Ohio Environmental Protection Agency

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

February 2, 2016

John A. Borell, Esq.,
Deputy Chief, Civil Division
Lucas County Prosecutor's Office
Adams and Erie Streets
Toledo, Ohio 43604

Re: King Road Landfill
Settlement Correspondence
Remedial Response
Lucas County
348000441007

Subject: King Road Landfill Site, 3535 King Road, Sylvania Township, Lucas County, Ohio; RD/RA Administrative Consent Order; Environmental Covenant

Dear Mr. Borell:

Enclosed is a certified copy of the signed, journalized RD/RA administrative consent order. Also enclosed is the signed, notarized environmental covenant, which is to be recorded in the Lucas County Recorder's Office. Please send a copy of the recorded environmental covenant to me. Should you have any questions in this regard, please call me, at 614-644-3037. Thank you for your cooperation in this regard.

Sincerely,

Mark J. Navarre
Supervising Attorney

Enclosures

ec: Leah Zedella / Mark Rickrich, DERR, CO (with enclosures)
Edward Onyia / Archie Lunsey, DERR, NWDO (with enclosures)
Tim Kern, AGO, EES (with enclosures)

cc: Thomas R. Hays, Esq., 8355 Island Lane, Maineville, Ohio 45039 (with enclosures)
Douglas G. Haynam, Esq., Shumaker, Loop & Kendrick, LLP, 1000 Jackson Street, Toledo, Ohio 43604 (with enclosures)

OHIO E.P.A.

FEB -3 2016

ENTERED DIRECTOR'S JOURNAL

BEFORE THE

OHIO ENVIRONMENTAL PROTECTION AGENCY

In the Matter of:	
Board of County Commissioners **Lucas County** **One Government Center, Suite 800** **Toledo, Ohio 43604**	**Director's Final Findings and Orders For Remedial Design and Remedial Action**
Respondents	
For the Site Known As:	
King Road Landfill **3535 King Road** **Sylvania Township** **Lucas County, Ohio**	

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

By [illegible] Date: 2-3-16

PREAMBLE

It is hereby agreed to by the Parties as follows:

I. JURISDICTION

1. These Director's Final Findings and Orders ("Orders") are issued to the Board of County Commissioners of Lucas County, Ohio ("Commissioners, pursuant to the authority vested in the Director of Ohio EPA under Ohio Revised Code ("ORC") §§ 3734.13, 3734.20, 6111.03, and 3745.01 and section 107(a)(4)(A) of CERCLA, 42 U.S.C. § 9607(a)(4)(A).

II. PARTIES BOUND

2. These Orders shall apply to and be binding upon Respondents and their successors in interest liable under Ohio law.

3. No change in ownership or corporate status of the Respondents, or of the Facility owned by Respondents, including but not limited to any transfer of assets or real or personal property, shall in any way alter Respondents' obligations under these Orders.

4. Respondents shall provide a copy of these Orders to all contractors, subcontractors,

laboratories and consultants retained to conduct any portion of the Work performed pursuant to these Orders. Respondents shall ensure that all contractors, subcontractors, laboratories and consultants retained to perform the Work pursuant to these Orders also comply with the applicable provisions of these Orders.

III. DEFINITIONS

5. Unless otherwise expressly provided herein, all terms used in these Orders or in any appendices shall have the same meaning as defined in ORC Chapters 3734 and 6111, and the rules promulgated thereunder. Whenever the terms listed below are used in these Orders or in any appendices, attached hereto and incorporated herein, the following definitions shall apply:

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

B. "Day" means a calendar day unless expressly stated to be a business day. "Business day" shall mean a day other than a Saturday, Sunday, or state holiday. In computing any period of time under these Orders, where the last day would fall on a Saturday, Sunday, or state holiday, the period shall run until the close of the next business day.

C. "Decision Document" means the remedial action selected by the Director of Ohio EPA for the Site as set forth in the documents attached to these Orders as Appendix A (2012 Decision Document) and Appendix B (2014 Modified Decision Document).

D. "Facility" means the Respondent Commissioners' facility located at 3535 King Road in Sylvania Township, Lucas County, Ohio.

E. "NCP" means the National Oil and Hazardous Substances Pollution Contingency Plan, codified at 40 C.F.R. Part 300 (1990), as amended.

F. "Ohio EPA" means the Ohio Environmental Protection Agency and its designated representatives.

G. "Paragraph" means a portion of these Orders identified by an arabic numeral or an uppercase or lowercase letter.

H. "Parties" means Respondents and the Ohio EPA.

I. "Remedial Action" ("RA") means those activities to be undertaken by Respondent Commissioners to implement and maintain the effectiveness of the remedy, as detailed in the final plans and specifications submitted by Respondent Commissioners pursuant to the Remedial Design and Remedial Action Work Plan and approved by Ohio EPA.

J. "Remedial Design" ("RD") means those activities to be undertaken by Respondent Commissioners to develop the final plans and specifications for the Remedial Action pursuant to the Remedial Design and Remedial Action Work Plan and approved by Ohio EPA.

K. "Remedial Design and Remedial Action Work Plan" ("RD/RA Work Plan") means the document submitted by Respondents and approved by Ohio EPA pursuant to the Performance of Work Section of these Orders.

L. "Respondents" mean the Board of County Commissioners of Lucas County, Ohio ("Commissioners") and their successors and assigns.

M. "Response Costs" means all costs, not inconsistent with the NCP, including, but not limited to, payroll costs, contractor costs, travel costs, direct costs, overhead costs, legal and enforcement related costs, oversight costs, laboratory costs, and the costs of reviewing or developing plans, reports, and other items pursuant to these Orders, verifying the Work, or otherwise implementing or enforcing these Orders.

N. "Section" means a portion of these Orders identified by a roman numeral.

O. "Site" means the King Road Landfill, located at 3535 King Road, Sylvania Township, Lucas County, Ohio where the historical releases or disposal of hazardous waste, and/or the discharge to waters of the state of industrial waste or other wastes have occurred, including any other area where such hazardous wastes, industrial wastes, and/or other wastes historically had migrated or threaten to migrate.

P. "Statement of Work" ("SOW") means the statement of work for the implementation of the Remedial Design and Remedial Action at the Site, as set forth in Appendix C to these Orders. The SOW is not specific to this Site, and shall be used as an outline in developing site-specific work plans.

Q. "Subject Property" means the footprint of the closed landfill, as described by the legal description in the attached Environmental Covenant (Appendix E).

R. "Transferee" means any future owner of any interest in the Site, including but not limited to, owners of an interest in fee simple, mortgagees, easement holders, and lessees.

S. "Waste Material" means (1) any "hazardous waste" under ORC §3734.01(J); (2) any "solid waste" under ORC §3734.01(E); (3) any "industrial waste" under ORC §6111.01(C); and (4) any "other waste" under ORC §6111.01(D).

T. "Work" means all activities Respondents are required to perform under the Performance of Work and Additional Work Sections of these Orders.

IV. FINDINGS

6. All of the findings necessary for the issuance of these Orders pursuant to ORC §§ 3734.13, 3734.20, 6111.03, and 3745.01 have been made and are outlined below. The Director of Ohio EPA has made the following findings:

A. The King Road Landfill (Site or landfill) is located at 3535 King Road, in Sylvania Township, Lucas County, Ohio. The landfill is within Section 20, Township 9 South, Range 6 East, of Sylvania Township.

B. The Site occupies a total of approximately 104 acres. The former Toledo, Angola, and Western Railroad right-of-way traverses the Site and provides separation between an approximate 25-acre former soil borrow area to the north and an approximate 79-acre disposal area to the south.

C. The 79-acre disposal area is bounded by the former railroad right-of-way to the north, King Road to the east, Covert Road to the south, and Silica Road to the west. Approximately 70 acres of this 79-acre disposal area are believed to have been disturbed by waste disposal activity. The former soil borrow area, now known as the Borrow Pit Pond, contains ponded water and marsh-like vegetation.

D. The key geologic and hydrogeologic features of the Site consist of a surficial sand layer extending to depths between 20 and 45 feet below the ground surface, which contains an unconfined aquifer with a water table typically found between one and eight feet below the ground surface. A silty to gravelly clay layer ranging from 3 to 35 feet in thickness is located beneath the surficial sand layer. Bedrock consisting of dolomitic limestone is found beneath the clay layer. A confined aquifer is contained within the dolomitic bedrock.

E. The Borrow Pit Pond is an apparent discharge area for the unconfined

aquifer. Ten Mile Creek is located west of Silica Road and is apparently both a discharge area for the unconfined aquifer and a recharge area for the confined aquifer. General groundwater movement in the unconfined aquifer is northwest toward Ten Mile Creek. Groundwater movement within the confined aquifer is east toward the Maumee River.

F. The Lucas County Commissioners purchased the Site in 1953. Landfilling operations commenced at the Site in January 1954 under the direction of the Lucas County Sanitary Engineer. The facility was operated by the County until May 8, 1967, when Park Forest Development, Inc. was contracted to operate the landfill. On March 15, 1970, the County again took over control of landfill operations.

G. Commercial waste haulers were prohibited from using the landfill on August 21, 1973, after which usage of the landfill gradually lessened. The County reportedly ceased waste disposal activities in December 1975. The County's final landfill permit expired in December 1975. Information was provided to the Agency documenting the acceptable closure in 1969 of an approximately 43-acre portion of the nearly 70-acre landfill. The remaining 27 acres of the 70-acre landfill were subject to closure under Ohio Administrative Code 3745-27-10(A)(2), effective July 29, 1976.

H. Upon opening in 1954, only local residents used the landfill. Gradually, commercial waste haulers and small municipalities began bringing their wastes to the facility. While the majority of disposed materials were believed to be general household refuse, disposal of some industrial wastes cannot be ruled out. During the time that Park Forest Development, Inc. operated the facility, the number of commercial and industrial waste haulers using the Site is reported to have increased. No disposal records are known to exist, but both solid and liquid wastes were reportedly accepted.

I. While open burning of the wastes was not typically an accepted practice, there are several reports of waste having caught fire during the operational life of the King Road Landfill. Due to the scarcity of records regarding landfill operations at the Site, it is impossible to determine the disposal rate at the facility over its entire period of operation. However, available records do indicate that the average volume of waste disposal between March 1970 and August 1973 was approximately 25,000 cubic yards per month. After commercial waste haulers were prohibited from using the facility in August 1973, the average volume of waste disposed reportedly decreased to approximately 5,000 cubic yards per month.

J. Since the cessation of waste disposal activities in 1975, Respondents supplemented the cover with clayey soils but few modifications to the facility have been made. Beginning in May 1980 and continuing through July 1991, a transfer station was operated near the main gate on King Road. In October 1991, a perimeter fence was installed to control Site access by unauthorized individuals.

K. A Remedial Investigation (RI) was conducted during 1993-94, and the results were issued in a November 1994 RI Report. A supplemental investigation was conducted in 1995 and a revised RI Report was issued in February 1996. The primary objectives of the RI investigation were to identify which contaminants were leaving the Site, the pathways through which this migration was occurring, and what risk to human health and the environment was associated with this migration. No investigation of deposited wastes was conducted.

L. A Feasibility Study (FS) Report identifying and evaluating a total of nine (9) remedial alternatives was completed in October 2002 for the Site. The FS Report is a compilation of the draft FS Report (nine alternatives), a modification of the FS Report to include an additional alternative (Alternative No. 10), and several iterations of an alternative (Alternative No. 11) submitted to Ohio EPA by the Lucas County Commissioners for consideration as an addendum.

M. A force-main interceptor sewer and associated pump station were installed in the 1993-94 period, at the northwest corner of the landfill along Silica Road. These facilities collect and transport landfill surface water runoff contaminated with landfill-derived leachate to the Lucas County Maumee River Wastewater Treatment System, a Publicly Owned Treatment Works (POTW). This collection and transport system was placed into service in May 1994.

N. In April 1993 explosive gas monitoring was initiated at the Site under an Order issued by the Director upon recommendation from Ohio EPA's Division of Solid and Infectious Waste Management. In the fall of 1996, a gas remediation trench was installed on the west side of the landfill, and six passive gas vents were installed near the south side of the landfill.

O. On December 4, 2008, the Lucas County Sanitary Engineer requested an exemption pursuant to ORC §3734.02(G) and OAC 3745-27-03(B), from the requirements to construct a composite cap system in accordance with OAC 3745-27-11(G). On April 16, 2009, the Director of Ohio EPA approved the request for exemption from the 2003 construction standards for a solid waste cap, such that an alternative cap may be installed. Threshold requirements for cap design must still be met; however, the exemption enables the threshold requirements of overall protection of human health and environment and

compliance with ARARs to be achieved.

P. On April 16, 2009, Ohio EPA issued a Preferred Plan outlining the preferred alternative to remediate contamination at the King Road Landfill site. The Preferred Plan was re-issued on November 29, 2010, based on the issuance of the April 16, 2009 exemption order from Ohio EPA allowing for use of a protective vegetative soil landfill cover instead of current capping requirements. Comments on the November 29, 2010 Preferred Plan were accepted during public meetings and comment periods.

Q. Based on the Preferred Plan and subsequent consideration of submitted comments, Ohio EPA issued a Decision Document on September 10, 2012, identifying the selected remedial alternative for the cleanup of the contamination at the site, and providing the rationale for the selection. The Decision Document was appealed to the Environmental Review Appeals Commission (ERAC) in early October 2012.

R. Subsequent to the issuance of the 2012 Decision Document and the associated ERAC appeal, information was provided to Ohio EPA documenting the acceptable closure in 1969 of an approximately 43 acre portion of the nearly 70 acre King Road Landfill. The thickness of the soil cover on the remaining 27 acre portion of the landfill was evaluated in June 2013. The resulting July 5, 2013 report indicated that the remedy will require the installation of additional soil cover on only about one (1) acre, located at the southwest corner of the western end of the landfill.

S. Based on an evaluation of all currently available information, Ohio EPA issued a Modified Decision Document on September 9, 2014, identifying the modifications to the remedial alternative originally selected for the cleanup of the site, and providing the rationale for the modifications. The 2012 Decision Document and the 2014 Modified Decision Document are attached hereto as Appendices A and B, and incorporated by reference herein.

T. The 2014 Modified Decision Document explained that in the selected remedy, portions of the soil cover in the remaining 27 acres were identified for further actions. The soil cover thickness in the 27-acre portion of the landfill was evaluated in June 2013. The resulting report issued July 5, 2013 indicated that only about one acre, located at the southwest corner of the western end of the landfill, had less than 24 inches of soil cover. Therefore, the remedial alternative in the 2012 Decision Document was modified by the 2014 Modified Decision Document to reduce the area of the landfill subject to additional cover.

U. Additional information was also provided to Ohio EPA regarding the "hot spot" ditch sediments and groundwater, which resulted in modifications and updates to the selected remedial alternative. Ohio EPA re-evaluated the "hot spot" ditch sediments (located on and just to the west of the landfill property). These sediments were to have been removed and either placed under the existing soil cover or properly disposed of off-site, pursuant to the 2012 Decision Document. Since the publication of the original RI and FS reports, including the previous risk assessment, applicable standards for many of the chemicals of potential concern were revised. Based on the evaluation of the RI data, the ditches were found to meet applicable risk goals and the hazard index for industrial receptors and residential receptors when arsenic was screened out of the risk assessment due to background levels. Therefore, the remedial alternative in the 2012 Decision Document was modified by the 2014 Modified Decision Document to eliminate the requirement to remove the ditch sediments.

V. Additional information was provided by and to Ohio EPA regarding the "No Well Zone" (NWZ) remedial component of the 2012 Decision Document. The specific limits of the NWZ were established after the 2012 Decision Document, based on Ohio EPA groundwater modeling (and discussions with the Respondents), to include a radius extending one-half mile from the landfill perimeter, to the north, east, west and southwest, and to Ten Mile Creek, a hydraulic barrier, to the west and northwest. Therefore, the remedial alternative in the 2012 Decision Document was modified by the 2014 Modified Decision Document to include the specific limits of the NWZ.

W. Respondents are each a "person" as defined in ORC §§3734.01(G) and 6111.01(I) and is or has been an "owner" or "operator" of a "facility" as that term is defined in ORC §3734.01(N).

X. The Site is a location where hazardous waste was released or disposed.

Y. Waste Material has been generated at the Site. The arsenic and other contaminants became Waste Material when they were released to the soil, ground water and surface water at the Site.

Z. Historically, because of their quantity, concentration, physical or chemical characteristics, the arsenic and other contaminants released at the Site constituted "hazardous wastes" as defined in ORC § 3734.01(J). The arsenic and other contaminants released at the Site constituted "industrial waste" or "other wastes" as defined in ORC §§ 6111.01(C) and (D).

AA. Ohio EPA concluded that conditions at the Site constituted a substantial

threat to public health or safety as provided in ORC §3734.20(B). Engineering controls have been implemented by the Respondents to mitigate this threat.

BB. The ground and surface waters at the Site are "waters of the state" as defined in ORC §6111.01 (H).

CC. The un-permitted discharge of Waste Material into waters of the state is prohibited under ORC §6111.04. However, in compliance with a December 1992 court order, Respondents constructed a pump and treat station along Silica Road adjacent to the Site, and by June 1994, the pump station commenced operation and intercepted leachate flow from the landfill.

DD. The migration and threatened migration of Waste Material into the ground water and/or surface water at or from the Site, constitutes pollution of waters of the state.

EE. The Work required by these Orders will contribute to the prohibition or abatement of the discharge of Waste Material to waters of the state.

FF. Ohio EPA has incurred Response Costs and continues to incur Response Costs associated with the Site.

GG. The actions to be taken pursuant to these Orders are reasonable and necessary to protect the public health or safety or the environment.

HH. The Director has given consideration to and based his determination on evidence relating to the technical feasibility and economic reasonableness of complying with these Orders and to evidence relating to conditions calculated to result from compliance with these Orders, and their relation to the benefits to the people of the state of Ohio to be derived from such compliance.

V. GENERAL PROVISIONS

7. Objectives of the Parties

The objectives of the Parties in entering into these Orders are to protect public health and safety and the environment from the disposal, discharge, or release of Waste Material at the Site through the design, construction, operation and maintenance of the remedy as set forth in the 2012 Decision Document, as modified by the 2014 Modified Decision Document.

8. Commitment of Respondents

Without admission of fact, violation or liability, Respondents agree to perform the Work in accordance with these Orders including but not limited to the SOW, all relevant guidance documents, and all standards, specifications, and schedules set forth in or developed pursuant to these Orders. Respondents also agree to reimburse Ohio EPA for all Response Costs and perform all other obligations of these Orders.

9. Compliance With Law

A. All activities undertaken by Respondents pursuant to these Orders shall be performed in accordance with the requirements of all applicable federal, state and local laws and regulations, and in a manner consistent with the NCP.

B. Ohio EPA expects that activities conducted pursuant to these Orders, if approved by Ohio EPA, would be considered necessary and consistent with the NCP.

C. Where any portion of the Work requires a permit, license or other authorization, Respondents shall submit applications in a timely manner and take all other actions necessary to obtain such permit, license or other authorization. These Orders are not, and shall not be construed to be, a permit, license or other authorization issued pursuant to any statute or regulation.

VI. PERFORMANCE OF THE WORK BY RESPONDENTS

10. Supervising Contractor

All Work performed pursuant to these Orders shall be under the direction and supervision of an employee or contractor with expertise in hazardous waste site investigation and remediation. Prior to the initiation of the Work, Respondents shall notify Ohio EPA in writing of the name of the supervising employee or contractor and any subcontractor to be used in performing the Work under these Orders.

11. Remedial Design and Remedial Action

A. Within twenty-one (21) days of the effective date of these Orders, unless otherwise mutually agreed to by the Parties, Respondents shall meet with Ohio EPA to discuss the requirements of the RD/RA Work Plan.

B. Within forty-five (45) days after the effective date of these Orders, unless otherwise specified in writing by Ohio EPA, Respondents shall submit to Ohio

EPA a work plan and schedule for implementation of the Work required under the Performance of Work Section of these Orders. The RD/RA Work Plan shall provide for the design, construction, operation and maintenance of the remedy as set forth in the 2012 Decision Document, as modified by the 2014 Modified Decision Document.

C. The RD/RA Work Plan shall be developed in conformance with the SOW, Appendix C of these Orders, and the guidance documents listed in Appendix D of these Orders, attached hereto and incorporated herein. If Ohio EPA determines that any additional or revised guidance documents affect the Work to be performed in implementing the RD/RA, Ohio EPA will notify Respondents, and the RD/RA Work Plan and other affected documents shall be modified accordingly.

D. Should Respondents identify any inconsistency between any of the laws and regulations and guidance documents that Respondents are required to follow in these Orders, Respondents shall notify Ohio EPA in writing of each inconsistency and the effect of the inconsistencies upon the Work to be performed. Respondents shall also recommend, along with a supportable rationale justifying each recommendation, the requirement Respondents believe should be followed. Respondents shall implement the affected Work as directed by Ohio EPA.

E. Ohio EPA will review the RD/RA Work Plan pursuant to the procedures set forth in the Review of Submittals Section of these Orders. Upon approval of the RD/RA Work Plan by Ohio EPA, Respondents shall implement the RD/RA Work Plan. Respondents shall submit all plans, reports, or other deliverables required under the approved RD/RA Work Plan, in accordance with the approved RD/RA schedule set forth therein, for review and approval pursuant to the Review of Submittals Section.

12. Health and Safety Plan

Within forty-five (45) days of the effective date of these Orders, Respondents shall submit to Ohio EPA for review and comment a health and safety plan developed in conformance with the guidance listed in Appendix D.

13. Operation and Maintenance Plan

The O&M Plan, including a schedule for implementation, shall be submitted in accordance with the approved RD/RA Work Plan. Ohio EPA will review the O&M Plan pursuant to the procedures set forth in the Review of Submittals Section of these Orders. Upon approval of

the O&M Plan by Ohio EPA, Respondents shall implement the O&M Plan. Respondents shall submit all plans, reports, or other deliverables required under the approved O&M Plan, in accordance with the approved O&M schedule set forth therein, for review and approval pursuant to the Review of Submittals Section of these Orders.

VII. ASSURANCE OF ABILITY TO COMPLETE WORK

14. Within ninety (90) days of the effective date of these Orders, unless otherwise specified in writing by Ohio EPA, Respondents shall establish and maintain financial security in the amount of Two million, Three Hundred Fifty-Two thousand Four Hundred Fifty-Six dollars ($2,352,456) in order to ensure performance and completion of the Work under these Orders. The financial security shall be a financial assurance mechanism approved by Ohio EPA. The May 23, 2014 letter to Ohio EPA from the Lucas County Auditor, demonstrating financial assurance of $7,000,000 for the landfill, is acceptable.

15. Verification of the existence and adequacy of the approved financial assurance mechanism shall be submitted to the Ohio EPA annually by the Respondents on the anniversary of the effective date of these Orders, or upon the request of Ohio EPA.

16. In the event that the Ohio EPA determines at any time that the financial assurance mechanism provided pursuant to this Section is inadequate, Respondents shall, within thirty (30) days of receipt of notice of Ohio EPA's determination, obtain and present to Ohio EPA another financial assurance mechanism to be approved by Ohio EPA. The Respondents may change the form of the financial assurance mechanism provided under this Section at any time, upon notice to and approval by Ohio EPA. Respondents' inability to demonstrate financial ability to complete the Work shall not excuse performance of any activities required under these Orders.

17. If Respondents can show that the estimated cost to complete the remaining Work has diminished below the financial security amount set forth in this Section, the Respondents may request that the amount of the financial security be reduced to the estimated cost of the remaining Work to be performed. This request for a reduction is available no more frequently than annually. Information relied upon in calculating the revised estimate of costs must be provided with the request for reduction. A reduction in the amount of the financial security can only be made with the approval of the Ohio EPA.

VIII. LAND USE AND CONVEYANCE OF TITLE

18. Environmental Covenant

Within forty-five (45) days after the effective date of these Orders, Respondents shall file for recording, in the Lucas County Recorder's Office, the executed Environmental Covenant

attached to these Orders as Appendix E. The Environmental Covenant must be recorded in the deed or official records of the Lucas County Recorder's Office. The terms and conditions of the Environmental Covenant are incorporated into these Orders and shall be binding upon Respondents.

19. Proof of Filing Environmental Covenant

Within forty-five (45) days after filing with the Lucas County Recorder's Office the executed Environmental Covenant, Respondents shall certify to Ohio EPA that the Environmental Covenant has been filed for recording, and shall include with the certification a file and date-stamped copy of the recorded Environmental Covenant. Upon each conveyance by Respondents of an interest in any portion of the Facility property, including but not limited to easements, deeds, leases and mortgages, Respondents shall include in the instrument of conveyance a restatement consistent with paragraph 10 of the Environmental Covenant. The terms and conditions of the Environmental Covenant are hereby incorporated into these Orders and shall be binding upon the Respondents. If the Environmental Covenant is violated or breached by Respondents, the Respondents shall be in violation of these Orders.

20. Land Use Self-Reporting Requirement

Respondents shall ensure that no portion of the Facility property will be used in any manner that would adversely affect the integrity of any security, monitoring, treatment or containment systems at the Facility property, or violate any activity and use limitations applicable to the Facility property under these Orders. Respondents shall submit on an annual basis until the year 2025, and thereafter upon request from Ohio EPA, written documentation verifying that required elements of the preferred alternative in the 2012 Decision Document (Appendix A), as modified by the 2014 Modified Decision Document (Appendix B), are implemented and operational.

21. Notice of Transfer of Property

Prior to each conveyance by Respondents of an interest in any portion of the Facility property, including but not limited to easements, deeds, leases and mortgages, Respondents shall notify Transferee of the existence of the activity and use limitations in the Environmental Covenant, and shall provide a copy of these Orders and the Environmental Covenant to Transferee. Respondents shall notify Ohio EPA at least thirty (30) days in advance of each conveyance of an interest in any portion of the Facility property. Respondents' notice shall include the name and address of the Transferee and a description of the provisions made for the continued access to and maintenance of the security, monitoring, treatment and containment systems.

22. Confirmation of Conveyance

Within thirty (30) days after each conveyance of an interest in any portion of the Facility property, the Respondents shall submit to Ohio EPA, the following information:

A. A copy of the deed or other documentation evidencing the conveyance;

B. The name, address, and telephone number of the new property owner and the name, address, and telephone number of the contact person for the property owner;

C. A legal description of the property, or the portion of the property, being transferred;

D. A survey map of the property, or the portion of the property, being transferred;

E. The closing date of the transfer of ownership of the property, or portion of the property.

IX. ADDITIONAL WORK

23. Ohio EPA may determine that in addition to the tasks defined in the approved RD/DA Work Plan, additional Work may be necessary to accomplish the Objectives of the Parties as provided in the General Provisions Section of these Orders and the SOW and guidance documents identified as Appendices C and D. Any additional Work proposed under this section shall not exceed the scope of the remedy selected in the 2012 Decision Document, as modified by the 2014 Modified Decision Document.

24. Within thirty (30) days of receipt of written notice from Ohio EPA that additional Work is necessary, unless otherwise specified in writing by Ohio EPA, Respondents shall submit a work plan and a schedule for the performance of the additional Work ("Additional Work Plan"). In addition, Respondents shall submit revisions for any other schedules impacted by the additional Work. To the extent the Respondents dispute that additional Work is necessary, Respondents shall initiate the procedures for dispute resolution set forth in the Dispute Resolution Section of these Orders within fourteen (14) days after receipt of Ohio EPA's notification of the need for additional Work. The Additional Work Plan shall conform to the standards and requirements set forth in the documents attached to these Orders as Appendices C and D. Upon approval of the Additional Work Plan and schedule by Ohio EPA pursuant to the Review of Submittals Section of these Orders, Respondents shall implement the approved Additional Work Plan in accordance with the revised

schedules contained therein.

25. In the event that Respondents determine that additional Work is necessary, Respondents shall submit an initial letter to Ohio EPA to explain why the additional Work is necessary, what the additional Work is, and what impact, if any, the additional Work will have on the overall Work schedule. If Ohio EPA concurs with the request for additional Work, Respondents shall submit an Additional Work Plan and schedule for the performance of additional Work. The Additional Work Plan shall conform to the standards and requirements set forth in the documents attached to these Orders as Appendices C and D. Upon approval of the Additional Work Plan and schedule by Ohio EPA pursuant to the Review of Submittals Section of these Orders, Respondents shall implement the approved Additional Work Plan in accordance with the schedules contained therein.

X. SAMPLING AND DATA AVAILABILITY

26. Unless otherwise agreed to by the Site Coordinators, Respondents shall notify Ohio EPA not less than seven (7) business days in advance of all sample collection activity. Upon request, Respondents shall allow split and/or duplicate samples to be taken by Ohio EPA or its designated contractor. Ohio EPA shall also have the right to take any additional samples it deems necessary. Upon request, Ohio EPA shall allow Respondents to take split and/or duplicate samples of any samples Ohio EPA takes as part of its oversight of Respondents' implementation of the Work.

27. Within seven (7) business days of a request by Ohio EPA, Respondents shall submit to Ohio EPA electronic copies of the results of all sampling and/or tests or other data, including raw data and laboratory reports, generated by or on behalf of Respondents with respect to the Site and/or the implementation of these Orders. An electronic copy shall be provided in a format approved by Ohio EPA. Respondents may submit to Ohio EPA any interpretive reports and written explanations concerning the raw data and laboratory reports. Such interpretive reports and written explanations shall not be submitted in lieu of laboratory reports and raw data. Should Respondents subsequently discover an error in any report or raw data, Respondents shall promptly notify Ohio EPA of such discovery and provide the correct information. Upon request, Ohio EPA agrees to provide Respondents electronic copies of the results of all sampling and/or tests or other data, including raw data and laboratory reports, generated by or on behalf of Ohio EPA with respect to the Site and/or implementation of these Orders.

XI. ACCESS

28. Ohio EPA and its contractors shall have access at all reasonable times to the Site

and any other property to which access is required for the implementation of these Orders, to the extent access to the property is controlled by Respondents. Access under these Orders shall be for the purposes of conducting any activity related to these Orders including but not limited to the following:

A. Monitoring the Work.

B. Conducting sampling.

C. Inspecting and copying records, operating logs, contracts, and/or other documents related to the implementation of these Orders.

D. Monitoring compliance with use restrictions.

E. Conducting investigations and tests related to the implementation of these Orders.

F. Verifying any data and/or other information submitted to Ohio EPA.

29. To the extent that the Site or any other property to which access is required for the implementation of these Orders is owned or controlled by persons other than Respondents, Respondents shall use their best efforts to secure from such persons access for Respondents and Ohio EPA and its contractors as necessary to implement these Orders. Copies of all access agreements obtained by Respondents shall be provided to Ohio EPA upon request. If any access required to implement these Orders is not obtained within thirty (30) days of the effective date of these Orders, or within thirty (30) days of the date Ohio EPA notifies Respondents in writing that additional access beyond that previously secured is necessary, Respondents shall promptly notify Ohio EPA in writing of the steps Respondents have taken to attempt to obtain access. Ohio EPA may, as it deems appropriate, assist Respondents in obtaining access.

30. Notwithstanding any provision of these Orders, the State of Ohio retains all of its access rights and authorities, including enforcement authorities related thereto, under any applicable statute or regulation including but not limited to ORC §§ 3734.20 and 6111.05.

XII. DESIGNATED SITE COORDINATORS

31. Within seven (7) days of the effective date of these Orders, the Respondents shall notify Ohio EPA, in writing, of the name, address and telephone number of their designated Site Coordinator and Alternate Site Coordinator. If a designated Site

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

32. To the maximum extent practicable, except as specifically provided in these Orders, communications between Respondents and Ohio EPA concerning the implementation of these Orders shall be made between the Site Coordinators. Respondents' Site Coordinator shall be available for communication with Ohio EPA regarding the implementation of these Orders for the duration of these Orders. Each Site Coordinator shall be responsible for ensuring that all communications from the other Party are appropriately disseminated and processed. Respondents' Site Coordinator or Alternate Site Coordinator shall be present on the Site or on call during all hours of Work at the Site.

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

A. Directing the type, quantity and location of samples to be collected by Respondent pursuant to an approved Work Plan.

B. Collecting samples.

C. Observing, taking photographs, or otherwise copying information related to the implementation of these Orders, including the use of any mechanical or photographic device.

D. Directing that the Work stop whenever the Site Coordinator for Ohio EPA determines that the activities at the Site may create or exacerbate a threat to public health or safety, or threaten to cause or contribute to air or water pollution or soil contamination.

E. Conducting investigations and tests related to the implementation of these Orders.

F. Inspecting and copying records, operating logs, contracts and/or other documents related to the implementation of these Orders.

G. Assessing Respondents' compliance with these Orders.

XIII. PROGRESS REPORTS AND NOTICE

34. Unless otherwise directed by Ohio EPA, Respondents shall submit a written progress

report on the implementation of the Work to the Ohio EPA on an annual basis by the tenth (10) day following the anniversary of these Orders. At a minimum, the progress reports shall include:

A. A description of the Work performed during the reporting period including an estimate of the percentage of the RD/RA completed.

B. A list of all target and actual completion dates for each element of activity including project completion.

C. An explanation for any deviation from any applicable schedule.

D. Summaries of all findings and sampling during the reporting period.

E. Summaries of all changes made in the RD/RA during the reporting period, indicating consultation with Ohio EPA and date of approval by Ohio EPA of those changes, when necessary.

F. Summaries of all contacts with representatives of the local community, public interest groups or government agencies during the reporting period.

G. Summaries of all problems or potential problems encountered during the reporting period, including those that delay or threaten to delay completion of project milestones with respect to the approved work plan schedule or Remedial Action Implementation Plan schedule.

H. Summaries of actions taken and/or planned to rectify or prevent problems.

I. Summaries of actions taken to achieve and maintain cleanup standards and performance standards.

J. Changes in personnel during the reporting period.

K. Projected Work for the next reporting period.

L. Copies of daily reports, inspection reports, sampling data, and laboratory/monitoring data, etc.

M. The quantity and disposition of the following media treated, removed, or contained as part of remedial activities under these Orders:

i. Soil treated or removed – Soil treated or removed shall be reported by

volume and soil contained shall be reported by area.

ii. Surface water load reduction - Load reduction shall address all contaminants of concern.

iii. Ground water treated, removed, or contained - Ground water treated shall be reported by volume and ground water contained shall be reported as an estimated area of the plume.

iv. Leachate treated, removed or contained - Leachate treated, removed or contained shall be reported by volume.

v. Sediments treated, removed, or contained - Sediments treated or removed shall be reported by volume and sediments contained shall be reported by area.

vi. Waste and debris treated, removed, or contained - Waste and debris shall be defined as regulated materials not otherwise covered in roman number i. through v. above. Waste debris treated or contained shall be reported by either volume or area as appropriate.

N. The disposition of contaminated soil, sediments, and waste material that was treated on or off site, or the disposal location for any quantity of contaminated ground water and/or surface water that was pumped and treated or disposed.

35. Progress reports (one copy only) and all other documents (two copies) required to be submitted pursuant to these Orders to Ohio EPA shall be sent to the following agency address:

Edward Onyia
Ohio EPA, Northwest District Office
347 N. Dunbridge Road
Bowling Green, Ohio 43402

Or e-mailed to Edward.Onyia@epa.ohio.gov

All written correspondence to Respondents shall be directed to:

Lucas County Board of Commissioners
One Government Center, Suite 800
Toledo, Ohio 43604

A Party may designate an alternative contact name or address upon written notification to the other Party and in accordance with the Designated Site Coordinator Section of these Orders, if applicable.

XIV. REVIEW OF SUBMISSIONS

36. Ohio EPA shall review any work plan, report, or other item required to be submitted pursuant to these Orders. Upon review, Ohio EPA may in its sole discretion: (a) approve the submission in whole or in part; (b) approve the submission upon specified conditions; (c) modify the submission; (d) disapprove the submission in whole or in part, notifying Respondents of deficiencies; or (e) any combination of the above. The results of Ohio EPA's review shall be in writing and provided to the Respondents. Approval or disapproval of submissions shall not be inconsistent with the NCP or with applicable federal or state statutes or regulations.

37. In the event of approval, approval upon condition, or modification of any submission by the Ohio EPA, Respondents shall proceed to take any action required by the submission as approved, conditionally approved, or modified by Ohio EPA.

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

39. In the event that Ohio EPA disapproves a revised submission, in whole or in part, and notifies Respondents in writing of the deficiencies, Respondents shall within thirty (30) days, or such longer period of time as specified by Ohio EPA in writing, either: (a) correct the deficiencies and incorporate all changes, additions, and/or deletions, and submit the revised submission to Ohio EPA for approval; or (b) initiate the dispute resolution process pursuant to Section XV, Dispute Resolution, of these

Orders. If Respondents fail to submit a revised submission incorporating all changes, additions, and/or deletions within thirty (30) days, or such period of time as specified by Ohio EPA in writing, or alternatively, fails to initiate the dispute resolution process pursuant to Section XV, Dispute Resolution, of these Orders, Respondents shall be considered in breach and/or violation of these Orders.

40. All work plans, reports, or other items required to be submitted to Ohio EPA under these Orders shall, upon approval by Ohio EPA, be deemed to be incorporated in and made an enforceable part of these Orders. In the event that Ohio EPA approves a portion of a work plan, report, or other item, the approved portion shall be deemed to be incorporated in and made an enforceable part of these Orders.

XV. DISPUTE RESOLUTION

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

42. The Respondents' written notification instituting the formal dispute resolution procedures shall include the technical rationale supporting the Respondent's position. If Respondents' written notice and technical rationale in support of their position are not received by Oho EPA within fourteen (14) days from the end of the informal dispute resolution period, the formal dispute resolution procedures may not be invoked for the disputed issue(s) and the dispute shall be considered resolved. Ohio EPA shall have thirty (30) days from the date the Respondents' formal written dispute position is received to reduce Ohio EPA's position to writing. Ohio EPA's writing shall include the technical rationale supporting Ohio EPA's position. Following the exchange of written positions, the Site Coordinators shall have an additional fourteen (14) days to resolve the formal dispute. If Ohio EPA concurs with the position of Respondents, then the work plan, report or other items required to be submitted pursuant to these Orders shall be modified accordingly.

43. If Ohio EPA does not concur with the Respondents' position, Ohio EPA's Site

Coordinator shall notify the Respondents in writing. Upon receipt of such written notice, the Respondents shall have fourteen (14) days to forward a written statement of the dispute to the Division of Environmental Response and Revitalization ("DERR") Assistant Chief and request a review of the decision regarding the dispute. If Ohio EPA does not receive such written statement and request from the Respondents within fourteen (14) days of Respondents' receipt of Ohio EPA's written notification of non-concurrence, Ohio EPA will adopt the written position of its Site Coordinator and the work plan, report, other item required to be submitted pursuant to these Orders, or any other item subject to the dispute resolution procedures of this Section shall be modified accordingly. If Ohio EPA receives such written statement and request from the Respondents within fourteen (14) days of Respondents' receipt of Ohio EPA's written notification of non-concurrence, the DERR Assistant Chief will resolve the dispute based upon and consistent with these Orders, the SOW, the work plans, and applicable federal and state laws and regulations. The decision of the DERR Assistant Chief is considered final for the purposes of these Orders.

44. The pendency of a dispute under this Section shall extend only the time period for completion of the tasks related to the matters in dispute, except that upon mutual agreement of the Parties, any time period may be extended as is deemed appropriate under the circumstances. Elements of the Work not affected by the dispute shall be completed in accordance with applicable schedules and time frames.

XVI. UNAVOIDABLE DELAYS

45. Respondents shall cause all Work to be performed in accordance with applicable schedules and time frames unless any such performance is prevented or delayed by an event that constitutes an unavoidable delay. For purposes of these Orders, an "unavoidable delay" shall mean an event beyond the control of Respondents that prevents or delays performance of any obligation required by these Orders and that could not be overcome by due diligence on the part of Respondents. Increased cost of compliance shall not be considered an event beyond the control of Respondents.

46. Respondents shall notify Ohio EPA in writing within five (5) days after the occurrence of an event that Respondents contend is an unavoidable delay. Such written notification shall describe the anticipated length of the delay, the cause or causes of the delay, the measures taken and to be taken by Respondents to minimize the delay, and the timetable under which these measures will be implemented. Respondents shall have the burden of demonstrating that the event constitutes an unavoidable delay.

47. If Ohio EPA does not agree that the delay has been caused by an unavoidable

delay, Ohio EPA will notify the Respondents in writing. If Ohio EPA agrees that the delay is attributable to an unavoidable delay, Ohio EPA will notify Respondents in writing of the length of the extension for the performance of the obligations affected by the unavoidable delay.

XVII. REIMBURSEMENT OF COSTS

48. Ohio EPA has incurred and continues to incur Response Costs in connection with the Site. Respondents shall reimburse Ohio EPA for all Response Costs incurred both prior to and after the effective date of these Orders.

49. Within thirty (30) days after the effective date of these Orders, Respondents shall remit a check to the Ohio EPA for $93,611.80 for all Response Costs incurred prior to January 1, 2015.

50. For Response Costs incurred after January 1, 2015, Ohio EPA will submit to Respondents on an annual basis an itemized invoice of its Response Costs for the previous year. Within thirty (30) days of receipt of such itemized invoice, Respondents shall remit payment for all of Ohio EPA's Response Costs for applicable time period.

51. Respondents shall remit payments to Ohio EPA pursuant to this Section as follows:

    A. Payment shall be made by certified check payable to "Treasurer, State of Ohio" and shall be forwarded to the Office of Fiscal Administration, Ohio EPA, P. O. Box 1049, Columbus, Ohio 43216-1049.

    B. A copy of the transmittal letter and certified check shall be sent to the Fiscal Officer, DERR, Ohio EPA, P. O. Box 1049, Columbus, Ohio 43216-1049, and to the Site Coordinator.

    C. Each payment shall identify the name and address of the party making payment, the site name, and Ohio EPA's revenue number identified on the associated invoice.

52. To the extent the Respondents dispute the accuracy of the state of Ohio's request for reimbursement or whether costs are inconsistent with the NCP, Respondents shall initiate the formal dispute provisions of the Dispute Resolution Section, within thirty (30) days after receipt of Ohio EPA's request for reimbursement of costs. Should the Respondents dispute a portion of the response costs set forth in an itemized statement, but not all of the costs, Respondents shall timely pay the uncontested portion pursuant to the provisions of the Reimbursement of Costs

Section.

XVIII. ACCESS TO INFORMATION

53. Upon request, Respondents shall provide to Ohio EPA within fourteen (14) days, copies of all documents and information within their possession or control or that of their contractors or agents relating to events or conditions at the Site including, but not limited to manifests, reports, correspondence, or other documents or information related to the Work.

54. Respondents may assert a claim that documents or other information submitted to Ohio EPA pursuant to these Orders are confidential under the provisions of OAC 3745-49-03 or ORC §6111.05(A). If no such claim of confidentiality accompanies the documents or other information when it is submitted to Ohio EPA, it may be made available to the public without notice to Respondents.

55. Respondents may assert that certain documents or other information are privileged under the attorney-client privilege or any other privilege recognized by state law. If Respondents make such an assertion, they shall provide Ohio EPA with the following: (1) the title of the document or information; (2) the date of the document or information; (3) the name and title of the author of the document or information; (4) the name and title of each addressee and recipient; (5) a general description of the contents of the document or information; and (6) the privilege being asserted by Respondent.

56. No claim of confidentiality shall be made with respect to any data or reports, including but not limited to laboratory or interpretive reports, and all sampling, analytical, and monitoring data, to the extent required to be submitted to Ohio EPA under these Orders.

57. Respondents shall preserve for the duration of these Orders and for a minimum of ten (10) years after termination of these Orders, all documents and other information within their possession or control, or within the possession or control of their contractors or agents, which in any way relate to the Work notwithstanding any document retention policy to the contrary. Respondents may preserve such documents by microfiche, or other electronic or photographic device. At the conclusion of this document retention period, Respondents shall notify Ohio EPA at least sixty (60) days prior to the destruction of these documents or other information; and upon request, shall deliver such documents and other information to Ohio EPA.

XIX. PERIODIC REVIEW

58. Respondents shall conduct studies and investigations as requested by Ohio EPA in order to permit Ohio EPA to conduct reviews as to the effectiveness of the Remedial Action at least every five years as described in section 121(c) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended and any applicable regulations.

59. If Ohio EPA determines that information received, in whole or in part, during a review conducted pursuant to the Periodic Review Section of these Orders indicates that the Remedial Action is not protective of public health and safety and the environment, the Respondents shall undertake any further response actions Ohio EPA has determined are appropriate. Respondents shall submit a plan for such work to Ohio EPA for approval in accordance with the procedures set forth in the Review of Submittals Section of these Orders, within thirty (30) days of receiving a request from Ohio EPA to submit such a work plan.

60. Respondents may invoke the procedures in the Dispute Resolution Section to dispute (1) Ohio EPA's determination that the Remedial Action is not protective of public health and safety and the environment or (2) Ohio EPA's selection of further response actions as unlawful or unreasonable.

XX. MODIFICATIONS

61. These Orders may be modified by agreement of the Parties. Modifications shall be in writing, signed by the authorized representative of the Respondents and by the Director, and shall be effective on the date entered in the Journal of the Director of Ohio EPA.

XXI. INDEMNITY

62. Respondents agree to indemnify, save, and hold harmless Ohio EPA from any and all claims or causes of action arising from, or related to, the implementation of these Orders or to events or conditions at the Site, including any acts or omissions of Respondents, their officers, employees, receivers, trustees, agents, or assigns. Said indemnification shall not apply to acts or omissions of the state of Ohio, its employees, agents or assigns at, on, upon, or related to the Site if said acts are negligent, performed outside the scope of employment or official responsibilities, or performed with malicious purpose, in bad faith, or in a wanton or reckless manner. Ohio EPA shall not be considered a party to and shall not be held liable under any contract entered into by Respondents in carrying out the activities pursuant to these Orders. Ohio EPA agrees to provide notice to Respondents within thirty (30) days after receipt of any claim that may be the subject of indemnity as provided in this Section, and to cooperate with Respondents in the defense of any such claim or

action against Ohio EPA.

XXII. OTHER CLAIMS

63. Nothing in these Orders shall constitute or be construed as a release from any claim, cause of action, or demand in law or equity against any person, firm, partnership, or corporation not a Party to these Orders, for any liability arising from, or related to, events or conditions at the Site.

XXIII. RESERVATION OF RIGHTS

64. Ohio EPA reserves the right to seek legal and/or equitable relief to enforce the terms and conditions of these Orders, including penalties against Respondents for noncompliance with these Orders. Except as provided herein, Respondents reserve any rights they may have to raise any legal or equitable defense in any action brought by or on behalf of Ohio EPA to enforce the terms and conditions of these Orders.

65. Ohio EPA reserves the right to terminate these Orders and/or perform all or any portion of the Work or any other measures in the event that the requirements of these Orders are not wholly complied with within the time frames required by these Orders. Except as provided herein, Respondents reserve any rights they may have to raise any legal or equitable defense in any action brought by or on behalf of Ohio EPA.

66. Ohio EPA reserves the right to take any action under applicable law against Respondents if conditions at the Site, previously unknown to the State, are discovered after the effective date of these Orders, or information is received, after the effective date of these Orders and these previously unknown conditions or this previously unknown information shows that the remedy for the Site as set forth in the Decision Document is not protective of public health or safety or the environment.

67. Subject to Section XXIV, the Agreement Not To Refer Section of these Orders, Ohio EPA reserves the right to take any action under applicable law, including but not limited to any enforcement action, or action to recover costs, or action to recover damages to natural resources, pursuant to ORC Chapters 3734, 3745, or 6111, or any available legal authority as a result of past, present, or future violations of state or federal laws or regulations or the common law, and/or as a result of events or conditions arising from, or related to, the Site.

68. Respondents reserve all rights, claims, demands and causes of action they may have against any and all persons and entities who are not Parties to these

Orders, including rights of contribution against any other parties who may be liable for actual or threatened releases of contaminants at the Site.

XXIV. AGREEMENT NOT TO REFER

69. During the implementation of these Orders, and provided Respondents are considered by Ohio EPA to be in compliance with these Orders, Ohio EPA agrees not to refer Respondents to the Ohio Attorney General's Office, or take administrative enforcement action against Respondents, for Work required by these Orders. Upon termination of these Orders pursuant to the Termination Section, Ohio EPA agrees to not refer Respondents to the Ohio Attorney General's Office, or take administrative enforcement action against Respondents for Work required under these Orders.

XXV. TERMINATION

70. Respondents' obligations under these Orders shall terminate upon approval in writing of Respondents' written certification to Ohio EPA that all Work required to be performed under these Orders including payment of Response Costs has been completed. The Respondents' certification shall contain the following attestation, "I certify that the information contained in or accompanying this certification is true, accurate, and complete." This certification shall be submitted by Respondents to Ohio EPA and shall be signed by a responsible official of Respondents. The termination of Respondents' obligations under these Orders shall not terminate the Respondents' obligations under the Reservation of Rights, Access to Information, Indemnity, Other Claims and Land Use and Conveyance of Title Sections of these Orders. Upon termination of these Orders in accordance with this section, and subject to the Reservation of Rights section of these Orders, Ohio EPA will release Respondents and their agents, assigns and successors from (1) any and all liability for Work required under these Orders and (2) any requirements to perform additional work at the Site pursuant to these Orders.

XXVI. WAIVER AND AGREEMENT

71. In order to resolve disputed claims, without admission of fact, violation, or liability, Respondents consent to the issuance of these Orders, and agree to comply with these Orders.

72. Respondents hereby waive the right to appeal the issuance, terms and conditions, and service of these Orders and Respondents hereby waive any and all rights that

they may have to seek administrative or judicial review of these Orders either in law or equity.

73. Notwithstanding the limitations herein on Respondents' right to appeal or seek administrative or judicial review, Ohio EPA and Respondents agree if these Orders are appealed by any other party to the Environmental Review Appeals Commission, or any court, Respondents retain the right to intervene and participate in such appeal. In such event, Respondents shall continue to comply with these Orders notwithstanding such appeal and intervention unless these Orders are stayed, vacated or modified.

XXVII. EFFECTIVE DATE

74. The effective date of these Orders shall be the date these Orders are entered in the Journal of the Director of Ohio EPA.

XXVIII. SIGNATORY AUTHORITY

75. Each undersigned representative of a Party to these Orders certifies that he or she is fully authorized to enter into these Orders and to legally bind such Party to these Orders.

IT IS SO ORDERED AND AGREED:

OHIO ENVIRONMENTAL PROTECTION AGENCY

Craig W. Butler, Director
Ohio Environmental Protection Agency

FEB - 3 2016
Date

IT IS SO AGREED:

LUCAS COUNTY COMMISSIONERS

Tina Skeldon Wozniak, Commissioner — Date: 1-19-16

Pete Gerken, Commissioner — Date: 1-19-16

Carol Contrada, Commissioner — Date: 1/19/16

APPENDIX A

2012 Decision Document

APPENDIX B

2014 Modified Decision Document

APPENDIX C

RD/RA SOW

APPENDIX D

List of Relevant Guidance Documents

APPENDIX E

Environmental Covenant

[redacted]

APPENDIX A

OhioEPA

State of Ohio
Environmental Protection Agency

OHIO E.P.A.
SEP 10 2012
ENTERED DIRECTOR'S JOURNAL

DECISION DOCUMENT

FOR THE REMEDIATION OF THE

KING ROAD LANDFILL

LUCAS COUNTY, OHIO

Division of Environmental Response and Revitalization

September 2012

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Scott J. Nally, Director

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

By Jennifer Lassiter Date: 9/10/12

DECLARATION

SITE NAME AND LOCATION

King Road Landfill
Lucas County, Ohio

STATEMENT OF BASIS AND PURPOSE

This Decision Document presents the selected remedial action for the King Road Landfill (Site) in Lucas County, Ohio (see Figures 1 and 2), chosen in accordance with the policies of the Ohio Environmental Protection Agency, statutes and regulations of the State of Ohio, and the National Contingency Plan, 40 CFR Part 300.

ASSESSMENT OF THE SITE

Actual and threatened releases of industrial waste, hazardous waste, and municipal wastes at the Site, if not addressed by implementing the remedial action selected in the Decision Document, constitute a substantial threat to public health or safety and are causing or contributing to air or water pollution or soil contamination. The municipal waste originated during the twenty-three (23) year operating history of the landfill, 1954 through 1976. During at least a three (3) year period, industrial and hazardous wastes were also accepted at the landfill.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy is Alternative No. 11 from the December 2010 Preferred Plan. Selection of this remedy is possible as a result of the exemption, issued by the Director of Ohio EPA on April 16, 2009, from the current construction standards for a solid waste cap. The exemption allows for the installation of an alternative cap. The Plan includes: a groundwater monitoring system, the collection of hazardous gases which form within the Site, an operation-& maintenance program, an environmental covenant to limit use of the Site, supplemental cover and an evapotranspirative cover, control of the Site to eliminate public contact with dangerous areas, permitted beneficial reuse, and the establishment of an administrative "No Well Zone" (NWZ) in conjunction with ensuring that all local receptors are linked to the municipal water supply. All existing measures to control leachate discharge from the Site must be retained.

The remedy will require the installation of additional soil cover in areas previously identified as having exposed waste or less than 24 inches of soil above the waste. The remedial design for the cover must be approved by Ohio EPA and the cover must pass

a post-construction inspection by Ohio EPA. Operation and maintenance of the cover must be provided for 30 years, at a minimum, through the development of an Operation and Maintenance (O&M) Plan, to be approved by Ohio EPA.

The Lucas County Board of Health intends to establish a NWZ around the landfill sufficient in radius to encompass the radial groundwater flow from the landfill, thus eliminating the dermal, inhalation, and ingestion potential of any contaminants found in the groundwater. The NWZ would prohibit all use of groundwater within this area. A series of shallow groundwater monitoring wells would be established between the landfill and Ten Mile Creek. The objective would be to establish a monitoring program to evaluate the shallow groundwater flow from the landfill toward the creek.

Monitored natural attenuation (MNA) is the most appropriate alternative to address the pond water and sediments. The first step in the MNA program is to control or eliminate the source material. This would be accomplished by the reduction/elimination of leachate through landfill capping. The collection basins currently required by the Ohio EPA Division of Surface Water (DSW) would continue to operate in order to remove contaminated surface water via the Publicly Owned Treatment Works (POTW). The second step in the MNA process is periodic monitoring of the pond water and sediments for all contaminants of concern (COCs).

Beneficial reuse projects would be allowed at the King Road Landfill, on a case by case basis, subject to a detailed written proposal, which would be submitted to Ohio EPA through the office of the Lucas County Sanitary Engineer.

The landfill cover must meet the Remedial Action Objectives (RAOs) for reducing leachate production, containing solid refuse, and collecting/controlling landfill gas.

Details of the final cover will be determined during the development of the Remedial Design and implemented during the Remedial Action. The final surface must be appropriately graded and maintained to ensure that erosion does not adversely impact the remedy, and the soil cover must be augmented with an appropriate vegetative cover.

The property boundary of the King Road Landfill is larger than the area comprising the known limits of waste deposition. Only the known limits of waste deposition must be covered by the vegetative cover material. Surface soils outside the known limits of waste deposition may be impacted from contaminant migration.

The cover must pass periodic inspections by Ohio EPA.

Existing fencing and signage around the perimeter of the landfill must be maintained. Fencing and signage must also be installed and maintained to restrict access to the Borrow Pit Pond waters and sediments. These actions must protect the capped section

of the landfill from damage, and prevent access to the areas containing contaminated surface water and sediments of the Borrow Pit Pond. These actions are expected to meet the RAO to prevent direct surface contact with contaminants.

Hot spots (i.e., sediment deposition in ditches) have been identified in the Remedial Investigation and Feasibility Study Reports approved by Ohio EPA. The hot spots include those ditches demonstrated to have been in seasonal contact with the unconfined aquifer, and/or to have been a receptor of landfill leachate and solid waste discharges. These materials must be stockpiled, sampled and the samples submitted for laboratory analysis to determine if the stockpiled material is a characteristic hazardous waste. Only non-hazardous excavated materials may be placed under the cap. Any materials determined to be hazardous wastes must be transported off-Site to a permitted hazardous waste disposal facility. This action is expected to meet the RAO of preventing direct surface contact with contaminants.

The NWZ would prohibit all use of groundwater within this area. The Lucas County Sanitary Engineer has determined that a public water supply is available to all homes and facilities currently present in the area around the King Road Landfill. This action is expected to meet the RAO of preventing contact with contaminated groundwater.

With a NWZ in place, the remaining concern would be potential environmental impact to Ten Mile Creek from the shallow aquifer, which is in communication with this surface water body. A series of shallow groundwater monitoring wells would be established between the landfill and Ten Mile Creek. The specific locations and number of wells, the monitoring frequencies and analytical parameters will be determined in Remedial Design. The objective would be to establish a monitoring program to evaluate the shallow groundwater flow from the landfill toward the creek. Results of initial annual monitoring would establish the frequency of future monitoring and/or the necessity for contingent (more active) remedial actions.

Increased contaminant flow toward the creek may necessitate the installation of leachate collection wells, with subsequent leachate discharge to the Lucas County POTW for treatment. This would provide control of contaminant migration in groundwater and assure that the leachate is properly treated prior to discharge to surface water.

The intermediate and deep groundwater zones are also to be included in the NWZ area. No practical or economic method exists for the remediation of the existing low contamination levels. The dilution of existing contaminants by natural groundwater movement, combined with the infiltration reduction associated with the cap, is expected to provide the most effective solution to the contaminants in these zones.

Direct communication between the Borrow Pit Pond and the ground water in the shallow aquifer has been documented. At present, the water discharged from the Pond is

captured and pumped to the Lucas County POTW by a pump station and force main installed for this purpose under a December 4, 1992 Consent Order between the State of Ohio and the Board of Lucas County Commissioners.

The contaminant levels in the sediments of the Pond are generally low in concentration and not precisely identified as to location, making physical remedial actions such as dredging or de-watering costly, while providing questionable benefits. Thus, monitored natural attenuation (MNA) is the most appropriate alternative to address the Pond water and sediments. The first step in the MNA program is to control or eliminate the source material. This will be accomplished by the reduction/elimination of leachate through landfill capping. The collection basins required by DSW must continue to operate in order to remove contaminated surface water via the POTW. The second step in the MNA process is periodic monitoring of the Pond water and sediments for all COCs. This action is expected to meet the RAO for preventing direct surface contact with contaminants.

Beneficial reuse projects would be allowed at the King Road Landfill, on a case-by-case basis, subject to a detailed written proposal, which would be submitted to Ohio EPA through the office of the Lucas County Sanitary Engineer. The submission and approval process would occur during the Remedial Design phase. Sufficient detail, as determined by Ohio EPA, will be required for each beneficial reuse project in order to allow Ohio EPA to evaluate each project.

STATUTORY DETERMINATIONS

The selected remedial action is protective of human health and the environment, complies with legally applicable state and federal requirements, is responsive to public participation and input and is cost-effective. The remedy uses permanent solutions and treatment technologies to the maximum extent practicable to reduce toxicity, mobility and volume of hazardous substances at the Site. The effectiveness of the remedy will be reviewed regularly.

Scott J. Nally, Director

8/31/12
Date

TABLE OF CONTENTS

Page Number

1.0 SUMMARY OF SITE CONDITIONS 8

1.1 Site History 8
1.2 Summary of the Remedial Investigation 11
1.2.1 Soil Contamination 11
1.2.2 Ground Water Contamination 11
1.2.3 Surface Water Contamination 11
1.2.4 Sediment Contamination 12
1.2.5 Outdoor and Indoor Air Contamination 12
1.3 Interim or Removal Actions Taken to Date 12
1.4 Summary of Site Risks and Need for Remedial Action 12
1.4.1 Risks to Human Health 13
1.4.2 Risks to Ecological Receptors 16
1.4.3 Summary of Risks 17

2.0 REMEDIAL ACTION OBJECTIVES 19

3.0 SUMMARY OF REMEDIAL ALTERNATIVES 21

3.1 No Action Alternative (Alternative 1) 21
3.2 Alternative Cap Alternative- FS Alternative No. 2 21
3.3 Limited Action Alternative-FS Alternative No. 3 22
3.4 Water Pre-Treatment Alternative-FS Alternative No. 4 22
3.5 Full Leachate Treatment Discharge to Surface Waters-FS Alternative No. 5 23
3.6 Installation of Slurry Wall Around Landfill Perimeter-FS Alternative No. 6 23
3.7 Eliminate Access to Off-Site Ditches-FS Alternative No. 7 23
3.8 Replace the Borrow Pit Pond with a Constructed Sedimentation Pond/Wetland System-FS Alternative No. 8 24
3.9 Future Beneficial Use Concept-FS Alternative No. 9 24
3.10 The No Barrier Cap Alternative-FS Alternative No. 10 25
3.11 Vegetative Final Cover/Site Controls and O&M Alternative - FS Alternative No. 11 25

4.0 COMPARISON AND EVALUATION OF ALTERNATIVES 26

4.1 Evaluation Criteria 26
4.2 Analyses of Evaluation Criteria 27

4.2.1 Overall Protection of Human Health and the Environment 27
4.2.2 Compliance with ARARs 29
4.2.3 Long-Term Effectiveness and Permanence 30
4.2.4 Reduction of Toxicity, Mobility or Volume Through Treatment ... 31
4.2.5 Short-Term Effectiveness 32
4.2.6 Implementability 32
4.2.7 Cost 35
4.2.8 Community Acceptance 37

5.0 SELECTED REMEDIAL ALTERNATIVE 38

5.1 Vegetative Final Cover/Site Controls and O&M 38
5.2 Site Access Control 39
5.3 Ditch Sediments 40
5.4 Groundwater 41
5.5 Pond Water and Sediments 42
5.6 Beneficial Reuse 43

6.0 DOCUMENTATION OF SIGNIFICANT CHANGES 44

7.0 RESPONSIVENESS SUMMARY 45

8.0 GLOSSARY 56

LIST OF FIGURES

1 – SITE LOCATION MAP

2 – SITE MAP

APPENDICES

A – COPY OF DECEMBER 1992 CONSENT ORDER

B – COPY OF OCTOBER 1994 and OCTOBER 1995 CONSENT ORDERS

C – COPY OF PUBLIC HEARING TRANSCRIPT AND VERBAL COMMENTS

D – COPY OF EACH WRITTEN PUBLIC COMMENT

DECISION SUMMARY
For King Road Landfill
Lucas County, Ohio

1.0 SUMMARY OF SITE CONDITIONS

1.1 Site History

The King Road Landfill (Site or landfill) is located at 3535 King Road, Sylvania Township, Lucas County, Ohio 43617. The landfill is within Section 20, Township 9 South, Range 6 East, of Sylvania Township. The Site occupies a total of approximately 104 acres. The former Toledo, Angola, and Western Railroad right-of-way traverses the Site and provides separation between an approximate 25-acre former soil borrow area to the north and an approximate 79-acre disposal area to the south. The 79-acre disposal area is bounded by the former railroad right-of-way to the north, King Road to the east, Covert Road to the south, and Silica Road to the west. Approximately 70 acres of this 79-acre disposal area are believed to have been disturbed by waste disposal activity. The former soil borrow area, now known as the Borrow Pit Pond, contains ponded water and marsh-like vegetation.

The key geologic and hydrogeologic features of the Site consist of a surficial sand layer extending to depths between 20 and 45 feet below the ground surface, which contains an unconfined aquifer with a water table typically found between one and eight feet below the ground surface. A silty to gravelly clay layer ranging from 3 to 35 feet in thickness is located beneath the surficial sand layer. Bedrock consisting of dolomitic limestone is found beneath the clay layer. A confined aquifer is contained within the dolomitic bedrock. The Borrow Pit Pond is an apparent discharge area for the unconfined aquifer. Ten Mile Creek is located west of Silica Road and is apparently both a discharge area for the unconfined aquifer and a recharge area for the confined aquifer. General groundwater movement in the unconfined aquifer is northwest toward Ten Mile Creek. Groundwater movement within the confined aquifer is east toward the Maumee River.

The Lucas County Commissioners purchased the Site in 1953. Landfilling operations commenced at the Site in January 1954 under the direction of the Lucas County Sanitary Engineer. The facility was operated by the County until May 8, 1967, when Park Forest Development, Inc. was contracted to operate the landfill. On March 15, 1970, the County again took over control of landfill operations. Commercial waste haulers were prohibited from using the landfill on August 21, 1973, after which usage of the landfill gradually lessened. The County officially ceased waste disposal activities in December 1976.

Upon opening in 1954, only local residents used the landfill. Gradually, commercial waste haulers and small municipalities began bringing their wastes to the facility. While

the majority of disposed materials were believed to be general household refuse, disposal of some industrial wastes cannot be ruled out. During the time that Park Forest Development, Inc. operated the facility, the number of commercial and industrial waste haulers using the Site is reported to have increased. No disposal records are known to exist, but both solid and liquid wastes were reportedly accepted.

While open burning of the wastes was not typically an accepted practice, there are several reports of waste having caught fire during the operational life of the King Road Landfill. Due to the scarcity of records regarding landfill operations at the Site, it is impossible to determine the disposal rate at the facility over its entire period of operation. However, available records do indicate that the average volume of waste disposal between March 1970 and August 1973 was approximately 25,000 cubic yards per month. After commercial waste haulers were prohibited from using the facility in August 1973, the average volume of waste disposed reportedly decreased to approximately 5,000 cubic yards per month.

Since the cessation of waste disposal activities in 1976, few modifications to the facility have been made. Beginning in May 1980 and continuing through July 1991, a transfer station was operated near the main gate on King Road. In October 1991, a perimeter fence was installed to control Site access by unauthorized individuals.

A Remedial Investigation (RI) was conducted during 1993-94, and the results were issued in a November 1994 RI Report. A supplemental investigation was conducted in 1995 and a revised RI Report was issued in February 1996. The primary objectives of the RI investigation were to identify which contaminants were leaving the Site, the pathways through which this migration was occurring, and what risk to human health and the environment was associated with this migration. No investigation of deposited wastes was conducted. A Feasibility Study (FS) Report identifying and evaluating a total of nine (9) remedial alternatives was completed in October 2002 for the Site. The FS Report is a compilation of the draft FS Report (nine alternatives), a modification of the FS Report to include an additional alternative (Alternative No. 10), and several iterations of an alternative (Alternative No. 11) submitted to Ohio EPA by the Lucas County Commissioners for consideration as an addendum.

A force-main interceptor sewer and associated pump station were installed in the 1993-94 period, at the northwest corner of the landfill along Silica Road. These facilities collect and transport landfill surface water runoff contaminated with landfill-derived leachate to the Lucas County Maumee River Wastewater Treatment System, a Publicly Owned Treatment Works (POTW). This collection and transport system was placed into service in May 1994.

Specific explosive gas monitoring requirements for the Site were included in an October 20, 1994 Order issued by the Director (and modified on October 25, 1995) upon recommendation from Ohio EPA's Division of Solid and Infectious Waste Management

In the fall of 1996, a gas remediation trench was installed on the west side of the landfill, and six passive gas vents were installed near the south side of the landfill.

On December 4, 2008, the Lucas County Sanitary Engineer requested an exemption pursuant to ORC 3734.02(G) and OAC 3745-27-03(B), from the requirements to construct a composite cap system in accordance with OAC 3745-27-11(G). On April 16, 2009, the Director of Ohio EPA approved the request for exemption from the 2003 construction standards for a solid waste cap, such that an alternative cap may be installed. Threshold requirements for cap design must still be met; however, the exemption enables the threshold requirements of overall protection of human health and environment and compliance with ARARs to be achieved.

1.2 Summary of the Remedial Investigation

The RI was conducted by the Lucas County Commissioners and included a number of tasks to identify the nature and extent of Site-related chemical contaminants. The investigation was conducted with oversight by Ohio EPA, and the subsequent RI Report was approved in February 1996. The tasks included sampling of air, water, soil, surface water and ground water. The data obtained from the investigation were used to conduct a baseline risk assessment and to determine the need to evaluate remedial alternatives. This Decision Document contains only a brief summary of the findings of the RI and FS. Please refer to the RI and FS Reports for additional information on contaminant concentrations.

The nature and extent of contamination at the King Road Landfill in each environmental medium and the COCs attributable to the Site are described below.

1.2.1 Soil Contamination

Throughout the Site, the principal contaminant of concern is arsenic. Arsenic concentrations in soil were high enough to cause excess cancer risks for ingestion and dermal contact. The areas of greatest concern are associated with landfill leachate seeps.

1.2.2 Ground Water Contamination

In both the confined and unconfined aquifers, contaminants were found at concentrations which result in unacceptable cancer risks for both ingestion and dermal exposure pathways. The primary contaminant is arsenic, although other chemicals of concern, including copper, beryllium, bromodichloromethane, bis(2-ethylhexyl)phthalate, 1,4-dioxane, and tetrahydrofuran were found in the unconfined aquifer. Copper is the only other chemical of concern, in addition to arsenic, found in the confined aquifer.

Based on the potentiometric surface of the unconfined aquifer and the results of groundwater modeling (particle tracking), most of the groundwater in this aquifer migrates westward toward the flood plain. There is also an apparent tendency for some migration to the south across Covert Road and to the east across King Road. This is consistent with the mounding of groundwater within the landfill.

1.2.3 Surface Water Contamination

Seasonally, surface water in the ditches is in communication with the unconfined aquifer. The ditches have been receptors of landfill leachate and surface water discharge from the landfill. The primary contaminant is arsenic.

The Borrow Pit Pond has also been a receptor of landfill leachate. The water and sediments in the pond have proven to be toxic to certain aquatic test species. One toxic agent has been identified as ammonia.

Contaminants were identified in both Ten Mile Creek and its flood plain, although the landfill may not be the source or only source of these contaminants. The primary contaminant is arsenic.

1.2.4 Sediment Contamination

The ditches have been receptors of landfill leachate from surface water discharge from the landfill. The primary contaminant is arsenic. Sediments from the Pond have been demonstrated to exhibit toxicity.

1.2.5 Outdoor and Indoor Air Contamination

Investigation of the air pathway determined that no chemicals of concern are present.

1.3 Interim or Removal Actions Taken to Date

A force-main interceptor sewer and associated pump station were installed and placed into service in 1993-94, under an Order issued by the Director upon recommendation of Ohio EPA's Division of Surface Water (DSW). These facilities are located at the northwest corner of the landfill along Silica Road, where they collect and transport landfill surface water runoff contaminated with landfill-derived leachate to the Lucas County Maumee River Wastewater Treatment System.

Specific explosive gas monitoring requirements for the Site were included in an October 20, 1994 Order issued by the Director (and modified on October 25, 1995) upon recommendation of Ohio EPA's Division of Solid and Infectious Waste Management. In the fall of 1996, a gas remediation trench was installed on the west side of the landfill, and six passive gas vents were installed near the south side of the landfill.

1.4 Summary of Site Risks and Need for Remedial Action

A baseline risk assessment was conducted to evaluate current and potential future risks to human health and to ecological receptors as the result of exposure to contaminants present at the Site. The results demonstrated that the existing concentration of contaminants in environmental media pose risks to human and ecological receptors at a level sufficient to necessitate remedial actions.

1.4.1 Risks to Human Health

The human health risk assessment is an analysis of the potential adverse health effects caused by substance releases from the Site in the absence of any actions to control or mitigate these releases. The risk assessment contributes to the Site characterization and subsequent development, evaluation, and selection of appropriate response alternatives.

Table 7.1.1 of the FS lists all of the chemicals included in the human health risk assessment. Since three risk assessment scenarios were evaluated, the parameters differ for each case. Inclusion of a particular parameter as a potential chemical of concern at this stage does not necessarily indicate such a parameter is at a concentration of significance for health risk.

The first step was to characterize the Site with respect to the general physical characteristics and with respect to the characteristics of the populations near the Site. Exposure pathways were identified and then exposure concentrations and intakes were estimated. An exposure pathway generally consists of 4 elements: (1) a source and mechanism of chemical release; (2) a retention or transport medium; (3) a point of potential human contact with the contaminated medium; and (4) an exposure route at the contact point.

The human health risk assessment scenarios for the King Road Landfill include:

I. Current and Future On-Site Trespass

II. Future On-Site Residential Use
    Unconfined aquifer
    Confined aquifer

III. Current and Future Off-Site Residential Use
    Unconfined aquifer
    Confined aquifer

Current and Future On-Site Trespass

Currently, access to the Site by the general public is restricted by a fence surrounding the entire Site. Nevertheless, the on-Site trespass scenario has been considered.

The risk assessment scenario assumes that three types of persons may trespass at the King Road Landfill; an adult, an adolescent, and a child. The adult and adolescent trespassers were evaluated for both current and future scenarios, and the child for the future case scenario only.

The pathways of exposure for this risk assessment case are soil dermal and ingestion, surface water dermal and ingestion, sediment dermal, and air inhalation. The groundwater and fish consumption pathways were not considered since it is assumed that the trespassers will not have access to the groundwater, nor will they eat fish while trespassing.

All of the surface soil analytical data results were used for the soil concentrations in the soil ingestion and soil dermal pathways. All of the surface water and sediment sample analytical data results obtained from the flood plain, Ten Mile Creek, the Borrow Pit Pond, Porter Ditch and the northwest ditch were used in the surface water and sediment pathways. The surface water analytical data was divided into two cases: (1) the first case considered the flood plain, Porter Ditch, and the northwest ditch to be wading areas; and (2) the second case considered the Borrow Pit Pond and Ten Mile Creek to be swimming areas.

Air samples were collected on four separate occasions. For the first two sampling events, samples were collected at five locations at the King Road Landfill. Samples were collected at two locations during the last two sampling events.

Future On-Site Residential Use

The King Road Landfill is not being used for any purpose at the present time. However, for risk assessment purposes, one of the scenarios assumes that residents will live on the landfill in the future. The risk assessment scenario assumes that an adult resident lives at the King Road Landfill an average of 9 years and the reasonable maximum exposure time is 30 years. The average time a child lives at the landfill is 6 years and the reasonable maximum exposure time is also 6 years.

The pathways of exposure for this risk assessment case are soil dermal and ingestion, surface water dermal and ingestion, sediment dermal, and air inhalation. Groundwater (confined and unconfined aquifers) dermal and ingestion and fish consumption are also considered. Separate scenarios were considered for the two distinct aquifers.

All of the surface soil analytical data results were used for the soil concentrations in the soil ingestion and soil dermal pathways. All of the surface water and sediment sample analytical data results obtained from the flood plain, Ten Mile Creek, the Borrow Pit Pond, Porter Ditch and the northwest ditch were used in the surface water and sediment pathways. The surface water analytical data was divided into two cases: (1) the first case considered the flood plain, Porter Ditch, and the northwest ditch to be wading areas; and (2) the second case considered the Borrow Pit Pond and Ten Mile Creek to be swimming areas.

Air samples were collected on four separate occasions. For the first two sampling events, samples were collected at five locations at the King Road Landfill. Samples were collected at two locations during the last two sampling events.

Current and Future Off-Site Residential Use

The risk assessment scenario assumes that an adult resident lives near the King Road Landfill an average of 9 years and the reasonable maximum exposure time is 30 years. The average time a child lives near the landfill is 6 years and the reasonable maximum exposure time is also 6 years. The pathways of exposure for this risk assessment case are soil dermal and ingestion, surface water dermal and ingestion, sediment dermal, air inhalation, groundwater (confined and unconfined aquifers) dermal and ingestion, and fish consumption. Separate scenarios were considered for the two distinct aquifers.

Air samples were collected on four separate occasions. For the first two sampling events, samples were collected at five locations at the King Road Landfill. Samples were collected at two locations during the last two sampling events.

Fish concentrations were obtained from previous Ohio EPA studies/reports. If a parameter was detected in the fish and was also detected at the King Road Landfill, then it was considered to be potentially Site-related and therefore was included in the risk assessment.

1.4.1.1 Human Health Assessment, Toxicity Assessment

Table 7.1.4 in the FS Report provides the toxicity values and carcinogenicity classifications for all of the chemicals used in the human health risk assessment, along with the sub-chronic reference dose (RfD) used in the Current and Future Trespasser scenario. The sub-chronic toxicity values were used to evaluate the potential non-carcinogenic effects of exposure periods between 2 weeks and 7 years. All toxicity values were obtained from either the Integrated Risk Information System (IRIS) or Health Effects Assessment Summary Tables (HEAST). These references were used to determine USEPA reviewed/accepted toxicity information. For a limited number of chemicals which did not have IRIS or HEAST data available, RfDs were estimated using equations in the *Risk Assessment Guidance for Superfund Evaluation Manual (RAGS)*. In order to be conservative, the maximum number of uncertainty and modifying factor values were used.

To help assess the polynuclear aromatic hydrocarbons for this risk assessment, the *Provisional Guidance for Quantitative Risk Assessment of Polynuclear Aromatic Hydrocarbons* was referenced.

1.4.1.2 Human Health Assessment, Risk Characterization

Non-Carcinogens

For non-carcinogens, *RAGS* and the Ohio EPA Generic Statement of Work (SOW) use a hazard index (HI) to assess the overall potential for health effects. For each non-carcinogenic chronic exposure pathway, a HI was calculated. To assess the overall potential for non-carcinogenic effects posed by all of the exposure pathways, a total exposure HI was calculated. In each case, whenever the HI exceeds unity (i.e., 1.0), there may be concern for potential non-carcinogenic health effects.

Carcinogens

The risk posed by carcinogens was also calculated to determine risk numbers. The calculated risk was then compared to acceptable risk standards. Ohio EPA has set an acceptable risk limit of $1x10^{-5}$ for remediation goals for single constituents.

Exposure determination for each pathway involved determining either the HI or the carcinogenic risk calculation. The chronic daily intake or dermal absorbed dose for each constituent was then considered. The *RAGS* evaluation manual and Dermal Exposure Assessment manual provided specific equations which were used to calculate exposure for each pathway.

Carcinogenic risks for both adults and children, and for each potential exposure pathway, have been calculated based on the daily intake, absorbed rates, and carcinogenic slope factors. After each of these risks was calculated, a separate total risk was compiled. Non-carcinogenic hazard index values for both adults and children were calculated for each potential pathway based on the daily intake and absorbed rates, and the verified reference doses.

1.4.2 Risks to Ecological Receptors

The ecological risk assessment presents an evaluation of potential ecological effects, and characterizes the adverse effects of waste constituents on flora and fauna, and at the population, community or ecosystem level.

The overall environmental assessment area includes all terrestrial areas within the landfill's property lines, the Borrow Pit Pond, the flood plain west of Silica Road, and Ten Mile Creek. By combining information from the presence of potential waste constituents in environmental media with information concerning the ecology of the various areas assessed, ecological resources of primary concern were identified.

Several criteria, as outlined by USEPA, were used to determine whether the King Road Landfill or surrounding areas contained ecological resources or areas of concern. Some environments such as wetlands, flood plains, lakes and streams may require consideration if local, state, or federal laws and regulations require that these ecological resources be given special consideration or protection. Other areas, such as unique or unusual habitats, or areas necessary for the continued propagation of key species may also warrant consideration. Areas which may meet one or more of the ecological criteria include the Borrow Pit Pond, Ten Mile Creek, and its adjacent flood plain.

Borrow Pit Pond

Based upon observations relative to the Borrow Pit Pond, it appears that any ecological risk associated with the leachate and the toxic constituent in the surface water (i.e., ammonia) is limited to the area in the immediate vicinity of the leachate seeps. However, any ecological risks which may be present as a result of the sediment toxicity in the Pond may be more aerially extensive. Since sediment toxicity has been demonstrated and it is clear that at least some fauna are likely to feed on the macro invertebrates and amphibians that inhabit the pond, the only conclusion that can be drawn at this time is that there may be some ecological risk associated with one or more of the constituents that have been detected in the sediments.

Ten Mile Creek

Parameter concentrations in the Creek were generally low. The exceedances of Ohio EPA water quality criteria were cyanide and total recoverable iron. Similar values for these parameters were experienced both upstream and downstream of the landfill.

Flood Plain

Amphibian and reptilian fauna appeared to be conspicuously absent from the flood plain during the period of investigation. The flood plain area is a unique forested wetland habitat that no longer exists elsewhere along the banks of Ten Mile Creek. Recent disturbances in the vicinity of the flood plain may be the reason for the absence of fauna in the area. These disturbances have included deforestation in the flood plain north of the area of study, excavation and blasting in the area for installation of a sanitary sewer system, and changes in hydrology due to the installation of a sump system which collects water leaving the landfill before it enters the flood plain.

1.4.3 Summary of Risks

In general, the primary health and environmental risks of this Site result from arsenic contamination. Concentrations of arsenic in shallow soils are high enough to cause excess cancer risks through ingestion and dermal contact. Arsenic, in both the confined and unconfined aquifers, has been identified at concentrations which result in

unacceptable cancer risks for both ingestion and dermal exposure pathways related to the current and future off-Site resident and the future on-Site resident scenarios. Bis(2-ethylhexyl)phthalate has been identified in excess of the carcinogenic risk goal for dermal contact in the unconfined aquifer related to the current and future off-Site scenario. Bis(2-ethylhexyl)phthalate and beryllium have been identified in excess of the carcinogenic risk goal for the ingestion and dermal pathways in the confined and unconfined aquifers related to the future on-Site scenario. And finally, 1,4-dioxane has been identified in excess of the carcinogenic risk goal for the ingestion pathway in the unconfined aquifer related to the future on-Site scenario.

The ecological risks associated with the King Road Landfill were evaluated based on several criteria for delineating ecological resources or areas of concern. Based on this evaluation, the areas of ecological significance were determined to be the Borrow Pit Pond and Ten Mile Creek and its adjacent floodplain. Water in the areas of leachate seeps in the Borrow Pit Pond was found to be toxic to two aquatic test species. The toxic agent was determined to be ammonia. Sediments in the Borrow Pit Pond were also determined to be toxic to environmental receptors. Arsenic and ammonia were constituents of concern identified in both Ten Mile Creek and its flood plain. These contaminants represent an environmental concern. Arsenic is a known human carcinogen and ammonia has been demonstrated to be toxic to environmental receptors.

2.0 REMEDIAL ACTION OBJECTIVES

As part of the RI/FS process, remedial action objectives (RAOs) were developed in accordance with the National Contingency Plan (NCP), 40 CFR Part 300, which was promulgated under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by, *inter alia*, the Superfund Amendments and Reauthorization Act of 1986 (SARA), and U.S. EPA guidance. The RAOs are goals that a remedy should achieve in order to ensure the protection of human health and the environment. The goals are designed specifically to mitigate the potential adverse effects of Site contaminants present in environmental media. For environmental media, remediation levels were developed for a range of potential residual carcinogenic risk levels (*i.e.*, 1 in 100,000, 1 in 1,000,000 etc.) and using a non-cancer hazard quotient (or index) of 1 for a range of potentially exposed receptors, including:

I. Grounds workers;
II. Construction workers;
III. Off-Site residents;
IV. On-Site trespassers;
V. Office employees;
VI. Future construction workers;
VII. Future adult residents; and
VIII. Future child residents.

These carcinogenic risk levels refer to the increased likelihood that someone exposed to the chemical releases from the Site would develop cancer during his/her lifetime as compared with a person not exposed to the Site. For example, a 1 in 10,000 risk level means that if 10,000 people were chronically exposed to the carcinogens at the Site, there is a probability of one additional case of cancer. Note that these risks refer only to the incremental risks created by exposures from the Site. They do not include the risks of cancer from other non-Site related factors to which people may be exposed. Non-carcinogenic hazards are generally expressed in terms of a hazard quotient or index, which combines the concentration of chemical exposures with the toxicity of the chemicals (quotient refers to the effects of an individual chemical whereas index refers to the combined effects of all chemicals). A hazard index of 1.0 represents the maximum exposure at which no harmful effects are expected.

The RAOs were developed to ensure that remedial actions reduce the projected risk to humans to acceptable levels. The U.S. EPA, through the NCP, defines acceptable Site remediation goals for known or suspected carcinogens to be concentration levels that represent an upper bound excess lifetime cancer risk, above that of the background, to an individual between 1 in 10,000 and 1 in 1,000,000 using information on the relationship between dose and response with the 1 in 1,000,000 risk level as the point of departure (the level of risk at which further remedial action is considered unnecessary). Ohio EPA has set an acceptable risk limit of 1×10^{-5} (1 in 100,000) for

remediation goals for single constituents. Noncarcinogenic risks are also to be reduced to an acceptable level, which corresponds to a hazard index of 1.0, at which harmful effects are generally not observed in exposed persons. In a similar manner, important ecological resources (e.g. waters of the state or endangered species) will also be protected.

The RAOs developed for the Site are detailed below.

- Reduce leachate production (to the maximum extent practicable);
- Contain the solid refuse;
- Collect/control landfill gas;
- Prevent contact with ground water; and
- Prevent direct surface contact with contaminants.

3.0 SUMMARY OF REMEDIAL ALTERNATIVES

A total of eleven (11) remedial alternatives have been presented. The FS Report, approved by Ohio EPA in October 2002, was comprised of the original nine alternatives. A modification to the FS Report included an additional alternative (Alternative No. 10), and several iterations of an alternative (Alternative No. 11) submitted to Ohio EPA for consideration as an addendum. A brief description of the major features of each of the remedial alternatives follows. More detailed information about these alternatives can be found in the FS Report.

3.1 No Action - FS Alternative No. 1

This alternative is required as part of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and provides a baseline against which other alternatives can be compared. Under Alternative 1, no future actions are planned. However, those engineering controls already undertaken are considered part of this remedy. These actions include the collection of leachate from the seeps at the northwest corner of the landfill, the collection of discharge from the Borrow Pit Pond and its subsequent pumping to the Lucas County POTW, and the continuation of the existing explosive gas monitoring plan.

This alternative provides no control of exposure to contaminated soils, sediments, or surface waters. While certain engineering controls have been implemented (i.e., collection of leachate, explosive gas monitoring, etc.) at the Site, Alternative 1 provides no additional reduction in risk to human health, nor is the migration of contaminants to ground water abated.

3.2 Alternate Cap Alternative - FS Alternative No. 2

This alternative includes a Geosynthetic Clay Liner (GCL) landfill cap to cover the entire landfill area; consolidation of hot spots from ditch sediments, Pond sediments, and other areas to beneath the future cap; leachate removal by extraction wells, with leachate discharged to the POTW; elimination of continued infiltration of contaminant sources to the Pond and other surface waters through capping and leachate extraction; allowing natural attenuation to decrease existing contaminant concentrations in the Borrow Pit Pond sediments; providing the opportunity for recovery of other surface waters through the combination of all other mentioned actions and institutional controls; establishing a No Well Zone around the landfill and implementing restrictions to control future use of the property; and continuing explosive gas monitoring, and periodic monitoring of groundwater and surface water.

3.3 Limited Action Alternative - FS Alternative No. 3

This alternative includes a composite barrier cap that consists of an 18 inch recompacted clay liner, a 40 mil high-density polyethylene membrane and 36 inches of soil cover to cover the entire landfill area; consolidation of hot spots from ditch sediments, Pond sediments, and other areas to beneath the future cap; leachate removal by extraction wells, with leachate discharged to the POTW; elimination of continued infiltration of contaminant sources to the Pond and other surface waters through capping and leachate extraction; allowing natural attenuation to decrease existing contaminant concentrations in the Borrow Pit Pond sediments; providing the opportunity for recovery of other surface waters through the combination of all other mentioned actions and institutional controls; establishing a No Well Zone around the landfill and implementing restrictions to control future use of the property; and continuing explosive gas monitoring, and periodic monitoring of groundwater and surface water. This alternative is similar to Alternative No. 2 with the exception that the GCL landfill cap is replaced with a composite barrier cap that consists of an 18 inch recompacted clay liner, a 40 mil high-density polyethylene membrane and 36 inches of soil cover.

3.4 Water Pre-Treatment Alternative - FS Alternative No. 4

This alternative includes a Geosynthetic Clay Liner (GCL) landfill cap to cover the entire landfill area; consolidation of hot spots from ditch sediments, Pond sediments, and other areas to beneath the future cap; leachate removal by extraction wells, on-Site pre-treatment of leachate; discharge of leachate to the POTW; elimination of continued infiltration of contaminant sources to the Pond and other surface waters through capping and leachate extraction; allowing natural attenuation to decrease existing contaminant concentrations in the Borrow Pit Pond sediments; providing the opportunity for recovery of other surface waters through the combination of all other mentioned actions and institutional controls; establishing a No Well Zone around the landfill and implementing restrictions to control future use of the property; and continuing explosive gas monitoring, and periodic monitoring of groundwater and surface water. This alternative is similar to Alternative No. 2 with the exception that extracted leachate would be pre-treated on-Site prior to discharge to the POTW.

3.5 Full Leachate Treatment/Discharge to Surface Waters - FS Alternative No. 5

This alternative includes a Geosynthetic Clay Liner (GCL) landfill cap to cover the entire landfill area; consolidation of hot spots from ditch sediments, Pond sediments, and other areas to beneath the future cap; leachate removal by extraction wells; complete treatment of leachate on-Site; discharge of leachate to surface water; elimination of continued infiltration of contaminant sources to the Pond and other surface waters through capping and leachate extraction; allowing natural attenuation to decrease existing contaminant concentrations in the Borrow Pit Pond sediments; providing the opportunity for recovery of other surface waters through the combination of all other mentioned actions and institutional controls; establishing a No Well Zone around the landfill and implementing restrictions to control future use of the property; and continuing explosive gas monitoring, and periodic monitoring of groundwater and surface water. This alternative is similar to Alternative No. 2, with the exception that extracted leachate would be fully treated on-Site prior to discharge to surface water.

3.6 Installation of Slurry Wall Around Landfill Perimeter - FS Alternative No. 6

This alternative includes a Geosynthetic Clay Liner (GCL) landfill cap to cover the entire landfill area; consolidation of hot spots from ditch sediments, Pond sediments, and other areas to beneath the future cap; leachate removal by extraction wells, with leachate discharged to the POTW; elimination of continued infiltration of contaminant sources to the Pond and other surface waters through capping and leachate extraction; allowing natural attenuation to decrease existing contaminant concentrations in the Borrow Pit Pond sediments; providing the opportunity for recovery of other surface waters through the combination of all other mentioned actions and institutional controls; establishing a No Well Zone around the landfill and implementing restrictions to control future use of the property; installation of a Slurry Wall around the landfill perimeter to minimize the migration of contaminated groundwater; and continuing explosive gas monitoring, and periodic monitoring of groundwater and surface water. This alternative is similar to Alternative No. 2, with the exception that a barrier wall would be installed around the perimeter of the landfill to contain contaminated ground waters.

3.7 Eliminate Access to Off-Site Ditches - FS Alternative No. 7

This alternative includes a Geosynthetic Clay Liner (GCL) landfill cap to cover the entire landfill area; consolidation of hot spots from ditch sediments, Pond sediments, and other areas to beneath the future cap; leachate removal by extraction wells, with leachate discharged to the POTW; elimination of continued infiltration of contaminant sources to the Pond and other surface waters through capping and leachate extraction; allowing natural attenuation to decrease existing contaminant concentrations in the Borrow Pit Pond sediments; providing the opportunity for recovery of other surface waters through the combination of all other mentioned actions and institutional controls; establishing a No Well Zone around the landfill and implementing restrictions to control future use of

the property; installation of a Slurry Wall around the landfill perimeter to minimize the migration of contaminated groundwater; conversion of open ditches to enclosed storm sewers; and continuing explosive gas monitoring, and periodic monitoring of groundwater and surface water. This alternative is similar to Alternative No. 6, with the exception that open ditches would be converted to enclosed storm sewers.

3.8 Replace the Borrow Pit Pond with a Constructed Sedimentation Pond/Wetland System - FS Alternative No. 8

This alternative includes a Geosynthetic Clay Liner (GCL) landfill cap to cover the entire landfill area; consolidation of hot spots from ditch sediments, Pond sediments, and other areas to beneath the future cap; leachate removal by extraction wells, with leachate discharged to the POTW; elimination of continued infiltration of contaminant sources to the Pond and other surface waters through capping and leachate extraction; elimination of the Borrow Pit Pond through filling and construction of a sedimentation pond/wetland system that is not in direct communication with the unconfined aquifer; providing the opportunity for recovery of other surface waters through the combination of all other mentioned actions and institutional controls; establishing a No Well Zone around the landfill and implementing restrictions to control future use of the property; installation of a Slurry Wall around the landfill perimeter to minimize the migration of contaminated groundwater; conversion of open ditches to enclosed storm sewers; and continuing explosive gas monitoring, and periodic monitoring of groundwater and surface water. This alternative is similar to Alternative No. 7, with the exception that the existing Borrow Pit Pond would be filled and a sedimentation pond/wetland system would be constructed which is not in direct communication with the unconfined aquifer. Effluent water would be discharged to Ten Mile Creek.

3.9 Future Beneficial Use Concept - FS Alternative No. 9

This alternative includes a Geosynthetic Clay Liner (GCL) landfill cap to cover the entire landfill area; consolidation of hot spots from ditch sediments, Pond sediments, and other areas to beneath the future cap; leachate removal by extraction wells, with leachate discharged to the POTW; elimination of continued infiltration of contaminant sources to the Pond and other surface waters through capping and leachate extraction; elimination of the Borrow Pit Pond through filling and construction of a sedimentation pond/wetland system that is not in direct communication with the unconfined aquifer; providing the opportunity for recovery of other surface waters through the combination of all other mentioned actions and institutional controls; establishing a No Well Zone around the landfill and implementing restrictions to control future use of the property; installation of a Slurry Wall around the landfill perimeter to minimize the migration of contaminated groundwater; conversion of open ditches to enclosed storm sewers; continuing explosive gas monitoring, and periodic monitoring of groundwater and surface water; and allowance for installation of beneficial re-use facilities on-Site. This alternative is

similar to Alternative No. 8, but would also allow for the installation of beneficial use facilities.

3.10 The No Barrier Cap Alternative - Alternative No. 10

This alternative includes a 24 inch uncompacted soil cover and appropriate vegetative cover for the entire landfill area; consolidation of hot spots from ditch sediments, Pond sediments, and other areas to beneath the future cap; leachate removal via existing extraction wells, with leachate discharged to the POTW; elimination of continued infiltration of contaminant sources to the Pond and other surface waters through capping and leachate extraction; elimination of the Borrow Pit Pond and construction of a pond/wetland system; providing the opportunity for recovery of other surface waters through the combination of all other mentioned actions and institutional controls; establishing a No Well Zone around the landfill and implementing restrictions to control future use of the property; and continuing explosive gas monitoring, and periodic monitoring of groundwater and surface water. This alternative is similar to Alternative No. 2 except it utilizes a cap with 24 inches of uncompacted soil cover and appropriate vegetative cover. It would utilize the existing leachate collection system with subsequent treatment at the Maumee River Wastewater Treatment Plant, and a constructed pond/wetland instead of a sedimentation pond.

3.11 Vegetative Final Cover/Site Controls and O&M Alternative - Alternative No. 11

This alternative includes additional soil cover for areas previously identified as having exposed water or less than 24 inches of soil cover above the waste and appropriate vegetative cover; consolidation of hot spots from ditch sediments, Pond sediments, and other areas to beneath the future cap; leachate removal via existing extraction wells, with leachate discharged to the POTW; elimination of continued infiltration of contaminant sources to the Pond and other surface waters through capping and leachate extraction; elimination of the Borrow Pit Pond and construction of a pond/wetland system; providing the opportunity for recovery of other surface waters through the combination of all other mentioned actions and institutional controls; establishing a No Well Zone around the landfill and implementing restrictions to control future use of the property; continuing explosive gas monitoring, and periodic monitoring of groundwater and surface water; and allowance for installation of limited beneficial re-use facilities on-Site. This alternative is similar to Alternative No. 2 except it includes additional soil in areas previously identified as having exposed waste or less than 24 inches of soil cover above the waste and vegetative cover. It would utilize the existing leachate collection system, with subsequent treatment at the Maumee River Wastewater Treatment Plant.

4.0 COMPARISON AND EVALUATION OF ALTERNATIVES

4.1 Evaluation Criteria

In selecting a remedy for a contaminated site, Ohio EPA considers the following eight evaluation criteria as outlined in U.S. EPA's NCP promulgated under CERCLA (40 CFR 300.430):

1. Overall protection of human health and the environment - Remedial alternatives shall be evaluated to determine whether they can adequately protect human health and the environment, in both the short- and long-term, from unacceptable risks posed by hazardous substances, pollutants, or contaminants present at the site.

2. Compliance with all applicable or relevant and appropriate requirements (ARARs) - Remedial alternatives shall be evaluated to determine whether a remedy will meet all of the applicable or relevant and appropriate requirements of state and federal environmental laws.

3. Long-term effectiveness and permanence - Remedial alternatives shall be evaluated to determine the ability of a remedy to maintain reliable protection of human health and the environment over time once pollution has been abated and RAOs have been met. This includes assessment of the residual risks remaining from untreated wastes, and the adequacy and reliability of controls such as containment systems and institutional controls.

4. Reduction of toxicity, mobility, or volume through treatment - Remedial alternatives shall be evaluated to determine the degree to which recycling or treatment are employed to reduce toxicity, mobility, or volume, including how treatment is used to address the principal threats posed by the site.

5. Short-term effectiveness -Remedial alternatives shall be evaluated to determine the following: (1) Short-term risks that might be posed to the community during implementation of an alternative; (2) Potential impacts on workers during remedial action and the effectiveness and reliability of protective measures; (3) Potential environmental impacts of the remedial action and the effectiveness and reliability of mitigative measures during implementation; and (4) Time until protection is achieved.

6. Implementability - Remedial alternatives shall be evaluated to determine the ease or difficulty of implementation and shall include the following, as appropriate: (1) Technical difficulties and unknowns associated with the construction and operation of a technology, the reliability of the technology, ease of undertaking additional remedial actions, and the ability to monitor the

effectiveness of the remedy; (2) Administrative feasibility, including activities needed to coordinate with other offices and agencies and the ability and time required to obtain any necessary approvals and permits from other agencies (for off-site actions); and (3) Availability of services and materials, including the availability of adequate off-site treatment, storage capacity, and disposal capacity and services; the availability of necessary equipment and specialists, and provisions to ensure any necessary additional resources; the availability of services and materials; and the availability of prospective technologies.

7. Cost - Remedial alternatives shall evaluate costs and shall include the following: (1) Capital costs, including both direct and indirect costs; (2) Annual operation and maintenance (O&M) costs; and (3) Net present value of capital and O&M costs. The cost estimates include only the direct costs of implementing an alternative at the site and do not include other costs, such as damage to human health or the environment associated with an alternative. The cost estimates are based on figures provided by the feasibility study.

8. Community acceptance - Remedial alternatives shall be evaluated to determine which of their components interested persons in the community support, have reservations about, or oppose.

Evaluation Criteria 1 and 2 are threshold criteria required for acceptance of an alternative that has accomplished the goal of protecting human health and the environment and complied with the law. Any acceptable remedy must comply with both of these criteria. Evaluation Criteria 3 through 7 are the balancing criteria for selecting the best remedial alternatives. Evaluation Criteria 8 (Community Acceptance) is a modifying criterion that will be determined by the public comments on the alternatives.

4.2 Analysis of Evaluation Criteria

This section reviews how each of the evaluation criteria is applied to each of the remedial alternatives found in Section 3.0 and compares how the alternatives achieve the criteria.

4.2.1 Overall Protection of Human Health and the Environment

The assessment of cancer risks and non-cancer hazards to human receptors requires that exposure pathways be identified and the risks and hazards of each pathway be numerically estimated. Two (2) chemical exposure routes have been identified: ingestion and dermal. The normal criteria for acceptability of risk represent an upper bound excess lifetime cancer risk to an individual to between 1 in 10,000 and 1 in 1,000,000. Ohio EPA has set an acceptable risk limit of $1x10^{-5}$ for remediation goals for single constituents. The total noncarcinogenic adverse health effects should result in a hazard index of less than 1.0.

Adverse impacts to ecological receptors are identified as a hazard quotient and, when appropriate, a hazard index value greater than 1.0. Thus, RAOs for ecological receptors in the feasibility study report are based on either a hazard quotient or hazard index of 1.0. Full attainment of the appropriate water quality criteria are also evaluated in the feasibility study report for sites with contaminated surface water bodies.

Alternative 1 fails to meet the threshold criteria of overall protection of human health and the environment. It also fails to control exposures to contaminated soils, sediments, or surface water and reduce risk to human health posed by contaminants in groundwater. Alternative No. 1 fails this threshold criterion and is no longer carried forward in the evaluation of alternatives.

Alternative 2 protects human health and the environment in the short term based upon the exemption, pursuant to ORC 3734.02(G) and OAC 3745-27-03(B), from the requirement to construct a composite cap system in accordance with OAC 3745-27-11(G). GCL liners are intended to serve as backup barriers underneath flexible membrane liners, not as primary barriers. It is likely that the cap would deteriorate in the long term and allow precipitation to pass through the contaminated waste. A cap designed according to current solid waste regulations (OAC-3745-27-08) would be protective.

This remedy provides long-term protection by eliminating exposures to groundwater by establishing a No Well Zone; reducing soil/sediment exposures by deed restrictions and consolidation of hot spots under the cap; controlling leachate and groundwater migration by extraction well collection; eliminating Borrow Pit Pond surface water and sediments by drain/dredging; and reducing leachate/hydraulic head with the GCL cap. Short-term worker risk is controlled via sound work practice. Short term risk to trespassers is limited by the fence barrier.

Alternative 3, using a different cap design (i.e., composite barrier cap), would provide a satisfactory level of protection of human health and the environment in comparison to Alternative 2. All other aspects of this alternative are the same as Alternative 2.

Alternative 4 is similar to alternative 2, except that pretreatment insures that constituent loading of leachate is adequately reduced prior to POTW treatment.

Alternative 5 is similar to alternative 2, except that on-Site full treatment allows discharge to Ten Mile Creek, which aids in re-establishing former flood plain and creek flows prior to interceptor well installation.

Alternative 6 is similar to alternative 2, except that the slurry wall minimizes volume and migration of groundwater contaminants into and out of the landfill and Borrow Pit Pond area.

Alternative 7 is similar to alternative 6, except that the ditches are converted to enclosed storm sewers to eliminate contact with residual contaminated sediments/surface water.

Alternative 8 is similar to alternative 7, except the quality of Borrow Pit Pond sediments/surface waters is improved by eliminating communication with the unconfined aquifer. Former surface water flows and recharge are re-established by restoring discharge to Ten Mile Creek. The current flow to the POTW is reduced by approximately 67 percent.

Alternative 9 is similar to alternative 8, with a beneficial use incorporated (e.g., "Rails to Trails" bike path connection and research experimentation station).

Alternatives 10 and 11 would adequately protect human health and the environment if access to the Site is prohibited, if existing engineered controls are maintained, and if a No Well Zone is established around the landfill. Alternative 11 incorporates the existing soil cover via augmentation where the material is less than 24 inches in thickness and provides for limited beneficial re-use of the landfill.

4.2.2 Compliance with ARARs

Alternative 2 includes a cap design that meets the present legal requirements for a solid waste cap (OAC 3745-27-08) based on the exemption, pursuant to ORC 3734.02(G) and OAC 3745-27-03(B), from the requirement to construct a composite cap system in accordance with OAC 3745-27-11(G). Location-specific ARARs regarding wetland and endangered/threatened species can be met by action/management consistent with U.S. Army Corps of Engineers (USACE) and Ohio Department of Natural Resources (ODNR) directives prior to the design phase.

Without an exemption, pursuant to ORC 3734.02(G) and OAC 3745-27-03(B), from the requirement to construct a composite cap system in accordance with OAC 3745-27-11(G), Alternative 3 would not meet the solid waste cap requirement as a result of the absence of a drainage layer between the soil cover and the flexible membrane liner. Compliance with other ARARs is identical to Alternative 2.

Alternative 4 is similar to Alternative 2, but also meets chemical-specific ARARs for air stripping, and action-specific ARARs for generated waste streams of sludge and filter bags.

Alternative 5 is similar to Alternative 4.

Alternatives 6 through 9 are similar to Alternative 2.

Alternative 10 utilizes a cap with 24 inches of un-compacted soil cover and appropriate vegetative cover with a constructed pond/wetland, and is otherwise similar to Alternative 2; however, the Director of Ohio EPA issued an exemption on April 16, 2009, pursuant to ORC 3734.02(G) and OAC 3745-27-03(B), from the requirements to construct a composite cap system in accordance with OAC 3745-27-11(G). As a result, Alternative 10 would comply with ARARs.

Alternative 11 is similar to Alternative 10 with respect to the additional soil and vegetative cover and includes bioremediation. The alternative complies with ARARs based on the exemption from the requirement to construct a composite cap system in accordance with OAC 3745-27-11(G).

4.2.3 Long-Term Effectiveness and Permanence

Alternative 2, as stated above, includes a cap that would not be reliable in the long-term because the GCL would be likely to deteriorate with time.

Alternative 3 includes a cap design that would have long-term effectiveness and permanence compared with the GCL option.

Alternative 4 is similar to Alternative 2, but the pre-treatment system would require monitoring to ensure POTW parameters were not exceeded.

Alternative 5 is similar to Alternative 4, but monitoring of the treatment stream would need to meet surface water discharge requirements.

Alternative 6 is similar to Alternative 2, but the short-term residual ecological risk to the Borrow Pit Pond surface water and sediments would be reduced based on the installation of a perimeter barrier system designed to contain contaminated groundwater.

Alternative 7 is similar to Alternative 2, except that it would require maintenance of the storm drains.

Alternative 8 improves on Alternative 2 in that the Borrow Pit Pond area would be eliminated via filling. Both the sedimentation basin and the wetland would require maintenance (periodic cleaning).

Alternative 9 is essentially the same as Alternative 8. Design and operation would require maintenance of remedial systems and Site monitoring activities.

Alternative 10 does nothing to reduce the magnitude of residual risk in soils, but may reduce the risks posed by contaminated groundwater. Reliability rests on the physical control provided by security fencing.

Alternative 11 reduces both soil and groundwater residual risk over time via natural attenuation.

4.2.4 Reduction of Toxicity, Mobility or Volume Through Treatment

Alternative 2 provides treatment by POTW, which is very reliable and which effectively reduces the toxicity of the collected leachate. The natural attenuation of Borrow Pit Pond Area contaminant recharge requires monitoring. The combined cap and leachate collection system reduces volume treated by POTW. Minimum toxicity reduction by discharges to POTW is tied to levels specified in the NPDES permit of the POTW. POTW treatment is irreversible. Attenuation is dependent upon loading, contact time and temperature.

Alternative 3 is similar to Alternative 2, except the cap reduces leachate output by an estimated 300,000 gallons per year, according to the FS Report.

Alternative 4 is similar to Alternative 2, but in addition, the leachate stream pre-treatment reduces contaminant levels to acceptable ranges for the POTW treatment. Solid waste is generated, which contains levels of contaminants reduced to levels lower than those found in the leachate stream.

Alternative 5 is similar to Alternative 4, except chemical flocculation is used to remove heavy metals and activated carbon is used to remove residual organic compounds. Full treatment may generate additional contaminant laden solid waste (carbon cartridges) which may be regenerated or landfilled. Flow to the POTW is also reduced by 52 percent of current output through elimination of all leachate flow to the POTW.

Alternative 6 is similar to Alternative 2, but the slurry wall acts in conjunction with the cap and extraction wells to control contaminant migration via the unconfined aquifer and volume of contaminated media. Volume treated by POTW is reduced by 48 percent of current output due to reduction in leachate flow. POTW treatment reduces contaminants to minimum levels established in the POTW NPDES permit. It also decreases the amount of contaminants to be treated by elimination of off-Site contaminants. Treatment efficiency is maintained with the duration of the slurry wall (approximately 30 years).

Alternative 7 is similar to Alternative 2.

Alternative 8 is similar to Alternative 2, except that the reconstruction of the Borrow Pit Pond area into the sedimentation/wetland eliminates surface water sent to the POTW, which is in contact with contaminated water from the unconfined aquifer. Reconstruction of the Borrow Pit Pond area eliminates communication of surface waters

with the unconfined aquifer, thus reducing the volume of contaminated water for POTW treatment to 33 percent of current output.

Alternative 9 is similar to Alternative 8.

Alternatives 10 and 11 provide no reduction, since treatment is not implemented.

4.2.5 Short-Term Effectiveness

Alternative 2 allows trespassers to be at risk by direct contact with arsenic in soil, until structural fill is placed over all Site soils. During draining/dredging of the Pond, workers incur risk due to arsenic by direct contact with sediment. Impacts during construction are mitigated by replacement improvements during the implementation phase. Objectives are realized during the first year of operation.

Alternatives 3 through 8 are the similar to Alternative 2.

Alternatives 9 through 11 are similar to Alternative 2 except direct contact with sediment associated with draining/dredging the Pond are not an issue based on natural attenuation.

4.2.6 Implementability

Based on the exemption from the requirement to construct a composite cap system in accordance with OAC 3745-27-11(G), Alternative 2 meets the regulations for solid waste landfill construction. Well application is an established technology. The volume of structural fill and cover soils required are challenging to obtain. The reliability of a leachate collection system is dependent upon design-phase placement of wells, and requires monitoring to assess acceptability for POTW discharge. If necessary, additional leachate treatment can be conducted (installed) at the northwest corner of the landfill. The discharge of surface water can be easily modified (POTW or Ten Mile Creek) based on monitoring. Extraction wells can be abandoned/added depending on the migration control needs. Monitoring of the groundwater is easily implemented with existing/new wells. The Borrow Pit Pond and leachate can be easily monitored. Cap integrity is also easily inspected. Approvals from ODNR, Army Corps of Engineers, Ohio EPA, and Lucas County can proceed along well-established means, but are dependent upon agency schedules/resources. Coordination with ODNR for the wetlands, with USACE for the Borrow Pit Pond, and with the Lucas County Health Department for the No Well Zone will be necessary. Numerous off-Site treatment, storage or disposal (TSD) services are established and operated locally. Skilled equipment and construction/operation contractors are readily available. Technologies are well-established and readily available.

Alternative 3 is similar to Alternative 2. Implementation of the composite barrier cap is allowable based on the exemption from the requirement to construct a composite cap system in accordance with OAC 3745-27-11(G).

Alternative 4 is similar to Alternative 2; the primary difference is that the pre-treatment system is easily constructed and operated. The pre-treatment system is based upon reliable chemical/physical processes, but is vulnerable to electrical current failure and requires a trained technician for operation and maintenance. The pre-treatment system utilizes electrical process monitoring and a control panel. Monitoring of influent and effluent streams is also required. Additional approval is necessary for the air permit and the NPDES permit to install the pre-treatment system. Local solid and hazardous waste facilities are readily available for disposal of sludge/bag filter wastes from the pre-treatment system.

Alternative 5 shares similarities with Alternatives 2 and 4. They are similar in that they readily provide for construction and operation of the same basic technologies. Additional similarities include the pre-treatment system, the electrical process monitoring and the control panel. Monitoring of influent and effluent streams is also required, as is the necessity to obtain an air permit and a NPDES permit. Local solid and hazardous waste facilities are readily available for disposal of sludge/bag filter wastes from the pre-treatment system. All other aspects of Alternative 5 are similar to Alternative 2.

Alternative 6 is similar to Alternative 2, except the slurry wall requires specialized construction methods which may be limited by Site soil conditions and which may require additional subsurface soil investigation. If slurry wall construction cannot be implemented before completion of structural fill placement, available fill soils will be lost. Less efficient barrier walls may be substituted for the slurry wall if Site soil conditions are prohibitive. Breaches in the slurry wall may be repaired and compensated by well-managed installation and operation. A number of qualified slurry wall contractors and specialized equipment are available. Related technologies such as deep soil mixing and sheet piling are also available.

Alternative 7 is similar to Alternative 2, except that the conversion of open ditches to storm sewers requires no special technology, and construction is common to such urban areas. The conversion process eliminates the possibility of potential contact with sediment and surface waters. The need for monitoring surface water in the ditches is eliminated.

Alternative 8 is similar to Alternative 2 with a few exceptions. Construction oversight would be necessary. Special equipment and materials are not needed except for the necessity to protect certain wetland plant species. Uncertainty regarding the quality of surface water discharge from the Borrow Pit Pond area is eliminated. Additional remedial action would not pose a problem and is less likely to affect water levels to the

Borrow Pit Pond area. The uncertainty of meeting the RAOs for surface water quality from the Borrow Pit Pond area is eliminated.

The necessity of ODNR and USACE involvement may increase. Construction oversight utilizing wetland specialists is required for the Borrow Pit Pond area. All of these resources and technologies are readily available.

In Alternative 9, construction of the facility would need to meet the requirements of the remediation systems implemented. Additional remedial actions would require consideration of modifications to the facility O&M, and would require limitations to public access during the construction period. It may be prudent to construct/install the facility after remediation elements have been implemented and evaluated for a sufficient period of time. The involvement of various Lucas County agencies is increased.

In Alternatives 10 and 11, implementation is readily accomplished.

4.2.7 Cost

Alternative 2.	Capital Costs =	$8,824,400
	Operating and Maintenance Costs =	Year Zero = $26,400 First Year = $179,900 Subsequent Years = $2,713,400
	Present Worth =	$11,897,100 assuming no purchase of structural fill. If purchase of all fill is required, estimate increases by approximately $5.1 million.
Alternative 3.	Capital Costs =	$10,766,900
	Operating and Maintenance Costs =	Year Zero = $26,400 First Year = $198,000 Subsequent Years = $2,988,100
	Present Worth =	$14,132,400 assuming no purchase of structural fill. If purchase of all fill is required, estimate increases by approximately $5.1 million.
Alternative 4.	Capital Costs =	$8,974,200
	Operating and Maintenance Costs =	Year Zero = $26,400 First Year = $210,300 Subsequent Years = $3,142,100
	Present Worth =	$12,507,100 assuming no purchase of structural fill. If purchase of all fill is required, estimate increases by approximately $5.1 million.
Alternative 5.	Capital Costs =	$9,007,500
	Operating and Maintenance Costs =	Year Zero = $26,400 First Year = $204,700 Subsequent Years = $3,086,900
	Present Worth =	$12,478,600 assuming no purchase of structural fill. If purchase of all fill is required,

estimate increases by approximately $5.1 million.

Alternative 6. Capital Costs = $10,334,000

Operating and Maintenance Costs = Year Zero = $26,400
First Year = $174,400
Subsequent Years = $2,631,200

Present Worth = $13,319,000 assuming no purchase of structural fill. If purchase of all fill is required, estimate increases by approximately $5.1 million.

Alternative 7. Capital Costs = $8,870,300

Operating and Maintenance Costs = Year Zero = $26,400
First Year = $179,900
Subsequent Years = $2,713,400

Present Worth = $11,897,100 assuming no purchase of structural fill. If purchase of all fill is required, estimate increases by approximately $5.1 million.

Alternative 8. Capital Costs = $9,181,100

Operating and Maintenance Costs = Year Zero = $26,400
First Year = $173,100
Subsequent Years = $2,576,400

Present Worth = $12,110,100 assuming no purchase of structural fill. If purchase of all fill is required, estimate increases by approximately $5.1 million.

Alternative 9. Capital Costs = $10,453,700

Operating and Maintenance Costs = Year Zero = $26,400
First Year = $251,100
Subsequent Years = $3,757,400

Present Worth = $14,641,700 assuming no purchase of structural fill. If purchase of all fill is required,

estimate increases by approximately $5.1 million.

Alternative 10. Capital Costs = Between $4,739,600 and $9,852,100

Operating and Maintenance Costs = Year Zero = $26,400
First Year = $144,500
Subsequent Years = $141,400

Present Worth = $7,096,000 to $12,208,500

Alternative 11.

The manner in which this late addition to the alternative array was presented failed to break down the elements of cost. The preliminary analysis merely indicated that the cost would be more than the No Action alternative and less than any alternative requiring a capping option. A present worth value was offered in the range of $1 to $3 million. By letter to Ohio EPA, dated June 12, 2012, the Lucas County Sanitary Engineer provided the following cost estimate.

Capital Costs = $ 1,373,500

Operating and Maintenance Costs = Year Zero =$ 18,500
First Year =$ 70,500
Subsequent Years = $ 1,012,500

Present Worth = $2,701,000.

4.2.8 Community Acceptance

Community acceptance is an important criterion that Ohio EPA evaluates during the remedy selection process for the King Road Landfill Site. Ohio EPA gauges the degree of community acceptance by including open dialogue with citizens concerning the results of the investigation, and by encouraging citizens to participate in the remedy selection process by commenting on the remedial alternatives. This interaction with the public is important to the remedy selection process and to making sound environmental decisions.

Ohio EPA received comments (Appendices C and D) from interested parties during the public comment period and at the public meeting held at the Toledo-Lucas County Public Library, Holland Branch, Holland, Ohio, on January 11, 2011. Those comments and Ohio EPA's responses are included in the Responsiveness Summary (Section 7.0).

5.0 SELECTED REMEDIAL ALTERNATIVE

Ohio EPA selected a modified version of Alternative 11 as the remedy for the King Road Landfill Site. The modification is based on the decision to install an additional cover, and included development of an operation and maintenance plan to ensure adequate cover integrity throughout the required duration.

The elements of Alternative 11 are as follows: supplemental soil cover; operation and maintenance of the soil cover; institutional controls to limit use of the Site; consolidation of contaminated sediments under the soil cover; ground water monitoring and establishment of the NWZ to ensure local receptors are connected to the municipal water supply; leachate control; and acceptable beneficial reuse.

5.1 Vegetative Final Cover /Site Controls and O&M

On April 16, 2009, the Director of Ohio EPA approved an exemption from the 2003 construction standards for a solid waste cap, such that an alternative cap may be installed. This exemption allows the installation of a vegetative cover.

The installation of additional soil cover will be required in areas previously identified as having exposed waste or less than 24 inches of soil above the waste. The Remedial Design for the cover must be approved by Ohio EPA and the cover must pass a post-construction inspection by Ohio EPA. The landfill cover must meet the RAOs for reducing leachate production (to the maximum extent practicable), containing solid refuse, and collecting/controlling landfill gas.

Details of the final cover will be determined during the development of the Remedial Design and implemented during the Remedial Action. The final surface will be appropriately graded and maintained to ensure that erosion does not adversely impact the remedy, and the soil cover will be augmented with an appropriate vegetative cover.

The property boundary of the King Road Landfill Site is larger than the area comprising the known limits of waste deposition (see RI and FS Reports). Only the known limits of waste deposition must be covered by the vegetative cover material. Surface soils outside the known limits of waste deposition may be impacted from contaminant migration.

Operation and maintenance of the cover must be provided for 30 years, at a minimum, through the development of an O&M Plan, to be approved by Ohio EPA. The cover must pass periodic inspections by Ohio EPA.

With respect to the Site controls, one of the requirements is to reduce and eventually eliminate leachate that would otherwise enter Ten Mile Creek. Such reduction may be provided through continued compliance with the requirements of Section V (Compliance

Schedule to Eliminate the Discharge of Leachate into the Drainage Ditch Tributary to the Ottawa River) of the Consent Order (Appendix A) for this Site dated December 4, 1992, between the State of Ohio and the Board of Lucas County Commissioners.

A second aspect of the Site controls is to collect and control landfill gases in a manner consistent with OAC 3745-27-12 (effective 8/15/2003), and more specifically pursuant to the Director's Orders dated October 20, 1994 (and as amended on October 25, 1995). Landfill gas concentrations shall be monitored at appropriate compliance points in accordance with this rule for a period of at least twenty years, with corrective actions taken should gas concentrations exceed safe levels. After that twenty year period, monitoring may be discontinued upon a demonstration that landfill gas no longer poses a risk of formation and migration. All actions shall be in accordance with the October 1994 and October 1995 Orders (Appendix B).

Performance Standards

- Installation of a landfill cap which meets or exceeds the current (2003) construction standards for a solid waste cap, or use of an alternative design as allowed by the April 16, 2009 exemption, to meet the RAOs for containing the solid waste, preventing direct contact with contamination and reducing leachate production (to the maximum extent practicable). The Remedial Design for either cap must be approved by Ohio EPA and the cap must pass a post-construction inspection by Ohio EPA, to ensure that the RAOs are being met.

- Provide for 30 years, at a minimum, of operation and maintenance (O&M) of the cap in accordance with an O&M Plan, to be approved by Ohio EPA, to ensure that the RAOs are being met. The cap will be expected to pass periodic inspections by Ohio EPA, to ensure that the RAOs are being met.

- The performance standard for reduction and eventual elimination of leachate that would otherwise enter Ten Mile Creek is met through compliance with the terms and conditions of the December 4, 1992 Consent Order, between the State of Ohio and the Board of Lucas County Commissioners.

- The performance standard for collection and control of landfill gases in a manner consistent with OAC 3745-27-12 (effective 8/15/2003) is met through compliance with the terms and conditions of the October 20, 1994 (and as amended on October 25, 1995) Order.

5.2 Site Access and Institutional Controls

Existing fencing and signage around the perimeter of the landfill must be maintained. Fencing and signage must also be installed and maintained to restrict access to the

Borrow Pit Pond waters and sediments, per a future O&M Plan, to be approved by Ohio EPA.

An Environmental Covenant - to maintain its land use, prohibit subsurface activities unless authorized by Ohio EPA, and prohibit the use of on-Site ground water for potable purposes - must be established and recorded. The environmental covenant will be transferable with the deed and will remain in place until it can be demonstrated that concentrations of chemicals of concern have attenuated to levels that no longer pose an unacceptable threat to human health.

These actions are expected to protect the capped section of the landfill from damage, and prevent access to the areas containing contaminated surface water and sediments of the Borrow Pit Pond. These actions are expected to meet the RAO to prevent direct surface contact with contaminants.

Performance Standards

Access controls (e.g., fencing, signage) will be established and maintained to eliminate human contact with surface water and ditch sediments.

- If the existing continuous fencing and signage around the perimeter of the landfill are maintained per an O&M Plan, to be approved by Ohio EPA, this performance standard is met.

- If the Borrow Pit Pond and ditches are fenced off with continuous fence and signage identified in an O&M Plan, to be approved by Ohio EPA, this performance standard is met.

- If Site access controls (i.e., fencing and signage) identified in an O&M Plan, to be approved by Ohio EPA, pass periodic inspections by Ohio EPA, this performance standard is met.

- The performance standard is met by providing documentation that an environmental covenant has been recorded with the Lucas County Recorder's Office, restricting the King Road Landfill to industrial land use only, prohibiting subsurface activities, and prohibiting the use of ground water for potable purposes.

5.3 Ditch Sediments

Hot spots (i.e., sediment deposition in ditches) have been identified in the RI and FS Reports approved by Ohio EPA. The hot spots include those ditches demonstrated to have been in seasonal contact with the unconfined aquifer, and/or to have been a receptor of landfill leachate and solid waste discharges. These materials must be

removed, stockpiled and sampled, and the samples submitted for laboratory analysis to determine if the stockpiled material is a characteristic hazardous waste. Only non-hazardous excavated materials may be placed under the cap. Any materials determined to be hazardous wastes must be transported off-Site to a permitted hazardous waste disposal facility. This action is expected to meet the RAOs of containing solid wastes and preventing direct surface contact with contaminants.

Performance Standard

- Hot spots (i.e., sediment deposition in ditches) can be considered to have been properly eliminated if post-removal sampling and analyses do not show any COCs, as identified per the RI Report, in excess of the acceptable risk limit of 10^{-5} remedial goal established for single carcinogenic constituents and a hazard index of 1 for non-carcinogenic constituents. Specific concentrations of each COC must be calculated as a part of future Remedial Design activities.

5.4 Groundwater (off-Site)

The Lucas County Board of Health intends to establish a "No Well Zone" (NWZ) around the landfill sufficient in radius to encompass the radial flow of potentially contaminated groundwater from the landfill, thus eliminating the dermal, inhalation, and ingestion potential of any contaminants found in the groundwater. The NWZ would prohibit all use of groundwater within this area. The Lucas County Sanitary Engineer has determined that a public water supply is available to all homes and facilities currently present in the area around the King Road Landfill. This action is expected to meet the RAO of preventing contact with contaminated groundwater.

With a NWZ in place, the remaining concern would be potential environmental impact to Ten Mile Creek from the shallow aquifer, which is in communication with this surface water body. A series of shallow groundwater monitoring wells must be established between the landfill and Ten Mile Creek. The specific locations and number of wells, the monitoring frequencies and analytical parameters shall be determined during Remedial Design activities. The objective is to establish a monitoring network and program to evaluate the shallow groundwater flow from the landfill toward the Creek. Results of initial annual monitoring will be used to establish the frequency of future monitoring and/or the necessity for contingent (more active) remedial actions.

Increased contaminant flow toward the Creek may necessitate the installation of leachate collection wells, with subsequent leachate discharge to the Lucas County POTW for treatment. This would provide control of contaminant migration in groundwater and assure that the leachate is properly treated prior to discharge to surface water.

The intermediate and deep groundwater zones are also to be included in the NWZ area. No practical or economically available method exists for the remediation of the existing low contamination levels. The dilution of existing contaminants by natural groundwater movement, combined with the infiltration reduction associated with the cap is expected to provide the most effective solution to the contaminants in these zones.

Performance Standards

- The performance standard is met if written documentation is provided to Ohio EPA documenting the establishment of the No Well Zone by the Lucas County Board of Health. There must be an enforceable requirement that the No Well Zone will remain in place until drinking water quality standards are met.

- The performance standard is met if documentation is provided to Ohio EPA documenting that all existing water delivery systems within the No Well Zone are connected to a municipal supply, and that there is an enforceable requirement that all future water delivery systems within the No Well Zone must be connected to a municipal supply.

- Ground water sample analyses of COCs must demonstrate, prior to the five-year remedy review, a statistically significant decreasing trend in the contaminant ground water flow from the landfill using methodology approved by Ohio EPA, before any reduction in the monitoring program is approved. Although unlikely, a statistically significant increasing trend would necessitate an evaluation of whether an alternative remedial technology (e.g., ground water collection system) would be necessary to address off-Site migration of contaminants in ground water.

- When drinking water quality standards are achieved, this performance standard is met.

5.5 Pond Water and Sediments

Direct communication between the Borrow Pit Pond and the ground water in the shallow aquifer has been documented. At present, the water discharged from the Pond is captured and pumped to the Lucas County POTW by a pump station and force main installed for this purpose under the December 4, 1992 Consent Order.

The contaminant levels in the sediments of the Pond are generally low in concentration and not precisely identified as to location, making physical remedial actions such as dredging or de-watering costly, while providing questionable benefits. Thus, monitored natural attenuation (MNA) is the most appropriate alternative to address the Pond water and sediments. The first step in the MNA program is to control or eliminate the source material. This would be accomplished by the reduction/elimination of leachate through

landfill capping. The collection basins required by Ohio EPA's Division of Surface Water (DSW) will continue to operate in order to remove contaminated surface water via the POTW. The second step in the MNA process is periodic monitoring of the Pond water and sediments for all COCs. This action is expected to meet the RAO for preventing direct surface contact with contaminants.

Performance Standards

- Ohio EPA inspections must show that the catch basins and pump stations are being operated per the specifications of the December 4, 1992 Consent Order for this Site.

- Periodic sampling and analyses of the Pond water and sediments for all COCs identified in the RI and FS Reports must be conducted to monitor contaminant levels until the remedial goals are met. Although unlikely, a statistically significant increasing trend would necessitate an evaluation of whether an alternative remedial technology would be necessary.

5.6 Beneficial Reuse

Beneficial reuse projects (*e.g.*, Bicycle Trail, vehicle parking area, and University research projects) will be allowed at the King Road Landfill, on a case by case basis, subject to a detailed written proposal, which is expected to be submitted to Ohio EPA through the office of the Lucas County Sanitary Engineer. The submission and approval process is expected to occur during the Remedial Design phase. Sufficient detail, as determined by Ohio EPA, will be required for each beneficial reuse project in order to allow Ohio EPA to evaluate each project.

Performance Standards

- Plans to support the expansion of the trail and the establishment of a parking area are to be approved by Ohio EPA. The trail expansion and parking area must not impact the remedy and users of these areas must be physically separated from the Borrow Pit Pond waters and sediment as well as the remainder of the landfill by security fencing.

- Any research projects conducted by any group or organization must be approved by Ohio EPA prior to any work being conducted. This will be required to insure that activities do not adversely impact the remedy.

6.0 DOCUMENTATION OF SIGNIFICANT CHANGES

Two significant changes to the Preferred Plan are contained in this Decision Document. The first change is based on the Director's April 16, 2009 approval of the request for an exemption from the 2003 construction standards for a solid waste cap, such that an alternative cap may be installed.

Threshold requirements for cap design must still be met. The exemption enables the threshold requirement of compliance with ARARs to be achieved. Now, an alternative cap design must be demonstrated, to the satisfaction of the Agency, to meet the threshold requirement of overall protection of human health and the environment.

The second significant change, prompted by public input, is the allowance on a case by case basis of alternative or beneficial re-uses of the landfill. The Agency will work with the Lucas County Sanitary Engineer to evaluate re-use projects.

7.0 RESPONSIVENESS SUMMARY

During the public comment period and at the public hearing, Ohio EPA received several comments concerning the Preferred Plan. Please find below a summation of the comments and Ohio EPA's responses. Appendix C contains a copy of the public hearing transcript and verbal comments, and Appendix D contains a copy of each written public comment received by the Ohio EPA.

RESPONSIVENESS SUMMARY for King Road Landfill
Sylvania, Lucas County, Ohio

A Public Meeting/Hearing was held on January 10, 2011, to present the Agency's Preferred Plan for the King Road Landfill ("KRL") and solicit public comment. Attached is the stenographic record of the public hearing portion of the meeting. Written comments were received during the public comment period. The majority of the comments received expressed support for the Preferred Plan. For those comments received by the Agency, a summation of each comment followed by the Agency's response is presented below.

Comments by the King Road Landfill Group

On behalf of the King Road Landfill Group (the "Group"), by letter dated January 17, 2011, Douglas G. Haynam, of Shumaker, Loop & Kendrick, LLP, asserted that the Plan is "unreasonable and unlawful for multiple reasons." The Group "objects to the Ohio EPA's refusal to consider the most recent data and risk analysis prepared by CRA, adopted by the County, and submitted to Ohio EPA in 2000" and re-submitted in 2009. The Group "opposes the selection of Alternative No. 11 . . . because it is inadequately developed, . . . unreasonably expensive, unnecessarily intrusive on the existing phyto cap environment, inconsistent with the Director's DFF&Os from 2009, and more harmful to human health and the environment than existing landfill site conditions." The Group supports "a status quo approach as outlined in CRA Alternative 13 preserving the existing phyto cap and implementing site access and use restrictions as the most cost-effective and environmentally sound remedial alternative . . ."

Specifically, the Group contends that "[t]he Preferred Plan ignores the more complete and current data gathered by Conestoga-Rovers and Associates ('CRA') at the behest of the Group in 1999 and the Baseline Risk Assessment also performed by CRA for the Group in April of 2000."

Ohio EPA's Response

The Preferred Plan is neither unreasonable nor unlawful. Moreover, the remedial alternative suggested by the Group is not substantively different from the Preferred Plan prepared by Ohio EPA. The principal issue distinguishing the alternatives appears to be the extent to which the existing soil cover is adequate. Based on an investigation performed by the Mannik & Smith Group on behalf of Lucas County, data suggests that

many areas of the landfill do not have soil cover of at least two feet in thickness. For areas where the soil cover thickness is not adequate, supplemental soil cover would be necessary in order to comply with the regulatory framework appropriate during the time at which the landfill ceased operations (i.e., 1976 Solid Waste Regulations). Ohio EPA proposes, as part of the Remedial Design, to incorporate delineation activities in an effort to refine the design concept proposed for supplemental soil cover.

Ohio EPA, as part of the Preferred Plan development, reviewed CRA's Evaluation of Remedial Alternatives, 1999 Additional Sampling Activities Report, and Baseline Risk Assessment Report. Ohio EPA concluded that the majority of the information contained within these three reports was previously available as part of the Remedial Investigation/Feasibility Study documentation and acknowledged the inevitable changes in sampling data (e.g., decreasing concentrations, increased extent of vegetative cover) and the variation of interpretations of the data. However, Ohio EPA did note several inconsistencies and erroneous assumptions and/or methodologies contained within the CRA documentation, e.g.:

- Risk assumptions concerning human receptor exposure in the un-sampled portion of the landfill. The Site was sampled only around the perimeter; yet in the human health risk assessment process, it was assumed that the human receptor trespassing, recreating or working in the central part of the Site would be exposed to chemical contaminants at the same concentration as at the perimeter. For on-Site exposures through soil, dust (surface soil), and air (landfill gas), this assumption may result in a significantly underestimated risk.

- Ambient air was not recognized as a medium of concern in the original RA report, and the CRA report also indicates that ambient air is not a concern. However, the supporting sampling method was inappropriate because air samples were only taken during February, when soil particulate matter and air/soil VOCs partitioning would be low compared to warmer months. Soil gas was not evaluated in the RA report. Typically, soil gas is generated by decomposition of organic material in the landfill and may contain volatile organic compounds (see: U.S. EPA: Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites, EPA/540/P-91/001 OSWER, Washington DC, 1991). The soil gas should be sampled, especially in the central part of the landfill, and the analytical results should be included in baseline risk assessment.

- The additional soil sampling for arsenic raises a particular concern. After Ohio EPA's review of the previously submitted RI/FS reports, two options were recommended regarding a potential method to estimate background concentrations of arsenic in the local soil: 1) collecting additional soil samples from an off-Site or appropriate on-Site location; or 2) using existing soil data that was gathered during the installation of the perimeter ground water wells.

  Initially, neither option was selected because the planned capping of the landfill would eliminate points of contact with landfill associated soils. In the present risk

assessment, an on-Site soil background arsenic determination was selected consistent with option 1. In the CRA Evaluation of Remedial Alternatives report, Figure 1.8 shows the results of background arsenic measurements in surficial soil in eight locations around the landfill perimeter. However, even though as stated "... these samples were collected from areas that were undisturbed by landfill operation activities...", the new sampling points selected for background values were located very close to (in the case of sample S3-99, almost identical to) the affected surficial soil sampling locations from 1993 (see: 1999 Additional Sampling Activities, Figure 3.5). Moreover, the new data have shown very low concentrations of arsenic or no-detects at a Sample Quantitation Limit (SQL) of 1 mg/kg. Even though background concentrations of arsenic in soil from similar locations may vary significantly, it is highly unlikely that arsenic levels in the same area (e.g., S3-99 and SS-12), allegedly "undisturbed by landfill operation activities," would show such variability and be reduced by a factor of 6 or more over a few years (1999 Additional Sampling Activities, Figure 3.5). Rather, sampling and/or analysis of the soil samples for arsenic may be suspect.

In addition, there was no attempt to establish background for arsenic.

- Additional concern is caused by the usage of an arithmetic mean (central tendency) to express the concentration term. It is not appropriate to use an arithmetic mean as the concentration term for any media in a Human Health or Ecological Risk Assessment. This is supported by U.S. EPA's "Risk Assessment Guidance for Superfund" (RAGS), and especially, the "Supplemental Guidance to RAGS: Calculating the Concentration Term" (U.S. EPA Publication 9285.7-081). As recommended by the U.S. EPA: "...Because of the uncertainty associated with estimating the true average concentration at a site, the 95 percent upper confidence limit (UCL) of the arithmetic mean should be used for this variable. [...] For decision-making purposes [...] RME is used to estimate risk ..."

  Therefore, in order to appropriately calculate a reasonable maximum exposure ("RME") and a central tendency ("CT") risk estimate, the 95% UCL of the mean is to be used for the concentration term (use the maximum contaminant concentration if it is lower than the UCL value).

  The difference between RME and CT risk estimates is based on using mean and central tendency values for exposure parameters in risk calculations (*e.g.*, soil ingestion rate, skin surface area, soil adherence factor, etc.), and not in using a mean concentration value. As stated above, the concentration term is to be either the 95% UCL of the arithmetic mean or the maximum detected concentration.

- Baseline risk assessment used a method of calculating "mean" or "central tendency" from all results, including non-detect, for use as the concentration term, which is not acceptable for either screening or Risk Assessment purposes.

To appropriately calculate the concentration term, based on the 95% upper confidence limit of the mean, the non-detected points surrounding any contiguous area of concern and/or separating multiple areas of concern should be eliminated from the combined data set. If the concentration of a chemical of concern in any part of the site exceeds safe levels, the individual or aggregated risk for the whole site should also exceed an acceptable level. Consequently, when properly estimated, risk presented by the entire site cannot be less than the risk calculated from either the maximum or the 95% UCL of the mean concentration of chemical contaminants in any specific area of concern. Any individual or aggregated health hazard quotient exceeding 1.0 and any excess in the cancer risk exceeding 1E-6 should be reported in the RA document.

Similarly, the presentation of "central tendency" in the exposure concentration summary tables for risk assessment purposes (Table 2.8 – 2.13), along with 95% UCL of the mean, is unnecessary and sometimes may be even misleading (see the bullet above).

In general, Ohio EPA determined that the CRA documentation did not provide information warranting a change of the assumptions associated with the Remedial Investigation Report, Baseline Risk Assessment Report, and Feasibility Study Report submitted by Lucas County pursuant to the Consent Order.

The Group also contends that "CRA Alternative 13 is the Most Appropriate and Cost-Effective Remedial Approach for the King Road Landfill." The Group contends that "CRA Alternative 13 does not disturb the existing landfill phyto cap," and "is also consistent with the Director's Final Findings and Orders issued on April 16, 2009."

Ohio EPA's Response

Ohio EPA disagrees with CRA's characterization of the existing soil cover as a "phyto cap". Ohio EPA acknowledges that vegetation does exist; however, it does not serve to eliminate the exposure pathway for direct contact and ingestion of waste material associated with the landfill. A minimum of two (2) feet of clean material must be present in order to eliminate the exposure pathway associated with direct contact and ingestion of waste material. In addition to elimination of the direct contact and ingestion exposure potential, two (2) feet of clean material comports with the regulatory requirements for landfill closure at the time Kind Road Landfill ceased operation. Ohio EPA's selection of Alternative 11 ensures that the potential risks associated with direct contact and ingestion are appropriately addressed and complies with the applicable regulatory requirements.

The Group also contends that "Alternative 11 Selected in the Preferred Plan is Insufficiently Developed and is Less Protective than the Status Quo." The Group contends that "[t]here is no analysis of the extent of the current landfill cover that would require supplementation or an analysis of how that supplementation would adversely impact the existing robust natural phyto cover that is already present on the King Road

Landfill. . . . In addition, there is no cost data or cost effectiveness analysis of Alternative 11." The Group also contends that "implementing Alternative 11 would require extensive site work and would needlessly expose workers involved in the remediation and the surrounding community to the waste mass currently covered by the existing phyto cap." In addition, the Group contends that "there is no current data suggesting that there is any exposed waste at the King Road Landfill." And finally, the Group contends that "Alternative 11 is certainly more expensive than CRA Alternative 13," that "Alternative 11 does nothing to enhance protection of human health and the environment," and that Alternative 11 "does not meet the Director's protectiveness standard as well as CRA Alternative 13."

Ohio EPA's Response

As stated in the previous response, Ohio EPA disagrees with CRA's characterization of the existing soil cover as a "phyto cap". The existing vegetation does not eliminate potential exposure for direct contact with wastes associated with the landfill. Further, the existing vegetation does not comply with relevant regulatory requirements for landfill closure. The Remedial Alternative recommended by Ohio EPA contemplates supplemental cover material and evapotranspirative cover as appropriate. As a result, Alternative 11 is more protective than the status quo and complies with the applicable regulatory requirements. The relevant issue is not the presence of exposed waste but rather the extent to which sufficient cover material exists between the waste and the surface of the landfill. The Mannik & Smith Group, on behalf of the Lucas County Sanitary Engineer's Office, performed a limited scale investigation to determine the extent to which sufficient cover material existed. The results indicated that a significant segment of the area investigated did not meet the minimum threshold for soil cover thickness. Ohio EPA plans to incorporate a more comprehensive evaluation as part of the Remedial Design phase of the remediation. For those areas that demonstrate sufficient soil cover exists, additional soil cover will not be necessary. To the extent practical, Ohio EPA plans to maintain existing vegetative features as well as unique Oak Openings flora and fauna. Ohio EPA's selection of Alternative 11 reflects the Agency's consideration of threshold criteria, including the protection of human health and the environment, as well as primary balancing criteria, including the expense of implementing the selected remedy.

Comments by Lucas County

On behalf of Lucas County, by letter dated January 14, 2011, James P. Shaw, III, P.E., Lucas County Sanitary Engineer, expressed support for the selection of Alternative No. 11, as the Preferred Plan, including the proposed research by the University of Toledo, and the proposed bicycle trail (allowance for beneficial reuse). In addition, Lucas County incorporated by reference prior comments that "contest for the record that the KRL received waste after 1975, or that the site was not previously closed." Further, Lucas County's comments included the County's position on arsenic levels and requested that the Agency take this information "into consideration when developing performance standards for the identification and clean up of hot spots at the KRL."

Ohio EPA's Response

Ohio EPA has not asserted that the KRL received waste after 1975, but rather, that the County failed to achieve the established standards for closure. See, *inter alia*, Ohio EPA correspondence with Lucas County, dated August 6, 1976, March 15, 1978, August 18, 1978, and August 30, 1978.

Comment by Olander Park System

Park System endorses the remediation plan and the proposed bicycle trail (allowance for beneficial reuse).

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

Comment by Sylvania Township Administrator

Township supports Alternative No. 11 as it reflects input from the University of Toledo, Olander Park System, and the Toledo Area Metroparks.

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

Comment by Sylvania Township Public Works Manager

Sylvania Township Public Works Manager offers the township's stock of leaves and compost material for soil enrichment and requests no truck traffic on Covert and Trotter Roads due to inadequate pavement composition and residential status of neighborhood.

Ohio EPA's Response

Ohio EPA appreciates the offer of potential soil enrichment material and notes the Sylvania Township Public Works objection to truck traffic on Covert and Trotter Roads. Ohio EPA plans to work with the party responsible for implementation of the remedy to ensure that alternative vehicle routes are used.

Comment by Thermodyn Corporation

Thermodyn, located adjacent to the landfill, requested that the landfill fence be relocated to allow for greater access behind the Thermodyn building for emergency vehicles and to address the issue of flooding.

Ohio EPA's Response

Ohio EPA will evaluate the potential relocation of the landfill fence as part of the Remedial Design. Relocation will be dependent on the extent to which the implementation does not adversely affect the proposed remedy.

Comment by University of Toledo

Individuals representing the University of Toledo in the areas of Environmental Sciences and Research Development expressed support for an evapo-transpiration cover with potential for environmental research options.

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

Individual comments which were received during the public comment period included the following:

One (1) individual comment was provided during the public hearing portion of the January 10, 2011 meeting, supporting the return to a useful Oak Opening standard with a beneficial reuse option.

Comment by Daniel Becker

"I would like to see it returned to as much of a useful space as possible, and if there's an opportunity to help return it to an Oak Opening standard I think that's the best for everyone."

Ohio EPA's Response

Ohio EPA plans to preserve as much of the existing Oak Opening habitat as possible.

Fifteen (15) separate e-mail comments representing private citizens, each expressing support of Alternative No. 11 and the proposed bicycle trail (allowance for beneficial use).

Comment by Kevin David

"Therefore I am fully in favor of Ohio EPA's Preferred Alternative #11. Furthermore, I would like to see the remediation done as soon as possible and encourage all parties to make every effort to combine the remediation with the proposed greenway/trail for cost savings and other synergies."

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

Comment by David Elliott

"I am in favor of Ohio EPA's Preferred Alternative #11. I would prefer that the remedy be installed as soon as possible and incorporate an extension of the University / Parks bike trail through the property."

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

Comment by Linda Wheeler

"I am in favor of Ohio EPA's Preferred Alternative #11. I would prefer that the remedy be installed as soon as possible and incorporate an extension of the University / Parks bike trail through the property."

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

Comment by Rick Rump

"I am in favor of Ohio EPA's Preferred Alternative #11. I am in favor of incorporating an extension of the University / Parks bike trail through the property."

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

Comment by Jim House

"I am in favor of Ohio EPA's Preferred Alternative #11. I would prefer that the remedy be installed as soon as possible and incorporate an extension of the University / Parks bike trail through the property."

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

Comment by Janet Smith

"I am in favor of Ohio EPA's Preferred Alternative #11. I would prefer that the remedy be installed as soon as possible and incorporate an extension of the University / Parks bike trail through the property."

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

Comment by Laurie Ferguson

"I am in favor of Ohio EPA's Preferred Alternative #11. I would prefer that the remedy be installed as soon as possible and incorporate an extension of the University / Parks bike trail through the property."

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

Comment by Jacqueline Campbell

"I am in favor of Ohio EPA's Preferred Alternative #11. I would prefer that the remedy be installed as soon as possible and incorporate an extension of the University / Parks bike trail through the property."

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

Comment by Pat Squire

"I am in favor of Ohio EPA's Preferred Alternative #11. I would prefer that the remedy be installed as soon as possible and incorporate an extension of the University / Parks bike trail through the property."

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

Comment by Rick Metcalf

"I am in favor of Ohio EPA's Preferred Alternative #11. I would prefer that the remedy be installed as soon as possible and incorporate an extension of the University / Parks bike trail through the property."

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

Comment by Mike Troxell

"I think it is important for the cycling community and future cyclists to have a complete trail system to provide safe connections to the area parks and the University.

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

Comment by Susan Richards

"I am in favor of Ohio EPA's Preferred Alternative #11. I would prefer that the remedy be installed as soon as possible and incorporate an extension of the University / Parks bike trail through the property."

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

Comment by Larry Billingsley

"I am in favor of Ohio EPA's Preferred Alternative #11. I would prefer that the remedy be installed as soon as possible and incorporate an extension of the University / Parks bike trail through the property."

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

Comment by Patricia Rapp

"I am in favor of Ohio EPA's Preferred Alternative #11. I would prefer that the remedy be installed as soon as possible and incorporate an extension of the University / Parks bike trail through the property."

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

Comment by Laura Schetter

"I am in favor of Ohio EPA's Preferred Alternative #11. I would prefer that the remedy be installed as soon as possible and incorporate an extension of the University / Parks bike trail through the property."

Ohio EPA's Response

No response necessary in light of the commenter's endorsement of Ohio EPA's Preferred Remedial Alternative.

8.0 GLOSSARY

Aquifer -	An underground geological formation capable of holding and yielding water.
ARARs -	Applicable or relevant and appropriate requirements. Those statutes and rules which strictly apply to remedial activities at the site, or those statutes and rules whose requirements would help achieve the remedial goals for the site.
Baseline Risk Assessment -	An evaluation of the risks to humans and the environment posed by a site.
Carcinogen -	A chemical that causes cancer.
CERCLA -	Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq. A federal law that regulates cleanup of hazardous substances sites under the U.S. EPA Superfund Program.
Contaminants of Concern (COCs) -	Chemicals identified at the site which are present in concentrations that may be harmful to human health or the environment.
Decision Document -	A statement issued by the Ohio EPA giving the Director's selected remedy for a site and the reasons for its selection.
Ecological Receptor -	Animals or plant life exposed or potentially exposed to chemicals released from a site.
Environmental Covenant -	A servitude (legal limitation) arising under an environmental response project that imposes activity and use limitations and that meets the requirements established in 5301.82 of the Ohio Revised Code.
Exposure Pathway -	Route by which a chemical is transported from the site to a human or ecological receptor
Feasibility Study -	A study conducted to ensure that appropriate remedial alternatives are developed and evaluated such that relevant information concerning the remedial action options can be presented to a decision-maker and an appropriate remedy selected.

Hazardous Waste -	A waste product, listed or defined by the RCRA, which may cause harm to humans or the environment.
Hazardous Substance -	A chemical that may cause harm to humans or the environment
Human Receptor -	A person or population exposed to chemicals released from a site.
NCP -	National Oil and Hazardous Substances Pollution Contingency Plan, codified at 40 C.F.R. Part 300 (1990), as amended. A framework for remediation of hazardous substance sites specified in CERCLA.
O&M -	Operation and Maintenance. Long-term measures taken at a site, after the initial remedial actions, to assure that a remedy remains protective of human health and the environment.
Performance Standard -	Measures by which Ohio EPA can determine if RAOs have been met.
Preferred Plan -	The plan that evaluates the preferred remedial alternative chosen by Ohio EPA to remediate the site in a manner that best satisfies the evaluation criteria.
Preliminary Remediation Goal (PRG) -	Initial clean-up goals that (1) are protective of human health and the environment and (2) comply with ARARs. They are developed early in the process (scoping) based on readily available information and are modified to reflect the results of the baseline risk assessment (termed site-specific PRGs at this point in time). They are also used during the analysis of remedial alternatives in the remedial investigation/feasibility study (RI/FS).
Remedial Action Objectives (RAOs) -	Specific goals of the remedy for reducing risks posed by the site.
Remedial Investigation -	A study conducted to collect information necessary to adequately characterize the site for the purpose of developing and evaluating effective remedial alternatives.

Responsiveness Summary-	A summary of all comments received concerning the Preferred Plan and Ohio EPA's response to all issues raised in those comments.
Water Quality Standards -	Chemical, physical and biological standards that define whether a body of surface water is unacceptably contaminated. These standards are intended to ensure that a body of water is safe for fishing, swimming and as a drinking water source. These standards can be found in Chapter 3745-1 of the Ohio Administrative Code.

APPENDIX B

OHIO E.P.A.
SEP -9 2014

Modified Decision Document

For the Remediation of the
King Road Landfill
Toledo, Lucas County, Ohio

Division of Environmental Response and Revitalization
Assessment, Cleanup and Reuse Section
Remedial Response Program
September 2014

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

By: _____ Date: 9-9-14

Ohio EPA's Division of Environmental Response and Revitalization (DERR) - Assessment, Cleanup & Reuse Section Remedial Response Program			Modified Decision Document for the Remediation of the King Road Landfill Toledo, Lucas County, Ohio		
THE REMEDIAL RESPONSE PROCESS					
(1) Preliminary Assessment & Site Inspection	(2) Remedial Investigation & Feasibility Study	(3) Remedy Selection (Preferred Plan & Decision Document)	(4) Remedial Design	(5) Remedial Action	(6) Remedy Operation, Maintenance & Monitoring

Ohio EPA Announces Modified Decision Document

On April 16, 2009, Ohio EPA issued a Preferred Plan outlining the preferred alternative to remediate contamination at the King Road Landfill site. The Preferred Plan was re-issued on November 29, 2010, based on the issuance of an April 16, 2009 exemption order from Ohio EPA allowing for use of a protective vegetative soil landfill cover instead of current capping requirements. Comments on the November 29, 2010 Preferred Plan were accepted during public meetings and comment periods. Based on the Preferred Plan and subsequent consideration of submitted comments, Ohio EPA issued a Decision Document on September 10, 2012, identifying the selected remedial alternative for the cleanup of the contamination at the site, and providing the rationale for the selection. The Decision Document was appealed to the Environmental Review Appeals Commission (ERAC) in early October 2012.

Subsequent to the issuance of the 2012 Decision Document and the associated ERAC appeal, information was provided to the Agency documenting the acceptable closure in 1969 of an approximately 43 acre portion of the nearly 70 acre King Road Landfill. The thickness of the soil cover on the remaining 27 acre portion of the landfill was evaluated in June 2013. The resulting July 5, 2013 report indicates that the remedy will require the installation of additional soil cover on only about one (1) acre, located at the southwest corner of the western end of the landfill. Additional information was also provided to the Agency with regard to the "hot spot" ditch sediments and groundwater, which resulted in modifications and updates to the selected remedial alternative in the 2012 Decision Document. Based on an evaluation of all currently available information, Ohio EPA is issuing this Modified Decision Document identifying the modifications to the remedial alternative originally selected for the cleanup of the site, and providing the rationale for the modifications.

Ohio EPA is issuing this Modified Decision Document in a manner consistent with Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). It summarizes information found in detail in the remedial investigation/feasibility study (RI/FS) reports, and other documents contained in the administrative record for this site. Ohio EPA encourages the public to review these documents to gain a better understanding of the site and the activities that have been conducted at the site. Additional information is available in the Ohio EPA Northwest District Office, and at the document repository established at the Toledo-Lucas County Public Library (Holland Branch) in Holland, Ohio.

TABLE OF CONTENTS

Page Number

1.0 INTRODUCTION 3
- 1.1 Site Name and Location 3
- 1.2 Statutory Basis and Statement of Purpose 3

2.0 SUMMARY OF SITE HISTORY/CONTAMINATION/SELECTED REMEDY 4
- 2.1 Summary of Site History 4
  - Table 1 – Chronology of Significant Site Events 4
- 2.2 Summary of Site Contamination 5
- 2.3 Summary of Selected Remedy in 2012 Decision Document 5

3.0 BASIS FOR THE DOCUMENT 5
- 3.1 Vegetative Final Cover (see Section 5.1 in 2012 Decision Document) 5
- 3.2 Ditch Sediments (see Section 5.3 in 2012 Decision Document 6
- 3.3 Off-Site Groundwater (see Section 5.4 in 2012 Decision Document) 6

4.0 DESCRIPTION OF SIGNIFICANT CHANGES/BASIS FOR CHANGES 7
- Table 2 – Documentation of Changes to Remedy 7

5.0 AFFIRMATION OF STATUTORY DETERMINATIONS 10

6.0 PUBLIC PARTICIPATION 10

DECLARATION

REFERENCES
- Note: List of all Documents relied upon in modifications to 2012 Decision Document

ATTACHMENTS
- Copies of all Documents Listed in the References Section
- Note: Original Figures, Site Plans and Tables are available in the 2012 Decision Document

MODIFIED DECISION DOCUMENT
King Road Landfill Site
Toledo, Lucas County, Ohio

1.0 INTRODUCTION

1.1 Site Name and Location

The King Road Landfill (Site or landfill) is located at 3535 King Road, Sylvania Township, Lucas County, Ohio 43617. The landfill is within Section 20, Township 9 South, Range 6 East, of Sylvania Township. The Site occupies a total of approximately 104 acres. The former Toledo, Angola, and Western Railroad right-of-way traverses the Site and provides separation between an approximate 25-acre former soil borrow area to the north and an approximate 70-acre disposal area to the south. The 70-acre disposal area is bounded by the former railroad right-of-way to the north, King Road to the east, Covert Road to the south, and Silica Road to the west. The former soil borrow area, now known as the Borrow Pit Pond, contains ponded water and marsh-like vegetation. See Figure 1 (Site Location Map) and Figure 2 (Site Map) in the September 10, 2012 Decision Document.

The Lucas County Commissioners purchased the Site in 1953. Landfilling operations commenced at the Site in January 1954 under the direction of the Lucas County Sanitary Engineer. The facility was operated by the County until May 8, 1967, when Park Forest Development, Inc. was contracted to operate the landfill. On March 15, 1970, the County again took over control of landfill operations. Commercial waste haulers were prohibited from using the landfill in 1973. The County's final landfill permit expired in December 1975. Information was provided to the Agency documenting the acceptable closure in 1969 of an approximately 43-acre portion of the nearly 70-acre landfill. The remaining 27 acres of the 70-acre landfill were subject to closure under Ohio Administrative Code 3745-27-10(A)(2), effective July 29, 1976.

1.2 Statutory Basis and Statement of Purpose

This Modified Decision Document sets forth the basis for the determination to issue a modification to the Decision Document issued September 10, 2012 ("2012 Decision Document"), for the King Road Landfill site. Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Section 300.435(c)(2)(i) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establish procedures for explaining, documenting and informing the public of significant changes to the remedy that occur after a Decision Document is issued. A Modified Decision Document (termed an Explanation of Significant Differences by U.S. EPA) is required when the remedial action to be taken differs significantly from the remedy selected in the Decision Document, but does not fundamentally alter the remedy.

Information was provided to the Agency documenting the acceptable closure in 1969 of an approximately 43-acre portion of the nearly 70-acre landfill. Further, issuance of an exemption order by the Director of Ohio EPA on April 16, 2009 allows for use of a protective

vegetative soil landfill cover instead of adherence to current solid waste capping requirements. In the selected remedy, portions of the soil cover in the remaining 27 acres were identified to need further actions. The soil cover thickness in the 27-acre portion of the landfill was evaluated in June 2013. The resulting report issued July 5, 2013 indicated that only about one acre, located at the southwest corner of the western end of the landfill, had less than 24 inches of soil cover. Therefore, the remedial alternative in the 2012 Decision Document is modified to reduce the area of the landfill subject to additional cover.

Additional information was provided by and to the Agency with regard to the "No Well Zone" (NWZ) remedial component of the 2012 Decision Document. In short, the specific limits of the NWZ were established post 2012 Decision Document, based on Ohio EPA groundwater modeling (and discussions with the responsible parties), to include a radius extending one-half mile from the landfill perimeter, to the north, east, west and southwest, and to Ten Mile Creek, a hydraulic barrier, to the west and northwest. Therefore, the remedial alternative in the 2012 Decision Document is modified to include the specific limits of the NWZ.

Further, the Agency re-evaluated the "hot spot" ditch sediments (located on and just to the west of the landfill property). These sediments were to have been removed and either placed under the existing soil cover or properly disposed of off-site, per the 2012 Decision Document. Since the publication of the original RI and FS reports, including the previous risk assessment, applicable standards for many of the chemicals of potential concern have been revised. Based on the evaluation of the RI data, the ditches meet applicable risk goals and the hazard index for industrial receptors and residential receptors when arsenic is screened out of the risk assessment due to background levels. Thus, the remedial alternative in the 2012 Decision Document is modified to eliminate the requirement to remove ditch sediments.

2.0 SUMMARY OF SITE HISTORY/CONTAMINATION/SELECTED REMEDY

2.1 Summary of Site History

Table 1- Chronology of Significant Site Events

Date	Site Event
4/16/2009	Ohio EPA issues Preferred Plan
4/16/2009	Ohio EPA issues O(2)(G) Exemption Order
11/29/2010	Ohio EPA issues Amended Preferred Plan
9/10/2012	Ohio EPA issues Decision Document
10/9/2012	Responsible Parties appeal Decision Document to ERAC
7/5/2013	Responsible Parties submit Cover Thickness Measurement Report
9/11/2013	Ohio EPA – Ground Water Modeling Memorandum
10/1/2013	Ohio EPA - Hot Spot / Ditch Sediment Memorandum
1/10/2014	Responsible Party submits "No 'Potable' Well Zone" Map
1/10/2014	Responsible Party submits Memo on Soil Cover Type and NWZ area
4/29/2014	Responsible Party submits updated Cost Estimate for Alternative 11
5/1/2014	Responsible Party submits updated No Well Zone Ordinance and Map

2.2 Summary of Site Contamination

The RI was conducted by the Lucas County Commissioners and included a number of tasks to identify the nature and extent of Site-related chemical contaminants. The investigation was conducted with oversight by Ohio EPA, and the subsequent RI Report was approved in February 1996. The tasks included sampling of air, water, soil, surface water and ground water. The data obtained from the investigation were used to conduct a baseline risk assessment and to determine the need to evaluate remedial alternatives. Additional data gathered by Conestoga-Rovers and Associates ("CRA") in 1999 and the Baseline Risk Assessment also performed by CRA in April of 2000 were provided to Ohio EPA by the Lucas County Commissioners in June of 2000.

Please refer to the approved RI and FS Reports, additional data gathered by CRA in 1999 and the Baseline Risk Assessment performed by CRA in April 2000, the 2012 Decision Document, and the October 1, 2013 Ohio EPA memorandum on "Hot Spot" ditch sediments (see **References** and **Attachments**) for additional information on contaminant concentrations and the associated risk re-evaluation.

2.3 Summary of Selected Remedy in 2012 Decision Document

The remedy selected in the 2012 Decision Document addressed principal risks posed by the King Road Landfill site. The Remedial Action Objectives (RAOs) in the 2012 Decision Document remain unchanged in this Modified Decision Document, and included:

- Reduce leachate production (to the maximum extent practicable);
- Contain the solid refuse;
- Collect/control landfill gas;
- Prevent contact with ground water; and
- Prevent direct surface contact with contaminants.

3.0 BASIS FOR THE DOCUMENT

Ohio EPA issued a Decision Document for the King Road Landfill site on September 10, 2012. The re-evaluation of previous data and the receipt of additional new information over the past year (see **Table 1 – Chronology of Significant Site Events**) have led Ohio EPA to modify the previously selected remedial alternatives. The 2012 Decision Document included the following remedial components that are being altered in this Modified Decision Document:

3.1 Vegetative Final Cover (see Section 5.1 in the 2012 Decision Document)

The additional information received by the Agency effectively documents the acceptable closure in 1969 of an approximately 43 acre portion of the nearly 70 acre King Road Landfill. Further, issuance of an exemption order by the Director of Ohio EPA on April 16, 2009 allows for the use of a protective vegetative soil landfill cover instead of adherence to current solid waste capping requirements. The July 5, 2013 report delineated only about one acre of the landfill, located at the southwest corner of the western end of the landfill, as having less than

24 inches of soil cover (and a poorly established vegetative cover). Ohio EPA has determined that this area is to receive additional soils to reach a thickness of 24 inches, to foster an acceptable vegetative cover. Therefore, the original remedial alternative in the 2012 Decision Document is being modified to substantially reduce and specifically identify the area of the landfill subject to additional soil cover.

3.2 Ditch Sediments (see Section 5.3 in the 2012 Decision Document)

The Agency re-evaluated the "hot spot" ditch sediments located on and just to the west of the landfill property. These sediments were to have been removed and either placed under the proposed additional soil cover or properly disposed of off-site per the 2012 Decision Document. Since the publication of the original RI and FS reports, including the previous risk assessment, applicable standards for many of the chemicals of potential concern have been revised. Based on the evaluation of the RI data, the ditches meet applicable risk goals and the hazard index for industrial receptors and residential receptors when arsenic is screened out of the risk assessment due to background levels. Therefore, the original remedial alternative is being modified to eliminate the requirement to remove the "Hot Spot" ditch sediments (*i.e.*, Section 5.3 in the 2012 Decision Document in its entirety).

3.3 Off-Site Groundwater (see Section 5.4 in the 2012 Decision Document)

Supplemental work was conducted and information provided to the Agency to clarify the "No Well Zone" (NWZ) remedial component included in the 2012 Decision Document. This information included the identification of all potable wells drawing water from the unconfined sand aquifer within a one-half mile (*i.e.*, 2,640 feet) radius of the landfill, and a re-evaluation of the historical groundwater sample analyses in the areas surrounding the landfill. In addition, the Agency conducted groundwater flow modeling in the area of the landfill.

In short, the specific limits of the NWZ have been established subsequent to the 2012 Decision Document, based on the Ohio EPA review of the additional information and associated ground water modeling efforts, to include a radius extending 2,640 feet from the landfill perimeter, to the north, east, west and southwest, and (as proposed by Lucas County) to Ten Mile Creek, a hydraulic barrier (recharge area), to the west and northwest, in the shallow unconfined sand aquifer, and in a radius of 1,000 feet from the landfill perimeter in confined bedrock aquifer.

Therefore, the original remedial alternative in the 2012 Decision Document has been updated to include the specific limits of the NWZ (see attached NWZ Map (prepared by The Mannik and Smith Group on behalf of Lucas County)), which were not originally delineated in the 2012 Decision Document. Lucas County provided Ohio EPA with a draft NWZ ordinance on June 26, 2014. The draft NWZ ordinance states that no person within the 1,000-foot potable NWZ shall withdraw ground water from any source (*i.e.*, the unconfined or confined aquifers) for any purpose, and that no person beyond the 1,000-foot potable NWZ but within the 2,640-foot potable NWZ shall withdraw ground water from the shallow unconfined sand zone aquifer for any potable use.

Subject to the modified description of the selected remedy included in this Modified Decision Document, the September 10, 2012 Decision Document presents the selected remedial action for the King Road Landfill (Site) in Lucas County, Ohio, chosen in accordance with the policies of the Ohio Environmental Protection Agency, statutes and regulations of the State of Ohio, and the National Contingency Plan, 40 CFR Part 300.

The selected remedy for the King Road Landfill site in the 2012 Decision Document, as revised in this Modified Decision Document, will be protective of human health and the environment, and will meet applicable or relevant and appropriate requirements (ARARs). Because industrial waste with hazardous constituents will remain on the site at levels that do not allow for unlimited use and unrestricted exposure, five-year reviews of the remedy will continue to be required, as requested by Ohio EPA.

4.0 DESCRIPTION OF SIGNIFICANT CHANGES/BASIS FOR CHANGES

Table 2 – Documentation of Changes to the Remedy summarizes the significant changes in the remedy being documented herein.

Table 2 - Documentation of Changes to Remedy	
Original Remedial Component	**Modification of Remedial Component**
Vegetative Final Cover: Installation of soil cover in all areas of the 70 acre landfill identified as having exposed waste or less than 24 inches of soil cover above the waste.	Installation of soil cover (to a thickness of 24 inches) in the ~1 acre area of the landfill delineated (in the July 5, 2013 thickness cover sampling report) to have less than 24 inches of soil cover (and poorly established vegetative cover), located at the southwest corner of the western end of the landfill.
Ditch Sediments: Removal, stockpiling, sampling and disposal (as appropriate) of "Hot Spots" (*i.e.*, sediment deposition in ditches), identified in the RI and FS to be located on and just west of the landfill and to be in seasonal contact with the unconfined aquifer, and/or a receptor of landfill leachate and/or solid waste discharges.	Since the publication of the original RI and FS reports, including the previous risk assessment for the site, applicable standards for many of the chemicals of potential concern have been revised. An Agency re-evaluation of the RI data indicates that the ditches meet applicable risk goals and the hazard index for industrial receptors and residential receptor when arsenic is screened out of the risk assessment due to background levels. As a result, removal of the "Hot Spots" is unnecessary.

Off-Site Groundwater: NWZ to be established (via Lucas County ordinance, after issuance of the 2012 Decision Document) around the landfill in a radius sufficient to encompass the radial flow of potentially contaminated groundwater from the landfill, thus eliminating the dermal, inhalation, and ingestion potential of any contaminants found in the groundwater.	While it may not rise to a formal modification to the remedial component in the 2012 Decision Document, the Agency has established the specific limits of the NWZ (to be included in the Lucas County ordinance), to include a radius extending one-half mile (2,640 feet) from the landfill perimeter to the north, east, west and southwest, and to Ten Mile Creek, a hydraulic barrier, to the west and northwest of the landfill. The draft NWZ ordinance states that no person within the 1,000-foot potable NWZ shall withdraw ground water from any source (*i.e.*, the unconfined or confined aquifers) for any purpose, and that no person beyond the 1,000-foot potable NWZ but within the 2,640-foot potable NWZ shall withdraw ground water from the shallow unconfined sand zone aquifer for any potable use.

Subject to the following modifications, the selected remedy, Alternative No. 11, in the 2012 Decision Document, remains otherwise unchanged and is incorporated by reference herein.

Vegetative Final Cover

The statements on page 2 (Description of the Selected Remedy), page 25 (Section 3.11), page 29 (Section 4.2.1) and page 38 (Section 5.1) of the 2012 Decision Document that read (*in effect*): "The remedy will require the installation of additional soil cover in areas previously identified as having exposed waste or less than 24 inches of soil above the waste" is hereby modified to read as follows:

> "The remedy will require the installation of additional soil cover in an approximately 1-acre area located at the southwest corner of the western end of the landfill, identified as the "Area Identified as Having Less than 24" of Cover," as delineated on Figure 1, Cover Thickness Measurement, attached to the Memo to Jim Shaw, P.E. and Matt Choma, Lucas County Sanitary Engineer's Office, from Karen Dolliver and Mike Momenee, The Mannik & Smith Group, dated July 5, 2013 (copy attached). Lucas County shall provide to Ohio EPA a grain size analysis of the proposed additional soil for the cover, demonstrating its suitability for establishing a vigorous soil vegetative cap, and suitable for sustaining Oak Openings vegetation."

Ditch Sediments

The statements on page 4 (Description of the Selected Remedy), page 25 (Section 3.11) and pages 40-41 (Section 5.3) of the 2012 Decision Document that read (in effect): "Hot Spots (*i.e.*, sediment deposition in ditches) identified in RI and FS reports to be in seasonal contact with the unconfined aquifer, and/or a receptor of landfill leachate and/or solid waste discharges are to be removed, stockpiled, sampled and analyzed, and the materials either placed under the landfill cap or if hazardous, transported to a permitted disposal facility" is hereby modified to read as follows:

> "Since the publication of the original RI and FS reports, including the previous risk assessment for the site, applicable standards for many of the chemicals of potential concern have been revised. An Agency re-evaluation of the RI data indicates that the Hot Spot ditch sediments meet applicable risk goals and the hazard index for industrial receptors and residential receptors when arsenic is screened out of the risk assessment due to background levels. As a result, removal of the "Hot Spot" ditch sediments is unnecessary. For all practical purposes, the requirements and performance standards in Section 5.3 (Ditch Sediments) of the 2012 Decision Document are hereby eliminated."

Off-Site Groundwater

The statements on page 3 (Description of the Selected Remedy), page 25 (Section 3.11), page 29 (Section 4.2.1) and pages 41-42 (Section 5.4) of the 2012 Decision Document that read (*in effect*): "The Lucas County Board of Health intends to establish a No Well Zone around the landfill in a radius sufficient to encompass the radial flow of potentially contaminated groundwater from the landfill, thus eliminating the dermal, inhalation, and ingestion potential of any contaminants found in the groundwater" is hereby modified to read as follows:

> "The Lucas County Board of Health intends to establish a No Well Zone around the landfill in a radius extending one-half mile from the landfill perimeter to the north, east, west and southwest, and to Ten Mile Creek, a hydraulic barrier (recharge area), to the west and northwest of the landfill."

Cost

The statement on page 37 (Section 4.2.7) that reads: "By letter to Ohio EPA, dated June 12, 2012, the Lucas County Sanitary Engineer provided the following cost estimate. Capital Costs: $1,373,500, Operating and Maintenance (O&M) Costs: Year Zero: $18,500, First Year: $70,500, Subsequent Years: $1,012,500, Present Worth = $2,701,000" is hereby modified to read as follows:

By email on April 29, 2014, counsel for the Lucas County Sanitary Engineer provided Ohio EPA with an updated cost estimate, prepared by the Mannik and Smith Group:

Capital Costs:		$ 381,073
O&M Costs:	Year Zero:	$ 41,860
	First Year:	$ 76,076
	Subsequent Years:	$ 2,234,520
Present Worth:		$ 2,749,110*

* Includes $15,579 for Periodic Review Costs, not included in Capital or O&M Costs.

5.0 AFFIRMATION OF STATUTORY DETERMINATIONS

Pursuant to the requirements of CERCLA, it is Ohio EPA's position that the selected remedy, as modified, remains protective of human health and the environment, complies with ARARs, and is cost-effective. In addition, the modified remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this site.

The remedial alternative in this modified Decision Document will be protective of human health and the environment, is cost-effective and compliant with ARARs, and is permanent in the long term.

6.0 PUBLIC PARTICIPATION

Ohio EPA issued a Preferred Plan identifying the preferred remedial alternative for this site on April 16, 2009. A public meeting was held on May 20, 2009, with public comment accepted through June 29, 2009. A revised Preferred Plan was issued on November 29, 2010, with a public meeting held on January 10, 2011, and public comment accepted through January 17, 2011.

Ohio EPA is making this Modified Decision Document available to the public to provide an update on the progress made at the site and of the changes made to the remedy. Ohio EPA has issued this Modified Decision Document for the site remedial work and has made it and supporting information available to the public at the Ohio EPA Northwest District Office and at the site information repository. Ohio EPA will ensure that a notice summarizing the Modified Decision Document is published in a newspaper of local circulation.

Site information is available for public review at the following locations:

Ohio EPA
Northwest District Office
347 N. Dunbridge Road
Bowling Green, OH 43402
(419) 352-8461
8:00am - 5:00pm, Mon-Fri

Toledo-Lucas County Public Library (Sylvania Branch)
6749 Monroe Street
Sylvania, OH 43560
(419) 882-2089
Hours: Mon-Thu (9 a.m. to 8:30 p.m.) and Fri-Sat (9 a.m. to 5:30 p.m.)

DECLARATION

Ohio EPA has determined that the changes to the King Road Landfill site Decision Document issued by the Director of Ohio EPA in September 2012 and provided in this Modified Decision Document are significant but do not fundamentally alter the overall site remedial action. I therefore approve the issuance of this Modified Decision Document for the King Road Landfill Site and the changes to the remedial action stated herein.

SEP 09 2014

Craig W. Butler, Director
Ohio Environmental Protection Agency

Date

REFERENCES

The changes included in this Modified Decision Document are based on information included in the following documents, which are also included as Attachments to this Modified Decision Document:

- Site plan from Lucas County Sanitary Engineer's Office, received by Ohio Department of Health on June 23, 1969 (and subsequently by Ohio EPA DERR-NWDO on November 27, 2012), regarding status and closure of portions of King Road Landfill.

- Memo (including Cover Thickness Measurement figures) to Jim Shaw, P.E. and Matt Choma, Lucas County Sanitary Engineer's Office, from Karen Dolliver and Mike Momenee, The Mannik and Smith Group, dated July 5, 2013.

- Internal Memorandum dated September 11, 2013, summarizing groundwater modeling results and proposing limits of NWZ, from Tim Christman, Ohio EPA DERR-CO, to Paul Jayko and Archie Lunsey, Ohio EPA DERR-NWDO.

- Internal memorandum dated October 1, 2013, on "hot spot" ditch sediment re-evaluation, from Carrie Rasik, Ohio EPA DERR-CO, to Paul Jayko and Archie Lunsey, Ohio EPA DERR-NWDO.

- Email (including an updated No Well Zone map) to Mark Navarre, Ohio EPA Legal Office, and Timothy Kern, Ohio Attorney General's Office, from Tom Hays, counsel for Lucas County, dated March 14, 2014.

- Email (including an updated remedial cost estimate from Mannik and Smith Group) to Mark Navarre, Ohio EPA Legal Office, and Timothy Kern, Ohio Attorney General's Office, from Tom Hays, counsel for Lucas County, dated April 29, 2014.

- Email (including a revised attachment labeled Resolution Prohibiting Potable Water Wells in the Vicinity of the King Road Landfill, Sylvania Township; and the No Well Zone Map) to Tom Hays, counsel for Lucas County, and Doug Haynam, counsel for the King Road Landfill Group, from Mark Navarre, Ohio EPA Legal Office, dated June 24, 2014. See also Tom Hays email to Timothy Kern dated June 26, 2014, stating that the documents attached to the June 24, 2014 email "are acceptable to Lucas County."

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ATTACHMENTS

(Copies of Documents* Listed in the References Section)

*Large map available in hard copy version only.

1800 Indian Wood Circle, Maumee, Ohio 43537
Tel: 419.891.2222 Fax: 419.891.1595
www.MannikSmithGroup.com

MEMO

To: **Jim Shaw, P.E., Matt Choma (Lucas County Sanitary Engineer's Office)**
From: Karen Dolliver and Mike Momenee (The Mannik & Smith Group)
CC: Paul Jayko, Dr. Timothy Christman, Archie Lunsey (Ohio EPA)
Andy Ranazzi, John Borell, Tom Hays (Lucas County Prosecutor's Office)
Doug Haynam (Shumaker, Loop & Kendrick, LLP)

Date: July 5, 2013

Project #: LUCC0F6K
Re: **King Road Landfill – Cover Thickness Evaluation**

On June 20, 2013 representative from The Mannik & Smith Group, Inc. (MSG) completed a cover thickness evaluation at the King Road Landfill. Dr. Timothy Christman and Mr. Paul Jayko from the Ohio EPA and Mr. Matt Choma from Lucas County Sanitary Engineer's Office were present during the field evaluation.

The evaluation consisted of determining the depth of cover over emplaced waste at ten locations on the western end of the landfill as requested by Ohio EPA. This evaluation was conducted on the portion of the landfill outside the areas marked "Closed" on a drawing submitted by the County and approved by the Ohio Department of Health in 1969. The sampling locations are in areas of relatively sparse vegetation as identified by Lucas County in prior submissions to Ohio EPA. These ten locations were shown on a draft sampling plan provided to the Ohio EPA on May 1, 2013. Ohio EPA reviewed the sampling plan and indicated up to five additional locations could be added based on site conditions. Ohio EPA's review is documented in a letter dated May 10, 2013.

Prior to June 20, 2013, MSG personnel field verified and staked the ten cover thickness sampling locations identified in the May 1, 2013 sampling plan. A copy of the figure identifying the ten soil cover thickness sample locations is attached for reference.

A hand auger and shovel were used to advance a borehole at each sample location a minimum of twenty-four (24) inches, or until the first signs of waste were encountered, whichever came first. Soil cover was found to be in excess of 24 inches at seven of the ten locations. The cover at two of the remaining three sample locations was 20 inches thick and 18 inches thick at the last location. The three locations with less than 24 inches of soil cover are localized at the southwest corner of the landfill. Based on these findings, Ohio EPA did not request any additional locations to be investigated for cover depth. A table summarizing the soil cover depths measured on June 20, 2013 is attached.

Based on the results of the June 20, 2013 the majority of the western end of the King Road Landfill clearly has a minimum 24 inches of cover soil and only sample location nos. 8, 9 and 10 in the southwest quadrant of the landfill have less than 24 inches of soil cover, but at least 18 inches.

King Road Landfill
Cover Thickness

Point Number	X (Easting)	Y (Northing)	Cover Thickness
1	1,632,345.32	736,325.29	>24"
2	1,632,358.37	736,045.93	>24"
3	1,632,316.60	735,965.00	>24"
4	1,632,050.30	735,800.52	>24"
5	1,632,159.95	735,766.58	>24"
6	1,632,042.47	735,489.83	>24"
7	1,632,042.47	735,322.74	>24"
9	1,632,287.88	735,215.70	20"
8	1,632,021.56	735,184.37	18"
10	1,632,327.04	735,103.44	20"

Coord are in SP 83 OH North Ft
Cover thickness was measureed on June 20, 2013

Figure 1
Cover Thickness Measurement
King Road Landfill
Sylvania Township
Lucas County, Ohio

Legend

Rare Species Status

Presumed Exerpated

Mannik Smith

Figure 1
Cover Thickness Measurement
King Road Landfill
Sylvania Township
Lucas County, Ohio

Legend

Presumed Excavated

Mannik Smith

INTEROFFICE MEMO

OhioEPA

To: Paul Jayko, DERR/NWDO Archie Lunsey, DERR/NWDO

From: Tim Christman, DERR/CO

Date: 9/11/2013

Subject: Ground Water Modeling for King Road Landfill

The purpose of this modeling was to determine a safe setback distance for a no-well zone around the King Road Landfill. The basic strategy was to start with the highest detected contaminant values at the landfill perimeter and track the plume concentrations moving away from the landfill. The distance at which concentrations dropped to MCL's would be a safe setback for a ban on potable water well use

I used two models for making the predictions. The first was a three dimensional MODFLOW model that covered an area 20,000 ft square, centering on the King Road Landfill. The second was the BIOSCREEN model from USEPA, which tracks concentrations along a downgradient plume from the source. While primarily intended for organic compounds, that model can readily be adjusted for inorganics as well. The input data are limited to those of the early 1990's remedial investigation. Given the uncertainties over some of that data, I intentionally used some very protective assumptions for this analysis. I assumed a conductivity of about 50 ft/day which, while higher than indicated from the limited number of slug tests performed on the uppermost aquifer, I believe is reasonable for a sand formation like the one that underlies the Oak Opening area. I have assumed that the contamination will not reach the bedrock regional aquifer in any significant quantity. Based on data from other sites in Lucas County, the thick clay bed will probably act as an effective aquitard. I also assumed a hydraulic gradient of 0.003 moving away from the landfill in all directions. Monitoring well data from near the landfill supports that gradient. To be cautious I assumed that gradient would remain constant throughout the spatial extent of the model. In addition, I assumed no adsorption to the aquifer media. A further conservative assumption is that all of a model block (in this case a 100 ft square) would be contaminated with any COC and that the block was effectively an infinite source during the modeling. While that assumption probably overstates the extent of contamination, is would work toward protectiveness.

In examining the data from the remedial investigation, I eliminated any contaminant values from wells with extreme turbidity (1000's of NTU). While some of the contaminant values in those wells are very high, they probably represent chemicals sorbed to particulate grains, which would likely not be mobile over a long range. The highest inorganic contaminant of concern in any clean well was arsenic at approximately 60 ppb (MCL = 10 ppb). Both models yielded very similar predictions of approximately 10 percent of source concentration at a half mile downgradient and 5 percent at one mile downgradient. Thus, even at a half a mile distance, we would be below the MCl for arsenic.

The organic chemistry data is more problematic. One well, 35, showed a very high value, 208 ppb, for benzene. Other samples from that well showed high turbidity (2690 NTU) so the contamination might be dismissed as sorbed to particulates. However, to play it safe, I considered a source with that level of benzene. Unlike arsenic, benzene is biodegradable, especially under aerobic conditions that would be likely in a shallow sandy aquifer. A report by the

USEPA[1] lists a range of observed half lives from 58 to 693 days for benzene in ground water. I ran the model using the longest reported value for half life (slowest biodegradation rate) and found that the predicted benzene concentration would be well below detectable levels at a half mile from the landfill.

Based on the results of these modeling simulations, both organic and inorganic contaminants appear to reach safe levels (MCL's) at approximately one half mile from the source. Thus, I would recommend that the no-well zone extend at least one half mile in all directions from the boundaries of the landfill.

[1] Aronson, D. *et al*, Aerobic Biodegradation of Organic Chemicals in Environmental Media: A Summary of Field and Laboratory Studies., U.S. Environmental Protection Agency, Office of Research and Development, Athens, Georgia 30605. 1997 http://www.epa.gov/osw/hazard/wastetypes/wasteid/hwirwste/pdf/risk/reports/s0549.pdf

Interoffice Memo

To: Paul Jayko, Site Coordinator/Lead Reviewer, DERR-NWDO; Archie Lunsey, Supervisor, DERR-NWDO

From: Carrie Rasik, Risk Assessor, ACRE, DERR-CO

Date: October 1st, 2013

Re: King Road Landfill, Sylvania Township, Lucas County, Ohio

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The Remedial Investigation (RI) report (1994, revised 1996) reported a number of inorganic chemicals of potential concern (COPC) above background parameters (Table 5.7.2) in the drainage ditches west of Silica Road. Since the publication of the report, applicable standards for many of the COPCs have been revised. Therefore, the request was made to re-evaluate the inorganic COPC data utilizing current Ohio EPA Ecological Sediment Reference Values (SRV) and US EPA Residential and Industrial Regional Screening Levels (RSLs) (Tables 1-3, below). The RSLs were adjusted to reflect the Ohio EPA state-wide cancer risk goal of 1x10^-5 and non-cancer hazard index of 1.

Table 1: Comparison of Ditch Detections to Ohio EPA Ecological Sediment Reference Values (units in ppm)

Chemical of Potential Concern	Minimum Detection	Maximum Detection	SRV
Arsenic	7.4	13	11
Barium	25	250	210
Chromium	6.6	56	51
Copper	7.3	34	42
Cyanide	0.11	1.2	Not Applicable
Iron	8900	31000	44000
Nickel (soluble salts)	7.2	47	36
Selenium	2.9	4.5	1.4
Zinc	24	290	190
Lead	4.8	34	47

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Table 2: Comparison of Ditch Detections to US EPA Residential Regional Screening Levels (units in ppm)

Chemical of Potential Concern	Maximum Detection	Cancer RSL	Non-Cancer RSL	Cancer Risk	Non-Cancer Hazard
Arsenic	13	6.1	34	2.13	0.38
Barium	250	NA	15000	NA	0.02
Chromium	56	NA	120000[2]	NA[2]	0.00
Copper	34	NA	3100	NA	0.01
Cyanide	1.2	NA	22	NA	0.05
Iron	31000	NA	55000	NA	0.56
Nickel (assuming soluble salts)	47	130000	1500	0.00	0.03
Selenium	4.5	NA	390	NA	0.01
Zinc	290	NA	23000	NA	0.01
Lead[1]	34	NA	400	NA	NA
Total Risk/Hazard				2.13x10^-5	1.08

[1] Standard takes into account other factors and assumptions; therefore, included lead in the cumulative risk considerations need not be performed.

[2] RSL for chromium III utilized

Table 3: Comparison of Ditch Detections to US EPA Industrial Regional Screening Levels (units in ppm)

Chemical of Potential Concern	Maximum Detection	Cancer RSL	Non-Cancer RSL	Cancer Risk	Non-Cancer Hazard
Arsenic	13	24	380	0.54167	0.03421
Barium	250	NA	190000	NA	0.00132
Chromium	56	NA	1500000[2]	NA[2]	0.00004
Copper	34	NA	41000	NA	0.00083
Cyanide	1.2	NA	140	NA	0.00857
Iron	31000	NA	720000	NA	0.04306
Nickel (assuming soluble salts)	47	640000	20000	0.00007	0.00235
Selenium	4.5	NA	5100	NA	0.00088
Zinc	290	NA	310000	NA	0.00094
Lead[1]	34	NA	800	NA	NA
Total Risk/Hazard				5.4x10^-6	0.09

[1] Standard takes into account other factors and assumptions; therefore, included lead in the cumulative risk considerations need not be performed.

[2] RSL for chromium III utilized

A number of COPCs had maximum detections slightly above their respective SRV, while the minimum detections were well below the SRV, with the exception of selenium which had a minimum detection slightly above the SRV. Given the majority of wide ranges of maximum and minimum detections, and the proximity of the maximum detections to the respective SRV, it cannot be determined if further evaluation of the ditch media to ecological receptors is necessary. Individual sample location and concentrations are not presented in the RI. A reasonable maximum exposure (RME) or central tendency concentration may indicate that the values in the media are protective of ecological receptors. However, not enough information is provided to calculate a statistical representation of the data.

The calculated cumulative residential cancer risk is 2x10^-5, and exceeds the state-wide cancer risk goal of 1x10^-5. However, the cancer risk exceedance is driven by arsenic, which is likely at or below the regional background level of arsenic for northwest Ohio. The elimination of arsenic due to background would result in a cumulative residential cancer risk meeting the state-wide cancer risk goal. The calculated cumulative industrial cancer risk is 5.4x10^-6, which meets the state-wide risk goal. The calculated residential and industrial hazard indices both meet the state-wide hazard index of 1.

Based on the evaluation of the RI data, the ditches meet applicable risk goals and hazard index for industrial receptors, and residential receptor risk goals and hazard index meet risk goals when arsenic is screened out of the risk assessment due to background, assuming no releases or source areas have affected the ditches since the collection of the 1994 data. However, unless runoff and leaching from the landfill has been contained since the ditch sediments were sampled, additional sampling of the ditch sediments is suggested to evaluate current exposure point concentrations.

Please feel free to contact me by phone or email if there are any questions.

Sincerely,

Carrie Rasik, Risk Assessor
Ohio EPA, Division of Environmental Response and Revitalization
Assessment, Cleanup, and Reuse (ACRE) Section
P.O. Box 1049, Columbus, OH 43216-1049
Ph: 614-644-2324
Carrie.Rasik@epa.ohio.gov

ec: Michael Allen, Risk Assessment Supervisor, ACRE, DERR-CO
Mark Rickrich, DERR-CO
Mark Navarre, Legal, CO
Tim Christman, DERR-CO
Robert C. Moormann, Office of Ohio Attorney General

Rickrich, Mark

From: Navarre, Mark
Sent: Monday, March 17, 2014 8:47 AM
To: Jayko, Paul; Lunsey, Archie
Cc: Rickrich, Mark; Christman, Timothy
Subject: FW: No Potable Well Zone
Attachments: LUCC0F6K.FIG.NoPotableWellZones-nowells.pdf; LC 1403B Rvsd Health Department NWZ Resolution Sent to OEOA.docx

Fyi

From: Thomas Hays [mailto:trhayslaw@gmail.com]
Sent: Friday, March 14, 2014 4:04 PM
To: Navarre, Mark; Timothy J. Kern
Cc: John Borell; Michael Momenee; Jim Shaw; Matt Choma; Kevin Pituch
Subject: Fwd: No Potable Well Zone

Mark and Tim,

Attached is the draft Portable No Well Zone resolution for action by the Toledo-Lucas County Board of Health. As I told Mark in our phone conversation, the County's original proposal was 1000 feet in all aquifers. Based on our discussions, this was modified to be larger in the shallow sandy aquifer. Please, let me have any comments.

Tom Hays
419-410-7069
419-410-7069

---------- Forwarded message ----------
From: **Michael Momenee** <MMomenee@manniksmithgroup.com>
Date: Fri, Mar 14, 2014 at 3:39 PM
Subject: No Potable Well Zone
To: trhayslaw@gmail.com

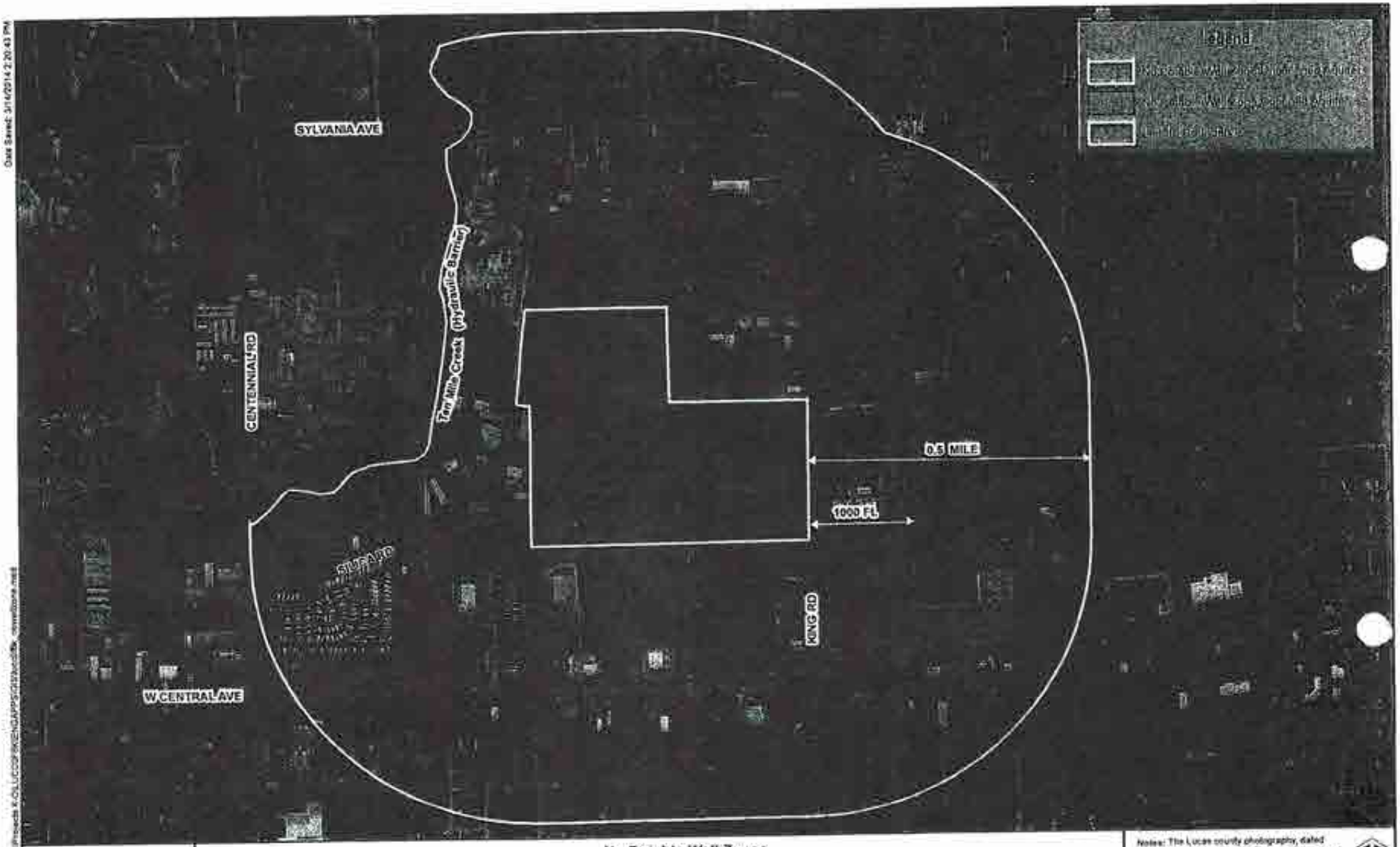
Hi Tom,

As requested, attached is a copy of a figure showing the proposed No Potable Well Zones surrounding the King Road Landfill.

Please don't hesitate to call with any questions of comments.

Mike

Michael J. Momenee, CP
Senior Project Manager
The Mannik & Smith Group, Inc.
1800 Indian Wood Circle
Maumee, OH 43537
(419) 279-5185 (Cell)
(419) 891-2222 Ext. 173 (Office)
www.manniksmithgroup.com



Mannik Smith

No Potable Well Zones
King Road Landfill
Sylvania, Ohio

Notes: The Lucas county photography, dated April 20011, is provided by OGRIP as part of the Ohio Statewide Imagery Program.

Feet
0 400 800

APPENDIX C

GENERIC STATEMENT OF WORK FOR CONDUCTING REMEDIAL DESIGNS AND REMEDIAL ACTIONS (RD/RA SOW)

OHIO ENVIRONMENTAL PROTECTION AGENCY DIVISION OF ENVIRONMENTAL RESPONSE AND REVITALIZATION REMEDIAL RESPONSE PROGRAM

1.0 PURPOSE

The purpose of this Remedial Design/Remedial Action Statement of Work (RD/RA SOW) is to define the procedures the Respondent(s) shall follow in designing and implementing the selected remedy for the Site as described in this SOW and the Director's Final Findings and Orders (Orders) to which it is attached. The Division of Environmental Response and Revitalization (DERR) documented the selection of a remedy for the Site in the Decision Document, which is attached to the Orders. The intent of the remedy is to protect the public health and/or the environment from the actual or potential adverse effects of the contaminants discovered at and related to the site. Further guidance for performing the RD/RA work tasks may be found in the U.S. EPA Superfund Remedial Design and Remedial Action Guidance document (OSWER Directive 9355.0-4A). All applicable regulatory requirements pertaining to the selected remedy and RD/RA activities shall be followed.

The Ohio EPA shall provide oversight of the Respondent's activities throughout the RD/RA. The Respondent's shall support the Ohio EPA's initiatives and conduct of activities related to the implementation of oversight activities.

2.0 DESCRIPTION OF THE REMEDIAL ACTION/ PERFORMANCE STANDARDS

Performance standards and specifications of the major components of the remedial action to be designed and implemented by the Respondent(s) are described below. Performance standards shall include cleanup standards, standards of control, quality criteria, and other requirements, criteria or limitations as established in the Decision Document, this SOW and the Orders to which it is attached.

See Appendix A, Decision Document, for description of the Remedial Action components and associated performance standards.

3.0 SCOPE OF THE REMEDIAL DESIGN AND REMEDIAL ACTION

The Remedial Design/Remedial Action (RD/RA) shall consist of seven principal tasks described below. Each task shall be completed and required documentation shall be submitted in accordance with the schedules established in the Orders and in the RD/RA Work Plan approved by Ohio EPA. All work related to this SOW shall be performed by the Respondent(s) in a manner consistent with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended, 42 USC 9601, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300 (1990), and other applicable federal and state rules and regulations.

Task Summary

3.1 Task I: RD/RA Work Plan
- 3.1.1 Site Access
- 3.1.2 Pre-Design Studies Plan
- 3.1.3 Regulatory Compliance Plan
- 3.1.4 Natural Resource Damage Assessment

3.2 Task II: Pre-Design Studies

3.3 Task III: Remedial Design
- 3.3.1 General Requirements for Plans and Specifications
- 3.3.2 Design Phases
- 3.3.3 Estimated Cost for Remedial Action
- 3.3.4 Remedial Action Implementation Plan
- 3.3.5 Community Relations Support

3.4 Task IV: Remedial Action Construction
- 3.4.1 Preconstruction Inspection and Conference
- 3.4.2 Design Changes During Construction
- 3.4.3 Remedial Action Construction Completion and Acceptance
- 3.4.4 Community Relations Support

3.5 Task V: Five-Year Reviews

3.6 Task VI: Operation and Maintenance/Performance Monitoring
- 3.6.1 Reporting During Operation and Maintenance
- 3.6.2 Completion of Remedial Action Report

3.7 Task VII: Reporting Requirements

3.7.1 Monthly Progress Reports during RD and RA Construction
3.7.2 Summary of Reports and Submittals

3.1 TASK I: RD/RA WORK PLAN

The Respondent(s) shall submit a work plan for the Remedial Design and Remedial Action (RD/RA) to the Ohio EPA for review and approval, which presents the overall strategy for performing the design, construction, operation, maintenance and monitoring of the Remedial Action (RA). The work plan shall provide a detailed discussion of the specific tasks necessary to implement the selected remedy, including a description of the technical approach, personnel requirements, plans, specifications, permit requirements and other reports described in this SOW.

The work plan shall document the responsibilities and authority of all organizations and key personnel involved with the development and implementation of the RD/RA. The qualifications of key personnel directing the RD/RA tasks, including contractor personnel, shall be described.

The work plan shall include schedules fixed in real time for the development of the (RD) and implementation of the RA, including milestones for the submittal of the document packages for Ohio EPA review and meetings for discussion of the submittals. The RD/RA Work Plan must be reviewed and approved by the Ohio EPA prior to initiation of field activities or proceeding with the RD.

Specific requirements to be addressed by the RD/RA Work Plan are described in the following sections.

3.1.1 Site Access

All site access agreements necessary to implement the RD and RA shall be obtained by the Respondent(s) prior to the initiation of any activities to be conducted under the Work Plan. Site access agreements shall extend for the duration of all remedial activities and shall include allowances for all operation and maintenance considerations and State oversight activities. The work plan shall describe the activities necessary to satisfy these requirements.

3.1.2 Pre-Design Studies Plan

The Respondent(s) shall develop a plan to complete the following pre-design studies, which are required to design and fully implement the remedial action.

[Describe any pre-design studies required to support the RD/RA.]

The Pre-Design Studies Plan (PDSP), as a component of the RD/RA Work Plan, will identify and describe, in detail, activities necessary to conduct the pre-design studies identified above. The plan shall include sufficient sampling, testing, and analyses to develop quantitative performance, cost and design data for the selected remedy.

At the discretion of the Site Coordinator for the Ohio EPA, the PDSP may be submitted for review and comment under separate cover from the work plan in accordance with the schedule established in the Orders. The PDSP must be approved by the Ohio EPA prior to initiation of associated field activities or treatability studies.

The Pre-Design Studies Plan shall include, as necessary, a Field Sampling Plan (FSP), a Quality Assurance Project Plan (QAPP) and a Health and Safety Plan (HSP). Section 4.0 of this SOW describes the required content of supporting plans such as the Field Sampling Plans, Quality Assurance Project Plans and Health and Safety Plans.

Prior to development of the Pre-Design Studies Plan, there shall be a meeting of the Site Coordinator for the Ohio EPA and the Project Manager representing the Respondent(s) to discuss scope, objectives, quality assurance and quality control issues, resources, reporting, communication channels, schedule, and roles of personnel involved. Other personnel representing the Respondent(s) and Ohio EPA, who may be needed to fully discuss the issues involved, should also participate in this meeting. Guidance documents to be consulted in developing the Pre-Design Studies Plan include U.S. EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies (EPA/540/G-89/004, October 1988) and Guide for Conducting Treatability Studies Under CERCLA (EPA/540/2-89/058, December 1989), as well as others listed in Appendix A, attached to this SOW.

The pre-design studies will be conducted as described under Task II.

3.1.3 Regulatory Compliance Plan

It shall be the responsibility of the Respondent(s) to ensure compliance with all applicable regulatory state and federal requirements for the RD/RA activities to be conducted at the site. The Respondent(s) shall develop a plan to identify and to satisfy all applicable state and federal laws and regulations for the RD/RA. he plan will include the following information:

1) Permitting authorities
2) Permits required to conduct RD/RA activities
3) Time required by the permitting agency(s) to process permit applications

4) Identification of all necessary forms
5) Schedule for submittal of applications
6) All monitoring and/or compliance testing requirements

The Respondent(s) shall identify in the plan any inconsistencies between any regulatory requirements or permits that may affect any of the work required. The plan shall also include an analysis of the possible effects such inconsistencies may have on the remedial action, recommendations, and supporting rationale for the recommendations. The Regulatory Compliance Plan shall be submitted to the Ohio EPA as part of the RD/RA Work Plan.

3.1.4 Natural Resource Damage Assessment

If natural resources are or may be injured as a result of a release, the Respondent(s) shall ensure that the trustees of the effected natural resources are notified. The trustees will initiate appropriate actions and provide input into the RD/RA in order to minimize or mitigate natural resource damages in accordance with the NCP and 43 CFR part 11. Trustees define "injury" as "a measurable adverse change, either long- or short-term, in the chemical or physical quality of a natural resource resulting either directly or indirectly from exposure to a discharge of oil or release of a hazardous substance. The Respondent(s) shall make available to the trustees all necessary information and documentation needed to assess actual or potential natural resource injuries.

3.2 TASK II: PRE-DESIGN STUDIES

The Respondent(s) shall schedule and detail the work necessary to accomplish the pre-design studies described in the Pre-Design Studies Plan submitted with the RD/RA Work Plan. The requirements of this section shall apply to studies undertaken to refine the understanding of the nature and extent of contamination at the site, as well as to bench and pilot scale treatability studies.

For any such studies required, the Respondent(s) shall furnish all services, including necessary field work, materials, supplies, labor, equipment, supervision, and data interpretation. Sufficient sampling, testing, and analyses shall be performed to provide the technical data necessary to support the remedial design effort with the goal of optimizing the required treatment and/or disposal operations and systems.
The Respondent(s) shall submit a draft Pre-Design Studies report for Ohio EPA's review and comment when the investigation and/or testing required by the Pre-Design Studies Plan is complete. The draft report shall present investigation/testing data and results along with an analysis of the implications those results have on the RD/RA, including a cost analysis, when appropriate. The draft report shall be submitted prior to the preliminary design submittal in accordance with the schedule specified in the Orders and approved RD/RA Work Plan. After making any required corrections or

modifications based on Ohio EPA comments, the Respondent(s) shall submit the final report with the Preliminary Design Report, unless otherwise specified in the approved RD/RA Work Plan.

3.2.1. Reporting Requirements for Groundwater data.

The Respondent(s) shall submit all groundwater data and monitoring well construction data. The Respondent(s) shall implement a groundwater monitoring program as identified in the RD workplan or as required by Ohio EPA. Respondent(s) shall submit all groundwater data and monitoring well construction data on a 3.5 inch diskette using the most current version of the U.S. EPA developed Ground Water Information Tracking System (GRITS) database software. GRITS is free software, and can be obtained by calling EPA office of Research and Development (ORD), at 513-569-7562, ask for Document # EPA/625/11-91/002. Respondent(s) shall submit one copy of each round of sampling data on printed paper in addition to the diskette format. The printed copy will be the official copy of the data.

3.3 TASK III: REMEDIAL DESIGN

The Respondent(s) shall prepare and submit to the Ohio EPA, in accordance with the schedule set forth in the compliance schedule of the Orders, construction plans, specifications and supporting plans to implement the remedial action at the Site as defined in the Purpose and Description of the Remedial Action sections of this SOW, the Decision Document, and/or the Orders.

3.3.1 General Requirements for Plans and Specifications

The construction plans and specifications shall comply with the standards and requirements outlined below. All design documents shall be clear, comprehensive and organized. Supporting data and documentation sufficient to define the functional aspects of the remedial action shall be provided. Taken as a whole, the design documents shall demonstrate that the remedial action will be capable of meeting all objectives of the Decision Document, including any performance standards.

The plans and specifications shall include the following:

1) Discussion of the design strategy and design basis including:
   a. Compliance with requirements of the Decision Document and the Orders and all applicable regulatory requirements;
   b. Minimization of environmental and public health impacts;

2) Discussion of the technical factors of importance including:

a. Use of currently accepted environmental control measures and technologies;
b. The constructability of the design;
c. Use of currently accepted construction practices and techniques;

3) Description of the assumptions made and detailed justification for those assumptions;

4) Discussion of possible sources of error and possible operation and maintenance problems;

5) Detailed drawings of the proposed design including, as appropriate:
   a. Qualitative flow sheets;
   b. Quantitative flow sheets;

6) Tables listing equipment and specifications;

7) Tables giving material and energy balances;

8) Appendices including:
   a. Sample calculations (one example presented and clearly explained for significant or unique calculations);
   b. Derivation of equations essential to understanding the report;
   c. Results of laboratory tests, field tests and any additional studies.

3.3.2 Design Phases

The Respondent(s) shall meet when necessary with Ohio EPA representatives to discuss design issues. The design shall be developed and submitted in the phases outlined below to facilitate progression toward an acceptable and functional design.

Submittals shall be made in accordance with the compliance schedule in the Orders, and the schedule in the approved RD/RA Work Plan.

3.3.2.1 Preliminary Design

A Preliminary Design, which reflects the design effort at approximately 30% completion, shall be submitted to the Ohio EPA for review and comment. At this stage of the design process, the Respondent(s) shall have verified existing conditions at the site that may influence the design and implementation of the selected RA. The Preliminary Design shall demonstrate that the basic technical requirements of the remedial action and any permits required have been addressed. The Preliminary Design

shall be reviewed to determine if the final design will provide an operable and usable RA that will be in compliance with all permitting requirements and response objectives. The Preliminary Design submittal shall include the following elements, at a minimum:

- Preliminary plans, drawings and sketches, including design calculations;
- Results of treatability studies and additional field sampling;
- Design assumptions and parameters, including design restrictions, process performance criteria, appropriate unit processes for treatment systems, and expected removal or treatment efficiencies for both the process and waste (concentration and volume);
- Proposed cleanup verification methods, including compliance with applicable laws and regulations;
- Outline of design specifications;
- Proposed sitting/locations of processes/construction activity;
- Expected long-term operation and monitoring requirements;
- Real estate and easement requirements;
- Preliminary construction schedule, including contracting strategy.

The supporting data and documentation necessary to define the functional aspects of the RA shall be submitted with the Preliminary Design. The technical specifications shall be outlined in a manner that anticipates the scope of the final specifications. The Respondent(s) shall include design calculations with the Preliminary Design completed to the same degree as the design they support.

If the Pre-Design Studies Report required under Task II have not been submitted prior to submission of the Preliminary Design, it shall be submitted with the Preliminary Design. Any revisions or amendments to the Preliminary Design required by the Ohio EPA shall be incorporated into the subsequent design phase.

3.3.2.2 Intermediate Design

Complex project designs necessitate preparation and Ohio EPA review of design documents between the preliminary and pre-final design phases. The Respondent(s) shall submit intermediate design plans and specifications to the Ohio EPA for review and comment when the design is approximately 60% complete in accordance with the schedule in the approved RD/RA Work Plan. All plans, specifications, design analyses and design calculations submitted to the Ohio EPA shall reflect the same degree of completion. The Respondent(s) shall ensure that any required

revisions or amendments resulting from the Ohio EPA's review of the Preliminary Design are incorporated into the Intermediate Design.

The Intermediate Design submittal shall include the following components:

- Design Plans and Specifications;
- Draft Construction Quality Assurance Plan;
- Draft Performance Standard Verification Plan;
- Draft Operation and Maintenance Plan;
- Health and Safety Plan.

The design shall include a Construction Quality Assurance Plan, a Performance Standard Verification Plan, an Operation and Maintenance Plan, and a Health and Safety Plan. The Performance Verification Plan shall include a Field Sampling Plan and a Quality Assurance Project Plan, as necessary. Section 4.0 of this SOW describes the required content of the supporting plans. The final Pre-Design Studies Report shall also be included, if it has not already been submitted. Revisions or amendments to the Intermediate Design required by Ohio EPA shall be incorporated into the Pre-final Design.

3.3.2.3 Pre-final Design

The Respondent(s) shall submit a Pre-final Design for Ohio EPA review in accordance with the schedule in the approved RD/RA Work Plan when the design effort is at least 90% complete. The Respondent(s) shall ensure that any modifications required by the Ohio EPA's prior review of related Pre-design Studies Reports, technical memoranda, the Preliminary and Intermediate Designs, and the QAPP and HSP are incorporated into the Pre-final Design submittal. The Pre-final Design submittal shall consist of the following components, at a minimum:

- Design Plans and Specifications;
- Construction Quality Assurance Plan;
- Performance Standard Verification Plan;
- Operation and Maintenance Plan;
- Remedial Action Implementation Plan;
- Cost Estimate;
- Health and Safety Plan.

General correlation between drawings and technical specifications is a basic requirement of any set of working construction plans and specifications. Before submitting the remedial design specifications with

the Pre-final Design, the Respondent(s) shall: (1) Coordinate and cross-check the specifications and drawings; (2) Complete the proofing of the edited specifications and required cross-checking of all drawings and specifications.

The Respondent(s) shall prepare and include in the technical specifications governing any treatment systems; contractor requirements for providing appropriate service visits by qualified personnel to supervise the installation, adjustment, startup and operation of the treatment systems; and appropriate training on operational procedures once startup has been successfully accomplished.

The Ohio EPA will provide written comments to the Respondent(s) indicating any required revisions to the Pre-final Design. Comments may be provided as a narrative report and/or markings on design plan sheets. Revisions to the plans and specifications required by Ohio EPA shall be incorporated into the Final Design. At the discretion of the Site Coordinator, the Respondent(s) shall also return to Ohio EPA all marked-up prints as evidence that the plans have been completely checked. The Pre-final Design submittal may serve as the Final Design, if Ohio EPA has no further comments and notifies the Respondent(s) that the Pre-final Design has been approved as the Final Design.

3.3.2.4 Final Design

Following incorporation of any required modifications resulting from the Ohio EPA's review of the Pre-final Design submittal, the Respondent(s) shall submit to the Ohio EPA the Final Design which is 100% complete in accordance with the approved schedule described in the RD/RA Workplan.

The Final Design submittal shall include all the components of the Pre-final Design and each of those components shall be complete. At the discretion of the Site Coordinator, any marked-up prints or drawings, which the Ohio EPA may have provided by way of comments on previous design submittals shall be returned to the Ohio EPA, if they have not already been returned.

The Respondent(s) shall make corrections or changes based on Ohio EPA comments on the Final Design submittals. The revised Final Design shall then be submitted in their entirety to the Ohio EPA for approval as the completed Final Design. Upon approval of the Site Coordinator, final corrections may be made by submitting corrected pages to the Final Design documents. The quality of the Final Design submittal should be

such that the Respondent(s) would be able to include them in a bid package and invite contractors to submit bids for the construction project.

3.3.3 Estimated Cost of the Remedial Action

The Respondent(s) shall refine the cost estimate developed in the Feasibility Study to reflect the detailed plans and specifications being developed for the RA. The cost estimate shall include both capital and operation and maintenance costs for the entire project. To the degree possible, cost estimates for operation and maintenance of any treatment system shall be based on the entire anticipated duration of the system's operation. The final estimate shall be based on the final approved plans and specifications. It shall include any changes required by the Ohio EPA during Final Design review, and reflect current prices for labor, material and equipment.

The refined cost estimate shall be submitted by the Respondent(s) with the Pre-final Design and the final cost estimate shall be included with the Final Design submittal.

3.3.4 Remedial Action Implementation Plan

The Respondent(s) shall develop a Remedial Action Implementation Plan (RAIP) to help coordinate implementation of the various components of the RA. It shall include a schedule for the RA that identifies timing for initiation and completion of all critical path tasks. The Respondent(s) shall specifically identify dates for completion of the project and major interim milestones in conformance with the approved RD/RA Workplan schedule. The Remedial Action Implementation Plan is a management tool which should address the following topics:

1) Activities necessary to fully implement each of the components of the RA;
2) How these activities will be coordinated to facilitate construction/ implementation in accordance with the approved schedule;
3) Potential major scheduling problems or delays, which may impact overall schedule;
4) Lines of communication for discussing and resolving problems, should they arise;
5) Common and/or anticipated remedies to overcome potential problems and delays.

The Remedial Action Implementation Plan shall be submitted with the Pre-final Design for review and comment by the Ohio EPA. The final plan and RA project schedule shall be submitted with the Final Design for review and approval.

3.3.5 Community Relations Support

A community relations program will be implemented by the Ohio EPA. The Respondent(s) shall cooperate with the Ohio EPA in community relations efforts. Cooperation may include participation in preparation of all appropriate information disseminated to the public, and in public meetings that may be held or sponsored by the Ohio EPA concerning the Site.

3.4 TASK IV: REMEDIAL ACTION CONSTRUCTION

Following approval of the Final Design submittal by the Ohio EPA, the Respondent(s) shall implement the designed remedial action(s) at the Site in accordance with the plans, specifications, Construction Quality Assurance Plan, Performance Standard Verification Plan, Health and Safety Plan, Remedial Action Implementation Plan, Quality Assurance Project Plan, and Field Sampling Plan approved with the final design. Implementation shall include the activities described in the following sections.

3.4.1 Preconstruction Inspection and Conference

The Respondent(s) shall participate in a preconstruction inspection and conference with the Ohio EPA to accomplish the following:

- Review methods for documenting and reporting inspection data;
- Review methods for distributing and storing documents and reports;
- Review work area security and safety protocol;
- Discuss any appropriate modifications to the Construction Quality Assurance Plan to ensure that site specific considerations are addressed. The final CQAP shall be submitted to the Ohio EPA at this time, if it has not already been submitted;
- Introduce key construction contractor, engineering and project management personnel and review roles during construction activities;
- Conduct a site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

The Respondent(s) shall schedule the preconstruction inspection and conference to be held within 10 days of the award of the construction contract. The preconstruction inspection and conference shall be documented by a designated person and minutes shall be transmitted to all parties by the Respondent(s) to all parties in attendance.

3.4.2 Design Changes During Construction

During construction, unforeseen site conditions, changes in estimated quantities of required construction materials and other problems associated with the project

are likely to develop. Such changing conditions may require either major or minor changes to the approved final design. Certain design changes will require approval of the Ohio EPA prior to implementation to ensure that the intent and scope of the remedial action is maintained. Changes, which could alter the intent or scope of the RA, may require a revision to the Decision Document and a public comment period. Changes to the remedial design which require Ohio EPA written approval prior to implementation include:

- Those that involve the deletion or addition of a major component of the approved remedy (e.g. changing one treatment system for another; deleting any designed layer of a multi-layer cap);
- Those that result in a less effective treatment for wastes associated with the site;
- Any changes that may result in an increase of the exposure to chemicals of concern and/or risk to human health or the environment as compared to the goals for the completed remedial action as stated in the Orders and this SOW;
- Those that result in a significant delay in the completion of the RA;
- Other changes that alter or are outside the scope/intent of the approved remedial design.

Ohio EPA shall be notified of other changes made during construction through daily inspection reports and monthly progress reports.

3.4.3 Remedial Action Construction Completion and Acceptance

As the construction of the remedial action nears completion, the following activities and reporting shall be completed by the Respondent(s) to ensure proper project completion, approval, closeout and transition to the operation and maintenance/ monitoring phase.

3.4.3.1 Pre-final Construction Conference

Within seven days of making a preliminary determination that construction is complete, the Respondent(s) shall provide written notification to the Ohio EPA and a pre-final construction conference shall be held with the construction contractor(s) to discuss procedures and requirements for project completion and close-out. The Respondent(s) shall have responsibility for making arrangements for the conference. Participants should include the Project Manager for the Respondent(s), the Site Coordinator for the Ohio EPA, all contractors involved with construction of the remedial action(s) and the remedial design agent (person(s) designed the remedy), if requested.

A list of suggested items to be covered at the conference includes, but is not limited to the following:

- Final Operation and Maintenance (O&M) Plan submission, if it has not been submitted already;
- Cleanup responsibilities;
- Demobilization activities;
- Security requirements for project transfer;
- Pre-final inspection schedule;
- Operator training.

The pre-final conference shall be documented by a designated person and conference minutes shall be transmitted to all parties in attendance by the Respondent(s).

3.4.3.2 Pre-final Inspection

Following the pre-final construction conference, a pre-final inspection of the project will be conducted. The pre-final inspection will be led by the Ohio EPA with assistance from the party with primary responsibility for construction inspection, if requested.

The pre-final inspection will consist of a walk-through inspection of the entire site. The completed site work will be inspected to determine whether the project is complete and consistent with the contract documents and the approved RD/RA Work Plan. Any outstanding deficient or incomplete construction items should be identified and noted during the inspection.

When the RA includes construction of a treatment system, the facility start-up and "shakedown" shall have been completed as part of the RA. "Shakedown" is considered to be the initial operational period following start-up during which adjustments are made to ensure that the performance standards for the system are reliably being achieved. The contractor shall have certified that the equipment has performed to meet the purpose and intent of the contract specifications. Retesting shall have been successfully completed where deficiencies were revealed. Such shakedown may take several months. Determination of remedy effectiveness for other types of remedial actions will be based on the Performance Standard Verification Plan (PSVP).

If construction of major components of a remedial action is performed in distinct phases or under separate contracts due to the complex scope of the site remedy, it may be appropriate to conduct the pre-final inspections

of those components separately. The approved RAIP should identify those projects and components, which should be handled in that manner.

Upon completion of the pre-final inspection, an inspection report shall be prepared by the Respondent(s) and submitted to Ohio EPA with the minutes from the pre-final conference. A copy of the report will be provided to all parties in attendance at the inspection. The report will outline the outstanding construction items, actions required to resolve those items, completion date for those items and a date for the final inspection. Ohio EPA will review the inspection report and notify the Respondent(s) of any disagreements with it.

3.4.3.3 Final Inspection

Within seven days following completion of any outstanding construction items, the Respondent(s) shall provide written notification to the Ohio EPA and schedule a final inspection. A final inspection will be conducted by the Ohio EPA with assistance from the party having primary responsibility for construction inspection, if requested.

The final inspection will consist of a walk-through inspection of the project site focusing on the outstanding construction items identified during the pre-final inspection. The Pre-final Inspection Report shall be used as a checklist. The contractor's demobilization activities shall have been completed, except for equipment and materials required to complete the outstanding construction items. If any items remain deficient or incomplete, the inspection shall be considered a pre-final inspection requiring another pre-final inspection report and final inspection.

As with the pre-final inspection, it may be appropriate to conduct final inspections of major components of a remedial action separately. Such projects and components should be identified in the approved Remedial Action Implementation Plan.

3.4.3.4 Construction Completion Report and Certification

Upon satisfactory completion of the final inspection, a Construction Completion Report shall be prepared by the Respondent(s) and submitted to the Ohio EPA within 30 days after the final inspection. The report shall include the following elements:

1) A brief description of the outstanding construction items from the pre-final inspection and an indication that the items were satisfactorily resolved;

2) A synopsis of the work defined in the approved RD/RA Work Plan and the Final Design and certification that this work was performed;

3) An explanation of any changes to the work defined in the approved RD/RA Work Plan and Final Design, including as-built drawings of the constructed RA facilities, and why the changes were necessary or beneficial for the project;

4) Certification that the constructed RA or component of the RA is operational and functional.

The construction completion report will be reviewed by the Ohio EPA. If the review indicates that corrections or amendments are necessary, then comments will be provided to the Respondent(s). The Respondent(s) shall submit a revised construction completion report based on Ohio EPA comments to the Ohio EPA within 30 days of receipt of those comments. Upon determination by the Ohio EPA that the report is acceptable, written notice of Ohio EPA's approval of the construction completion report will be provided to the Respondent(s).

3.4.4 Community Relations Support

The Respondent(s) shall provide support for Ohio EPA's community relations program during remedial action implementation as described in Section 3.3.5.

3.5 TASK V: FIVE-YEAR REVIEWS

At sites where contaminants will remain at levels that will not permit unrestricted use of the site, a review will be conducted no less frequently than once every five years to ensure that the remedy continues to be protective of human health and the environment. This is known as the "five-year review". The Respondent(s) shall complete Five-Year Review Reports no less often than every five years after the initiation of the remedial action or until contaminant levels allow for unrestricted use of the site. Further guidance for performing five-year review work tasks may be found in the U.S. EPA OSWER Directive 9355.7-02, Structure and Components of Five-Year Reviews.

The more specific purpose of the reviews is two-fold: (1) to confirm that the remedial action as specified in the Decision Document and as implemented continues to be effective in protecting human health and the environment (e.g., the remedy is operating and functioning as designed, institutional controls are in place and are protective); and (2) to evaluate whether original cleanup levels remain protective of human health and the environment. A further objective is to evaluate the scope of operation and

maintenance, the frequency of repairs, changes in monitoring indicators, costs at the site, and how each of these relates to protectiveness.

Fifteen months prior to the due date for completion of a five-year review, the Respondent(s) shall meet with Ohio EPA to discuss the requirements of the five-year review. The review must be completed within five years following the initiation of the remedial action. The scope and level of review will depend on conditions at the site. The scoping effort should include a determination by the Site Coordinator and Respondent(s) as to whether available monitoring data and other documentation will be sufficient to perform the five-year review or whether a field sampling effort will be a necessary component of the review. Within three months of the meeting, the Respondent(s) shall develop and submit a workplan to Ohio EPA that shall describe, at a minimum, the following activities and documentation:

1. Document Review
   a. Background Information
      1. Decision Document
      2. Decision Document Summary
      3. Administrative or Judicial Order for RD/RA
      4. Completion of Remedial Action Report
   b. Design Review
   c. Maintenance and Monitoring
      1. O&M Manual
      2. O&M Reports
      3. Groundwater Monitoring Plan
      4. Monitoring Data and Information

2. Standards Review
   a. Specific performance standards required by Decision Document
   b. Changing Standards
      1. Laws and Regulations applicable to conditions and activities at the site
   c. Risk Assessment
      1. As summarized in the Decision Document
      2. Review for changes in exposure pathways not previously evaluated

3. Interviews
   a. Background Information
      1. Previous Staff Management
      2. Nearest Neighbors, Respondent(s)
   b. Local Considerations
      1. State Contacts
      2. Local Government Contacts
   c. Operational Problems

1. Plant Superintendent
2. O&M Contractors

4. Site Inspection/Technology Review
   a. Performance and Compliance
      1. Visual Inspection
   b. Offsite Considerations
   c. Recommendations

5. Report
   a. Background
      1. Introduction
      2. Remedial Objectives
      3. Review of Applicable Laws and Regulations
   b. Site Conditions
      1. Summary of Site Visit
      2. Areas of Noncompliance
   c. Risk Assessment
   d. Recommendations
      1. Technology Recommendations
      2. Statement on Protectiveness
      3. Timing and Scope of Next Review
      4. Implementation Requirements

If sampling and analysis of environmental samples is required under the five-year review, the Respondent(s) are required to prepare and submit with the workplan other supporting plans. Supporting plans may include a Quality Assurance Project Plan, Field Sampling Plan and Health and Safety Plan. The purpose and content of these supporting plans are discussed in Section 4 of this SOW. The Five-Year Review Workplan must be reviewed and approved by the Ohio EPA prior to initiation of field activities or proceeding with the five-year review.

The Five-Year Review Report will be reviewed by the Ohio EPA. If the Ohio EPA review indicates that corrections or amendments are necessary, then comments will be provided to the Respondent(s). The Respondent(s) shall submit a revised Five-Year Review Report based on Ohio EPA comments to the Ohio EPA within 30 days of receipt of those comments.

3.6 TASK VI: OPERATION AND MAINTENANCE/PERFORMANCE MONITORING

The Respondent(s) shall implement performance monitoring and operation and maintenance procedures as required by the approved Performance Standard Verification Plan and approved Operation and Monitoring (O&M) Plan for the RA once it is demonstrated that the RA components are operational and functional.

3.6.1 Reporting During Operation and Maintenance

3.6.1.1 Operation and Maintenance Sampling and Analysis Data

Unless otherwise specified in the approved O&M Plan, sampling, analysis, and system performance data for any treatment system or other engineering systems required to be monitored during the O&M Phase shall be submitted by the Respondent(s) to the Ohio EPA on a monthly basis. These monthly submittals will form the basis for the annual progress report described below in Section 3.6.1.2

3.6.1.2 Progress Reports During Operation and Maintenance

The Respondent(s) shall prepare and submit annual progress reports during the operation and maintenance/performance monitoring phase of the RA. When appropriate, the RD/RA Work Plan shall specify progress reports during O&M to be submitted more frequently.

The O&M progress reports shall contain the same information as required for the monthly progress reports for the RD and RA construction phases, as specified in Section 3.6.1 of this SOW. It shall also include an evaluation of the effectiveness of any treatment and engineering systems in meeting the cleanup standards, performance standards and other goals of the RA as defined in the Orders, this SOW, the RD/RA Work Plan and the approved Final Design.

3.6.2 Completion of Remedial Action Report

At the completion of the remedial action, the Respondent(s) shall submit a Completion of Remedial Action Report to the Ohio EPA. The RA shall be considered complete when the all of the goals, performance standards and cleanup standards for the RA as stated in the Decision Document, this SOW, and the approved Final Design (including changes approved during construction) have been met. The report shall document that the project is consistent with the design specifications, and that the RA was performed to meet or exceed all required goals, cleanup standards and performance standards. The report shall include, but not be limited to the following elements:

1) Synopsis of the remedial action and certification of the design and construction;
2) Listing of the cleanup and performance standards as established in the Decision Document and the Orders, any amendments to those standards with an explanation for adopting the amendments;

3) Summary and explanation of any changes to the approved plans and specifications. An explanation of why the changes were necessary should be included and, where necessary, Ohio EPA approval of the changes should be documented;
4) Summary of operation of treatment systems including monitoring data, indicating that the remedial action met or exceeded the performance standards or cleanup criteria;
5) Explanation of any monitoring and maintenance activities to be undertaken at the site in the future as outlined in Section 3.0 of this RD/RA SOW.

3.7 TASK VII: REPORTING REQUIREMENTS

The Respondent(s) shall prepare and submit work plans, design plans, specifications, and reports as set forth in Tasks I through V of this SOW to document the design, construction, operation, maintenance, and performance monitoring of the remedial action. Monthly progress reports shall be prepared, as described below, to enable the Ohio EPA to track project progress.

3.7.1 Monthly Progress Reports during RD and RA Construction

The Respondent(s) shall at a minimum provide the Ohio EPA with monthly progress reports during the design and construction phases of the remedial action containing the information listed below. When appropriate, the RD/RA Work Plan shall specify progress reports to be submitted more frequently.

1) A description of the work performed during the reporting period and estimate of the percentage of the RD/RA completed
2) Summaries of all findings and sampling during the reporting period
3) Summaries of all changes made in the RD/RA during the reporting period, indicating consultation with Ohio EPA and approval by the Ohio EPA of those changes, when necessary
4) Summaries of all contacts with representatives of the local community, public interest groups or government agencies during the reporting period
5) Summaries of all problems or potential problems encountered during the reporting period, including those which delay or threaten to delay completion of project milestones with respect to the approved work plan schedule or RAIP schedule
6) Summaries of actions taken and being taken to rectify problems
7) Summaries of actions taken to achieve and maintain cleanup standards and performance standards
8) Changes in personnel during the reporting period
9) Projected work for the next reporting period
10) Copies of daily reports, inspection reports, sampling data, laboratory/ monitoring data, etc.

3.7.2 Summary of Reports and Submittals

A summary of the information reporting requirements contained in this RD/RA SOW is presented below:

- **Draft RD/RA Work Plan**
  - Health and Safety Plan (HSP)
  - Regulatory Compliance Plan
- **Final RD/RA Work Plan**
  - HSP
  - Regulatory Compliance Plan
- **Draft Pre-Design Studies Plan**
  - Quality Assurance Project Plan (QAPP)
  - Field Sampling Plan (FSP)
- **Final Pre-Design Studies Plan**
  - QAPP
  - FSP
- **Pre-Design Studies Reports** - Draft
- **Preliminary Design Documents**
- **Pre-Design Studies Reports** - Final
- **Intermediate Design Documents**
  - Draft Construction Quality Assurance Plan (CQAP)
  - Draft Performance Standard Verification Plan (PSVP)
  - Draft O & M Plan
  - Health and Safety Plan
- **Pre-final Design Documents**
  - CQAP
  - PSVP
  - O & M Plan
  - Draft Remedial Action Implementation Plan (RAIP)
  - Health and Safety Plan
- **Final Design Documents**
  - CQAP
  - PSVP
  - O & M Plan
  - Draft RAIP
  - Health and Safety Plan
- **Preconstruction Inspection and Conference Report**
- **Monthly Progress Reports During RD/RA**
- **Notification of Preliminary Completion of Construction**
- **Final O & M Plan**
- **Pre-final Inspection Report**

- **Notification for Final Inspection**
- **Construction Completion Report**
- **& M Sampling Data**
- **Progress Reports during O&M/Performance Monitoring period**
- **Completion of Remedial Action Report**
- **Five-Year Review Workplan**
- **Five-Year Review Report**

4.0 CONTENT OF SUPPORTING PLANS

The documents listed in this section shall be prepared and submitted as outlined in Section 3.0 of this SOW to support the activities necessary to design and fully implement the RA. These supporting documents include a Quality Assurance Project Plan (QAPP), a Field Sampling Plan (FSP), a Health and Safety Plan (HSP), a Construction Quality Assurance Plan (CQAP) and a Performance Standard Verification Plan (PSVP). The following sections describe the required contents of each of these supporting documents.

4.1 QUALITY ASSURANCE PROJECT PLAN

The Respondent(s) shall prepare a site-specific Quality Assurance Project Plan (QAPP) to cover sample analysis and data handling based on guidance provided by the Ohio EPA. Refer to the list of Ohio EPA and U.S. EPA guidance documents in Appendix B attached to the Orders.

A QAPP shall be developed for any sampling and analysis activities to be conducted as predesign studies and submitted with the Pre-Design Studies Plan for Ohio EPA review and approval.

During the remedial design phase the Respondent(s) shall review all remedial design information and modify or amend the QAPP developed for the Pre-Design Studies Plan, as necessary, to address the sampling and analysis activities to be conducted during implementation of the Remedial Action, including activities covered by the PSVP and O&M Plan. An amended QAPP shall be submitted with the Intermediate Design documents for review and comment by Ohio EPA. A final Quality Assurance Project Plan, which incorporates comments made by the Ohio EPA, shall be submitted for approval with the Final Design documents. Upon agreement of the Site Coordinator, the Respondent(s) may submit only the amended portions of the QAPP developed for the PDSP with the Intermediate, Pre-Final and Final Design documents.

The Respondent(s) shall schedule and attend a pre-QAPP meeting with representatives of Ohio EPA to discuss the scope and format of the QAPP. For sites where the Site Coordinator and Project Manager agree that a pre-QAPP meeting is not needed, this meeting may be omitted. The QAPP shall, at a minimum, include:

1. Data Collection Strategy - The strategy section of the QAPP shall include but not be limited to the following:
   a. Description of the types and intended uses for the data, relevance to remediation or restoration goals, and the necessary level of precision, accuracy, and statistical validity for these intended uses;
   b. Description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data;
   c. Description of the rationale used to assure that the data accurately and precisely represent a characteristic of a population, variation of physical or chemical parameters throughout the Site, a process condition or an environmental condition. Factors which shall be considered and discussed include, but are not limited to:
      i) Environmental conditions at the time of sampling;
      ii) Sampling design (including number, location and distribution);
      iii) Representativeness of selected media, exposure pathways, or receptors; and
      iv) Representativeness of selected analytical parameters.
      v) Representativeness of testing procedures and conditions; and
      vi) Independence of background or baseline from site influences.
   d. Description of the measures to be taken to assure that the following data sets can be compared quantitatively or qualitatively to each other:
      i) RD/RA data collected by the Respondent over some time period;
      ii) RD/RA data generated by an outside laboratory or consultant employed by the Respondent versus data collected by the Respondent, and;
      iii) Data generated by separate consultants or laboratories over some time period not necessarily related to the RD/RA effort.
      iv) Data generated by Ohio EPA or by an outside laboratory or consultant employed by Ohio EPA;
   e. Details relating to the schedule and information to be provided in quality assurance reports. These reports should include but not be limited to:
      i) Periodic assessment of measurement data accuracy, precision and completeness;
      ii) Results of performance audits;
      iii) Results of system audits;
      iv) Significant quality assurance problems and recommended solutions; and

v) Resolutions of previously stated problems.

2. Sample Analysis - The Sample Analysis section of the Quality Assurance Project Plan shall specify the following:

a. Chain-of-custody procedures, including:
   i) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment and verify the data entered onto the sample custody records;
   ii) Provision for a laboratory sample custody log consisting of serially numbered lab-tracking report sheets; and
   iii) Specification of laboratory sample custody procedures for sample handling, storage and disbursement for analysis.

b. Sample storage procedures and storage times;

c. Sample preparation methods;

d. Analytical procedures, including:
   i) Scope and application of the procedure;
   ii) Sample matrix;
   iii) Potential interferences;
   iv) Precision and accuracy of the methodology;
   v) Method detection limits;
   vi) Special analytical services required to ensure contract required detection limits do not exceed known toxicity criteria; and
   vii) Verification and reporting of tentatively identified compounds.

e. Calibration procedures and frequency;

f. Data reduction, validation and reporting;

g. Internal quality control checks, laboratory performance and systems audits and frequency, including:
   i) Method blank(s);
   ii) Laboratory control sample(s);
   iii) Calibration check sample(s);
   iv) Replicate sample(s);
   v) Matrix-spiked sample(s);
   vi) "Blind" quality control sample(s);
   vii) Control charts;
   viii) Surrogate samples;
   ix) Zero and span gases; and
   x) Reagent quality control checks.

h. Preventative maintenance procedures and schedules;

i. Corrective action (for laboratory problems); and

j. Turnaround time.

3. Modeling - The Modeling section of the Quality Assurance Project Plan shall apply to all models used to predict or describe fate, transport or transformation of contaminants in the environment and shall discuss:
   a. Model assumptions and operating conditions;
   b. Input parameters; and
   c. Verification and calibration procedures.

4. In Situ or Laboratory Toxicity Tests - The Toxicity Test section of the Quality Assurance Project Plan shall apply to all tests or bioassays used to predict or describe impacts of contaminants on a population, community, or ecosystem level.

5. Data Record - The QAPP shall also provide the format to be used to present the raw data and the conclusions of the investigation, as described in a, b, and c below:
   a. The data record shall include the following:
      i) Unique sample or field measurement code;
      ii) Sampling or field measurement location and sample or measurement type;
      iii) Sampling or field measurement raw data;
      iv) Laboratory analysis ID number;
      v) Property or component measured; and
      vi) Result of analysis (e.g., concentration).
   b. Tabular Displays - The following data shall be presented in tabular displays:
      i) Unsorted (raw) data;
      ii) Results for each medium, organism, or for each constituent measured;
      iii) Data reduction for statistical analysis;
      iv) Sorting of data by potential stratification factors (e.g., location, soil layer, topography, vegetation form);
      v) Summary data (i.e., mean, standard deviation, min/max values, and sample number); and
      vi) Comparisons with background or reference data.
   c. Graphical Displays - The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):
      i) Display sampling locations and sampling grid;
      ii) Indicate boundaries of sampling area, and areas where more data are required;
      iii) Display levels of contamination at each sampling location or location from which organism was taken;
      iv) Display geographical extent of contamination;

v) Display contamination levels, averages and maxima;
vi) Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters;
vii) Indicate features affecting intramedia transport and show potential receptors;
viii) Compare nature and extent of contamination with results of ecological or biological sampling or measurements; and
ix) Display comparisons with background or reference analyses or measurements.

4.2 FIELD SAMPLING PLAN

1. Sampling - The Sampling section of the Field Sampling Plan shall discuss:
   a. Sufficient preliminary sampling to ensure the proper planning of items b. through o. below;
   b. Selecting appropriate sampling locations, depths, vegetation strata, organism age, etc. and documenting relevance of sample for intended biological toxicity tests or analyses;
   c. Providing a sufficient number of samples to meet statistical or other data useability objectives;
   d. Measuring all necessary ancillary data such as ambient conditions, baseline monitoring, etc.;
   e. Determining environmental conditions under which sampling should be conducted;
   f. Determining which media, pathways, or receptors are to be sampled (e.g., ground water, air, soil, sediment, biota, etc.);
   g. Determining which parameters are to be measured and where;
   h. Selecting the frequency and length of sampling period;
   i. Selecting the sample design (e.g., composites, grabs, random, repeated, etc.);
   j. Selecting the number, location, media or organisms for determining background conditions or reference conditions (refer to Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002, December 1989);
   k. Measures to be taken to prevent contamination of the sampling equipment and cross contamination between sampling points;
   l. Documenting field sampling operations and procedures, including;
      i) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters and adsorbing reagents);
      ii) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;
      iii) Documentation of specific sample preservation method;

iv) Calibration of field devices;
v) Collection of replicate and field duplicate samples;
vi) Submission of field-biased and equipment blanks, where appropriate;
vii) Potential interferences present at the site or facility;
viii) Construction materials and techniques associated with monitoring wells and piezometers;
ix) Field equipment listing and sample containers;
x) Sampling order; and
xi) Decontamination procedures.

m. Selecting appropriate sample containers;
n. Sample preservation; and
o. Chain-of-custody, including:
   i) Standardized field tracking reporting forms to establish sample custody in the field prior to and during shipment;
   ii) Sample sealing, storing and shipping procedures to protect the integrity of the sample; and,
   iii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

2. Field Measurements - The Field Measurements section of the Field Sampling Plan shall discuss:
   a. Selecting appropriate field measurement locations, depths, organism age etc.;
   b. Providing a sufficient number of field measurements that meet statistical or data useability objectives;
   c. Measuring all necessary ancillary data such as ambient or baseline environmental conditions;
   d. Determining conditions under which field measurement should be conducted;
   e. Determining which media, pathways, or receptors are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, biota, etc.);
   f. Determining which physical, chemical, or biological parameters are to be measured and where;
   g. Selecting the frequency and duration of field measurement; and
   h. Documenting field measurement operations and procedures, including:
      i) Procedures and forms for recording raw data and the exact location, time and Site specific considerations associated with the data acquisition;
      ii) Calibration of field devices;
      iii) Collection of replicate measurements;
      iv) Submission of field-biased blanks, where appropriate;

v) Potential interferences present at the Site;
vi) Construction materials and techniques associated with monitoring wells and piezometers used to collect field data;
vii) Field equipment listing;
viii) Order in which field measurements were made; and
ix) Decontamination procedures; and
i) Selecting the number, location, media, and organisms for determining background or reference conditions.

4.3 SITE HEALTH AND SAFETY PLAN

The Respondent(s) shall submit a Health and Safety Plan (HSP) to the Ohio EPA with the RD/RA Work Plan for any on-site activities taking place during the design phase. The Respondent(s) shall review the remedial design information and modify the HSP developed for the RD/RA Work Plan, as necessary, to address the activities to be conducted on the site during implementation of the Remedial Action. It shall be designed to protect on-site personnel and area residents from physical, chemical and other hazards posed by the construction, operation and maintenance activities of the Remedial Action.

The Respondent(s) shall prepare a site HSP which is designed to protect on-site personnel and area residents from physical, chemical and all other hazards posed by RD/RA activities. The HSP shall address the following topics:

1. Major elements of the Health and Safety Plan shall include:
   a. Facility or site description including availability of resources such as roads, water supply, electricity and telephone service;
   b. Description of the known hazards and an evaluation of the risks associated with the incident and with each activity conducted;
   c. Listing of key personnel (including the site safety and health officer) and alternates responsible for site safety, response operations, and for protection of public health;
   d. Delineation of work area, including a map;
   e. Description of levels of protection to be worn by personnel in the work area;
   f. Description of the medical monitoring program for on-site responders;
   g. Description of standard operating procedures established to assure the proper use and maintenance of personal protective equipment;
   h. The establishment of procedures to control site access;
   i. Description of decontamination procedures for personnel and equipment;
   j. Establishment of site emergency procedures;
   k. Availability of emergency medical care for injuries and toxicological

problems;

l. Description of requirements for an environmental monitoring program. (This should include a description of the frequency and type of air and personnel monitoring, environmental sampling techniques and a description of the calibration and maintenance of the instrumentation used.);
m. Specification of any routine and special training required for responders; and
n. Establishment of procedures for protecting workers from weather related problems.

2. The Health and Safety Plan shall be consistent with:
   a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
   b. CERCLA Sections 104(f) and 111(c)(6)
   c. EPA Order 1440.3 -- Respiratory Protection;
   d. EPA Order 1440.2 -- Health and Safety Requirements for Employees Engaged in Field Activities;
   e. EPA Occupational Health and Safety Manual;
   f. EPA Interim Standard Operating Safety Procedures and other EPA guidance as developed by EPA;
   g. OSHA regulations particularly in 29 CFR 1910 and 1926;
   h. State and local regulations; and
   i. Site or facility conditions.

4.4 CONSTRUCTION QUALITY ASSURANCE PLAN

The Respondent(s) shall develop a Construction Quality Assurance Plan (CQAP) based on the plans and specifications and performance standards for the RA. The CQAP is a site specific document that shall specify procedures to ensure that the completed remedial action work meets or exceeds all design criteria and specifications. A draft CQAP shall be submitted with the Intermediate Design submittal for review and comment by the Ohio EPA. Subsequent drafts shall be submitted with the Pre-final and Final Design submittals that incorporate comments made by the Ohio EPA. Certain aspects of the CQAP, for example personnel names and qualifications, may not be known at the time of design approval. A complete and final CQAP shall be submitted to Ohio EPA for approval prior to the start of construction. At a minimum, the CQAP shall address the elements listed below.

4.4.1 Responsibility and Authority

The responsibility and authority of all organizations (i.e. technical consultants, construction firms, etc.) and key personnel involved in the construction of the remedial action(s) shall be described fully in the CQAP. The Respondent(s) shall

provide a copy of the approved CQAP to each organization with responsibility and authority for implementing the CQAP. The Respondent(s) shall also identify a CQA officer and the necessary supporting inspection staff.

4.4.2 Construction Quality Assurance Personnel Qualifications

The qualifications of the Construction Quality Assurance officer and supporting inspection personnel shall be presented in the CQAP to demonstrate that they possess the training and experience necessary to fulfill their identified responsibilities.

4.4.3 Inspection Activities

The observations and tests that will be used to monitor the construction and/or installation of the components of the remedial action shall be described in the CQAP. The plan shall include scope and frequency of each type of inspection. Inspections shall verify compliance with the design, applicable requirements of state and federal law and performance standards. Inspections shall also ensure compliance with all health and safety standards and procedures. The CQAP shall include provisions for conducting the preconstruction, pre-final and final inspections and associated meetings as described in Section 5.4 of this SOW.

4.4.4 Sampling Requirements

The sampling activities necessary to ensure that the design specifications and performance standards are achieved shall be presented in the CQAP. The description of these activities shall include sample sizes, sample locations, frequency of sampling, testing to be performed, acceptance and rejection criteria, and plans for correcting problems as addressed in the design specifications.

4.4.5 Documentation

Reporting requirements for CQA activities shall be described in detail in the CQAP. This shall include such items as daily summary reports, meeting reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports and final documentation. Provisions for the storage of all records shall be presented in the CQAP.

4.5 PERFORMANCE STANDARD VERIFICATION PLAN

A Performance Standard Verification Plan (PSVP) shall be prepared to consolidate information for required testing, sampling and analyses to ensure that both short-term and longterm performance standards for the RA are met. Performance standards may include clean-up standards for contaminated environmental media as well as the

measurement of the effectiveness of engineering controls or other controls used to control migration of or exposure to contaminants. For example, the containment of a plume of contaminated ground water by pumping wells would be a performance standard requiring verification. The PSVP should describe the measurements to be taken, such as water levels in monitoring wells and piezometers, along with any analyses to be conducted on the data obtained, such as ground water modeling, to verify that the plume is contained. The PSVP shall include a FSP and a QAPP for any sampling and analyses to be conducted.

The Draft PSVP shall be submitted with the Intermediate Design for review and comment by the Ohio EPA. The final PSVP, which fully addresses comments made by the Ohio EPA must be submitted with and approved as part of the Final Design.

4.6 OPERATION AND MAINTENANCE PLAN

The Respondent(s) shall prepare an Operation and Maintenance Plan (O&M Plan) to cover long term operation and maintenance of the RA. Operation and maintenance for all components of the Remedial Action, shall begin after it is demonstrated that those components are operational and functional. The plan, at a minimum, shall be composed of the elements listed below.

1. Normal Operation and Maintenance
   a. Description of tasks for operation
   b. Description of tasks for maintenance
   c. Description of prescribed treatment or operating conditions
   d. Schedules showing the frequency of each O&M task

2. Potential Operating Problems
   a. Description and analysis of potential operating problems
   b. Sources of information regarding potential operating problems
   c. Description of means of detecting problems in the operating systems
   d. Common remedies for operating problems

3. Routine Monitoring and Laboratory Testing
   a. Description of monitoring tasks
   b. Description of required laboratory tests and interpretation of test results
   c. Required QA/QC procedures to be followed
   d. Schedule of monitoring frequency and provisions to discontinue, if appropriate

   Note: Information on monitoring and testing that is presented in the PSVP should be referenced, as appropriate, but should not be duplicated in the

O&M Plan.

4. Alternative O&M
   a. Description of alternate procedures to prevent undue hazard, should systems fail
   b. Analysis of the vulnerability and additional resources requirements should a failure occur

5. Safety Plan
   a. Description of safety procedures, necessary equipment, etc. for site personnel
   b. Description of safety tasks required in the event of systems failure (may be linked to the Site Safety Plan developed for the RD/RA)

6. Equipment
   a. Description of equipment necessary to the O&M Plan
   b. Description of installation of monitoring components
   c. Description of maintenance of site equipment
   d. Replacement schedule for equipment and installed components

7. Annual O&M Budget
   a. Costs for personnel
   b. Costs for preventative and corrective maintenance
   c. Costs of equipment and supplies, etc.
   d. Costs of any contractual obligations (e.g., lab expenses)
   e. Costs of operation (e.g., energy, other utilities, etc.)

8. Records and Reporting Mechanisms Required
   a. Daily operating logs
   b. Laboratory records
   c. Records for operating costs
   d. Mechanism for reporting emergencies
   e. Personnel and maintenance records
   f. Monthly/semi-annual reports to Ohio EPA

The Respondent(s) shall submit a draft O&M Plan to the Ohio EPA for review and comment with the Intermediate Design submittal. Subsequent drafts of the O&M Plan shall be submitted with the Pre-final and Final Design submittals, which reflect the refined plans and specifications of those submittals and any comments made by the Ohio EPA. The final O&M Plan shall be submitted by the Respondent(s) prior to or at the completion of construction of the remedial action and shall incorporate any modifications or corrections required by the Ohio EPA.

APPENDIX D

LIST OF GUIDANCE DOCUMENTS AND REFERENCES FOR USE WITH OHIO EPA DERR REMEDIAL RESPONSE PROGRAM REMEDIAL DESIGN/REMEDIAL ACTION STATEMENT OF WORK AND ORDERS

Statement of Purpose and Use of This Guidance Document List:

The purpose of this list of Ohio EPA and U.S. EPA policies, directives and guidance documents is to provide a reference of the primary documents which provide direction and guidance for designing and implementing selected remedial actions at Remedial Response sites. *The listed documents incorporate by reference any documents listed therein*. Certain sites may have contaminants or conditions which are not fully addressed by the documents in this list. There is an evolving body of policy directives, guidance and research documentation which should be used, as needed, to address circumstances not encompassed by the documents in this list. For sites where activities are conducted in response to an administrative or judicial order, this list will be an attachment to the order and will govern the work conducted. When entering into or issuing an order for any site, Ohio EPA reserves the right to modify this list to fully address the site conditions.

Analytical Methods

Compendium of Methods for Determination of Toxic Organic Compounds in Ambient Air second edition, Compendium Method TO-14A, EPA/625/R-96/010b, U.S. EPA, January 1999. See also: Air Toxics – Monitoring Methods.

SW 846, Test Methods for Evaluating Solid Waste, 3rd Edition and updates (online), originally dated November 1986.

Standard Methods for the Examination of Water and Waste Water, American Public Health Association, 18th Edition 1992, and recent editions (online).

U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, U.S. EPA, EPA-540-R-04-004, OSWER 9240.1-45, October 2004.

U.S. EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, U.S. EPA, EPA-540-R-08-01, June 2008.

ARARs

Applicable or Relevant and Appropriate Requirements (ARARS), U.S. EPA (online).

ARARs Table, Ohio EPA DERR, Remedial Response Program. [This is a list of generic ARARs that is periodically updated and subject to change.]

CERCLA Compliance with Other Laws Manual - Part I and Part 2, OSWER Directive 9234.1-01, EPA/540/G-89/006, August 1988, and OSWER Directive 9234.1-02, EPA/540/G-89/009, August 1989.

Ohio EPA Rules (online).

Use of Applicable or Relevant and Appropriate Requirements (ARARs) in the Ohio EPA Remedial Response Program, Ohio EPA DERR, September 2003.

Attainment of Cleanup Goals

Methods for Evaluating the Attainment of Cleanup Standards, Volume 1: Soils and Solid Media, U.S. EPA, EPA 230/02-89-042, February 1989.

Methods for Evaluating the Attainment of Cleanup Standards, Volume 2: Ground Water, U.S. EPA, EPA 230-R-92-014, July 1992.

Methods for Evaluating the Attainment of Cleanup Standards, Volume 3: Reference-Based Standards for Soils and Solid Media, U.S. EPA, EPA 230-R-94-004, December 1992.

Background Guidance

Use of Background for Remedial Response Sites, Technical Decision Compendium, Ohio EPA DERR, August 2009.

Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites, U.S. EPA, EPA 540-R-01-003 OSWER 9285.7-41, September 2002.

Role of Background in the CERCLA Cleanup Program, OSWER 9285.6-07P, April 2002.

Data Quality Objectives

Data Quality Evaluation Statistical Toolbox (Data QUEST) Users Guide, U.S. EPA ORD, EPA/600/R-96/085 (EPA QA/G-9D), December 1997. No longer available. For a link to other free software for performing data quality assessment, see Quality-Related Resources – Software.

Data Quality Objectives Decision Error Feasibility Trials Software (DEFT) – Users Guide, U.S. EPA, EPA QA/G-4D, EPA/240/B-01/007, September 2001.

Data Quality Objectives Process for Hazardous Waste Site Investigations, U.S. EPA, EPA/600/R-00/007 (EPA QA/G-4HW), January 2000.

Data Quality Objectives Process for Superfund, Interim Final Guidance, OSWER Directive 9355.9-01, EPA540-R-93-071, September 1993.

Data Quality Objectives Process Summary, DERR-00-DI-32 Ohio EPA DERR Remedial Response Program, January 2002.

Guidance for Data Quality Assessment: Practical Methods for Data Analysis, U.S. EPA, EPA/600/R-96/084 (EPA QA/G-9), QAOO Update, July 2000.

Guidance on Systematic Planning Using the Data Quality Objectives Process, U.S. EPA, EPA QA/G-4, EPA/240/B-06/001, February 2006.

Health and Safety Plan

American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices, ISBN: 1-882417-46-1, 2002.

NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, DHHS (NIOSH) Publication No. 85-115, October 1985.

NIOSH Pocket Guide to Chemical Hazards, National Institute for Occupational Safety and Health (online, last updated November 2010).

OSHA Regulations particularly in 29 CFR 1910 and 1926

OSHA Regulation 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response; U.S. Department of Labor (OSHA).

OSHA Regulation 29 CFR 1910.134, Respiratory Protection Standard;

U.S. EPA Standard Operating Safety Guides (Publication 9285.1-03, PB92-963414, June 1992 (chapters 1-3, 4-7, 8-11)

Section 111(c)(6) of CERCLA

Landfills

Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites, OSWER Directive 9355.3-11, EPA/540/P-91/001, February 1991.

Presumptive Remedy for CERCLA Municipal Landfill Sites, U.S. EPA, EPA 540-F-93-035, September 1993.

Presumptive Remedies: CERCLA Landfill Caps RI/FS Data Collection Guide, U.S. EPA, EPA/540/F-95/009, August 1995.

Seminar Publication - Requirements for Hazardous Waste Landfill Design, Construction, and Closure, U.S. EPA, EPA/625/4-89/022, August 1989 (# 625489022).

Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments, U.S. EPA, EPA/530-SW-89-047, July 1989 (# 530SW89047).

Superfund Accelerated Cleanup Bulletins: Presumptive Remedies for Municipal Landfill Sites, U.S. EPA Publication 9203.1-02I:
1.) April 1992, Vol. 1, No. 1; 2.) February 1993, Vol. 2, No. 1; and, 3.) August 1992, Vol. 1, No. 3

Land Use and Reuse

Land Use in the CERCLA Remedy Selection Process, U.S. EPA, OSWER 9355.7-04, May 25, 1995.

Reuse Assessments: A Tool To Implement The Superfund Land Use Directive, U.S. EPA, OSWER 9355.7-06P, June 4, 2001.

Lead

Integrated Exposure Uptake Biokinetic Model for Lead in Children, Windows® version (IEUBKwin v1.0 build 263) (December, 2005).

Superfund Lead-Contaminated Residential Sites Handbook, U.S. EPA, OSWER 9285.7-50, August 2003.

Monitored Natural Attenuation

Calculation and Use of First-Order Rate Constants for Monitored Natural Attenuation Studies, U.S. EPA, EPA/540/S-02/500, November 2002.

Distinction between Monitored Natural Attenuation and Enhanced Monitoring at DERR Remedial Response Sites, Ohio EPA DERR Remedial Response Program, October 2002.

Natural Attenuation for Groundwater Remediation, Committee on Intrinsic Remediation, National Academy of Sciences, 2000.

Performance Monitoring of MNA Remedies for VOCs in Ground Water, U.S. EPA, EPA/600/R-04/027, April 2004.

Remediation Using Monitored Natural Attenuation, Ohio EPA DERR Remedial Response Program, January 2001.

Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents In Ground Water, U.S. EPA, EPA/600/R-98/128, September 1998.

Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action and Underground Storage Tank Sites, U.S. EPA, OSWER Directive 9200.4-17P, April 1999.

Oversight

Interim Guidance on implementing the Superfund Administration Reform on PRP Oversight, U.S. EPA, OSWER Directive 9200.0-32P, May 2000.

Using RCRA's Results-Based Approaches and Tailored Oversight Guidance" when Performing Superfund PRP Oversight, U.S. EPA December 2006, OSWER, EPA 530-R-03-012, September 2003.

Presumptive Remedies

Presumptive Remedies: Site Characterization and Technology Selection for CERCLA Sites with Volatile Organic Compounds in Soil, U.S. EPA, OSWER 9355.4-048FS, September 1993.

Presumptive Remedy: Supplemental Bulletin Multi- Phase Extraction (MPE) Technology for VOCs in Soil and Groundwater, U.S. EPA, OSWER 9355.0-68F8, April 1997.

Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites, U.S. EPA, EPA 540/R-96/023, OSWER 9283.1-12, October, 1996, final guidance.

User's Guide to the VOCs in Soils Presumptive Remedy, U.S. EPA, OSWER 9355.0-63FS; EPA 540/F-96/008; PB 96-963308, July, 1996.

Quality Assurance

Data Quality Assessment: A Reviewer's Guide, (QA/G-9R), U.S. EPA, EPA/240/B-06/002, February, 2006.

Data Quality Assessment: Statistical Methods for Practitioners, U.S. EPA, EPA/240/B-06/003 (EPA QA/G-9S), February 2006

Guidance for Preparing Standard Operating Procedures, U.S. EPA, EPA QA/G-6, EPA/240/B-01/004, March 2001.

Guidance for Quality Assurance Plans for Modeling, U.S. EPA, EPA QA/G-5M, EPA/240-R02/007, December, 2002.

Guidance for Quality Assurance Project Plans, U.S. EPA, QA-G-5, EPA/240/R-02-009, December 2002.

Guidance on Environmental Data Verification and Data Validation, U.S. EPA, EPA/240/R-02/004, November 2002.

Guidelines and Specifications for Preparing Quality Assurance Project Plans, Ohio EPA, DERR-00-RR-008, September 1998.

Laboratory and Field Data Screening for Preparing Quality Assurance Project Plans, Ohio EPA DERR. DI-00-034, August 2005.

Preparation Aids for the Development of Category 1 Quality Assurance Project Plans, U.S. EPA, EPA/600-8-91-003, February 1991 (#600891003).

Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures, Interim Final, U.S. EPA, EPA/540/G-90/004, April 1990 (# 540G90004).

Technical Guidance Document: Construction Quality Assurance and Quality Control for Waste Containment Facilities, U.S. EPA, EPA/600/R-93/182, September 1993 (# 600R93182).

RD/RA – General Guidance

A Compendium of Technologies Used in the Treatment of Hazardous Wastes, U.S. EPA, EPA/625/8-87/014, September 1987 (# 625887014).

Assessment of Technologies for the Remediation of Radioactively Contaminated Superfund Sites, U.S. EPA, EPA/540/2-90/001, January 1990 (# 540290001).

Closure Criteria Focus Group Report, ITRC Work Group In Situ Bioremediation - Technologies Task Team, March 1998.

Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, OSWER, EPA-540-R-05-012, December 2005.

Cost & Performance Reporting for In-Situ Bioremediation Technologies, ITRC In Situ Bioremediation Technical Task Team, Final, December 1997.

Design Guidance for Application of Permeable Barriers to Remediate Dissolved Chlorinated Solvents, ITRC Permeable Reactive Barriers Work Group, Second Edition, December 1999.

General Protocol for Demonstration of In Situ Bioremediation Technologies, ITRC Workgroup – In Situ Bioremediation Work Team, September 1998.

Guidance on Remedial Actions for Superfund Sites with PCB Contamination, OSWER Directive 9355.4-01, EPA/540/G-90/007, August 1990.

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Guidance for Remedial Actions for Contaminated Ground Water at Superfund Sites, OSWER Directive 9283.1-2, EPA/540/G-88/003, December 1988.

Handbook - Dust Control at Hazardous Waste Sites, U.S. EPA, EPA/540/2-85/003, November 1985 (# 540285003).

Handbook for Stabilization/Solidification of Hazardous Wastes, U.S. EPA, EPA/540/2-86/001, June 1986 (# 540286001).

Handbook - Guidance on Setting Permit Conditions and Reporting Trial Burn Results - Volume II of the Hazardous Waste Incineration Guidance Series, U.S. EPA, EPA/625/6-89/019, January 1989 (# 625689019).

Handbook - Hazardous Waste Incineration Measurement Guidance Manual - Volume III of the Hazardous Waste Incineration Guidance Series, U.S. EPA, EPA/625/6-89/021, June 1989 (# 625689021).

Handbook on In Situ Treatment of Hazardous Waste-Contaminated Soils, U.S. EPA, EPA/540/2-90/002, January 1990, (hard copy/microfish available through NTIS PB90-155607/XAB).

Handbook - Quality Assurance/Quality Control (QA/QC) Procedures for Hazardous Waste Incineration, U.S. EPA, EPA/625/6-89/023, January 1990 (# 625689023).

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Pump-and-Treat Ground-Water Remediation: A Guide for Decision Makers and Practitioners, U.S. EPA ORD, EPA/625/R-95/005, July, 1996.

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Regulatory Guidance for Permeable Barriers to Remediate Inorganics and radionuclides, Interstate Technology Regulatory Council (ITRC) Permeable Reactive Barriers Work Group, September 1999.

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Remedial Design/Remedial Action Statement of Work, Ohio EPA DERR, August 30, 2004.

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Technical and Regulatory Guidelines for Soil Washing, Interstate Technology Regulatory Council (ITRC) Metals in Soils Work Team – Soil Washing Project, Final, December 1997.

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Sampling and Analysis

A Rationale for the Assessment of Errors in the Sampling of Soils, U.S. EPA – Environmental Monitoring Systems Laboratory, EPA/600/4-90/013, July 1990.

Compendium of ERT Soil Sampling and Surface Geophysics Procedures, U.S. EPA, OSWER 9360.4-02, January 1991.

Groundwater Sampling and Monitoring with Direct Push Technologies, U.S. EPA OSWER, EPA 540/R-04/005, August 2005.

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Superfund Ground Water Issue: Ground Water Sampling for Metals, U.S. EPA, EPA/540/4-89/001, March 1989 (# 540489001).

Treatability Studies

Guide for Conducting Treatability Studies Under CERCLA, U.S. EPA OSWER/ORD, EPA/540/R-92/071a, Final, October 1992.

Guide for Conducting Treatability Studies Under CERCLA: Soil Vapor Extraction, U.S. EPA – Office of Emergency and Remedial Response, EPA/540/2-91/019A, (#540291019A), Interim, September 1991.

Guide for Conducting Treatability Studies Under CERCLA: Aerobic Biodegradation Remedy Screening, U.S. EPA Office of Research and Development, EPA/540/2-91/013A, Interim, July 1991.

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Vapor Intrusion

Sample Collection and Evaluation of Vapor Intrusion to Indoor Air, Ohio EPA DERR, May 2010.

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Wetland (and Stream) Delineation and Restoration

Addendum to Biological Criteria for the Protection of Aquatic Life: Volume II. Users Manual for Biological Field Assessment of Ohio Surface Waters. Ohio EPA, Division of Surface Water, 1989.

Amphibian Index of Biotic Integrity (AmphIBI) for Ohio Wetlands, Ohio EPA, Wetland Ecology Group, Division of Surface Water, Final, Volume 7, 2004.

Biological Criteria for the Protection of Aquatic Life: Volume I. The Role of Biological Data in Water Quality Assessment. Ohio EPA, Division of Surface Water, 1987.

Biological Criteria for the Protection of Aquatic Life: Volume II. Users Manual for Biological Field Assessment of Ohio Surface Waters. Ohio EPA, Division of Surface Water, 1987.

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Wetlands Delineation Manual, U.S. Army Corps of Engineers, 1987.

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Disclaimer: Please note that web links are not maintained.

March 28, 2012 updates

To be recorded with Deed Records - ORC 317.08

ENVIRONMENTAL COVENANT

This Environmental Covenant is entered into by the Lucas County Commissioners (Owner) and the Ohio Environmental Protection Agency (Ohio EPA) pursuant to Ohio Revised Code (ORC) §§ 5301.80 to 5301.92 for the purpose of subjecting the Property to the activity and use limitations set forth herein.

Background. The King Road Landfill (Property) is located at 3501 and 3601 King Road, Sylvania Township, Lucas County, Ohio. The landfill Site occupies a total of approximately 104 acres. The 79-acre disposal area is bounded by the former railroad right-of-way to the north, King Road to the east, Covert Road to the south, and Silica Road to the west. Approximately 70 acres of this 79-acre disposal area are believed to have been disturbed by waste disposal activity. The former soil borrow area, now known as the Borrow Pit Pond, contains ponded water and marsh-like vegetation.

The Lucas County Commissioners purchased the Site in 1953. Landfilling operations commenced at the Site in January 1954 under the direction of the Lucas County Sanitary Engineer. The facility was operated by the County until May 8, 1967, when Park Forest Development, Inc. was contracted to operate the landfill. On March 15, 1970, the County resumed control of landfill operations. Commercial waste haulers were prohibited from using the landfill on August 21, 1973, after which usage of the landfill gradually lessened. Information was provided documenting the acceptable closure in 1969 of an approximately 43 acre portion of the nearly 70 acre King Road Landfill. The County's final landfill permit expired in December 1975. The remaining 27 acres were subject to closure under Ohio Administrative Code 3745-27-10(A)(2) effective July 29, 1976.

Since the cessation of waste disposal activities in 1976, few modifications to the facility have been made. Beginning in May 1980 and continuing through July 1991, a transfer station was operated near the main gate on King Road. In October 1991, a perimeter fence was installed to control Site access by unauthorized individuals.

A Remedial Investigation (RI) was conducted during 1993-94, and the results were issued in a November 1994 RI Report. A supplemental investigation was conducted in 1995 and a revised RI Report was issued in February 1996. The primary objectives of the RI investigation were to identify which contaminants were leaving the Property, the pathways through which this migration was occurring, and what risk to human health and the environment was associated with this migration. A Feasibility Study (FS) Report identifying and evaluating a total of nine (9) remedial alternatives was completed in October 2002 for the Site. The FS Report is a compilation of the draft FS Report (nine alternatives), a modification of the FS Report to include an additional alternative (Alternative No. 10), and several iterations of an alternative (Alternative No. 11) submitted to Ohio EPA by the Lucas County Commissioners for consideration as an addendum. Ohio EPA issued a Preferred Plan in December 2010, a Decision Document on September 10, 2012, and a Modified Decision Document on September 9, 2014.

The Administrative Record for this Site, including the Preferred Plan, the Decision Document, and the Modified Decision Document, is maintained at the Ohio EPA, Northwest District Office, 347 North Dunbridge Road, Bowling Green, Ohio.

Now therefore, Owner and Ohio EPA agree to the following:

1. Environmental Covenant. This instrument is an environmental covenant developed and executed pursuant to ORC §§ 5301.80 to 5301.92.

2. Property. This Environmental Covenant concerns the approximately 104-acre property, located at 3501 and 3601 King Road in Sylvania Township, Lucas County, Ohio, identified as permanent parcel numbers 7830447 and 7831937, and more particularly described in Exhibit A attached hereto and hereby incorporated by reference herein (Property).

3. Owner. The Board of County Commissioners of Lucas County (Owner), with offices located at One Government Center, Suite 800, in Toledo, Ohio, currently own the Property.

4. Holder. Pursuant to ORC § 5301.81, the holder of this Environmental Covenant is the Owner listed above.

5. Activity and Use Limitations. In accordance with the Decision Document issued by Ohio EPA on September 10, 2012, as modified by the Modified Decision Document issued by Ohio EPA on September 9, 2014, Owner hereby imposes the following activity and use limitations on the Property and agrees to comply with such limitations, unless this Environmental Covenant is amended pursuant to paragraph 13 herein:

A. The Property shall be kept in a natural state, except for existing structures, and structures associated with remedial activities approved by Ohio EPA pursuant to the Decision Document issued by Ohio EPA on September 10, 2012, as modified by the Modified Decision Document issued by Ohio EPA on September 9, 2014; no other buildings, billboards or structures of any kind, either temporary or permanent, shall be placed or erected on the Property.

B. Ground Water Prohibition. No person shall drill, construct, install, develop, operate or use any ground water well, or extract, cause the extraction of, or use any ground water, located at or underlying the Property for any purpose, potable or otherwise, except for investigation, monitoring or remediation of the ground water.

C. There shall be no filling, excavating, or removal of top soil, sand, gravel, rock, minerals or other materials on or at the Property, nor any building of roads or change in topography of the land in any manner, other than that caused by the forces of nature, except in accordance with the Decision Document issued by Ohio EPA on September 10, 2012, as modified by the Modified Decision Document issued by Ohio EPA on September 9, 2014.

D. No power or petroleum transmission lines may be constructed, nor any other

interests in the Property shall be granted for this purpose. However, the Owner reserves the right to maintain and repair, or allow others to maintain and repair telephone, electric, water, and other utility lines or mains, and monitoring wells, owned by the Owner or located within existing easements. The area affected by the repair work shall be the minimum necessary to accomplish the task. Upon completion of all construction for such utilities, the area shall be restored as appropriate.

E. No towers for communication or otherwise shall be constructed on the Property.

F. Use of vehicles for recreation, including snow mobiles, all-terrain vehicles or other motorized vehicles, shall not be permitted on the Property.

G. Hunting and trapping on the Property are prohibited.

H. Each and every other activity or construction that is inconsistent with the purpose of this Environmental Covenant or which may endanger, affect or impair the natural or scenic state of the Property is prohibited.

I. The Property shall not be subdivided. The Owner, its successors or assigns shall notify the Trustees of any proposed transfer of the Property, or any portion thereof, at least ninety (90) days prior to any such proposed transfer. The Owner, its successors or assigns shall not transfer the Property, or any portion thereof, without the prior written consent of the Trustees.

J. Notwithstanding the foregoing, in accordance with section 5.6 of the Decision Document issued by Ohio EPA on September 10, 2012, beneficial reuse projects (*e.g.*, multiuse path, vehicle parking area, and University research projects) will be allowed at the Property, on a case by case basis, subject to a detailed written proposal, which is expected to be submitted to Ohio EPA through the office of the Lucas County Sanitary Engineer. Sufficient detail, as determined by Ohio EPA, will be required for each beneficial reuse project in order to allow Ohio EPA to evaluate each project.

6. Breach. If any event or action by or on behalf of a person who owns an interest in or holds an encumbrance on the Property, or any other person constitutes a breach of the activity and use limitations, Owner shall notify Ohio EPA within thirty (30) days of becoming aware of the event or action, and shall remedy the breach of the activity and use limitations within sixty (60) days of becoming aware of the event or action.

7. Running with the Land. This Environmental Covenant, including the activity and use limitations set forth in paragraph 5 herein, shall be binding upon the Owner and all assigns and successors in interest, including any Transferee, and shall run with the land, pursuant to ORC §5301.85, subject to amendment or termination as set forth herein. The term "Transferee," as used in this Environmental Covenant, shall mean any future owner of any interest in the Property including, but not limited to, owners of an interest in fee simple,

mortgagees, easement holders, and/or lessees.

8. Compliance Enforcement. In the event of a violation of this Environmental Covenant, a civil action for injunctive and/or other equitable relief may be maintained by the Ohio Attorney General on behalf of Ohio EPA, or other parties authorized by law pursuant to ORC § 5301.91 or other applicable law. Failure to timely enforce compliance with this Environmental Covenant or the activity and use limitations contained herein by any party shall not bar subsequent enforcement by such party and shall not be deemed a waiver of the party's right to enforce this Environmental Covenant. Nothing in this Environmental Covenant shall restrict Ohio EPA from exercising its authority under applicable law.

9. Rights of Access. Owner hereby grants to Ohio EPA, its agents, contractors, and employees, the right of access to the Property for implementation or enforcement of this Environmental Covenant.

10. Compliance Reporting. Owner or any Transferee shall submit to Ohio EPA, on an annual basis until the year 2024, and thereafter upon request by Ohio EPA, written documentation verifying compliance with this Environmental Covenant.

11. Notice upon Conveyance. Each instrument hereafter conveying any interest in the Property, or any portion thereof, shall contain a notice of the activity and use limitations set forth in this Environmental Covenant, and provide the recorded location of this Environmental Covenant. The notice shall be substantially in the following form:

> THE INTEREST CONVEYED HEREBY IS SUBJECT TO AN ENVIRONMENTAL COVENANT, RECORDED IN THE DEED OR OFFICIAL RECORDS OF THE LUCAS COUNTY RECORDER ON _____ __, 2016, IN [DOCUMENT , *or* BOOK ____, PAGE ,].

Owner shall notify Ohio EPA within ten (10) days after each conveyance of an interest in the Property. The notice shall include the name, address, and telephone number of the Transferee, a copy of the deed or other documentation evidencing the conveyance, and a survey map that shows the boundaries of the property being transferred.

12. Representations and Warranties. Owner hereby represents and warrants to the other signatories hereto:

A. that the Owner is the sole owner of the Property;

B. that the Owner holds fee simple title to the Property and that the Owner has conducted a current title search that shows that the Property is not subject to any interests or encumbrances that conflict with the activity and use limitations set forth in this Environmental Covenant;

C. that the Owner has the power and authority to enter into this Environmental Covenant, to grant the rights and interests herein provided and to carry out all obligations hereunder;

D. that the Owner has identified all other persons that own an interest in or hold an encumbrance on the Property and notified such persons of the Owner's intention to enter into this Environmental Covenant; and,

E. that this Environmental Covenant will not materially violate or contravene or constitute a material default under any other agreement, document or instrument to which Owner is a party or by which Owner may be bound or affected.

13. Amendment. This Environmental Covenant may be amended by consent of all of the following: the Owner or a Transferee; and the Ohio EPA, pursuant to ORC § 5301.90 and other applicable law. The term, "Amendment" as used in this Environmental Covenant, shall mean any changes to the Environmental Covenant, including the activity and use limitations set forth herein, or the elimination of one or more activity and use limitations so long as there is at least one activity and use limitation remaining.

This Environmental Covenant may be amended only by a written instrument duly executed by the Director of Ohio EPA, and the Owner or Transferee of the Property, as applicable. Within thirty (30) days of signature by all requisite parties on any amendment of this Environmental Covenant, the Owner or Transferee shall file such instrument for recording with the Lucas County Recorder's Office, and shall provide a file and date-stamped copy of the recorded instrument to Ohio EPA.

14. Severability. If any provision of this Environmental Covenant is found to be unenforceable in any respect, the validity, legality, and enforceability of the remaining provisions shall not in any way be affected or impaired.

15. Governing Law. This Environmental Covenant shall be governed by and interpreted in accordance with the laws of the State of Ohio.

16. Recordation. Within thirty (30) days after the date of the final required signature upon this Environmental Covenant, Owner shall file this Environmental Covenant for recording, in the same manner as a deed to the Property, with the Lucas County Recorder's Office.

17. Effective Date. The effective date of this Environmental Covenant shall be the date upon which the fully executed Environmental Covenant has been recorded as a deed record for the Property with the Lucas County Recorder.

18. Distribution of Environmental Covenant. The Owner shall distribute a file- and date-stamped copy of the recorded Environmental Covenant to Ohio EPA.

19. Notice. Unless otherwise notified in writing by or on behalf of the current owner, or Ohio EPA, any document or communication required by this Environmental Covenant shall be submitted to:

Board of County Commissioners
Lucas County
One Government Center
Suite 800
Toledo, Ohio 43604

King Road Landfill Site Coordinator
DERR
Ohio EPA
347 North Dunbridge Road
Bowling Green, Ohio 43402

The undersigned representative of Owner represents and certifies that the undersigned is authorized to execute this Environmental Covenant.

IT IS SO AGREED:

LUCAS COUNTY COMMISSIONERS [Owner]

Carol Contrada
Carol Contrada, Commissioner

11/5/2015
Date

Tina Skeldon Wozniak
Tina Skeldon Wozniak, Commissioner

11/5/15
Date

Pete Gerken
Pete Gerken, Commissioner

11/5/15
Date

State of Ohio)
) ss:
County of Lucas)

Before me, a notary public, in and for said county and state, personally appeared Carol Contrada, Tina Skeldon Wozniak, and Pete Gerken, Lucas County Commissioners, who acknowledged to me that they did execute the foregoing instrument on behalf of Lucas County, Ohio.

IN TESTIMONY WHEREOF, I have subscribed my name and affixed my official seal this 5TH day of NOVEMBER, 2015.

NOTARIAL SEAL STATE OF OHIO

Notary Public

3/17/19
Date of My Commission Expiration

OHIO ENVIRONMENTAL PROTECTION AGENCY

Craig W. Butler, Director

2/2/16
Date

State of Ohio)
) ss:
County of Franklin)

Before me, a notary public, in and for said county and state, personally appeared Craig W. Butler, the Director of Ohio EPA, who acknowledged to me that he did execute the foregoing instrument on behalf of Ohio EPA.

IN TESTIMONY WHEREOF, I have subscribed my name and affixed my official seal this 2nd day of February, 2016.

NOTARIAL SEAL STATE OF OHIO

Notary Public
CHARMA DIANE CASTEEL
NOTARY PUBLIC
STATE OF OHIO
MY COMMISSION EXPIRES

Date of My Commission Expiration
May 10, 2019

This instrument prepared by:

John A. Borell, Esq.
Lucas County Prosecutor's Office
Lucas County Courthouse
Toledo, Ohio 43604

Mark J. Navarre, Esq.
Ohio EPA Legal Office
50 W. Town Street
Columbus, Ohio 43216-1049

EXHIBIT A

COMMITMENT FOR TITLE INSURANCE

SCHEDULE A

Commitment No.: **147861**

1. Effective Date: **June 06, 2014, 8:00 am**

2. The policy or policies to be issued are: POLICY AMOUNT

   (a) ALTA Owner's Policy -
   Proposed Insured: **Informational Commitment**

   (b) ALTA Loan Policy -
   Proposed Insured:

3. **Fee Simple** interest in the land described in this Commitment is owned, at the effective date by:

   Board of Lucas County Commissioners of Lucas County, Ohio, by instrument recorded as Volume 1523 of Deeds, page 310 and Deed No. 93-284-A11 and re-recorded as Deed No. 93-326-D07.

4. Legal description of the land:

   Parcel 1
   A) That part of the south 13 chains and 44 links of the northwest quarter and the south thirteen chains and forty four links of the west one half of the northeast quarter of Section twenty, Town nine, South, Range six East, in Sylvania Township, that lies easterly of the center line of Silica Road, also;

   The Northwest quarter of the southeast quarter of Section twenty, Town nine South, range six East in Sylvania Township, excepting from all of the above described property a strip of land sixty feet in width extending southeasterly from the centerline of Silica Road to the east line of the west one half of the east one half of said Section twenty; the northerly line of said strip of land being twenty three and fifty hundredths feet northerly of and parallel with the centerline of the main track of the Toledo, Angola, and Western Railway Company as now constructed.

   B) The northeast quarter of the southeast quarter of Section twenty, Town nine South, range six East in Sylvania Township; excepting therefrom the northerly forty feet thereof. Being all subject to legal highways.

   LESS AND EXCEPT FROM A AND B ABOVE THE FOLLOWING DESCRIBED PARCEL:

   That part of the North ½ of the Southeast ¼ of Section 20, Town 9 South, Range 6 East in Sylvania Township, Lucas County, Ohio, bounded and described as follows:

   Beginning at the intersection of the East line of said Section 20 and the North line of Trotter Whelan Co. Plat II (as recorded in Volume 43, pages 41 and 42, Book of Plats, Lucas County, Ohio, Records), said intersection being a point at Station 66+07.18 on the centerline of King Road; thence

North 84° 56' 03" West, along aforesaid North line of Trotter Whelan Co. Plat II, a distance of 85.00 feet to a point 85.00 feet left of Station 66+07.24; thence North 05° 01' 20" East, a distance of 5.00 feet; thence North 70° 15' 24" East, a distance of 49.56 feet to its intersection with a line that is 40.00 feet west of and parallel to the East line of said Section 20; thence North 05° 01' 20" East, along aforesaid parallel line, a distance of 1,261.71 feet to its intersection with the South right of way line of the Waterfront Electric Railway; thence South 84° 54' 48" East, along aforesaid South right of way line, a distance of 40.00 feet to its intersection with the East line of said Section 20; thence South 05° 01' 20" West, along the East line of said Section 20 (being centerline of King Road), a distance of 1,287.55 feet to the point of beginning.

Containing 1.198 acres (52,195 square feet) of land, more or less, of which the present road occupies 0.887 acres (38,627 square feet).

The above description is based on a survey for said Improvement #756 dated 12/12/85 by Donald A. Hamm, Registered Surveyor No. 4977.

Grantors, for itself, its successors and assigns reserves the rights of ingress and egress over and above described property.

Parcel 2

A) A strip of land one hundred fifty five feet in width extending Easterly from the center of Ten Mile Creek in the Southeast quarter of the Northwest quarter of Section twenty, Town nine South, Range six East in Sylvania Township, Lucas County, Ohio, a distance of five hundred fifty feet; also a strip of land sixty feet in width extending Easterly from said last above described strip to the East line of the West one half of the East one half of Section twenty, the Northerly line of each of said strips of land being twenty three and fifty hundredths feet Northerly of and parallel with the centerline of the main track of the Toledo, Angola and Western Railway Company as now constructed, excepting therefrom that part thereof lying Westerly of the centerline of Silica Road.

Subject to legal highways.

B) A strip of land forty feet in width off the North side of the Northeast quarter of the Southeast quarter of Section twenty, Town nine South, Range six East, containing one and twenty one hundredths of an acre of land, more or less, all in Sylvania Township, Lucas County, Ohio excepting therefrom that part thereof conveyed to the Board of Lucas County, Ohio Commissioners in Deed 88-453A09

Less and except: That part of the North 40.00 feet of the Northeast 1/4 of the Southeast 1/4 of Section 20 and also that part of the North 50.00 feet of the Southwest 1/4 of Section 21, all in Town 9 South Range 6 East in Sylvania Township, Lucas County, Ohio bounded and described as follows:

Beginning at the Northwest corner of the Southwest 1/4 of said Section 21, and being a point at Station 79+34.73 on the centerline of right of way of King Road; thence South 89 -34' -36" East, along the North line of the Southwest 1/4 of said Section 21, a distance of 40.11 feet to a point 40.00 feet right of Station 79 + 37.73; thence South 04 -43' 00" West, parallel to the West line of the Northwest 1/4 of said Section 21, a distance of 3.11 feet to a point 40.00 feet right of Station 79 + 34.84(back); thence South 05 -01' -20" West, parallel to the West line of the Southwest 1/4 if said Section 21, a distance of 47.05 feet to its intersection with a line that is 50.00 feet south of and parallel to the North line of the Southwest 1/4 of said Section 21 and being a point 40.00 feet right of Station 78 + 87.79; thence North 89 -34' 36" West, along the line that is 50.00 feet South of and parallel to the North line of the Southwest 1/4 said Section 21, a distance of 40.13 feet to a point on the West line of the Southwest 1/4 of said Section 21 at Station 78 + 84.57; thence North 05° -01' -20"

East, along the West line of the Southwest 1/4 if saud Section 21 (being also the centerline of right of way of King Road) a distance of 10.16 feet to its intersection with a line that is 40.00 feet south of and parallel to the North line of the Southeast 1/4 of said Section 20, at Station 78 + 94.73; thence North 84 ° - 54' -48" West, along the line that is 40.00 feet south of and parallel to the North line of the Southeast 1/4 of said Section 20, a distance of 40.00 feet to a point 40.00 feet left of Station 78 + 94.77; thence North 05° -01' -20" East, parallel to the East line of the Southeast 1/4 of said Section 20, a distance of 39.85 feet to a point 40.00 feet left of Station 79 + 34.62 (back): thence North 04 ° - 43' -00" East, parallel to the East line of the Northeast 1/4 of said Section 20, a distance of 0.15 feet to its intersection with the North line of the Southeast 1/4 and being a point 40.00 feet left of Station 79+ 34.99 thence South 84° 54' -48" East, along the North line of the Southeast 1/4 of said Section 20, a distance of 40.00 feet to the point of beginning. Containing 3607 square feet of land of which the present road occupies 2705 square feet.

The above description is based on a survey for said improvement # 756 dated 12/12/85 by Donald A. Hamm, Registered Surveyor No. 4977.