



Decision Document

For the Remediation of the
Zeidrich Dump
Minerva, Columbiana County, Ohio



Division of Environmental Response and Revitalization
January 2018

Ohio EPA's Division of Environmental Response and Revitalization (DERR) - VAP, Enforcement, Remedial Response, and Brownfields Program			Decision Document for the Remediation of the Zeidrich Dump Site Minerva, Columbiana County, Ohio		
THE REMEDIAL RESPONSE PROCESS					
(1) Preliminary Assessment & Site Inspection [Completed]	(2) Remedial Investigation & Feasibility Study [Completed]	(3) Remedy Selection (Preferred Plan & Decision Document)	(4) Remedial Design	(5) Remedial Action	(6) Remedy Operation, Maintenance & Monitoring

Ohio EPA Announces Decision Document

On October 11, 2017, the Ohio Environmental Protection Agency (Ohio EPA) issued an Amended Preferred Plan that outlined Ohio EPA's preferred alternative to remediate contamination at the Zeidrich Dump Site ("Site"). Ohio EPA held a public meeting on December 11, 2017 at Minerva High School, 501 Almeda Ave., Minerva, Ohio to explain the Preferred Plan. Oral and written comments were accepted at this meeting and during the comment period, which ran from October 12, 2017, to December 18, 2017.

Based on the Amended Preferred Plan and the consideration of comments received during the comment period, Ohio EPA is issuing this Decision Document identifying the new remedial alternative for the cleanup of the contaminated soil and ground water at the Site, and providing the rationale for the selection.

Ohio EPA is issuing this 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) and remedial design/remedial action (RD/RA) 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.

ERAC Appeal Period: As a final action of the Director of Ohio EPA, the Decision Document may be appealed to the Environmental Review Appeals Commission (ERAC) pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with ERAC (77 South High Street, 17th Floor, Columbus, OH 43215) within thirty (30) days after notice of the Director's action.

Additional Information: Available from (1) Ohio EPA's Northeast District Office, located at 2110 East Aurora Road, Twinsburg, Ohio 44087, Ed D'Amato, (330) 963-1170, Ed.Damato@epa.ohio.gov; and (2) locally from the information repository located at the Minerva Public Library, 677 Lynwood Drive, Minerva, Ohio 44657, (330) 868-4101, <http://www.minerva.lib.oh.us>.

DECLARATION

SITE NAME AND LOCATION

Zeidrich Dump Site
near East Line Rd.
Village of Minerva, Columbiana County, Ohio

STATEMENT OF BASIS AND PURPOSE

This Decision Document presents the selected remedial action for the Zeidrich Dump Site, Minerva, Columbiana 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.

ASSESSMENT OF THE SITE

Actual and threatened releases of PCBs, trichloroethylene, cadmium, chromium, cobalt, and manganese 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.

Industrial and municipal waste disposed at the Site from the early 1950s until 1970 caused the contamination.


DESCRIPTION OF THE SELECTED REMEDY

The major components of the selected remedial alternative include:

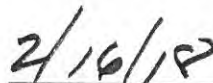
- Excavation and off-site disposal of landfill wastes;
- Monitor, assess, and mitigate ground water as necessary; and
- Mitigate adjacent wetlands, as necessary.

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 selected remedy uses permanent solutions 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.



Craig W. Butler, Director



Date

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TABLE OF ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of Concern
COPC	Contaminant of Potential Concern
DERR	Division of Environmental Response and Revitalization
DFFO	Director's Final Findings and Orders
ERA	Ecological Risk Assessment
FS	Feasibility Study
FFSA	Focused Feasibility Study Addendum
HHRA	Human Health Risk Assessment
HI	Hazard Index
MCL	Maximum Contaminant Level
mg/kg	Milligrams per Kilogram
µg/L	Micrograms per Liter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NORM	Naturally-Occurring Radioactive Materials
O&M	Operation and Maintenance
PCBs	Polychlorinated Biphenyls
PRG	Preliminary Remediation Goal
RA	Remedial Action
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RG	Remediation Goal
RI	Remedial Investigation
RL	Remediation Levels
SVOCs	Semi-volatile Organic Compounds
TCLP	Toxicity Characteristic Leaching Procedure
TDC	Technical Decision Compendium
TSCA	Toxic Substances Control Act
VOCs	Volatile Organic Compounds

DECISION DOCUMENT
Zeidrich Dump Site
Minerva, Columbiana County, Ohio

1.0 EXECUTIVE SUMMARY

Site Name and Location

The Zeidrich Dump Site is located in a 1.5 to 2-acre cleared area on the southern portion of a 7.05-acre wooded parcel near East Line Road, approximately 1,300 feet east of the Village of Minerva, Ohio (see Figure 1: Site Location Map and Figure 2: Site Map). The landfill is located at the bottom of a ravine and consists of two dump pile areas containing approximately 10,484 cubic yards (16,000 tons) of waste material. The Site extends across three parcels owned by Northrup Grumman Systems Corporation (NG); one in Stark County (Paris Township) and two in Columbiana County (West Township).

Following negotiations, TRW signed Director's Final Findings and Orders (DFFOs) on October 2, 1992 that called for the performance of a Remedial Investigation/Feasibility Study (RI/FS) at the Site. On September 17, 1996, the RI report was approved by Ohio EPA. On May 4, 1999, the FS was approved by Ohio EPA.

Director's Final Findings and Orders (DFFOs) for a Remedial Design and Remedial Action (RD/RA) were issued to NG, the subsequent owner to TRW, in March 2004. In 2006, NG proposed an alternate remedy option for removal and disposal off-site of the landfill waste. From 2007 to 2013, NG pursued a Toxic Substances Control Act (TCSA) exemption from U.S. EPA for disposal of the waste in a Class D Landfill and permit modification requests with Ohio EPA, to allow disposal in a Subtitle D facility. They were unable to obtain the required U.S. EPA waivers, resulting in NG changing the disposal approach. In November 2013, NG submitted a Focused Feasibility Study Addendum (FFSA) to Ohio EPA evaluating the disposal of the landfill wastes in a TCSA-permitted landfill. The FFSA was revised in response to Agency comments, and approved on June 6, 2017.

The RI report documented the existence of contamination at the Site which would require remediation. The primary contaminants of concern (COCs) at the Site and additional details concerning the health risks associated with each primary COC are located in Appendix B Primary Contaminants of Concern.

This Decision Document summarizes information on the range of remedial alternatives evaluated, identifies Ohio EPA's selected remedial alternative and explains the reasons for selection of the remedial alternative. The Decision Document is based on the Ohio EPA-approved RI and FFSA reports completed by O'Brien & Gere and AECOM, respectively.

NG proposed a remedial alternative that was evaluated in an Amended Preferred Plan issued on October 18, 2017. The major components of the selected remedy in this in this Decision Document include:

1. Removal and off-site disposal of landfill wastes;
2. Ground water monitoring/assessment to determine remedy effectiveness and mitigation as necessary; and
3. Mitigate impacts to adjacent wetlands as necessary.

Ohio EPA's selected remedial alternative should yield a permanent solution for risks associated with the contaminated media at the Site. The expectations for the selected alternative include:

- Long-term effectiveness without the need for long-term maintenance; and
- Cost-effectiveness and limitation of expenses to what is necessary to achieve the selected alternative expectations.

2.0 SUMMARY OF SITE HISTORY/CONTAMINATION/SELECTED REMEDY

2.1 Site History

The Zeidrich Dump property was originally owned by Andy Dietrich, and was leased to Matthew Zeidrich for use as a disposal site in 1947. In 1954, Matthew Zeidrich purchased the property from Andy Dietrich. Disposal of municipal waste began in the early 1950s. From 1963 to 1970, the landfill accepted industrial wastes from the TRW, Inc. (TRW) facility located in Minerva. The industrial wastes that were disposed on-site included ceramic mold material which contained polychlorinated biphenyls (PCBs) and drummed wastes. The drummed wastes consisted primarily of caustic soda, baghouse dust and solvents. Elemental mercury was also disposed on-site.

Following Matthew Zeidrich's death in 1978, the property was transferred to his children: Matthew Zeidrich (legal name change); Joseph Zeidrich, and Frances Elaine Zeidrich Baum. The property was eventually acquired by TRW, Inc. Northrop Grumman Space & Mission Systems Corp.¹ purchased TRW in 2002. The Site is no longer used for waste disposal.

Historically significant Site events are summarized in Table 1 below:

Table 1. Chronology of Significant Site Events	
Date	Site Event
1950s-early 1960s	Disposal of municipal waste by Andy Dietrich and Matthew Zeidrich.
1963-1970	Disposal of industrial waste by TRW.
September 1983	Minerva Village Services Director filed a complaint with Ohio EPA about the dump.
1989	Ohio EPA refers Zeidrich Dump Site to U.S. EPA. Sampling performed.

¹On January 1, 2010, Northrop Grumman Space and Mission Systems Corp. merged by law and continued to operate as Northrop Grumman Systems Corporation.

1990	U.S. EPA negotiates removal order with TRW; 1,582 drums removed from Site.
October 1992	Ohio EPA journalizes orders for TRW to perform an RI/FS.
April 1993	Ohio EPA approves RI/FS Workplan.
September 1996	Ohio EPA approves RI.
May 1999	Original FS approved.
July 2002	Preferred Plan issued recommending a low-permeability cap as chosen remedy.
May 2003	Decision Document issued.
March 2004	RD/RA activities implemented under Director's Final Findings and Orders (DFFOs) for collection of additional samples in wetland.
November 2004	Pre-design waste characterization report completed by Northrop Grumman.
February 2005	Additional Sampling Request Investigation Report submitted for ground water sampling Ohio EPA requested under the additional work provision of the DFFOs.
December 2005	Amended Decision Document is issued removing sediment remediation component from the remedy in the wetland area.
March 2006	ODH gives Northrup Grumman exemption of low-level radioactive waste as NORM, allowing for landfill disposal.
November 2006	Additional waste characterization field work conducted.
March 2007	Draft Subtitle D disposal application for remediation-derived wastes submitted to U.S. EPA.
April 2007	A Subtitle-D Risk-Based Disposal Application submitted to U.S. EPA for disposal of landfill materials in Coshocton Landfill. U.S. EPA never formally responded to the application for a PCB exemption for the landfill to accept the material.
August 2007	Additional field work for pre-disposal waste characterization.
October 2007	Northrup Grumman requested remedy change from on-site landfilling wastes to removal and offsite disposal.
October 2008	Ohio EPA seeks permit modification at Coshocton Landfill to allow disposal of Zeidrich Dump TSCA wastes.
November 2009	U.S. EPA TSCA Program approves permit modification allowing disposal of PCB-contaminated wastes at Coshocton Landfill.
August 2010	Ohio EPA requested that Northrup Grumman repair perimeter fencing and conduct residential ground water sampling.
January 2011	U.S. EPA policy on disposal landfilling of TSCA wastes under internal review, requiring additional re-evaluation of Ohio EPA permit modification.
May 2011	U.S. EPA concurs with Ohio EPA request for disposal of wastes at Coshocton Landfill
August 2011	Coshocton Landfill prepares to close; Northrup Grumman and Ohio EPA begin searching for new disposal site for Zeidrich Dump wastes.
June 2012	Mahoning Landfill announced as potential site for Zeidrich Dump waste disposal.

October 2013	Due to opposition from the public and local officials, Mahoning Landfill removed from consideration. Additional locations are considered.
November 2013	Northrop Grumman submitted a Focused FS Addendum (FFSA) evaluating a remedy option of removal and off-site disposal of landfill waste in a TSCA-permitted landfill.
November 2014	Amended FFSA submitted to Ohio EPA.
January 2015	Response to Northrop Grumman on amended FFSA; required revisions.
December 2015	Ohio EPA and Northrop Grumman agree on final list of COCs, need to conduct wetlands delineation.
March 2016	Northrop Grumman corporate initiated internal review of all ongoing environmental projects, halting work until November 2016.
December 2016	Revised FFSA submitted based upon Ohio EPA's comments
June 2017	Ohio EPA approves FFSA.

2.2 Summary of Site Contamination

The RI, performed by TRW with Ohio EPA oversight, included several tasks to identify the nature and extent of site-related chemical contaminants. The tasks included: sampling of air, surface and subsurface soils, sediments, 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/FS. Please refer to the RI Report (O'Brien & Gere, January 1996) and FS Report (O'Brien & Gere, March 1999) for additional information on contaminant concentrations.

The nature and extent of contamination at the Zeidrich Dump Site in each environmental medium and the contaminants of concern attributable to the Site are described below.

Landfilled Material (Waste):

Waste characterization samples taken in 2004 and 2005 indicated that:

- The former landfill waste material contains 90 - 95% broken ceramic molds that have disintegrated over time. PCBs were detected in all samples of waste material in concentrations ranging from 7.1 milligrams per kilogram (mg/kg) to 13,954.78 mg/kg. PCBs in leachate samples ranged from 2.0 micrograms per liter (µg/L) to 2.3 µg/L.

The landfilled waste was further characterized through test pits and soil borings, most recently in 2014, to support off-site disposal. Toxicity Characteristic Leaching Procedure (TCLP) data indicated that the material did not exhibit the hazardous waste characteristic of toxicity. PCBs were detected at concentrations ranging from 7 mg/kg to 1,200 mg/kg. PCB homologues ranged from 20 mg/kg in coarse materials, to 13,954 mg/kg in fine materials. Since the material contained PCBs at concentrations above 50 mg/kg, it would need to be disposed at a facility licensed to receive TSCA wastes.

Solid waste materials (tires, car chassis, metal parts, wood pallets, and trash) have also been placed on-site outside the landfilled waste area.

Media surrounding the landfilled material (ambient air, landfill perimeter soil, ground water, sediment and surface water) were sampled during the RI and in subsequent versions of the FS for the following contaminants of concern (COCs): PCBs, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, pesticides, and herbicides. Radioactivity was also evaluated.

Landfill perimeter soil and "hot spot" areas:

During the RI, 10 soil borings were collected around the perimeter of the landfilled waste and five soil borings were collected from a mercury "hot spot" area to delineate the nature and extent of contamination. The perimeter samples were analyzed for VOCs, SVOCs, pesticides, PCBs, metals and radioactivity. No VOCs were found in perimeter samples. SVOCs, pesticides, PCBs and some metals were detected, mostly at depth.

There are naturally-occurring radioactive materials (NORM) in the broken ceramic molds that are found in the landfill. All levels of radioactivity detected are within the permitted limits at the proposed disposal facility.

Based on additional sampling, a list of soil COCs was established in the 2016 FFSA. They include chromium and PCBs. See Table 6.

Contaminants and concentrations detected are provided in the RI Report, 1999 FS, 2016 FFSA, and in the 2003 and 2005 Preferred Plans.

Ground water:

A total of 14 permanent ground water monitoring wells were installed at the Site starting in June 1990. Thirteen temporary wells were installed in Geoprobe direct-drive points in 2012. Site-related contamination, including VOCs (specifically trichloroethylene (TCE)), SVOCs (specifically bis-(2-ethylhexyl) phthalate), pesticides (specifically 4,4'-DDE and gamma chlordane), PCBs and metals (such as chromium, cobalt and manganese) were detected in overburden ground water. Two SVOCs (bis-(2-ethylhexyl) phthalate and 2-methylnaphthalene), as well as metals, were detected in bedrock ground water. Details on the historic contamination found in ground water are provided in the RI Report, 1999 FS, 2016 FFSA and the 2003 and 2005 Preferred Plans.

The ground water COCs for the Site have been established based on the most current sampling, and are provided in Table 6. They include TCE, chromium, cobalt, manganese and PCBs.

At Ohio EPA's request, nearby residential supply wells were also analyzed in August 2010. No VOCs or PCBs were detected in the residential wells.

Ambient air:

Ambient air samples were collected in 1993, both upwind and downwind of the Site. 1,1,1-trichloroethane and toluene were detected in all samples and benzene was detected in one sample. The concentrations detected are provided in the 2005 Decision Document.

Wetland sediment and surface water:

Surface water and sediment samples were collected in the wetland downgradient of the landfilled material, as well as in an upgradient reference wetland in May 2003 and in January 2005, and analyzed for metals and PCBs. Details on the contamination found in the wetland areas are provided in the RI Report, 1999 FS, 2016 FFSA, and the 2003 and 2005 Preferred Plans. Based on the most recent sampling, COC levels detected were below screening and/or remedial standards. All levels of radioactivity were below background.

An additional wetland area is developing at the base of the landfill. According to Northrop Grumman the wetland was created either by a spring or run-off from landfilled materials. This area will be evaluated as necessary once the landfilled material and contaminated soil and sediment have been removed.

Land use:

The properties surrounding the Site are largely undeveloped, with a few single-family, residential homes greater than 1,000 feet away from the Site. No potable private or public water sources have been impacted by site-related contamination. The reasonably anticipated future land use for the Site is residential, as was presented by Northrop Grumman in the FFSA.

A human health risk assessment (HHRA) and ecological risk assessment (ERA) were performed during the RI to evaluate human health and ecological risk based on current and anticipated future use, and to assess potential impacts of COCs on the environment (e.g., animals, water bodies, plants, etc.) at the Site. Please refer to the RI and FS reports for more detailed information. These reports, along with other site-related materials, are located in the information repository at the Minerva Public Library (contact: Tom Dillie, minervadirector@gmail.com), and in Ohio EPA's Northeast District Office.

2.3 Summary of Selected Remedy in Decision Document

The selected remedy includes excavation and off-site disposal at a TCSA-approved disposal facility of approximately 16,000 tons of source media (waste) and contaminated soil and sediment, placement of institutional controls and Site restoration of disturbed areas. Confirmatory sampling would be conducted post-removal to verify that the remedial goals (RGs) are met. Ground water would be monitored/assessed post-removal and mitigated as necessary. The Remedial Action Objectives (RAOs) of preventing direct contact with waste materials and contaminated media would be attained with this alternative.

The RAOs in the Decision Document are listed below in Table 2 Remedial Action Objectives. These RAOs are protective of current users (trespassers) and future potential users (construction workers and residents²). Additional information on the RAOs is provided in the 2016 FFSA, Table 5.

TABLE 2. REMEDIAL ACTION OBJECTIVES	
Landfilled Materials/ Waste	
Human Health Risk	Prevent trespasser, construction worker and future resident exposure to landfilled materials/waste.
Environmental Risk	Prevent ecological receptor exposure to landfilled materials/waste.
Soil	
Human Health Risk	Prevent trespasser, construction worker and future resident direct contact with soils at the Site having COCs in excess of a total lifetime cancer risk (for all contaminants) greater than 1×10^{-5} and a Hazard Index (HI) of 1.
Environmental Risk	Prevent ecological receptors from direct contact with soils at the Site having concentrations of COCs in excess of an HI greater than 1.
Ground water	
Human Health Risk	Prevent construction worker direct and future resident drinking/direct contact with ground water at the Site having concentrations of COCs greater than the MCL, or in excess of a total excess lifetime cancer risk greater than 1×10^{-5} or an HI greater than 1.
Human Health Risk	Prevent future resident inhalation of vapors in future on-site buildings with concentrations of COCs in excess of a 1×10^{-5} excess lifetime cancer risk (for all contaminants) and an HI of 1.
Sediment	
Human Health Risk	Prevent trespasser, construction worker and future resident direct contact with sediment having concentrations of COCs in excess of a total excess lifetime cancer risk (for all contaminants) greater than 1×10^{-5} and an HI of 1.
Environmental Risk	Prevent releases of COCs from sediments in excess of an HQ or an HI greater than 1 for aquatic or terrestrial ecological receptors (e.g., fish- eating birds and animals).
Environmental Risk	Prevent releases of COCs from sediments that would result in surface water levels in excess of State of Ohio or U.S. EPA water quality criteria (e.g., ambient water quality criteria).

In the process of scoping and conducting the RI and FS, generic preliminary remediation goals (PRGs) were established. These PRGs were converted to site-specific RGs following

² Remedial action objectives that protect future residents will also be protective of commercial/industrial workers, or recreational users.

completion of the FS phase of the project. The 2016 FFSA includes a list of RGs for soil, sediment, and ground water that are protective of human health and the environment.

The human health protective RGs for direct-contact soil and sediment were established using the acceptable excess lifetime cancer risk and non-cancer hazard goals identified in the Division of Environmental Response and Revitalization (DERR) Technical Decision Compendium (TDC) document "Human Health Cumulative Carcinogenic Risk and Non-Carcinogenic Hazard Goals for DERR Remedial Response and Federal Facility Oversight", dated August 21, 2009. These goals are given as 1×10^{-5} (i.e., 1 in 100,000) excess lifetime cancer risk and a HQ or HI of 1, and were established using the default exposure parameters provided by U.S. EPA or site-specific information. This TDC can be found at <http://www.epa.ohio.gov/portals/30/rules/riskgoal.pdf>. U.S. EPA's Region 5 2003 Ecological Screening Levels were used to establish soil and sediment levels protective of ecological receptors. Ohio EPA's sediment reference values for the Western Allegheny Plateau were used to establish background levels for metals in sediment.

For ground water COCs, U.S. EPA's Maximum Contaminant Level (MCL), if available, was used to establish the potable use ground water RG. If an MCL was unavailable, risk-based RGs protective of human health were established following the protocol in Ohio EPA's August 2009 TDC. Target ground water levels for vapor intrusion COCs, if detected after removal of the landfilled material and contaminated soil, have been established using U.S. EPA's vapor intrusion screening level (VISL) calculator.

RGs for PCBs in soil and sediment were established using the TSCA standard for high-occupancy areas established by U.S. EPA (40 CFR 761).

Naturally-occurring radioactive materials (NORM) standards for unrestricted use were established per Ohio Department of Health protocol.

The COCs and the RGs, now termed final remediation levels (RLs), for the Site are shown in Table 6 Proposed Contaminants of Concern/Remediation Levels.

3.0 BASIS FOR THE DOCUMENT

Ohio EPA issued a Decision Document for the Zeidrich Dump Site in December 2005, which included the following remedial components:

- Excavation and consolidation of contaminated soils and sediments to a location within the landfill boundaries;
- Installation of a vegetated, low-permeability cap over the landfill;
- Installation of a leachate collection system;
- Long-term monitoring of cap thickness to ensure the protectiveness of the remedy;
- Ground water monitoring to ensure the contamination does not leave the property;
- Maintenance of fencing and signs around the property; and
- Thirty years of operation and maintenance.

New information gained during the course of the project has led Ohio EPA to review and revise the selected remedy. In November 2005, NG completed a pre-design waste characterization report which determined that the primary contaminant of potential concern (COPC) was PCBs. This led to consideration of the possibility of removal and off-site disposal as a remedy.

On November 29, 2013, NG submitted an FFSA evaluating a change of remedy to removal and off-site disposal of landfill waste. Following Ohio EPA comments, revisions to the FFSA were received on November 21, 2014 and December 9, 2016. Ohio EPA approved the FFSA on June 6, 2017.

Further descriptions of the changes documented in this Decision Document are provided in Section 4.0 below. The selected remedy for the Site, as revised by this Decision Document, will be protective of human health and the environment, and will meet applicable or relevant and appropriate requirements (ARARs).

4.0 DESCRIPTION OF SIGNIFICANT CHANGES/BASIS FOR CHANGES

Table 3 summarizes the changes in the remedy being documented herein.

Table 3. Documentation of Changes to Remedy	
Original 2005 Remedy Components	Amended Remedy Components
Low-permeability cap.	Excavation and off-site disposal.
Ground water monitoring to ensure contamination does not leave property.	Ground water assessment to determine remedy effectiveness. Mitigation if needed.
Installation of a leachate collection system.	Leachate collection not necessary.
Thirty years of operation and maintenance.	No operation and maintenance.
Institutional Controls/Land Use Restriction/Ground water Use Restriction.	Ground water use restriction, if necessary/Unrestricted land use.
Mitigation of impacts to adjacent wetlands as necessary.	Mitigation of impacts to adjacent wetlands as necessary.

4.1 Remedial Alternatives

Original Remedy: Containment

This alternative includes excavation of impacted soil and sediment outside the waste boundaries, consolidation and placement of a low-permeability cap on approximately 1.5 acres of the landfill area. The cap will be vegetated, and a leachate collection system will

be installed. The low-permeability cap alternative will attain the RAOs to prevent direct-contact with waste materials and contaminated soil and sediment, and limit leachate production from source materials. The existing perimeter fence and the final cover will limit physical access to the Site and waste materials.

The proposed leachate management system will minimize infiltration into the subsurface, and further protect ground water. Long-term monitoring of cap thickness and integrity will ensure the protectiveness of the remedy. Also included in this remedy, is long-term monitoring of ground water to detect potential off-site migration of COCs. Impacts to adjacent wetlands may need to be mitigated following excavation and construction.

Amended Remedy: Removal and Off-Site Disposal

This remedy includes excavation and off-site disposal at a TCSA-approved disposal facility of approximately 16,000 tons of source media (waste) and contaminated soil and sediment, placement of institutional controls as needed, and Site restoration of disturbed areas. Confirmatory sampling would be conducted post-removal to verify that the RLs are met.

Following source removal, ground water in the unconsolidated and bedrock zones would be evaluated through installation of a monitoring well network, monitoring as necessary to ensure that any site-related COCs met the ground water RLs, and mitigation of ground water impacts as necessary. This remedy alternative would ensure that the RAOs for the Site are met, long-term, by preventing direct contact with waste materials and contaminated media and through a comprehensive analysis of ground water impacts in combination with the risk assessment. Impacts to adjacent wetlands may need to be mitigated following excavation. This alternative uses proven and readily available technology which could be implemented following a detailed design phase.

5.0 COMPARISON AND EVALUATION OF REMEDIAL ALTERNATIVES

5.1 Evaluation Criteria

Ohio EPA considers eight criteria, as outlined in the NCP, to evaluate the various remedial alternatives individually and compare them with each other, in order to select a remedy. A more detailed analysis of the remedial alternatives can be found in the FS report. The eight evaluation criteria, including the threshold, balancing, and modifying criteria, are shown below in Table 4 Remedial Alternative Evaluation Criteria.

TABLE 4. REMEDIAL ALTERNATIVE EVALUATION CRITERIA
Threshold Criteria (2)
Overall Protection of Public Health and the Environment - determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, treatment, etc.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) - evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the Site, or whether a waiver is justified.
Balancing Criteria (5)
Long-Term Effectiveness and Permanence – evaluates the ability of an alternative to maintain protection of human health and the environment over time.
Reduction of Toxicity, Mobility or Volume of Contaminants Through Treatment – evaluates the amount of contamination present, the ability of the contamination to move in the environment, and the use of treatment to reduce harmful effects of the principal contaminants.
Short-Term Effectiveness – evaluates the length of time needed to implement an alternative and the risks the alternative poses to workers, residents and the environment during implementation.
Implementability – evaluates the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
Cost – includes estimated capital and annual operation and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
Modifying Criterion (1)
Community Acceptance – considers whether the local community agrees with Ohio EPA's analyses and preferred alternative. Comments received on the Decision Document are an important indicator of community acceptance.

Evaluation Criteria 1 and 2 are threshold criteria required for acceptance of an alternative. Any acceptable remedy must comply with both of these criteria. Evaluation Criteria 3 through 7 are the balancing criteria used to select the best remedial alternative(s) identified in the Preferred Plan. Evaluation Criteria 8, community acceptance, is evaluated through public comment on the alternatives received during the comment period.

5.2 Summary of Evaluation Criteria

This section examines how each of the evaluation criteria is applied to each of the remedial alternatives listed in Section 4.0 and compares how the alternatives achieve the evaluation criteria.

Overall Protection of Human Health and the Environment

Evaluation of the overall protectiveness of the alternatives focused on whether each alternative achieves adequate protection of human health and the environment and identifies how Site risks posed through each pathway being addressed are eliminated, reduced or controlled by the alternative. This evaluation also includes consideration of whether the alternative poses any unacceptable short-term or cross-media impacts.

Remedy Alternatives: Both the Original Remedy and the Amended Remedy are protective of human health and the environment. The Original Remedy (low-permeability cap) reduces the potential for contact with COPCs, but relies on the maintenance of the cap and leachate collection system to do so. The Amended Remedy (removal and off-site disposal) removes COPCs from the Site and eliminates long-term risk.

Compliance with ARARs

This evaluation criterion is used to determine whether each alternative will meet all of the applicable federal, state and local ARARs. The three types of applicable federal, state and local regulations are: chemical-specific, location-specific and action-specific.

Remedy Alternatives: Both remedy alternatives are expected to comply with the ARARs.

Long-Term Effectiveness and Permanence

The long-term effectiveness and permanence of each of the alternatives was divided into two areas: long-term protection of the community and magnitude of residual risks. These two areas are summarized below:

Remedy Alternatives: The Original Remedy (low-permeability cap) is protective in the long term, but only if the cap and leachate collection system are maintained. Following removal of the source and impacted soils/sediments, the Amended Remedy (removal and off-site disposal) would provide the greatest level of long-term protection of the community.

Residual risks are reduced by physical isolation and sequestration processes in the Original Remedy (low permeability cap), provided it is maintained properly. Residual risks are significantly reduced compared to current conditions by mass removal in the Amended Remedy (removal and off-site disposal).

Reduction of Toxicity, Mobility or Volume by Treatment

The assessment of this criterion addressed the preference for selection of remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility or volume of the hazardous waste substances.

Remedy Alternatives: The Original Remedy (low-permeability cap) reduces toxicity and mobility through containment, provided the cap is properly maintained. The volume of soil and fill containing PCBs, SVOCs and metals is completely and permanently reduced by the Amended Remedy (removal and off-site disposal).

Short-Term Effectiveness

The following factors were considered in assigning weight for short-term effectiveness in protecting human health and the environment:

Protection of Workers – The risks posed to workers at the Site during the construction and implementation were qualitatively evaluated for each alternative.

Protection of the Community – The risks posed to the community adjacent to and downgradient of the Site during the construction and implementation were qualitatively evaluated for each alternative.

Adequacy and Reliability of Controls – The adequacy and reliability of controls used during construction and implementation were qualitatively evaluated for each alternative.

Remedy Alternatives: Workers are potentially exposed to COPCs via inhalation of fugitive dust and dermal contact during the constructed remedies of the Original Remedy (low permeability cap) and the Amended Remedy (removal and off-site disposal). Worker exposure risks will be minimized through the implementation of a written Health and Safety Plan for remediation activities.

Nearby residents and workers may be potentially exposed to COPCs via inhalation of fugitive dusts and gaseous emissions that originate from disturbed and exposed soil/fill and sediment, and that are dispersed in ambient air during construction activities. This risk is greatest for the two alternatives involving disturbance of waste materials, the Original Remedy (low-permeability cap) and Amended Remedy (removal and off-site disposal). Air quality monitoring and engineering controls, to reduce dust and emissions, will be implemented during construction activities to minimize potential exposure risk.

The Amended Remedy poses a risk to workers and residents along transportation routes, should releases of excavated material occur during transportation.

Long-term maintenance and monitoring will be required for the Original Remedy (low-permeability cap) alternative because of the potential for disturbance from soil erosion, or other cap-disturbing activities. The effects of the disturbance necessitate monitoring and repairs; however, additional detailed analyses such as side slope stability modeling, surface water runoff, or other engineering considerations (e.g., leachate management) may be required for design of an appropriate operation and maintenance (O&M) and/or monitoring plan.

The Original Remedy (low-permeability cap) includes a ground water monitoring component. The Amended Remedy includes a ground water assessment and, as necessary, mitigation component. The monitoring well network for each would need to be maintained to ensure adequacy and reliability.

The Amended Remedy also includes a plan to assess residual toxicity and mitigate ground water impacts, if necessary. Mitigation activities may expose the community to COPCs during follow-up remedial activities. Community exposure risks will be minimized through air quality monitoring and engineering controls.

Implementability

This criterion addresses the availability of goods and services required for its implementation, the reliability of the alternative to provide an effective reduction in COCs in the environment and the ease of executing the construction. The following factors were considered:

Technical Feasibility – The ability to construct, reliably operate, and meet technology-specific regulations for process options, including operation, maintenance, replacement and monitoring for both the initial implementation and into the future after the remedial action is complete.

Administrative Feasibility – The ability to obtain approvals from other offices and agencies.

Availability of services and materials – The availability of equipment, technical specialists and materials to successfully implement the remedy.

Remedy Alternatives: There are no technical or administrative impediments to the implementation of the two alternatives, and the services and materials required for implementation of all are available locally.

Monitoring, maintenance, and repair are required to maintain the reliability of the Original Remedy (low permeability cap). These activities might need to be conducted indefinitely, resulting in no foreseeable end in cost expenditures and site activities. Ability to achieve the clean-up goals, especially with respect to naturally-occurring metals, may require excavation of additional soil volumes and/or replacement of residual cover for construction of the Amended Remedy (removal and off-site disposal).

Cost

The engineering, construction-and O&M costs were estimated using the conceptual remedy designs presented in Section 3. Engineering and contingency costs are assumed at 20 percent.

Original Remedy Cost:

Estimated Capital Cost	\$4,183,714
Estimated 30-year O&M Cost ³	\$2,855,400
Estimated Total Cost (including 5-year review costs)	\$7,135,114

Amended Remedy Cost:

Estimated Capital Cost	\$6,832,789
Estimated 30-year O&M Cost	\$29,160
Estimated Total Cost	\$6,861,949

³ 30 Year O&M costs include ground water evaluation and monitoring.

Ground water evaluation and monitoring/mitigation costs for the Amended Remedy would vary widely because the work scope of this alternative cannot be defined due to unknown scenarios. For example: the extent of COPC impacts (if any), need for mitigation, type of mitigation, etc., would need to be evaluated.

Remedy Alternatives: The costs are estimates for the purposes of comparison only and do not represent final project costs, because the final project scope and schedule have not been established. However, to the extent practicable, capital costs, annual O&M costs, and periodic costs for both remedies have been estimated. The estimated cost of the Amended Remedy is less than that of the Original Remedy.

Community Acceptance

Ohio EPA did not receive any comments at the public meeting held December 11, 2017 at the Minerva High School, or during the public comment period, which ran between October 11, 2017 and December 18, 2017.

TABLE 5. EVALUATION OF SITE REMEDIAL ALTERNATIVES

Remedial Alternatives	Threshold Criteria		Balancing Criteria					Modifying Criteria
	1. Protects Human Health & Environment	2. Compliance with ARARs	3. Long Term Effectiveness	4. Reduces T, M and/or V by Treatment	5. Short Term Effectiveness	6. Implementability	7. Costs	
Source Control								
Original Remedy	■	■	■	■	■	■	■	
Amended Remedy	■	■	■	■	■	■	■	
■ = Fully Meets Criteria ■ = Partially Meets Criteria □ = Does Not Meet Criteria								

6.0 OHIO EPA'S SELECTED ALTERNATIVE

Ohio EPA's selected remedial alternative for the Zeidrich Dump Site is the Amended Alternative: removal and off-site disposal of landfill materials and a ground water assessment monitoring and mitigation plan.

The Amended remedial alternative was selected over the original alternative because it provides for cleanup of the Zeidrich Dump Site to residential unrestricted use standards.

7.0 DOCUMENTATION OF SIGNIFICANT CHANGES

Ohio EPA did not receive any comments on the Amended Preferred Plan, and no significant changes have been made to the selected remedial alternative.

8.0 RESPONSIVENESS SUMMARY

A public meeting/hearing was held on December 11, 2017 to present the Agency's Amended Preferred Plan for the Zeidrich Dump Site and to solicit public comment. Additionally, oral and written comments were accepted at this meeting and during the comment period, which ran from October 11, 2017 to December 18, 2017.

Ohio EPA received no comments at the public meeting/hearing nor during the public comment period.

REFERENCES

O'Brien & Gere. 1996. *Remedial Investigation, Zeidrich Site, Minerva, Ohio*, prepared by O'Brien & Gere Engineers, Inc. January 1996.

O'Brien & Gere. 1997. *Remedial Investigation Feasibility Study, Zeidrich Site, Minerva, Ohio*, prepared by O'Brien & Gere Engineers, Inc. May 1999.

Ohio EPA. 2004. *Director's Final Findings and Orders for Remedial Design and Remedial Action, Zeidrich Dump Site, Minerva, Ohio*. March 18, 2004.

Ohio EPA. 2005. Preferred Plan Amendment for the Remediation of Zeidrich Dump. November 2005.

ARCADIS. 2007. *Additional Waste Characterization Work Plan – Zeidrich Dump Site, Minerva, Ohio*. July 24, 2007.

AECOM. 2016. *Focused Feasibility Study Addendum, Zeidrich Dump, Minerva, Ohio*. December 2016.

ATTACHMENTS

APPENDICES

Appendix A Glossary of Terms

Administrative Record: All documents that Ohio EPA considered or relied on in selecting a remedial action for a site.
Applicable or Relevant and Appropriate Requirements (ARARs): Those rules that strictly apply to remedial activities at the site or those 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 in the absence of any remedial action, which also determines the extent of cleanup needed to reduce potential risk levels to within acceptable ranges.
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 that 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.
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 can be selected.
Hazardous Substance: A chemical that may cause harm to humans or the environment.
Hazardous Waste: A waste product listed or defined by RCRA that may cause harm to humans or the environment.
Human Receptor: A person/population exposed to chemicals released at a site.
Imminent Threat: A high probability that exposure is occurring.
Leachate: Water that collects contaminants as it migrates through wastes, pesticides, or fertilizers. Leaching may occur in farming areas and landfills, and may result in hazardous substances entering surface water, ground water, soil, or sediment.
Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in a public drinking water supply. The level is established by U.S. EPA and incorporated into OAC 3745-81-11 and 3745-81-12.
Monitoring Well: A well installed to collect ground water samples for the purpose of physical, chemical, or biological analyses to determine the amounts, types, and distribution of contaminants in ground water beneath a site.
Naturally Occurring Radioactive Material (NORM): Materials, wastes or by-products enriched with radioactive elements found in the environment.
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.

Appendix A Glossary of Terms, Cont'd

Operation and maintenance (O&M): 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 determines if RAOs are being 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 RGs at this point in time). They are also used during the analysis of remedial alternatives in the RI/FS.
Present Worth Cost: Estimated current cost, or value, of the future remedial costs to be expended, typically discounted at the current market rate. Provides a solid basis for comparing costs of each of the remedial alternatives.
Project Action Level: A concentration for a COC that has been determined by regulation or through a risk assessment to be protective of human health or ecological receptors. This concentration value could be based on a preliminary remediation goal (PRG); a drinking water maximum contaminant level (MCL); or a background concentration (background).
RCRA: Resource Conservation and Recovery Act of 1976, as amended, 42 U.S.C. 6901 et seq. A federal law that regulates the handling of hazardous wastes.
Remedial Action Objectives: Specific remedial goals 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 the comments.
Sediment: Topsoil, sand and minerals washed from the land into water, usually after rain or snow melt.
Toxic Substances Control Act (TSCA): Toxic Substances Control Act of 1976, as amended, 15 U.S.C. §2601 et seq.
Toxicity Characteristic Leaching Procedure (TCLP): A soil sample analytical method for chemical analysis designed to leaching in a landfill environment.
Water Quality Criteria: 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 OAC Chapter 3745-1.

Appendix B Primary Contaminants of Concern

A total of primary contaminants of concern (COCs) have been identified that pose the greatest potential risk to human health and the environment at this site. Additional details on each primary COC (from the Agency for Toxic Substances and Disease Registry ([ATSDR Toxicological Profiles](#))) are provided below:

Cadmium is a natural element in the earth's crust. All soils and rocks contain some level of cadmium. Most cadmium used in the U.S. is extracted during production of metals like zinc, lead and copper. It does not corrode easily and is used primarily in batteries, pigments, metal coatings, and plastics. Breathing high levels can severely damage the lungs. Ingesting high levels severely irritates the stomach, leading to vomiting and diarrhea. Long-term exposure to lower levels can lead to a build up in the kidneys and subsequent kidney disease. Another long-term effect is fragile bones. Cadmium is a known human carcinogen.

Cobalt is a naturally occurring element found in rocks, soil, water, plants, and animals. Cobalt is used to produce alloys used in the manufacture of aircraft engines, magnets, grinding and cutting tools, artificial hip, and knee joints. Cobalt compounds are also used to color glass, ceramics, and paints, and used as a drier for porcelain enamel and paints. Exposure to high levels of cobalt can result in lung and heart effects and dermatitis. Liver and kidney effects have also been observed in animals exposed to high levels of cobalt.

Chromium is a naturally occurring element found in rocks, animals, plants, soil, and in volcanic dust and gases. Chromium is present in the environment in several different forms. The most common forms are chromium(0), chromium(III), and chromium(VI). No taste or odor is associated with chromium compounds. Chromium(III) occurs naturally in the environment and is an essential nutrient. Chromium(VI) and chromium(0) are generally produced by industrial processes. The metal chromium, which is the chromium(0) form, is used for making steel. Chromium(VI) and chromium(III) are used for chrome plating, dyes and pigments, leather tanning, and wood preserving.

Manganese is a naturally occurring substance found in many types of rocks and soil. Pure manganese is a silver-colored metal; however, it does not occur in the environment as a pure metal. Rather, it occurs combined with other substances such as oxygen, sulfur, and chlorine. Manganese is a trace element and is necessary for good health. Exposure to excess levels of manganese may occur from breathing air, particularly where manganese is used in manufacturing, and from drinking water and eating food. At high levels, it can cause damage to the brain.

Polychlorinated Biphenyls (PCBs) are mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. Historically, PCBs have been used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they do not readily burn and are effective insulators. PCB manufacturing was stopped in the U.S. in 1977 because of evidence that they build up in the environment and can cause harmful health effects. Studies in exposed workers have shown changes in blood and urine that may indicate liver damage. Animals ingesting large amounts of PCBs for short periods experienced liver damage, or death in some cases. Animals ingesting smaller amounts over several weeks or months developed anemia, skin conditions, and liver stomach and thyroid gland injuries. U.S. EPA has determined that PCBs are a probable human carcinogen.

Trichloroethylene is a colorless, volatile liquid. Liquid trichloroethylene evaporates quickly into the air. It is nonflammable and has a sweet odor. The two major uses of trichloroethylene are as a solvent to remove grease from metal parts and as a chemical that is used to make other chemicals, especially the refrigerant, HFC-134a. Trichloroethylene was once used as an anesthetic for surgery.