

COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection
Hazardous Sites Cleanup Program
Keystone Metals Reduction Site
Cheswick Borough, Allegheny County
Southwest Region

ANALYSIS OF ALTERNATIVES AND PROPOSED RESPONSE

The purpose of this Analysis of Alternatives and Proposed Response document is to outline the decision-making process involved in the selection of the proposed response and to provide a description of the proposed response. This document will be included in the Administrative Record which will be compiled for this response pursuant to Section 506 of the Pennsylvania Hazardous Sites Cleanup Act, Act of October 18, 1988, P.L. 756 No. 108 ("HSCA"), 35 P.S. § 6020.506.

This proposed response consists of a 4.5 to 6-foot cap over the former Keystone Metals Reduction property ("Site") to eliminate direct contact with the contaminated material; a soil management plan and deed restrictions to ensure that the cap remains intact and that the contaminated material is handled properly if disturbed; and monitoring to ensure that the remedies are maintained. In addition, an environmental covenant will ensure that use of the Site will be restricted to nonresidential use, a radon mitigation system will be required for any building on the property, and groundwater will not be used on the Site. Groundwater will continue to be monitored and a Fate and Transport Model will be developed to evaluate if additional measures are needed to ensure that groundwater off the Site continues to be safe.

I. SITE INFORMATION

A. Site Location, Description, and History

The Site is located in the 1000 block of Freeport Road in the Borough of Cheswick, Allegheny County, Pennsylvania (See attached map). The area planned for remediation is primarily located on property now owned by North American Fencing Corporation. An office, workshop and storage area occupy the property. The Allegheny River is located approximately 500 feet south of the site, beyond Freeport Road. The Harmer Township Municipal Authority production wells and treatment facility are located approximately 400 feet west of the Site.

The Keystone Metal Reduction Company ("KMR") purchased the Site in 1921 and operated a uranium processing facility on the property. Records indicate that KMR utilized an extraction process on previously 'milled' uranium ore to produce radium. The facility reportedly produced about two grams of radium and ceased operations in the early 1920s.

In August 2010, staff from the Department of Environmental Protection's ("Department") Radiation Protection Program conducted a radiological scoping survey of the Site. During the survey, no byproducts from radium processing were observed on the property. However, elevated radiation levels were found at two locations. Surface soil radiation readings of 35 micro roentgens per hour (uR/hr) were found at one location and an additional surface soil area had readings of up to 140 uR/hr. Background radiation levels in the area were between 3 and 7 uR/hr. A soil sample was collected by the Department from the location with the highest radiation measurement. Laboratory analysis of the soil sample exhibited elevated levels of radium-226 (Ra-226) at 66.4 picocuries per gram (pCi/g), exceeding the USEPA criteria for Ra-226 in surface soil (5 pCi/g).

In addition to the radiological surveys performed, fourteen diffusion barrier charcoal canisters were placed in occupied areas of the two businesses closest to the Site to test for Radon-226. The results of the tests ranged from 0.1 to 1.6 picocuries per liter (pCi/l), below the USEPA suggested level of 4.0 pCi/l. Therefore, the radon tests performed indicated that there was no imminent threat to public health and safety within these buildings under the current conditions.

In 2011, investigation of the Site was begun to determine the type and extent of contamination. An additional investigation was conducted in 2013 to further delineate the extent of impact to the soil and groundwater at the Site.

Characterization of the Site has shown that there is radiological contamination present above the EPA suggested level; the primary Contaminant of Concern is Radium-226. Contamination in the soil is present to depths up to approximately 12 feet; in some areas this is near or below the groundwater table. In areas where contamination is found near or below the water table, the groundwater is impacted. A monitoring well network and the nearby Harmar Township Municipal Authority production wells continue to be sampled.

Remedial alternatives to address the contamination at the Site were evaluated in 2014 and 2016.

B. Threat of Release of Hazardous Substances

The Department has determined that Radium-226 is the primary Contaminant of Concern at the Site. Radium-226 is a hazardous substance as defined by the Hazardous Sites Cleanup Act and is a carcinogen. This contaminant presents an exposure that will exceed acceptable levels if conditions at the Site change from current conditions (because of, for example, a change in use; or the construction of buildings that might allow an accumulation of radon gas).

The current and potential threat to human health and welfare addressed by this response is the threat of direct contact to the contamination and vapor intrusion into occupied buildings that may be built on the Site.

The current threat to the environment is the threat to wildlife that may come into direct contact with and/or ingest the contamination present in the soil at the Site.

II. RESPONSE CATEGORY

The response category for this proposed response is an Interim Response. The response is projected to cost less than 2 million dollars and will take less than 1 year.

III. CLEANUP STANDARDS

Under the Pennsylvania Land Recycling and Environmental Remediation Standards Act 2 (35 P.S. §§ 6026.1012, *et seq.*) ("Act 2"), the applicable cleanup standard is an exposure that represents an excess upper bound lifetime risk for carcinogens between 1 in 10,000 and 1 in 1 million. Based on EPA analysis, an exposure of 15 mrem/year or less falls within this acceptable risk range and is considered protective under Act 2. The goal of this response is to meet the Act 2 Site Specific Standard by reducing exposure to less than 15 mrem/year.

IV. APPLICABLE, RELEVANT and APPROPRIATE REQUIREMENTS (ARARs)

The following standards, requirements, criteria or limitations are legally applicable, or relevant and appropriate, under the circumstances presented at this Site.

The Pennsylvania Hazardous Sites Cleanup Act (35 P.S. Section 6020.101)

The Pennsylvania Solid Waste Management Act 97 (35 P.S. Sections 6018.101-6018.1003)

The Pennsylvania Land Recycling and Environmental Remediation Standards Act 2 (35 P.S. Section 6026.1012 *et seq.*)

The Pennsylvania Clean Stream Law, the Act of June 22, 1937, as amended, P.L. 1987, 35 P.S. 691.1 *et seq.*

Radiation Protection Act of July 10, 1984, P.L. 688, 35 P.S. §§7110.101 *et seq.*

Federal regulations as referenced by the U.S. Nuclear Regulatory Commission, 40 C.F.R. § 192.32

V. ANALYSIS OF ALTERNATIVES

Alternative 1. No Action

Description of Alternative:

This alternative consists of taking no action to address the contaminated soil at the Site.

Compliance with ARARs:

This Alternative would not comply with Section 501 (a) of HSCA because the release or threat of a release of hazardous substances would not be addressed. In addition, this alternative would not comply with Act 2 because the long-term risk posed by the Site would not meet any of the standards of the Act.

Cost Effectiveness:

There is no cost associated with this Alternative, but it is not effective in addressing the ARARs.

Alternative 2. Cap the Site with 4.5 to 6 feet of clean fill; restrict use of the Site to industrial/commercial use.

Description of Alternative:

Demolish buildings now on Site. Up to 3 feet of clean fill would be used to bring the lowest elevations now on Site up to an elevation level with the former process building foundation. Cover all contaminated areas with an additional 4.5 to 6 feet of clean fill. Future use of the Site would be restricted to nonresidential use; new buildings would be required to be constructed with radon mitigation systems; fate and transport modeling of groundwater and continued groundwater monitoring would be conducted to ensure that off Site groundwater continues to be safe. A soil management plan would be used to ensure that the cap remains intact and the contaminated material is handled properly if disturbed. Deed restrictions would be put in place to ensure that use restrictions remain in place and periodic inspections would be done to ensure that the remedy is maintained.

Compliance with ARARs:

This Alternative would comply with Section 501 (a) of HSCA because the release or threat of a release of hazardous substances from the soil would be addressed. This alternative would comply with the Site Specific Standard of Act 2.

Cost Effectiveness:

The estimated cost for this Alternative is \$1,612,913. This Alternative would comply with Act 2 and reduce the risk posed by the Site to levels well below acceptable exposure levels (0.00035 mrem/year estimated exposure after remediation vs. 15 mrem/year acceptable risk exposure).

Alternative 3. Remove contaminated soil to the groundwater table; utilize clean fill to bring the area up to grade.

Description of Alternative:

This Alternative consists of removing all contaminated soil above the water table. Maximum depth of excavation is estimated to be about 10 feet. Clean fill would be used to bring the areas back up to grade. A soil management plan would be used to ensure that the cover over the remaining contamination remains intact and the contaminated material is handled properly if disturbed. The future use of the Site would be restricted to nonresidential use; new buildings would be required to be constructed with radon mitigation systems; groundwater would not be used on Site; fate and transport modeling of groundwater and continued groundwater monitoring would be conducted. Deed restrictions would be put in place to ensure that use restrictions remain in place and periodic inspections would be conducted to ensure that the remedy is maintained.

Compliance with ARARs:

This Alternative would comply with Section 501 (a) of HSCA because the release or threat of a release of hazardous substances from the soil would be addressed. This alternative would comply with the Site Specific Standard of Act 2 and the Radiation Protection Act ("RPA").

Cost Effectiveness:

The estimated cost for this alternative is \$8,666,253. This alternative would permanently remove much of the contaminated soil from the Site; however, some contaminated soil would remain at or below the water table.

Alternative 4. Excavate and Dispose of All Contaminated Soil

Description of Alternative:

This Alternative consists of the removal of impacted soil with Ra-226 concentrations above 6 pCi/g. Clean fill would be used to bring excavated areas up to grade. Fate and transport modeling of groundwater and groundwater monitoring would be conducted to ensure that the removal of contaminated soil has eliminated groundwater impacts.

Compliance with ARARs:

This Alternative would comply with Section 501 (a) of HSCA because the release or threat of a release of hazardous substances from the soil would be addressed. This alternative would comply with the Act 2 and the RPA.

Cost Effectiveness:

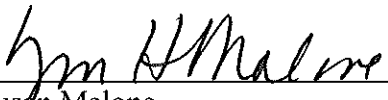
The estimated cost for this Alternative is \$9,796,396. This alternative would permanently remove the contaminated soil from the Site.

VI. PROPOSED RESPONSE

The proposed selected alternative is Alternative 2 (demolish buildings now on Site; bring low elevations to a level grade, cover with an additional 4.5 to 6 feet of clean fill; use of the Site restricted to nonresidential use; buildings constructed with radon mitigation systems). Although Alternatives 2, 3, and 4 all comply with one or more of the ARARs, Alternative 2 can be accomplished at a reasonable cost and in a reasonable time frame with minimum disruption and risk to the community during remediation. After remediation, the risk posed by the Site will be extremely low, well below the acceptable risk allowed under the Act 2 remediation standards. Alternative 2 represents the optimal response in terms of cost-effectiveness and protectiveness.

VII. DEP APPROVALS

FOR THE COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

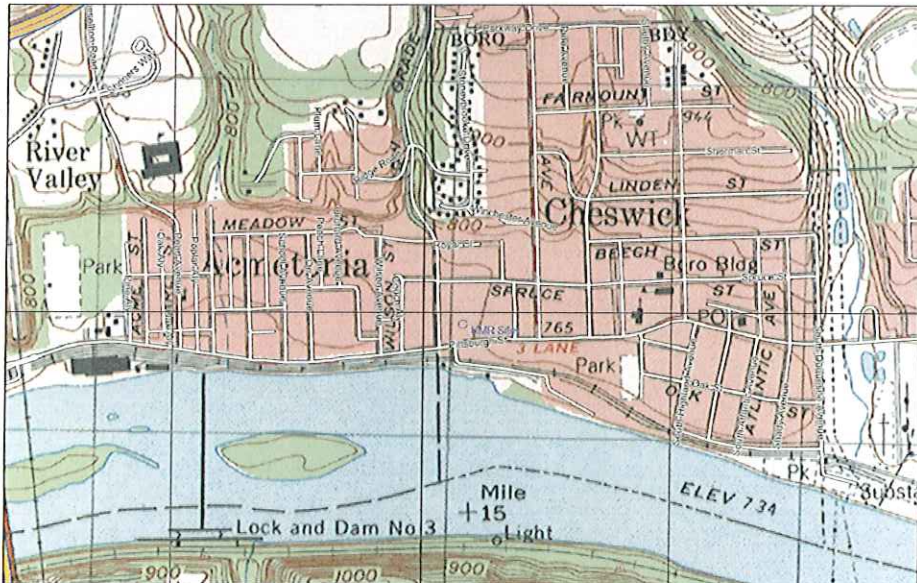


Susan Malone
Regional Director
Southwest Region

9.30.16
Date

Summary of Alternatives

	Total Effective Dose Equivalent	Cost
	<i>Goal is less than 15 mrem/year</i>	
Alternative 1 No Action	29 mrem/year	
Alternative 2 Industrial Use 4.5 to 6 feet of cover	$3.5 \times 10^{-4} =$ Less than 0.00035 mrem/year	\$1,612,913
Alternative 3 Removal to Water Table	$3.0 \times 10^{-17} =$ 0.00000000000000003 mrem/year	\$8,666,253
Alternative 4 Total Removal	$1.0 \times 10^{-18} =$ 0.000000000000000001 mrem/year	\$9,796,396



Location Map for the Keystone Metals Reduction Site.
 Located in the 1000 block of Freeport Road (aka Pittsburgh Street) in Cheswick,
 Allegheny County. Approximately 40° 32' 29" and 79° 48' 25"