



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 8

1595 Wynkoop Street
Denver, CO 80202-1129
Phone 800-227-8917
www.epa.gov/region8

Ref: 8SEM-EMR

ACTION MEMORANDUM AMENDMENT 1

SUBJECT: Approval of a 12-month statutory exemption and Continued Approval and Funding for a Removal Action at the Billings PCE Site, Billings, Yellowstone County, Montana

FROM: Joyel Dhieux
Federal On-Scene Coordinator

Joe Payne
Federal On-Scene Coordinator

THRU: Kerry Guy, Supervisor
Response Section

Deirdre Rothery, Manager
Emergency Management Branch

Aaron Urdiales, Director
Superfund and Emergency Management Division

TO: K.C. Becker, Regional Administrator
EPA Region 8

Site ID # 08ME

I. PURPOSE

The purpose of this Action Memorandum Amendment is to request and document an exemption to the 12-month statutory limit to the removal action described herein for the Billings PCE Site (Site) in Billings, Yellowstone County, Montana. The original Action Memorandum for this time-critical removal action was signed on February 7, 2023.

This time-critical removal action involves the installation of vapor mitigation system in residential homes to mitigate the threat of tetrachloroethylene (PCE) vapors entering the homes from the contaminated shallow groundwater plume at the Site. Conditions existing at the Site present a threat to public health or welfare or the environment and meet the criteria for initiating a removal action under 40 CFR 300.415(b)(2) of the National Contingency Plan (NCP).

This removal action involves no nationally significant or precedent-setting issues. This time-critical removal action will not establish any precedent for how future response actions will be

taken and will not commit the U.S. Environmental Protection Agency (EPA) to a course of action that could have a significant impact on future responses or resources.

II. SITE CONDITIONS AND BACKGROUND

Site Name: Billings PCE Superfund Site
Removal Category: Time Critical
Site Spill ID (SSID): 08ME
NRC Case Number: Not Applicable
CERCLIS Number: MTD986073252
Site Location: Yellowstone County, Montana
Lat/Long: 45.783935, -108.528385
Potentially Responsible Party (PRP):
NPL Status: NPL
Removal Start Date: March 2023

A. Site Description

1. Removal site evaluation

The Billings PCE Site consists of an 860-acre contaminant shallow groundwater plume that extends from 715 Central Avenue (the presumed primary source area) approximately three miles east-northeast through residential, commercial, and school buildings and into downtown Billings, Montana. The contaminated groundwater plume contains chlorinated solvents, mainly PCE, from historic area dry cleaning businesses. The site is listed on the National Priorities List and is currently undergoing remedial investigation/feasibility study (RI/FS).

The Site is undergoing expansive sampling studies by the Superfund Remedial Program as part of the RI/FS. In Spring 2022, an indoor air study was completed in several residential homes located within the Site. Both indoor air samples and sub-slab vapor intrusion air samples were collected. Sample results were found to be in exceedance of human health standards in multiple homes when compared against EPA's Indoor Air Vapor Intrusion Screening Levels (IA VI SLs), Indoor Air Vapor Intrusion Removal Management Levels (IA VI RMLs), and Sub-Slab Vapor Action Levels (SSALs).

Please see the original Action Memorandum for the Site for further information on the removal site evaluation, signed on February 7, 2023.

2. Physical location

Please see the original Action Memorandum for the Site, signed on February 7, 2023.

3. Site characteristics

Please see the original Action Memorandum for the Site, signed on February 7, 2023.

4. Release or threatened release into the environment of a hazardous substance, or pollutant or contaminant.

Please see the original Action Memorandum for the Site, signed on February 7, 2023.

5. NPL Status

The Site is listed on the National Priorities list as Billings PCE Superfund Site and is currently in the RI/FS stage.

6. Maps, pictures and other graphic representations

Please see the original Action Memorandum for the Site, signed on February 7, 2023.

B. Other Actions to Date

1. Previous actions

Please see the original Action Memorandum for the Site, signed on February 7, 2023.

2. Current actions

Please see the original Action Memorandum for the Site, signed on February 7, 2023.

C. State and Local Authorities' Roles

1. State and local actions to date

Please see the original Action Memorandum for the Site, signed on February 7, 2023.

2. Potential for continued State/local response

Please see the original Action Memorandum for the Site, signed on February 7, 2023.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Please see the original Action Memorandum for the Site, signed on February 7, 2023.

IV. EXEMPTION FROM STATUTORY LIMITS

The Federal OSC is seeking an exemption from the 12-month statutory limit under the consistency exemption. Work at the site is consistent with Remedial efforts to mitigate the health risks of PCE and its daughter products in Billings, MT. Continued removal efforts beyond the 12-month statutory timeline are necessary to prevent further exposure from contaminants and to bolster the efforts of the Remedial Action.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed action description

The objective for this removal action is to reduce the indoor air contamination with the installation of vapor mitigation systems in prioritized structures at the Site. This Action Memorandum Amendment seeks permission to continue the work initiated by the original Action Memorandum. As accounted for in the original Action Memorandum, field conditions and sampling results mandate further action beyond the targeted properties identified in the original Action Memorandum. For specific proposed action descriptions, please see the original Action Memorandum for the Site, signed on February 7, 2023.

2. Contribution to remedial performance

Please see the original Action Memorandum for the Site, signed on February 7, 2023.

3. Engineering Evaluation/Cost Analysis (EE/CA)

An EE/CA is not required for a time-critical removal action.

4. Applicable or relevant and appropriate requirements (ARARs)

Please see the original Action Memorandum for the Site, signed on February 7, 2023.

5. Project schedule

Removal Actions are underway per the original Action Memorandum, and the expected completion date with this amendment is October 2024.

B. Estimated Costs

	Original Ceiling	Currently Obligated	Proposed Increase	Proposed New Ceiling
ERRS contractor	\$175,000	\$175,000	\$0	\$175,000
START contractor	\$110,000	\$110,000	\$0	\$110,000
Other Extramural Costs (Strike Team, other Fed Agencies)	\$ 0	\$ 0	\$0	\$ 0
SUBTOTAL	\$285,000	\$285,000	\$0	\$285,000
Contingency costs (20% of subtotal)	\$57,000	\$57,000	\$0	\$57,000
Total Removal Project Ceiling	\$342,000	\$342,000	\$0	\$342,000

*EPA direct and indirect costs, although cost recoverable, do not count toward the Removal Ceiling for this removal action. Liable parties may be held financially responsible for costs incurred by the EPA as set forth in Section 107 of CERCLA

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Please see the original Action Memorandum for the Site, signed on February 7, 2023.

VII. OUTSTANDING POLICY ISSUES

None

VIII. ENFORCEMENT

Please see the original Action Memorandum for the Site, signed on February 7, 2023.

IX. RECOMMENDATION

This decision document represents an amendment to the timeline for the selected removal action for the Billings PCE Site, in Billings, Yellowstone County, Montana, developed in accordance with CERCLA as amended, and is not inconsistent with the NCP. This decision is based on the administrative record for the Site.

Conditions at the Site meet the NCP section 300.415(b) criteria for a removal and the CERCLA section 104(c) consistency exemption from the 12-month limitation, and I am approving proposed 12-month exemption. The total project ceiling if approved will remain \$342,000, this amount is funded by a Special Account established by the Remedial Program.

Approve

K.C. Becker, Regional Administrator
EPA Region 8

Date

Disapprove

K.C. Becker, Regional Administrator
EPA Region 8

Date

Attachments

Attachment 1: Original Action Memorandum

ATTACHMENT 1:
Billings PCE Action
Memo



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8**

1595 Wynkoop Street
Denver, CO 80202-1129
Phone 800-227-8917
www.epa.gov/region8

Ref: 8SEMD-EMB

ACTION MEMORANDUM

SUBJECT: Approval and Funding for a Time-Critical Removal Action at the Billings PCE Site, Billings, Yellowstone County, Montana

FROM: Joyel Dhieux
Federal On-Scene Coordinator

Joe Payne
Federal On-Scene Coordinator

THRU: Kerry Guy, Supervisor
Emergency Response Section

Deirdre Rothery, Manager
Emergency Management Branch

TO: Ben Bielenberg, Acting Director
Superfund and Emergency Management Division

Site ID# 08ME

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of the removal action described herein for the Billings PCE Site (Site) in Billings, Yellowstone County, Montana. This time-critical removal action involves the installation of vapor mitigation systems in residential homes to mitigate the threat of tetrachloroethylene (PCE) vapors entering the homes from the contaminated shallow groundwater plume at the Site. Conditions existing at the Site present a threat to public health or welfare or the environment and meet the criteria for initiating a removal action under 40 CFR 300.415(b)(2) of the National Contingency Plan (NCP).

This removal action involves no nationally significant or precedent-setting issues. This time-critical removal action will not establish any precedent for how future response actions will be taken and will not commit the U.S. Environmental Protection Agency

(EPA) to a course of action that could have a significant impact on future responses or resources.

II. SITE CONDITIONS AND BACKGROUND

Site Name:	Billings PCE Superfund Site
Superfund Site ID (SSID):	08ME
NRC Case Number:	Not Applicable
CERCLIS Number:	MTD986073252
Site Location:	Yellowstone County, Montana
Lat/Long:	45.783935, -108.528385
Potentially Responsible Party (PRP):	
NPL Status:	Listed on the NPL on September 9, 2021
Removal Start Date:	March 2023

A. Site Description

1. Removal Site Evaluation

The Billings PCE Site consists of an 860-acre contaminant shallow groundwater plume that extends from 715 Central Avenue (the presumed primary source area) approximately three miles east-northeast through residential, commercial, and school buildings and into downtown Billings, Montana. The contaminated groundwater plume contains chlorinated solvents, mainly PCE, from historic area dry cleaning businesses. The site is listed on the National Priorities List and is currently undergoing remedial investigation/feasibility study (RI/FS).

The Site is undergoing expansive sampling studies by the Superfund Remedial Program as part of the RI/FS. In Spring 2022, an indoor air study was completed in several residential homes located within the Site. Both indoor air samples and sub-slab vapor intrusion air samples were collected. Sample results were found to be in exceedance of human health standards in multiple homes when compared against EPA's Indoor Air Vapor Intrusion Screening Levels (IA VI SLs), Indoor Air Vapor Intrusion Removal Management Levels (IA VI RMLs), and Sub-Slab Vapor Action Levels (SSALs). Based on the sampling results, EPA has determined that at least nine of these homes require immediate prioritization for the installation of vapor mitigation systems. Below is a table comparing the PCE levels found in those nine homes with EPA's human health standards. Further sampling information, including Trichloroethylene (TCE) and Dichloroethane (DCE) levels, are available in Attachment 2.

Standard ($\mu\text{g}/\text{m}^3$)		Sampled PCE ranges ($\mu\text{g}/\text{m}^3$)
Indoor Air Vapor Intrusion Screening Level	4.17	0.41-130
Indoor Air Vapor Intrusion Removal Management Level	125	0.41-130
Sub-Slab Action Level	139	1400-9900

2. Physical Location

The Site is located in a residential and industrial section of downtown Billings, the most populous city in Montana. There are 298 residential, 4 schools, 8 condominium, and 179 commercial properties overlying the groundwater plume. There is an estimated population of 33,000 people affected by the plume's presence. This action will prioritize approximately nine residential homes with an approximate population of 40 people.

3. Site Characteristics

The Site is currently used for various types of public and private urban living, including the residential homes that will be addressed by this removal action. Approximately half of the affected area falls within the 80th percentile mark nationally for a potential Environmental Justice Area.

There are no federal, state, or local government ownership aspects of the Site.

EPA has previously taken a removal action at the Site to address one of the sources of contamination. This removal action is discussed in the Previous Actions section of this document. This new removal action will address residential properties that are affected by indoor PCE vapors.

4. Release or Threatened Release into the Environment of a Hazardous Substance, Pollutant, or Contaminant

PCE and its daughter products Trichloroethylene (TCE), Dichloroethane (DCE), and chloroform are chlorinated ethylenes and are all hazardous substances as defined by 40 CFR §302.4 and Section 101(14) of CERCLA.

Groundwater within the Site continues to mix with, and become contaminated, by the Dense Non-Aqueous Phase Liquid (DNAPL). PCE and its daughter products in the contaminated groundwater plume volatilize to gasses that migrate towards the surface through porous soils and rock, eventually finding either open air or in many cases, into residential homes via the sub-slab and basement (vapor intrusion).

Exposure to PCE and its daughter chemicals can lead to a multitude of human health problems. PCE exposure can lead to nervous system and respiratory system defects, organ failure (particularly the liver), as well as several types of cancer (bladder, non-Hodgkin-lymphoma, and myeloma particularly). These health effects have been documented in both chronic and acute exposures.

In the spring of 2022, the EPA's remedial team gathered indoor air samples from many residential homes and business buildings at the Site. The results showed exceedances of EPA's Indoor Air Vapor Intrusion Screening Levels (IA VI SLs), Indoor Air Vapor Intrusion Removal Management Levels (IA VI RMLs), and Sub-Slab Vapor Action Levels (SSALs) for PCE and its daughter products in several residential homes, either in ambient indoor air or in the sub-slab vapor samples, or both. A toxicology technical memorandum is included in Attachment 2 for further detail on sample exceedances in the prioritized homes.

5. NPL Status

This Site is listed on the National Priorities List and is currently in the RI/FS stage.

6. Maps, Pictures, Other Geographic Representations

A map of the Site is available in Attachment 1.

B. Other Actions to Date

1. Previous Actions

The Montana Department of Environmental Quality (MDEQ) completed a preliminary assessment of the Site from 1992-1993. The preliminary assessment findings were "no further action" based on lack of drinking water usage of the affected aquifer. Subsequent field investigations were conducted by the MDEQ in 1994. MDEQ conducted a CERCLA site investigation in 1999 and 2001. The MDEQ site investigation revealed an east-northeast trending groundwater contaminant plume and potential indoor air contamination associated with the groundwater contamination.

In 2007, EPA conducted a removal action that included removing and disposing of contaminated soil, injecting chemicals to help reduce groundwater contamination, and installing a barrier wall around the most highly contaminated groundwater. EPA also installed vapor mitigation systems at seven structures overlying the contaminated groundwater plume. Since that time, the EPA Region 8 remedial team has been documenting plume characteristics through the RI/FS.

In 2019, MDEQ issued a remedial investigation report to document the current nature and extent of contamination, if other sources were contributing to contamination, and if vapor intrusion was continuing to occur. Results found multiple sources of contaminated soil, and that subsurface soils at several source locations were continuing to contaminate groundwater. Groundwater contamination did decrease after EPA's removal work, but the shallow groundwater plume remains contaminated above Montana's human health standards.

2. Current Actions

The Superfund Remedial Team in EPA Region 8 is conducting RI/FS at the Site. This removal action is in support of their current activities.

C. State and Local Authorities' Role

1. State and Local Actions to date

As described in the "Previous Actions" section of this document, MDEQ took an active role in characterizing the Site and has since requested EPA assistance due to the size and magnitude of the contamination.

2. Potential for Continued State/Local Response

State and local entities do not have the resources or authority to conduct this removal action and are involved in a consultation role only.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Conditions at the Site present a threat to public health and the environment and meet the criteria for initiating a removal action under 40 CFR 300.415(b)(2) of the NCP.

EPA has considered all the factors described in 40 CFR 300.415(b)(2) of the NCP and determined that the following factors apply at the Site.

(ii) Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, or pollutants or contaminants;

The Billings PCE contaminated groundwater plume encompasses approximately three miles of an urban area southwest of downtown Billings, Montana. There are approximately 298 residential, eight condominium, and 179 commercial properties overlying the plume. Air samples from nine residential homes have shown exceedances of EPA's Removal Management Levels, Indoor Air Vapor Intrusion Screening Levels, and Sub-Slab Vapor Action Levels and require immediate action. Many of the indoor air exceedances were found in bedrooms,

living rooms, and kitchens, all of which are high occupancy areas in residential homes, which creates threats to both acute and chronic PCE exposures. In some cases, EPA observed children and young adults are living in the basement bedrooms of these prioritized homes.

(iv) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;

PCE has migrated from the presumed primary source area adjacent to 715 Central Avenue to a downgradient groundwater plume encompassing approximately three miles. PCE vapors from the contaminated groundwater plume are diffusing upward through pores in the soil and into overlying structures.

(vii) The availability of other appropriate federal or state mechanisms to respond to the release;

No other local, state, or federal agency is in the position, or has the resources, to independently implement an effective response action to address the on-going threats presented at the Site.

IV. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed Action Description

The objective for this removal action is to reduce the indoor air contamination exposure in the nine residential structures that triggered sample exceedances at the Site. The nine prioritized residences are identified in the sampling results found in Attachment 2. Field conditions and sampling results may mandate additional action outside of the nine prioritized homes.

The proposed method of indoor air contamination reduction is the installation of vapor mitigation systems in the structures. Namely, basement sub-slab depressurization systems that will use a fan to create a vacuum in the soil and extract the contaminated gasses before they enter the homes and dispel them above the roofline outside. Sub-slab depressurization systems are a well-established technology that offer efficient vapor reductions without being an intrusive presence in the home. Sealing of cracks and hole patching in sub-slabs may be required to create a vacuum.

After installation, the sub-slab will be checked for the presence of vacuum toward the edges of the property to assure effectiveness. Additional confirmation sampling may be conducted. While PCE and its daughter products

may remain detectable in the homes after this removal action, the levels will be significantly reduced.

2. Contribution to Remedial Performance

This effort contributes to current Remedial Performance and will, to the extent practical, contribute to any future remedial effort at the Site.

3. Engineering Evaluation/Cost Analysis (EE/CA)

An EE/CA is not required for a time-critical removal action.

4. Applicable or Relevant and Appropriate Requirements (ARARs)

This Action Memorandum addresses the proposed time-critical removal action at the Billings PCE Site. PCE is the principal contaminant of concern. Removal actions conducted under CERCLA are required, to the extent practicable considering the exigencies of the situation, to attain ARARs. In determining whether compliance with an ARAR is practicable, the lead agency may consider appropriate factors, including the urgency of the situation and the scope of the removal action to be conducted. A table containing potential Site-specific ARARs is provided as Attachment 3 to this Action Memorandum.

5. Project Schedule

This removal action is proposed to start in March 2023. It is anticipated that installation of vapor mitigation systems for the nine prioritized homes will take approximately three weeks. Completion is expected by December 31, 2023.

B. Estimated Costs*

	Estimated Costs
ERRS contractor	\$ 175,000
START contractor	\$110,000
SUBTOTAL	\$ 285,000
Contingency costs (20% of subtotal)	\$ 57,000
Total Removal Project Ceiling	\$ 342,000

*EPA direct and indirect costs, although cost recoverable, do not count toward the Removal Ceiling for this removal action. Liable parties may be held financially responsible for costs incurred by the EPA as set forth in Section 107 of CERCLA.

V. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

A delay in action or no action at this Site would increase the actual or potential threats to the public health and/or the environment. This includes but is not limited to continued

exposure to residents in these structures and increased likelihood that they should experience chronic and/or acute side effects of PCE and related-contaminant exposure.

VI. OUTSTANDING POLICY ISSUES

None

VII. ENFORCEMENT

A separate Enforcement Addendum has been prepared providing a confidential summary of current and potential future enforcement activities.

VIII. RECOMMENDATIONS

This decision document represents the selected removal action for the Billings PCE Site in Billings, Yellowstone County, Montana developed in accordance with CERCLA as amended, and is not inconsistent with the NCP. This decision is based on the administrative record for the Site.

Conditions at the Site meet the NCP section 300.415(b)(2) criteria for a removal action, and I recommend your approval of the proposed removal action. The total project ceiling, if approved, will be **\$342,000**; this amount will be funded from a special account established by the Remedial Superfund program.

APPROVE

BEN BIELENBERG

Digitally signed by BEN
BIELENBERG
Date: 2023.02.07 09:25:58 -07'00'

Ben Bielenberg
Acting Director
Superfund and Emergency Management Division

Date

DISAPPROVE

Ben Bielenberg
Acting Director
Superfund and Emergency Management Division

Date

Attachments:

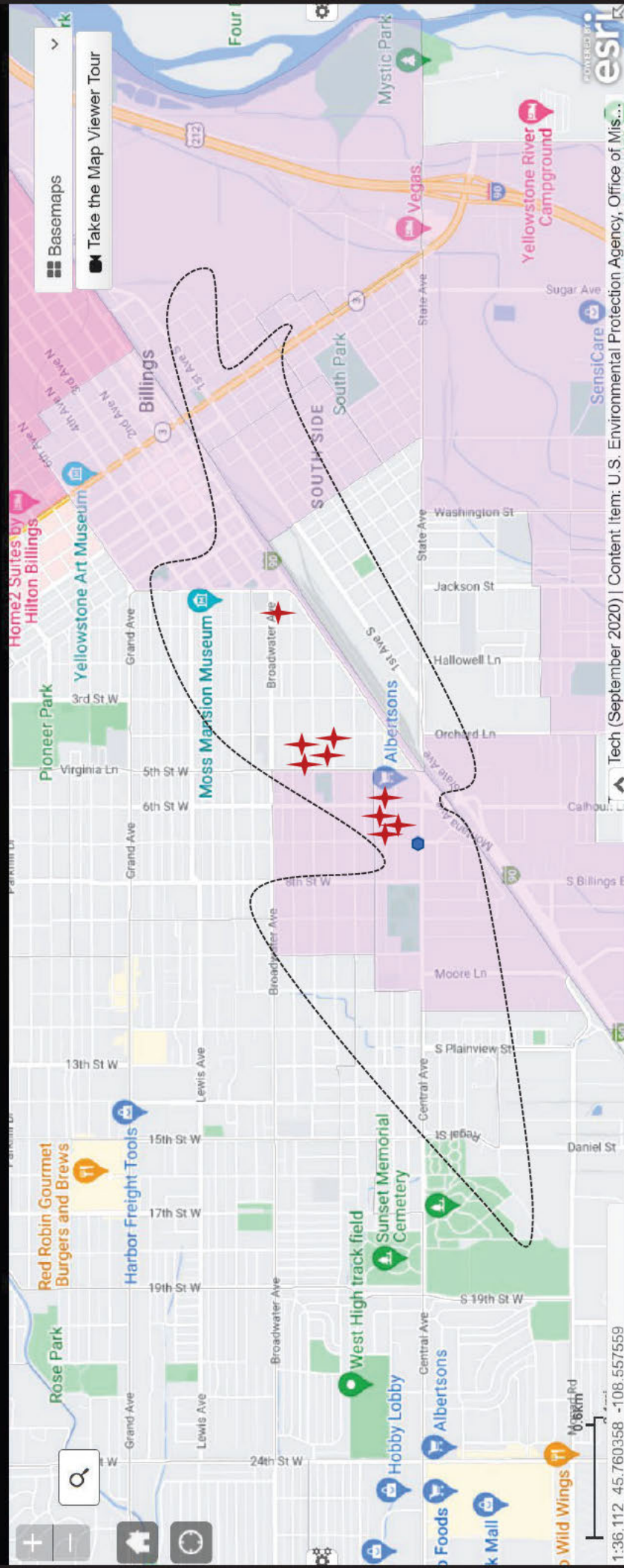
- Attachment 1: Site Map
- Attachment 2: Toxicology Memo and Sampling Results
- Attachment 3: Applicable or Relevant and Appropriate Requirements (ARARs)

ATTACHMENT 1:

Site Map



EPA Region 8 TERA Viewer



ATTACHMENT 2: Toxicology Memo and Sampling Results



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8

1595 Wynkoop Street
DENVER, CO 80202-1129
Phone 800-227-8917
<http://www.epa.gov/region08>

DATE: 19 Aug, 2022 (draft) 06 Oct, 2022 (final)

TECHNICAL MEMORANDUM

SUBJECT: Request for Region 8 Superfund Emergency Response Program Assistance for the Billings PCE superfund site in Billings, MT.

TO: Roger Hoogerheide, RPM, USEPA R8, Montana
Bridget Williams, RPM, USEPA R8, Montana

FROM: Jason Fritz, Ph.D., Toxicologist, Toxicology Team Lead and Acting Manager, Technical Assistance Branch, EPA Region 8 Laboratory Services and Applied Sciences Division

RE: **Exceedances of Removal Management Levels in Residential Structures**

Summary:

The Billings PCE (BPCE) vapor intrusion (VI) Study Area (the “Site”) is defined by a 100-foot buffer surrounding the 1.0 microgram per liter ($\mu\text{g/L}$) perchloroethylene (PCE) isopleth, as defined in the 2019 RI Report (Trihydro, 2019). The Site was added to the National Priorities List in the Federal Register in September 2021, and includes a shallow groundwater contaminant plume encompassing 855 acres and extending three miles through numerous mixed-use neighborhoods into downtown Billings. Groundwater contamination is associated with releases of dry-cleaning chemicals, including PCE, trichloroethylene (TCE), *cis*-1,2-dichloroethylene (1,2-DCE), as well as petroleum hydrocarbons and volatile organic compounds (VOCs) such as chloroform from other industrial sources. Based upon historical data, and recent sampling of sub-slab soil vapor (SS), crawlspace (CS) and/or indoor air (IA) from approximately 70 structures conducted in April, 2022, a complete VI pathway has been identified at some structures. Analytical results were compared against VI screening levels (VISLs), including sub-slab soil vapor action levels (SSAL), consistent with EPA and Montana Department of Environmental Quality (DEQ) recommendations for VI investigations (EPA, 2015a,b; MTDEQ, 2021).

While results from numerous structures exceeded regional screening levels (RSLs) and comparable VISLs based upon a hazard quotient (HQ) > 0.1 , and/or a cancer risk (CR) value of $> 1 \times 10^{-6}$ (EPA, 1991a,b), results from the nine residential structures described below were especially concerning, because they exceeded removal management levels (RMLs), or comparable SSALs, for one or more Site contaminants of potential concern (COPC).

As a Toxicologist responsible for providing technical support to the Region 8 Superfund program, I recommend securing removal group support for acting based upon concerns for human exposures above RMLs, and the resulting increased potential for adverse effects on public health (EPA, 1991a).

Analysis:

The baseline human health risk assessment (HHRA) for Billings PCE has not yet been completed (EPA, 1991b); as part of the remedial investigation, sample data was compared against VISLs, SSALs, and RMLs as described above (EPA, 1991a), and selected results are illustrated below in Table 1 for specific residential structures of concern.

Table 1 Selected Analytes from Specific Residential Structures

Tier	Property	Sample Location	Sample Date	PCE ⁴	TCE ⁴	1,2-DCE ⁴	Chloroform ⁴
		EPA Residential IA VI RML ¹		125	2.09	125	12.2
		EPA Residential IA VISL ²		4.17	0.209	4.17	0.122
		EPA Residential SSAL ³		139	6.95	139	4.07
1	█ Terry	IA-DININGROOM_04	4/20/2022	18.0	1.52	< 0.234 U	
		IA-LIVINGRM_05	4/20/2022	16	0.96	< 0.018 U	0.80
		CS-BASEMENT_01	4/20/2022	35.7	2.95	< 0.234 U	
		CS-BASEMENT_01D	4/20/2022	36.1	3.06	< 0.234 U	
		CS-CRAWLSPACE_03	4/20/2022	19	1.1	0.058 J	0.60
1	█ Terry	IA-BASEMENT_02	4/21/2022	31.9	6.55	0.226 J	
		IA-MASTERBED_03	4/21/2022	24.6	4.66	< 0.226 U	
		CS-CRAWLSPACE_01	4/21/2022	21.1	3.89	< 0.226 U	
		SS-BASEMENT_05	4/21/2022	9900 J	1100 J	17 J	42 J
1	█ Miles	IA-BASEMENT_02	4/22/2022	30.4	3.33	< 0.226 U	
		IA-KITCHEN_03	4/22/2022	17.9	2.13	< 0.226 U	
		CS-BASEMENT_01	4/22/2022	33.9	4.41	< 0.226 U	
1	█ Miles	IA-BASEMENT_01	4/25/2022	130 D	7.52	0.238 J	
		IA-LIVINGROOM_02	4/25/2022	104 D	5.83	< 0.232 U	
		SS-BASEMENT_03	4/25/2022	7600 J	340 J	14 J	16 J
2	█ Custer	IA-BASEMENT_07	4/20/2022	9.68	1.32	< 0.234 U	
		IA-BASEMENT_08	4/20/2022	6.5	0.67		0.24
		IA-LIVINGROOM_09	4/20/2022	3.02	0.419 J	< 0.234 U	
		SS-BASEMENT_11	4/19/2022	36000	3100	200	160
2	█ Howard	IA-BASEBDRM_06	4/27/2022	2.07	0.957	< 0.235 U	
		IA-BEDRM_07	4/27/2022	0.907	< 0.378 U	< 0.235 U	
		SS-BASEMENT_08	4/27/2022	23000 J	5500 J	490 J	87 J
2	█ Custer	IA-BASEMENT_01	4/27/2022	8.82	1.11	< 0.192 U	
		IA-HALLWAY_02	4/27/2022	8.98	1.00	< 0.192 U	
		SS-BASEMEN_04	4/27/2022	8100 J	660 J	14 J	25 J
3	█ Terry	IA-BASEMENT_01	4/20/2022	2.61	< 0.376 U	< 0.234 U	

Tier	Property	Sample Location	Sample Date	PCE ⁴	TCE ⁴	1,2-DCE ⁴	Chloroform ⁴
		IA-BASEMENT_01D	4/20/2022	2.18	< 0.376 U	< 0.234 U	
		IA-LIVRM_03	4/20/2022	1.84	< 0.376 U	< 0.234 U	
		SS-BASEMENT_05	4/20/2022	1600 J	120 J	0.55 J	2.4 J
		SS-BASEMENT_05D	4/20/2022	1400 J	94 J	0.95 J	2.6 J
3	Miles	IA-BEDROOM_01	4/26/2022	2.26 J	< 0.375 U	< 0.233 U	
		IA-BEDROOM_01D	4/26/2022	3.52 J	0.528 J	< 0.233 U	
		IA-BEDROOM_03	4/26/2022	0.88	0.060 J	< 0.014 U	0.68
		IA-BEDROOM_03D	4/26/2022	0.96	0.058 J	< 0.014 U	0.67
		IA-LIVINGROOM_05	4/26/2022	1.65	< 0.375 U	< 0.233 U	
		IA-LIVINGROOM_06	4/26/2022	0.41	0.035 J	< 0.014 U	0.71
		IA-LIVINGROOM_06D	4/26/2022	0.43	0.041 J	< 0.013 U	0.78
		SS-BASEMENT_08	4/25/2022	3400 J	170 J	1.8 J	1.6 J

¹ Risk management level (RML), based upon CR > 1 x 10⁻⁴ and/or HQ = 3.0 for all contaminants except for TCE, where HQ = 1.0; red highlighting indicates exceedance.

² Vapor intrusion screening level (VISL) for indoor air (IA) and crawlspace (CS) samples, based upon CR > 1 x 10⁻⁶ and/or HQ = 0.1; yellow highlighting indicates exceedance.

³ Sub-slab soil vapor action level (SSAL); yellow highlighting indicates exceedance based upon CR > 1 x 10⁻⁶ and/or HQ = 0.1; red highlighting indicates exceedance based upon CR > 1 x 10⁻⁴ and/or HQ = 3.0 for all contaminants except for TCE, where HQ = 1.0, comparable to an RML for sub-slab soil vapor.

⁴ Results presented for PCE, TCE, 1,2-DCE and chloroform are presented in µg/m³. "J" and "D" codes included from laboratory reported results, as indicated.

The nine structures were categorized into priority tiers as follows:

- **Tier 1 (four structures):** RML exceedances of indoor and/or crawlspace air for one or more contaminants, along with exceedances of SSALs comparable to RMLs where SS samples were available.
- **Tier 2 (three structures):** RSL exceedances of indoor and/or crawlspace air for one or more contaminants, along with exceedances of SSALs comparable to RMLs.
- **Tier 3 (two structures):** Exceedances of SSALs comparable to RMLs for one contaminant, with lesser SSAL exceedances for one or more other contaminants.

Results:

A release of hazardous substances, pollutants, or contaminants is present due to documented VI at the Site. Multiple completed exposure pathways may exist for VI, as PCE and decomposition products TCE and 1,2-DCE, as well as other VOCs including chloroform, have been documented in the groundwater, in the sub-slab soil vapor, crawlspace and/or indoor air (TriHydro, 2019).

PCE and TCE are hazardous substances within the meaning of Section 101(14) of CERCLA because they are listed at 40 C.F.R. § 302.4. Historical groundwater, sub-slab and indoor air sampling, in addition to current results, indicate that PCE vapors are migrating into residential structures at levels that may be harmful to human health. Breathing high levels of 1,2 DCE and/or chloroform can cause nausea, drowsiness, and tiredness; breathing very high levels can be fatal. While long-term human health effects of exposure to low concentrations of 1,2 DCE are not known, effects similar to PCE and TCE are suspected.

Structures in Tier 1 are clearly being impacted by VI above RMLs for breathable air and should be the highest priority for short-term action. Impacts to breathable air in Tier 2 structures, while less than that in Tier 1, are substantial, and are present along with SS concentrations exceeding SSALs by up to 790-fold, a staggering amount, which presents very high probability of significant increases in IA over the near term. Structures in Tier 3 had limited impacts to breathable air from the April 2022 sampling event, but SSAL exceedances comparable to RMLs were detected for TCE, a contaminant of particular concern for intermediate duration exposures for women who are or may become pregnant. Therefore the possibility for unacceptable near-term impacts to indoor air resulting from any disturbance of slab integrity, change in environmental conditions, fluctuations in water table, etc, appears high.

Conclusions:

The conditions for these structures at the Site present a threat to the public health or welfare, and the environment, and may meet the criteria for a removal action as provided for in the NCP at 40 C.F.R. § 300.415(b)(2). These criteria include, but are not limited to, the following: actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants.

Analytical results described above indicate that hazardous substances (PCE, TCE, cis-1,2-DCE, and chloroform), as defined by CERCLA § 101(14) are present and represent an actual or potential exposure threat to nearby human populations. Concentrations of the hazardous substance exceeds relevant screening levels, as described above (EPA 1991a,b).

Endangerment Recommendation:

Given the conditions at the Site, the nature of the known and suspected hazardous substances at the Site, and the potential for exposure, actual or threatened releases of hazardous substances from this Site may present an imminent and substantial endangerment to public health, welfare, or the environment, if not addressed for the specific structures described above.

I recommend that some manner of appropriate response action is implemented to control PCE and breakdown product vapors and/or emissions originating from Site source(s), or to otherwise reduce human residential exposures.

References:

U.S. Environmental Protection Agency (EPA). 2015a. Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air. Washington, DC. OSWER Publication 9200.2-154

U.S. Environmental Protection Agency (EPA). 2015b. Technical Guide For Addressing Petroleum Vapor Intrusion At Leaking Underground Storage Tank Sites. Washington, DC. OUST Publication. EPA 510-R-15-001

U.S. Environmental Protection Agency (EPA). 1991a. Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions. Washington, DC. OSWER Directive 9355.0-30

U.S. Environmental Protection Agency (EPA). 1991b. Risk Assessment Guidance for Superfund (RAGS), Volume 1, Part B. Washington, DC. EPA Publication 9285.7-01B

Montana Department of Environmental Quality. 2021. Montana Vapor Intrusion Guide. DEQ-WMRD-Vapor-1

Trihydro. 2019. Remedial Investigation Report, Billings PCE Groundwater Facility, Billings, Montana. May 15.

ATTACHMENT 3:

ARARs

Statute and Regulatory Citation	Description	ARAR Determination	Comment	Chemical Specific	Location Specific	Action Specific
State ARARs						
Disposal						
<u>75-10-212. Disposal in unauthorized area prohibited – exception</u>	<p>(1) A person may not dispose of solid waste except as permitted under this part.</p> <p>(2) It is unlawful to dump or leave any garbage, dead animal, or other debris or refuse:</p> <p>(a) in or upon any highway, road, street, or alley of this state;</p> <p>(b) in or upon any public property, highway, street, or alley under the control of the state of Montana or any political subdivision of the state or any officer or agent or department of the state or political subdivision of the state;</p> <p>(c) within 200 yards of a public highway, road, street, or alley or public property;</p> <p>(d) on privately owned property where hunting, fishing, or other recreation is permitted; however, this subsection does not apply to the owner, the owner's agents, or those disposing of debris or refuse with the owner's consent.</p> <p>(3) A person in violation of this section is absolutely liable, as provided in <u>45-2-104</u>, and is subject to the civil penalties provided in <u>75-10-233</u>.</p>	Relevant and appropriate	For the generation of waste related to concrete, PVC, dirt, side paneling, etc. while installing vapor mitigation systems.			X
Transportation						
<u>17.50.523 - Transportation</u>	(1) Solid waste must be transported in such a manner so as to prevent its discharge, dumping, spilling, or leaking from the transport vehicle.	Relevant and appropriate	For transportation of waste related to concrete, PVC, dirt, side paneling, etc. while installing vapor mitigation systems.			X