



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8

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Ref: 8SEM-EM

ACTION MEMORANDUM

SUBJECT: Approval and Funding for an Emergency Removal Action at the CDPHE Mercury Site in Denver, Denver County, Colorado, pursuant to the On-Scene Coordinator's delegated authority under CERCLA Section 104

FROM: Peter Stevenson and Valeriy Bizyayev
Federal On-Scene Coordinators

THRU: Laura Williams, Chief
Response Section

Deirdre Rothery, Chief
Emergency Management Branch

TO: Betsy Smidinger, Director
Superfund and Emergency Management Division

Site ID #: B808

I. PURPOSE

The purpose of this memorandum is to document the decision to initiate emergency response actions described herein for the CDPHE Mercury Site (Site) located in Denver, Denver County, Colorado pursuant to the On-Scene Coordinator's delegated authority under CERCLA Section 104.

This emergency response involved the collection of elemental mercury from an office building storage room and disposal at an off-site facility. Conditions existing at the Site presented a threat to public health and the environment and met the criteria for initiating a removal action under 40 CFR §300.415(b)(2) of the National Contingency Plan (NCP).

This response action involved no nationally-significant or precedent-setting issues. This emergency response does not establish any precedent for how future response actions will be taken and does not commit the United States 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:	CDPHE Mercury
Superfund Site ID (SSID):	B808
CERCLIS Number:	CON000820969
Site Location:	4300 Cherry Creek South Drive, Denver, CO
Lat/Long:	39.704743, -104.937308
Potentially Responsible Party (PRP):	
NPL Status :	Non NPL
Removal Start Date :	05/29/2019

A. Site Description

1. Removal Site Evaluation

On May 29, 2019, the Colorado Department of Public Health & Environment (CDPHE) contacted the EPA Region 8 Emergency Operations Center (EOC) requesting assistance to address a release of an unknown amount of mercury inside a storage room at CDPHE's office in Denver, CO (initial release was reported as a broken thermometer). The incident occurred sometime between May 24, 2019 and May 28, 2019, the actual date of release is unknown. A CDPHE employee discovered elemental mercury beads inside the storage room on May 28, 2019. CDPHE personnel removed as much mercury as they could and isolated the area but lacked the monitoring equipment to verify clearance to safe levels. Upon receiving the CDPHE's request, EPA deployed an On-Scene Coordinator (OSC) and a Superfund Technical Assessment and Response Team (START) contractor to assess the office building. Initial concentrations of ambient air mercury vapor in the breathing zone were greater than 50,000 nanograms per cubic meter (ng/m^3) in the storage room of CDPHE using a Lumex Mercury Vapor Monitor (Lumex). Additional monitoring of the cubicles, office space and hallway using the Lumex and Jerome 431-X indicated the mercury contamination had been spread from the storage room into the hallway. The OSC presented the results of the assessment to CDPHE representatives who then asked EPA to complete the response action.

The planned actions described in this Action Memorandum refer to the removal of mercury from the storage room and hallway area to recommended mercury vapor levels protective of human health in commercial settings ($< 3,000 \text{ ng}/\text{m}^3$) and for normal occupancy levels for the most sensitive persons ($< 1,000 \text{ ng}/\text{m}^3$)¹.

2. Physical Location

The Site consists of a commercial building in a building complex in Denver, Denver County, CO. The area of the spill is located on the second floor of Building A in a storage room (approximately 25x30 feet) and an adjacent hallway. The building address is 4300 Cherry Creek South Drive, Denver CO.

¹ United States of America, Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine Prevention, Response and Medical Support Branch Emergency Response Team. (2012, March 22). [Action Levels For Elemental Mercury Spills](#).

3. Site Characteristics

The office building is a five-story concrete structure that is part of a three-building complex occupied by CDPHE. Ambient air mercury concentrations in the storage room and hallway area exceeded the recommended levels that are protective of human health for commercial and sensitive populations. Employees using the office space include women of child bearing age.

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

The contaminant of concern at the Site is elemental mercury. Mercury is a hazardous substance as defined by Section 101(14) of CERCLA. Mercury is the only metal that is liquid at room temperature. In its pure form (often called metallic or elemental), mercury is a shiny, silver-white, odorless liquid. At room temperature, mercury vaporizes into a toxic, colorless, odorless gas.² In its vapor form, mercury is easily inhaled and extremely toxic. For elemental mercury, the most important route of absorption is through inhalation. Because of the chemical nature of elemental mercury vapor, deposition and retention in the lungs are quite high (on the order of 80 percent in humans).³

In a 1997 Mercury Study Report to Congress the EPA states:

Effects on the nervous system appear to be the most sensitive toxicological endpoint observed following exposure to elemental mercury. Symptoms associated with elemental mercury-induced neurotoxicity include the following: tremors, initially affecting the hands and sometimes spreading to other parts of the body; emotional lability, often referred to as "erethism" and characterized by irritability, excessive shyness, confidence loss, and nervousness; insomnia; neuromuscular changes (e.g., weakness, muscle atrophy, muscle twitching); headaches; polyneuropathy (e.g., paresthesia, stocking glove sensory loss, hyperactive tendon reflexes, slowed sensory and motor nerve conduction velocities); and memory loss and performance deficits in test of cognitive function. At higher concentrations, adverse renal effects and pulmonary dysfunction may also be observed.

EPA's 1997 study, in reference to elemental mercury, concluded:

Neurotoxicity is the most sensitive indicator of adverse effects in humans exposed to elemental mercury and methylmercury

An RfC for inhaled elemental mercury based on neurotoxic effects in exposed workers is $3 \times 10^{-4} \text{ mg/m}^3$ (300 ng/m³).

² Agency for Toxic Substances and Disease Registry (ATSDR). 1999. [Toxicological Profile for Mercury](#). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service

³ [Arch Environ Health](#), 1976 Nov-Dec; 31(6):302-9. Clearance of mercury (HG-197, HG-203) vapor inhaled by human subjects

*Elemental mercury is a developmental toxicant in experimental animals. If the mechanisms of action producing developmental toxicity in animals occur in humans, elemental mercury is very likely to produce developmental effects in exposed human populations. U.S. EPA has made no estimate of dose response for developmental effects of elemental mercury.*⁴

When spilled or tracked into a small or poorly ventilated room, mercury can pose significant health threats. Very small amounts of mercury, released into an enclosed space (such as a home or classroom), can raise air concentrations to harmful levels. Metallic mercury is extremely difficult to remove from shoes, clothes, furniture, carpet, and other porous items and is easily tracked and transferred. If these items are not properly disposed or cleaned, the mercury can linger for months or years, continuing to pose a health threat.

5. NPL Status

This Site is neither on nor currently being considered for inclusion on the NPL.

6. Maps, Pictures & Other Graphic Representations

Site map is presented in Attachment 1. Site photographs are presented in Attachment 2.

B. Other Actions to Date

1. Previous Actions

There were no previous activities performed by EPA at the Site.

2. Current Actions

There are no current activities being conducted by EPA at the Site.

C. State and Local Authorities' Roles

1. State and Local Action to Date

CDPHE personnel removed most of the gross contamination of mercury before EPA's arrival at the Site. CDPHE personnel swept up and contained materials collected from cleanup in a tightly sealed plastic bag. CDPHE supported EPA with building logistics.

2. Potential for Continued State/Local Response

Local and state governments did not have the capability or resources to conduct this action in a timely manner.

⁴ Mercury Study Report to Congress, Volume V: Health Effects of Mercury and Mercury Compounds, December 1997, <http://www.epa.gov/mercury/report.htm>

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

Conditions at the Site presented a threat to public health and the environment and met 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.

- (i) *“Actual or potential exposure to nearby human populations, animals or the food chain from hazardous substances or pollutants or contaminants;”*

Elemental mercury was the contaminant of concern at this Site. For elemental mercury, the most important route of absorption is through inhalation. The extent of the contamination was to the storage room and hallway of the second floor. Because mercury is easily tracked to other areas by foot-traffic, it is of immediate concern to remove mercury-contaminated materials and to clean impacted areas of free and residual mercury. If left unabated, mercury from the areas of the Site posed an immediate concern to CDPHE personnel and adjacent buildings.

- (vii) *“The availability of other appropriate federal or state response mechanisms to respond to the release.”*

No other local, state or federal agency had the capability or the resources to independently implement a timely, effective response action to address the ongoing threat presented at the Site.

IV. SELECTED REMOVAL ACTIONS AND ESTIMATED COSTS

A. Planned Actions

1. Planned Action Description

On May 30, 2019, EPA’s Emergency Response and Removal Services (ERRS) contractor was deployed to provide removal of mercury and cleanup of mercury contamination. ERRS removed tile flooring and the base layer of tile mastic, decontaminated surfaces, and heated the room with space heaters while maintaining negative air pressure, thereby circulating the air from the room. Porous items that were contaminated were disposed of appropriately. CDPHE also surrendered additional mercury thermometers (approximately 14 thermometers) that were taken for proper disposal. START provided air monitoring during the response utilizing the Lumex and Jerome 431-X. The floor was then sealed twice with an epoxy-based sealant. Final ambient air mercury vapor concentrations were below 1,000ng/m³, the action level recommended for protection of sensitive populations.

2. Contribution to Remedial Performance

This effort will, to the extent practical, contribute to any future remedial effort at the Site. However, no further federal action is anticipated at this time.

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

An EE/CA is not required for an emergency response action.

4. Applicable or Relevant and Appropriate Requirements (ARARs)

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.

No ARARs have been identified for this removal action. RCRA requirements concerning waste analysis, manifesting, packaging, and transporting, while not ARARs, apply to off-site shipments of hazardous wastes.

5. Project Schedule

This emergency response action was initiated on May 29, 2019. Waste transportation and disposal activities are anticipated to be completed by July 1, 2019.

B. Estimated Costs*

Contractor costs	
START	\$21,000.00
ERRS	\$40,000.00
Contingency costs (20% of subtotal)	\$12,200.00
Total Removal Project Ceiling	\$73,200.00

*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 ACTIONS BE DELAYED OR NOT TAKEN

A delay in action or no action at this Site would have increased the actual or potential threats to public health and the environment.

VI. OUTSTANDING POLICY ISSUES

None.

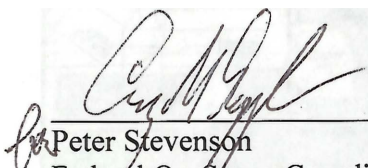
VII. ENFORCEMENT

An investigation to evaluate potential enforcement options will be undertaken. A separate Enforcement Addendum will be prepared if appropriate providing a confidential summary of potential enforcement activities.

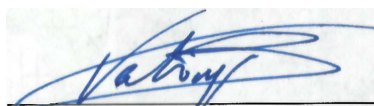
VIII. APPROVALS

This decision document represents the selected response action for the CDPHE Mercury Site in Denver, Denver County, Colorado, 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 met the NCP section 300.415(b) criteria for an emergency response action and, through this document, I am approving the selected removal action. The total project ceiling is \$73,200.00; this amount will be funded from the Regional removal allowance.


Peter Stevenson
Federal On-Scene Coordinator

6/26/19
Date


Valeriy Bizyayev
Federal On-Scene Coordinator

6/25/19
Date

Attachment 1: Site Map
Attachment 2: Site Photographs

Attachment 1 – Site Map

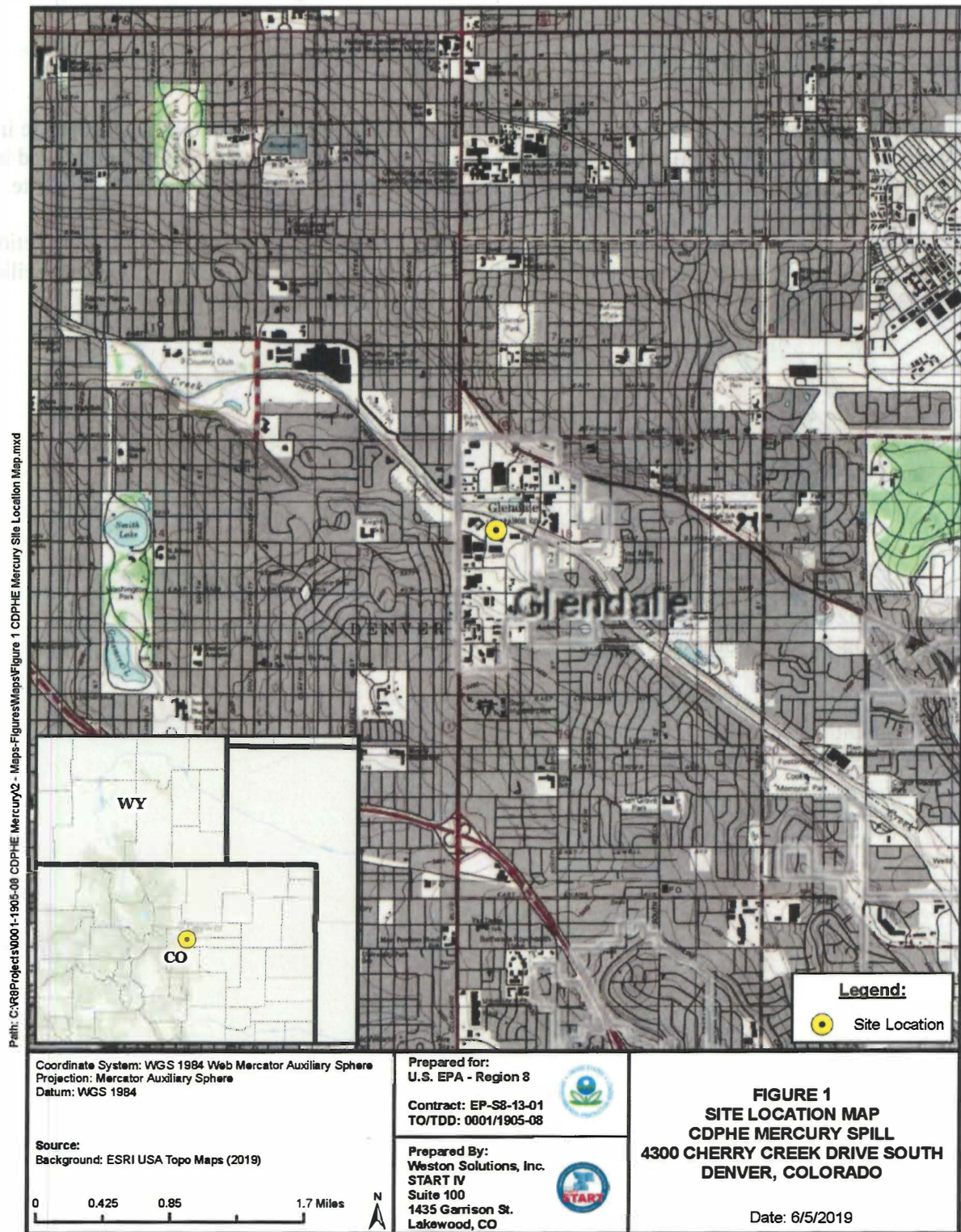




Figure 1. (Above) EPA START contractor performing storage room assessment and readings for mercury vapors utilizing Jerome (mg/m³) and Lumex (ng/m³) instrumentation.



Figure 2. (Left) Representative thermometer of the additional 14 thermometers surrendered by the State to EPA for disposal. Thermometer depicted is one like what is believed to have been broken to cause initial mercury release.

Figure 3. (Right) EPA ERRS contractor removing floor tile from contaminated area in the storage room area.



**Administrative Record Index for Action Memorandum for Emergency Removal Action at CDPHE
Mercury Site, Denver County, Colorado:**

United States Environmental Protection Agency Action Memorandum for Emergency Removal Action at
CDPHE Mercury Site, June 26, 2019