


BISHOP TUBE HSCA SITE

ANALYSIS OF ALTERNATIVES AND PROPOSED RESPONSE

Tom Wolf, Governor

Patrick McDonnell, Secretary

PRESENTATION OUTLINE

- SITE INFORMATION
- RELEASE OF HAZARDOUS SUBSTANCES
- ANALYSIS OF ALTERNATIVES
- PROPOSED RESPONSE
- NEXT STEPS

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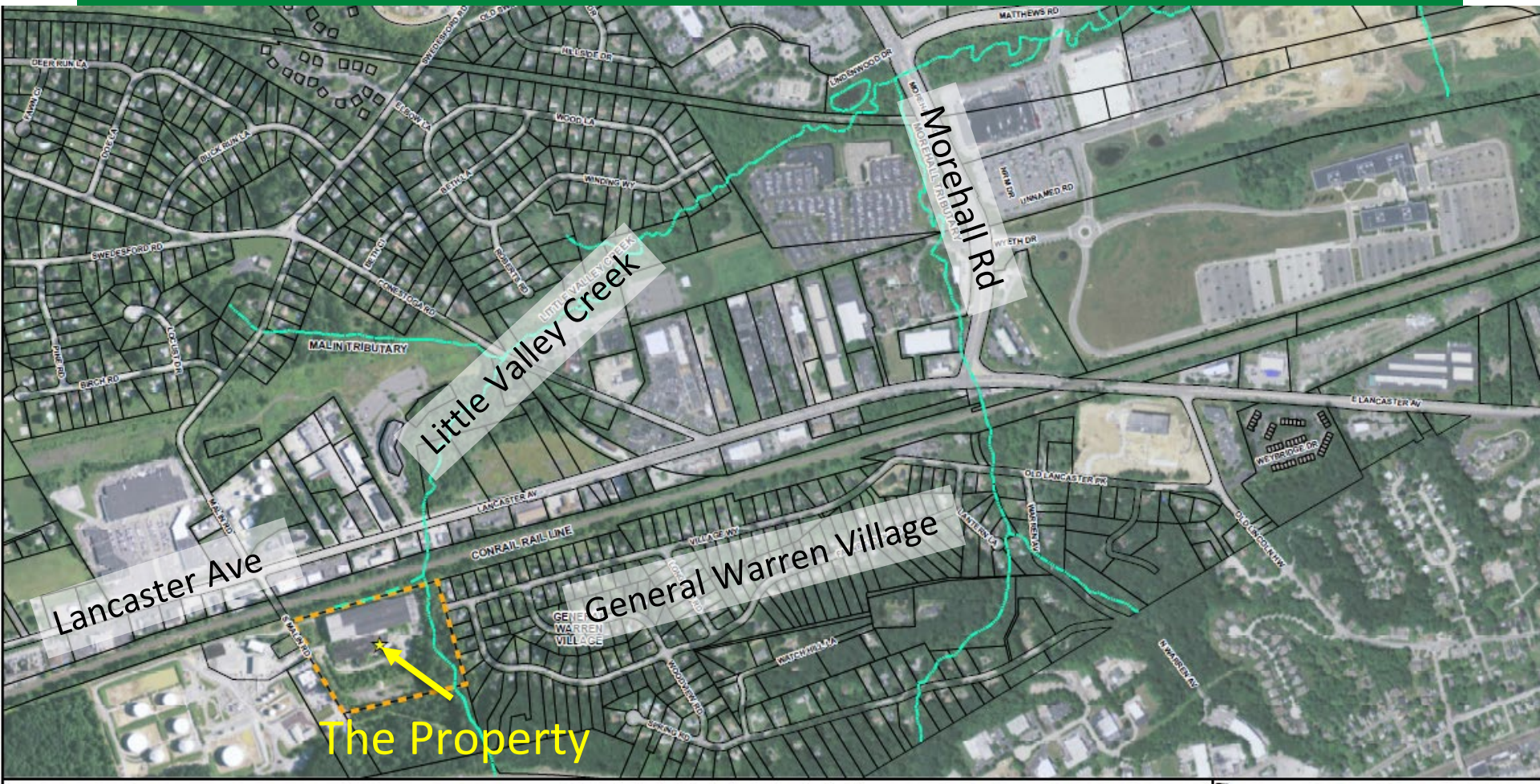
SITE INFORMATION: Site Location



Legend

- Site Location
- Stream
- Drainage Swale
- Site Boundary
- Parcels

Note:

1. Service Layer Credits: ESRI, DigitalGlobe, GeoEye, Earthstar Geopgraphics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Layer Access Date: 8/27/2015.

600 0 600 1,200 Feet

Title:

LOCAL AREA MAP

FORMER BISHOP TUBE FACILITY
CHESTER COUNTY, PENNSYLVANIA

Prepared For:

BISHOP TUBE PROJECT TEAM

ROUX

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: SET	Date: 8/27/2015
Prepared by: SET	Scale: 1:7,200
Project Mgr: JAK	Office: NJ
File No: 1016.F3(BL)	Project: 0539.0003.0000

FIGURE 3

SITE INFORMATION: Ownership

1950 - 1969: J. Bishop & Co. Platinum Works & Matthey Bishop, Inc.

1969 - 1974: Whittaker Corp.

1974 - 2005: Christiana Metals Corp (equitable title) & Central & Western Chester County Industrial Development Authority (legal title)

2005 - Present: Constitution Drive Partners, L.P.

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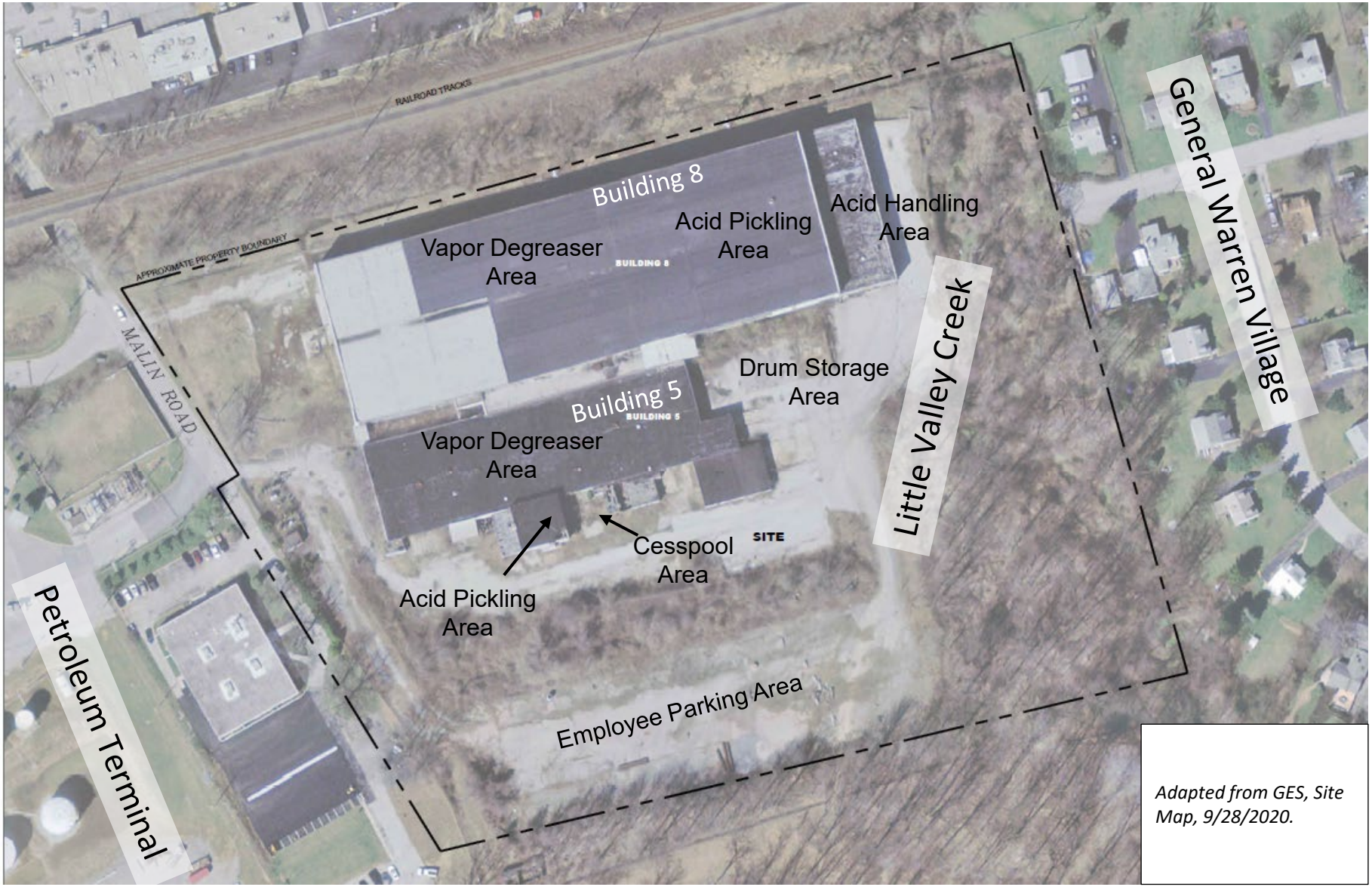
SITE INFORMATION: Site Layout Map



Adapted from GES, Site Map, 9/28/2020.

SITE INFORMATION: Operations

Processes	Operators
1951-1960s: Precious Metals & Tube Manufacturing	1951-1969: J. Bishop, Matthey Bishop, Inc. & Johnson Matthey, Inc.
1960s - 1989: Stainless Steel Tubing Redraw Processing	1969 – 1974: Whittaker Corp.
	1974 – 1988: Christiana Metals Corp.
	1988 – 1989: Alloy Steel Corp.
1990s-1999: Welded Stainless Steel Tubing Processing	1991 – 1999: Marcegaglia USA, Inc.

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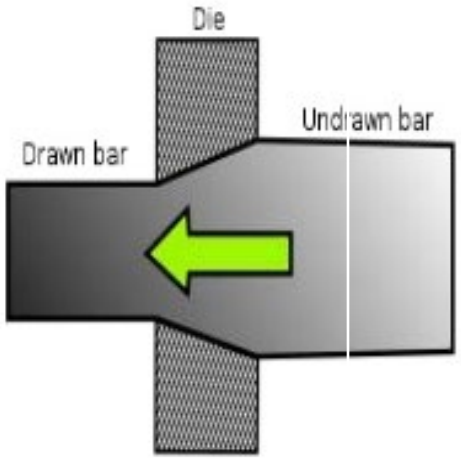
SITE INFORMATION: Operations

Stainless Steel Tube Manufacturing Process:



- The cold re-draw mill process involved repeatedly lubricating tubing & drawing tubes through a tapered hole in a die to achieve smaller diameters
- After each draw, degreaser is used to remove lubricants prior to heat and acid treatment for hardening and removing impurities from the stainless steel

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RELEASE OF HAZARDOUS SUBSTANCES

Contaminants of Concern ("COCs")

- Chlorinated Solvents
- Other Organic Compounds
- Inorganic Compounds

Primary COC: Trichloroethene ("TCE")

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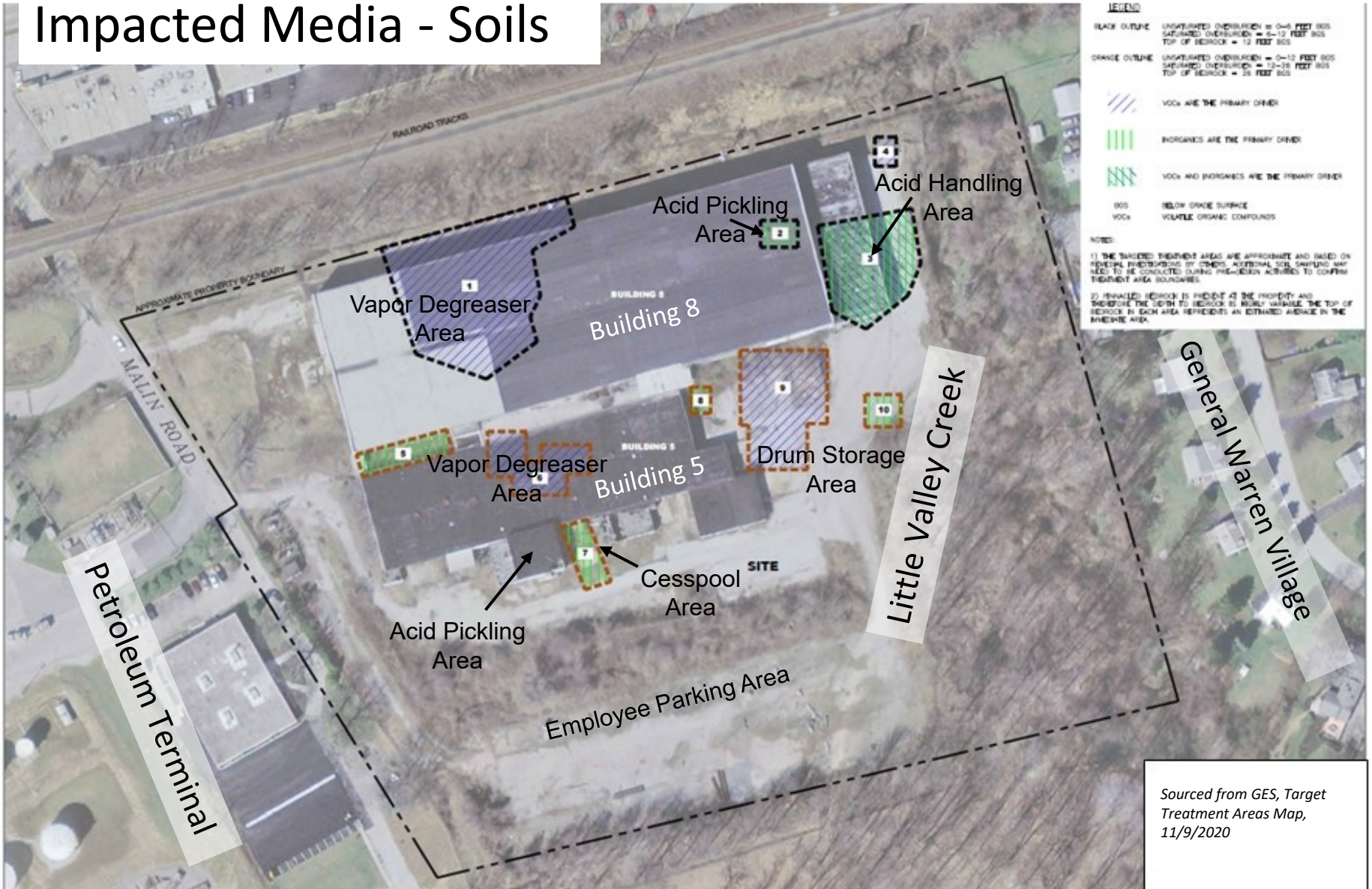
RELEASE OF HAZARDOUS SUBSTANCES

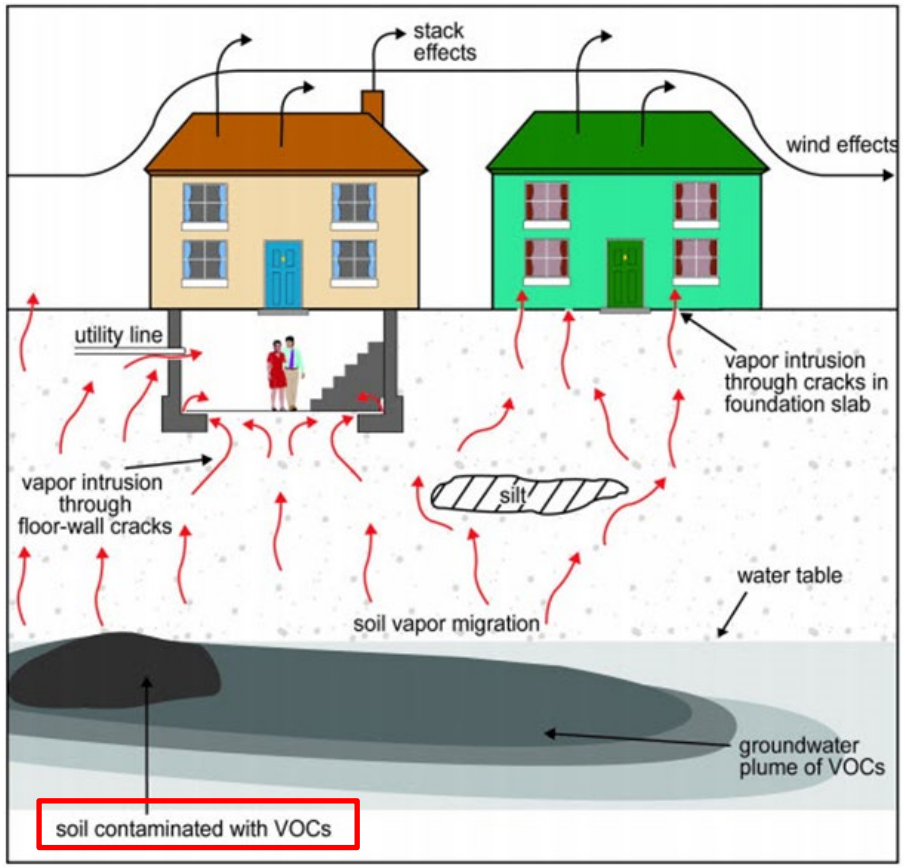
Impacted Media - Soils



Sourced from GES, Target Treatment Areas Map, 11/9/2020

RELEASE OF HAZARDOUS SUBSTANCES

Impacted Media - Soils - Potential Pathways



- Direct Content
- Vapor Intrusion (VI)
- Soil to Groundwater

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RELEASE OF HAZARDOUS SUBSTANCES

Impacted Media - Groundwater

- Groundwater contaminated by TCE & other chlorinated solvents in deep & shallow aquifers on source property & east northeast of the source property
- Evidence of free product in groundwater
- Inorganics in groundwater on the source property – surface water discharge

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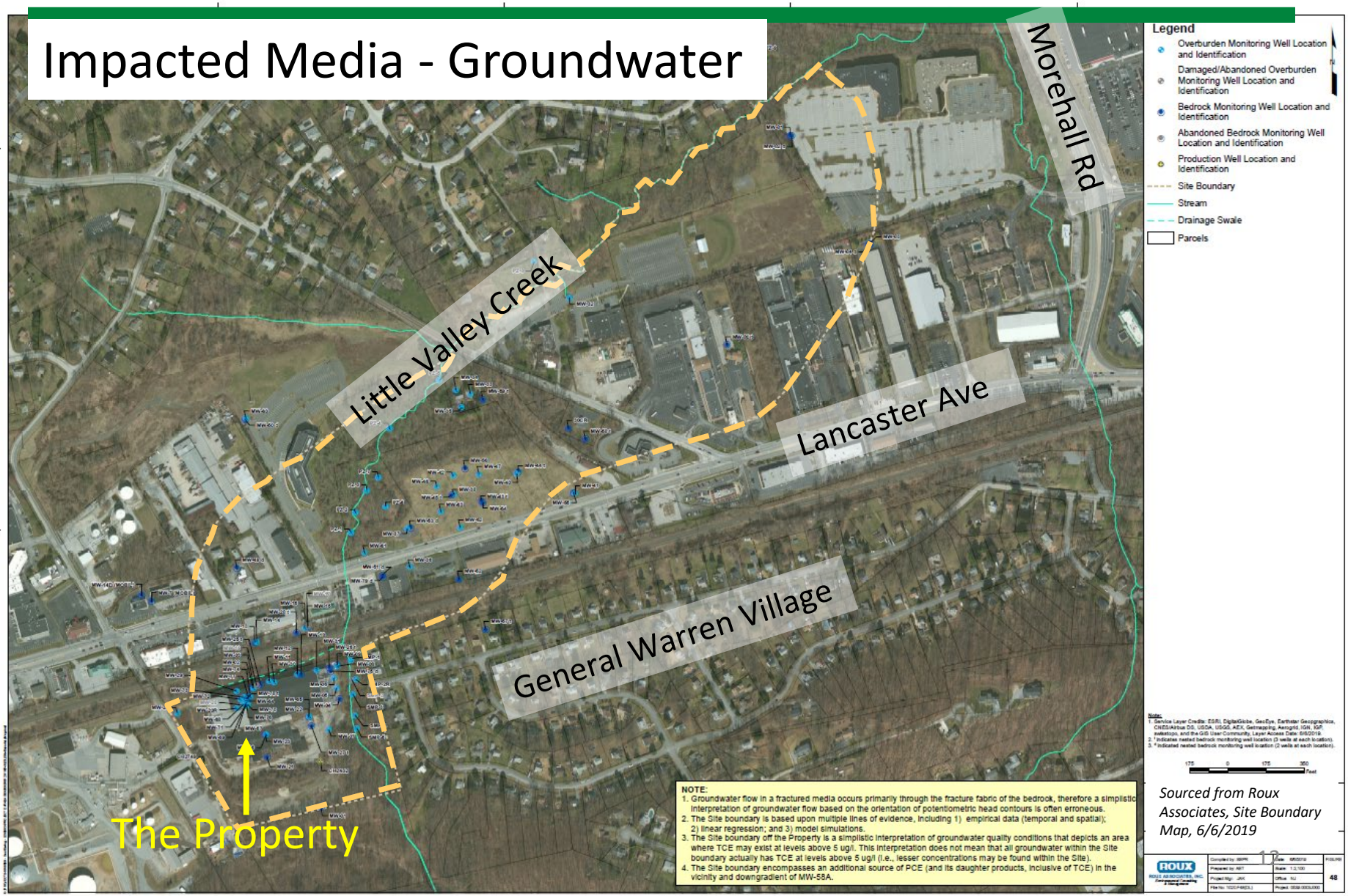
RELEASE OF HAZARDOUS SUBSTANCES

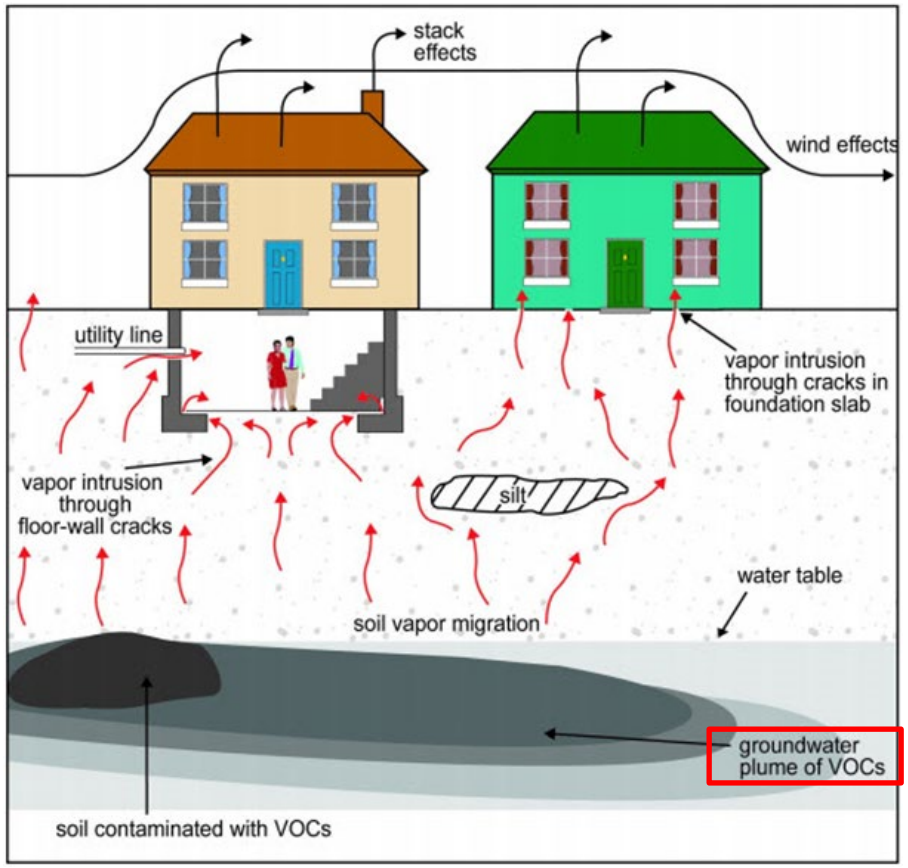
Impacted Media - Groundwater



Sourced from Roux Associates, Site Boundary Map, 6/6/2019

RELEASE OF HAZARDOUS SUBSTANCES

Impacted Media - Groundwater - Potential Pathways



- Groundwater use
- Vapor Intrusion (VI)
- Discharge to Little Valley Creek

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RELEASE OF HAZARDOUS SUBSTANCES

Impacted Media - Surface Water/Stream

- Little Valley Creek – exceptional value

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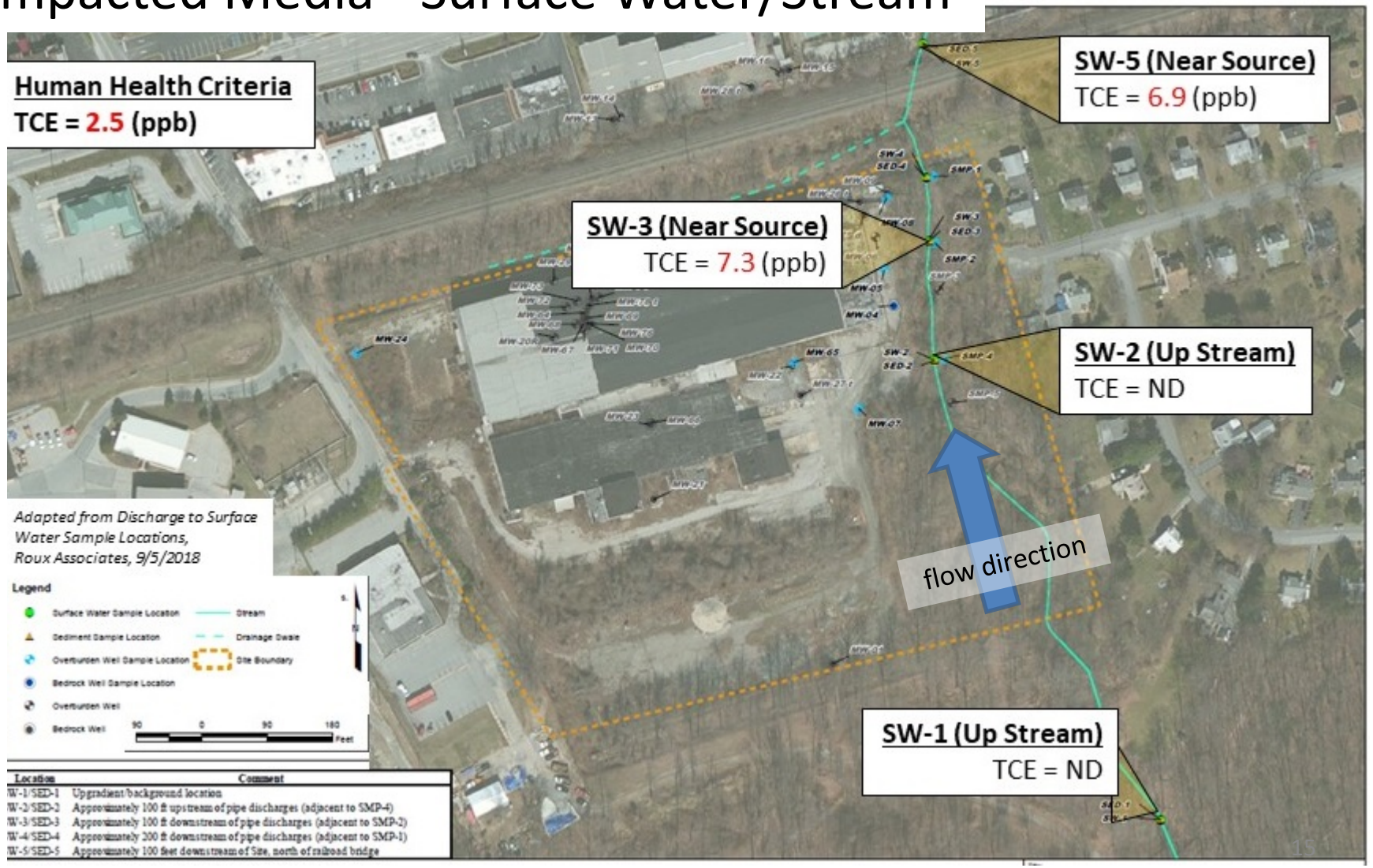
RELEASE OF HAZARDOUS SUBSTANCES

Impacted Media - Surface Water/Stream



ANALYSIS OF ALTERNATIVES

Evaluation Criteria for Remedial Alternative Technologies ("Alternatives"):

1. the protection of public health & the environment;
2. compliance with or otherwise addresses Applicable or Relevant & Appropriate Requirements ("ARARs");
3. feasibility, effectiveness, implementability, & permanence;
4. the cost effectiveness of each alternative; &
5. Community Acceptance.

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ANALYSIS OF ALTERNATIVES

DEP is proposing to divide the Site into three operable units ("OU") to address the contamination at the Site.

- OU1 would address soil contamination on the Source Property.
- OU2 would address Site groundwater.
- OU3 would address drinking water impacts.

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ANALYSIS OF ALTERNATIVES: OU1

OU1: Soils

- consists of the soil source areas includes unsaturated soils.
- Saturated soils are defined as the solid media located below the groundwater table & above the bedrock.
- Alternatives for addressing saturated soils are evaluated as part of either OU1 or OU2 Groundwater depending on the nature of the remediation involved.

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ANALYSIS OF ALTERNATIVES: OU1

OU1: Soils - Remedial Action Objectives ("RAOs") are

1. assuring that exposure pathways are eliminated or remain closed in accordance with an Act 2 Standard (Background, Statewide Health or Site-Specific);
2. reducing contaminant transfer & migration from the soil into groundwater;
3. preventing movement of contaminated soils by water or wind.

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ANALYSIS OF ALTERNATIVES: OU1

OU1: Soils - DEP evaluated the following Alternatives:

- OU1: Alternative 1 - No Action
- OU1: Alternative 2 - Engineering Controls, Coupled with Institutional Controls
- OU1: Alternative 3 - Excavation with Offsite Treatment &/or Disposal
- OU1: Alternative 4 - Excavation with Onsite Treatment
- **OU1: Alternative 5 - In Situ Chemical Oxidation &/or In Situ Chemical Reduction ("ISCO/ISCR"), Coupled with Soil Mixing**

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ANALYSIS OF ALTERNATIVES: OU1

OU1: Soils - Cost Comparison

Alternative Name	Costs
Alternative 1 - No Action	$ -
Alternative 2 - Engineering Controls, Coupled with Institutional Controls	$ 796,250
Alternative 3 - Excavation with Offsite Treatment &/or Disposal	$ 7,301,240
Alternative 4 - Excavation with Onsite Treatment	$ 6,043,010
Alternative 5 – ISCO/ISCR Coupled with Soil Mixing	**$ 2,817,700**

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PROPOSED RESPONSE: OU1

OU1: Soils - Alternative 5 - ISCO/ISCR, Coupled with Soil Mixing - *Description*:

- Selection of amendments could be tailored to address CVOC or Inorganic COCs present in different areas of soil contamination.
- Soil excavation would not be required.
- Contaminated areas are treated as smaller units (cells) to optimize reagent dosing, ensure thorough mixing, & facilitate attainment evaluation.

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PROPOSED RESPONSE: OU1

SOIL MIXING EQUIPMENT

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ANALYSIS OF ALTERNATIVES: OU2

OU2: Groundwater

- consists of contaminated groundwater originating from the Source Property & extending to the east northeast.
- includes the diffuse discharge of contaminated groundwater to Little Valley Creek.

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ANALYSIS OF ALTERNATIVES: OU2

OU2: Groundwater - RAOs are

1. assuring that potential future exposure pathways remain closed in accordance with Act 2 based on the intended land use. (Background, Statewide Health, or Site-Specific)
2. reducing contaminant migration across the Source Property Boundary;
3. reducing COC discharge to the Little Valley Creek; &
4. hastening retraction of the groundwater contaminant plume.

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ANALYSIS OF ALTERNATIVES: OU2

OU2: Groundwater - DEP evaluated the following Alternatives:

- OU2: Alternative 1 - No Action
- OU2: Alternative 2 - Monitored Natural Attenuation ("MNA")
- **OU2: Alternative 3 - In Situ Injection (ISCO/ISCR/Bioremediation)**
- OU2: Alternative 4 - In Situ Thermal Treatment ("ISTT")
- OU2: Alternative 5 - Hydraulic Control ("HC")

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ANALYSIS OF ALTERNATIVES: OU2

OU2: Groundwater - Cost Comparison

Alternative Name	Costs
Alternative 1 – No Action	$ -
Alternative 2 – MNA	$ 3,001,320
Alternative 3 – In Situ Injection (ISCO/ISCR/Bioremediation)	**$ 5,210,730**
Alternative 4 – ISTT	$ 16,882,190
Alternative 5 – HC	$ 38,467,450

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PROPOSED RESPONSE: OU2

OU2: Groundwater - Alternative 3 - In Situ Injection (ISCO/ISCR/Bioremediation) - *Description*:

- Involves introducing amendments directly into the contaminated aquifer.
- Injections would be focused on limited hot spot areas of the Source Property (the former vapor degreaser in Plant 8 & the DSA).
- A phased strategy would be implemented.
- The effectiveness & performance of the remedy would be assessed by monitoring amendment distribution.

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ANALYSIS OF ALTERNATIVES: OU3

OU3: Drinking Water

- consists of the one contaminated potable drinking water supply, located within the Site area.

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ANALYSIS OF ALTERNATIVES: OU3

OU3: Drinking Water - DEP evaluated the following Alternatives:

- OU3: Alternative 1 - No Action.
- OU3: Alternative 2 - Continued Operation, Maintenance, & Monitoring of Whole House Carbon Filtration Systems, Combined with Restrictions on the Use of Groundwater.
- **OU3: Alternative 3 - Connection to the Existing Public Water Supply Waterline, Combined with Restrictions on the Use of Groundwater.**

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ANALYSIS OF ALTERNATIVES: OU3

OU3: Drinking Water - Cost Comparison

Alternative Name	Costs
Alternative 1 – No Action	$ -
Alternative 2 - Continued Operation, Maintenance, and Monitoring of Whole House Carbon Filtration Systems, Combined with Restrictions on the Use of Groundwater	$ 37,420
Alternative 3 - Connection to the Existing Public Water Supply Waterline, Combined with Restrictions on the Use of Groundwater	**$ 24,000**

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PROPOSED RESPONSE: OU3

OU3: Drinking Water - Alternative 3 - Connection to the Existing Public Water Supply Waterline, Combined with Restrictions on the Use of Groundwater - *Description*:

- consists of a lateral connection from the waterline main to the affected residential property;
- the connection of the lateral to the in-house plumbing;
- the repairs to all road surfaces or properties disturbed by the waterline lateral construction; &
- the required abandonment of the private water supply well.

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PROPOSED RESPONSE: Summary

OU1: Soils - ISCO/ISCR, Coupled with Soil Mixing

OU2: Groundwater - In Situ Injection (ISCO/ISCR/Bioremediation)

OU3: Drinking Water - Connection to the Existing Public Water Supply Waterline, Combined with Restrictions on the Use of Groundwater

Total Estimated Cost: $ 8.1M.

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NEXT STEPS

- Until January 31, 2022, DEP will continue to compile public comments.
- After January 31, 2022, DEP will respond to public comments & file its final statement of decision of its selected response action for the Site in accordance with HSCA.
- DEP will work with responsible parties to facilitate implementation of the selected response action.

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Submit written comments to:

Dustin Armstrong
HSCA Project Officer
2 East Main Street
Norristown, PA 19401
RA-EP-SEROECB@pa.gov

DEP's Website for Bishop Tube: www.dep.pa.gov/bishoptube

DEADLINE FOR COMMENTS: January 31, 2022

**Please indicate in the letter or email that you are providing a comment to be included in the Administrative Record.*

TECHNICAL REFERENCES

- Fractured Bedrock: CLU-IN | Issues > Fractured Rock > Overview
- In Situ Chemical Reduction (ISCR): CLU-IN | Technologies > Remediation > About Remediation Technologies > In Situ Chemical Reduction > Overview
- In Situ Chemical Oxidation (ISCO): CLU-IN | Technologies > Remediation > About Remediation Technologies > In Situ Oxidation > Overview.
- Bioremediation: CLU-IN | Technologies > Remediation > About Remediation Technologies > Bioremediation > Overview
- Natural Attenuation: CLU-IN | Technologies > Remediation > About Remediation Technologies > Natural Attenuation > Overview
- In Situ Thermal Treatment (ISTT): CLU-IN | Technologies > Remediation > About Remediation Technologies > Thermal Treatment: In Situ > Overview
- NJ DEP Site Remediation and Waste Management Program. *In Situ Remediation, Design Considerations and Performance Monitoring Technical Guidance Document (Version 1)*, October 2017

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