thereof (EPA 2004a); pH levels in these samples were in the 2 s.u. to 3 s.u. range (EPA 2004b). A sample was also collected from the Main Ditch at the point of discharge from the flume (MLD1). Cadmium was detected in this sample at a concentration above the TCLP and the pH was between 2 s.u. and 3 s.u.

Emissions from the hydrofluoric acid tanks and reaction tanks were captured by a pack-bed scrubber (similar to the final scrubber on the Nos. 6 and 7 kilns). A baghouse was used to control emissions from the dryer.

2.1.4 Ancillary Areas

CDP and KBF_4 production activities, along with the north and south rock storage areas, utilized roughly the entire eastern portion of the plant. Within these two areas, additional areas of general activity or use included several electrical substations and the Instrument Shop.

The western portion of the plant was used to house support operations and activities, including:

- Bone Yard/warehouse - for storage of various equipment and materials
- Paint Booth/warehouse - for miscellaneous painting operations and storage
- Carpenter Shop/warehouse - for lumber storage and construction activities
- Mobile Equipment Shop/warehouse - for performing routine vehicle maintenance
- central warehouses - for storage of spare equipment and parts
- offices/laboratory - for management offices and a quality control laboratory
- power house - formerly for power generation and related activities
- electrical substations
- gas substation

Additional support facilities within the Main Plant Area included rail lines and petroleum storage areas. Four sets of rail lines were present in the Main Plant Area. The northern line was used to transport bulk raw materials to the KBF_4 Production Area. The "elevated rail" was used to transport phosphate rock to the rock unloading area and, reportedly, to off load Bunker C oil to the storage tank in this area (see below). The central line was likely used to transport raw material to the Feed Prep Area and to transport CDP off site in bulk. The southern line was likely used for idling rail cars, and may have been used to transport rock to the Southern Rock Storage Area.

At the time of plant shutdown, Coronet maintained registration for seven petroleum or petroleum product storage tanks. These included three aboveground diesel tanks (Nos. 29, 34, and 37), two aboveground dedusting oil (mineral oil) tanks (Nos. 32 and 33), and a diesel tank on the roof of the fluid bed reactors (No. 42), and one underground gasoline tank (No. 41). Discharge release forms (DRFs) had been previously submitted for Tanks Nos. 29, 32 and 33, and 34.

Three aboveground petroleum tanks for storing Bunker C oil were historically present in the Main Plant Area. Bunker C oil was used to fire the Nos. 3, 4, and 5 kilns until the 1970s, after which natural gas was used. The historical aerial photographs suggest that the tanks were constructed between 1948 and 1966, and were reportedly used into the 1970s and dismantled by 1979. The decommissioning date preceded requirements for tank registration and regulation. Oil was transferred overhead to the larger western tank (600,000-gallon capacity) from rail cars and then conveyed overhead to the 170,000-gallon capacity tank to the east (Nos. 6 and 7 Kilns Area) for distribution to the Nos. 3, 4, and 5 kilns.[6] The smaller tank (less than 5,000-gallon capacity) was used to handle overflow from the larger tank.

[6] In 2003, two DRFs were submitted to the FDEP for the Nos. 6 and 7 kiln trunnions area; one due to the presence of petroleum-related constituents in a groundwater sample collected from a monitoring well and one in response to the presence of stained soils at the base of the adjacent trunnions. Subsequently, Coronet informed the FDEP that a light non-aqueous phase liquid (LNAPL) was discovered on the groundwater surface and submitted a Free Product Removal Notification Form which indicated that the potential sources of the separate-phase liquid included storage of lubricating oil, diesel fuel, and hydraulic oil in the No. 3 trunnion area, and the use of lubricating oil on the kiln trunnions.

2.1.5 Process Water Recirculation System and Waste Handling

2.1.5.1 Process Water Recirculation System

The process water recirculation system is defined as that system which was used to supply non-potable water to the plant processes; it included a distribution line, Ponds 1S and 6, and a series of intervening conveyance ditches. The process water makeup included contributions of storm water runoff and groundwater obtained from the plant production wells. The approximate volume of process water recirculated within the system on a daily basis was 9.9 million gallons.

Figure 2-3 presents a flow diagram for the system. Water in Pond 1S initially flowed to the Carpenter Shop Ditch, from which water was pumped through the distribution line to various production and production support areas:

- mineral acid tanks storage
- CDP feed prep
- Nos. 1 and 2 fluid bed reactors
- Paragon, Nos. 3, 4, and 5, and Nos. 6 and 7 kilns

As discussed in Sections 2.1.2 and 2.1.3, process water was then discharged to the Main Ditch via the inground flume in the KBF_4 area and underground lines associated with the Nos. 3, 4, and 5 kilns and the Nos. 6 and 7 kilns. The inground flume received process water streams from the KBF_4 area, CDP feed prep, Paragon kiln, and the fluid bed reactors. The underground lines associated with the remaining rotary kilns received process water from these kilns only.

Process water in the Main Ditch was treated with lime to facilitate the precipitation of solids from the water and to maintain the appropriate pH for process uses (approximately 3 s.u.). The treated water was pumped to the Elevated Ditch and gravity drained to Pond 6 for cooling and clarification. Water in Pond 6 gravity drained to the Return Ditch which discharged to Pond 1S. Seepage from Pond 6 was collected in a series of seepage ditches around the pond and the lowlands area southeast of the pond; water in the seepage ditch was pumped to the Return Ditch via Pumping Station No. 2 and water in the lowlands area was pumped to Pond 6.

The Emergency Ditch would occasionally receive water from Pond 1S (e.g., when the Carpenter Shop pumps were not working and water levels in Pond 1S were elevated) and convey this water into the Main Ditch. This action retained the process water within the recirculation system rather than releasing it to Pond 1N (see below). The Nos. 6 and 7 Kilns Ditch received storm water runoff from the eastern portion of the plant and, depending on hydrologic conditions, seepage from the Main Ditch and groundwater. Water accumulating in this ditch was used to supplement process water volumes in the Nos. 6 and 7 kilns.

In advance of heavy storms, water from Pond 1S could be and was released to Pond 1N to prevent potential overtopping of the pond berms. Management of the water once it was released to Pond 1N and entered the water management system is discussed in Section 2.2. Based on anecdotal information, water could be released from Pond 6 to Ditch 4 (no documented events have been identified). Water accumulating in Ditch 4 (which was largely seepage from Pond 5 and storm water runoff from this area and the golf course) was pumped to Pond 5.

Samples of the various process water streams collected by the EPA during its 2003 inspection indicate the presence of cadmium, chromium, arsenic or a combination thereof at concentrations above the TCLP limits, and acidic pH levels, in some samples (Sections 2.1.2 and 2.1.3). These data, and data for pond and surface water samples that were collected within the recirculation system during the Phase I and Phase II assessments, indicate the presence of these and other hazardous substances within the process water system.[7]

As the water was recirculated through the manufacturing area, ponds, and conveyance ditches, it came into direct or indirect contact with soil, surface water, sediment, and groundwater, resulting in the presence of constituents in the process water stream within these other environmental media at concentrations that are above various state and federal standards (Section 4). Due to several factors, process water is defined (in Section 5) as a primary source of contamination (i.e., an initial source and a source of significant magnitude). These factors include:

- the chemical nature of the water
- the volume of water present in the system
- the period of system operation (which has not changed materially since the 1960s)
- the physical extent of the recirculation system throughout the southern portion of the property
- the transfer (migration) of contaminants between the water and other media

2.1.5.2 Solid Waste and Construction and Demolition Debris Handling

Four areas used for the disposal of solid waste, construction and demolition (C&D) debris or both have been confirmed at the Coronet property: the area between Ponds 1S and 6, the northern rock storage area, an area southeast of Pond 6, and the south berm of Pond 6.

The area between Ponds 1S and 6 was investigated during the Phase I and Phase II assessments based on anecdotal information suggesting its former use for disposal. Solid waste was encountered and the limits of disposal determined (Figure 2-2). As part of the Pond 6 interim removal action (Section 2.3.6), approximately 125,000 cubic yards of soil were excavated from this area for use as borrow material. In May 2007, during excavation of soil in the Northern Rock Storage Area for use as for borrow for the Pond 6 interim action, solid waste was encountered. The solid waste recovered from these areas

[7] A list of the hazardous substances is provided in 40 CFR Part 302, Table 302.4.

was sent off site for disposal at a permitted landfill or for recycling. The period during which wastes were placed in these areas is not known, but use would have ceased circa 1981 based on information reviewed relative to closure of a disposal area southeast of Pond 6, as discussed below.

During an inspection in 1981, the Hillsborough County Environmental Protection Commission observed solid waste in a low-lying area southeast of Pond 6 and requested closure of the area due to its proximity to a jurisdictional wetland (Figure 2-1). This disposal area was closed, capped, and a dike constructed.[8] Water accumulating within the dike was pumped to Pond 6; currently it is piped to the Return Ditch and Pond 1S. Coronet personnel report that following closure of this area, solid waste was disposed of off site at a permitted solid waste landfill.

In January 1982, Amax requested a permit from the Hillsborough County Environmental Protection Commission for operation of a C&D disposal area north of Pond 6 (i.e., between Ponds 5 and 6). An area in which reinforced concrete was disposed of was encountered during excavation of borrow material for the Pond 6 interim action.

Coronet personnel report that C&D debris was typically placed along the south berm of Pond 6. The berm was altered during the interim action; recovered recyclable material was taken off site and construction rubble was placed in the pond.

2.1.5.3 Hazardous Waste Handling

Coronet's hazardous waste facility identification number, issued to Borden in 1980, is FLD001704741. The Coronet plant, while operated by Borden, Amax, CMI, and Coronet, identified itself as a small quantity generator (SQG) or conditionally exempt SQG pursuant to RCRA. During plant shutdown and decommissioning, Coronet identified itself as a large quantity generator for the period of July 2004 through December 2004, having exceeded the 1,000 kilogram per month threshold for a SQG.

Under normal operating conditions during Coronet's tenure, wastes were contained in 55 gallon drums and placed in the Drum Storage Area adjacent to the west wall of the Mobile Equipment Shop (Figure 2-2). Although similar handling and storage occurred during shutdown, decommissioning, and dismantling, bulk management of waste materials from the scrubbers and acid and caustic tanks was also required.

2.1.6 Research Building Area

During the entire period of Coronet's ownership of its property (i.e., since October 1993), the Research Building Area, west of the Main Plant Area, has been leased to CMI. The 20-year lease

[8] Pursuant to Rules of the Environmental Protection Commission of Hillsborough County, Chapter 1-7 Waste Management, Section 1-7.202(1)(c), excavation of solid waste, modification or development of a solid waste filled area, or construction on or through such an area is prohibited without written authorization from the Director of the Hillsborough County Environmental Protection Commission.

between CMI and Coronet states that at the time the agreement was signed in October 1993, simultaneous with Coronet's purchase of the property, the Research Building Area was being used as "laboratory research facilities" associated with research and development of a paramagnetic separator, various phosphate related chemical analyses, a pilot plant for "fluo solid fluid bed calcining" (presumably a fluid bed reactor pilot and not the rotary kiln pilot), and offices for CMI's land department. Information obtained from the FDEP indicates it was last used as a real estate sales office; it is not currently in use.

The aerial photographs for the area indicate that: the Research Building Area was not mined; the current rail system was present by 1938; and that the research building was not constructed until after 1948 with the western portion constructed by 1957. Conditions in the 1966 photograph are similar to existing conditions, although several of the smaller structures and the eastern portion of the building were not yet constructed. The 1972, 1979, and 1985 photographs indicate limited modifications in this area, with the last apparent expansion of the building by 1985.

The Research Building Area occupies approximately 6.4 acres. Based on drawings and information obtained from the FDEP, the building housed a laboratory, rotary kiln defluorination pilot plant, offices, and storage space. Ancillary structures include a storage building, a tank farm with three aboveground tanks (one 3,020 gallon tank and two 2,800 gallon tanks), a septic tank, an aboveground fiberglass tank and silo, and a water tank. Most of these structures and the tank farm are believed to be associated with the pilot plant. The two smaller storage tanks contained phosphoric acid and the larger tank is believed to have contained petroleum, presumably used to fire the kiln; the fiberglass tank is believed to have been used to store hydrofluoric acid. Information obtained from the FDEP suggests that a production well may be present; however, the Southwest Florida Water Management District (SWFWMD) has no record of a production well permit and Coronet can confirm that water was supplied to the Research Building Area by one of the Coronet production wells.

During a July 2004 inspection of the Research Building Area by the FDEP and the EPA, the agencies observed: containers of nitric acid, sulfuric acid, ethylene glycol, unknown liquids including corrosives, paint, solvents or adhesives; pesticide sprayers, gas cans, oil jugs, oxygen cylinders, laboratory glassware; and batteries and tellerets. Within the rotary pilot plant area, tellerets were present in the scrubber and scale/precipitate visible on piping and a valve under the "tall tower". The agencies also noted the presence of various sumps and pipes, including one sump "below the [pilot] plant" which reportedly received water from at least three sources and "several" others which were filled in and their functions could not be determined (FDEP 2004a).

Based on the inspection, the FDEP identified two alleged violations: failure to make a hazardous waste determination before abandoning wastes and abandonment of hazardous waste in the Research Building Area without a permit to do so (FDEP 2004a). Recommended actions included performance of

an asbestos survey, inventory all abandoned materials and make hazardous waste determinations within 30 days, removal of hazardous waste within 90 days, and completion of a preliminary assessment of impact to the environment. A FDEP memorandum subsequently reported that the asbestos survey had been completed, available records had been compiled, the main building and maintenance shed had been cleaned, and hazardous waste, furniture, trash, and debris had been removed (FDEP 2004b). A majority of the waste was comprised of various acids with lesser volumes of organic materials (e.g., paint and petroleum distillates) described above.

2.2 Historical Water Management

The reworking of the surface water features during historical mining activities created many of the ponds present today. The mining operations removed the overburden above the Bone Valley Member and likely used water to slurry the phosphate ore and separate the sand and clay matrix. The clay was placed in settling areas, including former mining pits (Stricker 2000). The overburden and sand are believed to have been used to construct berms for the ponds.

During the period of CDP and KBF_4 production, the remnant mine pits and constructed ponds were used for process and storm water management. The water has been managed for some time in accordance with the requirements of an Industrial Wastewater Facility Permit (IWFP; No. FL0034657) issued by the FDEP.[9] Water managed pursuant to the IWFP included rinse, wash, and process water generated by the production units; water generated by two quality control laboratories; and contact storm water runoff. (A description of the process water, including its chemical composition, distribution, and recirculation system was presented in Section 2.1.5.1.) In March 2004, when production operations ceased, 11 ponds (identified as Ponds 1S, 1N, 2, 2A, 3, 4, 4A, 5, 6, 7, and 8 on Figure 2-1) covered approximately 350 acres of the facility.[10]

Ponds 1S and 6, and a series of ditches collectively referred to as the "conveyance ditches" (Figures 2-1 and 2-2), were the primary structures used to manage process water and contact storm water runoff. Except for Ponds 4A and 7, the remaining ponds were used to store storm water runoff and limited direct or indirect overflow from the process ponds. Pond 4A was, and is, used in the water treatment process and is considered to be a process water pond for that reason only. Pond 7 was, and is, used exclusively for storm water management. Flow between the ponds and discharge from the ponds was, and continues to be, controlled by a series of weirs, ditches, and pump stations.

[9] The IWFP constitutes authorization to discharge to waters of the state under the National Pollutant Discharge Elimination System.

[10] In response to ongoing water treatment activities (Section 2.3.4), water levels and the overall acreage of the ponds have significantly decreased. The pond limits shown in the assessment figures and herein reflect conditions at the time of the topographic mapping in June 2004.

The process water was routed to the Main Ditch and a single-stage liming operation was used to adjust the pH; the water was pumped to the Elevated Ditch, which conveyed the water to Pond 6. In Pond 6, the water was cooled and clarified through precipitation of particulate matter, calcium fluoride, and other inorganic salts. Treated process water was conveyed from Pond 6 to Pond 1S via the Return Ditch north of the Main Ditch. Cadmium was detected at concentrations above the TCLP limit in samples of influent to and effluent from Pond 6 collected by the EPA during its inspection (samples P61 and P63, EPA 2004a). Water in Pond 1S was returned to the manufacturing process via the Carpenter Shop pumps.[11]

Seepage ditches are present east of Ponds 4 and 4A and, until recently, along the northern, eastern, and southern limits of the Pond 6 berm. The water collected in these ditches is comprised of seepage from these ponds, shallow groundwater, and storm water runoff. As discussed in Section 2.3.6, Pond 6 is being capped as an interim response measure; as part of this activity the adjoining seepage ditches have been eliminated.

The accumulation of storm water in the process ponds made it necessary to transfer water to other ponds from time to time, typically from Pond 1S to 1N, to Ponds 2 and 2A, then to Pond 4. Liming was used to raise the pH of the water and to reduce the concentrations of certain constituents to meet discharge requirements and reduce arsenic and other metal levels in Pond 4 as it was transferred to Pond 4A where settling and clarification occurred. The treated water was discharged through Outfall D001, a permitted outfall. Stored storm water also was discharged through Outfall D005 (north of Pond 5). Additional information on D001 and D005 (including treatment before discharge) is presented in Section 2.3.4.

Discharges of process water to Ponds 1S and 6 ceased in March 2004; storm water continues to enter Pond 1S by direct runoff and by pumping from adjoining seepage and storm water ditches. Storm water accumulating in the Pond 6 area from March 2004 forward was and will be directed to Pond 1S and to Pond 5 via Ditch 4 (which was modified as part of the interim measure to increase its detention capacity). Seepage water accumulating in this area from March 2004 forward was and will be directed to Pond 1S.

2.3 Regulatory Program Activities

Beginning in 2003, activities that have been conducted in cooperation with several regulatory agencies under multiple regulatory programs, including the following:

[11] The ditch east of Pond 1S served as an emergency channel ("Emergency Ditch") to lower the water level in Pond 1S rapidly by bypassing the "Carpenter Shop" pumps and directing the excess water to the Main Ditch for conveyance to Pond 6. The Nos. 6 and 7 Kiln Ditch, between the manufacturing area and the Main Ditch, was reportedly used to collect process water from the Nos. 3, 4, and 5 kilns from the 1950s until the mid-1980s and, since the mid-1980s, to collect storm water runoff from the combined kilns area, and storm water and seepage water that accumulated in the area of Pump Station No. 2.

- 2003 Case Development Inspection - conducted by the EPA and the FDEP under RCRA
- 2003 Public Health Consultation - conducted by the Agency for Toxic Substances and Disease Registry (ATSDR) and the Florida Department of Health (FDOH)
- 2004 Shutdown and Decommissioning Plan - prepared by Coronet and submitted to the EPA, FDEP, and U.S. Department of Justice (DOJ)
- 2004 Immediate Final Order (IFO) - entered into with the FDEP to address plant shutdown and water management issues; the IFO was amended to address the water management program in response to the intense 2004 hurricane season
- 2004 Administrative Order on Consent (AOC) - entered into with the EPA under Section 3013(a) of RCRA to conduct the Phase I assessment
- 2005 Amended Consent Order (ACO) - entered into with the FDEP for operation and maintenance of the pond system which replaced in their entireties a 2001 Consent Order and a 2003 Amendment to Consent Order
- 2005 AOC - entered into with the EPA under Section 3013(a) of RCRA to conduct the Phase II assessment
- 2006 Amendment to the ACO - entered into with the FDEP for continued operation and maintenance of the pond system
- 2006 Administrative Settlement Agreement (ASA) - entered into with FDEP to conduct an interim response action at Pond 6
- 2007 Amendment to the ACO - entered into with the FDEP for continued operation and maintenance of the pond system

An overview of the activities completed in conjunction with the various regulatory programs is provided in the following sections.

2.3.1 Case Development Inspection

Before operations at the Coronet property ceased, the EPA and the FDEP conducted a Case Development Inspection from November 12 through 14, 2003. The findings of the inspection were presented in a December 21, 2004 report, which acknowledged that Coronet had since ceased production operations and had addressed several of the items noted in the report (EPA 2004a).

Analytical data for several samples collected during the inspection (primarily of various process water streams including samples from the conveyance ditch system) indicated that arsenic, cadmium or chromium, or a combination thereof were present in some samples of the process water at concentrations above the TCLP limit and that the pH in some of these samples was acidic in nature. The results for samples of various aqueous samples collected during the inspection were presented in Section 2.1.2

Based on these results and other observations and findings noted in the report (including the potential for the process water recirculation system to have impacted environmental media; Section 2.1.6), Coronet agreed to perform an assessment of conditions on its property and entered the 2004 and 2005 AOCs.

2.3.2 ATSDR/FDOH Assessment

The ATSDR was established under CERCLA; although one of the functions of the agency is to conduct public health assessments of listed CERCLA sites, it also performs assessment for other sites to evaluate whether exposure related to these unlisted sites is harmful. The FDOH assists the ATSDR in this process under a cooperative agreement between the two agencies.

The ATSDR approach is to assess observable health effects from "shorter-term, higher dose levels" of contaminants in a qualitative manner. Regardless of the ATSDR's findings, CERCLA requires that a baseline risk assessment (RA) be conducted as part of the RI. The RA is a rigorous evaluation of environmental media data and potential exposure pathways that evaluate and in many cases quantify potential long-term risks to human health (such as cancer or other health effects) and the environment both on site and off site.

Beginning in 2003, the ATSDR and the FDOH conducted several studies in the area to provide an initial evaluation of observable health effects in the vicinity of but not including the Coronet property. The studies included sampling and analysis of private drinking water wells, soil from beyond the Coronet property boundaries, fish from a local pond, and ambient air; collection and analysis of urine samples from residents in the vicinity of the property; and analysis of area cancer rates.

Based on an evaluation of analytical findings and evaluation of cancer rates, the summary report concluded (ATSDR 2007):

> *...the area around the Coronet site is currently "no apparent public health hazard." Levels of contaminants measured in urine of nearby residents, private drinking water wells, off-site surface soil, fish, and outdoor air are not likely to cause respiratory ailments, fertility problems, dental problems, or other illness.*

As part of the assessment, the FDOH initiated a domestic supply well sampling and analytical program in 2003. During the initial event samples were collected from 145 wells in the vicinity of the Site (Figure 2-5). All of the samples were analyzed for metals and volatile organic compounds; samples from 42 wells also were analyzed for gross alpha. Those samples with concentrations above 5 picocuries per liter (pCi/l) also were analyzed for radium as Ra-226 and Ra-228. The FDOH identified seven parameters of potential interest (arsenic, boron, cadmium, lead, sodium, thallium, and radium) based on detection in one or more of the samples at a concentration above the selected screening criteria, identified

as state drinking water standards under Chapter 62-550, F.A.C., or the health advisory level (HAL) for boron.

Based on these findings, the FDOH and the FDEP provided bottled water to 39 residences supplied by wells where sample results showed one or more parameter concentrations to be above the screening criteria (Figure 2-5). Three previously vacant residences subsequently were supplied with bottled water resulting in a total of 42 residences.

Subsequent FDOH assessment activities included the collection of samples on a semi-annual basis in 2004 and 2005, and again in June 2006 from wells where a parameter of interest previously was detected at a concentration above one-half the value of the screening criterion. At the request of the FDEP, 12 samples were collected in February 2005 and May 2005 for analysis of radium or metals. Based on the results of these sampling programs, 4 additional residences (46 total residences) were supplied with bottled water (Figure 2-5).

Figures 2-6 through 2-8 show those wells where arsenic, sodium, and gross alpha/radium were detected at concentrations above the drinking water standards together with the reported concentrations. Figure 2-9 shows those wells where boron was detected at a concentration above the HAL. Figure 2-9 includes both the HAL and the FDEP global risk-based corrective action (RBCA) groundwater target cleanup level (GWCTL) for boron promulgated in 2005 under Chapter 62-777, F.A.C. and Chapter 62-780, F.A.C. Figure 2-10 shows those wells where other constituents were detected at concentrations above the drinking water standards.

The Plant City public water supply line has been recently expanded (Figures 2-5 through 2-10) at the request of the FDEP, primarily to provide access to water to those residences on bottled water although all of the residents in the area of expansion will be given the opportunity to connect to the system. Bottled water will not be provided to residents currently being served who do not elect to connect to the system; however, the FDEP will periodically contact these residents to determine if they have reconsidered tying into the system. At this time and under current Florida law (Chapter 373, F.S. and Chapter 62-532, F.A.C.), neither current nor future new residents will be prohibited from using an existing well or installing a new well for domestic use if all SWFSWMD permits are obtained.

The FDOH collected samples from a portion of the original 145 wells identified in the area in Spring 2007 (Figure 2-11). Although the FDOH contacted all of the owners of these wells to request permission to sample (excluding those on bottled water, for which sampling was not proposed), only 87 agreed to participate. The samples were submitted for analysis of arsenic, nitrate, boron, cadmium, thallium, lead, and sodium; the data has not yet been made available for evaluation or incorporation into this document. The FDOH intends to sample wells at those residences not electing to tie into the public

water supply and with parameter concentrations above one-half the value of the screening criteria in 2008 and every 3 years thereafter.

2.3.3 Plant Shutdown and Material Management

Coronet submitted a Shutdown and Decommissioning Plan to the EPA, FDEP, and DOJ in February 2004 (Coronet 2004c) describing the steps to be taken to shut down the plant in a manner that minimized risk to human health and the environment; de-energized all process equipment and controls; removed unused raw materials, products, and wastes from the plant; and decommissioned the process equipment and related systems. Coronet ceased production activities in March 2004.

In May 2004, Coronet entered into an IFO with the FDEP (2004a). Pursuant to the IFO, a Material Management Plan (IFO Attachment 3) was developed and implemented. As part of this plan, Coronet was required to characterize the nature of wastes within 90 days of the effective date of the plan and remove or appropriately manage any hazardous waste that may be identified within 180 days of the effective date.

Coronet performed hazardous waste determinations in accordance with 40 CFR Section 262.11 and Chapter 62-730, F.A.C. Generator knowledge was used to design the waste characterization program which included analysis for TCLP metals and corrosivity; certain samples were also tested for flammability.

Samples for waste characterization were collected from 14 phosphoric acid tanks, 13 hydrofluoric acid tanks and 9 sumps, and 5 KBF_4 process vessels and associated pumps and piping. Also characterized were phosphate rock, lime, borax, soda ash, CDP, and used demister pads, tellerets, and kiln bricks. Based on the analytical results the following materials were properly disposed of off site:[12]

- 32,000 gallons of hydrofluoric acid rinse water and rainwater
- 23,000 gallons of phosphoric acid rinse water and rainwater
- 20,000 gallons of hydrofluoric acid sludge
- 5,185 gallons of phosphoric acid sludge and tank scale
- 2,970 gallons of NaOH (sodium hydroxide) rinse water
- 1,155 gallons of hydrofluoric acid scrubber sump solids
- nine 55 gallon drums of hydrofluoric acid solids
- six 55 gallon drums of used demister pads and miscellaneous materials
- 3,100 chemical containers obtained from the laboratory

In addition, Coronet cleaned and closed all registered mineral acid tanks and sampled over 75 electrical transformers and 75 switches. Five of the transformers were found to contain between 50 parts per million (ppm) and 500 ppm polychlorinated biphenyls (PCBs) and were properly managed. In 2005, an

[12] Manifests for the various wastes are available at Coronet's office.

underground storage tank containing gasoline was emptied and cleaned, as were most of the diesel fuel tanks. Several double-walled, portable diesel tanks remain in use as part the surface water management operation.

2.3.4 Surface Water Treatment Consent Orders

The May 2004 IFO with the FDEP also addressed interim water treatment and discharge activities during the 2004 rainy season (FDEP 2004c); an October 2004 amendment modified the IFO in response to the intense hurricane season (FDEP 2004d). Under the IFO, Coronet agreed to lower pond water levels by transferring water to Pond 4, treat the water using liming to adjust pH, and use Pond 4A as a settling basin. Treated water was to be discharged from Pond 4A to English Creek through outfall D001. Under the IFO, water in Pond 5 did not require continuous treatment, but was monitored for pH and neutralized, if necessary, before discharge through outfall D005. Water treatment and discharge pursuant to the IFO began in mid-June 2004 and ended in early January 2005.

Coronet entered an ACO with the FDEP in 2005. This ACO replaced a 2001 Consent Order, a 2003 Amendment to Consent Order, and the 2004 IFO and IFO amendment. The 2005 ACO and amendments to the ACO in 2006 and 2007, addressed operation and maintenance of the pond system, including water management, treatment, and discharge (FDEP 2005a, 2006a, and 2007). In both 2005 and 2006, the treatment (which included liming and reverse osmosis) and discharge activities began in June and continued through mid-November; a similar schedule is anticipated for 2007.

Surface water will continue to be managed during the RI/FS and, as appropriate, future needs will be evaluated during the RI/FS and incorporated into the Site-wide remedy and documented in the ROD.

2.3.5 RCRA 3013 Orders

In 2004 and 2005, Coronet entered into RCRA Section 3013(a) AOCs with the EPA (EPA 2004c and EPA 2005). Pursuant to the 2004 order, Coronet implemented a Phase I assessment to characterize facility conditions, except for the Main Plant Area; the findings were presented to the EPA and the FDEP in the Phase I Site Assessment Report (Coronet 2005a). Pursuant to the 2005 order, Coronet implemented a Phase II assessment to provide supplemental characterization of facility conditions, including the Main Plant Area, and to investigate areas beyond the Coronet property boundaries. The draft Phase II Site Assessment Report (Coronet 2006) presented the findings for both assessments. Summaries of these activities and findings are presented in Section 4.0.

In January 2007, Coronet submitted a proposal to install additional monitoring wells based on recommendations included in the draft Phase II report, and in response to comments received from the EPA and the FDEP. The wells were installed in March and April 2007 (Figure 2-1); groundwater

samples from the new wells and other selected wells were collected in May 2007. The findings will be incorporated into the RI report.

2.3.6 Pond 6 Interim Response/Removal Action

Coronet entered into an ASA with the FDEP in August 2006 for a removal action at Pond 6 (FDEP 2006b). Coronet completed a characterization of potential risks which showed that the removal action was an appropriate interim protective measure to reduce and control potential vertical migration of constituents of interest (COIs).[13] The goal of this interim response action was mitigation of potential risks to human health and the environment as a result of the pond's historical use and its proximity to the southern boundary of the facility. Although the action was taken under state authority, it was coordinated with the EPA to conform with the NCP (40 CFR Part 300).

The specific objectives for the removal action at Pond 6 were:

- to reduce the potential migration of COIs from the sediments to groundwater by reducing vertical infiltration of rain water
- to reduce the potential migration of COIs from the sediments to surface water by eliminating direct contact of rain water with the sediments
- to reduce the potential risks to human and ecological receptors by eliminating the potential for direct contact exposure to the sediments in the pond
- to reduce the potential migration of COIs during capping of the sediments by collecting and treating groundwater potentially impacted by seepage water emanating from the pond
- to consolidate, to the extent feasible and appropriate, a limited quantity of soil containing COIs and sediment from other targeted areas into the pond, thereby reducing the potential risk to human and ecological receptors before development and implementation of a long-term Site-wide remedy

Based on an evaluation of effectiveness, implementability, compatibility with possible future Site work, and relative cost, a multi-layer cap was selected as an interim measure. The capping alternative is consistent with the long-term goals of reduction in contaminant mobility, volume, and potential exposures. The historical seepage collection system was removed and replaced with a groundwater interceptor trench. Short-term operation of the trench is designed to capture groundwater that may contain constituents that have been released or may be released from the Pond 6 area as a result of the closure activities. Storm water runoff from the capped pond will be routed to and stored in Pond 1S or

[13] Constituents are categorized as COIs based on a single detection above one or more screening levels. Additional discussion and identification of COIs for various environmental media is presented in Section 4.

Ditch 4 for management in accordance with the 2007 Amendment to the ACO (FDEP 2007), until the long-term Site-wide strategy, including a surface water management plan, is selected.

Cap construction activities began in late 2006 and were materially complete in August 2007. Maintenance of the cap and operation of the groundwater collection, treatment, and discharge, and storm water management systems will be performed pursuant to the requirements of the ASA. The groundwater portion of the interim action will be evaluated during the FS as part of a Site-wide remedy, and if incorporated, documented in the ROD.

2.4 Facility Dismantling

In late 2004, Coronet began preparations to dismantle the production facility and commissioned a qualified third party to perform an asbestos survey. The surveyor identified asbestos-containing material in transite siding, floor and ceiling tile, and pipe insulation. Two licensed asbestos contractors removed asbestos containing materials from all process areas and former office buildings in 2006; this work was monitored by the Hillsborough County Environmental Protection Commission.

Following asbestos removal, dismantling activities commenced in April 2006 and were completed in March 2007. All process structures, tanks, storage bins, and buildings (with the exception of three buildings, a water tank, and two equipment sheds still in use) were removed to grade level. Concrete foundations were not removed. The scope of the dismantling activities included the sale of approximately 75 transformers, 50 electric motors, and 30 pieces of material handling conveyors, tanks, and air compressors. In addition, over 7,100 tons of scrap steel and 170,000 pounds of copper were recycled. Over 3,500 tons of construction debris were disposed of in licensed landfills and over 13,000 cubic yards of concrete have been utilized to construct internal roadways at Pond 6, which are now beneath the final cap.

3.0 Site Description

As discussed in Section 1.0, the Site is comprised of the Coronet property and the areal extent of any contamination that has emanated from the property. Although the limits of the Site will be defined during the RI, the local and property-specific information presented below are also applicable to the Site.

The Coronet property historically was part of a larger, 2,500-acre tract that was mined for phosphate (Figure 2-1). The Coronet property is approximately 980 acres including the system of ponds and ditches and intervening land surfaces (approximately 650 acres), a former public golf course in the western portion of the property (approximately 220 acres), the Main Plant Area in the south-central portion of the property (approximately 60 acres), and three outparcels (A, B, and C) south and east of the Main Plant Area (approximately 50 acres).

Outparcels A and C were used for company housing (the residences were dismantled circa 1966) and, as noted in Section 2, Outparcel B has been vacant and not known to have been used. The golf course was leased by various entities from at least 1938 through June 2006 at which time the lease was terminated and the area was vacated. Pursuant to the ASA, Coronet used soil from portions of the golf course for borrow material for the Pond 6 removal action. As discussed in Section 2.1, the Research Building Area is in the western-most portion of the Main Plant Area. Although Coronet did not operate the Research Building Area, which was leased to a third party or its successors since at least 1993, it was historically operated by the former owners of the original 2,500-acre mine tract and, therefore, will be evaluated as part of the RI/FS.

The topography in the vicinity of the Site is generally flat, with elevations generally ranging between approximately 140 feet mean sea level (ft-msl) to 130 ft-msl. Higher elevations in the area (e.g., 150 ft-msl) typically reflect alterations to the native ground surface during mining operations. Lower elevations (e.g., 120 ft-msl) occur naturally in the downstream areas of English Creek and Howell Branch.

3.1 Meteorology

According to the National Climatic Data Center (NCDC 2006), with the exception of the southernmost part of the State, Florida is characterized as a humid subtropical climate zone. Dominant influences on climate include the Azores-Bermuda High and the El Niño-Southern Oscillation (ENSO). The Azores-Bermuda High is a high-pressure system that moves into Florida during the winter months and limits precipitation. The onset of the "rainy season" is triggered by the weakening of this high-pressure system in the summer months. Summer rain storms are formed by the convergence of hot, humid air from the Atlantic Ocean and the Gulf of Mexico. The ENSO occurs in the equatorial Pacific

Ocean when unusually warmer (El Niño) or cooler (La Niña) water temperatures affect the jet streams and weather patterns in North America. According to the National Climatic Data Center, "El Niño typically brings 30 to 40 percent more rainfall and cooler temperatures to Florida in the winter, while La Niña brings a warmer and drier than normal winter and spring. La Niña is frequently a trigger to periodic drought in Florida." Weak La Niña conditions developed in late 2005 and continued through March and April 2006. As of February 2007, a weak warming episode was observed in the equatorial Pacific that signifies El Niño conditions (NOAA 2007).

Climatological data for Plant City are archived by the Southeast Regional Climate Center (SERCC). During the period of 1971 to 2000, the annual mean temperature was 72.2 degrees Fahrenheit (°F), with the highest monthly means in July and August (81.5 °F) and the lowest in January and February (61.1 °F and 62.6 °F). Monthly total precipitation data and monthly precipitation means for January 1931 through December 2006 indicate that the mean annual precipitation for Plant City is 54.23 inches (SERCC 2007).

The SWFWMD classifies June through September as the "rainy" or "wet" season in southwest Florida. The monthly mean precipitation for Plant City for this period ranges from 7.0 inches to 8.6 inches. During the "dry" season (October through May), the mean monthly precipitation ranges from 1.84 inches to 3.72 inches. In 2005, the annual precipitation was 51.84 inches, which was 2.71 inches below the mean. According to U.S. Drought Monitor maps for 2005, portions of western Florida, including Hillsborough County, were abnormally dry in mid-September through mid-November 2005, with effects on agriculture and hydrological resources (USDA et al. 2006).

Below normal rainfall continued in January 2006 (-2.01 inches) and, while February 2006 rainfall was slightly above average (+1.42 inches), only a trace amount of precipitation was reported for March 2006 which is tied for the driest March since records began in April 1890 (National Weather Service 2006). U.S. Drought Monitor maps indicate that abnormally dry conditions continued throughout the State from March 28, 2006, and throughout the spring (USDA et al. 2006). Currently, approximately one-third of Florida, including the Site, is suffering a moderate drought (USDA et al. 2007).

Wind direction changes seasonally in the Plant City area. The predominant wind directions are from the northwest during the winter (November through March) and from the southeast during the summer (May through September); there is no predominant wind direction in either April or October.

3.2 Zoning and Land Use

The Coronet property is bordered on the north by agricultural property (cattle grazing); farther to the north, but south of U.S. Highway 92, are several small commercial/industrial properties. Property to the east of the Coronet property is mixed agricultural (crops and cattle grazing) and low-density

residential. South of the eastern portion of the Coronet property is primarily agricultural (crops) with minimal residential use. South of the central and western portion of the Coronet property is largely residential. Property to the west, generally extending to Park Road, is primarily agricultural (cattle grazing).

In 2005, the adjacent properties to the north, east, and some areas to the west were purchased for residential development. A development plan obtained in November 2004 from the Plant City Planning and Zoning Department suggested the phased construction of single- and multi-family homes and elimination of certain wetlands within the area. Recently the owners of the potential residential development have begun efforts with the City of Plant City to change the future development of this property to commercial/industrial use. The City of Plant City owns property along the west-central property boundary including Boy Scout Pond and two small parcels along the northern boundary of the Lakeside property. Property to the south of Boy Scout Pond is privately owned; Roberts Ranch LLC owns property to the south of this privately owned tract. Figure 2-3 illustrates owners of the significant land tracts in the area.

Most of the Coronet property is within the jurisdiction of Hillsborough County. The northern portion of the Coronet property is zoned "Agricultural Industrial"; the southern portion of the property including the Main Plant Area is zoned "Manufacturing." The Hillsborough County properties south and east of the Coronet property are zoned "agricultural" and "planned development." Properties to the north, west, and east of Ponds 4 and 4A, and the western portion of the former golf course are within the jurisdiction of Plant City and are zoned for mixed use allowing for residential development. Figure 3-1 illustrates current zoning for the Coronet property and surrounding area.

3.3 Well Water Use

3.3.1 Coronet Water Use

Coronet maintains water use permits through the SWFWMD for four production wells within the Main Plant Area (PW-1 through PW-4; Figure 2-2) and two wells in the area of the former golf course (PW-7 and PW-8; Figure 2-1). These wells obtain water from the Upper Floridan aquifer which serves as the primary water supply for the area. Historically, the four production wells in the Main Plant Area were used to provide sanitary and process water for the plant operations. Previously, PW-1 was used by Coronet as a sanitary water supply for the office buildings. Coronet will be connected to the new municipal water supply system in Fall 2007, thus eliminating the need to use PW-1. PW-2 and to a lesser extent PW-4 are used for blending water for surface water management. PW-2 and on occasion PW-3 have been used to obtain water for miscellaneous purposes (e.g., equipment cleaning, dust suppression).

PW-2, and potentially PW-4, will continue to be used for blending as part of the water management activities and to supply water for other high-volume needs (e.g., dust suppression) for the foreseeable future. The golf course historically used PW-8 as a potable water supply; PW-7 is believed to have been used for irrigation of the golf course.

Coronet anticipates that one or more of the existing wells will be maintained longer term and until such time as remedial needs at the Site are met. The future use of the wells will be evaluated in the FS, which will consider the possible advantages to closing some or all of the wells, and for those wells that are closed, transferring the consumptive use permits to the city of Plant City.

In addition to these production wells, what appeared to be a former production well was identified beyond the northwest corner of the Coronet property by representatives of Coronet and the FDEP in 2005 (Figure 2-1). Neither Coronet nor the SWFWMD have any information regarding this well.

3.3.2 Local Water Use

With the exception of a housing development southwest of the Coronet property that was historically serviced by municipal water, potable water in the area is supplied primarily by private domestic wells. Expansion of the existing municipal water service area began in mid-2006; construction of the water supply system is complete and the FDOH approved activation of the service on July 19, 2007. It is anticipated that construction of the connections between the existing residences and the expanded system will be completed in late 2007. The layout of the new water supply system is shown in Figure 3-1.

All of the residents in the area of the municipal supply system expansion will be given the opportunity to tie into the system; no one will be compelled to tie into the system or abandon their well. New residences within Plant City will, however, be required to tie into the system (if available at the property frontage); Hillsborough County has not made a final decision as to whether permits for new residences within the unincorporated portion of the county (i.e., outside of Plant City) will be required to tie-in. Regardless of municipality, future housing developments with sufficient density will trigger a requirement to tie into the public water system.[14] The RI report will identify the locations and owners of residences with private wells that decline either to connect to the public supply system or abandon their wells.

Of the 145 domestic wells included in the FDOH's evaluation, construction information is available for approximately 25. The construction information is limited to approximate well depths

[14] As previously noted, pursuant to Chapter 373, F.S. and Chapter 62-532, F.A.C., neither current nor future new residents will be prohibited from using an existing well or installing a new well for domestic use if all SWFWMD permits are obtained.

(approximately 60 feet to 600 feet) and well diameters (between 4 inches and 8 inches). Wells installed subsequent to the FDOH's initial 2003 evaluation do not appear to have been identified or sampled; construction information for these wells should be available through the SWFWMD. Available construction information and the residential well sample data will be compiled, and evaluated and potentially presented in the RI and FS reports.

In addition to domestic supply wells in the area, there are several wells used primarily or exclusively for irrigation. Most of these wells, particularly those with higher production requirements, are believed to be supplied by the Upper Floridan aquifer.

3.4 Geology and Hydrogeology

The following sections present a summary of regional and local geologic and hydrologic conditions based on information collected during the Phase I and II assessments and obtained during an extensive literature review.

3.4.1 Geology

The regional geologic framework of west-central Florida consists of a series of clastic sediments overlying a thick sequence of carbonate rocks (Figure 3-2). Surficial soils at in the vicinity of the Site are comprised of Pleistocene- to Holocene-age undifferentiated terrace sands. These sands are very fine to medium-grained with minor amounts of heavy minerals (Campbell 1984); in undisturbed areas these soils are classified as Myakka and Ona Fine Sands (USDA 1989). During mining operations, the surficial soils were removed to expose phosphate ore, principally within the Bone Valley Member of the Peace River Formation. Soils that were disturbed by mining activities (i.e., excavation and replacement) are classified as Arents soils, indicating the absence of natural soil profiles with no predictable stratification or other physical or drainage characteristics (USDA 1989). The clay content of the highly permeable undifferentiated terrace sands increases with depth, transitioning to the clayey sand of the upper Bone Valley of the Peace River Formation.

The Peace River Formation and underlying Arcadia Formation comprise the Miocene-age Hawthorn Group. The Peace River Formation, a predominantly silicaclastic unit with varying amounts of carbonate (limestone and dolostone) beds, is divided into the Bone Valley Member and the lower undifferentiated Peace River Formation. All of the economic phosphate deposits in the Central Florida Phosphate district can be found within the Peace River Formation. The phosphate occurs as sand and gravel-sized particles; gravels are most abundant in the Bone Valley Member and are the most lithologically important factor in the differentiation of this lithostratigraphic unit from the remainder of the Peace River Formation.

The Bone Valley Member is believed to be of alluvial origin, derived from the weathering of the underlying Hawthorn Group. It consists of pebble or gravel-sized phosphate fragments and sand-sized phosphate grains in a matrix of quartz sand and clay. Clay is typically the matrix material, but it may occur as discrete beds. Very phosphatic sections of the Bone Valley Member grade upward into slightly phosphatic to non-phosphatic clayey sands, known as the upper Bone Valley. The Bone Valley Member disconformably overlies the Arcadia Formation throughout much of its extent. The contact between the Bone Valley Member and the undifferentiated Peace River Formation or Arcadia Formation is typically marked by a basal gravelly unit. The undifferentiated Peace River Formation consists of interbedded quartz sands, clays, and carbonates. The quartz sands are characteristically clayey, calcareous to dolomitic, phosphatic, very fine to medium grained, and poorly consolidated; colors range from light gray and yellowish gray to olive gray. The Peace River Formation unconformably overlies the Arcadia Formation, a predominantly carbonate unit; however, the contact between the two formations is gradational. The Arcadia Formation consists of the undifferentiated Arcadia Formation, the Tampa Member, and the Nocatee Member. With the exception of the silicaclastic Nocatee Member, the formation is predominantly limestone and dolostone with thin inter-beds of quartz sand, clay, and phosphate grains.

The Hawthorn Group overlies an Oligocene- to Eocene-Age carbonate sequence consisting of the Suwannee Limestone, Ocala Limestone and Avon Park Formation. The Suwannee Limestone can be divided into three lithologic units in Hillsborough County. The upper unit is typically chalky with low to moderate intergranular and moldic porosity. The middle unit is a highly recrystallized, skeletal limestone with good intergranular and vugular porosity. The lower unit is a chalky limestone with minor amounts of peat, pyrite, clay, and fossils (Campbell 1984). The Ocala Limestone (late Eocene-age) consists of soft, chalky, fine-grained, skeletal limestone. The lower portion of the Ocala Formation may contain sucrosic, dolomitic limestone (SWFWMD 2003). The Avon Park Formation consists of fractured, interbedded dolostone, dolomitic limestone, and limestone (Johnson 1984).

3.4.2 Hydrogeology

Regionally, there are three recognized aquifer systems: surficial, intermediate, and Upper Floridan (Figure 3-2). The undifferentiated surficial sand deposits and the Bone Valley Member of the Peace River Formation make up the surficial aquifer system; the deposits of the Hawthorn Group generally coincide with the intermediate aquifer system and the Upper Floridan aquifer consists of all or part of the Eocene- to Oligocene-age carbonate rocks (Yobbi and Halford 2005).

3.4.2.1 Surficial Aquifer System

The terrace sands and the upper Bone Valley comprise the unconfined surficial aquifer system. The surficial aquifer produces relatively small quantities of water which is typically used for lawn irrigation or other domestic purposes. Water levels are typically lowest in the spring and highest in late summer, reflecting the well defined dry and rainy seasons. The surficial aquifer ranges in thickness from about 10 feet to 30 feet. The aquifer is recharged primarily by rainfall; the aquifer also is also intermittently recharged by ponds and other surface water bodies.

A surficial aquifer potentiometric map was constructed from data collected in March 2006 (Figure 3-3). Groundwater flow is predominantly south with components of flow west towards Howell Branch, and east towards English Creek. Groundwater flow generally is not affected by seasonal fluctuations in the water table based on data generated during the Phase I and Phase II assessments (Coronet 2005a and 2006). Notable changes in the groundwater surface since initiation of the assessments include the groundwater depression at Pond 2 which resulted from lowering of the pond as part of the water management program and continued pumping of water from this area to Pond 4, and a decline in water levels immediately adjacent to areas east and south of Pond 6.

Groundwater flow within the Coronet property boundaries is affected by man-made ponds and surface water drainage features (ditches and swales). The series of seepage ditches at Ponds 4, 4A, and 6, and the southeastern perimeter storm water ditch (SEPSWD) within the Main Plant Area were designed to intercept groundwater flow, although during periods of higher flow (i.e., during precipitation events) these ditches may recharge groundwater (Section 3.4.3). Ultimately, groundwater in the surficial aquifer that is not otherwise intercepted discharges to Howell Branch or English Creek.

Data obtained from slug tests conducted on the Coronet property were used to determine a localized hydraulic conductivity (K) for the aquifer (Coronet 2005a and 2006). The K values, using test data for wells screened within the sand or Bone Valley Member, ranged from 0.45 feet per day (ft/day) to 17 ft/day; the geometric mean was calculated to be 2.7 ft/day. A hydraulic conductivity of 3.7 ft/day was calculated using test data from wells screened entirely or largely within the undifferentiated terrace sands. Using this range of conductivities, an average hydraulic gradient of 5.4×10^{-3}, and an assumed effective porosity of 30 percent,[15] the average linear groundwater flow velocity calculated using a modified version of the Darcy equation (Domenico and Schwartz 1990) ranges between approximately 0.05 ft/day (where, K = 2.7 ft/day) to 0.07 ft/day (where, K = 3.7 ft/day).[16]

[15] The assumed effective porosity is consistent with the sand deposits at the site (Domenico and Schwartz 1990)

[16] The gradient was calculated based on flow paths between MW-32 to MW-37 (November 2005, and February and March 2006) and between PZ-2R and MW-62, MW-30 to MW-64, MW-61 to MW-63, MW-72 to MW-73, and PZ-1A to MW-70 (May 2007). These flow paths were selected because there is little to no influence from surface water

3.4.2.2 Intermediate Aquifer System

The undifferentiated Peace River Formation and the underlying Arcadia Formation of the Hawthorn Group comprise the confining deposits that hydraulically separate the surficial aquifer from the underlying Upper Floridan aquifer (SWFWMD 2003). In the vicinity of the Site, the inter-bedded sand, clay, limestone, and dolomite within these formations form an intermediate aquifer system.

The intermediate aquifer system in the vicinity of the Site is approximately 80 feet to 100 feet thick. Although the system may be used locally for domestic wells, it is not believed that the water-bearing zones yield sustainable quantities of water (EST 2002). In general, it is comprised of up to three water-producing zones (PZ1, PZ2, PZ3) separated by confining units; however, PZ1 is not regionally extensive and is not present in Hillsborough County (Figure 3-2). All of the intermediate aquifer monitoring wells are screened within zone PZ2, with the exception of SPB-MW-1I, SPB-MW-2I, and SPB-MW-3I. These three wells (and SPB-MW-4I) are constructed with two screened intervals, with the upper screen in zone PZ2 and the lower screen in zone PZ3.

The intermediate aquifer system typically occurs under leaky confined conditions and can transmit water to the surficial aquifer, surface water, or the underlying Floridan system, depending on the hydraulic head relationships (Lewelling et al. 1998). A potentiometric surface contour map for the intermediate aquifer using March 2006 groundwater elevation data is presented in Figure 3-4. The contour map indicates a groundwater flow divide centered near the MW-60I and MW-13R wells. This groundwater divide coincides with a topographic high and mirrors the general flow directions within the surficial aquifer. The available water level data indicate there is little to no influence from the ponds on groundwater flow in the intermediate aquifer.

Groundwater elevation data indicate a moderate downward potential vertical gradient generally is present between the surficial and intermediate aquifers over most of the study area. Despite the potential for downward groundwater movement, minimal inter-aquifer flow from the surficial to intermediate aquifer appears to have occurred based on the hydrochemical data. The limited downward flow reflects the low permeability of lithologic units within the Bone Valley Member and the numerous surface water bodies in the area (which generally act as areas of groundwater discharge). Based on groundwater and estimated streambed elevations near MW-45/45I and a weak upward vertical hydraulic gradient, the intermediate aquifer likely discharges to English Creek southeast of the Coronet property. Groundwater within the intermediate aquifer is similarly anticipated to discharge to Howell Branch south-southwest of the property.

bodies particularly during the dry season, nor severe topography changes. The range of velocities is biased low because the majority of the measurements were collected during the dry season (i.e., May 2007).

3.4.2.3 Upper Floridan Aquifer System

The Upper Floridan aquifer is a carbonate sequence comprised of the Suwannee Limestone, Ocala Limestone, and portions of the Avon Park Formation (Figure 3-2). This aquifer generally consists of two permeable zones (Suwannee Limestone and the Avon Park Formation) and a semi-confining unit (Ocala Limestone). In northeastern Hillsborough County, the Upper Floridan aquifer is estimated to be 1,000 feet thick (SWFWMD 2003). In nearby Polk County, the Upper Floridan aquifer occurs under confined conditions and is the major source of water. Information on this aquifer system is largely derived from logging of production wells on the Coronet property. Gamma and caliper logs for three of these wells (PW-1, PW-2, and PW-4) indicate that the Upper Floridan aquifer is separated from intermediate zone PZ3 by a 10-foot to 30-foot thick low permeability confining unit (Nocatee Member of the Arcadia Formation) consisting of interbedded clay, limestone, and dolosilt (Figure 3-2).

3.4.3 Surface Water/Groundwater Interaction

The Site is situated within the Alafia River drainage basin. The closest surface water drainage features are Howell Branch, approximately 0.75 mile to the west, and English Creek, approximately 0.25 mile to the east (Figure 1-1). Howell Branch joins with English Creek approximately 3.5 miles to the south-southeast, and English Creek eventually converges with the North Prong of the Alafia River. All streams within the Site drainage area are Class III surface waters of the State of Florida as defined by Chapter 62-302, F.A.C. Class III surface water is designated for recreation and propagation and maintenance of fish and wildlife.

The surface water bodies at the Coronet property and those on the adjacent property to the west primarily consist of a series of isolated and interconnected ponds and a network of drainage ditches or swales, all of which appear to have been created during previous mining operations based on their presence, geometry, and interconnections; those within the Coronet property boundaries were, as necessary and over time, modified to support water management needs. Currently, sources of water to the Coronet ponds (and those to the west) include direct precipitation, surface drainage from the ditch systems, and seepage from the surficial aquifer. Pond seepage into the surficial aquifer is dependent on the relative surface water and groundwater elevations, pond construction, and characteristics (e.g., thickness and permeability) of the pond sediments. Pond water losses are caused by evaporation and seepage into the surficial aquifer; pond water losses within the property are also attributed to permitted discharges and the transfer of water between ponds via pumping.

The relative magnitude of pond water gains and losses is influenced by spatial and temporal (i.e., seasonal) variations. For example, several ponds, including Ponds 1N, 2, 4 and 5, were used for the storage of storm water run-off from precipitation events. The increase in this surface water inflow

component during wet periods would have resulted in a corresponding change in pond outflows via enhanced seepage into the surficial aquifer and/or inter-pond transfers. The net pond water gains associated with periods of higher amounts of precipitation could also be balanced by changes in the character of selected seepage ditches surrounding pond areas. A ditch, or portion of a ditch, that acts as a source of groundwater recharge during low flow (i.e., dry) periods may become a discharge area under wetter conditions in response to transient increases in both pond seepage and local groundwater surface elevations.

An understanding of the hydraulic interaction between the ponds and ditches and groundwater system is pertinent to the evaluation of groundwater flow pathways and associated water quality at the Coronet property. Given the differences in historical activities, separate discussions are provided for the Main Plant/Process Ponds Area and the Northern Ponds Area. Additional detailed information, including hydrographs illustrating the relationships between many of the surface water bodies within the property and a discussion of these relationships, was presented in the draft Phase II report. Further investigation of the relationship between groundwater and surface water will be completed as part of the numerical modeling to be performed during the RI (Section 7).

3.4.3.1 Main Plant/Process Ponds Area

Pond 1S receives groundwater inflow from the surficial aquifer and outflows to the west. The construction of Pond 6, which includes several mining pits and dredge areas, appears to have facilitated the seepage of mixed storm and process water to the surficial aquifer. Given the groundwater sampling data, the seepage rate, and associated mass flux of dissolved constituents, the recharge from Pond 6 appears to have been more significant than for Pond 1S. The potential for pond water from Ponds 1S and 6 to recharge the intermediate aquifer is believed to be limited in these formerly mined areas by the low permeability of the clayey bottom sediments (less than 4×10^{-6} centimeters per second) and strata comprising the lower portion of the Bone Valley Member (Coronet 2006).

In general, the groundwater flow direction within the surficial aquifer in the Main Plant/Process Ponds Area varies from east (Pond 6 and vicinity) to south and west (Pond 1S and Main Plant). Seepage from Pond 6 migrated eastward, consistent with anticipated flow. Some proportion of this water discharged to the seepage ditch at the base of the berm or to the low-lying area immediately to the east. The seepage ditches south and north of Pond 6 also allowed for shallow groundwater flow to these areas. The seepage collected in all three of the Pond 6 ditches was returned to the pond. Additionally, the Lexie Lane ditch represents a potential discharge point for some groundwater outflow from the Pond 6 area. Any pond seepage that did not enter these ditch areas would inter-mix with aquifer water flowing beyond the property boundaries eastward, and eventually discharge as base flow to English Creek or its tributaries. Overall, this stream acts as a line hydraulic sink (linear area or feature where the surface

water elevation is lower relative to the hydraulic heads in the surrounding aquifers), that would allow for the capture of shallow groundwater flowing east from the Coronet property. The capping of Pond 6, as part of the interim measure, and the corresponding reduction in aquifer recharge via surface infiltration will alter the groundwater surface and flow paths in this area.

The conveyance ditch system north of the Main Plant Area (e.g., Main Ditch and Emergency Ditch) represents both a groundwater recharge and discharge area for the surficial aquifer. Evaluation of the water level data indicates that groundwater flows generally southward from the Main Plant Area (Coronet 2006). Under normal flow conditions, the SEPSWD appears to be a primary groundwater discharge point downgradient of the eastern portion of the Main Plant Area (including the Nos. 6 and 7 Kilns Ditch) within the surficial aquifer. Higher water levels in the ditches which occur in response to storm events might cause short-term, or transient, conditions that result in the reversal of the hydraulic gradients proximate to the SEPSWD and movement of water from the ditch into the unconsolidated sand deposits. Groundwater flow from the western portion of the Main Plant Area and Ponds 1S and 1N continues south and west within both the surficial and intermediate aquifers. Howell Branch, a gaining stream west of the Coronet property, serves as the primary discharge area for the shallow groundwater flow from these areas.

3.4.3.2 Northern Ponds Area

The Phase I and Phase II assessment results suggest that the Coronet holding ponds were sources of recharge to the surficial aquifer, although subtle differences exist between different sub-areas (e.g., Ponds 2 and 2A and Ponds 4 and 4A) with respect to the groundwater-surface water interaction (Coronet 2005a and 2006). For example, except where intercepted by the eastern seepage ditches, seepage to the surficial aquifer from Ponds 4 and 4A generally flows away from the pond area, whereas the seepage from Ponds 3 and 5 is controlled, in part, by the local groundwater flow system. The outflow area for Pond 5 seepage is generally along its eastern side, which is consistent with hydraulic gradients in the area around this pond. Recent activities appear to have altered groundwater-surface water interaction, particularly in the Pond 2/2A area. Evaluation of the hydrologic and hydrogeologic data suggests the groundwater-surface water interaction for these two surface water bodies was similar in character to other ponds in this portion of the Coronet property. Under this pre-existing condition, seepage into the shallow groundwater would have flowed away from Pond 2 along the western (outflow) side. Overall, Pond 2 currently may be characterized as a terminal surface water body which receives groundwater inflow from the surrounding area and water losses are dominated by evaporation. However, inflows to Pond 2 may exceed net evaporation during rainy periods, thus necessitating the pumping of water to maintain surface water levels. The potential for pond water to recharge the intermediate aquifer is believed to be limited in

un-mined areas by lithologic units within the lower Bone Valley Member, and in mined areas by the presence of the low permeability clayey sediments.

The ditches, constructed immediately adjacent to the pond areas, typically serve as localized discharge points for some of the pond seepage. This hydrologic relationship is evident for the seepage ditch and drainage swale in the areas east of Ponds 4 and 4A, and south at Pond 5. Groundwater discharge to these linear surface features appears to minimize the downgradient spreading of seepage outflow from these ponds. Any seepage outflow from Pond 5 that does not enter Ditch 4 would flow eastward and eventually discharge as base flow to English Creek. It should be noted that Ditch 4 in the vicinity of Pond 5 also may represent an area of potential recharge to groundwater under certain flow conditions. Temporal changes in the groundwater-ditch water interaction appear to be associated with the removal (i.e., pumping) of water back to the pond.

Shallow groundwater flow south and west of Pond 4 appears to discharge to a series of low-lying pond/wetland areas immediately to the west of Ponds 2 and 2A. The hydrologic data also suggest that seepage along the north side of Pond 4A typically discharges to a surface water area immediately north of Coronet's property boundary.

As groundwater continues to flow away from the pond areas and beyond other points of interception, the streams to the east (English Creek) and west (Howell Branch) serve as the primary discharge areas for the shallow groundwater system. Overall, these streams act as line hydraulic sinks for groundwater flow in the surficial and intermediate aquifers.

4.0 Site Evaluation

This section presents the analytical results for samples of soil, pond water and sediments, surface water and sediments, and groundwater collected during the Phase I and Phase II assessments and, based on a comparison with FDEP and EPA screening criteria, identifies COIs.

The Phase I assessment involved characterization of conditions within the Coronet property, with the exception of the Main Plant Area. The assessment activities included a review of historical aerial photographs; a bathymetric survey of select ponds; evaluations of pond water and sediment conditions, surface water and sediment conditions in other areas (i.e., non-pond areas); evaluation of soil conditions along the pond berms and in the area between Ponds 1S and 6; and installation of monitoring wells and evaluation of groundwater conditions.

The Phase II assessment involved characterization of conditions in the Main Plant Area and provided additional information on conditions within and beyond the Coronet property boundaries. The assessment activities included an evaluation of soil conditions within the property, gamma radiation surveys of the Main Plant Area and the area between Ponds 1S and 6, further evaluation of pond sediment conditions, an evaluation of surface water and sediment conditions at locations within and beyond the property boundaries, installation of monitoring wells within and beyond the property boundaries, further evaluation of groundwater conditions, and an evaluation of the physical relationship between groundwater and surface water.[17]

For both assessments, the sample analytical programs typically included target analyte list metals (excluding mercury) and boron, general chemistry parameters, and radiological parameters. In addition, certain soil and sediment samples were analyzed using Synthetic Precipitation Leaching Procedure (SPLP) and TCLP methods.

Section 4.1 presents the EPA and FDEP screening criteria used to evaluate the Phase I and Phase II assessment data for the purpose of identifying COIs. As noted in Section 2, constituents are categorized as COIs based on a single detection above one or more screening levels. Sections 4.2 through 4.6 summarize the assessment activities and findings, identify COIs, evaluate delineation status, and identify the need for investigation during the RI. The concentration distribution is one of the factors used to design the scope of the RI presented in Section 7. Based on the results of the RI activities to be performed, additional investigation may be necessary to complete documentation of the extent of impact, and that such activities may occur beyond the Coronet property boundaries. It is understood that the list of COIs presented herein is preliminary and it may be modified as the RI progresses, and that all of the

[17] The relationship between groundwater and surface water was presented in Section 3.4.3.

data, regardless of whether a constituent is identified as a COI, will be evaluated during the RA for the purpose of determining the need for remediation.

4.1 Screening Criteria

The EPA screening criteria include Region 9 preliminary remediation goals (PRGs) and soil screening levels (SSLs) for soil (EPA 2004d), Region 4 ecological surface water screening values (EPA 2001a), and maximum contaminant levels (MCLs) for groundwater established under the National drinking water regulations (EPA 2006). The FDEP screening criteria include the FDEP global RBCA cleanup target levels (CTLs) for soil, surface water, and groundwater, and sediment quality assessment guidelines (SQAGs) (Chapter 62-777, F.A.C. and Chapter 62-780, F.A.C.). Tables 4-1a through 4-1d present these screening criteria on a media-by-media basis.

- Soil
  - The PRGs for soil include those for the protection of human health in residential settings (PRG_R) and industrial settings (PRG_I). Because the PRGs for arsenic in soil are known to be lower than the naturally occurring levels of arsenic throughout much of Florida and because the FDEP screening criteria take into account bioavailability (the PRGs do not), the arsenic PRGs were not used for screening.
  - The PRGs for radioisotopes are based on a quantitative risk level of 1×10^{-6}. Due to the nature of geologic deposition throughout the Florida, these values are below known background soil conditions. For the purpose of screening, the EPA therefore requested that the soil (and sediment) data be compared to twice background (EPA 2000a). The radioisotope that is anticipated to drive remedial needs is radium 226 (Ra-226); the mean background concentration for Ra-226 in an unmined area geologically similar to the Site is estimated at 1 picocurie per gram (pCi/g), resulting in a screening criterion of 2 pCi/g.[18]
  - The SSLs are for the protection of groundwater quality. Because natural levels of arsenic in soil in Florida may be above the SSL, the arsenic SSL was not used for screening.
  - The soil CTLs (SCTLs) include those for the protection of human health in residential settings ($SCTL_R$) and in commercial/industrial settings ($SCTL_{CI}$), and the protection of groundwater quality ($SCTL_{GW}$) and surface water quality ($SCTL_{SW}$). The FDEP global RBCA SCTLs do not address radiological parameters.

- Surface Water
  - The Region 4 ecological surface water screening values include those for acute and chronic exposure; approximately one-half of the criteria are established default values, the remaining values are hardness dependent and are calculated based on the receiving stream.

  - The FDEP surface water CTLs (SWCTLs) reflect the surface water standards established by Chapter 62-302, F.A.C.; similar to the Region 4 criteria, approximately one-half of the SWCTLs are established default values and the remaining values are hardness dependent and are calculated based on the receiving stream.

[18] This default background value is used for screening purposes only; a Site-specific background value, which may be higher than 1 pCi/g, will be established during the RI (Section 7.1.1.1).

- Sediment
  - The EPA requested that the soil screening value for Ra-226 be used to screen sediments; thus, twice the mean estimated background level (2 pCi/g) will be used, as discussed above.
  - The FDEP SQAGs developed for use as screening tools for chemical parameters (MacDonald et al. 2003) include probable effect concentrations (PECs) and the lower threshold effect concentrations (TECs).[19] The EPA Region 4 sediment screening values (EPA 2001a) were used, where SQAGs have not been developed.
  - At the request of the FDEP, sediment data were also screened against the SCTLs for the protection of groundwater and surface water although these SCTLs are not applicable to sediment (i.e., saturated soil); in instances where the sediment may become exposed, the data were also compared to the human health screening criteria.

- Groundwater - The FDEP GWCTLs reflect the drinking water standards established by Chapter 62-550, F.A.C. These criteria were used for screening because they are the same as or more stringent than the MCLs adopted as the State's drinking water standards, and include parameters for which there is no MCL.

The SSLs provide default values and the SCTLs include default values for certain constituents and methods for developing such values for other constituents; both permit calculation of site-specific values for most constituents. As part of the Phase I and Phase II assessments, Coronet attempted to develop Site-specific $SCTL_{GW}$ and $SCTL_{SW}$ using the total and SPLP results for soil samples. Through statistical or manual analysis, total concentrations in soil were determined that are theoretically protective of groundwater or surface water quality for a particular constituent. Most of the values identified in this manner do not appear to be appropriate, however, because the statistical outputs produced negative trend lines, poor regressions, or negative concentrations.[20] Further, many of the default and Site-specific values do not appear to be appropriate for evaluating Site conditions based on the poor correlation between those constituents detected at concentrations above the SSLs and SCTLs (and therefore predicted to be present in groundwater and surface water at concentrations above the aqueous screening criteria) and those constituents actually detected at concentrations above the aqueous screening criteria. Based on these factors and in light of the provisions for developing site-specific leachability screening criteria, the COIs identified that are based on the SSLs, $SCTL_{GW}$, or $SCTL_{SW}$ are preliminary, and until such time as Site-specific screening criteria are developed, evaluation of the need for additional characterization relative to these screening criteria cannot be performed. The RI activities include provisions for development of Site-specific criteria (Section 7.1.1.2), which can be used to determine the need for additional characterization.

[19] The PECs are levels above which harmful effects may be observed; the TECs are levels below which adverse effects are expected to occur infrequently.
[20] Derivation of the values presented in the data tables is discussed in Appendix A.

4.2 General Soil Conditions

Sections 4.2.1 through 4.2.5 summarize soil conditions in several areas of the property:

- two discrete areas along the perimeter of the Coronet property
- the pond berms
- the outparcels
- the golf course
- the area between Ponds 1S and 6

The Phase I and Phase II assessments did not include an evaluation of conditions in the Research Building Area, west of the Main Plant Area; this area will be investigated during the RI (Section 7.1.5).

Figures 4-1, 4-2, and 4-3 identify the Phase I and Phase II soil sample locations. Concentrations of metals (COIs) detected at concentrations above the residential and commercial/industrial screening criteria and concentrations of Ra-226 above the screening criterion are shown in these drawings. Fluoride is a also COI based on its concentration reported above the residential screening criteria; however, because it was only detected at a concentration above this criterion in one location (SB-44 in the Main Plant Area), fluoride data for the entire Site are not presented in these figures (Figure 4-8 does present the fluoride data for samples collected in the Main Plant Area). The figures do not present (1) COI concentrations at locations where criteria were not exceeded; these data are presented in Tables 4-2a through 4-7c, or (2) COI concentrations in samples collected in the area between Ponds 1S and 6, because this area was significantly modified during the Pond 6 interim action and the data are no longer pertinent (Section 4.2.5). Sample data for the area between Ponds 1S and 6 are presented in Tables 4-6a through 4-6c.

Until such time as Site-specific leachability screening criteria for the protection of groundwater and surface water can be developed for the various areas and soil (and sediment) types, no such figures can be prepared for these screening criteria nor can delineation be evaluated. The RI scope of work includes provisions for the development of these values (Section 7.1.1). If the COIs identified relative to these screening criteria are determined to pose an unacceptable risk that requires implementation of a remedial action, delineation to below these values may be necessary.

4.2.1 Perimeter Soil

During the Phase II assessment, soil samples were collected at 33 locations within two discrete areas along the eastern and southern Coronet property boundaries (Figure 4-1).[21] The objective of the sampling and analytical program was to evaluate conditions adjacent to agricultural property and a public roadway. Minor disturbance (e.g., grading, placement of mine tailings) of the ground surface in these

[21] Appendix B, Figure 8-2 (from the draft Phase II assessment report) provides additional detail on the locations along Cason Road.

areas likely occurred during mining and post-mining eras; the southern area has also been disturbed by municipal activities relative to the county storm water ditch immediately north of Cason Road and routine road maintenance.

The concentrations reported for soil samples collected from these two discrete areas are lower than reported for most other soil samples collected on the Coronet property consistent with the general absence of activities that would impact soil conditions in these areas (e.g., CDP processing, pond water management) .

Based on a comparison of the soil sample results and screening criteria (Tables 4-2a to 4-2c), these COIs were identified:

- human health criteria: As
- groundwater protection criteria: Sb, As, Ba, Cd, Cr, Se, Ag
- surface water protection criteria: Cr, Se, Ag
- radiological screening criteria: Ra-226

Further investigation along the perimeter of the Coronet property, during the RI, is addressed in Sections 7.1.2 and 7.1.3.

4.2.2 Pond Berms

Berms were constructed of mine tailings and native surficial soil; sediment excavated from the ponds and in some areas rubble (such as refractory brick) were also reportedly used in berm construction. The berms were evaluated during the Phase I assessment to determine if further evaluation was warranted. Soil samples (76) were collected from borings (40) advanced through the pond berms to the native ground surface (Figure 4-1). The locations were selected to provide general coverage and modified as appropriate to evaluate areas of potential instability.

Based on a comparison of the soil sample results and screening criteria (Tables 4-3a to 4-3c), these COIs were identified:

- human health criteria: As, Ba, Cd, V
- groundwater protection criteria: Al, Sb, As, Ba, Cd, Cr, Co, Fe, Mn, Ni, Se, Ag
- surface water protection criteria: Al, Cr, Fe, Se, Ag
- radiological screening criteria: Ra-226

Characterization to the residential screening criteria along the Coronet property boundaries will be performed during the RI. This activity will address BR1-5 (west of Pond 1S) the single existing berm sample location in which a constituent was detected above the commercial/industrial criteria (BR6-6, in which a constituent was also detected above the screening criteria is beneath the Pond 6 interim removal

action cover and delineation is provided by locations closer to the property boundaries). Investigation of the berms is addressed in Sections 7.1.3 and 7.1.4.1.

4.2.3 Outparcels A, B, and C

Outparcels A, B, and C were not mined although it is possible that mine tailings may have been placed in these areas as fill. All three areas were cleared before 1938 (at the time of the first aerial photograph). Outparcels A and C were used for company housing to circa 1966; use, if any, of Outparcel B is not known. Coronet elected to collect shallow soil samples from the outparcels in December 2004 for its own general evaluation purposes (Figure 4-2).

Based on a comparison of the soil sample results and screening criteria (Tables 4-4a to 4-4c), these COIs were identified:

- human health criteria: As, Ba, V
- groundwater protection criteria: Sb, As, Ba, Cd, Cr, Ni, Se
- surface water protection criteria: Cr, Se, Ag
- radiological screening criteria: Ra-226

Delineation to the residential human health screening criteria is not complete within Outparcel A for arsenic or vanadium or within Outparcel C for arsenic or barium. Delineation to the residential screening criteria along the Coronet property/outparcel boundaries is to be completed during the RI, as previously discussed. Delineation to the human health screening criteria will also be completed within these outparcels during the RI to provide greater flexibility in determining future use scenarios. Investigation of the outparcels is addressed in Sections 7.1.3 and 7.1.4.2.

4.2.4 Golf Course

The golf course is believed to be constructed of mine tailings and native surficial soil. Except in the area of Ponds 2 and 2A and Boy Scout Pond, this area is not known to have been mined. The earliest aerial photograph for the area is for 1938; mining could possibly have occurred before that time.

Pursuant to the Pond 6 ASA, Coronet used golf course soil for borrow material for the Pond 6 interim removal action. In anticipation of the removal action, soil samples were collected from the golf course in December 2005 to evaluate the area for borrow (Figure 4-1).

Based on a comparison of the soil sample results and screening criteria (Tables 4-5a to 4-5c), these COIs were identified:

- human health criteria: As, Ba, V
- groundwater protection criteria: Al, Sb, As, Ba, Cd, Cr, Co, Fe, Mn, Ni, Se, dieldrin
- surface water protection criteria: Al, Cr, Fe, Se, Ag, dieldrin
- radiological screening criteria: Ra-226

Because a significant portion of the golf course soil was excavated during the Pond 6 interim action (Figure 4-1), the existing data are of limited utility in evaluating current conditions. Therefore as-left conditions, including radiological conditions, will be evaluated during the RI (Section 7.1.3 and 7.1.4.3).

4.2.5 Area Between Ponds 1S and 6

During the Phase I and Phase II assessments, 7 borings, 10 test pits, and 1 monitoring well were completed in the area between Ponds 1S and 6 (Appendix B, Figure 9-5). The Phase I assessment work was performed in response to anecdotal information suggesting potential disposal activities in this area. The results indicated there were no operations-related effects north of the Return Ditch. South of the ditch, the presence of certain constituents at concentrations above screening criteria (only SCTLs were used to evaluate these data during the assessments) and inert materials such as concrete, plastic bags, and rubber hose were identified. The Phase II assessment included provisions for delineating the debris and constituents detected at concentrations above the SCTLs, characterizing piles of soil which were believed to have been sediment that had been dredged from the surrounding conveyance ditches, and performing a radiological survey. The subsequent approval by the FDEP to use shallow soil in this area as fill for construction of the Pond 6 interim removal action negated the need to complete delineation.

During the Phase II assessment, inert materials such as brick, pieces of metal, plastic sheeting and buckets, and wood were observed in three locations (LF4-1, LF4-2, and LF4-3; Appendix B, Figure 9-5). Based on the absence of debris in the other six locations (LF4-4, LF4-3A, LF4-A through LF-4D), it was concluded that the extent of the debris was delineated (Figure 2-2). To evaluate the nature of the soil (i.e., formerly sediment believed to have been dredged from the adjacent conveyance ditches), surface and subsurface soil samples were also collected from 12 locations (CB-series locations; Appendix B, Figure 9-5).[22]

Based on a comparison of the soil sample results and screening criteria (Tables 4-6a to 4-6c), these COIs were identified:

- human health criteria: As, Cd, Cr, Tl, V
- groundwater protection criteria: Sb, As, Ba, Be, B, Cd, Cr, Ni, Se, Ag, Tl, F^-, benzene, methylene chloride

[22] All of the soil data for this area is presented in Tables 4-6a, 4-6b, and 4-6c. With one exception the soil sample locations and chemical analytical data are not presented in any of the Work Plan figures because, with the excavation of soil throughout the area during the interim removal action for Pond 6, the data are no longer pertinent. Results for CB-11 are presented in the Work Plan figures because this location is south of the Main Ditch and within the Main Plant Area.

- surface water protection criteria: As, Be, B, Cr, Se, Ag, Tl, F^-
- radiological screening criteria: Ra-226

A radiological survey was performed in this area during the Phase II assessment to evaluate the potential use of soil in the area as fill. The survey was performed by Environmental Strategies Consulting LLC (now WSP Environmental Strategies LLC) using a portable gross gamma detector. Readings in counts per minute were recorded at approximate 20-foot intervals along various paths through the area (Appendix B, Figure 9-5). Several samples were collected from this area for analysis for Ra-226 to establish a predictable relationship between isotope concentrations and the gross gamma readings. Although the results did not indicate a clear correlation, the findings did suggest a generally parallel relationship (i.e., higher gamma activity levels were generally present in areas with higher Ra-226 concentrations).[23] The gross gamma isoconcentration lines developed using the survey data (Figure 4-4)[24] suggest that the highest counts per minute are present in topographically elevated areas (those associated with the former sediments) and that conditions in this area are similar to the Main Plant Area relative to the range of gross gamma readings.

Coronet proposed that the soil in this area be used as fill as part of the interim action for Pond 6. This action, which was accepted by the FDEP, addressed two issues: (1) the significant volume of soil available in this area that would meet the fill requirements for the interim action, and (2) placement of the soil, which was considered to be impacted based on comparison with the soil screening criteria, would reduce future potential migration of contaminants from the soil to other media. The as-left conditions (following excavation for placement in Pond 6) will be evaluated during the RI (Sections 7.1.3 and 7.1.4.4).

4.3 Main Plant Area Soil Conditions

The Main Plant Area soil investigation completed during the Phase II assessment included characterization of general conditions (Section 4.3.1), conditions near areas of potential concern including those in petroleum storage and miscellaneous areas potentially affected by organic parameters (Section 4.3.2), and a radiological survey (Section 4.3.3).

Since the completion of the Phase II assessment, the Main Plant Area has been dismantled. All aboveground structures, except those indicated in the figures, have been removed to grade or to the foundations (some of which are above grade). The construction rubble (i.e., concrete), residual piles of

[23] Due to absence of a clear quantitative relationship between the gross gamma and Ra-226 data, the counts per minute recorded for gross gamma cannot be translated into concentrations for this (or other) isotopes.

[24] Because the isoconcentrations are based solely on the gamma readings, they do not take into account any of the Ra-226 data.

rock and material that had been stored for reprocessing, and rock used to maintain the rail bed were placed in Pond 6 as part of the interim action.

Following dismantling, soil was removed from seven areas within the Main Plant Area and the soil placed in Pond 6 during the interim action (Figure 4-3):

- two areas in which boron was present at concentrations above the leachability screening criterion for groundwater were excavated (Area A1 in the northern rock storage area and Area A2 in the KBF_4 Production Area) [25]
- five areas that were topographically elevated were brought to grade (Areas B1 through B5, including the elevated rail)

Because Areas A2 and B2 were excavated to near the dry season water table, soil obtained from golf course borrow areas were placed in these two areas to limit the presence of groundwater seepage and pooling of storm water during the rainy season.

4.3.1 General Conditions

During the Phase II assessment, soil samples were collected from 50 locations for analysis of metals, fluoride, or pH or a combination thereof; samples from 30 of these locations were also analyzed for Ra-226.[26] The sample results are presented in Tables 4-7a to 4-7c and organized based on geographic location and historical activities.

4.3.1.1 Constituent Distribution Summary

The following observations were based on a qualitative evaluation of the metals and fluoride data for the purpose of determining if the data are indicative of specific activities/operations in the Main Plant Area. Therefore, the discussion is focused on constituents known to be related with these activities and those of potential interest based on their identification as COIs (i.e., arsenic, boron, sodium, fluoride, and Ra-226).

Arsenic concentrations in soil within the Main Plant Area were typically between 1 milligram per kilogram (mg/kg) and 10 mg/kg (Figure 4-5). Concentrations between 10 mg/kg and 20 mg/kg were detected in samples from the Northern Rock Storage Area, KBF_4 Production Area, east end of the Nos. 6 and 7 kilns (near the Nos. 3, 4, and 5 kilns discharge line), near the Paragon kiln, and along the rail lines. This concentration distribution likely reflects the storage of phosphate rock and material reclaimed for reprocessing in these areas and the use of the rock or off-spec material for maintaining the rail beds. The

[25] The Site-specific boron screening criteria for the protection of groundwater and surface water for the Main Plant Area are believed to be appropriate for evaluating Site conditions because the statistical analysis indicated an appropriate slope and, regression factor (Appendix A) and some correlation between boron concentrations in soil above the screening criterion and in groundwater above the groundwater criterion.

[26] As noted in the draft Phase II assessment report, three samples from the Bone Yard were also analyzed for PCBs; none were detected.

highest arsenic concentrations (28.3 mg/kg to 44.9 mg/kg) were detected in samples collected near former process water discharge lines: SB-9 near the inground flume in the KBF_4 Production Area and SB-10 near the Nos. 3, 4, and 5 kilns discharge line.

Related to the distribution of arsenic:

- cadmium and chromium were also reported at higher concentrations in samples collected from SB-9 and SB-10 than in other samples; the presence of these constituents and arsenic at these locations is consistent with the makeup of the process water that was conveyed through these two systems as determined by the EPA during its inspection[27]

- cadmium, chromium, thallium, and vanadium were typically present at higher concentrations at locations with higher arsenic concentrations throughout the plant; this "collocation" is consistent with the presence of these metals in the phosphate rock and associated materials

Boron concentrations in soil within much of the plant were less than 100 mg/kg. Concentrations of 100 mg/kg to over 1,000 mg/kg were detected in samples collected from the KBF_4 Production Area, northern rock storage area, and Mineral Acid Tanks Storage Area. This distribution (Figure 4-6) is consistent with the offloading, storage, and use of borax in the KBF_4 Production Area. The presence of boron in the other two areas may be related to localized transport of boron particulates. With the exception of the Paragon Kiln Area, no boron concentrations above 30 mg/kg were reported in any samples collected south of the operations areas consistent with the presence of structures which would have limited localized transport of particulates. A similar (but not as clear/obvious) pattern of distribution was noted for potassium, consistent with the use of potassium chloride in the production of KBF_4.

Sodium concentrations in soil within the Main Plant Area ranged from less than 100 mg/kg to 32,800 mg/kg; most were 10,000 mg/kg or less (Figure 4-7). Concentrations above 10,000 mg/kg were reported typically in samples collected from the northern and Foskor rock storage areas, KBF_4 Production Area, the Nos. 6 and 7 and Paragon kilns areas, Mineral Acid Tanks Storage Area, and near CDP storage and load out. Sodium-containing materials, caustic and soda ash, were stored in the acid tanks area and in the Feed Prep Area. The storage and use of these materials in these areas is consistent with the higher concentrations observed near the acid tanks and the Foskor Rock/Paragon Kiln Area (east of Feed Prep). The presence of sodium in the green feed and final product accounts for the higher concentrations observed in the kilns areas (including the telleret storage area) and the load out area. The presence of sodium above 10,000 mg/kg in several samples collected from the KBF_4 and Northern Rock Storage areas reflect the offloading, storage, and use in this area of borax (sodium tetraborate pentahydrate).

Fluoride concentrations in soil within the Main Plant Area ranged from not detect to 930 mg/kg (Figure 4-8). Concentrations greater than 50 mg/kg were confined to the Mineral Acid Tanks Storage

[27] Refer to Section 2.1 regarding the presence of arsenic, cadmium, and chromium in samples collected during the inspection.

Area and the Nos. 3, 4, 5, 6, and 7 kilns area. The highest concentrations in the tank area were in samples collected from within the tank dike; the highest concentration in the kiln area was collected at SB-10 near the Nos. 3, 4, and 5 kilns discharge line. The distribution may reflect the storage of acid in the tank area, and the release of fluorine gas during CDP production and the presence of fluoride in the process water discharge from the kilns.

Ra-226 concentrations in soil ranged from less than 1 pCi/g to over 60 pCi/g (Figure 4-4). Because fewer samples were collected for radiological testing than testing for metals and fluoride, and because (unlike the samples collected for analysis of metals and fluoride) many of the samples were collected at depth (i.e., deeper than 2 feet) patterns in the distribution are not as discernable. In general, however, lower concentrations of Ra-226 were reported in samples collected at depth than in samples collected at the surface.

4.3.1.2 Screening Results

Based on a comparison of the soil sample results and screening criteria, these COIs were identified:

- human health criteria: As, Ba, Cd, Cr, Fe, Tl, V, F^-
- groundwater protection criteria: Al, Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Fe, Mn, Ni, Se, Ag, Tl, Zn, F^-
- surface water protection criteria: Al, As, Be, B, Cr, Fe, Se, Ag, Tl, F^-
- radiological screening criteria: Ra-226

The data indicate that arsenic, thallium, vanadium, and Ra-226 concentrations above the screening criteria are not delineated within the plant, and that delineation within the plant is complete for arsenic relative to the $SCTL_{CI}$ and for barium, cadmium, chromium, iron, and fluoride relative to the residential criteria. Delineation to the residential human health screening criteria along the Main Plant Area property boundary will be performed during the RI due to some residential use adjacent to the plant. The RI includes supplemental investigation of conditions within the Main Plant Area, including areas that were not previously evaluated (Section 7.1.5).

4.3.2 Petroleum Storage and Miscellaneous Areas

The Phase II assessment included an assessment of soil conditions and groundwater quality potentially affected by petroleum storage[28] and soil conditions in miscellaneous areas potentially affected by organic compounds.

Conditions were evaluated near five registered aboveground petroleum or petroleum product storage tanks (Nos. 29, 32, 33, 34, and 37[29]), the former Bunker C oil storage tanks, and the "Kiln Trunnions" area near the Nos. 6 and 7 kilns where LNAPL was observed. The investigation areas are shown in Figure 4-9; larger-scale maps illustrating the sample locations are presented in Appendix B, Figures 9-8 through 9-11.[30] Impact from petroleum was suspected in each of the areas based on visual observations (e.g., blackened soil, staining, and oil sheen) or petroleum odors (Appendix B, Table 9-5) noted during the field investigation. Based on the nature of the materials, soil samples collected from the petroleum storage areas were submitted for laboratory analysis of the following consistent with FDEP standards (Chapter 62-770, F.A.C.): benzene, toluene, ethylbenzene and xylene, methyl-tert-butyl ether, and ethylene di-bromide (1,2-dibromoethane); polynuclear aromatic hydrocarbons (PAHs); and total recoverable petroleum hydrocarbons (TRPH).[31] Impact from petroleum was also suspected at SB-23, SB-9, and SB-50 and in sediment within the Nos. 6 and 7 Kilns Ditch and SEPSWD based on visual observations. Samples from SB-23 were analyzed for the target compound list (TCL) volatile organic compounds (VOCs), PAHs, and TRPH; samples collected in the other areas were analyzed for TRPH or PAHs.

Based on a comparison of the soil sample results and screening criteria, these organic COIs were identified in one or more areas (the sediment sample results are addressed in Section 4.5.2):

- human health criteria: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a.h)anthracene, and indeno(1,2,3-cd)pyrene, carcinogenic PAHs (CPAHs),[32] TRPH

[28] Pursuant to an agreement with the FDEP (FDEP 2004e), further activities required in these areas under Rule 62-770, F.A.C. were deferred based on incorporation of such work into the assessment activities.

[29] Evaluation of conditions proximate to a 1,000-gallon capacity gasoline underground storage tank (Tank No. 41) south of the warehouse and east of the Mobile Equipment Shop, was to be performed during the Phase II assessment. Coronet elected to evaluate conditions in this area as part of the plant demolition activities. However, at the time of demolition and tank removal (2007), the Hillsborough County Environmental Protection Commission indicated that confirmatory sampling was not necessary because it was being addressed as part of the assessment activities. As a result, conditions in this area have not been evaluated.

[30] The drawings identify constituents and concentrations present in soil at concentrations above the SCTLs only, as the draft Phase II assessment report did not screen these data against any EPA criteria.

[31] One sample, collected from a test pit completed in the Bunker C East/Kiln Trunnion Area was analyzed only for TRPH and fingerprint analysis.

[32] The SCTLs include criteria for a subgroup of PAHs, i.e., those which are carcinogenic; refer to the data tables regarding the calculation of the total CPAH criteria.

- groundwater protection criteria: benzene, 1,2-dibromoethane, ethylbenzene, methylene chloride, xylenes, acenaphthene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorine, 2-methylnaphthalene, naphthalene, phenanthrene, TRPH

- surface water protection criteria: acenaphthene, anthracene, fluoranthene, fluorene, 2-methylnaphthalene, naphthalene, pyrene, TRPH

The miscellaneous areas evaluated included the Mobile Equipment Shop, the Paint Booth Area, and the rail lines. Soil samples collected from the equipment shop and rail lines were analyzed for PAHs, TRPH or both, because these parameters would be indicative of impacts from operations in these areas. The samples collected from the Paint Booth Area were analyzed for TCL VOCs due to the use of paints and probable other VOC-containing products in this area.

Based on a comparison of the soil sample results and the screening criteria, these COIs were identified in one or more areas:

- human health criteria: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene, CPAHs

- groundwater protection criteria: benzene

The data indicate that the majority of the organic constituents are not delineated. Delineation to the human health screening criteria will be completed within the interior of the Main Plant Area during the RI so that it will not be necessary to include analysis for organic parameters in the perimeter soil samples. Section 7.1.5 presents the scope of work to complete delineation and to evaluate the presence of LNAPL.

4.3.3 Radiological Screening Results

During the Phase II assessment, a portable gross gamma detector was also used to survey areas within the plant. The objective of the survey was to provide a general understanding of radiological conditions in conjunction with soil sample data for Ra-226.

The survey was performed by Environmental Strategies. Within the Main Plant Area, the readings (in counts per minute) were recorded at the ground surface proximate to and at varying radii from the soil and well borings (readings also collected at various sample depths were presented in the lithologic logs appended to the draft Phase II assessment report). Within the Bone Yard, a more intensive program was performed to evaluate conditions based on the rejection of scrap metal removed from this area in the summer of 2005 by a recycling facility. The survey in this area was performed at approximate 20-foot intervals along 24 north-south trending transects.

Analysis for Ra-226 also was performed for some samples collected from each of these areas to establish a predictable relationship between isotope concentrations and the gross gamma readings. Although a clear quantitative correlation was not established, the data suggested a generally parallel relationship.[33]

The gross gamma isoconcentration lines developed using the survey data indicated that the highest counts per minute within the Main Plant Area were proximate to the rail lines, rock storage areas, and roads or ramps (Figure 4-4).[34] Similarly, the highest counts per minute in the Bone Yard were consistent with the locations of temporary roads/ramps constructed across the lines used to transfer water as part of the water treatment system. The distribution of readings within the Main Plant Area and Bone Yard was consistent with the reported historical use of phosphate rock for maintenance of the rail beds and roadways within the plant.

As noted in Section 4.2, seven areas within the Main Plant Area were excavated or brought to grade following completion of the Phase II assessment and dismantling activities. The radiological survey and Ra-226 sampling results indicated generally higher counts per minute and concentrations than observed in most other areas of the plant in areas that were subsequently excavated or brought to grade (Areas B1, B2, B3, and A1; Section 4.3). Due to these modifications and the absence of survey information or Ra-226 data in other areas of the plant, additional radiological surveying and sampling and analysis will be performed during the RI (Section 7.1.3).

4.4 Pond Water and Sediment Conditions

A review of historical aerial photographs was performed to determine the extent of mining operations in the area and to understand the development of the existing process and holding pond system. The estimated limits of mined areas are illustrated in the figures presented in the Work Plan. Sediment probing and bathymetric surveys were performed during the Phase I assessment to gain an understanding of pond development and construction.

The aerial photographs also were used to evaluate the development of the conveyance ditch system between Ponds 1S and 6. Several small ponds and ditches associated with Pond 1S were present in the operations area as early as 1938, including a small pond east of Pond 1S shown in the figures. Various changes occurred in the system between 1937 and 1972, by which time the current system was in place with the exception of a return ditch from Pond 6 which was first observed in the 1979 photograph.

[33] Due to absence of such a quantitative relationship, the counts per minute recorded for gross gamma cannot be translated into concentrations for Ra-226 or other isotopes.

[34] Because the isoconcentrations are based solely on the gamma readings, they do not take into account any of the Ra-226 data.

Early mining operations likely used water to remove the overburden above the Bone Valley Member and to slurry the phosphate ore to separate the sand and clay matrix from the phosphate pebbles. The resulting clay was placed in settling areas (Stricker 2000). The sediment encountered in the former mine pits which are part of the pond system are representative of this practice and subsequent settling and consolidation. The overburden and sand (sand tailings) are believed to have been placed in nearby pits or on the ground surface. A mixture of native soil and sand tailings appears to have been used to construct the berms and to grade the golf course.

Ponds on the Coronet property (and in nearby areas) typically include remnant mine pits around which berms were placed on the (native) ground surface to increase the pond capacities; in some areas (e.g., Pond 4) the berms encompass several mined areas and intervening areas of the native surface (sometimes referred to as "shelf" areas).

4.4.1 Pond Water

The Phase I and Phase II assessments provided pond water quality data to document conditions and provide a database to evaluate short- and long-term improvements in water quality. Samples were collected from multiple locations in each of the ponds (Figure 4-10). Based on the comparison of pond water sample results for October 2005 (the last time the ponds were all sampled during a single event for analysis of metals and general chemistry parameters) and the surface water screening criteria, pond water COIs included aluminum, arsenic, boron, cadmium, chromium, iron, selenium, zinc, fluoride, pH, and conductivity (Table 4-8a). A comparison of the pond water results for radiological parameters for August and September 2004 (the last time the ponds were sampled during a single event for radiological analyses), indicated the gross alpha at concentrations above the surface water screening criteria in a sample from Pond 6 and gross alpha and radium in a sample from Pond 2 (Table 4-8b).

As a result of the cessation of processing operations and the efforts to rehabilitate pond water quality as discussed in Section 2.3.4, pond water pH has been restored to the neutral range at Ponds 1S, 4, 5, 6, 7 and 8. The neutral pH of the water in these ponds has reduced the solubility of constituents to concentrations below the surface water screening criteria except for aluminum, arsenic, boron, zinc, and fluoride (as noted in Appendix J of the draft Phase II assessment report). These reductions in constituent concentrations were achieved without benefit of sediment remediation to reduce leaching to surface water. The RI/FS will evaluate the effectiveness and permanence of pH neutralization with and without sediment remediation as a remedial technology for pond water.

Average measurements of conductivity in the pond system did not decrease significantly between the Phase I and Phase II assessments. In 2005, Coronet added reverse osmosis to the liming and gravity settling water treatment process to reduce the conductivity of the pond discharge in accordance with the

ACO. Concentrated, high conductivity reject from the operation of the reverse osmosis system is returned to the pond system at Pond 4. This interim measure limits the restoration of pond water conductivity at Pond 4.[35] The RI will include the collection and analysis of samples from the ponds to evaluate surface water quality trends and the relationship of surface water quality to pond sediment quality (Section 7.2).

4.4.2 Pond Sediments

The pond sediment sample locations are shown in Figure 4-11. The Phase I assessment sample results were reevaluated during the Phase II assessment based on changes in the screening criteria for some parameters which reflect the use of new data to recalculate the $SCTL_{SW}$ and $SCTL_{GW}$. Tables 4-9 through 4-18 present the assessment data and comparisons with the screening criteria.

4.4.2.1 Phase I Assessment

The Phase I assessment sediment activities were designed to characterize the quality of sediments in the process and holding ponds. At most locations, samples were collected from the upper 0.5-foot zone of sediment (the most active biotic zone for potential ecological receptors); additional samples were collected from subsequent depth intervals where a change in material type was observed, down to native or undisturbed soil on the shelf areas or below the base of the mine pits.

The Phase I assessment sampling program provided data on the lateral and vertical distribution of the COIs. Similarities in the distribution of some constituents (e.g., barium, cadmium, and chromium) at all sampling depths were evident throughout the pond system, possibly representing ubiquitous conditions related to former phosphate mining operations. Dissimilar distribution of constituents with depth was observed between the process ponds (Ponds 1S, 4A, and 6) and the holding ponds (Ponds 1N, 2, 2A, 3, 4, 5, 7, and 8), possibly representing conditions related to process water management. Concentrations of arsenic, antimony, nickel, silver, and zinc were detected above the PECs (used to screen the Phase I assessment data) in samples collected throughout the sediment column at the process ponds, but only in surface samples collected at the holding ponds. Similarities in lateral distribution of contaminants were evident throughout the pond system, possibly representing the homogenous nature of sediments related to former phosphate mining operations.

The Phase I assessment sampling program also provided data on the leachability of the pond sediments. Coronet performed SPLP testing on the sediments to calculate site-specific $SCTL_{GW}$ and $SCTL_{SW}$ at the request of the FDEP, although the SPLP test is only potentially relevant to unsaturated

[35] The FS will evaluate remedial alternatives for water treatment; the evaluation will include an assessment of disposal options for alternatives that generate waste streams, such as reverse osmosis.

soil. Similarities in the leachability of constituents in similar materials (i.e., clay, sand, or peat) were evident, possibly representing differing sorptive capacity of the materials. However, Coronet concluded that SPLP testing and results were not appropriate to evaluate sediment conditions because the results reflected both the characteristics of the pore (pond) water and the potential for metals to leach from the sediment. The FDEP concurred with this conclusion and the subsequent development of a modified SPLP method to address this issue during the Phase II assessment.

Cadmium was detected at concentrations above the TCLP limit in 2 of the 30 pond sediment samples submitted for testing. Both samples were collected at depth from one location in Pond 1S, near the point of discharge from the Return Ditch. To determine if the presence of cadmium at concentrations above the TCLP limit was representative of sediment in Pond 1S or represented an anomaly, 15 additional sediment samples were collected from the pond in 2005 for analysis of total and TCLP cadmium. The sample data demonstrated that the 95 percent upper confidence level (UCL) of the mean for TCLP cadmium was below 1 milligram per liter (mg/l), indicating that the sediments are not hazardous (Coronet 2005b) and that the presence of cadmium above the TCLP in the one previously sampled location was an anomaly.

An evaluation of the Ra-226 results for the ponds indicates that the average concentrations for the process ponds and holding ponds were 17.0 pCi/g and 34.5 pCi/g, indicating that process pond sediments are a lesser source of Ra-226 than the mining clay sediments present in the holding ponds.

4.4.2.2 Phase II Assessment

The Phase II assessment activities included the collection of sediment samples to (1) reevaluate potential leaching using a modified SPLP method (2) evaluate whether the metals concentrations in the clay sediments were consistent with natural conditions or were enriched by historical activities and (3) supplement general characterization.

As discussed in Appendix B of the Phase II Site Assessment Work Plan (Coronet 2005c), the SPLP method yielded data that combined sediment leachability and transient pore water quality, and was biased high as a result. Based on this, Coronet did not consider the $SCTL_{GW}$ and $SCTL_{SW}$ developed based on the SPLP data to be an appropriate means of predicting leaching from sediments. During development of the Phase II assessment work plan, Coronet evaluated the Phase I data for pond water, groundwater, seepage ditch water, and SPLP tests for the Pond 6 area and concluded that the primary source of constituent loading to groundwater was pond water seepage and recharge and that leaching from sediments, suggested by the initial SPLP data and calculations, was a minor potential source of impact. To confirm this conclusion (and with FDEP concurrence), a modified SPLP test was developed such that the results reflect only sediment leachability (and not pore water quality) (Phase II Site Assessment Work Plan, Appendix B; Coronet 2005c).

An evaluation of metals concentrations in sediment samples collected from the holding ponds was performed during the Phase II assessment using the FDEP's "Interpretive Tool for Assessment of Metal Enrichment in Florida Freshwater Sediment," a database that defines the relatively constant relationship that exists between aluminum and other naturally occurring metals. Evaluation of the Phase I assessment data indicated that many of the metal concentrations in clay samples were within or just above the natural range for Florida freshwater sediment. Samples of the clay-rich holding pond sediment quality collected during the Phase II were analyzed using the FDEP's recommended total digestion analytical procedure such that the data could be used for comparison with the database for natural (i.e., unenriched) Florida freshwater sediment.[36] The results, presented in Appendix C indicate that only cadmium is present in the (clay-rich) holding pond sediments at concentrations beyond the natural range. Consequently, only cadmium was identified as a SQAG for clay-rich sediment samples collected from these ponds and other surface water bodies not associated with the process water recirculation system.

The identification of COIs for the pond sediments presented below is organized based on pond use. Ponds 1S, 4A, and 6 are considered to be process ponds based on their historical use (Ponds 1S and 6) or current use (Pond 4A). The $SCTL_{GW}$ and $SCTL_{SW}$ used to evaluate the sediments in these ponds are based on the results of modified SPLP results generated during the Phase II assessment. Due to the enrichment of sediments in these ponds by historical process operations, the metals enrichment evaluation was not conducted for sediments from Ponds 1S, 4A, or 6. Based on a comparison of the sediment sample results with these screening criteria, the COIs for these ponds include:

Pond	SQAGs/TECs	Groundwater Protection	Surface Water Protection
Pond 1S	Sb, As, Ba, Cd, Cr, Pb, Ni, Ag, Zn	Al, Sb, As, B, Cd, Cr, Co, Cu, Fe, Pb, Mn, Se, Ag, Tl, Zn, F^-	Al, As, Be, B, Cr, Fe, Se, Ag, Tl, F^-
Pond 4A	As, Ba, Cd, Cr, Ni, Ag, Zn	Al, Sb, As, B, Cd, Cr, Fe, Mn, F^-	Al, As, Be, B, Cr, Fe, Se, Ag, F^-
Pond 6	- (a)	Al, Sb, As, B, Cd, Cr, Co, Cu, Fe, Pb, Mn, Se, Ag, Tl, Zn, F^-	- (a)

a/ The data for samples collected from the Pond 6 were not compared to the SQAGs or $SCTL_{SW}$ because these pathways are not relevant now that the pond has been closed.

Ra-226 is a COI based on concentrations above 2 pCi/g in samples collected from each of these ponds; arsenic is a COI for Ponds 1S and 4A due to concentrations above the $SCTL_{CI}$ which could be potentially relevant where sediments could be exposed.

[36] The results of the evaluation presented in the draft Phase II assessment report have been modified to eliminate an adjustment factor for the Phase I assessment data which were not obtained using the total digestion method.

Ponds 1N, 2/2A, 3, 5, 7, and 8 are considered to be holding ponds based on their historical and current use. The $SCTL_{GW}$ and $SCTL_{SW}$ used to evaluate the sediments in these ponds are based on the results of standard SPLP results generated during the Phase I and limited testing via standard SPLP during the Phase II assessment (modified SPLP was not run on holding pond sediments during the Phase II). The metals enrichment evaluation of clay sediments in the holding ponds suggests a more limited list of COIs (i.e., cadmium) than presented below; however, metals concentrations in sand and peat above the SQAGs added constituents to this list. Based on a comparison of the sediment sample results with these screening criteria, the COIs for these ponds include:

Pond	SQAGs/TECs	Groundwater Protection	Surface Water Protection
Pond 1N	Sb, As, Ba, Cd, Cr, Pb, Ni	Al, Sb, Cd, Cr, Se, F^-	Al, Be, Cr, Se, Ag,
Ponds 2/2A	Sb, As, Ba, Cd, Cr, Ni, Pb, Zn	Al, Sb, As, B, Cd, Cr, Fe, Se, Tl, Zn, F^-	Al, As, Be, B, Cr, Fe, Se, Ag, Tl, F^-
Pond 3	Sb, As, Ba, Cd, Cr, Pb, Ni	Al, Sb, As, B, Cd, Cr, Co, Cu, Pb, Se, Tl, Zn, F^-	Al, As, Be, B, Cr, Se, Ag, F^-
Pond 4	Sb, As, Ba, Cd, Cr, Ni, Zn	Al, Sb, As, B, Cd, Cr, Co, Cu, Fe, Pb, Mn, Se, Tl, Zn, F^-	Al, As, Be, B, Cr, Fe, Se, Ag, Tl, F^-
Pond 5	Sb, As, Ba, Cd, Cr, Ni, Ag	Al, Sb, As, Cd, Cr, Cu, Fe, Pb, Se, Zn, F^-	Al, As, Be, B, Cr, Fe, Se, Ag, F^-
Pond 7	As, Ba, Cd, Cr	Al, Cd, Cr, Fe, F^-	Al, Be, Cr, Se, Ag
Pond 8	Ba	Al, Sb, As, Cr, Fe, Pb, Mn, F^-	Al, As, Be, Cr, Fe, Se, Ag, F^-

Ra-226 is a COI for all of these ponds based on concentrations above 2 pCi/g in samples from each. Arsenic is a COI for all of the ponds and cadmium is a COI for Ponds 1N and 2/2A based on concentrations above the $SCTL_{CI}$ in one or more sample.

Although the existing data are sufficient to support the RA, the RI scope of work (Section 7.2) includes provisions for additional pond sediment characterization (excluding Pond 6) to aid in evaluating remedial alternatives. Further delineation of COIs in pond sediments will not be necessary because the existing data are believed to be representative of conditions throughout the ponds and because the extent of contaminants is physically confined to the limits of the ponds. Further characterization of specific materials (i.e., sand and peat), however, might be warranted before selecting or designing a final remedy.

4.5 Surface Water and Sediment Conditions

The Phase I and Phase II assessments included the collection of surface water and sediment samples from various water bodies within and beyond the Coronet property boundaries (excluding the process and holding ponds). Figure 4-12 illustrates locations beyond the Main Plant Area; Figure 4-13 illustrates those within the plant. Section 4.5.1 summarizes the surface water data; emphasis is given to the Phase II assessment data because the dataset is more recent and robust. Section 4.5.2 summarizes the sediment data; both sets of data have been evaluated in a similar manner because, unlike aqueous conditions, sediment conditions are less likely to have changed between the Phase I and Phase II assessments.

4.5.1 Surface Water

4.5.1.1 Phase I Assessment

Phase I assessment surface water samples were collected from several of the conveyance ditches and the seepage ditches to establish baseline conditions shortly after cessation of plant operations.[37] Samples were also collected to evaluate general conditions in eight miscellaneous locations within the Coronet property and along the property boundary which may have been impacted by seepage from nearby ponds. Table 4-19 identifies and describes the miscellaneous locations.

The Phase I assessment surface water sample data are presented in Tables 4-20a and 4-20c. Based on a comparison of these sample results and the screening criteria, the following COIs were identified:

- conveyance and seepage ditches: aluminum, arsenic, beryllium, boron, cadmium, chromium, iron, selenium, thallium, zinc, chloride, fluoride, ammonia, alkalinity, pH, and gross alpha
- miscellaneous locations: aluminum, arsenic, beryllium, boron, cadmium, iron, chloride, fluoride, ammonia, alkalinity, pH, and conductivity

Consistent with its historical use of receiving and transferring process water from the Main Plant Area to Pond 6, the highest concentrations of most of the metals were reported in the samples from the Main Ditch (specifically CS-10).

4.5.1.2 Phase II Assessment

Phase II assessment surface water samples were collected from the Carpenter Shop Pump and Nos. 6 and 7 Kilns ditches and the SEPSWD, and 30 miscellaneous locations within and beyond the Coronet property boundaries (Table 4-19). The objective was to complete evaluation of conditions in the process ditches, evaluate conditions in the SEPSWD (which intercepts shallow impacted groundwater in

[37] Samples collected of the waste streams discharged to or managed in these ditches collected by the EPA during its inspection indicate the presence of certain metals at concentrations above the TCLP limits and pH values of less than 3 s.u. (refer to Section 2.1 for specifics).

the Main Plant Area downgradient of the kilns), and more thoroughly evaluate conditions near and beyond the Coronet property boundaries.

The Phase II assessment surface water sample data for chemical and radiological parameters are presented in Tables 4-21a and 4-21c. Based on a comparison of these sample results and the screening criteria, the following COIs have been identified:

- conveyance ditches and SEPSWD: aluminum, arsenic, boron, cadmium, chromium, iron, lead, selenium, silver, thallium, zinc, fluoride, pH, and gross alpha[38]

- miscellaneous areas: aluminum, antimony, arsenic, boron, cadmium, chromium, copper, iron, lead, silver, fluoride, pH, conductivity, gross alpha, and radium

Consistent with its historical use for transferring process water from Pond 1S to the Main Plant Area, higher concentrations of most constituents were reported in samples from the Carpenter Shop Pump Area than in the kilns ditch and SEPSWD. Within the SEPSWD, the highest chemical concentrations were reported in samples from MSW-3 and MSW-4 nearest the Nos. 6 and 7 kilns; the lowest were in those locations farthest from the production areas (MSW-5, MSW-6, and MSW-7).

4.5.1.3 Summary

The Phase I and Phase II assessment surface water COIs for the conveyance and seepage ditches and SEPSWD are very similar. The absence of ammonia and alkalinity as COIs for the Phase II reflects the fact that these analyses were not performed during this assessment.[39] These ditches are considered to be confined: they do not "flow" beyond the Coronet property boundaries; where there is water leaving these ditches it either flows or is pumped to another of these same ditches or a process or holding pond, or recharges groundwater. Consequently, delineation of the various COIs is considered complete and no sampling and analysis during the RI is necessary.

The Phase II assessment COIs for miscellaneous surface water samples (i.e., samples other than from the conveyance and seepage ditches and SEPSWD) is more extensive than that for the Phase I assessment; the absence of alkalinity reflects the fact that analysis was not performed during the Phase II. One possible reason for the larger number of COIs identified during the Phase II assessment is that many of these samples were collected during low-flow conditions when concentrations would be expected to be somewhat higher than during high-flow conditions when the Phase I assessment samples were collected.

Water in the miscellaneous locations ultimately discharges to English Creek or Howell Branch. The concentrations of COIs detected in the samples collected during the Phase II assessment are

[38] Analysis for ammonia and alkalinity were not performed for samples collected during the Phase II assessment.

[39] The presence of beryllium in aqueous samples is being evaluated; therefore, its identification as a COI is tentative. Refer to the draft Phase II assessment report for further discussion, specifically Appendix A.

presented in Figure 4-14.[40] The data indicate that several of the COIs have not been delineated to concentrations below the SWCTLs.

The RI scope of work includes the collection and analysis of additional surface water samples to complete delineation (Section 7.3). The locations for these samples are shown in Figure 4-14. To evaluate base-flow conditions (i.e., during the dry season), surface water samples were collected from the majority of these locations in June 2007.[41] The data will be used to identify locations from which samples will be collected during the RI and the results for both sampling events will be incorporated into the RI report.

4.5.2 Sediment

4.5.2.1 Conveyance and Seepage Ditches and SEPSWD

During the Phase I and Phase II assessments, sediment samples were collected from each of the conveyance and seepage ditches and the SEPSWD. The purpose of both assessments was to provide general characterization data for the sediments such that the potential need for remedial action might be ascertained.[42]

Chemical and radiological results for samples collected during both assessments are presented in Tables 4-22a to 4-22c. Based on a comparison of these sample results and the screening criteria, the following COIs have been identified. Due to possible enrichment of sediments (increase in metals concentrations) resulting from historical process operations, the findings of the metals enrichment analysis were not used to potentially reduce the COIs identified relative to SQAGs in clay-rich sediment encountered in these areas.

Ditch System	SQAGs/TECs	Groundwater Protection	Surface Water Protection
Conveyance	Sb, As, Ba, Cd, Cr, Cu, Pb, Ni, Ag, Zn	Al, Sb, As, B, Cd, Cr, Cu, Co, Fe, Pb, Mn, Se, Tl, Zn, F^-, TRPH	Al, As, Be, B, Cr, Fe, Se, Ag, Tl, F^-, TRPH
Seepage			
Pond 4	Ba, Cd	As, Co, Fe, Mn	Cr, Fe, Se, Ag
Pond 4A	As, Ba	Al	Al, Cr, Ag

[40] Data for the conveyance, seepage, and SEPSWD COIs which are not also miscellaneous surface water COIs are not shown because these constituents were not detected above any screening criteria in the miscellaneous locations and, therefore, are delineated.

[41] The figure identifies those locations where surface water samples could not be collected due to the absence of water.

[42] Samples from the SEPSWD (D1), Pond 6 seepage ditch (D2), and Elevated Ditch (D3) were collected by the EPA during its inspection. The samples were analyzed for TCLP metals; none of the metals were reported at concentrations above the TCLP limits (EPA 2004a).

Ditch System	SQAGs/TECs	Groundwater Protection	Surface Water Protection
Pond 6	- (a)	Al, Sb, As, B, Cd, Cr, Co, Cu, Fe, Mn, Ni, Se, Zn, F^-	- (a)
SW-2 Area	Sb, As, Cd, Cr, Pb, Ag, Zn	Sb, As, B, Cd, Cr, Fe, Pb, Mn, Se, Tl, Zn, F^-	As, B, Cd, Cr, Se, Ag
SEPSWD	As, Ba, Cd, Cr, Cu, Pb, Ag, Zn	Al, Sb, As, B, Cd, Cr, Co, Cu, Fe, Pb, Mn, Zn, TRPH	Al, As, Be, B, Cr, Fe, Se, Ag, TRPH

a/ The data for samples collected from the Pond 6 seepage ditches were not compared to the SQAGs or $SCTL_{SW}$ because these pathways are no longer relevant with the removal of these ditches during the interim removal action.

Ra-226 is also a COI based on concentrations above 2 pCi/g in all but one sediment sample collected from these ditches (Table 4-22c).

Table 4-22b presents the sediment sample results and identifies metals at concentrations above the commercial/industrial screening criteria, which would be potentially relevant in areas where the sediment could be exposed in the future. Because these ditches are within the interior of the Coronet property, the sample results were not compared to the residential screening criteria. Arsenic was detected at concentrations above the commercial/industrial screening criteria in one or more sample collected from the conveyance ditches and the SEPSWD. The data for samples collected from the Pond 6 seepage ditches were not compared to the human health screening criteria because this pathway is no longer potentially relevant with the removal of these ditches as part of the Pond 6 interim removal action.

The number of constituents detected at concentrations above one or more of the screening criteria in samples collected from the conveyance ditches, the Pond 6 seepage ditches, and the SEPSWD is consistent with historical use: holding and transferring process water, intercepting groundwater impacted by seepage from Pond 6, and intercepting groundwater impacted by operations in the Main Plant Area. The fewer number of constituents detected above criteria in the Pond 4 and 4A ditches reflect the use of these ponds to hold overflow from the process ponds that has been diluted by storm water runoff, and in the case of Pond 4A, to detain treated water prior to discharge.

As noted in Section 4.5.1.3, because these ditches do not transfer water to surface water bodies beyond the Coronet property boundaries, delineation of the COIs is considered to be complete within the limits of the ditches. Delineation to below the residential screening criteria will be completed for soil along the perimeter of the property, thereby completing delineation to the $SCTL_{CI}$ for soil and sediment.

Coronet believes that the data are adequate for the purpose of evaluating risk and determining the need for remedial action. Based on these factors, no further investigation is necessary during the RI. If appropriate, additional investigation/delineation activities may be performed to support the evaluation of remedial alternatives for these ditches during the FS or during a pre-design phase for a selected remedy.

4.5.2.2 Miscellaneous Areas

During the Phase I and Phase II assessments, sediment samples were collected from 40 locations within the Coronet property and beyond the property boundary (Table 4-19).

Based on the function of most of these streams, ditches, and ponds (to manage storm water runoff), the $SCTL_{GW}$ and $SCTL_{SW}$ used to evaluate these data were those developed for the holding ponds.[43] Based on a comparison of these sample results and the screening criteria, the following COIs have been identified for these interior areas. The metals enrichment evaluation of clay sediments suggests a more limited list of COIs (i.e., cadmium) than presented below; however, metals concentrations in sand and peat above the SQAGs added constituents to this list for the golf course/Ditch 4 and Pond 1S ditch.

Area	SQAGs/TECs	Groundwater Protection	Surface Water Protection
golf course/Ditch 4	Ba, Cd	Al, As, F^-	Al, Cr, Se, Ag
Pond 1S ditch	As, Ba, Cd, Cr, Pb, Ni, Ag, Zn	Al, As, B, Cd, Cr, Co, Cu, Fe, Pb, Mn, Se, Zn, F^-	Al, As, Be, Cr, Fe, Se, Ag

Ra-226 is a COI based on concentrations above 2 pCi/g in all of the sediment samples collected from these ditches (Table 4-22c).

The relative number of constituents at concentrations above screening criteria in these areas is consistent with their use. The golf course ditch and Ditch 4 were generally used to handle surface water runoff, and the Pond 1S ditch and area southeast of Pond 6 were used to handle runoff and likely captured some seepage from the nearby ponds.

Further investigation of these areas as part of the RI is not necessary:

- sediment and shallow soil in the vicinity of the golf course ditch and Ditch 4 were excavated and placed in Pond 6 and the remaining soil regarded to facilitate use of this area primarily for handling storm water runoff from the Pond 6 cap
- the data for the Pond 1S ditch and area southeast of Pond 6 are sufficient to proceed with the risk assessment[44]

Further investigation/delineation of the Pond 1S ditch and area southeast of Pond 6, may be performed for certain constituents if the sediments are determined to be a source of groundwater or surface water impact or if the risk assessment indicates the sediments pose an unacceptable risk. Such

[43] As discussed in Section 4.4.2.1, the SPLP values used to calculate these leachability criteria are biased low due to the incorporation of pore water in the results.

[44] The RI does include provisions for the collection of additional surface water and sediment samples, including the collection of samples in the area east of SW-2 (southeast of Pond 6) and SW-3 (Lexie Lane) (Section 7.3.2).

work would be performed to support the evaluation of remedial alternatives for these areas during the FS or during a pre-design phase for a selected remedy.

Based on a comparison of the results for samples collected generally along and beyond the Coronet property boundaries and the FDEP screening criteria, the following COIs have been identified for these areas. The metals enrichment evaluation of clay sediments suggests a more limited list of COIs (i.e., cadmium) than presented below; however, metals concentrations in sand and peat above the SQAGs added constituents to this lists for the eastern and western property boundaries.

Property Boundary	SQAGs/TECs	Groundwater Protection	Surface Water Protection
Northern	-	Cr, F^-	Cr, Se, Ag
Eastern	Ba, Cd, Cu	Al, As, B, Cr, Cu, Fe, Mn	Al, Cr, Fe, Se, Ag
Western (a)	Sb, As, Ba, Cd, Ni (b)	Al, Sb, As, B, Cd, Cr, Cu, Fe, Pb, Mn, Se, Zn, F^-	Al, As, Be, B, Cr, Fe, Se, Ag

a/ Data for samples collected from P2SW-2 and PZ-2 were only compared to the $SCTL_{GW}$ because these are no longer areas that accumulate surface water, thus eliminating the applicability of the SQAG and $SCTL_{SW}$.
b/ Chromium was only detected at concentrations above the SQAG in clay sediment samples collected along the western property boundary.

Ra-226 is a COI based on concentrations above 2 pCi/g in at least one sample collected along each of the three property boundaries (Table 4-22c).

Table 4-22b presents the sediment sample results and identifies metals at concentrations above the human health screening criteria, which would be potentially relevant in areas where the sediment could be exposed in the future. Because the golf course/Ditch 4, Pond 1S ditch, and SW-2 are within the interior of the Coronet property, sample results for these areas were not compared to the residential screening criteria. Constituents detected at concentrations above screening criteria in one or more samples from these areas are as follows.

Area	Residential	Commercial/Industrial
golf course/Ditch 4	-	-
Pond 1S ditch	-	As
SW-2	-	As
Northern Property Boundary	As, Ba	-
Eastern Property Boundary	As, Ba, Fe	-
Western Property Boundary	As, Ba, Fe, V	As, Fe

Sediment samples were collected concurrent with the June 2007 surface water sampling event (Figure 4-14). The results will be used, if necessary, to identify appropriate locations for the collection of

sediment samples during the RI (Section 7.3.1); both sets of results will be incorporated into the RI report.

4.6 Groundwater Conditions

Table 4-23 identifies the monitoring wells, Floridan aquifer production wells, and piezometers installed within and beyond the Coronet property boundaries. The well and piezometer locations are shown in all figures.

The objective of the Phase I assessment groundwater investigation was to determine whether further assessment was warranted and, if so, to determine the nature and scope of such activities. Seven surficial aquifer monitoring wells were installed in accordance with the Phase I assessment work plan (Coronet 2004b). Groundwater samples were collected in August or October 2004 from all of the existing MW-series monitoring wells, the surficial and shallow intermediate SPB-series wells,[45] most of the piezometers, and production wells PW-1, PW-3, and PW-4.[46,47] Based on the sample results, Coronet installed seven additional surficial wells and two intermediate wells; a second monitoring event followed in November 2004 which included the new wells and selected nearby existing wells.

During the Phase II assessment, 55 additional wells (35 surficial and 20 intermediate) were installed within the property and beyond the property boundaries. The first Phase II groundwater sampling event was in November 2005; samples were collected from all of the monitoring wells, most of the piezometers, and production wells PW-1 through PW-4. The second sampling event, in February 2006, included most of these same locations. The discussions of findings relative to the three aquifers presented below (and presented in the figures) are based entirely on the November 2005 results due to the more comprehensive nature of this sampling event.

The Phase I and Phase II assessment groundwater data are presented in Tables 4-24a and 4-24c; isoconcentration maps are provided for certain COIs using the data set for November 2005.[48] Based on the assessment results, additional monitoring wells were installed in March and April 2007 (Figures 4-15 through 4-27) and samples were collected in May 2007. The results and any necessary supplemental delineation activities will be incorporated into the RI report as discussed in Section 7.4.

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[45] The SPB-MW-I series wells include deep screened sections (e.g., SPB-MW-1Ib) that are sealed off from the shallow screened sections (e.g., SPB-MW-1Ia). The deep sections were last sampled in August 2004.

[46] The Phase I report wrongly stated that a sample was collected from PW-2; this sample was actually collected from nearby well PW-1.

[47] For both sampling events, all samples were analyzed for: gross alpha, gross beta, Ra-226 and Ra-228, and gamma spectroscopy. During the first event isotope-specific analysis was performed for some samples. During the second sampling event, all samples were analyzed for polonium 210 (Po-210) and lead 210 (Pb-210); certain samples were also analyzed for radon 222 (Rn-222).

[48] The isoconcentrations are interpretations of the November 2005 data and are meant to be used to provide a general understanding of conditions at that point in time. The isoconcentration lines will be revised as appropriate during the RI to present updated information.

4.6.1 Surficial Aquifer

The discussion of water quality is focused on those constituents or parameters identified as groundwater COIs for the surficial aquifer. The constituents are categorized as primary, secondary, or minimum-derived COIs based on their GWCTL status (which is generally consistent with the primary and secondary MCLs):

- primary: Sb, As, Cd, Cr, Pb, Ni, Se, Na, Tl, F^-, gross alpha, radium[49]
- secondary: Al, Fe, Mn, Zn, Cl, F^-, SO_4, total dissolved solids (TDS), pH[50]
- minimum-derived: B, V

Benzene and TRPH are also considered key COIs for the surficial aquifer in the Main Plant Area.

The distributions of primary, secondary, and minimum-derived inorganic COIs are addressed in Section 4.6.1.1 through 4.6.1.3; the distribution of benzene and TRPH are addressed in Section 4.6.1.4.

4.6.1.1 Primary COIs

Of the primary COIs, arsenic, sodium, fluoride, and gross alpha were more frequently detected at concentrations above the screening criteria than the other primary constituents. Concentrations of arsenic and gross alpha[50] above the groundwater screening criteria were generally reported in two areas of the site: the Ponds 1S and 6 and Main Plant area, and the Ponds 2/2A, 3, and 4 area (Figures 4-15 and 4-16). Concentrations of sodium and fluoride above the screening criteria were generally reported in the Ponds 1S and 6 and Main Plant area, and the Pond 4 area (Figures 4-17 and 4-18). The northwest and central areas were not affected due to higher hydraulic heads; one exception is the presence of gross alpha above the screening criteria at MW-60 in the center of the property.

The highest concentrations of arsenic, sodium, and fluoride were typically detected near and downgradient of the Nos. 6 and 7 and Paragon kilns. The highest concentrations of gross alpha were reported in samples collected near Pond 6, east of Pond 3, and near and downgradient of the Nos. 6 and 7 and Paragon kilns.

Due to the limited number of samples in which antimony, cadmium, chromium, lead, nickel, selenium, and thallium were reported above the screening criteria, the November 2005 results for all of

[49] Antimony, cadmium, chromium, lead, nickel, selenium, thallium, and zinc were detected at concentrations above the screening criteria in 1 to 8 of the 59 samples collected during the November 2005 event. MMW-2 through MMW-8, MMW-10, and MMW-11 were treated as one well due to their proximity; at a distance from these wells, MMW-9, MMW-12, and MMW-13 were each treated as individual wells. Results for the piezometers (other than PZ-6-W which was constructed as a well) were not considered as they are more representative of pond water than groundwater.

[50] Because there was no sampling event for which a majority of samples were analyzed for gross alpha and the various rounds of radiological data were generated over a period of 18 months and during different flow conditions (e.g., high flow, low flow), there was no data set appropriate for developing meaningful isoconcentrations. Due to the relatively sporadic analysis for radium through the Phase II, the data do not provide a clear pattern of distribution. Subsequent sampling and analysis, beginning in March 2007, has included analysis for gross alpha and radium for all samples to address this issue.

these metals are presented in Figures 4-19 and 4-20 (Site and Main Plant Area). The highest concentrations of these metals were also typically reported in groundwater samples collected from the Main Plant Area, specifically near and downgradient of the Nos. 6 and 7 and Paragon kilns.

Based on concentration distributions in groundwater, the draft Phase II assessment report recommended the installation of three surficial monitoring wells to complete delineation (MW-62, MW-63, and MW-64); the agencies concurred with these recommendations and requested installation of additional wells (MW-65 through MW-75). As noted in Section 4.6.1, these wells have been installed and samples collected, and the results and any supplemental delineation activities will be incorporated into the RI report.

4.6.1.2 Secondary COIs

The concentrations of aluminum, iron, manganese, zinc, chloride, sulfate, and TDS, and the pH levels are presented in Figure 4-21. Because TDS reflects the mass of dissolved minerals in groundwater, including naturally-occurring soluble minerals (e.g., carbonates) and as affected by other metals/anions/cations, the TDS isoconcentrations presented in this figure are considered to be generally representative of conditions for the other secondary COIs. The fluoride isoconcentrations for both the primary and secondary standards presented in Figure 4-16 are very similar.

The highest concentrations of most COIs were reported near and downgradient of the Paragon Kiln and KBF_4 Production areas. Constituent-specific differences in distribution above the screening criteria include:

- aluminum - highest concentrations near Ponds 4/4A, 1S, and 6, and not within the Main Plant Area (except near the Paragon kiln)
- iron - highest concentrations near surface water bodies or low-lying areas reflecting localized reducing conditions
- manganese and chloride - highest concentrations in the southern part of the property
- zinc - only detected above the screening criterion in MW-30 immediately downgradient of the Paragon kiln
- fluoride - highest concentrations in the Ponds 1S and 6 and Main Plant area, and the Pond 4 area
- sulfate - typically limited to the southern portion of the property, with the highest concentrations near the Nos. 6 and 7 and Paragon kilns areas
- TDS - highest concentrations near the Nos. 6 and 7 Kilns and the KBF_4 Production areas

The acceptable pH range is 6.5 s.u. to 8.5 s.u. The median anticipated pH of the surficial aquifer within the water management district is 6.5 s.u. (FGS 1992) which is at the lower end of the acceptable

limit. The distribution of pH levels indicates that wells in the southwest portion of the study area tend to be within the 6.5 s.u. to 8.5 s.u. range (with the exception of pH values below 6.5 s.u. near the kilns and the KBF_4 Production Area) and pH values below 6.5 s.u. are typical to the north and east.

Delineation of the secondary COIs to below the screening criteria has not been evaluated because it is presumed that delineation of the primary COIs and boron would provide such information. Confirmation that delineation is complete will be included in the RI report.

4.6.1.3 Minimum-Derived COIs

Concentrations of boron above the screening criterion were detected in samples collected near the northern ponds and in the Ponds 1S and 6 and the Main Plant area (Figure 4-22); concentrations of vanadium above the screening criterion were detected in sporadic locations in the southern portion of the Coronet property (Figures 4-19 and 4-20). The northwest and central areas were not affected.

Boron concentrations above the screening criterion generally ranged between 1.4 mg/l and 14.7 mg/l. Higher concentrations were reported in samples collected in the Nos. 6 and 7 and Paragon kilns areas (55 mg/l to 140 mg/l) and in the KBF_4 Production Area (140 mg/l or above). The highest concentrations of vanadium also were reported in samples collected near the Nos. 6 and 7 and Paragon kilns.

Data generated for the additional monitoring wells installed in March and April 2007, are anticipated to complete delineation for these constituents.

4.6.1.4 Organic COIs

Benzene, for which there is a primary standard, was detected at concentrations above the screening criterion in groundwater samples collected from the Bunker C Tanks West and Bunker C Tank East/Kiln Trunnions areas (Figure 4-23). The maximum benzene concentration was 8 micrograms per liter (µg/l);[51] the screening criterion is 1 µg/l.

The presence of TRPH at concentrations above its minimum-derived screening criterion was limited to the Tank No. 29 and Bunker C Tank East/Kiln Trunnions areas and near Tank Nos. 32 and 33. The areas that appear to be affected are relatively limited in size and centered near MMW-4[52] and TC7E-05 in the Kiln Trunnions Area, and southwest of the de-dusting oil tanks (Tank Nos. 32 and 33). The maximum TRPH concentration was 7.05 mg/l; the screening criterion is 5 mg/l.

Delineation of these parameters to below the screening criteria is complete.

[51] The results for a grab sample of groundwater collected from a test pit in which benzene was detected at 16 µg/l, are not considered to be representative of groundwater quality based on the method of collection.

[52] LNAPL was observed at the surface of MMW-4 in February 2005 (0.08 foot), February 2006 (0.02 foot), and March 2006 (0.25 foot). LNAPL was not observed during water level monitoring events in March or November 2005. Changes in water levels and the presence of LNAPL do not correlate. However, the precipitation event that occurred 3 days before the February event may have promoted the flushing of LNAPL from unsaturated soil resulting in its detection at that time.

4.6.2 Intermediate Aquifer

Similar to the surficial aquifer, discussion of water quality in the intermediate aquifer is focused on those constituents or parameters identified as COIs for this aquifer based on the November 2005 data:

- primary : As, Na, Tl, gross alpha, radium[53]
- secondary: Al, Fe, Mn, Cl, SO_4, TDS, pH[54]
- minimum-derived: B

The distributions of primary, secondary, and minimum-derived inorganic COIs are addressed in Section 4.6.2.1 through 4.6.2.3.

4.6.2.1 Primary COIs

Of the primary COIs, sodium and gross alpha were more frequently detected at concentrations above the screening criteria than the other primary constituents. Sodium concentrations above the screening criterion were detected in samples collected from the Main Plant Area, the central portion of the property, and south and southeast of Pond 6 (Figure 4-24). Gross alpha concentrations above the screening criterion were reported in the Main Plant Area, and near Pond 6 and Pond 2/2A (Figure 4-25).

Due to the limited number of samples in which arsenic and thallium were detected above the screening criteria, a figure has not been prepared for these constituents. Arsenic was detected above the screening criterion in samples from four wells (MW-60I in the central portion of the Coronet property and MW-18I, MW-25I, and PZ-2I along the eastern, southern, and western property boundaries); thallium was detected above the screening criterion in a sample from SPB-MW-4I, south of Pond 6. Arsenic is delineated downgradient of MW-25I and thallium is delineated downgradient of SPB-MW-4I.

Based on the data for the primary COIs, the draft Phase II assessment report recommended the installation of MW-62I downgradient of PZ-2I. The agencies concurred with this recommendation and requested the installation of three additional intermediate wells to complete or further refine delineation: MW-46I and MW-68I to the east and MW-69I to the south. As noted in Section 4.6.1, these wells have been installed and samples collected, and the results and any supplemental delineation activities will be incorporated into the RI report.

4.6.2.2 Secondary COIs

The concentrations of the secondary COIs are presented in Figure 4-26. The constituent distribution is summarized below.

- Aluminum was detected above the screening criterion in a sample collected from MW-42I, east of the Coronet property.

[53] Aluminum, arsenic, thallium, sulfate, and pH were detected at concentrations above the screening criteria (or beyond the pH range) in 1 to 4 of the 31 samples collected in November 2005.

- Iron concentrations above the screening criterion were generally limited to wells near the southern property boundary. The highest concentrations were reported in wells in or downgradient of the Nos. 6 and 7 Kilns Area. Concentrations above the screening criterion were infrequently detected beyond the property boundaries.

- Manganese concentrations above the screening criterion occurred sporadically (Figure 4-26). The highest concentrations were reported near and downgradient of the Nos. 6 and 7 Kilns Area. Manganese was not detected above the screening criterion in samples collected beyond the property boundaries.

- Chloride concentrations above the screening criterion were reported near Ponds 2/2A, Pond 6, and the Main Plant Area. The highest concentrations were reported downgradient of the Nos. 6 and 7 Kilns Area and south of Pond 6. Chloride was only detected at a concentration above the screening criterion in one well beyond the property boundaries (MW-40I, south of Pond 6).

- Sulfate was detected above the screening criterion in a sample collected from SPB-MW-3I in the Main Plant Area.

- TDS concentrations detected above the screening criterion (500 mg/l) typically ranged from approximately 520 mg/l to 2,300 mg/l. Concentrations of 2,300 mg/l to 5,000 mg/l were detected near Pond 2A, within or downgradient of the Nos. 6 and 7 kilns, and south of Pond 6. Similar to chloride, TDS was only detected at a concentration above the screening criterion in one well beyond the property boundaries (MW-40I, south of Pond 6).

With these few exceptions, downgradient delineation of these secondary COIs is complete: iron at MW-3 and MW-45I, manganese at MW-3 and MW-15I, and TDS at MW-9R and MW-15I.

pH levels beyond the screening range were reported in samples collected from MW-40I and MW-42I (south and east of the facility) and SPB-MW-3I and MMW-9I in the Main Plant Area. Delineation of pH to within the acceptable range is complete.[54]

4.6.2.3 Minimum-Derived COIs

Boron concentrations above the screening criterion were reported near Ponds 2/2A, Pond 6, and in the Main Plant Area (Figure 4-27). The highest concentrations were reported in samples collected from the Main Plant Area. Data generated for the additional monitoring wells installed in March and April 2007, are anticipated to complete delineation for boron downgradient of PZ-2I and MW-60I.

4.6.3 Upper Floridan Aquifer

The following COIs were identified for the Upper Floridan aquifer based on their detection in one or more of the four Coronet production wells at concentrations above screening criteria:

[54] The levels in SPB-MW-3I and MMW-9I are in the 6 s.u. range (below the lower end of the screening range) and consistent with facility operations (i.e., low pH levels). The levels in MW-40I and MW-42I are above the range and are believed to reflect the grout used in well construction rather than any effects from historical operations.

- secondary COIs: Fe, Mn, TDS
- minimum-derived COI: B

Concentrations of iron, manganese, and boron were detected in the samples collected from PW-1 and PW-2 during the Phase I and Phase II, and a concentration of iron above the screening criterion was detected in the sample collected from PW-3 during the Phase I (analysis for TDS was not always performed).

Based on the detection of concentrations of boron above the screening criterion in PW-1 and PW-2 during the assessments and subsequent testing that was performed to evaluate use of the water for blending, Coronet evaluated the integrity of all four production wells. The evaluation concluded that the presence of boron in PW-1 might reflect migration along the outside of the well casing from the intermediate aquifer to the Upper Floridan at this location (the well casing was not seated in the Upper Floridan) and that the presence of boron in nearby PW-2 might reflect conditions at PW-1.

To confirm these conclusions, Coronet installed a fully-cased well within the existing 10-inch diameter steel casing and open borehole at PW-1. Thereafter the wells were monitored approximately every month. The analytical results indicated the continued presence of boron at concentrations above the screening criteria. The draft Phase II report recommended that periodic monitoring continue until such time as a downward trend in boron concentrations was observed or, if such a trend was not observed in a reasonable period time, that Coronet might propose an appropriate action that would take into consideration the need for continued use of the production wells.

4.6.4 Summary

Based on the current understanding of conditions, the distribution of constituents and their relative concentrations in the surficial aquifer are consistent with prior operations at the Coronet property.

- The highest concentrations of most of the COIs are present in the Main Plant Area near and downgradient of the kilns, where low pH fluids (e.g., recovered acid, process water) containing elevated concentrations of metals and other inorganic contaminants appear to have entered the surficial aquifer.

- The relatively lower concentrations of the COIs present in other areas of the plant and Ponds 1S and 6, reflect the use of the recirculation system for handling the low pH (i.e., acidic) process water that contained elevated levels of these same constituents and recharge of groundwater (via seepage from the ponds or periodic recharge to groundwater from the conveyance ditches).

- Concentrations of these same constituents in groundwater in the holding ponds areas are typically lower than reported in the southern portion of the property, likely reflecting distribution of recirculation system overflow and dilution afforded by precipitation and storm water runoff, and subsequent recharge of groundwater by pond seepage.

The data distribution within the intermediate aquifer suggests that vertical migration from the surficial to the intermediate aquifer has been minimized by preferential lateral flow within the surficial aquifer and the presence of lower permeability materials (aquitards) that separate these two aquifers.

5.0 Conceptual Site Model

This preliminary Conceptual Site Model (CSM) was developed to identify potential source areas, release mechanisms, exposure media, and potential receptors and routes of exposure to ensure that the RA evaluates all appropriate receptors and exposure routes. The CSM will be updated as necessary based on data and information generated during the RI to reflect new findings. This information will also help ensure that the scope of the RI is appropriate to determine the nature and extent of contamination at the Site and, where necessary based on the outcome of the RA, to support the selection of remedial alternatives.

5.1 Nature and Extent of Contamination

The contaminants associated with the Coronet property are mainly inorganic, including but not limited to various metals, uranium (i.e., gross alpha/radium), boron, chloride, and fluoride. All are present naturally within the matrix of the underlying soils (e.g., surficial sand, Bone Valley member components). Mining operations brought subsurface soil that contained higher levels of metals, uranium, and fluoride (e.g., Bone Valley Member) to the ground surface and exposed these soils to more intensive chemical weathering which, to some extent, resulted in releases of certain constituents from the soil matrix.

As discussed in Section 2.1.1, phosphate rock and soda ash/caustic were two of the primary components in the production of CDP. Use of these materials increased the total mass of associated constituents (e.g., arsenic, vanadium, uranium, fluoride, sodium) present within the area, specifically within the Main Plant Area. Fluorine gas was liberated from the rock during CDP production and was recovered as hydrofluoric acid by the kiln scrubber systems. The production, storage, and subsequent use of hydrofluoric acid in the KBF_4 process also increased the mass of available fluoride within the Main Plant Area. The use of borax (sodium tetraborate pentahydrate) and potash (potassium chloride) added to the mass of sodium, chloride, and boron.

Organic contaminants associated with the property include benzene, PAHs, and TRPH. The primary means of introduction were leaks or spills associated with the various petroleum storage and lubrication areas; another means would have been the presence of creosote-treated rail ties.

Section 5.1.1 identifies potential sources and source areas of contaminants and assesses whether these are confirmed sources based on a qualitative evaluation of the Phase I and Phase II assessment data. Section 5.1.2 identifies the main transport mechanisms believed responsible for the migration of contaminants.

An evaluation of the extent of contamination (i.e., presence of constituents above screening criteria) was presented in Section 4 on an area-by-area basis. Based on the number of sources and source areas, similarity in the nature of contamination, and co-mingling of contaminants within and between these areas and various media, determining the extent of impact of each source is not practical and may not be possible particularly within the Main Plant Area. Exceptions within the plant area include the petroleum sources and constituents associated with specific sources (e.g., boron and fluoride), the extent of which may be easily determined. Further and as also discussed in Section 4, most of the leachability criteria for soil and sediment do not appear to be appropriate for evaluating Site conditions and, therefore, should not be used for delineation purposes. Coronet does not believe that it is necessary to complete delineation to proceed with the RA, because the exposure pathways and receptors identified herein (Section 5.3) are not likely to change or expand in response to final delineation.

5.1.1 Source Areas

Identification of potential and confirmed sources is addressed below. The discussions are focused on primary (i.e., initial) sources. Secondary and tertiary sources have been identified and confirmed (based on contaminant concentrations in the associated media above screening criteria), but are not discussed below. To the extent necessary and practicable, additional consideration and discussion of these sources will be contained in the CSM presented in the RI report. The exposure pathways and receptors identified in Figures 5-1a and 5-1b, were determined based on the primary, secondary, and tertiary sources and transport mechanisms.

5.1.1.1 Identification of Potential Sources

As discussed in Section 2.1.5.1, five areas used for disposal of solid waste, C&D debris or both have been identified: (1) between Ponds 1S and 6 (2) Northern Rock Storage Area (3) southeast of Pond 6, (4) south berm of Pond 6, and (5) between Ponds 4 and 6. Due to the inert nature of the wastes and based on the absence of impact associated with the waste encountered in the area between Ponds 1S and 6, none of these are considered to be potential contaminant source areas.

Based on historical operations, previously identified conditions, and the findings of the EPA inspection presented in Section 2, the following potential sources were identified for the area encompassing the Main Plant Area (including the Research Building Area) and the process water recirculation system (i.e., Ponds 1S and 6, and the conveyance ditch system):

- process water
- CDP Processing Area
- KBF_4 Production Area
- Mineral Acid Tanks Storage Area
- petroleum tank areas
- two oil storage areas
- Bone Yard
- Paint Booth
- Mobile Equipment Shop
- electric substations
- laboratory/septic system
- Drum Storage Area
- unconfined/fugitive emissions
- Research Building Area

These areas are discussed below, either separately or in groups as appropriate.

The nature of the process water was discussed in detail in Section 2.1.5.1. In general, it was acidic and contained elevated concentrations of various constituents (Sections 2.1.2, 2.1.3, 2.1.5). Process water should also be considered a source as it was distributed and used throughout the southern portion of the property where it could impact soil, surface water, sediment, and groundwater. Because the nature of the water circulated in this system was essentially similar in all areas, except for slightly lower pH levels in the Main Ditch before liming, and because there was limited retention time given that the system recirculated approximately 9.9 million gallons per day, the individual components of the system are not considered to be separate source areas.

The CDP Processing Area included several potential sources or source areas: rock unloading and storage, tellerets, feed prep, fluid bed reactors, and three rotary kiln systems. The rock unloading and storage areas are a potential source due to the nature of the rock; the tellerets were a suspected source due to the potential for leaching of contaminants present in associated residue. The other areas were identified based on: (1) potential releases associated with the use of phosphoric acid, recirculated process water (within the reactors, quench tank, spray towers, and scrubbers), and inground sumps to accumulate hydrofluoric acid recovered from the rotary kiln emissions; (2) potential releases associated with the sumps used to accumulate process water and the inground flume or underground lines used to transfer this water to the conveyance system; (3) use of lead shot to remove product buildup within the kilns; (4) impacts to groundwater reported for the Nos. 6 and 7 Kilns Area in 1999 and confirmed by the EPA in 2003; and (5) results for samples collected by the EPA of scrubber blowdown from the feed prep east and west scrubbers and from the No. 7 kiln scrubber.

The KBF_4 Production Area, which included the inground flume, was identified as a potential source area based on: (1) the use of boron in the process and the known presence of boron in groundwater and pond water samples collected historically from the Coronet property; (2) potential releases associated with hydrofluoric acid use and of materials (e.g., liquids, slurries) generated in this area; (3) potential releases associated with conveyance of process water to and within the inground flume to the conveyance system; and (4) the results for samples collected by the EPA from the reactor tanks, mixing tanks, centrifuge rinsate, and pooled water from beneath the centrifuge, and from the Main Ditch at the point of discharge from the inground flume.

The Mineral Acid Tanks Storage Area was identified as a potential source based on the storage of caustic and phosphoric and hydrofluoric acid, accumulation of backflush from the acid and caustic conveyance lines within a sump which then discharged the water overhead to the Emergency Ditch, and the results for a sample collected from the Emergency Ditch by the EPA.

The petroleum tank storage areas were identified as source areas or potential source areas based on the submittal of DRFs to the FDEP for 4 of 7 registered petroleum tanks and in response to the presence of petroleum observed in the soil and as LNAPL in the Nos. 6 and 7 Kilns Area, and based on the potential for releases from the remaining registered tanks and the Bunker C oil tanks. Also identified as potential sources of petroleum contamination were oil storage areas Nos. 6 and 7 Kilns Area and beneath the elevated rail area.

The reasons for which the following areas were identified as potential sources include:

- Bone Yard - occasional storage of transformers and related electrical equipment and rejection of scrap metal from the yard by a recycling facility based on radiation readings
- Paint Booth, Mobile Equipment Shop, laboratory/septic system - storage, use or both of materials containing organics (e.g., VOC-containing materials, lubricating oils, degreasers)
- Drum Storage Area - temporary storage of various wastes (awaiting off-site disposal) that may have contained various contaminants
- rail beds - potential presence of contaminants in the bed material and rail ties (metals, uranium, PAHs)
- electrical substations - potential presence of PCBs

Fugitive emissions and localized transport of particulates associated with the following are also considered potential sources:

- use of open vessels (tanks, sumps, bins) for mixing components of KBF_4, accumulating hydrofluoric acid, and storing materials
- unpaved roads (and rail lines) and unvegetated areas where rock and product were used or present
- stockpiles of raw materials, product, materials recovered for reprocessing (e.g., feed prep reclaim pile)
- rock unloading, conveyor system, grinding/milling, and loading and unloading of bulk (loose) material and product

The Research Building Area is considered a potential source area based on suspected activities which may have released contaminants. At this time it is not possible to identify specific sources because there is little documentation available and because Coronet has not yet entered this area and completed its assessment of historical operations and physical attributes. This area will be investigated during the RI.

The only operations-related activity in the northern portion of the property (i.e., Northern Area) was water management in the Coronet ponds. Consequently, the primary sources in this area are soil and pond water.

5.1.1.2 Source Confirmation

Soil and phosphate rock are inherent sources of most of the Site contaminants based on their mineralogy. Soil is ubiquitous, although the mass of contaminants available in the soil structure varies as a result of disturbance: native surficial soil has been exposed to extensive chemical weathering since deposition thus naturally depleting the contaminant mass, but soil exposed to the surface during mining has not been extensively weathered and, therefore, contains greater contaminant mass. Phosphate rock was largely confined to the Main Plant Area, consistent with the presence of contaminants at higher concentrations in this area than in other areas of the Coronet property.

Process water was a source based on the contaminant concentrations reported in surface water, sediment, and groundwater. Surface/pond water and sediment samples collected from the conveyance system and Ponds 1S and 6, and the northern ponds confirm the presence of contaminants at concentrations above screening criteria (i.e., typically above anticipated background concentrations). The presence of contaminants in groundwater in the southern portion of the Coronet property resulted from process water recirculation and leaks and spills, leaks and spills associated with other liquids (hydrofluoric or phosphoric acid), or both. The lower concentrations of these contaminants in groundwater in the northern portion of the property reflect the impact of pond water (i.e., dilute process water) recharge to groundwater (the relative heads in the ponds and groundwater also dictate such a relationship).

Due to the relatively similar concentrations of metals, fluoride, and Ra-226 in soil samples throughout much of the plant (particularly in the CDP Processing, KBF_4 Production, and Mineral Acid Tanks Storage areas), confirming and isolating point sources is not typically feasible; exceptions are noted below. The tables and figures presented in Section 4 provide information specific to the various areas discussed below.

Potential source areas that were not evaluated include the laboratory/septic system area, substations, Drum Storage Area, and the Research Building Area. Section 7 presents the scope of RI activities in these areas, where warranted.

- CDP Production Area
  The presence of higher concentrations of sodium in soil samples collected proximate to the Feed Prep Area than in other areas indicate that this is a probable source area (Section 4.3.1). The Nos. 3, 4, and 5 kilns are also a confirmed source based on the concentrations of arsenic and fluoride in soil samples collected adjacent to the former process water discharge line, as noted in the process water discussion. The Telleret Pavilion appears to be a source based on the presence of most metals at higher concentrations in samples collected in this area than in other areas of the plant and Ra-226 concentrations below 2.5 pCi/g; this suggests the source of the metals is not related to the presence of rock or related materials in this area. Lead concentrations in soil throughout the plant and within this area are generally in the range of 1 mg/kg to 300 mg/kg; the random nature of the distribution of lead concentrations suggests that the shot was not a source of impact via leaching to soil or volatilization in the kilns.

The distribution of contaminant concentrations in groundwater within the Main Plant Area indicate that releases of most of the groundwater COIs occurred in these areas. Due to the use and reuse of process water in these areas, it is not possible to isolate individual sources (e.g., scrubbers, wastewater sumps, product sumps).

While there was low soil sample density (for inorganic analysis) in the immediate vicinity of the actual kilns, emission control devices, and sumps in all four production areas, no evaluation of groundwater conditions was conducted in the area of the fluid bed reactors, and limited evaluation of conditions was conducted within the Nos. 3, 4, and 5 Kiln Area.

- KBF_4 Production Area
  As discussed in Section 4.3, concentrations of boron, sodium, and potassium in soil samples collected from this area were higher than those reported in other areas indicating that releases of borax and potash occurred in this area. The data for soil samples collected near the inground flume indicate that releases of process water from this structure also were likely. The distribution of contaminant concentrations in groundwater within the Main Plant Area also indicate that releases occurred in this area, specifically the data for sodium, boron, TDS, chloride, and sulfate.

- Mineral Acid Tanks Storage Area
  Both sodium and fluoride were detected at higher concentrations in soil samples collected from this area than most areas of the plant. The presence of both suggests that operation of this tank farm, where caustic and hydrofluoric acid were stored, resulted in leaks or spills. The concentrations of sodium detected in groundwater samples collected from this area were the same order of magnitude as detected through most of the plant; therefore, it is not clear that operations in this area necessarily resulted in groundwater impact. However, the distribution of fluoride concentrations in groundwater (i.e., higher concentrations in this area) indicates that releases to groundwater occurred.

The DRFs submitted for four petroleum tank areas (Nos. 29, 32 and 33, and 34) and the presence of LNAPL in the Nos. 6 and 7 Kilns Area indicate these were source areas. Data for soil, and in some areas groundwater, for these areas generated during the Phase II assessment confirmed these sources, and identified two additional source areas: Tank No. 37 and the area beneath the elevated rail. Characterization of conditions near the underground gasoline and roof-top diesel oil storage tanks (Tank Nos. 41 and 39) was not performed (refer to Section 4.3.2). It is not known whether the storage of oil proximate to the Nos. 6 and 7 kilns and beneath the elevated rail contributed to the presence of contamination in these areas and, if so, the magnitude of impact, because the contribution cannot be isolated from the other sources in these areas.

The presence of inorganic COIs (e.g., metals, fluoride, Ra-226) in soil in the Bone Yard, near the Paint Booth, and along the rail beds (and groundwater in the Bone Yard) is consistent with the presence of soil and rock in these areas, it does not indicate that these are sources. The presence of organic COIs detected in soil in the Mobile Equipment Shop, Paint Booth, and rail bed, however, does indicate that these were sources.

Because the inorganic constituents that are present in the soil, phosphate rock, and other sources in the plant would also be associated with fugitive emissions, it is impossible to determine the role played, if any, by localized transport of particulate from fugitive sources.

5.1.2 Transport Mechanisms

The transport mechanisms discussed below were identified based on an understanding of historical operations and data generated during the Phase I and Phase II assessments. As noted in Section 5.0, the CSM will be updated and revised as appropriate based on information generated during the RI.

The primary (i.e., initial) release mechanisms in the Main Plant Area/process water recirculation system are shown in Figure 5-1a. As illustrated in this figure, there are also secondary and tertiary release mechanisms including continual (closed-loop) mechanisms such as the flux (or communication) between groundwater and surface water. Of particular note is the flux between groundwater and the water in the conveyance ditches, seepage ditches, and SEPSWD. The mechanisms shown in Figure 5-1a believed to result in the highest degree of mass transfer between media include:

- primary mechanisms
  - formation of the process water, as described in Section 5.1.1
  - discharge of process water into the recirculation system
  - releases associated with the process water streams which may have leached contaminants from the adjacent soil and rock and discharged to groundwater

- secondary mechanisms
  - recirculation of the process water to and through the conveyance system to Pond 6 and back to Pond 1S
  - recharge of groundwater by the conveyance system

- tertiary mechanism
  - seepage of pond water to groundwater

The exposure media identified in Figure 5-1a contain one or more COIs at concentrations above human health or ecological screening criteria.

The primary release mechanisms in the Northern Area are shown in Figure 5-1b. As illustrated in this figure, there are also secondary and tertiary release mechanisms, with some continual mechanisms such as the flux between groundwater and surface water in the Ponds 4 and 4A seepage ditches and Pond 5 seepage ditch (Ditch 4). The mechanisms believed to result in the most mass transfer between media include:

- primary mechanism
  - transfer of treated and diluted process wastewater primarily from Pond 1S to the northern pond system (Ponds 1N, 2/2A, 4, and 4A)

- secondary mechanism
  - recharge of groundwater by the Ponds 1N, 2/2A, 4, and 4A

The exposure media identified in Figure 5-1b also contain one or more COIs at concentrations above human health or ecological screening criteria.

5.2 Future Use Assessment

Potential future uses of the Coronet property will be influenced by the physical conditions remaining after historical mining and processing operations ceased and by the environmental conditions after the remedial action is completed. The potential future uses will guide the RI/FS scope and the human health and ecological risk assessments.

The majority of Coronet's property can be divided into five areas (Figure 5-2):

- outparcels A, B, and C
- former golf course area
- Main Plant Area, including the Research Building Area
- former process ponds, conveyance ditches, and intervening land
- holding ponds, adjacent wetlands, and intervening land

The precise limits of these areas will be defined in the Sampling and Analysis Plan (SAP). The risk assessment protocols are presented in Section 8.

Although Coronet has no plans for future residential use of the property, certain portions of the property will be evaluated for future residential use as part of the baseline risk assessment.

Given their frontage on Coronet Road, outparcels A, B, and C will most likely be used as commercial/industrial property. Outparcel A has been considered for use as a cemetery by the City of Plant City, although a decision has not been made to proceed further with the development of this potential use. The smaller sizes of outparcels B and C presents practical limits on the future commercial/industrial. Because these outparcels could theoretically be developed for residential use, Coronet will evaluate potential risks to hypothetical future residents as part of the RA; any proposed limitations on the future uses will be developed during the preparation of the RA.

Potential future uses of the golf course area could theoretically include residential, recreational, or commercial/industrial, although other, more restricted uses may be appropriate. No specific end uses have been identified by Coronet at this time. As described previously, Coronet will evaluate potential risks to hypothetical future residents at the golf course property as part of the RA and any proposed limitations on future use will be developed during the preparation of the RA.

The Main Plant Area will potentially be used as commercial/industrial property consistent with its current zoning. The specific commercial/industrial user has not been identified by Coronet at this time.

Any limitations on the commercial/industrial use will be determined during the RA and will be implemented by deed restriction as an institutional control.

The Ponds 1S and 6 and conveyance ditch area may be zoned for commercial/industrial use given the proximity to the Main Plant Area, although other, more restricted uses may be appropriate. For Pond 6, where an interim response action has been implemented, limitations developed during the RA will be based on as-built conditions remaining after construction of the multi-layer cap. Thus the future use of Pond 6 may conceivably be different than the future use of Pond 1S. Following remedial action, the future use of Pond 4A will, given its proximity, likely be tied to the future use of the holding ponds area. Any limitations on the use of these ponds and ditches will be developed during the preparation of the RA.

The potential future use of the holding ponds is as fresh water ponds providing storm water detention and management, including passive discharge of surface water to receiving streams. Based on the potential storm water storage requirements and the limited access to the ponds due to the adjacent wetlands, it is unlikely that the holding ponds could be developed for commercial/industrial use, although the potential future use may include recreational use or other restrictive uses. Any limitations on future use of the ponds will be developed during the preparation of the RA and implemented as an institutional control.

5.3 Potential Human and Ecological Exposure

The CSM describes potential pathways of exposure for potential current and future human and ecological receptors to the exposure media (Figures 5-1a and 5-1b). The "Current/Future" headings in these figures are indicative of at least a theoretical possibility of both current and future exposure to site media, with the possible exception of the "construction worker". Although there are currently no "construction workers" (e.g., for building construction for future occupants), there have been demolition and remediation contractors on the property periodically.[55] The magnitude of potential exposure is dependent on receptors that may be present, and the types of activities that may occur.

5.3.1 Potential Human Receptors

Coronet's operations ceased in March 2004. Current human receptors are limited to a small number of administrative staff, security personnel, and contractors, including construction workers involved with the Pond 6 interim removal action. The construction workers have been trained to work safely with hazardous materials and exposures to affected media are managed in accordance with

[55] It should be noted that these contractors are different from the "construction worker" receptor typically evaluated in the CERCLA risk assessment process in that they are OSHA trained and certified and have been provided with information regarding potential environmental hazards at the site.

applicable Occupational Safety and Health Administration regulations. These receptors will be evaluated as such in the human health risk assessment (HHRA).

The FDEP considers all groundwater as a potential drinking water resource except in limited cases where groundwater meets regulatory definitions of "low yield" or "poor quality." Coronet currently provides bottled water for employees at the facility; drinking water will soon be provided via the public water supply system. Coronet continues to use water from several production wells in the Floridan aquifer for non-potable purposes. In areas beyond the Coronet property boundary, bottled drinking water is being provided to residents with affected wells and many residents in the area will be connected to the public water supply line in the near future. However, connection to the water supply currently is not mandatory. As a result, the HHRA will evaluate the potential exposure to groundwater for current residents in areas around the Coronet property.

With regard to potential future exposures, the EPA has established the standard of "reasonably foreseeable" as the basis for identifying potentially complete future receptors and exposure pathways. This criterion was first specified in the NCP (40 CFR Part 300), which lays out the protection goals for Superfund investigations and later in the primary Superfund risk assessment guidance manual, *Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual* [Part A] (EPA 1989), as well as in specific Office of Solid Waste and Emergency Response (OSWER) directives (e.g., *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions*, 1991a). The "reasonably foreseeable" criterion was applied in establishing scenarios for potential future exposures to Site-related media as discussed below.

Six potential future human receptors were identified to cover a range of potential exposure at the Site, including:

- commercial/industrial workers
- grounds maintenance workers
- trespassers
- construction workers
- recreational users
- residents

Construction workers are assumed to be potentially exposed to a "mixed" soil horizon from ground surface to the water table (typically less than 4 feet in depth). Commercial/industrial workers, grounds maintenance workers, trespassers, recreational users, and residents are assumed to be potentially exposed to surface soil (0 to 0.5 feet and 0.5 to 2 feet in depth). For soil, potentially complete exposure pathways will include ingestion, inhalation, dermal contact, and external radiation exposure. Data from soil at depths of greater than 8 feet will not be evaluated as part of a potentially complete exposure pathway as contact at that depth or greater is unlikely to occur.

As stated above, Coronet is not planning any future residential use of its property and intends to evaluate the use of appropriate institutional controls on the property. Nevertheless, groundwater and soil data will be compared to the risk-based screening levels for residential receptors as described in Section 8.1.1 as part of developing the list of constituents of potential concern (COPCs) that will be further evaluated in the HHRA. This will serve as a screening-level approach to the evaluation of residential risks within most of the facility. In addition, Coronet will evaluate potential risk to hypothetical future residents in the outparcels and former golf course area. The HHRA will also evaluate potential groundwater exposures for off-property residents that elect not to connect to the public water system.

Data from areas beyond the Coronet property boundaries will be evaluated using the risk-based screening levels described in Section 8.1.1 to identify potential concerns related to current or future land use.

5.3.2 Potential Ecological Receptors

The pond system on the Coronet property provides habitat for a variety of terrestrial and aquatic ecological receptors. Exposure of ecological receptors to environmental media will be evaluated in an ecological risk assessment (ERA). As described in Section 8, receptors, exposure pathways, and assessment and measurement endpoints will be established following EPA's 8-Step ERA process.

5.4 Remedial Needs

The development of the CSM in this section allows further identification of potential remedial action objectives, remedial technologies, and a preliminary range of remedial action alternatives. The objective is to ensure that data needed to evaluate the technologies associated with the preliminary alternatives are collected as part of the RI activities. Those data should assist in evaluating technical feasibility and balancing the evaluation of long-term operating and maintenance (O&M) costs with the higher capital costs for permanent remedies.

Table 5-1 summarizes the remedial action objectives for each affected medium and identifies general response actions and preliminary remedial alternatives to potentially achieve these objectives. The table identifies a range of viable remedial technologies, including treatment technologies that significantly reduce the toxicity, mobility or volume of waste, containment alternatives, and a no-action alternative. The preliminary remediation alternatives highlighted on Table 5-2 are summarized by specific medium and area.

Technology options, including innovative technologies and resource recovery options, were identified with assistance from *Technology Screening Guide for Treatment of CERCLA Soils and Sludges*

(EPA 1988b) and other guidance. The technology data collection requirements for the evaluation of the preliminary alternatives are noted in the table.

The preliminary remediation alternatives and the reuse assessment discussed in Section 5.2 guided the development of the RI/FS scope of work. The preliminary screening or remedial alternatives will be revised based on additional characterization work to be conducted during the RI; the formal review of potential remedial alternatives will be conducted during the FS.

6.0 RI/FS Project Planning

The EPA RI/FS guidance (1988a) suggests a variety of RI/FS project planning activities, including meetings with the agencies, evaluating existing data, characterizing the physical aspects of the site, developing a CSM, determining if additional studies are necessary, identifying preliminary remedial action alternatives, and identifying treatability study needs, applicable or relevant and appropriate requirements (ARARs), and data needs.

Meetings between the agencies and meetings between the agencies and Coronet have occurred on numerous occasions in preparation of the Work Plan. An evaluation of existing information and data for the Site (largely presented in Section 4) was used to develop the preliminary CSM presented in Section 5, and to provide the foundation for the development of the scopes of work for the RI, RA, and FS presented in Section 7, 8, and 9. This section addresses the plans necessary to implement the scope of the RI/FS; it includes a preliminary list of federal and state requirements for consideration as ARARs and factors to be considered (TBCs).

6.1 Project Plans

The required RI/FS project plans include: a Work Plan, a SAP, a Health and Safety Plan (HASP), and a Community Relations Plan (CRP). Consistent with CERCLA requirements, this Work Plan does not include specifics with regard to sample collection, laboratory analysis, or various quality assurance mechanisms. Such information will be presented in the SAP which will be submitted as a separate document for agency review and approval. The SAP will include a Field Sampling Plan (FSP) that outlines the field scope of work and protocols to be used, and a Quality Assurance Project Plan (QAPP) that describes the policy, organization, functional activities, and quality assurance and quality control protocols. The QAPP will be developed consistent with *EPA Requirements for Quality Assurance Project Plans* (EPA 2001b). A HASP (consistent with the requirements of 29 CFR 1910.120) will similarly be provided to the EPA under separate cover for review only.

The development and implementation of community relations activities are the responsibility of the EPA. The critical planning steps to be performed by the EPA include conducting community interviews and developing a CRP. The extent of Coronet's involvement in community relations activities will be at the discretion of the EPA and will be specified in the CRP. These activities may include providing information on the Site's history, participating in public meetings, preparing fact sheets, and establishing a repository for the administrative record.

As provided in the Settlement Agreement, Coronet will prepare a Technical Assistance Plan (TAP) for providing and administering a grant of Coronet's funds to be used by a qualified community group to hire an independent technical advisor(s).

The community group will be entitled to use these funds to: (1) hire a technical advisor(s), independent from, and not retained by, Coronet and any other parties with an interest in the Site; , to help interpret and comment on the Site-related documents and help group members understand Site cleanup issues; and (2) share this information with others in the community. TAP funds may not be used for activities related to lawsuits, litigation or other legal actions, including attorneys' fees and/or the technical advisor's fees for assisting an attorney with legal action or preparing for and serving as an expert witness at any legal proceeding regarding or affecting the Site.

TAP assistance may be awarded to one qualified group at a time. To qualify for the TAP funds, a community group shall be: (1) comprised of people who are affected by a release or threatened release at the Site; and (2) able to demonstrate the ability to adequately and responsibly manage TAP responsibilities. A group is ineligible if it is: (1) a potentially responsible party (PRP), represents such a PRP at the Site, or receives money or services from a PRP; (2) affiliated with a national organization; (3) an academic institution; (4) a political subdivision; (5) a tribal government; or (6) a group established or presently sustained by any of the entities listed above or if members of the group represent any of these entities.

The EPA will provide applications to interested community groups and review completed applications based on the criteria specified above and other relevant factors. The agency shall document its selection of the qualified community group and inform both Coronet and the group about its decision. The EPA also shall: (1) inform the selected group of the activities that it can and cannot undertake with the TAP funds; (2) if necessary, provide the selected group with assistance soliciting an independent technical advisor(s) and review and approve the group's recommended choice; (3) review any request from the selected group for additional TAP funds consistent with the Settlement Agreement.

The TAP will be submitted to the EPA within 30 days of a request from the agency. The TAP will include a proposed plan for negotiating an agreement with a selected community group that will specify the duties of Coronet and such group. The draft agreement will be provided to the EPA for approval. The TAP will also include provisions for submittal of quarterly progress reports regarding implementation of the TAP.

Within 15 days of the EPA's request, Coronet will designate a primary point of contact for the selected community group. If Coronet opts to use a third party to act as the point of contact, it will submit that person's name, title, and qualifications to the agency for approval within this 15-day period.

6.2 Preliminary Identification of Requirements for Consideration as ARARs and TBCs

This section provides a summary of preliminary federal and state environmental and public health requirements for consideration as ARARs and TBCs for the Site. Further review and analysis of ARARs and TBCs will be conducted during the FS; final selection of ARARs and TBCs will be documented in the ROD.

6.2.1 Definition of ARARS

Section 121(d)(2)(A) of CERCLA specifies that Superfund remedial actions must meet any federal and state standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate requirements, or ARARS.

CERCLA and the NCP (40 CFR Part 300) and the Superfund Amendments and Reauthorization Act (42 USC 9621 *et seq.*) define applicable requirements as those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a site. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a site, address problems or situations similar to those encountered. With respect to the selection of remedial alternatives, relevant and appropriate requirements are afforded the same weight and consideration as applicable requirements.

ARARs are divided into the following categories:

- Chemical-specific - health or risk-based concentration limits or ranges in various environmental media for specific hazardous substances, pollutants, or contaminants. These limits may take the form of cleanup levels or discharge levels.

- Location-specific - restrictions on activities that are based on the characteristics of a site or its immediate environment. An example would be restrictions on wetlands development.

- Action-specific - controls triggered by specific remedial actions at a site such as hazardous waste management or wastewater treatment, if applicable. An example would be RCRA incineration standards.

In addition to legally binding laws and regulations, many federal and state environmental and public health programs also develop criteria, advisories, guidance, and proposed standards that are not legally binding and do not have the status of potential ARARs. These TBC factors may provide useful information or recommended procedures. In some circumstances, however, TBCs will be considered concurrently with ARARs in determining the necessary level of remediation for protecting human health and the environment.

6.2.2 Consideration of ARARS During the RI/FS

ARARs will be considered during the following activities of the RI/FS process:

- Scoping - identification of chemical-specific and location-specific ARARs on a preliminary basis.
- Site characterization and risk management - identification of chemical-specific ARARs and TBC material and location-specific ARARs comprehensively to help determine cleanup goals.
- Development of remedial alternatives - identification of action-specific ARARs for each of the proposed alternatives and consideration with other ARARs and TBC material.
- Detailed evaluation of alternatives - examination of all ARARs and TBCs for each alternative as a package to determine what is needed to comply with laws and regulations.
- Selection of remedy - selection of an alternative able to attain all ARARs unless one of six statutory waivers is invoked.
- Remedial design - assurance that the technical specifications of remedial construction attain ARARs.

ARARs will be further evaluated during the RI/FS process and a final determination documented in the ROD. These will be used as criteria to establish the appropriate extent of Site cleanup and will aid in scoping, formulating, and selecting treatment technologies. They will also help govern the implementation and operation of the selected action. Primary consideration will be given to remedial alternatives that attain or exceed the requirements found in ARAR regulations. At each interval, ARARs will be identified and utilized by taking into account the following:

- contaminants that may be present at the Site
- chemical analyses that will be performed
- types of media that will be sampled
- geology and other Site characteristics
- use of resources and media
- levels of exposure and risk
- potential transport mechanisms
- purpose and application of the potential ARARs
- remedial alternatives that will be considered for the Site

6.2.3 Preliminary Identification of ARARS and TBCs

Based on the anticipated RI/FS activities to be completed in accordance with this Work Plan, a summary of preliminary federal and state regulatory requirements for consideration as ARARs are provided in Table 6-1. Where ARARs did not exist for a particular chemical or potential remedial activity, or where the existing ARARs may not be sufficiently protective of human health or the environment, other criteria, advisories, and guidance were identified that may be useful during data analysis, the RA, or the design and

selection of a remedial alternative. These are summarized in Table 6-2. As part of the FS process, a proposed list of ARARs and TBC information will be developed based on the proposed remedial alternatives selected for the Site. The selected remedy and final determination of ARARs and TBCs will be identified in the ROD.

7.0 Remedial Investigation

The scope of work presented herein is designed to collect the necessary data and information to conduct the RI/FS. The data needs and data collection activities are identified by media in the following sections.

Data collection will be conducted in accordance with the SAP which will include both the FSP and the QAPP. The SAP will provide specific information on sample locations, depths, collection methods, and analytical parameters and methods. The field methods will, with few exceptions (e.g., FDEP guidance will be followed for well installation and completion), be consistent with EPA's *Environmental Investigations Standard Operating Procedures and Quality Assurance Manual* (EPA 2001c). These exact same protocols were used to implement the Phase I and Phase II assessments. As noted in Section 6.1, the QAPP will describe the policy, organization, functional activities, and quality assurance and quality control protocol for the project consistent with EPA's QA/QC requirements as outlined in *EPA Requirements for Quality Assurance Project Plans* (EPA 2001b). This same guidance was used to implement the Phase I and Phase II assessments.

The data packages for the conventional chemical parameters will be Level III with deliverables similar to those required by the EPA's contract laboratory program and the radiological data packages will contain full documentation required pursuant to the Multi-Agency Radiological Laboratory Analytical Protocols Manual (EPA 2004f). The data will, consequently, be appropriate for conducting the RI (characterization and delineation), performing the RA, and evaluating potential remedial alternatives. To ensure the quality and utility of the data generated during the Phase I and Phase II assessments (for which these data deliverables were also provided) and the RI, approximately 20 percent of the data packages generated during the assessments and RI will be validated by a third party consistent with *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, and *Multi-Agency Radiological Laboratory Analytical Protocols Manual* (EPA 2007, 2004g, and 2004f).

Data and information generated during the RI will be used to update the current understanding of the Site characteristics, determine if delineation is complete and if known RA and FS data needs have been adequately addressed. If these requirements have not been met, Coronet will notify the agencies, prepare an appropriate supplement to the Work Plan for approval, and address the needs as soon as possible in an effort to prevent a notable delay in the schedule.

7.1 Soil Conditions

Except as otherwise noted below, surface and subsurface soil samples will be collected from all locations, and analysis will be performed for metals (boron and the target analyte list metals, excluding mercury[56]). A portion of soil samples in which total concentrations of arsenic, barium, cadmium, chromium, lead, selenium, or silver are greater than 20 times the TCLP limit will be submitted for TCLP analysis of these same metals. Along the perimeter, soil samples will also be collected for analysis of radiological testing; additional locations for radiological sampling and analysis will be determined based on the results of gross gamma screening (Section 7.1.3). Radiological testing will initially be performed for Ra-226 and Ra-228.[57] To confirm equilibrium conditions (consistent with the data generated to date), analysis will also be performed for uranium 234 (U-234), U-235, U-238, Po-210, and Pb-210 on a statistically appropriate number of samples collected from areas with differing historical activity backgrounds.

7.1.1 Establishment of Background Conditions and Leachability Screening Criteria

Two primary data gaps for soil are the absence of background contaminant concentrations and Site-specific screening criteria with which to evaluate the potential for leaching from soil to groundwater and soil to surface water at concentrations above the groundwater and surface water screening levels.

Determining background concentrations of naturally occurring constituents in soil is necessary to ensure that delineation efforts are appropriate (i.e., delineation below background concentrations is not performed) and to performing the RA (i.e., constituents present below background concentrations may be excluded from quantitative risk estimates).

Delineation of COIs to the lowest of the screening criteria is required for soil (and sediment). As discussed in Section 7.1.2, delineation to the human health screening criteria will be completed along the perimeter (and in some cases within the property itself). As shown on Figures 4-1 through 4-3, there are relatively few contaminants present in soil at concentrations above the residential screening criteria beyond the Main Plant Area. Consequently, delineation to these criteria would be relatively straightforward with little follow-up delineation anticipated. However, for almost all metals, the existing default and site-specific leachability screening criteria are lower than the residential screening criteria. As a consequence, the driver for the purpose of delineation would be leachability criteria. Coronet has been unable to identify a complete set of leachability criteria appropriate to the Site because: (1) the input

[56] During the design of the Phase I and Phase II assessments, the EPA Region 4 RCRA group and the FDEP agreed that mercury was not associated with operations at the Coronet property and, consequently, that analysis was not necessary.

[57] Gamma spectroscopy will be used to determine the radium concentrations; this method will also provide concentrations for other gamma emitters in the uranium and thorium series.

values for the default criteria do not reflect the many different Site conditions; (2) identification of Site-specific criteria (following FDEP guidance) has produced only a handful of criteria that appear to be appropriate for evaluating Site conditions (refer to Appendix A); and (3) metals that are frequently detected at concentrations above the leachability screening criteria are not typically present in groundwater and surface water at concentrations above the groundwater or surface water screening criteria. In the absence of Site-specific leachability screening criteria, the extent of soil that may be a source of groundwater or surface water impact cannot be determined at this time and delineation to the lowest appropriate criteria cannot be completed.

7.1.1.1 Background

An area or areas that are geologically equivalent to the study area will be identified and jointly agreed to by the agencies and Coronet for determination of background soil quality ("background study areas"). Soil borings will be completed at various locations within these areas with soil samples collected continuously from the ground surface to termination within the Bone Valley Member. This will facilitate the collection of all representative natural soil types that might reasonably be expected to make up soils at the Site.

The soil will be classified in the field and representative samples submitted for classification based on geotechnical properties (including grain-size distribution), qualitative evaluation of mineralogical makeup, and chemical and radiological testing. The analytical parameters for background samples will be identified in the SAP. This information should provide a distinct "fingerprint" for each of the undisturbed soil types, potentially allowing for determining the natural factors that affect COI concentrations and differentiate the soil types (e.g., relative clay content, metalliferous mineral content, depositional regime), and providing a technically sound data base of background concentrations with which to judge the presence of contaminants in soil samples collected at the Site.

In addition to collecting soil samples for analysis of radiological parameters, the background conditions will also be evaluated through performance of a gross gamma survey, similar to that performed for the Coronet property (Section 7.1.3).

7.1.1.2 Leachability Screening Criteria

During development of the draft FSP, the EPA, the FDEP, and Coronet will review the existing database for the Site and develop a written program for identifying/developing Site-specific $SCTL_{GW}$ and $SCTL_{SW}$ for soil (and sediment) for pertinent COIs in groundwater and surface water, which may include additional sampling and analyses.

Delineation to the leachability screening criteria may be completed during the initial RI activities where feasible, but in many cases may not be determined until the RA is complete, as the RA will identify

those constituents that are constituents of concern (COCs) or constituents of ecological concern (COECs) which drive the need for remediation.

7.1.2 Perimeter Delineation

Soil samples will be collected along portions of Coronet property boundaries including those associated with each of the four discernable land areas: the main property (excluding the outparcels), Ouparcel A, Outparcel B, and Outparcel C.

One objective of this activity is to ensure that residential criteria are met at the Coronet property boundaries consistent with FDEP global-RBCA. As needed, additional sampling beyond and along the perimeter will be performed until such time as the contaminant concentrations for inorganic parameters (excluding radiological parameters) are below the appropriate screening criteria or at background concentrations (if background concentrations are higher than the screening criteria). In recognition of the potential need to delineate fluoride to the leachability screening criteria, the perimeter soil samples will also be analyzed for this parameter.

A second objective is to evaluate the concentrations of radionuclides, specifically Ra-226, along the perimeter. Additional sampling for radionuclides will be determined based on a confirmed background-based screening criterion. The background-based criterion may be the cleanup level for unrestricted land use developed for uranium mill tailing sites (i.e., Uranium Mill Tailings Radiation Control Act): 5 pCi/g Ra-226 above background for the top 15 centimeters of soil and 15 pCi/g Ra-226 above background for subsurface soil, averaged over 100 square meters.

7.1.3 Gross Gamma Survey and Radiological Testing

Coronet will perform a gross gamma radiation survey for the outparcels, golf course, area between Ponds 1S and 6, the Main Plant Area,[58] and the Pond 6 area. The precise areas and limits of the gross gamma radiation survey activities will be identified in the SAP.

The survey data will be used to characterize overall conditions and identify potentially impacted areas from which surface and subsurface soil samples would be collected for analysis of radionuclides. Soil samples will also be collected from locations having the entire range of gamma radiation readings to provide a more robust and unbiased data set and to provide data for determining area-weighted average concentrations of radionuclides. The quantified risk for these areas will be used to evaluate future potential land use, determine the need for remediation and, as warranted, identify alternatives appropriate to meet the specified land use(s) including institutional controls.

[58] The Main Plant Area survey will not include the Bone Yard which was thoroughly surveyed during the Phase II assessment.

Performance of a gamma radiation survey of the ponds is not appropriate because water provides a barrier to exposure. Coronet will perform a gamma radiation survey in portions of the intervening areas which can safely be accessed to evaluate conditions in these areas and identify locations for the collection of surface and subsurface soil necessary to perform the RA. As described above, the RA will be used to quantify risk, evaluate future potential land use, and determine the need for remedial action, including the possible need for institutional controls. Areas in which the survey will not be performed include those areas bounded by ponds and the Coronet property boundaries. These areas are typically wetlands, are too small for viable reuse, and have limited access.

The gross gamma survey will also be performed along the perimeter concurrent with the collection of soil samples described in Section 7.1.2 to document general conditions and identify potential locations which would warrant the collection of additional samples for analysis. Use of the detector will be limited in some areas due to very poor access conditions. Gamma radiation surveys along the perimeter will include measurements at the ground surface and at a height of approximately 1 meter above the ground surface. Measurements made at a height of 1 meter will be correlated to the measurement of external exposure rates at several locations spanning the range of gamma radiation readings. Linear surveying and sampling will be performed along Lexie Lane in the southeastern portion of the Coronet property, because it is used as a private lane for several residences.

As noted above, the areas in which the survey will be performed will be identified in the SAP.

Soil samples will be analyzed for radiological parameters. Until background radiological conditions are quantified and concentrations throughout the Coronet property are better understood, provisions for the collection and analysis of additional samples for the purpose of characterization or delineation cannot be defined. Radiological characterization is expected to be limited within the Coronet property boundary; however, indications of migration of radiological contaminants beyond the Coronet property as a result of Coronet Industries, Inc. activities, if any, may require further characterization.

7.1.4 Area-Specific Characterization (excluding the Main Plant Area)

7.1.4.1 Berms

Delineation within the berms relative to the human health screening criteria is not necessary due to the close proximity of most of these locations with the perimeter (where delineation is to be performed) and the few locations in which contaminants were reported at concentrations above these screening criteria. Further, the existing database for contaminants other than radiological parameters is sufficient to proceed with the RA for the pond areas. To address the radiological data gap, soil samples will be collected around the pond berms during the RI as discussed in Section 7.1.3.

7.1.4.2 Outparcels A, B, and C

Soil samples will be collected for analysis of metals and fluoride from locations throughout these three areas, including randomly-identified locations and locations proximate to those from which samples were previously collected. The gamma radiation survey data for these areas (Section 7.1.3) will be used to identify locations from which soil samples will be collected for analysis of radionuclides.

Delineation to the residential human health screening criteria and the background-based radiological screening criterion will be performed along the perimeter (Sections 7.1.2 and 7.1.3). The historical data (Figure 4-2) and data generated during the RI will be used to determine if a follow-up sampling program is warranted to delineate to the radiological and the residential or commercial/industrial screening criteria. Such delineation in this area is being considered because these outparcels are beyond the main property and to potentially increase the number of available future use scenarios.

The RA will quantify the potential risks associated with these areas, identify future potential use scenarios, and determine if a remedial action is necessary to meet such end uses.

7.1.4.3 Golf Course

The as-left conditions at the golf course following excavation as part of the Pond 6 removal action will be evaluated during the RI. Surface and subsurface soils will be collected for analysis of metals, fluoride, herbicides or a combination thereof from:

- locations that are identified using grid-based statistical sampling (including the area between Ponds 5 and 6) - to supplement the existing database and provide data for soil intervals necessary to the RA

- locations near undisturbed tees and greens - to evaluate the potential contribution of metals (e.g.., arsenic, copper) and organic compounds from application of herbicides (specifically, monosodium methane arsenate) in these areas

- locations using grid-based statistical sampling within used borrow areas (including former tee and green areas) - to establish current conditions

As discussed in Section 7.1.3, the gamma radiation survey data for this area will be used to identify locations from which surface and subsurface soil samples will be collected for analysis of radionuclides.

The existing data indicate the presence of only one contaminant (arsenic) above the commercial/industrial screening criterion and in only one location (SS-30). Based on the results for samples collected during the RI for metals, fluoride, and organic compounds, it may be necessary to perform additional characterization for the purpose of delineation or to support the evaluation of future use scenarios, and remedial alternatives.

The potential risk associated with the golf course soil will be used to evaluate future potential use scenarios, determine what, if any, remedial action is necessary to meet these end uses, and identify appropriate alternatives.

7.1.4.4 Area Between Ponds 1S and 6

The as-left conditions in this area following excavation for the Pond 6 interim removal action will be evaluated during the RI. Soils will be collected for analysis of metals and fluoride from randomly-identified locations; based on data generated during the Phase I and Phase II assessments, analysis for organic parameters is not warranted. As discussed in Section 7.1.3, the gamma radiation survey data for this area will be used to identify locations from which soil samples will be collected for analysis of radioisotopes.

Delineation relative to the commercial/industrial screening criteria will be performed during the RI to potentially increase the number of available future use scenarios. Delineation to residential and radiological screening criteria, regardless of remedial action in this area, will be addressed at the perimeter of the Coronet property.

The RA will quantify the potential risks associated with these areas, identify future potential use scenarios, and determine if a remedial action is necessary to meet such end uses.

7.1.4.5 Pond 6 Area

Following completion of the Pond 6 interim action and pursuant to the requirements of the Operation, Maintenance & Monitoring Plan (WSP 2007), soil samples were collected from the capped area and adjacent berms for analysis of inorganic parameters. The data will be used to quantify potential risk and, as appropriate, establish guidelines for exposure (e.g., grass cutting, cap maintenance) and to formulate appropriate institutional controls (e.g., deed restriction) or engineering controls for this area.

Based on the results and EPA's review of the data, it may be necessary to collect additional soil samples in this area for analysis of inorganic parameters as part of the RI. As noted in Section 7.1.3, a gamma radiation survey will be completed in this area and, as appropriate based on the results, soil samples will be collected for analysis of radiological parameters.

7.1.5 Main Plant Area Characterization

Delineation to the residential and commercial/industrial screening criteria for metals and fluoride, and delineation to the Ra-226 screening criteria will be addressed along the perimeter (Section 7.1.2). Delineation to the residential and commercial/industrial screening criteria for organic compounds will be completed with the Main Plant Area to eliminate the need to analyze for these parameters along the perimeter.

All of the samples collected in the Main Plant Area will be analyzed for metals and fluoride in anticipation of the potential need to complete delineation to the Site-specific leachability screening criteria for groundwater and surface water. Based on existing Site-specific leachability criteria for boron (groundwater and surface water protection) and fluoride (surface water) and the existing soil sample data, delineation to these criteria (which are lower than the human health screening criteria) is either complete or will be completed using data generated during the RI. Delineation to the Site-specific leachability screening criteria for arsenic in gravel(ly) soil (groundwater and surface water) will be completed at the perimeter as these criteria are higher than the human health screening criteria. Although there are no Site-specific leachability screening criteria for arsenic in sandy soil, it is anticipated that the criteria that will be identified (Section 7.1.1.2) will also be higher than the human health screening criteria and, thus, delineation will be complete at the perimeter.

A grid-based gamma radiation survey will be completed for the Main Plant Area to provide a more detailed picture of conditions than provided for during the Phase II assessment (Section 7.1.3). The survey will be used to identify locations from which soil samples will be collected for analysis of radioisotopes.

The following RI soil sampling and analytical program for metals and fluoride for the Main Plant Area is presented on an area-by-area basis or based on use (i.e., petroleum storage areas) similar to the discussion presented in Section 5.1.

- Process Water - Soil samples will be collected in the vicinity of the underground sections of the process water conveyance line: south of the Mineral Acid Tanks Storage Area and leading to the Nos. 3, 4, and 5 spray tower.

- CDP Production Area - Soil samples will be collected in the vicinity of the spray towers, scrubbers, and sumps in each of three kiln areas and in the vicinity of the Nos. 1 and 2 fluid bed reactors (including the storm water drain area). These areas were not specifically evaluated during the Phase II assessment and pose a potential to have been impacted by releases of process water. Within the Paragon Kiln/Feed Prep area, samples will also be collected to evaluate contaminant concentrations near the reclaim pile and the west scrubber (soil in the vicinity of the east scrubber was excavated [Area A2]).

  Although the Telleret Pavilion appears to be a potential source area (Section 5.1.1.2) the concentrations of metals above the residential screening criteria do not warrant further delineation as they are below the commercial/industrial screening criteria.

  Samples will be collected in the above areas to complete delineation of fluoride to the Site-specific leachability screening criteria for the protection of surface water.

  Samples will not be collected from the rock unloading and storage areas, craneway, mill room, product storage area, or near the former conveyors. Existing data for the storage areas (except the northern area which was impacted by activities in the KBF_4 Production and Mineral Acid Tanks Storage areas) and samples collected proximate to some of these other areas are consistent with conditions across the process area and reflect impacts from the

relatively ubiquitous presence of phosphate rock. Conditions in the rock unloading and other areas are therefore expected to be the same.

- KBF_4 Production Area - Soil in this area was excavated in the dry season to the water table and the area backfilled during the Pond 6 interim removal action (Area A2). The excavation was completed primarily to address the presence of concentrations of boron above the Site-specific leachability screening criteria (groundwater and surface water protection), but also addressed the presence of arsenic above the commercial/industrial human health screening criteria, and fluoride above the leachability screening criteria for surface water. Soil samples will be collected along the perimeter of the excavated area (including the area near SB-23 and the elevated rail) to determine if additional sampling is warranted to complete delineation for boron and fluoride (delineation of arsenic to the human health screening criteria is complete). Samples of the soil fill obtained from the golf course and placed in this area after excavation will also be collected for characterization purposes.

  Samples will be collected along the former inground flume, near SB-9, to delineate the presence of PAHs to the residential and commercial/industrial screening criteria. The analytical program will include testing for volatile organics and TRPH, which were not previously analyzed for in this area.

- Mineral Acid Tanks Storage Area - Soil in the vicinity of the northern tanks and northern rock storage area was excavated in the dry season to near the water table (Area A1). The excavation was completed primarily to address concentrations of boron above the Site-specific leachability screening criteria for groundwater and surface water protection, but also addressed the presence of arsenic above the commercial/industrial human health screening criteria, and fluoride above the Site-specific leachability screening criteria for surface water. Soil samples will be collected along the perimeter of the excavated area to determine if additional sampling is warranted to complete delineation for boron and fluoride (delineation of arsenic to the human health screening criteria is complete).

  Samples will also be collected around the southern tank area to complete delineation of boron and fluoride to the Site-specific leachability screening criteria; the program will include the collection of samples in the vicinity of the sump used to collect backflush from the tanks.

- Petroleum Storage Tank Areas - Samples will be collected proximate to each of the former tank areas (Tank Nos. 29, 32 and 33, 34, and 37) and the former Bunker C tank areas[59] to complete delineation of organic parameters (e.g., VOCs, PAHs, TRPH) to the residential and commercial/industrial screening criteria and the leachability screening criteria.

  Samples will be collected in the vicinity of the former underground gasoline storage tank (Tank No. 41) to evaluate conditions in this area following removal of the tank in early 2007. Additional samples will be collected as necessary to delineate the presence of contaminants to the residential and commercial/industrial screening criteria. The data will also be used to delineate the presence of these contaminants above the leachability screening criteria, if necessary. The samples will be analyzed for appropriate organic parameters.

[59] The Bunker C Tank West Area includes the area "beneath" the elevated rail near SB-23 and the former miscellaneous oil storage area. The Bunker C Tank East Area includes the "kiln trunnion area" near MMW-4 where LNAPL has been observed.

The presence and potential presence of LNAPL in the Bunker C tank areas will be evaluated and, as necessary, delineated.

- Bone Yard - Samples will not be collected from this area because the existing data are sufficient and indicate concentrations of contaminants consistent with the presence of soil and phosphate rock (i.e., it is not a source area).

- Mobile Equipment Shop, Drum Storage Area, and Paint Booth - Samples will be collected proximate to the Mobile Equipment Shop to delineate PAHs to the residential and commercial/industrial screening criteria. Samples will also be collected near the adjacent Drum Storage Area for analysis of inorganic and organic parameters to evaluate potential impact from waste handling. These samples and samples to be collected in the vicinity of the Paint Booth will be analyzed for benzene to complete delineation to the leachability screening criteria.

- Rail Beds - Samples will be collected from along the rail beds to evaluate the presence of PAHs. Samples will also be collected near SB-21, SB-24, and SB-34 to delineate PAHs to residential and commercial/industrial screening criteria; samples collected near SB-31 will also be analyzed for benzene to complete delineation to the leachability screening criteria. Samples of the soil fill obtained from the golf course and placed in Area B2 after excavation will also be collected for characterization purposes.

- Other Potential Source Areas - Potential source areas that were not evaluated during the Phase I and Phase II assessments include the laboratory/septic system area, substations, and the Research Building Area. Samples collected from the laboratory area will be analyzed for metals, fluoride, VOCs (based on the potential use of products containing these compounds in the lab) or a combination thereof. Because there is very little knowledge with regard to operations in the Research Building Area, samples collected in this area will be analyzed for target analyte list metals, TCL VOCs, semi-volatile organic compounds, pesticides, and PCBs, as well as fluoride and boron which are suspected of being associated with activities in this area such as boron and fluoride. Samples collected from the transformer areas will be analyzed for metals for general characterization purposes, TRPH (indicative of the presence of oil), and PCBs.

  Samples will be collected from the Research Building Area for analysis of radiological parameters. The locations will be selected based on the results of the gross gamma survey.

- General Conditions - Soil samples will be collected from locations within the Main Plant Area to provide additional general characterization data. The sample locations will not be identified randomly but will be selected to provide coverage in areas that were either not previously assessed or where there was low sample density.

7.1.6 Technology Data Requirements

Two of the preliminary remedial alternatives presented in Section 5.4 require additional data to evaluate potential technologies for handling soil containing benzene and TRPH: biological treatment and thermal desorption (Table 5-1). During the investigation of the petroleum storage areas described previously, samples will also be analyzed for parameters to support the technology evaluation. To

provide data that is representative of the most impacted material for use in evaluating technologies, a portion of the samples will be collected from known "hot spots."

7.2 Pond Water and Sediments

Further characterization of pond water quality is needed to support the evaluation of remedial alternatives. To provide updated information on the condition of water in the ponds, Coronet collected samples from each of the remaining ponds in September 2007 (i.e., not Ponds 3 or 6) for analysis of an abbreviated list of parameters relevant to the IWFP permit[60] and will collect samples from each of the remaining ponds during the RI for analysis of metals, general chemistry parameters (e.g., chloride, fluoride, sulfate, pH), and radiological parameters. Radiological testing will initially be performed for gross alpha, gross beta, Ra-226, and Ra-228. Analysis will also be performed for U-234, U-235, U-238, and Po-210 on samples with gross alpha concentrations above the screening criterion (15 pCi/l). If the gross alpha concentrations cannot be accounted for by radium, uranium, and polonium, analysis would then be performed for a supplemental list of appropriate radionuclides. The data will be used to evaluate changes in pond water quality over time to aid in the evaluation of a potential natural attenuation alternative. No further characterization is required for the evaluation of other potential treatment alternatives for pond water.

Further delineation of COIs in the pond sediments is not necessary given the observed similarities in distribution demonstrated by existing data. To support the evaluation of remedial alternatives for pond sediments, samples will be collected from Ponds 1S, 2/2A, 4, and 4A for analysis of total and modified SPLP metals, fluoride, and Ra-226. Samples of pore water will also be analyzed for these parameters to evaluate the potential relationship between sediment leaching and pore water.[61]

To evaluate the feasibility of stabilization/solidification technology for treating sediment, bench-scale testing of sediments is recommended. Coronet completed informal testing of the stabilization/solidification of sediments from Pond 6. A formal test plan to replicate a representative portion of the bench–scale tests previously performed by Coronet will be provided in a Treatability Study Work Plan.

7.3 Surface Water and Sediments

As stated in Section 4.5, the existing surface water and sediment sample database for the conveyance and seepage ditches and SEPSWD are adequate to evaluate risk and determine the need for

[60] These parameters include: arsenic, fluoride, cadmium, boron, total phosphorous, and specific conductance.
[61] Pore water in the sediment samples will be centrifuged from the sediment and analyzed and reported separately from the sediment leaching extract.

remediation. Further, delineation is not necessary as these are confined systems and the "extent" of contamination is bound by physical limits of the ditches. Similar to the ponds (Section 4.2.2.2), it may be necessary to obtain additional data to support the design for a selected remedy.

7.3.1 Miscellaneous Surface Water

The surface water COIs have not been delineated to the surface water screening criteria as illustrated in Figure 4-14. In June and September 2007, Coronet collected samples of surface water, sediment, or both on its property and beyond its property boundary; the locations are shown in Figure 7-1. The primary objectives of these activities were to evaluate "base flow" conditions in the dry season and conditions in the rainy season, and to delineate surface water COIs to below the screening criteria. Based on the results, which will be presented in the FSP, surface water samples will be collected from a portion of these locations during the RI to complete delineation, as necessary.

Ditches historically used to transfer storm water runoff from the Main Plant Area are present in Outparcel B. The larger (north-south) ditch is shown on Figure 7-1; the smaller (east-west) ditch runs along the southern boundary of the outparcel and discharges to the larger ditch. Coronet will collect several additional samples from this outparcel during the RI which will be used in conjunction with the soil sample data and "in consideration of future storm water management needs" to determine if the ditches are to remain and if further evaluation or remediation is necessary.

Based on a review of information largely obtained from the FDEP (FDEP 2004a and 2004b), Coronet understands that there are two ditches and a swale within the Research Building Area. Ditches south and north of the rail spurs convey water to Howell Branch; the southern ditch receives runoff from this area, the westernmost portion of the Main Plant Area, and the rail bed, and the northern ditch receives runoff from the golf course and rail bed, and is believed to have historically intercepted seepage from Pond 1S. A swale present between the spurs accumulates storm water runoff from the rail beds. These three areas may receive discharges from the Research Building (other than storm water) based on the FDEP's observations of various pipes in these areas. To evaluate conditions in this area, Coronet will collect surface water samples from these areas during the RI; to the extent possible, the locations will be in areas upstream and at or immediately downstream of any identified discharge points.

The RI sampling and analytical event will also include the collection of surface water samples from some of the historical sampling locations (e.g., Pond East) to evaluate current conditions and potentially identify trends in the data.[62]

[62] It is Coronet's intent to implement this sampling program concurrent with a semi-annual groundwater and surface water monitoring program.

Surface water samples collected during the RI will be analyzed for metals, general chemistry parameters (e.g., chloride, fluoride, sulfate, pH), and radiological parameters. The radiological testing will be identical to that for pond water. Surface water samples collected in the Research Building Area will also be analyzed for TRPH.

7.3.2 Miscellaneous Sediment

The COIs associated with the sediment samples collected from miscellaneous locations (i.e., those primarily along and beyond the Coronet property boundary) have not been delineated to the SQAGs. The existing data and data for samples collected in June and September 2007 will be used to evaluate delineation to these screening criteria and the need for additional sampling and analysis during the RI. The RI sampling and analytical program will also include the collection of sediment samples from the Research Building Area and Outparcel B coincident with the surface water samples.

Delineation to the leachability screening criteria cannot be performed at this time due to the absence of screening criteria appropriate for evaluating Site conditions. Once these values are identified, delineation may be performed if warranted based on the results of the RA.

The sediment samples collected during the RI will be analyzed for metals, fluoride, and radiological parameters. Similar to the soil analytical program, radiological testing for sediment will include analysis for Ra-226 and Ra-228 with certain samples to be analyzed for U-234, U-235, U-238, Po-210, and Pb-210 to confirm equilibrium conditions.

7.4 Groundwater

Groundwater activities to be completed as part of the RI include the delineation of COIs above the groundwater screening criteria, installation of additional monitoring wells, an evaluation of the residential well conditions relative to Site conditions, a preliminary evaluation of remedial technologies (including monitored natural attenuation), and construction of a hydrologic flow and transport model.

7.4.1 COI Delineation, Well Installation, and Groundwater Sampling and Analysis

In March and April 2007, Coronet installed 13 additional surficial monitoring wells and 4 intermediate aquifer monitoring wells to complete delineation of the groundwater COIs. Groundwater samples were collected from these and nearby wells in May 2007. These data and data collected during the September 2007 semi-annual monitoring event will be reviewed to determine if the reported concentrations are consistent with anticipated conditions or if confirmatory sampling is warranted, and if delineation is complete or additional downgradient well installation is necessary. The data will be presented in the FSP and used to determine the need for additional evaluation during the RI.

During dismantling of the plant several of the surficial aquifer monitoring wells were damaged or destroyed: MW-31, MW-32, MMW-5, and MMW-10 were destroyed and MMW-2, MMW-3, MMW-4, MMW-11, and MMW-13 were damaged such that they can no longer be used to determine groundwater elevations. During the RI, MW-32 will be replaced with MW-32R which will be installed due south of MW-32 and due west of MW-31. The location (Figure 7-1) is within the plume identified at MW-32 and downgradient of the KBF_4 tanks area. MW-31 will not be replaced as downgradient conditions are being monitored by MW-30. None of the MMW-series wells will be replaced because there are more than adequate wells remaining in this area.

Four surficial monitoring wells will be installed in the southern portion of the Coronet property during the RI in areas not previously evaluated (Figure 7-1):

- MW-76 will be installed in the vicinity of the Nos. 1 and 2 fluid bed reactors to evaluate potential impacts from operation of these units and from Tank No. 29
- MW-77 will be installed in the area south of and between the Nos. 3, 4, and 5 kilns spray tower, sumps, and scrubber area (the location is downgradient of MMW-10, which was destroyed)
- RTW-1 and RTW-2 will be installed in the Research Building Area

Grab samples of groundwater will also be collected from the Research Building Area. Data for the two new wells and grab samples will be supplemented with data for MW-71 which was installed along the downgradient property boundary in April 2007.

The RI sampling event, the scope of which will be presented in the FSP, will include analysis for metals, general chemistry parameters, and radiological parameters; analysis for organic parameters will be performed for certain wells in the Main Plant Area. The radiological testing will be similar to that for surface water except that analysis for Rn-222 will be performed for certain samples.

A Groundwater Findings Technical Memorandum which will include the findings of the May 2007 sampling event, the semi-annual monitoring events, and the RI sampling event will be prepared and submitted to the agencies. The memorandum is intended to provide the agencies with both up-to-date groundwater information for the entire Site and a means for documenting delineation well in advance of submitting the RI report.[63]

[63] Coronet understands that completion of delineation activities does not necessarily mean that further characterization of groundwater may not be necessary during the RI, particularly in support of the groundwater modeling effort.

7.4.2 Residential Well Evaluation

Due to the current limited information available on residential well construction, specifically the zones from which these wells obtain water, evaluation of the analytical data for the private wells relative to data for the groundwater monitoring wells may not be meaningful. Therefore, the RI will include provisions for monitoring groundwater quality within those zones from which nearby residents may be reasonably be expected to with obtain water, rather than attempting to evaluate the residential well data. The scope of such activities will be defined in the SAP and incorporated into the groundwater investigation activities. The results and evaluation of the data, which may include data for residential wells about which construction information is obtained during closure (Sections 2.3.2 and 3.3.2), will be presented in the RI report

7.4.3 Evaluation of Remedial Technologies

Data will be generated during the RI to evaluate activated alumina and iron-oxide nano-particles as groundwater treatment technologies. Analysis for dissolved silica will be performed on representative samples of groundwater from the vicinity of Ponds 2, 4, and 6, and the Main Plant Area to evaluate the feasibility of using activated alumina. Bench-scale testing is recommended to evaluate the feasibility of the innovative groundwater treatment technology of iron-oxide nano-particles; a bench–scale test plan, using representative samples of groundwater, will be provided in a Treatability Study Work Plan.

Coronet has initiated a preliminary evaluation of the viability of monitored natural attenuation as a remedial alternative for groundwater. To date, the evaluation has included the identification of likely two-end-member mixing zones (i.e., plumes with a single COI source that mix into unperturbed, ambient, receiving groundwater) that are test cases for determining if COIs (namely arsenic, boron, fluoride, and radium) are conservative or reactive in the aquifers during transport away from the source areas. Concentrations of several bulk and minor cations and anions have been measured, along with the COIs, in surface water and groundwater at monitoring points along the identified plumes, to provide conservative tracers against which the behaviors of the COIs are compared. In addition, data on the major ion chemistry of source area and ambient groundwater, as well as other factors potentially affecting COI fate and behavior (e.g., oxidation-reduction potential, arsenic and other ion speciations, pH, dissolved oxygen content) have been collected to characterize the water masses. To the extent that COIs are found to be reactive in the aquifers, the characterization of source and ambient water bulk chemistries will help in recognizing possible reaction tendencies toward stable COI species, states, or phases and the potential irreversibility of those reactions.

Two series of piezometers were installed in March 2007 to provide additional groundwater monitoring locations within two of the test case plumes for use in evaluation of the potential MNA

remedial alternative. PZ-1A and PZ-1B were installed downgradient of PZ-1 and possible source area Pond 1S. PZ-30A and PZ-30B were installed between possible source area well MW-30 in the Paragon Kiln Area and downgradient well MW-64 (Figure 7-1).

Coronet will prepare a Technical Memorandum that outlines the findings of the preliminary assessment of MNA and identifies additional work necessary to complete the evaluation as part of the RI/FS and consistent with federal guidance and state rule (EPA OSWER Directive 9200.4-17P and FDEP RBCA Rule 62-780.690).

7.4.4 Hydrologic and Contaminant Transport Modeling

A hydrologic model of the Site will be developed to determine the inter-relationship between groundwater and surface water and to provide a foundation for assessing the future potential extent of contaminants in these systems. The information obtained from the modeling efforts will be used to help determine the need for remediation; the models themselves would be available for use to evaluate various remedial alternatives in the FS and to aid in the design of selected alternatives.

A scope of work for the modeling effort is presented in Appendix D. As stated in that document, Coronet anticipates that the conceptual model will identify data gaps necessary to complete and calibrate the numeric models (e.g., aquifer testing, water level monitoring). To the extent practicable, actions to address these gaps will be performed during the RI and the results incorporated into a hydrologic model report which will be submitted as part of the RI report.

8.0 Risk Assessment

The EPA CERCLA program has developed and refined a framework for evaluation of potential human health and ecological risk from exposure to chemicals and radionuclides in the environment. Risk assessment is a regulatory process that uses information about the toxicity of chemical and radiological substances to estimate a theoretical level of risk for people or ecological receptors potentially exposed to those substances. It is important to understand the context of the risk assessment process before drawing conclusions from a risk assessment report. The risk assessment process is used to determine if levels of site-related constituents in the environment pose an unacceptable risk as defined by regulatory standards and requirements.

8.1 Human Health Risk Assessment

An HHRA consistent with the reuse assessment presented in Section 5.2 will be included in the RI report. The HHRA will incorporate approaches consistent with EPA guidance including the standard EPA Risk Assessment Guidance for Superfund (RAGS), Vol. I, Part A (EPA 1989) and subsequent updates (EPA, 1991a, 1991b, 1997a, 2000a, 2001b, 2001c, 2002). The HHRA also will incorporate FDEP-specific risk assessment requirements established in Chapters 62-777 and 62-780, F.A.C., and associated technical guidance (FDEP 2005b). The FDEP guidance will be used to supplement, but not supersede EPA guidance.

The objective of the HHRA will be to identify those constituents in environmental media that currently pose or may in the future pose a potential risk of adverse health effects for exposed human receptors. If necessary, the quantitative results of the RA will be used to calculate Remedial Goal Options (RGOs) which will be used to support the FS and final Site-wide remedy selection.

The risk assessment process, in general, involves the following major steps:

- data evaluation and refinement of COPCs
- exposure assessment
- toxicity assessment
- risk characterization
- uncertainty analysis

8.1.1 Data Evaluation and Refinement of COPCs

Section 5 outlines the current understanding of the nature and extent of COIs at the Site based on the Phase I and II assessments. The Phase I and II data, supplemented by additional sampling conducted by Coronet as described in Section 7, will be the primary sources of data used in the human health risk

characterizations. Additional data from samples collected by the FDOH or other agencies also may be used to evaluate potential risks outside the Coronet property boundary.

For groundwater, the maximum detected concentrations for COIs will be compared to the FDEP GWCTLs to develop an initial list of COPCs (the FDEP GWCTLs meet, or exceed the federal maximum contaminant levels and maximum contaminant level goals (40 CFR Parts 141 and 142).

For soil, the list of COPCs will be identified by comparing the maximum detected constituent concentration in the data from each exposure unit (described below) to the EPA Region 9 residential PRGs and the FDEP residential SCTLs.

8.1.2 Exposure Assessment

The Exposure Assessment will consider the environmental fate and transport of the identified COPCs and the potential pathways by which humans could be exposed. This requires a description of the exposure setting in terms of the natural environment and local land use and demographics. The purpose of this description is to provide the information needed to identify potential exposure pathways and receptors, and the estimation of exposure factors (e.g., amount of soil ingestion, amount of water consumed) for the receptors.

8.1.2.1 Exposure Units

Potential reuse scenarios for the Site have been considered and are described in Section 5.2. The five areas within the Coronet property that will comprise the exposure units for HHRA purposes (Figure 5-2) include:

- outparcels A, B, and C
- former golf course area
- Main Plant Area, including the Research Building Area
- former process ponds
- holding ponds, adjacent wetlands, and intervening land

Exposure units for areas beyond Coronet's property will be based on current parcel boundaries for neighboring properties, as appropriate, and will be evaluated using the risk-based screening levels described in Section 8.1.1 to identify potential concerns related to current or future land use.

Surface soil data from the 0 to 0.5 feet below ground surface (ft-bgs) and 0.5 to 2 ft-bgs intervals will be used to estimate exposures to commercial/industrial workers, grounds maintenance worker, recreational users, and residents within the applicable exposure units. Construction workers will be assumed to be potentially exposed to a "mixed" soil horizon from ground surface to the water table (typically less than 4 feet in depth), within the applicable exposure units. For soil, complete exposure pathways will include the ingestion, inhalation, dermal routes of exposure, and external radiation

exposure. For the inhalation pathway, estimated airborne concentrations from volatilization and particulate emission of soil COPCs will be evaluated.

8.1.2.2 Exposure Point Concentrations

The estimation of risk requires some measure of the concentration of contaminants to which a receptor might be exposed. If one assumes random contact with soils across the exposure unit, the best parameter for use as an exposure point concentration (EPC) would be the 'true average' of the contaminant concentration across the exposure unit. However, the 'true average' is never known and can only be estimated through sampling. Therefore, the sampling pattern used to develop an EPC is an important consideration.

While directed samples are well-suited for understanding the nature and extent of contamination they are less informative in determining the exposure unit average concentrations suitable as an EPC. Including data from biased samples in the calculation of an EPC violates the assumptions upon which the statistical inferences are drawn and often overestimates exposure. To address these concerns, the additional sampling discussed in Section 7 is generally based on the collection of discrete random samples intended to be representative of potential exposure within certain exposure units. In addition, use of area-weighted or geostatistical approaches might be appropriate in some situations to improve the estimate of an EPC. In this case, biased samples could be used in a statistically valid EPC calculation.

Typical EPA and FDEP procedures use a UCL of the average constituent concentration as an EPC for a given exposure unit. The result is a conservative EPC that guards against the possibility of sampling data that underestimates the true exposure unit average. For this Site, 95 percent UCLs will be calculated for each COPC based on the Phase I and II assessment data, supplemented by additional sampling described in Section 7. EPA's ProUCL software will be used to calculate 95 percent UCLs based on the data within each exposure unit. This program uses algorithms designed to select an appropriate calculation method to deal with the statistical issues presented by the sample data.

Because 95 percent UCLs may sometimes exceed the maximum detected concentration in the sampling data, EPCs will be estimated as the lower of the 95 percent UCL or the maximum detected concentration within an exposure unit. Estimated concentrations (i.e., those results with a J qualifier) will be included in the calculation of the 95 percent UCL.

8.1.2.3 Receptors and Exposure Factors

Six potential human receptors are identified in the preliminary CSM presented in Section 5:

- commercial/industrial workers
- grounds maintenance workers
- trespassers

- recreational users
- construction workers
- residents (limited to outparcels A, B, and C, the former golf course area, and beyond the Coronet property boundaries)

For all potential receptors, the exposure factors used in the HHRA will be consistent with those presented in relevant EPA and FDEP guidance. Coronet anticipates the preparation and submittal of a technical memorandum providing detailed exposure factors for the receptors to be evaluated in the RA.

8.1.3 Toxicity Assessment

Toxicity Assessment identifies estimates of the non-cancer toxicity and potential carcinogenicity for each COPC suitable for use with the dose estimates calculated in the Exposure Assessment step.

8.1.3.1 Chemicals

Standard EPA toxicity values (i.e., Reference doses [RfDs] for non-cancer effects and Cancer Slope Factors [CSFs] for cancer effects) will be used. These values will be obtained from the hierarchy sources listed in OSWER Directive 9285.7-53 (EPA 2003).

8.1.3.2 Radionuclides

The EPA has developed CSFs for a large number of radionuclides. These values will be obtained from the EPA's Health Effects Assessment Summary Tables (HEAST) (EPA 2001d). These values were updated in 2001 to incorporate information from Federal Guidance Report No. 13 (Eckerman et al. 1999), which used improved methods that account for age- and gender-dependence of radionuclide intake, metabolism, dosimetry, radiogenic cancer risk, and competing risks.

8.1.4 Risk Characterization

Risk Characterization makes use of the doses estimated in the Exposure Assessment coupled with the toxicity values identified in the Toxicity Assessment to calculate estimates of the potential non-cancer risk and theoretical excess cancer risk associated with site-related exposure to the COPCs. In addition to deriving these numerical estimates, the risk characterization provides an interpretation of the potential significance of the risk estimates by comparing them to regulatory guidelines indicating the need for addressing potential risks.

Upper bound cancer risks are estimated as the incremental probability of an individual developing cancer over a lifetime as a result of pathway-specific exposure to potentially carcinogenic constituents. Under the NCP (40 CFR Part 300), cancer risk levels are typically evaluated in relation to the EPA's target range of 1×10^{-4} to 1×10^{-6} for incremental cancer risk. Estimated upper bound excess cancer risk

levels less than 1×10^{-6} are considered to be not significant, and risk levels greater than 1×10^{-6} require further characterization, but not necessarily remedial action or other risk reduction measures. The FDEP, on the other hand, typically calls for risk reduction measures (i.e., engineering and/or institutional controls) at sites where cumulative upper bound excess cancer risk estimates exceed 1×10^{-6}.

For non-carcinogens, risks will be evaluated by calculating the ratio of the average daily intake during the exposure period to the RfD. This ratio is defined as a hazard quotient (HQ). For a given medium, HQs for each COPC will be summed to obtain a Hazard Index (HI). A HI greater than one indicates that potential health risks associated with the exposure medium cannot be ruled out. Further characterization of the HI in terms of specific target organs and/or mechanisms of toxicity may be necessary to evaluate potential non-carcinogenic health effects.

COCs will be identified as the COPCs that significantly contribute to a pathway in a use scenario for a receptor (e.g. commercial/industrial worker, construction worker) that either (a) exceed an upper bound excess cancer risk of 1×10^{-6} or (b) exceed a non-carcinogenic target organ/effect HI of 1. As discussed below, RGOs will be calculated for each COC.

8.1.5 Uncertainty Analysis

Consistent with standard risk assessment practice, a detailed discussion of the sources of uncertainty for the risk estimates will be provided. Analysis of the critical areas of uncertainty and identification of those expected to most significantly affect the results provides the risk manager with context for better understanding the assessment's conclusions.

8.1.6 Development of Remedial Goal Options

EPA Region 4 Guidance indicates that RGOs be presented for the risk manager's use as the last component of the HHRA (EPA 2000a). Constituent-specific ARARs will also be presented. RGOs will be calculated using the ratio method and target risk levels described in the EPA Region 4 guidance (EPA 2000a). The FDEP requirement that site-specific CTLs meet cumulative risk-targets established in Chapter 62-780, F.A.C., will also be considered in the development of RGOs as appropriate. The purpose of these receptor-specific and media-specific RGOs is to provide the risk manager with a range of risk-related media levels as a basis for determining the most appropriate remedial action alternatives.

8.2 Ecological Risk Assessment

The ERA will be conducted in accordance with EPA and FDEP guidance including *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessment* (EPA 1997b), and the *Guidelines for Ecological Risk Assessment* (EPA 1998).

The ERA will be conducted to evaluate whether hazardous substance releases have the potential to cause adverse effects to ecological resources. A brief overview of the methodology that will be used to conduct the ERA is provided in this section. The current EPA ecological risk assessment paradigm includes eight general steps (EPA 1997b):

Step 1 - Screening-Level Problem Formulation and Effects Evaluation
Step 2 - Screening-Level Exposure Estimate and Risk Calculation
Step 3 - Baseline Problem Formulation
Step 4 - Study Design and Data Quality Objective (DQO) Process
Step 5 - Verification of Field Sampling Design
Step 6 - Site Investigation and Data Analysis
Step 7 - Risk Characterization
Step 8 - Risk Management

Steps 1 and 2 are commonly referred to as the Screening-Level Ecological Risk Assessment (SLERA), while Steps 3-8 comprise the Baseline Ecological Risk Assessment (BERA).

Coronet anticipates that the following stand-alone deliverables may be provided as part of the ERA:

- A report summarizing the results of the SLERA (Steps 1-2), Screening Refinements (Step 3A), and if necessary, the Baseline Problem Formulation (Step 3B).
- A Step 4 Work Plan and Sampling and Analysis Plan for the BERA.
- A BERA report documenting the entire ERA process may be submitted as a stand-alone document or as a component of the RI report.

8.2.1 Screening-Level Problem Formulation and Effects Evaluation (Step 1)

The objective of Step 1 is to determine if viable ecological habitat exists for ecological receptors to receive direct or food chain exposure to Site-related constituents. In this step, the environmental surroundings, receptor species/assemblages, habitat/cover types, and relevant environmental and biotic transfer mechanisms related to the Site will be evaluated and described. This will be accomplished through a detailed and robust ecological habitat characterization, which will include a compilation of existing ecological information (Site history information, maps, aerial photos, natural resource databases, interviews, etc.) and Site reconnaissance activities to identify wildlife and vegetative communities.

A number of sources are available to assist in determining the appropriate habitat cover types and species inhabiting these areas. The Florida Natural Areas Inventory (http://www.fnai.org) provides

general habitat descriptions. The Florida Land Use Cover Forms and Classification System developed by the Florida Department of Transportation are also commonly used for land use and vegetative community mapping. National Wetland Inventory maps are also available for download from the United States Fish and Wildlife Service website at http://www.nwi.fws.gov.

As part of the ecological characterization, information regarding the presence of State- and Federal-listed threatened and endangered species, species of special concern, and wildlife and fisheries resources, special concern habitats, and natural areas within the general vicinity of the Site will also be obtained.

This information will be used to develop a preliminary CSM describing ecological pathways and receptors. Receptor species representing preliminary Assessment Endpoints will selected based on the likelihood of complete exposure pathways. Coronet anticipates that benthic invertebrates and fish, as well as selected species of mammals and birds that might utilize the terrestrial and aquatic areas of the Site and its vicinity will be identified based on field observations, the presence of suitable habitat, representation of a range of relevant trophic groups, and availability of exposure data. Specific descriptions of selected receptors, their habitat requirements, and presence on the Site will be presented in further detail in the SLERA report.

8.2.2 Screening-Level Exposure Estimate and Risk Calculation (Step 2)

The objective of Step 2 is to provide a conservative evaluation of the potential for adverse ecological effects associated with Site-related constituents in soil, sediment and surface water. Constituents of potential ecological concern (COPECs) will be identified by comparing the maximum detected concentrations to the ecological screening values (ESVs). In each medium, a screening HQ for each constituent will be calculated by dividing the maximum-detected concentration by its ESV. ESVs will be based on the lower of the FDEP screening criteria where available (e.g., fresh water SWCTLs and SQAGs) and EPA Region 4 ESVs for fresh surface water, sediment, and soil. Analytes with an HQ > 1 will be designated as preliminary COPECs. Constituents without available ESVs will also be retained as preliminary COPECs at this step.

8.2.3 Baseline Problem Formulation (Step 3)

Coronet anticipates that a number of COPECs will be identified based on the screening in Step 2 requiring additional evaluation. Based on current EPA Region 4 guidance, this evaluation is performed as part of Step 3. Following completion of Step 3, there is a Scientific Management Decision Point (SMDP) with two possible decisions: (1) No Further Action or (2) move forward with the BERA if the SLERA identifies media or areas with potential ecological risk. If risks are considered potentially significant at

Step 3, additional study such as biota sampling or toxicity testing may be deemed warranted. Step 3 of the ERA is broken down into two components which are discussed briefly below.

8.2.3.1 COPEC Refinement (Step 3A)

Because of the conservative assumptions used during the initial risk screen (Step 2), additional COPECs may be eliminated at the refinement stage. The refinement process streamlines the ERA by considering quantitative and qualitative elements that may be used in a weight-of-evidence approach at the SMDP. These refinement elements may include:

- information on ecological community structure/function
- background concentrations
- essential nutrients (calcium, iron, magnesium, sodium, and potassium)
- alternative screening values
- spatial distribution of COPECs
- frequency and magnitude of detection and screening value exceedences
- bioaccumulative properties of select COPECs

It may also be appropriate to perform literature-based food chain modeling as part of the Step 3A refinements. This involves identification of specific receptors that represent a preliminary set of Assessment Endpoints identified for the Site. These preliminary Assessment Endpoints will represent various trophic levels to ensure the protectiveness of the habitat-specific food web. Receptors specific to each exposure scenario will be selected based on consideration of factors such as (1) ecological relevance, (2) exposure potential, (3) sensitivity, and (4) availability of natural history information.

For each of these receptors, an exposure model would be constructed that characterizes how the receptor is exposed to the COPECs in environmental media and through the ingestion of prey. Inputs to these exposure models (e.g., receptor body weight, primary diet, food consumption rates, foraging range) would be identified in the literature. To estimate potential risk to these receptors, Toxicity Reference Values (TRVs) that characterize the potential toxicity to each receptor would also be identified. Toxicity data that are as relevant as possible to the preliminary Assessment Endpoints for the Site are selected from the scientific literature and used to develop TRVs through the application of appropriate uncertainty factors.

Exposure estimates are then compared to the TRV for each COPEC. When the estimated exposure is below the conservative safe level represented by a TRV, the corresponding HQ is less than 1 for that constituent. These constituents can be concluded to have insignificant potential to pose ecological risks for that receptor. On the other hand, when COPECs generate HQs greater than 1, it does not necessarily indicate that the ecological receptor is at risk. However, an elevated HQ is an indication that further evaluation may be warranted.

8.2.3.2 Baseline Problem Formulation (Step 3B)

The Problem Formulation for the BERA is conducted when COPECs are retained after the application of all appropriate refinement elements discussed in Step 3A. Step 3B serves as the foundation for the BERA and includes a more detailed toxicological evaluation of the COPECs, refinement of the Assessment Endpoints and CSM, and the development of risk questions and hypotheses.

8.2.4 Study Design and DQO Process (Step 4)

As appropriate, Step 4 includes the development of the Work Plan and Sampling and Analysis Plan for the BERA. This document, if deemed necessary, will be a stand-alone deliverable, and will identify Measurement Endpoints with which to quantitatively evaluate the selected Assessment Endpoints, Site investigation methods, sampling locations and media, and data reduction and interpretation techniques. The BERA Work Plan and Sampling and Analysis Plant developed in Step 4 provides the strategy for refining estimates of potential ecological impacts in a more site-specific, comprehensive manner. A SMDP at this step will be to reach consensus with the regulatory reviewers on the methods presented in the Work Plan and Sampling and Analysis Plan.

8.2.5 Verification of Field Sampling Design (Step 5)

The primary purpose of the field verification step is to ensure that the samples specified by the Sampling and Analysis Plan can be collected. Field verification will be conducted prior to initiation of activities under this plan; any modifications to the plan as a result of the field verification step will be approved by the regulatory reviewers.

8.2.6 Site Investigation and Data Analysis (Step 6)

Step 6 of the ERA process is the implementation phase of the BERA Work Plan that is developed in Steps 4 and 5. In the event that conditions during fieldwork may necessitate modifications to the Sampling and Analysis Plan, approval from the regulatory reviewers will be sought. Similarly, significant departures from the data analysis described in the plan will require approval from the regulatory reviewers, and all modifications will be documented.

8.2.7 Risk Characterization (Step 7)

Step 7 continues and expands the data analysis started in Step 6, and is the final step in the BERA process. Data analysis could be similar to the screening-level risk calculations from Step 3, but using Site-specific inputs or other exposure factors. Following a weight-of-evidence evaluation for each COPEC, a determination of whether there are significant indications of ecological risk is made.

Constituents that are retained at this stage will be classified as COECs and remedial goals will be developed for them.

8.2.8 Risk Management (Step 8)

In Step 8, information made available from previous steps in the BERA process will be used to determine whether remedial activities are warranted for specific areas or media and to present potential remedial options to address unacceptable risks.

9.0 Feasibility Study

The FS is the mechanism used to present the evaluation of potential remedial alternatives for the Site. Existing Site data, data to be generated during the RI, and the results of the RA will be evaluated to define the preliminary remedial action objectives. Based on the requirements set forth by the remedial action objectives to address risks identified for human health and the environment, the development, initial screening, and detailed analysis of remedial alternatives will be performed consistent with the procedures recommended in *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA 1988a).

The activities comprising the FS will be formulated to accomplish the following objectives:

- development of remedial action objectives and general response actions
- identification and screening of remedial technologies and process options
- development and screening of remedial alternatives

A preliminary review of alternatives was conducted as part of the Phase I and Phase II assessments, as discussed in Section 5.4. A full assessment of potential alternatives will be conducted during the FS based on the results from the RI and RA. The long-term aspects of the interim removal action being conducted at Pond 6 will be included in the evaluation of remedial alternatives.

9.1 Development of Remedial Action Objectives and General Response Actions

Based on the Phase I and Phase II data, and the data collected in the RI, the remedial action objectives will be developed. Before the development of these objectives, relevant Site conditions and contaminant pathways will be identified. The remedial action objectives will consist of medium-specific goals designed to protect human health and the environment, based on federal and state regulations designated as ARARs. The objectives will be as specific as possible without significantly limiting the range of alternatives that can be developed. The remedial action objectives will specify:

- the final COCs
- exposure routes and receptors
- an acceptable exposure level for each exposure route

Based on the objectives, general response actions will be delineated to address each of the Site problem areas and to meet the clean up goals and objectives. General response actions will describe those actions that will satisfy the remedial action objectives and may include treatment, containment, excavation, disposal, and institutional controls, or a combination of these. The response actions will form the foundation for the screening of remedial technologies, and will also include the "No Action" alternative as a baseline against which all other alternatives will be compared.

9.2 Identification and Screening of Technologies and Development of Alternatives

Based on the remedial action objectives and each identified general response action, potentially applicable technologies will be identified. A medium-specific, technology-based prescreening of potential technologies will be conducted to assess suitability as part of a remedial alternative. Technology prescreening criteria will be based on eliminating general response actions that cannot be implemented technically at the Site. To simplify the evaluation where several process options exist for a particular technology (e.g., soil cover, asphalt cover, multi-layer cap), the process option for which most data exist and where capacities or constraints match Site conditions will be selected to best represent the technology type. The specific process actually used to implement the remedial action may not be selected until the remedial design phase.

Technologies which may prove extremely difficult to implement, may not achieve the remedial action objectives effectively or in a reasonable time, or are not applicable or feasible based on the Site-specific conditions will be eliminated from further consideration.

The development of alternatives will require combining appropriate remedial technologies and process options retained after the screening step in a manner that will satisfy the Site remediation strategies or remedial action objectives. CERCLA guidance requires that remedial alternatives be developed in each of the following categories.

- An alternative for treatment that would eliminate, or minimize to the extent feasible, the need for long-term management (including monitoring) at the Site.
- Alternatives that would use treatment as a primary component of an alternative to address the principal threats at the Site.
- An alternative that relies on containment, with little or no treatment but is protective of human health and the environment by preventing potential exposure or by reducing mobility.
- A "No Action" alternative.

The removal action at Pond 6 will be considered in the development of alternatives for the FS. The Pond 6 removal action includes the installation of a groundwater interceptor trench around the perimeter of the pond. Short-term operation of the groundwater interceptor trench is designed to capture groundwater containing contaminants that have been released or may be released from the Pond 6 area as a result of the removal activities. Long-term potential groundwater impacts, the need for groundwater response, and the applicability of the Pond 6 groundwater interceptor trench as part of the long-term groundwater response will be evaluated during the FS. An option to permanently reduce the risk to residents using wells as their primary source of potable water (i.e., those that do not elect to connect to the

municipal system) that are potentially affected by the Site also will be included in the development of alternatives.

Based on the results of the RI and RA, the development of remedial alternatives will consider dividing the Site into operable units, as appropriate. In addition, the use of presumptive remedy policies and procedures (EPA 1993) may be incorporated as applicable to streamline the effort of identifying solutions for the Site and proceeding to subsequent phases.

9.3 Evaluation of Technologies and Remedial Alternatives

The list of potential remedial alternatives developed in the previous step will be screened. The objective of this effort will be to reduce the number of technologies and alternatives for further analysis while preserving a range of options. This screening will be accomplished by evaluating alternatives based on effectiveness, implementability, and estimated cost as specified in the EPA RI/FS guidance document (1988a). These screening criteria are briefly described below.

9.3.1 Effectiveness

The effectiveness evaluation will consider the capability of each remedial alternative to protect human health and the environment. Each alternative will be evaluated for the level of protection, and the reduction in toxicity, mobility or volume of contaminants which it would achieve.

9.3.2 Implementability

The implementability evaluation will be used to measure the technical and administrative feasibility of constructing, operating and maintaining a remedial action alternative. In addition, the availability of the technologies involved in a remedial alternative will also be considered.

Innovative or presumptive technologies will be considered during the screening process if there is a reasonable belief that they offer potential for better treatment performance or implementability, fewer adverse impacts than other available approaches, or lower costs than demonstrated technologies.

9.3.3 Cost

The evaluation of cost will include estimates of capital costs, annual O&M cost, and present worth analysis. These conceptual cost estimates will be order-of magnitude estimates, and will be prepared based on preliminary conceptual engineering for major construction components, and unit costs of capital investment and general annual O&M costs available. A technical memorandum summarizing the screening evaluations completed to this point will be provided for agency review.

9.4 Refinement of Alternatives Based on Treatability Study

In some cases, technologies have not been sufficiently demonstrated or characterization alone is insufficient to predict treatment performance or to estimate the size and cost of appropriate capital equipment. When this occurs, actual testing of the process or technology may be a cost-effective means of obtaining the necessary data. As appropriate, treatability testing will be used to evaluate a specific process or technology to help refine the remedy-selection process.

Section 7 of the Work Plan identifies two candidate technologies for which treatability studies will be performed during the RI to evaluate treatment of groundwater and sediment. Treatability studies will be conducted on the iron oxide nano-particle technology for treating groundwater and the stabilization and solidification technology for treating sediments. A technical memorandum summarizing the treatability studies will be provided for agency review.

After the results of the treatability studies are received and evaluated, the information will be incorporated into the FS process. The scope of the remedial alternatives under consideration and corresponding costs will be refined to reflect the information obtained.

9.5 Detailed Evaluation of Remedial Alternatives

The detailed analysis of alternatives will consist of analysis and presentation of relevant information needed to allow decision makers to select a Site-wide remedy. During the detailed analysis, each alternative will be assessed against the evaluation criteria described previously. The results of this assessment will be arrayed to compare the alternatives and identify the key tradeoffs among them.

The remedial alternatives that pass the initial screening will be evaluated further. The evaluation will be consistent with the requirements of the NCP, in particular, Section 300.430, and will consist of a technical, environmental and cost evaluation and an analysis of other factors, as appropriate.

The NCP (40 CFR Part 300.430) presents a set of nine evaluation criteria for the evaluation of each remedial alternative. Table 9-1 presents the nine evaluation criteria and the factors considered for each. A brief description of each criterion is provided below.

- Short-Term Effectiveness - This criterion addresses the effects of the alternative during construction and implementation, until the remedial actions have been completed and the selected level of protection achieved. Each alternative will be evaluated with respect to its effect on the community and Site workers during the remedial action, environmental impacts resulting from implementation, and the amount of time until protection is achieved.

- Long-Term Effectiveness - This criterion addresses the results of a remedial action in terms of the risk remaining at the Site after the remedial action objectives have been met. The primary focus is to determine the extent and effectiveness of the controls that may be required to manage the risk posed by treatment residuals and/or untreated wastes. The factors to be evaluated include the magnitude of remaining risk (measured by numerical standards such ascancer risk levels), and the adequacy, suitability and long-term reliability of management controls for providing continued protection from residuals (i.e., for assessment of potential failure of the technical components). The long-term effectiveness of the removal action at Pond 6, including the groundwater interceptor drain, will be evaluated relative to other permanent and less O&M intensive alternatives.

- Reduction of Toxicity, Mobility, and Volume - This criterion addresses the preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility or volume of the contaminants. The factors to be evaluated include the treatment process employed, the amount of hazardous material destroyed or treated, the degree of reduction expected in toxicity, mobility or volume, and the type and quantity of treatment residuals.

- Implementability - This criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during implementation. Technical feasibility will consider construction and operational difficulties, reliability, ease of undertaking additional remedial action (if required), and the ability to monitor its effectiveness. Administrative feasibility will consider activities needed to coordinate with other agencies (e.g., state and local) in regards to obtaining permits or approvals, if necessary, for implementing remedial actions.

- Cost - This criterion will address capital costs, annual O&M costs, and present worth analysis. Current EPA guidance (2000b) will be used as appropriate during the cost estimating process.

  Capital costs consist of direct (construction) and indirect (non-construction and overhead) costs. Direct costs include expenditures for the equipment, labor, and material necessary to perform remedial actions. Indirect costs include expenditures for engineering, financial, and other services that are not part of actual installation activities but are required to complete the installation. Annual O&M costs are post-construction costs to ensure the continued effectiveness of a remedial action. These costs will be estimated to provide an accuracy of +50 percent to -30 percent.

  To the extent necessary to demonstrate the required accuracy of cost estimates for remedial alternatives that may require long-term operating costs, a groundwater model may be employed during the detailed evaluation, if appropriate.

  A present worth analysis will be performed to evaluate expenditures that occur over different time periods by discounting all future costs to a common base year (e.g., usually the current year). This will allow the cost of remedial action alternatives to be compared on the basis of a single figure representing the amount of money that would be sufficient to cover all costs associated with the remedial action over its planned life. EPA guidance (2000b) for determining an appropriate discount rate will be considered during the performance of the FS.

- Compliance with ARARs - This criterion will be utilized to determine how each alternative complies with federal and state requirements designated as ARARs. These include chemical-specific, action-specific, and location-specific requirements. The evaluation will summarize which requirements are applicable to an alternative and which requirements are relevant and appropriate.

- Overall Protection of Human Health and the Environment - This criterion will provide a final check to assess whether each alternative meets the requirement that it is protective of human health and the environment. The overall assessment of protection will be based on a composite of factors assessed under the evaluation criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs.

- State Acceptance - This criterion will evaluate the technical and administrative issues and concerns the State may have regarding each of the alternatives. The factors to be evaluated include those features of alternatives that the State supports, reservations of the State, and opposition of the State.

- Community Acceptance - This criterion will incorporate public concerns into the evaluation of the remedial alternatives. Community input will be incorporated from public comment from public meetings. This criterion will be addressed in the ROD once comments on the proposed plan have been received.

After each of the remedial alternatives has been evaluated against the nine criteria, a comparative analysis will be performed. The analysis will compare all the remedial alternatives relative to each other with respect to the nine evaluation criteria. This is in contrast to the preceding analysis in which each alternative was analyzed independently.

10.0 RI/FS Reporting

This section summarizes the information to be provided in the RI/FS project submittals. With the exception of the monthly status reports (and general correspondence), both paper and electronic copies of the documents will be provided to the EPA and FDEP; monthly status reports will be provided only electronically. The contents of the Phase I and Phase II assessment reports meet the guidance requirements for a preliminary site characterization summary; consequently, a separate summary document will not be provided.

Coronet will provide 6 paper copies of the appropriate documents to the EPA Remedial Project Manager and 2 copies to the FDEP Project Manager. For ease of distribution and reproduction, each paper copy will be accompanied by a CD containing the document. For the RI and FS reports, both initial and final versions will be prepared and distributed.

10.1 Monthly Status Reports

Coronet will submit monthly status reports to the EPA and the FDEP. The reports will include the following topics:

- technical issues, including:
  - a summary of work completed during the previous month to comply with the Settlement Agreement
  - general discussions regarding analytical results received; data review activities; development, screening, and detailed analysis of alternatives findings; unanticipated findings; modifications to the approved scope of work
  - description of any and all actual or anticipated problems and solutions developed to address such problems
  - a summary of work to be performed during the next two months and implications of this work on the overall RI/FS schedule

- scheduling issues, including:
  - an updated project schedule
  - description of any and all actual or anticipated delays and their durations, and solutions developed to address such delays

- correspondence submitted, including a list of:
  - interim project documents (e.g., technical memoranda)
  - general correspondence
  - notable electronic correspondence

The reports will be submitted electronically by the 15th of each month, commencing the first month after the effective date of the Settlement Agreement and ending the month after submittal of the final FS report.

10.2 Technical Memoranda

Sections 7, 8, and 9 of this Work Plan identify the technical memoranda related to the RI, the RA, and the FS that may be submitted. In summary, these include:

- Groundwater and Surface Water Quality Technical Memorandum, which will summarize the results of groundwater and surface water sampling events implemented subsequent to completion of the Phase II assessment through to and including the RI sampling event, for the purpose of updating the agencies and determining if any additional delineation or investigation is required during the RI

- Monitored Natural Attenuation Technical Memorandum, which will summarize the results of the preliminary evaluation performed to date, assess the feasibility of this remedial alternative, and outline a program for generating additional data (if necessary) and assessing the findings as part of the RI

- Interim deliverables related to the ERA, which will include the SLERA and screening refinements, which comprise Steps 1, 2 and 3a of EPA's 8-step ERA process. Other elements of the ERA process, such as the Baseline Problem Formulation (Step 3b) and the Baseline ERA Work Plan (Step 4), if deemed necessary, also may be provided as technical memoranda

- Human Health Exposure Assessment Technical Memorandum, which will provide detailed information on the Exposure Unit boundaries, the human receptors to be evaluated in the RA, and the exposure factors proposed to quantitatively estimate exposure for those receptors

- Treatability Study Evaluation Technical Memorandum, which will provide the results of any treatability testing completed during the FS activities

- Remedial Alternatives Development and Screening Technical Memorandum, which will provide a discussion of the approach used for the development of the remedial alternatives, identification of the remedial alternatives being considered, and the results of the screening process

As appropriate, Coronet will submit additional memoranda, data, or other information to the agencies from time to time. Such submittals may be used to achieve consensus on an issue or to apprise interested parties of Site conditions as they are evaluated.

10.3 RI Report

The RI report will be a stand-alone document. The report will provide the data and findings pertinent to understanding Site conditions that were generated during the Phase I and Phase II assessments; the more recent work completed under the existing RCRA 3013 order; the results of any activities performed pursuant to this Work Plan; and the results of the semi-annual groundwater and surface water monitoring events.

Coronet anticipates that the RI report will include the RA in its entirety, such that final determination regarding the need for remedial action based on both human health and ecological risks can be presented. To facilitate prompt review of the RI report, and recognizing that the completed ERA may not be available until after completion of the HHRA, the RI report could be submitted without the ERA (if necessary) and the ERA be subsequently submitted as an addendum to the RI report.

The RI report will include that information required by the EPA RI/FS guidance (1988a) as appropriate for the Site. The anticipated general contents are identified below.

- Site Background - to include a presentation of the general characteristics of the Site including the Site setting; historical activities, e.g., mining activities, subsequent development and operations; and regulatory activities.

- Investigation Activities - to include a summary of field and other activities performed to characterize Site conditions; much of this information will be appended to the RI report to focus the report text on the findings as opposed to data generation.

- Site Characteristics - to include a presentation of the physical characteristics of the Site pertinent to understanding the nature and extent of contamination such as surface features, meteorology, geology, hydrogeology, hydrology (surface water and surface water/groundwater communication), adjacent land use, and ecological setting. Where appropriate, the report text will be enhanced by graphical representations of these characteristics to support a general understanding of the Site and to facilitate an understanding of the inter-relationships between many of these characteristics.

- Nature and Extent of Contamination - to include the identification of contaminant sources; contaminant delineation within soil, pond sediments, surface water and sediments, and groundwater. The text will include an update to the CSM, such that the relationship between sources and environmental media can be better understood. The text will be accompanied by tabulated analytical data with a comparison to ARARs, and various graphical presentations in plan or section view as appropriate.

- Contaminant Fate and Transport - to include the identification of potential migration routes, a discussion of contaminant persistence, and a discussion of factors affecting migration. The report will include an evaluation of groundwater migration based on a preliminary evaluation of monitored natural attenuation as one of the remedial action alternatives for groundwater.

- Human Health and Ecological Risk Assessments - to include a refinement of the COIs for human and ecological receptors; identification of receptors, exposure pathways, and receptor intake; toxicity assessment; and risk characterization. The report will evaluate current and foreseeable future Site-specific risks to human receptors based on reasonable maximum exposure estimates. Central tendency risk estimates may also be provided if warranted. The potential for ecological risk will be evaluated according to EPA's 8-Step ERA process. At a minimum the results of the SLERA and screening refinements (Steps 1-3a) will be documented. Additional steps of the ERA process will be completed as warranted. All evaluations presented as technical memoranda will be incorporated into the final RI report.

- Summary and Conclusions - to include a summary of findings relative to the nature and extent of contamination, contaminant fate and transport, and results of the RA, and conclusions relative to any additional data needs and the recommended remedial action objectives.

10.4 FS Report

An FS report will be prepared to summarize the activities performed and to present the results and associated conclusions drawn from the FS process. The report will include a summary of laboratory treatability studies (if performed), a description of the initial screening study process, and the detailed evaluations of the remedial action alternatives studied. The FS report will be prepared and presented in the format consistent with RI/FS guidance (EPA 1988a) and *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study* (EPA 2000b).

Coronet anticipates that the FS report will include an executive summary and five major sections. The executive summary will be a brief overview of the FS and the analysis underlying the remedial alternatives which were evaluated. The remainder of the report will include the following:

- Introduction and Site Background
- Identification of ARARs and TBCs
- Identification and Screening of Remedial Technologies
- Development and Initial Screening of Remedial Alternatives
- Description and Detailed Analysis of Alternatives

The introduction will provide background information regarding Site location and history and the nature of the problem, as identified through the various studies. A summary of hydrogeological conditions, remedial action objectives, the nature and extent of contamination, and the RA also will be provided. The feasible technologies and process options for Site remediation will be identified for each general response action, and the results of the remedial technologies screening will be described.

Remedial alternatives will be developed by combining the technologies identified during the screening process. The results of the initial screening of remedial alternatives, with respect to effectiveness, implementability, and cost, will be described.

A detailed description of the cost and non-cost features of each remedial action alternative passing the initial screening will be presented. The detailed evaluation of each remedial alternative with respect to nine evaluation criteria and a comparison of these alternatives also will be presented.

11.0 Project Schedule

Figure 11-1 presents the project schedule which commences the effective date of the Settlement Agreement and ends with the final monthly progress report following submittal of the revised FS report. Although the durations shown for Coronet's activities are binding, those for the agency reviews are not; the agency review periods are provided only for general information and planning purposes. Differences between the anticipated and actual duration of agency review periods will, naturally, impact Coronet's start/finish dates for associated activities. Notable issues and assumptions in the schedule follow.

- RI Activities
  - The RI field investigation schedule is based on the general scope of work identified in this Work Plan. The actual scope of the field investigation will be presented in the SAP. Because the precise scope of the field investigation is not known at this time, the schedule presented may not accurately reflect the final work scope. Coronet will, to the extent practicable, endeavor to meet the schedule presented in Figure 11-1.
  - The schedule does not include any time to address unknown data gaps. As soon as practicable following identification of any data gaps, Coronet will notify the EPA of the gap and identify a means of addressing it in the most timely fashion.
  - The schedule indicates that the gross gamma survey work must be done before completing the bulk of the soil sampling activity. This is necessary to facilitate the concurrent collection of soil samples for chemical and radiological analysis for most of the Site (i.e., areas other than background and perimeter).
  - The RI includes the collection of groundwater, surface water, and pond water samples in 2008; depending on the actual project schedule, this event may effectively replace a semi-annual event.
  - Laboratory deliverables are to be provided to Coronet within 35 calendar days of receipt of the samples. The schedule accounts for this period, one week to prepare a deliverable for the data validator, and three weeks for data validation.

- FS Activities
  - Treatability Study activities schedule is based on EPA approval of the Treatability Study Work Plan before commencement of RI activities in order to coordinate treatability sample collection with the RI fieldwork.
  - The schedule for completion of remedial alternatives development and screening is based on EPA approval of the technical memoranda for groundwater and surface water quality and monitored natural attenuation
  - Feasibility Study report completion is contingent on finalization of ARARs identification and completion of technical memoranda for human health exposure assessment and SLERA

12.0 Project Management and Coordination

The project organization chart is provided in Figure 12-1 and identifies the major lines of communication between the EPA, FDEP, and Coronet and its consultants, and between key members of these entities. Due to the various regulatory and technical complexities inherent in this project, secondary lines of communication between these agencies and Coronet will also be used to facilitate the successful completion of all RI/FS activities. Coronet will work diligently to promote interagency communication such that all are sufficiently informed and updated, to encourage a streamlined approach to decision-making.

To expedite the project schedule, Coronet will endeavor to communicate with both agencies via email and telephone. The outcome of such communication will be documented in the status reports as appropriate.

The majority of the RI/FS activities will be completed by WSP Environmental Strategies LLC, Pittsburgh, Pennsylvania. WSP completed all of the Phase I and Phase II assessment work, directed water treatment activities under the IFO, ACO and amended ACO, and designed and currently is overseeing the removal action at Pond 6. The RA will be completed by Environ International Corporation, Monroe, Louisiana; geochemical and hydrologeologic modeling expertise will be provided by Environ in Hartford, Connecticut and Tampa, Florida. Radiological expertise will be provided by Dr. John Frazier, Ph.D., CHP, Knoxville, Tennessee. These firms and the key technical personnel have extensive experience in completing projects under the CERCLA program, including experience in EPA Region 4. The EPA has approved of these consultants as provided in the Settlement Agreement. If Coronet wishes to obtain additional firms to support this team of consultants, Cornet will make a formal request to the EPA for approval of the firm and key project personnel.

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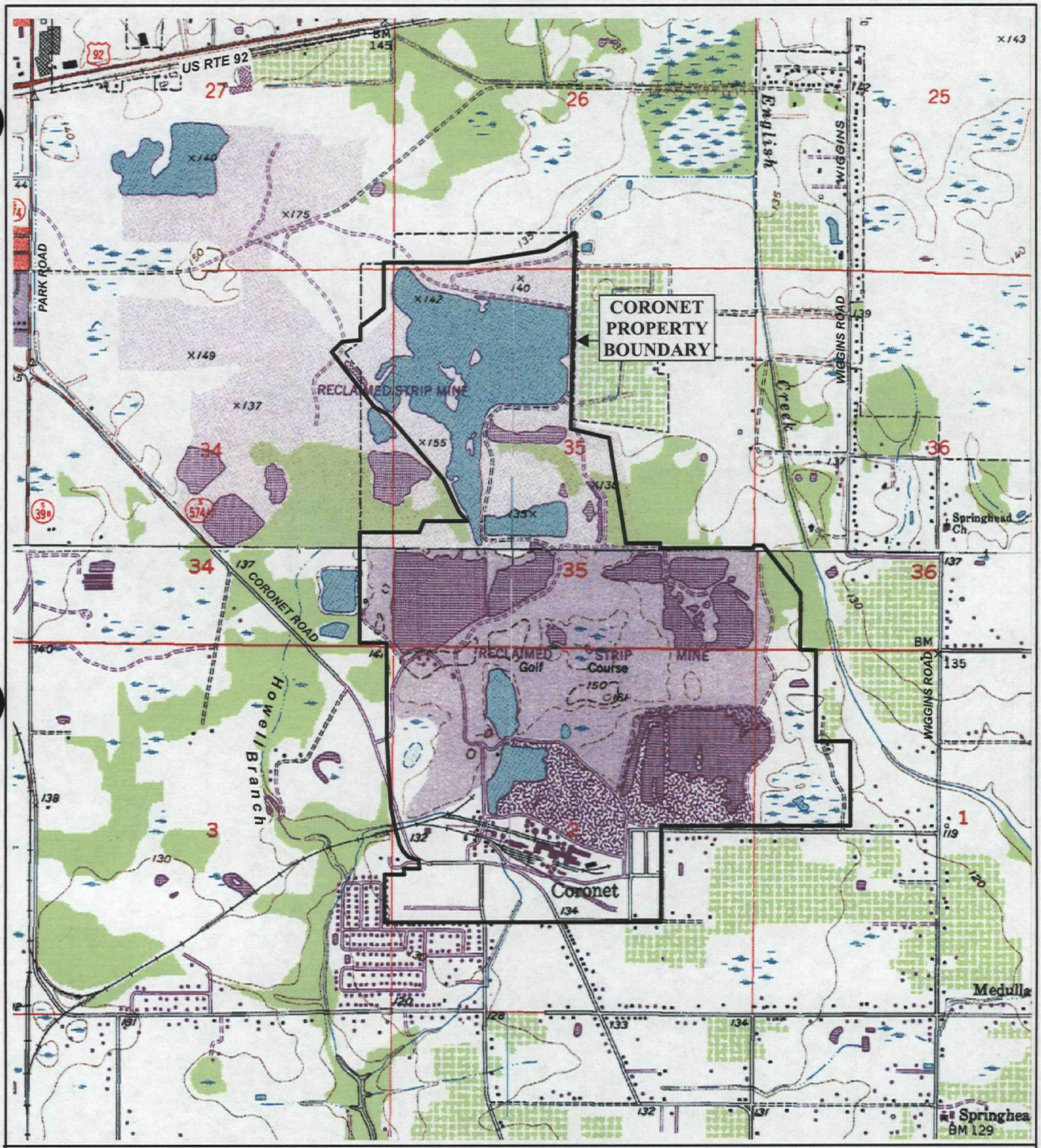

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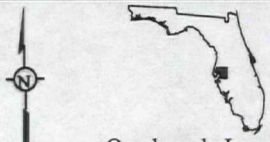
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CORONET INDUSTRIES, INC.

Appendix B
Map of Site
Administrative Settlement Agreement
and Order on Consent for
Remedial Investigation/Feasibility Study

127531

APPENDIX C

Coronet Site RI/FS Trust Agreement

This Coronet Site RI/FS Trust Agreement (the "Agreement") is entered into as of _____, 2007, by and between Coronet Industries, Inc. (the "Grantor") and de maximis, inc. (the "Trustee").

WHEREAS Grantor is the owner of the Coronet Industries Site ("Site") located at 4082 Coronet Road, Plant City, Hillsborough County, Florida, Latitude: 27° 59' 17" North, Longitude: 82° 04' 20" West;

WHEREAS the Site was the location of phosphate rock mining from approximately 1906 through approximately 1940, and manufacturing of phosphate-based commercial products from approximately 1946 through March 2004;

WHEREAS Grantor purchased the Site in 1993 and conducted manufacturing operations until approximately March 2004, when operations permanently ceased;

WHEREAS Grantor is working cooperatively with the U.S. Environmental Protection Agency ("EPA") and the Florida Department of Environmental Protection ("FDEP") to assess environmental conditions at the Site and to determine appropriate Site remediation measures;

WHEREAS the EPA and Grantor have agreed to enter into an Administrative Settlement Agreement and Order on Consent for Remedial Investigation/Feasibility Study, U.S. EPA Region 4, CERCLA Docket No. CERCLA-04-2008-3755 ("Settlement Agreement") regarding the performance of a Remedial Investigation/Feasibility Study at the Site as set forth in Respondent's RI/FS Work Plan attached as Appendix A to the Settlement Agreement;

WHEREAS the Settlement Agreement requires a performance guarantee for the Work to be performed, the amount of which is $1,000,000;

WHEREAS, the Settlement Agreement provides that Grantor may establish a trust as the mechanism to provide such a guarantee for performance of the Work; and

WHEREAS, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this Agreement, and the Trustee is willing to act as trustee.

NOW, THEREFORE, the Grantor and the Trustee agree as follows:

Section 1. Definitions.

As used in this Agreement:

(a) The term "Beneficiary" shall mean the EPA.

(b) The term "EPA" means the United States Environmental Protection Agency and any successor departments or agencies of the United States.

(c) The term "Grantor" means Coronet Industries, Inc. and any successors or assigns of the Grantor.

(d) The term "Trustee" means the Trustee who enters into this Agreement and any successor Trustee.

(e) The term "Work" shall have the same meaning as it has in the Settlement Agreement.

Section 2. Establishment of Trust; Purpose; Environmental Remediation Trust

(a) There is hereby established an express irrevocable trust under the laws of the State of Florida for the benefit of EPA. The trust so established shall be known as the "Coronet Site RI/FS Trust" and is referred to in this Agreement as the "Trust." The Grantor and the Trustee intend that no third party have access to the assets of the Trust except the Beneficiary as herein provided.

(b) The sole purpose of the Trust is to collect, hold, administer, and disburse funds to be used for the performance of Work as required by the Settlement Agreement. It is understood, however, that Grantor is not hereby admitting any liability with regard to the Site.

(c) The Trust hereby established is an environmental remediation trust as described in U.S. Treasury Regulation § 301.7701-4(e) with the Grantor treated as its owner for federal tax purposes. The Trust shall have no purpose of generating income or profit other than income generated by temporary investment of Trust assets, which income shall be incorporated into the corpus of the Trust and used exclusively for Trust purposes. The Trust has been organized with no objective to continue or engage in the conduct of a trade or business.

(d) Nothing in this Agreement precludes the EPA or Grantor from asserting any claims, causes of action, or demands for indemnification, contribution, or cost recovery against any persons not party to this Agreement. Grantor does not assign or convey to the Trust, and the Trustee expressly disclaims receiving, any right to indemnification, contribution, or cost recovery against persons not a party to this Agreement related to or arising from the performance of the Work or use of the Trust estate.

Section 3. Standby Trust.

This Trust shall remain dormant until funded, and while the Trust is dormant the Trustee shall have no duties or responsibilities beyond safekeeping this document. Upon funding this Trust shall become active and be administered pursuant to the terms of this Agreement.

Section 4. Trust Funding; Estate; Account; Recordation.

(a) The Trust shall be initially funded through Grantor's contribution of principal in the amount of $1,000,000 within 60 days of execution of the Settlement Agreement by EPA. Principal contributions shall consist of cash or securities acceptable to the Trustee, provided such securities are allowed under Section 6 of this Agreement.

(b) The Trust estate is comprised of all assets acquired by the Trust under the terms of the Settlement Agreement and this Agreement, and any income or other gains received by the Trustee in connection with investment of the assets held in the Trust estate. The Trust estate shall be held by the Trustee, IN TRUST, as provided herein. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount or adequacy of, nor any duty to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor established by the EPA.

(c) The Trustee shall establish an account called the "Coronet Site RI/FS Trust Account" ("Trust Account") to hold all monies of the Trust estate. The Trustee may establish such sub-accounts as are necessary or useful, in his or her discretion, to the exercise of the Trustee's rights, privileges, and powers hereunder. The Trust Account shall initially be established at Smith Barney/Citigroup and may thereafter be moved to a different financial institution upon written approval of EPA.

Section 5. Payment for Work.

(a) The Trustee shall make such payments from the Trust Account as the EPA shall approve to provide for the payment of the cost of the Work required pursuant to the Settlement Agreement. Compliance with the following claims procedures shall constitute EPA approval for payment:

(i) Grantor may submit invoices for performance of the Work required by the Settlement Agreement to the Trustee for direct payment without first paying such invoices, or, at its discretion, Grantor may pay any such invoices first and seek reimbursement from the Trustee.

(ii) All invoices submitted to the Trustee for direct payment and all claims for reimbursement shall be accompanied by a completed Claim Certificate signed by an officer of the Grantor in the format provided in Attachment 1 hereto, and shall simultaneously be submitted to EPA as provided in Section 15.

(iii) The Trustee shall pay all claims promptly after 20 days from the date of receipt of the Claim Certificate unless by that time the EPA has objected to, in whole or in part, the claim.

(iv) If EPA has objected to a claim in part, the Trustee shall promptly pay the undisputed portion of the claim.

(v) Grantor may resubmit any claim that was objected to, or any portion of a claim that was objected to in part, after consultation with the EPA, as provided in (ii) above. In such case, the Claim Certificate shall specifically recite a description of the consultation with the EPA and proposed resolution of the previously-objected to claim.

(vi) In the event that Grantor fails to perform the Work required by the Settlement Agreement, and the EPA undertakes a Work Takeover pursuant to Paragraph 94 of the Settlement Agreement, then the EPA as Beneficiary of the Trust shall provide notification to the Trustee of such Work Takeover. EPA's notification of the Work Takeover shall be in writing, which notification Trustee is expressly entitled to rely on.

Thereafter, EPA may submit invoices for performance of the Work to the Trustee for direct payment without first paying such invoices, or, at its discretion, the EPA may pay any such invoice first and seek reimbursement from the Trustee. Upon receiving such written notice from EPA, the disbursement procedures set forth in Sections 5(a)(i)-(v) above shall immediately be suspended, and the Trustee shall thereafter (subject to Section 9) make payments from the Fund only to such person or persons as the EPA may direct in writing from time to time for the sole purpose of providing payment for performance of Work required by the Settlement Agreement. EPA's reimbursement requests shall be submitted in substantially the same format as provided in Attachment 1 hereto and shall simultaneously be submitted to the Grantor. Further, after receiving such written notice from EPA, the Trustee shall not make any disbursements from the Fund at the request of the Grantor, including its representatives and/or contractors, or of any other person except at the express written direction of EPA (except for claims received by the Trustee before the Trustee received written notice of Work Takeover from EPA, which claims shall be processed by the Trustee in accordance with Sections 5(a)(i)-(v)). If EPA ceases such a Work Takeover in accordance with the terms of the Settlement Agreement (including after dispute resolution), EPA shall so notify the Trustee in writing and, upon the Trustee's receipt of such notice, the disbursement procedures specified in Sections 5(a)(i)-(v) above shall be reinstated. Nothing in this Agreement shall be constued to abrogate or alter in any way Grantor's right to invoke dispute resolution under the Settlement Agreement, including but not limited to invoking dispute resolution regarding Work Takeover or any cost incurred by EPA that is submitted to the Trustee for direct payment or reimbursement.

Section 6. Trustee Management.

The Trustee shall invest and reinvest the principal and income of the Trust estate in the Trust Account without distinction between principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this Section. In investing, reinvesting, exchanging, selling, and managing the Trust Account, the Trustee shall discharge his or her duties solely in the interest of the Beneficiary and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims, except that:

(a) Securities or other obligations of the Grantor, or any other prior owner or operator of the Site, or any of their affiliates as defined in the Investment Company Act of 1940, as amended, 15 U.S.C. 80a-2.(a), shall not be acquired or held, unless they are securities or other obligations of the Federal or a State Government;

(b) The Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon; provided, however that the Trustee shall only maintain enough money in cash in the Coronet Site RI/FS Trust Account, and any sub-accounts, as is reasonably anticipated to be necessary to make payments within approximately the next 90-120 days for Work required pursuant to the Settlement Agreement.

(c) Except as provided in Subsection (b), above, with respect to cash, the monies in the Coronet Site RI/FS Trust Account, and any sub-accounts, shall at all times be invested in one or more of the following: Money market funds rated "AAAm" or "AAAm-G" or better by S&P; obligations of, or obligations guaranteed as to principal and interest by, the United States or any agency or instrumentality thereof, when such obligations are backed by the full faith and credit of the United States; municipal obligations rated "Aaa/AAA" or general obligations of States with a rating of "A2/A" or higher by both Moody's and S&P; and commercial paper which is rated at the time of purchase in the single highest classification, "P-1" by Moody's and "A-1+" by S&P; provided, however, that no investment shall be made in any obligation listed above, which would mature more than 90 calendar days after the date of purchase without the written authorization of Grantor.

Section 7. Commingling and Investment.

The Trustee is expressly authorized in its discretion:

(a) To transfer from time to time any or all of the assets of the Trust estate to any common, commingled, or collective trust fund created by the Trustee in which the Trust is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and

(b) To purchase shares in any investment company registered under the Investment Company Act of 1940, 15 U.S.C. 80a-1 et seq., including one which may be created, managed, underwritten or to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote such shares in its discretion.

Section 8. Express Powers of Trustee.

Without in any way limiting the powers and discretions conferred upon the Trustee by the other provisions of this Agreement or by law, and subject to Section 6, the Trustee is also expressly authorized and empowered:

(a) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale consistent with this Agreement. No person dealing with the Trustee shall be bound to see to the application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition;

(b) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;

(c) To register any securities held in the Trust Account in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depository with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United

States Government, or any agency or instrumentality thereof, with a Federal Reserve bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Trust estate;

(d) To deposit any cash in the Trust Account in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the Federal or a State government; and

(e) To compromise or otherwise adjust all claims in favor of or against the Trust estate.

Section 9. Taxes and Expenses.

Except as provided below, any taxes of any kind that are liabilities of the Trust (excluding taxes on Trust income treated as liabilities of the Grantor under the Internal Revenue Code or other regulations) and all brokerage commissions incurred by the Trust shall be paid only from the income generated by the Trust estate, and all other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal and accounting services rendered to the Trustee, the compensation of the Trustee (to the extent not paid directly by the Grantor pursuant to Section 12), and all other proper charges and disbursements of the Trustee shall be paid only from the income generated by the Trust estate. Should the income generated by the Trust estate be insufficient to cover such taxes (if any) and expenses, the Trustee shall pay such excess taxes and expenses from the Trust estate and shall promptly request that the Grantor reimburse the Trust in the amount of the excess. Should Grantor fail to promptly reimburse the Trust in the amount of the excess, Grantor is deemed to have consented to a request from the EPA for an increase in the amount of financial assurance equivalent to the amount of the excess taxes and expenses pursuant to Paragraph 108 of the Settlement Agreement. Failure by the Grantor to provide such reimbursement to the Trust within 30 days of such request from the Trustee shall constitute a violation of Section XXVII of the Settlement Agreement, which could subject Grantor to stipulated penalties under Section XVII, Subparagraph 75(b)(v), of the Settlement Agreement.

Section 10. Accounting.

(a) The Trustee shall keep or cause to be kept proper books, records, and accounts of all transactions relating to the Trust and the Trust Account in such form and manner as will enable the Trustee to produce all reports and accountings called for in this Agreement.

(b) The Trustee shall semi-annually, at least 30 days prior to each semi-annual anniversary date of establishment of the Trust, furnish to the Grantor and to the EPA a statement confirming the value of the Trust estate and an accounting of claims, taxes, and expenses paid. Any securities shall be valued at market value as of no more than 60 days prior to the semi-annual anniversary date of establishment of the Trust. The failure of the Grantor to object in writing to the Trustee within 90 days after the statement has been furnished to the Grantor and the EPA shall constitute a conclusively binding assent by the Grantor, barring the Grantor from asserting any claim or liability against the Trustee with respect to matters disclosed in the statement.

(c) In accordance with U.S. Treasury Regulation § 301.7701-4(e)(2), no later than March 1 following the close of a calendar year during the Trust's term, the Trustee shall provide Grantor and the EPA with the following information:

(i) Schedule K-1 or similar schedule as attached to the Form 1041 for the Trust filed with the Internal Revenue Service for the calendar year reporting the items attributable to the Trust Account; and

(ii) A statement showing all items of income, deduction and credit of the Trust for the calendar year, including information necessary to determine which such items are deductible expenses and capital expenditures for the year.

(d) The Trustee shall reasonably cooperate with requests for accounting and tax information from Grantor or the EPA.

Section 11. Advice of Counsel.

The Trustee may from time to time consult with counsel, who may not be counsel to the Grantor, with respect to any question arising as to the construction of this Agreement or any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

Section 12. Trustee Compensation.

The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time to time with the Grantor. The Grantor shall be responsible for paying such compensation to the Trustee in accordance with such written agreement.

Section 13. Successor Trustee.

Any successor Trustee must be approved in writing by EPA and must not be affiliated with the Grantor. The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor trustee, EPA approves the successor Trustee, and this successor accepts the appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor Trustee the Trust estate. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instructions. The successor trustee shall specify the date on which it assumes administration of the Trust in a writing sent to the Grantor, the EPA, and the present Trustee ten (10) days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this Section shall be paid as provided in Section 9.

Section 14. Instructions to the Trustee.

All orders, requests, and other instructions by the Grantor to the Trustee, including claims, shall be in writing. The Trustee shall be fully protected in acting without inquiry in accordance with

the Grantor's orders, requests, and instructions. All orders, requests, and instructions by the EPA to the Trustee shall be in writing, signed by the EPA, or the designee, and the Trustee shall act and shall be fully protected in acting in accordance with such orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor or the EPA hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instructions from the Grantor and/or the EPA, except as provided herein.

Section 15. Notices; Representatives.

All notices, including but not limited to claims, orders, requests, instructions, and other submissions required by this Agreement shall be provided by overnight express or, for claims correspondence, electronic mail to the parties' and the EPA's representative(s) as follows:

Notices to the Trustee:

R. Thomas Dorsey, CFO
de maximis, inc.
450 Montbrook Lane
Knoxville, TN 37919-2705
(865) 691-5052
(865) 691-9835 (fax)
Tom@demaximis.com

Notices to Grantor:

David K. Denner
President and Chief Executive Officer
Coronet Industries, Inc.
4082 Coronet Road
(P.O. Box 760)
Plant City, Florida 33564
(813) 719-7204
corininc@yahoo.com

Notices to EPA:

Mr. Bradley Jackson
Remedial Project Manager
U.S. Environmental Protection Agency, Region 4
Atlanta Federal Center
61 Forsyth Street, S.W.
Atlanta, GA 30303
404-562-8925
jackson.brad@epa.gov

Ms. Colleen E. Michuda
Associate Regional Counsel
U.S. Environmental Protection Agency, Region 4
Atlanta Federal Center
61 Forsyth Street, S.W.
Atlanta, GA 30303
404-562-9685
michuda.colleen@epa.gov

Any party may change its representative(s) or their contact information by notice to all other parties as provided in this Section. In addition, the parties may agree in writing, on notice to the EPA, to an alternative form of notice where the alternative form of notice may be more cost-effective or efficient. Such alternative form of notice will not, however, be effective with respect to the EPA unless the EPA also consents in writing.

Section 16. Amendment of Agreement.

This Agreement may be amended only by an instrument in writing executed by the Grantor and the Trustee, with the written concurrence of the EPA, or by the Trustee and the EPA, if the Grantor ceases to exist, but only to the extent that such amendment does not revoke the Trust and is not inconsistent with the Settlement Agreement. The parties expressly recognize that, with the written concurrence of the EPA as may be appropriate in the circumstances, this Agreement may be amended to enlarge its purpose to serve as a mechanism for financial assurance for other Site projects beyond the Work required by the Settlement Agreement.

Section 17. Irrevocability and Termination.

Subject to the right of the parties to amend this Agreement as provided in Section 16, this Trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor and the Trustee, with the written concurrence of the EPA, or by the Trustee and the EPA, if the Grantor ceases to exist. The EPA's written concurrence may not be obtained until the Work has been completed and the EPA has provided written notification of completion of Work as provided in Paragraph 116 of the Settlement Agreement, unless otherwise agreed by the EPA in writing. Upon termination of the Trust, the remainder of the Trust estate, if any, less final trust administration expenses and taxes, shall be delivered to the Grantor, or, in the event the Grantor ceases to exist, shall be disposed of in accordance with the applicable provisions of governing law .

Section 18. Immunity and Indemnification.

The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any directions by the Grantor or the EPA issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the Trust estate, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, except in an instance of gross negligence or intentional

misconduct, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

Section 19. Choice of Law.

This Agreement shall be administered, construed, and enforced according to the laws of the State of Florida.

Section 20. Interpretation and Severability.

As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each Section of this Agreement shall not affect the interpretation of the legal efficacy of this Agreement. If any provision of this Agreement is adjudged to be void or unenforceable, the remainder of this Agreement shall remain in effect to the maximum extent permissible by law; provided, however, that if a material provision is adjudged void or unenforceable, the parties shall negotiate such amendment to this Agreement, consistent with Section 16 (including the written concurrence of the EPA), as may be necessary or appropriate to effectuate the intent of the parties as evidenced by this Agreement as a whole.

IN WITNESS WHEREOF the parties have caused this Agreement to be executed by their respective officers as of the date first above written.

Coronet Site RI/FS Trust Agreement

FOR GRANTOR

_____ _____

David K. Denner **Date**
President and Chief Executive Officer
Coronet Industries, Inc.
4082 Coronet Road
(P.O. Box 760)
Plant City, Florida 33564
(813) 719-7204
corininc@yahoo.com

Coronet Site RI/FS Trust Agreement

FOR TRUSTEE

_____	_____
R. Thomas Dorsey, CFO **de maximis, inc.** **450 Montbrook Lane** **Knoxville, TN 37919-2705** **(865) 691-5052** **(865) 691-9835 (fax)** **Tom@demaximis.com**	**Date**

Attachment 1 – Claim Certificate Form

To: Trustee, Coronet Site RI/FS Trust

This request for payment is made pursuant to Section 5(a)(ii) of the Coronet Site RI/FS Trust Agreement (Agreement) for:

____ direct payment of an invoice; or

____ reimbursement of an invoice already paid

for qualifying Work under Section 5. This request meets the criteria for payment set forth in the Agreement and is summarized as follows:

1. Date request submitted:

2. Citation to the RI/FS Work Plan as to the element of required work to which the qualifying cost relates:

3. Amount of the qualifying cost:

4. Payee for the qualifying costs:

5. Description of the qualifying cost:

6. Description of the attached documentation substantiating the cost [documents, such as invoices, to be attached]:

7. [For reimbursement of an invoice already paid by Grantor only] Proof of payment of the invoice:

8. Additional information [if any]:

A true and accurate copy of this request for payment and all attachments has been served upon the EPA on this date by _____.

[Signed]

[Coronet Officer]