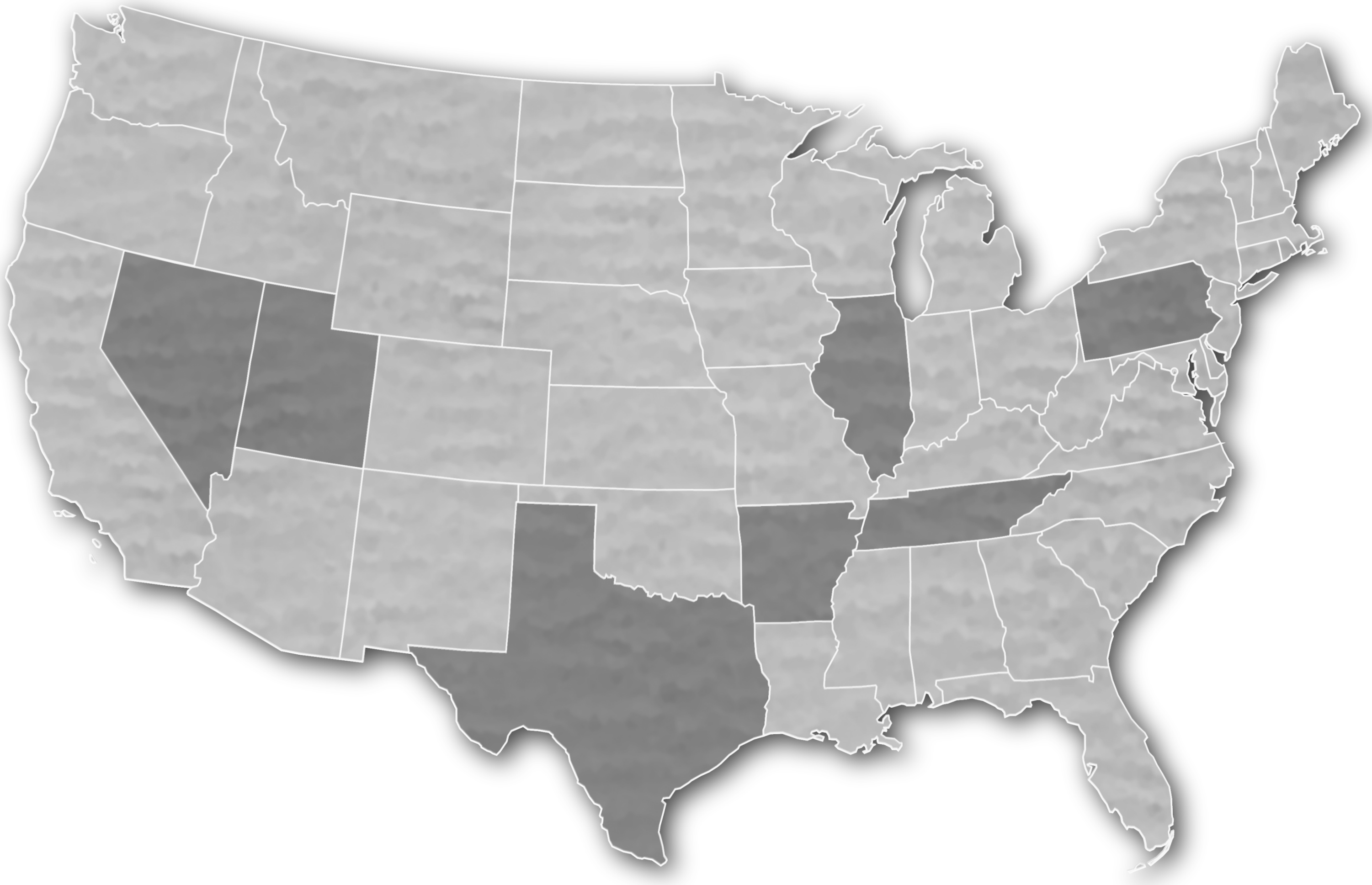
DOE/EIS-0423-S2D
June 2022

DRAFT

Long-Term Management and Storage of Elemental Mercury

Supplemental Environmental Impact Statement



Summary

U.S. Department of Energy
Office of Environmental Management
Washington, DC

METRIC TO ENGLISH			ENGLISH TO METRIC		
Multiply	**by**	**To get**	**Multiply**	**by**	**To get**
Area					
Square meters	10.764	Square feet	Square feet	0.092903	Square meters
Square kilometers	247.1	Acres	Acres	0.0040469	Square kilometers
Square kilometers	0.3861	Square miles	Square miles	2.59	Square kilometers
Hectares	2.471	Acres	Acres	0.40469	Hectares
Concentration					
Kilograms/square meter	0.16667	Tons/acre	Tons/acre	0.5999	Kilograms/square meter
Milligrams/liter	1 [a]	Parts/million	Parts/million	1 [a]	Milligrams/liter
Micrograms/liter	1 [a]	Parts/billion	Parts/billion	1 [a]	Micrograms/liter
Micrograms/cubic meter	1 [a]	Parts/trillion	Parts/trillion	1 [a]	Micrograms/cubic meter
Density					
Grams/cubic centimeter	62.428	Pounds/cubic feet	Pounds/cubic feet	0.016018	Grams/cubic centimeter
Grams/cubic meter	0.0000624	Pounds/cubic feet	Pounds/cubic feet	16,018.5	Grams/cubic meter
Length					
Centimeters	0.3937	Inches	Inches	2.54	Centimeters
Meters	3.2808	Feet	Feet	0.3048	Meters
Kilometers	0.62137	Miles	Miles	1.6093	Kilometers
Radiation					
Sieverts	100	Rem	Rem	0.01	Sieverts
Temperature					
Absolute					
Degrees C + 17.78	1.8	Degrees F	Degrees F - 32	0.55556	Degrees C
Relative					
Degrees C	1.8	Degrees F	Degrees F	0.55556	Degrees C
Velocity/Rate					
Cubic meters/second	2118.9	Cubic feet/minute	Cubic feet/minute	0.00047195	Cubic meters/second
Grams/second	7.9366	Pounds/hour	Pounds/hour	0.126	Grams/second
Meters/second	2.237	Miles/hour	Miles/hour	0.44704	Meters/second
Volume					
Liters	0.26418	Gallons	Gallons	3.7854	Liters
Liters	0.035316	Cubic feet	Cubic feet	28.316	Liters
Liters	0.001308	Cubic yards	Cubic yards	764.54	Liters
Cubic meters	264.17	Gallons	Gallons	0.0037854	Cubic meters
Cubic meters	35.314	Cubic feet	Cubic feet	0.028317	Cubic meters
Cubic meters	1.3079	Cubic yards	Cubic yards	0.76456	Cubic meters
Cubic meters	0.0008107	Acre-feet	Acre-feet	1233.49	Cubic meters
Weight/Mass					
Grams	0.035274	Ounces	Ounces	28.35	Grams
Kilograms	2.2046	Pounds	Pounds	0.45359	Kilograms
Kilograms	0.0011023	Tons (short)	Tons (short)	907.18	Kilograms
Metric tons	1.1023	Tons (short)	Tons (short)	0.90718	Metric tons
ENGLISH TO ENGLISH					
Acre-feet	325,850.7	Gallons	Gallons	0.000003046	Acre-feet
Acres	43,560	Square feet	Square feet	0.000022957	Acres
Square miles	640	Acres	Acres	0.0015625	Square miles

a. This conversion is only valid for concentrations of contaminants (or other materials) in water.

METRIC PREFIXES

Prefix	Symbol	Multiplication factor
exa-	E	1,000,000,000,000,000,000 = 10^{18}
peta-	P	1,000,000,000,000,000 = 10^{15}
tera-	T	1,000,000,000,000 = 10^{12}
giga-	G	1,000,000,000 = 10^{9}
mega-	M	1,000,000 = 10^{6}
kilo-	k	1,000 = 10^{3}
deca-	D	10 = 10^{1}
deci-	d	0.1 = 10^{-1}
centi-	c	0.01 = 10^{-2}
milli-	m	0.001 = 10^{-3}
micro-	µ	0.000 001 = 10^{-6}
nano-	n	0.000 000 001 = 10^{-9}
pico-	p	0.000 000 000 001 = 10^{-12}

COVER SHEET

***Responsible Federal Agency*:** U.S. Department of Energy (DOE)

***Title*:** Draft Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (DOE/EIS-0423-S2D) (Mercury Storage SEIS-II)

***Candidate Locations for Storage Facilities*:** Arkansas, Illinois, Nevada, Pennsylvania, Tennessee, Texas, and Utah.

For further information or for copies of this Draft Mercury Storage SEIS-II, *please contact*:	*For general information on the DOE-Office of Environmental Management National Environmental Policy Act (NEPA) process, contact*:
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This document is available for viewing and downloading on the DOE NEPA website (http://energy.gov/nepa/).

Abstract: Pursuant to the *Mercury Export Ban Act of 2008* (Public Law [P.L.] 110-414), and the *Frank R. Lautenberg Chemical Safety for the 21st Century Act* (P.L. 114-182) (together referred herein as MEBA), DOE has been directed to designate a facility or facilities for the long-term management and storage of elemental mercury generated within the United States. DOE issued the *Final Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement* (Mercury Storage EIS) (DOE/EIS-0423) in January 2011 and the *Final Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement* (Mercury Storage SEIS) (DOE/EIS-0423-S1) in September 2013. DOE is analyzing the storage of up to 7,000 metric tons (7,700 tons) of elemental mercury in an existing facility or facilities operated in accordance with the *Solid Waste Disposal Act*, as amended by the *Resource Conservation and Recovery Act*. DOE has prepared this Mercury Storage SEIS-II in accordance with the *National Environmental Policy Act of 1969*, as amended (NEPA; Title 42 of the *United States Code* [U.S.C.] § 4321 et seq.), the Council on Environmental Quality (CEQ) implementing regulations (Title 40 of the *Code of Federal Regulations* [CFR] Parts 1500–1508), and DOE's NEPA implementing procedures (10 CFR Part 1021) to evaluate the reasonable alternatives for a facility or facilities for the long-term management and storage of elemental mercury. This Mercury Storage SEIS-II analyzes the potential environmental, human health, and socioeconomic impacts of elemental mercury storage at existing facilities in eight candidate locations: Hawthorne Army Depot near Hawthorne, Nevada; Waste Control Specialists LLC, near Andrews, Texas; Bethlehem Apparatus in Bethlehem, Pennsylvania; Perma-Fix Environmental Services in

Kingston, Tennessee; Veolia Environmental Services in Gum Springs, Arkansas; and Clean Harbors Environmental Services, with three potential locations in Tooele, Utah; Greenbrier, Tennessee; and Pecatonica, Illinois. As required by CEQ NEPA regulations, the No-Action Alternative is also analyzed. DOE's Preferred Alternative is to designate one or more of the existing commercial facilities evaluated in this Draft SEIS-II.

Public Comments: On May 24, 2021, DOE issued a Notice of Intent in the *Federal Register* (86 FR 27838) notifying the public of DOE's intent to prepare this Draft SEIS-II. (In accordance with 10 CFR § 1021.311(f), a public scoping process is not required for a DOE-issued SEIS.) Comments on this Draft SEIS-II may be submitted during the 45-day comment period, which will begin upon publication of the U.S. Environmental Protection Agency's Notice of Availability in the *Federal Register*. A virtual, online public hearing on this Draft SEIS-II will be held during this 45-day comment period. The dates, times, and locations of the public hearing will be published in a DOE *Federal Register* notice, posted online at www.energy.gov/nepa, and announced through other media. DOE will consider any comments received after the comment period ends to the extent practicable.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

CEQ	Council on Environmental Quality
CFR	*Code of Federal Regulations*
CH_3Hg	methylmercury
CSB	Container Storage Building
DNSC	Defense National Stockpile Center
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FR	*Federal Register*
Hg^0	elemental mercury
$HgCl_2$	mercuric chloride
HgS	mercuric sulfide
HWAD	Hawthorne Army Depot
IBC	International Building Code
Interim Guidance	*U.S. Department of Energy Interim Guidance on Packaging, Transportation, Receipt, Management, and Long-Term Storage of Elemental Mercury*
MEBA	*Mercury Export Ban Act of 2008*, as amended by the *Frank R. Lautenberg Chemical Safety for the 21st Century Act*
MT	metric ton
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NGM	Nevada Gold Mines, LLC
NNSA	National Nuclear Security Administration
OSHA	Occupational Safety and Health Administration
P.L.	public law
RCRA	*Resource Conservation and Recovery Act*
ROD	Record of Decision
ROI	region of influence
SA	supplement analysis
SEIS	supplemental environmental impact statement
SL	severity level
TSCA	*Toxic Substances Control Act*
U.S.C.	*United States Code*
VGS	Veolia Gum Springs
WCS	Waste Control Specialists
Y-12	Y-12 National Security Complex

SUMMARY

S.1 INTRODUCTION

Elemental mercury is a dense, naturally occurring metal that is liquid at room temperature. Mercury is found in the environment as elemental mercury (Hg^0) (e.g., elemental mercury vapor), inorganic mercury compounds (e.g., mercuric chloride [$HgCl_2$] and mercuric sulfide [HgS]), and organic mercury compounds (e.g., methylmercury [CH_3Hg]). Mercury enters the environment through natural processes such as volcanoes and wildfires and through human activities.

The mercury emitted from human activities is primarily in its elemental or inorganic form. The inorganic form of mercury, when bound to airborne particles or in its gaseous form, is readily removed from the atmosphere by dry deposition (settling) onto land surfaces and wet deposition (precipitation), including deposition in waterbodies. Most of the mercury in water, soil, sediment, plants, and animals is in the form of inorganic mercury salts (e.g., mercuric chloride) and organic mercury (e.g., methylmercury).

Mercury and its compounds are persistent, bioaccumulative, and toxic. The toxic effects of mercury depend on its chemical form and the route of exposure. Methylmercury, a mercury compound that is generally not used commercially or stored, is the most toxic form. It can affect the immune system; alter genetic systems; and damage the nervous system, including coordination and the senses of touch, taste, and sight. Methylmercury can be particularly damaging to developing embryos. Exposure to methylmercury is usually by ingestion; it is absorbed more readily than other forms of mercury. Less toxic than methylmercury, elemental mercury vapors can cause tremors, gingivitis, and excitability when inhaled over a long period of time. If elemental mercury is ingested, it is absorbed relatively slowly and can pass through the digestive system without causing damage.

It is estimated that since the 19th century, the total amount of mercury available in the environment has increased by a factor of two to five above pre-industrial levels. As the quantity of available mercury in the environment has increased, so have the risks of neurological and reproductive problems for humans and wildlife. These increases in risk make mercury a pollutant of environmental concern in the United States and throughout the world (EPA 2000).

S.1.1 Purpose and Need for Agency Action

The *Mercury Export Ban Act of 2008* (Public Law [P.L.] 110-414) and the *Frank R. Lautenberg Chemical Safety for the 21st Century Act* (Chemical Safety Act of 2016; P.L. 114-182) (altogether referred herein as MEBA), amend the *Toxic Substances Control Act* (TSCA) (15 United States Code [U.S.C.] § 2601 et seq.) and the *Resource Conservation and Recovery Act* (RCRA) at 42 U.S.C. § 6939f to address, among other things, the export and long-term management and storage of elemental mercury. MEBA prohibits the sale, distribution, or transfer by Federal agencies to any other Federal agency, any state or local government agency, or any private individual or entity, of any elemental mercury under the control or jurisdiction of a Federal agency (with certain limited exceptions) (15 U.S.C. § 2605(f)(1)–(2)). MEBA also amended Section 2611(c) of TSCA to prohibit the export of elemental mercury from the United States (with certain limited exceptions). MEBA directs DOE to designate a facility or facilities of the Department of Energy for the long-term management and storage of elemental mercury generated within the United States (42 U.S.C. § 6939f(a)(1)). MEBA further provides the Secretary of Energy with the authority to establish such terms, conditions, and procedures as are necessary to carry out this long-term management and storage function (42 U.S.C. § 6939f(f)). Although the phrase "facility or facilities of [DOE]" is not defined in MEBA, DOE has a longstanding practice in various other contexts of leasing facilities to accomplish the Department's core mission. Consistent with that practice, DOE construes the term facility of DOE to include a facility leased from a commercial entity or another Federal agency over which DOE provides an appropriate level of oversight and guidance. Accordingly, if DOE were to designate a facility that currently is owned by a commercial entity or by another Federal agency, DOE would obtain a leasehold interest in that facility. DOE would ensure that any such facility currently owned by a commercial entity or by another Federal agency would afford DOE an appropriate level of responsibility and control over the facility.

MEBA also authorizes DOE to assess and collect a fee at the time of delivery of mercury to the DOE storage facility to cover certain costs of long-term management and storage (42 U.S.C. § 6939f(b)).[1] Much of the costs of mercury storage will be covered by the generators of the mercury. These costs include operations and maintenance, security, monitoring, reporting, personnel, administration, inspections, training, fire suppression, closure, and other costs required for compliance with applicable laws; such costs shall not include costs associated with land acquisition or permitting. In addition, the generators of the mercury will be responsible for the costs of shipping mercury to the DOE storage facility (or facilities). The incentive for generators to send their mercury to the DOE facility is that DOE will indemnify the generator from future liability (42 U.S.C. § 6939f(e))

MEBA established January 1, 2019, as the date by which a DOE facility for the long-term management and storage of elemental mercury generated within the United States must be operational (42 U.S.C. § 6939f(a)(2)). MEBA requires that DOE adjust fees for generators temporarily accumulating elemental mercury if the DOE facility is not operational by January 1, 2019 (42 U.S.C. § 6939f(b)(1)(B)(iv)). If the DOE facility is not operational by January 1, 2020, DOE must: (1) immediately accept the conveyance of title to all elemental mercury that has accumulated on site prior to January 1, 2020,[2] (2) pay any applicable Federal permitting costs, and (3) store, or pay the cost of storage of, until the time at which a facility is operational, accumulated mercury to which the Secretary has title in a facility that has been issued a permit (42 U.S.C. § 6939f(b)(1)(C)). DOE issued a Record of Decision (ROD) on December 6, 2019, that designated the Waste Control Specialists LLC (WCS) site near Andrews, Texas, as a DOE facility for

[1] DOE would undertake a fee rulemaking, including any required NEPA analysis, at a later time, following completion of the present NEPA analysis and Record of Decision regarding designation of a storage facility. Among the allowable costs to be collected under MEBA are costs associated with management and "other costs required for compliance with applicable law," which DOE interprets to include potential costs associated with treatment and disposal of elemental mercury (42 U.S.C. § 6939f(b)(2)). "Management," as it appears in RCRA and implementing regulations, includes treatment and disposal (42 U.S.C. § 6903(7), (33) and 40 CFR § 260.10). While there is currently no disposal standard for elemental mercury, it is possible that the U.S. Environmental Protection Agency will, in the future, approve a standard, which would require additional treatment and allow for disposal. DOE acknowledges the potential for this eventual treatment and disposal standard but does not analyze such treatment and disposal in this SEIS-II because the specifics of it are too speculative at this time. Undertaking additional treatment and disposal likely would require additional NEPA review, which DOE will evaluate and undertake, as appropriate, if such an option becomes viable. This issue is discussed in more detail in Section 2.6 of this SEIS-II.

[2] Conveyance of title pertains to mercury accumulated in accordance with 42 U.S.C. § 6939f(g)(2)(D).

management and storage of up to 6,800 metric tons (MT) (7,480 tons) of elemental mercury (Volume 84 of the *Federal Register* [FR] page 66890). On December 23, 2019, DOE issued a rule to establish the fee for long-term management and storage of elemental mercury (84 FR 70402). However, both of these actions were challenged in two separate lawsuits. Consistent with the terms of a settlement agreement resolving one of the lawsuits, the fee rule was vacated and remanded to DOE, and DOE withdrew the designation in an amended ROD (85 FR 63105, October 6, 2020) (More information related to these lawsuits is provided in Section S.1.2). Because statutory milestone dates have now passed, DOE needs to designate a facility and begin accepting elemental mercury as soon as practicable.

DOE prepared this *Draft Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement* (DOE/EIS-0423-S2D) (Mercury Storage SEIS-II) in accordance with the *National Environmental Policy Act of 1969*, as amended (42 U.S.C. § 4321 et seq.) (NEPA), the Council on Environmental Quality (CEQ) implementing regulations (Title 40 of the *Code of Federal Regulations* [CFR] Parts 1500–1508), and DOE's NEPA implementing procedures (10 CFR Part 1021) to evaluate reasonable alternatives for a facility (or facilities) for the long-term management and storage of elemental mercury.

S.1.2 Previous DOE NEPA Documents and Actions Related to the Long-Term Management and Storage of Mercury

Pursuant to MEBA, DOE prepared the *Final Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement* (2011 Mercury Storage EIS) to analyze the storage of up to 10,000 MT (11,000 tons) of elemental mercury generated over a 40-year period. The purpose of the 2011 Mercury Storage EIS was to evaluate the potential impacts of the proposed action of establishing a facility for the long-term management and storage of elemental mercury.

The 2011 Mercury Storage EIS analyzed the potential environmental, human health, and socioeconomic impacts of elemental mercury storage at seven candidate locations for either new construction or use of an existing facility: Grand Junction Disposal Site near Grand Junction, Colorado (new construction); Hanford Site near Richland, Washington (new construction); Hawthorne Army Depot (HWAD) near Hawthorne, Nevada (existing facilities); Idaho National Laboratory near Idaho Falls, Idaho (new construction and an existing facility); Kansas City Plant in Kansas City, Missouri (existing facility); Savannah River Site near Aiken, South Carolina (new construction); and the WCS site near Andrews, Texas (new construction and an existing facility). In the 2011 Mercury Storage EIS, DOE identified the WCS site near Andrews, Texas, as the Preferred Alternative for the long-term management and storage of elemental mercury. The 2011 Mercury Storage EIS is relevant because it examines mercury storage at seven locations throughout the United States, including two of the alternatives considered in this Mercury Storage SEIS-II.

DOE subsequently reconsidered the range of reasonable alternatives evaluated in the 2011 Mercury Storage EIS. Accordingly, DOE prepared the *Final Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement* (2013 Mercury Storage SEIS) to evaluate three additional locations for an elemental mercury storage facility, all three of which were proposed as new construction in the vicinity of the Waste Isolation Pilot Plant near Carlsbad, New Mexico. The 2013 Mercury Storage SEIS updated some of the relevant analyses for alternatives from the 2011 Mercury Storage EIS.

In June 2019, DOE evaluated a potential decision to manage and store elemental mercury at the WCS facility near Andrews, Texas, in the *Supplement Analysis of the Final Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement* (2019 Mercury SA). The 2019 Mercury SA evaluated changes in environmental conditions that had occurred since the initial analyses were completed in 2011 and updated in 2013, in accordance with 10 CFR § 1021.314(c). The SA also presented some additional changes that had occurred since 2011, which included:

- The total inventory of elemental mercury that was projected for the next 40 years in the 2011 Mercury Storage EIS (and subsequently evaluated in the 2013 Mercury Storage SEIS) was 10,000 MT. The 40-year projection evaluated in the 2019 Mercury SA was reduced to 6,800 MT. The derivation of this projection was presented in Appendix B of the 2019 Mercury SA and is updated in Section 2.1.2 of this Mercury Storage SEIS-II.

- The 2011 Mercury Storage EIS and 2013 Mercury Storage SEIS evaluated the use of the existing Container Storage Building (CSB) at the WCS facility near Andrews, Texas, which had capacity to store up to 2,000 MT of elemental mercury. The 2011 EIS and 2013 SEIS also evaluated the construction of a new facility at WCS that could accommodate up to 10,000 MT of elemental mercury. In 2019, WCS identified a combination of two existing facilities (the CSB and the Bin Storage Unit 1) that could accommodate the analyzed inventory of 6,800 MT. Therefore, no new construction would be required to manage and store the full projected inventory.

The 2019 Mercury SA determined that the long-term management and storage of up to 6,800 MT of elemental mercury in existing buildings at the WCS facility near Andrews, Texas, would not constitute a substantial change from the proposal evaluated in the 2011 Mercury Storage EIS and updated in the 2013 Mercury Storage SEIS.

Supported by the analysis in the 2011 Mercury Storage EIS, 2013 Mercury Storage SEIS, and the 2019 Mercury SA, DOE published a ROD (84 FR 66890; December 6, 2019) to designate the WCS site near Andrews, Texas, for the management and storage of up to 6,800 MT (7,480 tons) of elemental mercury and to manage and store the elemental mercury in leased portions of existing buildings—the CSB and Bin Storage Unit 1—on the same WCS site. On December 23, 2019, DOE published its rule to establish the fee for long-term management and storage of elemental mercury (84 FR 70402; the “Fee Rule”).

Subsequently, two domestic generators of elemental mercury, Coeur Rochester, Inc., and Nevada Gold Mines, LLC (NGM), filed complaints in United States District Court challenging, among other things, the validity of the Fee Rule and the designation. On August 21, 2020, DOE and NGM executed a settlement agreement that resolved NGM’s lawsuit. Under the settlement agreement with NGM, DOE agreed to withdraw the designation of WCS as a facility of DOE for the purpose of long-term management and storage of elemental mercury and agreed to accept title to and store 112 MT of elemental mercury that was in temporary storage at NGM facilities as of December 31, 2019. Consistent with the settlement agreement, on September 3, 2020, DOE filed a motion in the

District Court asking the Court to vacate and remand the Fee Rule. The District Court granted the motion to vacate and remand the Fee Rule on September 5, 2020. In an amended ROD, DOE subsequently withdrew the designation of WCS as the DOE facility for long-term management and storage, but also decided to store elemental mercury to which DOE accepts the conveyance of title pursuant to a legal settlement or proceeding at WCS, pursuant to MEBA (85 FR 63105, October 6, 2020). On April 25, 2021, the District Court signed a joint stipulation dismissing Coeur Rochester, Inc.'s lawsuit. On March 7, 2022, DOE published another amended ROD (87 FR 12680) to withdraw the decision to store at WCS certain elemental mercury to which DOE accepts conveyance of title pursuant to a legal settlement or proceeding.

On October 14, 2020, DOE issued a Sources Sought Synopsis/Request for Information to identify companies capable of potentially providing (1) leased space for the long-term management and storage of elemental mercury generated in the United States and (2) the associated services necessary for the long-term management and storage of elemental mercury. Section S.2.2 identifies how information received in response to this Sources Sought/Request for Information has informed the alternatives evaluated in this SEIS-II. DOE will continue to obtain additional information in a procurement process that will be ongoing in parallel with the development of this Mercury Storage SEIS-II. Information gained during the procurement process will inform the analysis and potential selection of a preferred alternative in this SEIS-II.[3]

On December 3, 2020, DOE issued basic ordering agreements to five companies to conduct nationwide waste management services, including ancillary services such as the long-term management and storage of elemental mercury.[4] Section S.2.3 identifies how outreach efforts to these contract awardees also informed the alternatives evaluated in this SEIS-II. On February 4, 2022, DOE issued a Request for Task Order Proposals to these five contract holders, seeking proposals to provide interim management and storage of the 112 MT of elemental mercury subject to the settlement agreement between DOE and NGM.

On March 17, 2022, DOE signed an Interim Action Determination that evaluates DOE's proposal to accept title to the 112 MT of elemental mercury from the NGM facilities and to provide interim management and storage of up to 120 MT, to allow for margin, of elemental mercury in a permitted facility selected by DOE based on responses to the Request for Task Order Proposals. The CEQ regulations at 40 CFR § 1506.l(a) state that "until an agency issues a finding of no significant impact, as provided in § 1501.6 of this chapter, or record of decision as provided in § 1505.2 of this chapter, no action concerning the proposal may be taken that would: (1) [h]ave an adverse environmental impact; or (2) [l]imit the choice of reasonable alternatives." DOE's implementing procedures refer to an "interim action" as, "an action concerning a proposal that is the subject of an ongoing EIS and that DOE proposes to take before the ROD is issued, and that is permissible under 40 CFR 1506.1" (10 CFR § 1021.104(b)).

[3] On March 24, 2022, DOE issued a Request for Proposals for Elemental Mercury Long-Term Management and Storage (https://www.energy.gov/em/articles/doe-issues-request-proposals-elemental-mercury-long-term-management-and-storage). The initial capacity requirement in the procurement is 1,280 MT, which would not include mercury currently stored as a commodity at Y-12. As identified in Section 2.1.2 of this SEIS-II, the Y-12 mercury could be identified as a waste in the future. DOE could modify the capacity requirement as needs dictate.
[4] https://www.energy.gov/em/articles/doe-awards-basic-ordering-agreements-nationwide-low-level-mixed-low-level-waste

As detailed in the Interim Action Determination, DOE determined that the proposed treatment, transportation, and interim management and storage of up to 120 MT of elemental mercury would not (1) have an adverse environmental impact; or (2) limit the choice of reasonable alternatives.[5] If DOE awards a task order as a result of the Request for Task Order Proposals and implements this interim action prior to issuance of the Final Mercury Storage SEIS-II, DOE will update the associated analyses in the Final SEIS-II to reflect the location and status of the elemental mercury subject to this interim action.

S.1.3 Proposed Action

DOE proposes to designate one or more facilities for the long-term management and storage of elemental mercury in accordance with MEBA. Facilities must comply with applicable requirements of Section 5(d) in MEBA, "Management Standards for a Facility," including the requirements of the *Solid Waste Disposal Act of 1965*, as amended by RCRA, and other state-specific permitting requirements (42 U.S.C. § 6939f(d)).

After completion of DOE's Proposed Action, DOE would establish the fee for long-term management and storage of elemental mercury through a rulemaking conducted pursuant to the *Administrative Procedure Act* (5 U.S.C. § 551 et seq.). DOE would evaluate the potential environmental impacts of the rulemaking in accordance with NEPA implementing procedures at 10 CFR Part 1021 at that time.

S.2 ANALYTICAL FRAMEWORK AND THE IDENTIFICATION, DESCRIPTION, AND COMPARISON OF ALTERNATIVES

S.2.1 Analytical Framework

The analysis of the Proposed Action requires the identification of several key parameters to establish a framework for the NEPA analysis. These key parameters include the following, which are addressed in more detail below:

- Duration of the Proposed Action assumed for analysis;
- Estimated mercury inventory used for analysis;
- Transportation of mercury to the DOE-designated storage facility; and
- Features of a mercury storage facility.

S.2.1.1 Duration of Proposed Action

The 2011 Mercury Storage EIS and 2013 Mercury Storage SEIS assumed a mercury storage period of 40 years for the analysis of potential environmental impacts. A degree of uncertainty in this timeframe was acknowledged because there was no U.S. Environmental Protection Agency (EPA)-approved method of treating nonradioactive mercury for eventual land disposal, and it was unknown when such a treatment method would be available. Because the eventual treatment and disposal of mercury was highly speculative, the 2011 EIS and 2013 SEIS did not consider or

[5] The Interim Action Determination is available at: https://www.energy.gov/nepa/doeeis-0423-s2-supplemental-environmental-impact-statement-long-term-management-and-storage

evaluate its treatment or disposal; therefore, the previous evaluations only evaluated the 40-year storage timeframe.

As of the publication of this Draft Mercury Storage SEIS-II, there still is no EPA-approved treatment method for nonradioactive mercury for eventual disposal in the United States; however, US Ecology has petitioned the EPA for a site-specific Determination of Equivalent Treatment for its permitted disposal facility. The EPA has posted a notice on its website that acknowledges its review of US Ecology's request for a site-specific variance for a new Land Disposal Restriction treatment technology that stabilizes elemental mercury extracted from high-level mercury-containing wastes through a process of conversion to mercuric sulfide followed by double encapsulation and monofil disposal. According to the notice, upon completion of its review, EPA will post a public notice in the Federal Register of its intent to approve or deny the petition and to solicit public comment. If approved, EPA would propose revisions to the regulations. The treatment technology described in US Ecology's variance request could offer a permanent disposal solution for elemental mercury in the United States. The EPA estimates that its draft Notice of Proposed Rulemaking to revise the regulations could be issued by November 2022.[6]

Section 2.6 of the Mercury Storage SEIS-II provides an overview of the Federal and state regulatory processes that would be required before an approved treatment method and disposal location could become a reality. As such, the Mercury Storage SEIS-II continues to consider the analysis and presentation of potential environmental impacts associated with treatment and disposal of mercury as speculative and assumes a 40-year mercury storage timeframe to be consistent with previous analyses. However, the SEIS-II includes a sensitivity study (Section 2.10) to provide a perspective of how the estimated environmental impacts might change if the duration required for DOE storage of MEBA mercury were shorter than 40 years. If a treatment method for mercury is approved and potential location(s) for land disposal are identified, DOE would evaluate, as appropriate, treatment and disposal actions related to elemental mercury stored in the DOE-designated facility under a separate NEPA review.

S.2.1.2 Estimated Elemental Mercury Inventory

Table S-1 provides the estimate of accumulated mercury inventory as of February 1, 2018 (consistent with the information in the 2019 Mercury SA) and includes an estimate of additional accumulation (primarily from ore processors) as of the date that DOE was required to accept mercury at a DOE-designated storage facility under MEBA (January 1, 2019; see Section S.1.1). Table S-2 provides projected inventories of mercury subject to MEBA based on updated annual generation rates from those used in the 2011 Mercury Storage EIS. The information in these tables provides a basis for the estimate of storage capacity needed for the 40-year period used for analysis in the Mercury Storage SEIS-II.

Table S.2-2 also includes the generation estimates and sources used in the 2011 Mercury Storage EIS and the 2013 Mercury Storage SEIS for comparison. The 2011 Mercury Storage EIS and the 2013 Mercury Storage SEIS assumed a total accumulation during a 40-year period of 10,000 MT

[6] The status of EPA's review of the petition can be found at: https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202104&RIN=2050-AH21.

(11,000 tons) of elemental mercury, which was rounded up from an actual estimated maximum total of 9,700 MT (10,700 tons).

Table S-1 U.S. Inventories of Elemental Mercury in Storage as of January 1, 2019

Source	Quantity as of 2/1/2018 (MT)	Quantity as of 1/1/2019 (MT)	Notes
Nevada ore processors	38	148[a]	Estimated based on average monthly generation rates.
Other U.S. ore processors	11	12	Estimated based on assumed annual generation of 6 MT (5 percent of Nevada ore processors) accumulated since passage of the Chemical Safety Act of 2016.
Commercial storage	301	301	Based on inventory information provided by commercial storage entities in early February 2018.
NNSA	1,206	1,206	Currently stored at the Y-12 National Security Complex in Oak Ridge, Tennessee. For analysis purposes, this inventory is assumed eventually to be managed as waste. Some or all could remain a commodity depending on NNSA mission needs.
Total	**1,600**	**1,700**	**Estimated inventory assumed subject to MEBA requirements. Rounded to two significant figures.**

MEBA=*2008 Mercury Export Ban Act*; MT=metric tons; NNSA=National Nuclear Security Administration.
Note: To convert metric tons to tons, multiply by 1.1023.
a. Per the settlement agreement with NGM (as discussed in Section S.1.2), the quantity of mercury that was in onsite storage in NGM's facilities was 112 MT as of December 31, 2019.

Table S-2 Projections of Annual Generation of Mercury Subject to MEBA

Source	SEIS-II Estimate	2011 EIS Estimate[a]	Notes
Nevada ore processors	120 MT/yr	127 MT/yr	The actual maximum estimated rate in the 2011 Mercury Storage EIS was 122.5 MT per year, or 4,900 MT total, which is consistent with the current estimate. The additional 5 MT per year is due to rounding used in the 2011 EIS.
Other U.S. ore processors	6 MT/yr	1 MT/yr	Non-Nevada mining is conservatively assumed to represent an amount equivalent to about 5 percent of the elemental mercury generation.
Chlor-alkali plants	0 MT/yr	27 MT/yr	The 2011 Mercury Storage EIS assumed that a total of about 1,200 MT would be shipped to the DOE storage facility. Current information indicates that the chlor-alkali plants are dispositioning excess elemental mercury using a Canadian facility and, therefore, would not be stored at a DOE facility.[c]
Recycling and reclamation	5 MT/yr	63 MT/yr	The 2011 Mercury Storage EIS estimated a 40-year total of 2,500 MT. Based on current data, no excess mercury is being generated as a result of these activities; however, a small quantity is included to account for uncertainty.

Source	SEIS-II Estimate	2011 EIS Estimate[a]	Notes
Total annual generation	130 MT/yr	220 MT/yr	Reported to only two significant digits due to uncertainty in the estimates.
Total accumulated as of 1/1/2019	1,700 MT[b]	1,200 MT	The SEIS-II estimate is from Table S-1 and includes all stored mercury as of January 1, 2019. The 2011 Mercury Storage EIS only accounted for the NNSA inventory in storage.
40-year total	6,900 MT (rounded to 7,000)	10,000 MT	The SEIS-II estimate is considered conservative based on the available information. Nevertheless, it represents about a 30-percent reduction from the 2011 Mercury Storage EIS.

MT=metric tons; NNSA=National Nuclear Security Administration; yr=year.

a. The values in this column were derived in the 2011 EIS but were also used for the analysis in the 2013 SEIS.

b. The SEIS-II estimate is from Table S-1.

c. In accordance with MEBA, elemental mercury is first converted to a mercury compound prior to shipping to Canada.

Note: To convert metric tons to tons, multiply by 1.1023.

As demonstrated in Table S-2, the annual generation rates assumed for the SEIS-II have decreased for some generators (as compared to 2011) and now total approximately 130 MT per year. Adding the projected MEBA mercury generated over the next 40 years to the estimated 1,700 MT already accumulated as of January 1, 2019 (from Table S-1) yields about 7,000 MT, a reduction of about 30 percent from the 2011 EIS and 2013 SEIS.

As identified in Section S.2.1.1, there is the possibility that a treatment and disposal approach for elemental mercury could be approved by regulatory authorities and available much earlier than 40 years. If a treatment and disposal approach becomes available and DOE completes the required steps to utilize that approach, DOE could begin the process of sending elemental mercury for treatment and ultimate disposal and eliminate the need for storage. This possibility introduces an uncertainty in the necessary capacity of a DOE-designated storage facility. For instance, if a treatment and disposal approach were available within five years, the total estimated amount of elemental mercury to be accumulated and need storage by that time would be about 2,500 MT.

S.2.1.3 Transportation of Mercury

Transportation of the mercury from source locations to the designated storage facility(ies) is analyzed as an element of the Proposed Action. To ensure a conservative analysis of potential transportation impacts, this Mercury Storage SEIS-II also considers the potential additional transportation for shipment of mercury from ore processors to a RCRA-permitted treatment facility to ensure that the mercury meets the waste acceptance criteria prior to shipment to the DOE-designated storage facility(ies). The 2011 Mercury Storage EIS and 2013 Mercury Storage SEIS evaluated potential impacts of transportation by truck and rail. After further evaluation, it was determined that rail transportation is an unlikely transportation mode. Rail transportation also requires truck transportation at the source location and at the storage facilities to move the mercury to and from the rail facility. This introduces additional handling (i.e., loading and unloading) of the mercury containers. Because mercury shipments would come from multiple source locations, the size of individual mercury shipments likely would be small relative to the capacity of railcars, making rail transportation less economical or efficient. Truck transportation can handle the size of mercury shipments and move the mercury containers directly from the generator to the storage facilities, eliminating additional handling of the mercury storage containers. Therefore, this Mercury Storage SEIS-II does not reevaluate rail transportation.

S.2.1.4 Features of a Mercury Storage Facility

As required by MEBA (42 U.S.C. § 6939f(d)), DOE developed guidance,[7] entitled *U.S. Department of Energy Interim Guidance on Packaging, Transportation, Receipt, Management, and Long-Term Storage of Elemental Mercury* (Interim Guidance) (DOE 2009), identifying the basic standards and procedures for the receipt, long-term management, and long-term storage of mercury at a DOE facility. The Interim Guidance, which was prepared in 2009, is primarily based on laws, regulations, and DOE Orders and Standards, but also includes best management practices and other desired conditions and features.[8] DOE is considering updates to the 2009 Interim Guidance. The specific requirements for a DOE mercury storage facility are based on RCRA requirements and will be included in the procurement and contractual documents associated with the designated facility(ies). Similarly, the waste acceptance criteria for the facility designated for long-term management and storage of elemental mercury would be specific to the facility designated and would be determined by the state regulator. In addition to shipping, handling, storage, and administrative areas, examples of the expected technical characteristics of a long-term mercury storage facility would include the following):

- RCRA-regulated/permitted with proper spill containment features and emergency-response procedures,
- Fully enclosed[9] weather-protected building(s),
- Reinforced-concrete floors able to withstand structural loads of mercury storage,
- Ventilated storage and handling area(s),
- Fire suppression systems, and
- Security and access control.

These expectations are based on existing requirements prescribed in applicable RCRA regulations (e.g., 40 CFR Parts 264 and 265), Occupational Safety and Health Administration (OSHA) regulations (e.g., 29 CFR Part 1910, Subpart H, “Hazardous Materials, Subpart L Fire Protection,” and Subpart Z, “Toxic and Hazardous Substances”), National Fire Protection Association (NFPA) standards (e.g., NFPA 101, “Life Safety Code”), and the International Building Code (IBC) (e.g.,

[7] The Interim Guidance was prepared after consultation with EPA and all appropriate state agencies in affected states.

[8] The 2011 Mercury Storage EIS and 2013 SEIS included an assumption of 99.5% elemental mercury by volume, which was an assumption in DOE’s 2009 Interim Guidance. This SEIS-II does not include this assumption; however, the analysis does assume that only RCRA hazardous waste with codes D009 and/or U151 would be in the containers, ensuring that no other hazardous materials need to be considered. Additionally, RCRA regulations require that the containers not include contaminants that would be corrosive or other incompatible materials (e.g., acid solutions, chloride salt solutions, water) that would compromise the integrity of the containers during storage, per 40 CFR 264/265.172.

[9] This requirement is implied by 40 CFR § 264/265.173(b), which states that a hazardous waste container must not be *“…stored in a manner which may rupture the container or cause it to leak.”* For long-term storage, extending potentially for several decades, exposure of carbon steel containers to weather elements could result in container failures and not be compliant with this regulation.

IBC Chapter 3, "Occupancy Classification and Use"), as well as state-specific requirements that may be imposed.

The mercury storage facility is assumed to accept two types of mercury containers: 3-liter (3-L) (76-pound) flasks and 1-MT (1.1-ton) containers. Figure S-1 shows the typical 3-L flask and 1-MT container that are used to store mercury. These two types of containers are commercially available and routinely used in industry for storage and transport of elemental mercury. They are typically made of carbon steel and also satisfy the U.S. Department of Transportation hazardous materials regulations for mercury transport (49 CFR § 172.101).

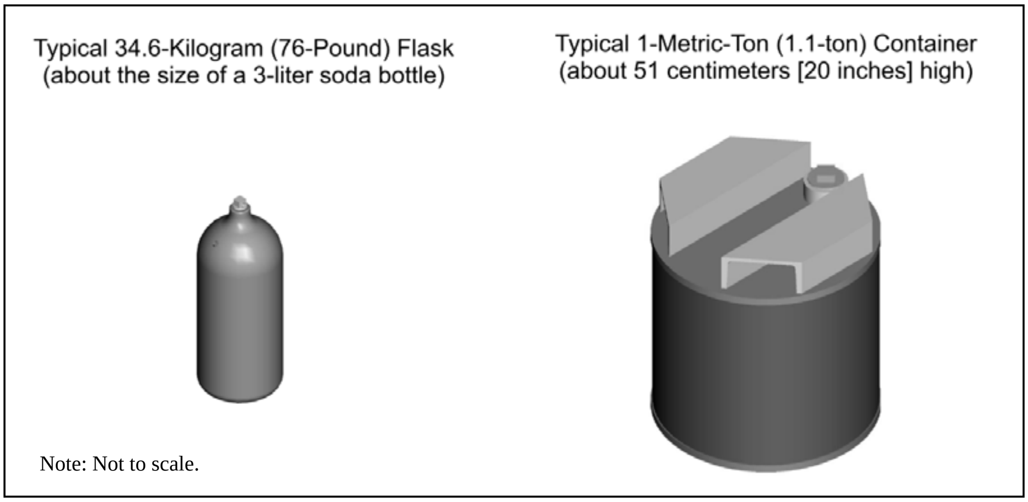


Figure S-1 Typical Elemental Mercury Storage Containers

Based on the facility structural capabilities, the storage containers may be single- or double-stacked, depending on seismic and safety considerations and lifting equipment limitations, as well as the requirements of the RCRA permit. If stacking were implemented, its configuration would have to provide for compliance with RCRA inspection and containment requirements.

The facility would have a reinforced-concrete floor, strong enough to withstand the heavy loads from mercury storage. The facility will utilize spill containment trays or have floors treated with an epoxy or other acceptable sealant to add strength and make them impervious to mercury leaks and spills and water from the fire suppression system. The facility would include a receiving and shipping area. The facility would be RCRA-regulated and -permitted, and thus would require, among other things, secondary containment (e.g., curbing), regular inspection of stored materials, strict recordkeeping, and periodic reporting. The building would have ventilation, fire suppression, and security monitoring systems appropriate for a RCRA-permitted mercury storage facility and as determined by NFPA and IBC requirements. Security provided for the facility would reduce the threat of inadvertent or deliberate unauthorized access to the facility. Security measures might include fences, barriers, locks, video monitoring, alarms, and guards.

Operations personnel would include management and administrative staff, facility technicians, facility maintenance staff, and security staff. Worker activity levels at the storage facility would increase during periods of receipt of mercury shipments. Facility technicians would be responsible for inspections and leak and small-spill response. Facility maintenance staff would be responsible for maintaining the operability of the building(s).

S.2.2 Potential Storage Facility Alternatives

The alternatives considered in the 2011 Mercury Storage EIS and the 2013 Mercury Storage SEIS included construction of new facilities and the use of existing facilities for the long-term management and storage of mercury. These alternatives are identified in Table S-3. In this Mercury Storage SEIS-II, DOE's range of reasonable alternatives includes existing facilities that could be designated with only minor modifications to meet the permitting requirements for mercury storage. Construction of a new facility generally would not meet the purpose and need for agency action, as identified in Section S.1.1, since schedule delays associated with new construction would further exacerbate the MEBA requirement that a DOE-designated storage facility be operational by January 1, 2019. New construction would add at least three years, when compared to using existing facilities, negatively impacting the statutorily imposed schedule for DOE's receipt of elemental mercury.

Table S-3 Alternatives Evaluated in the 2011 Mercury Storage EIS and 2013 Mercury Storage SEIS

Facility Alternative	Location	New Construction/Existing
2011 Mercury Storage EIS		
DOE Grand Junction Disposal Site	Grand Junction, Colorado	New Construction
DOE Hanford Site	Near Richland, Washington	New Construction
Hawthorne Army Depot (HWAD)	Hawthorne, Nevada	Existing Facility
DOE Idaho National Laboratory	Near Idaho Falls, Idaho	Existing Facility and New Construction
Bannister Federal Complex	Kansas City, Missouri	Existing Facility
DOE Savannah River Site	Near Aiken, South Carolina	New Construction
Waste Control Specialists LLC (WCS) Site	Near Andrews, Texas	Existing Facility and New Construction
2013 Mercury Storage SEIS		
Waste Isolation Pilot Plant (three separate locations)	Near Carlsbad, New Mexico	New Construction

Sources: 2011 Mercury Storage EIS and 2013 Mercury Storage SEIS

Of the four existing facilities evaluated in the 2011 Mercury Storage EIS, two remain as reasonable alternatives: HWAD and the WCS site.

This Mercury Storage SEIS-II also evaluates other alternative facilities that maintain or would be capable of maintaining a RCRA Part B permit for the long-term management and storage of mercury. DOE used four methods to identify these additional alternatives: (1) DOE contacted commercial facilities that had previously certified to DOE that they meet the requirements to accept and store elemental mercury at least until the DOE-designated facility is operational and accepting shipments of mercury;[10] (2) DOE issued a Sources Sought Synopsis/Request for Information to identify companies to potentially provide leased space and/or associated services

[10] The permitted mercury storage facility notifications can be found at the following link: https://www.energy.gov/em/downloads/permitted-mercury-storage-facility-notifications

for the management and storage of mercury; (3) DOE issued basic ordering agreements to companies to conduct nationwide waste management services, including ancillary services such as management and storage of mercury; and (4) DOE reevaluated existing facilities on DOE property that could be repurposed for the management and storage of mercury.

Through an evaluation of the alternatives analyzed in previous NEPA documents and the outreach efforts described above, DOE has identified the following reasonable alternative sites for evaluation in this Mercury Storage SEIS-II (Figure S-2):

- HWAD in Hawthorne, Nevada;
- WCS site near Andrews, Texas;
- Bethlehem Apparatus Company in Bethlehem, Pennsylvania;
- Perma-Fix Diversified Scientific Services, Inc. (Perma-Fix DSSI), in Kingston, Tennessee;
- Veolia in Gum Springs, Arkansas; and
- Clean Harbors (facilities in Pecatonica, Illinois; Greenbrier, Tennessee; and Tooele, Utah).

The following sections describe the characteristics and processes associated with each identified potential mercury storage facility. Table S-4 compares key physical characteristics of the eight site locations.

As applied to existing facilities evaluated in this Mercury Storage SEIS-II, DOE expects that some of the buildings being considered may require minor modifications to meet the applicable regulatory (i.e., NFPA, OSHA, IBC) and RCRA permit requirements for storing mercury. Additionally, for Federal Government-owned facilities, compliance with applicable DOE standards may also be required. Characteristics of the building systems, such as fire protection, ventilation, secondary containment, and security, and permitted uses vary among the site locations based on current use, building size, and current permit conditions. For example, mercury vapor monitors may need to be added to mercury storage and handling areas. Because it is not possible to identify each modification that may be required for each building, for the purposes of this SEIS-II, these are considered minor modifications that occur internal to the building and do not affect the analysis of potential impacts. In addition, RCRA permit modifications required prior to mercury storage, including updates to Emergency Response Plans, would address various building systems. DOE assumes that the designated building(s) for mercury storage would meet Federal and/or state permit requirements prior to acceptance, receipt, and storage of mercury and provide the appropriate safeguards and protections to workers and the general public. Depending on the regulator, the applicable RCRA permit may be modified to include the DOE as a co-permittee.

Figure S-2 Locations of Alternative Sites being Evaluated for Long-Term Management and Storage of Mercury

Table S-4 Comparison of the Physical Characteristics of Potential Mercury Storage Locations

Location Characteristic	Hawthorne Army Depot	WCS Site	Bethlehem Apparatus[a]	Perma-Fix DSSI	Veolia Gum Springs	Clean Harbors Grassy Mountain	Clean Harbors Greenbrier	Clean Harbors Pecatonica
Location	Hawthorne, NV	Andrews County, TX	Bethlehem, PA	Kingston, TN	Gum Springs, AR	Tooele, UT	Greenbrier, TN	Pecatonica, IL
Site Property Size	147,000 acres	13,500 acres	10 acres	80 acres	1,400 acres	640 acres	12 acres	10 acres
Developed Area Footprint[b]	175 acres	1,338 acres	10 acres	12 acres	75 acres	0.4 acres	5.3 acres	4 acres
Number of Buildings w/in Proposed Facility	Up to 29	1	2	2	1	1	1	2
Building(s) size (length by width)	Three storehouse types 200×50 ft 160×50 ft 100×50 ft	190×166 ft	Bldg 945 192×160 ft Bldg 1055 120×120 ft	CSBU 140×60 ft CSBU Expansion 140×60 ft	Rectifier Area 368×47 ft Sand and Lime Area 378×67 ft Second Cut Area 210×66 ft	80×73 ft	100×60 ft	CSB-1 100×60 ft CSB-2 274×168 ft
Building(s) Height	14.8 ft	25 ft	Bldg 945 20 ft Bldg 1055 24 ft	18.5 ft	44.9 ft	30 ft	20 ft	CSB-1 12 ft CSB-2 16–20 ft
Building Construction	Concrete floor, walls, and support columns with steel roof trusses and transite roofing	Steel frame, metal building on concrete with 24-in-diameter piers	Steel frame, insulated metal walls, and concrete slab-on-grade floor	Steel frame, insulated metal walls, pier/footing, and foundation concrete slab-on-grade floor	Concrete and steel	Steel frame, insulated metal walls, and concrete slab floor	Pre-engineered steel frame with insulated metal walls	Steel frame, insulated metal walls, and concrete slab floor

Location Characteristic	Hawthorne Army Depot	WCS Site	Bethlehem Apparatus[a]	Perma-Fix DSSI	Veolia Gum Springs	Clean Harbors Grassy Mountain	Clean Harbors Greenbrier	Clean Harbors Pecatonica
Available Storage Space	220,000 ft^2	24,874 ft^2	Bldg 945 30,110 ft^2 Bldg 1055 14,400 ft^2	CSBU 6,450 ft^2 CSBU Expansion 8,400 ft^2	Rectifier Area 17,296 ft^2 Sand and Lime Area 25,326 ft^2 Second Cut Area 13,860 ft^2	5,840 ft^2	2,430 ft^2	CSB-1 4,360 ft^2 CSB-2 29,232 ft^2
Estimated Mercury Storage Capacity (metric tons)	7,000	3,000	Bldg 945 3,000 Bldg 1055 3,000	CSBU 1,200 CSBU Expansion 1,800	6,352 to 12,704	900	1,875	CSB-1 2,465 CSB-2 12,330
RCRA Permitted for Hazardous Waste	Yes, not specific to these buildings for mercury storage	Yes, permitted for mercury storage	Bldg 945 – Yes Bldg 1055 – No	Yes, modification to increase storage capacity	Yes, modification may be required	Yes, expect a Class 2 permit mod from Utah for mercury.	Yes, permitted to store mercury	Yes, permitted to store mercury
Secondary Containment	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Floor Sealant	No	Yes	Yes	Yes	No	In Progress	Yes	Yes

Location Characteristic	Hawthorne Army Depot	WCS Site	Bethlehem Apparatus[a]	Perma-Fix DSSI	Veolia Gum Springs	Clean Harbors Grassy Mountain	Clean Harbors Greenbrier	Clean Harbors Pecatonica
Access/ Security	Military Base Manned control point 24/7 security patrols	Facility located within a larger hazardous waste storage complex with perimeter fence and gated access.	Work area fenced and gated. Facility secured with locks and access codes, motion sensor detectors, and third-party 24/7 monitoring service.	Facility enclosed by a 6-ft-high chain-link fence. Access controlled through manned security gate.	Facility enclosed by a 6-ft-high chain-link fence with three strands of barbed wire. Access controlled through security gate.	Facility enclosed by a 6-ft-high chain-link fence with three strands of barbed wire. Access controlled through security gate.	Facility enclosed by a 6-ft-high chain-link fence with three strands of barbed wire. Access controlled through security gate. Facility secured with alarm system and third-party 24/7 monitoring service.	Facility enclosed by a 6-ft-high chain-link fence with three strands of barbed wire. Access controlled through security gate.
Fire Suppression	No	Yes	Bldg 945 – Yes Bldg 1055 – Yes	Yes	Yes	Yes	Yes	Yes
Ventilation System	No	Mechanical	Mechanical	Mechanical	Passive	Mechanical/ passive	Passive	Passive

Bldg=building; CSB=Container Storage Building; CSBU=Container Storage Building Unit; ft=foot/feet; WCS=Waste Control Specialists

a Bethlehem Apparatus buildings are located on two separate land parcels.

b Developed area footprint is the developed area within each site location (in some cases may include maintained landscape areas). Proposed facilities could include multiple buildings.

S.2.2.1 Alternative 1: Hawthorne Army Depot

The HWAD is located just outside Hawthorne, Nevada. The 147,000-acre site is owned and managed by the U.S. Department of Defense (DoD). The HWAD contains 2,427 magazines (storage buildings for military ammunition, explosives, or provisions) and 488 buildings with a combined storage footprint of 7,685,000 square feet.

Facility Characteristics and Storage

Under this alternative, DOE would designate a maximum of 29 buildings in the Central Magazine Area (Group 110 design storehouses). The buildings include three sizes of storehouses: 50×100, 50×160, and 50×200 feet. Assuming each sized building comprises about one-third of the 29 buildings, the buildings would provide up to approximately 220,000 square feet of space for DOE storage of mercury (Figure S-3). Many of these buildings are currently used for storage. HWAD would remove and re-warehouse these materials prior to use for mercury storage. Modifications to the proposed buildings would be required prior to DOE storage of mercury and would include modifying some space to create a handling area; reinforcing and appropriately sealing the floors; and installing spill-control berms or curbing, fire protection systems, ventilation systems, and necessary utilities. These 29 buildings are similar to the 14 buildings designated for Defense National Stockpile Center (DNSC) storage of mercury before they were modified.[11] HWAD operates under an existing RCRA permit. However, the RCRA permit would have to be modified for DOE mercury, or a new RCRA permit may be required. Figure S-4 shows the location of the 29 storage buildings in relation to the DNSC mercury storage buildings and other buildings within the HWAD. Truck access is available to each building in the Central Magazine Area. The buildings are located within a restricted area behind a manned control point and round-the-clock security patrols.

Figure S-3 Existing Storage Buildings at the HWAD in Nevada

[11] The DoD currently stores 4,436 metric tons (4,890 tons) of DNSC elemental mercury in fourteen buildings (Group 110 design storehouses) in the Central Magazine Area. The design of the buildings consists of reinforced-concrete walls, floors, and foundations. The roof materials are steel truss systems covered with asbestos concrete (transite) roofing material. This mercury is separate from the elemental mercury analyzed in this Mercury Storage SEIS-II.

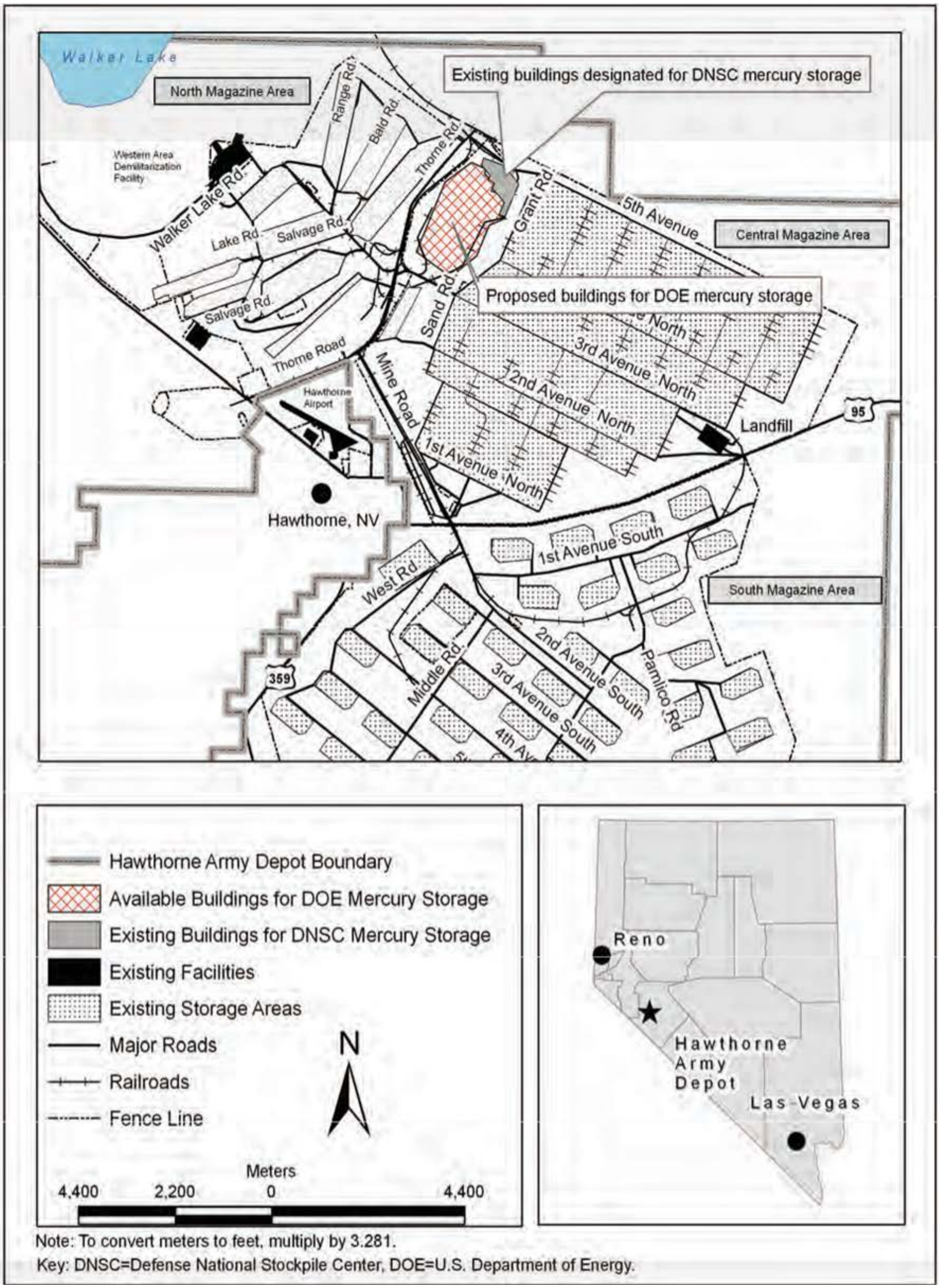


Figure S-4 Location of Proposed Buildings for Storage of DOE Mercury in Central Magazine Area at HWAD

S.2.2.2 Alternative 2: Waste Control Specialists Site

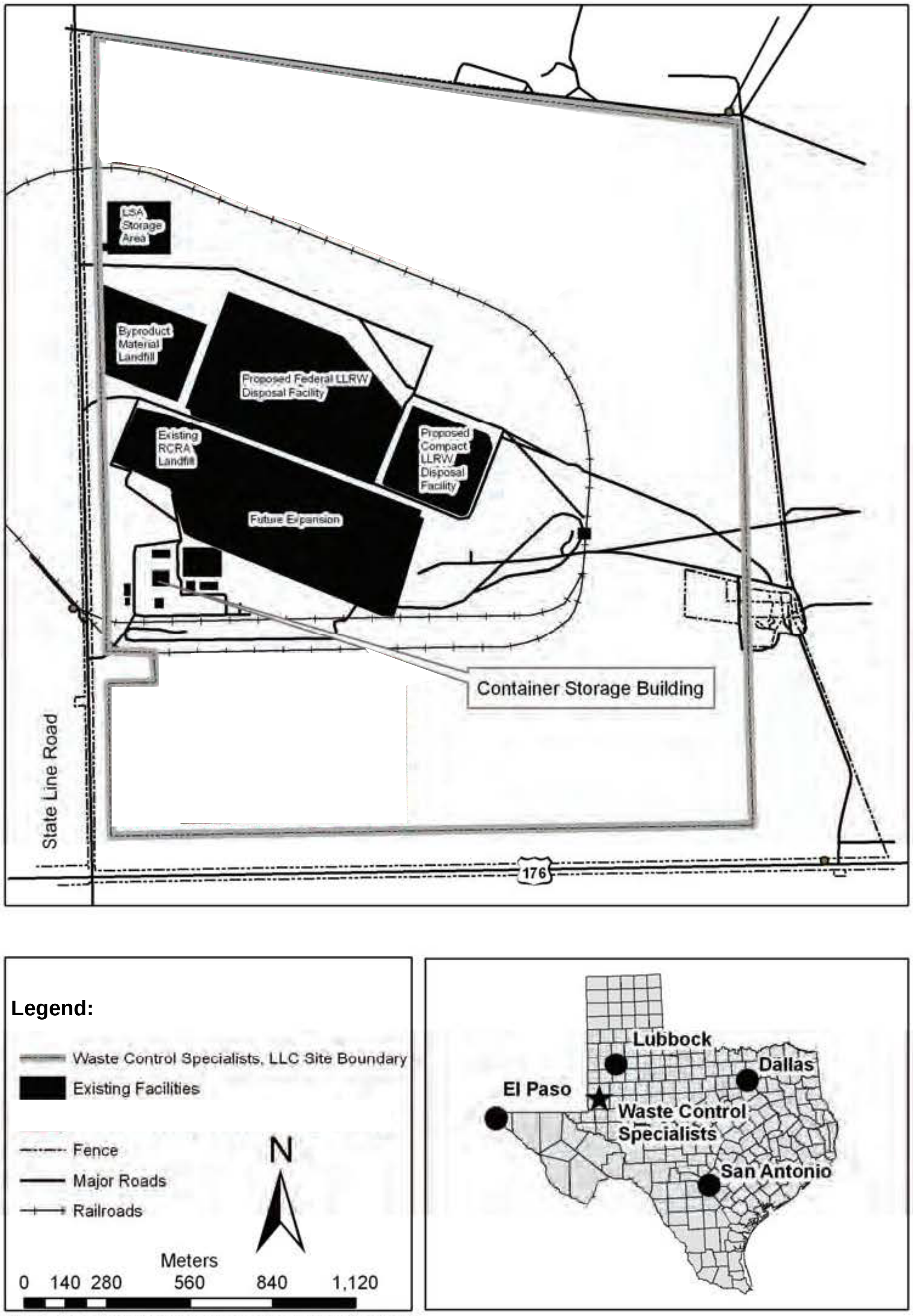
WCS owns a 13,500-acre site located approximately 31 miles west of Andrews, Texas, and six miles east of Eunice, New Mexico. Within this site, WCS operates a 1,338-acre facility for the treatment, storage, and landfill disposal of various hazardous and radioactive wastes. This facility is licensed by the Texas Commission on Environmental Quality and consists of the Texas Compact Waste Facility, Federal Waste Facility, the Byproduct Facility, a landfill for disposal of hazardous waste, and an area for the treatment and storage of various waste streams.

Facility Characteristics and Storage

Within the developed area designated for treatment and storage of hazard waste, the CSB is configured to store hazardous waste and has been modified to store elemental mercury (Figure S-5). The CSB is a commercial-grade metal building sitting on a reinforced concrete foundation with 24-in-diameter piers. The CSB is 190×166 feet and is currently permitted to store mercury to which DOE has accepted title. The CSB has 10 bermed container storage areas and two separate drum staging areas. These areas are designed to provide protection from the external environment and isolation from other storage areas in the event of a leaking source. Four of the bermed container storage areas are currently permitted for the long-term storage of mercury under MEBA. The current permitted storage capacity is 1,206 MT (1,330 tons) of mercury, assuming a container mixture of 948 1-MT containers and 129 pallets of 3-L flasks (WCS 2021a). With additional permit modifications, the total available mercury storage capacity could be approximately 3,000 MT (3,307 tons). Potential additional storage capacity could be available in a second existing facility with permit authorizations if needed in the future.

Figure S-5 Container Storage Building at Waste Control Specialists Site

As shown in Figure S-6, the CSB is located within a larger hazardous waste disposal and storage area that is secured with a perimeter fence and gated access. The CSB is equipped with a fire suppression system. The 10-compartment storage area in the CSB is ventilated by two exhaust fans. The mercury storage area is equipped with a mercury vapor monitor. WCS also has available several mercury spill kits, vapor suppressant, drum overpacks, and a mercury vacuum with filtration.



Note: To convert meters to feet, multiply by 3.281.

Key: LLRW=Low-Level Radioactive Waste, LSA=Liquid Storage Area, RCRA=Resource Conservation and Recovery Act.

Figure S-6 Location of Proposed CSB for Storage of DOE Mercury at the WCS Site

S.2.2.3 Alternative 3: Bethlehem Apparatus Site

Bethlehem Apparatus Company operates two sites in Northampton County in eastern Pennsylvania that use various methods for the treatment of mercury. The original "Hellertown Site" is located at 890 Front Street, Hellertown, Pennsylvania. The newer "Bethlehem Site" is located at 935 and 945 Bethlehem Drive, Bethlehem, Pennsylvania, and consists of two buildings on a 7.2-acre parcel in a mixed commercial/industrial area. These buildings are operated as one RCRA-permitted facility through site access control. A third building at the Bethlehem Facility is located at 1055 Win Drive, approximately 460 feet south of 935 Bethlehem Drive, on a 1.24-acre parcel. The Bethlehem Drive facility has two primary processes: (1) reclamation of mercury from mercury-bearing hazardous waste for sale to commercial and industrial users and (2) mercury retirement in which elemental mercury is converted to mercury sulfide for potential landfill disposal.[12] The 935 Bethlehem Drive building is approximately 38,400 square feet and includes an office area, a paved receiving lot, a material sorting and preparation area with various safety and handling equipment, an enclosed and covered container storage area, six high-vacuum mercury retorts and associated equipment, a high-vacuum auto-feed retort system, a calomel (mercurous chloride) process area, a research and development laboratory, and a mercury amalgamation area (for mercury retirement). The 945 Bethlehem Drive building is primarily used for storage of incoming waste materials to be processed and materials that have been processed and are awaiting disposition. A mercury decanting operation in Building 945 purifies mercury product prior to shipping off site. The 1055 Win Drive building is used as general warehouse storage. Adjacent sites are commercial/light industrial properties. Beyond the adjacent commercial/light industrial properties are some scattered enclaves of residential houses.

The existing storage buildings at 945 Bethlehem Drive and 1055 Win Drive are being considered for the DOE mercury storage facility(ies) and can provide for up to approximately 6,000 MT (6,600 tons) of mercury storage capacity.

Facility Characteristics and Storage

Building 945

The Bethlehem Apparatus primary candidate mercury storage facility is the operational, RCRA-permitted facility located at 945 Bethlehem Drive, Bethlehem, Pennsylvania (Figure S-7). Building 945 is a standard industrial structure constructed of a steel frame with insulated metal walls and a concrete slab-on-grade floor. The building measures 192×180 feet and is 20 feet high, providing a total of 30,110 square feet of floor space. Due to co-located storage of other waste materials, this building has a mercury storage capacity of up to approximately 3,000 MT (3,300 tons).

The floor in Building 945 has been sealed with a polymer coating, in accordance with permit requirements, to ensure that no waterborne contaminants can escape the facility. Building 945 also includes 4-inch-high sealed concrete containment curbing around the interior perimeter. All expansion joints have been sealed to ensure complete containment of all materials accepted.

[12] At present, landfill disposal is not allowed in the United States; however, Bethlehem Apparatus prepares mercury sulfide for clients proposing to dispose of mercury in Canada.

Figure S-7 Bethlehem Apparatus Building 945 (foreground) and Building 935 (rear left)

Facility operations (i.e., container handling and management) are conducted inside the enclosed, covered building, such that exterior containment is not necessary.

Building 945 includes exhaust fans that are nominally located near the roof line; however, they are not credited as an environmental control system intended to maintain mercury vapors below healthy breathing levels in the event of a spill. Rather, operation of Building 945 leverages existing Bethlehem Apparatus operational expertise and infrastructure (i.e., from ongoing activities related to mercury treatment) to minimize airborne releases from the facility. Specifically, mercury spill kits and portable mercury vacuums are used for cleaning any spilled mercury. Various models of dust collection/mercury vapor filtration mobile units are also available to manage fugitive emissions from spills. To provide the ability to quickly identify and respond to off-normal conditions (e.g., leaking containers, spills), staff members inspect all containers weekly and record mercury vapor readings daily, in accordance with permit requirements.

Building 945 includes security features to prevent unauthorized entry. The receiving area is fenced. Door keys and security codes are required for access. Entry sensors and motion detectors are installed in the building to further enhance the facility security. Finally, a third-party contractor provides 24-hour intrusion-monitoring services.

Fire protection in Building 945 is provided by a conventional sprinkler system that is compliant with the National Fire Protection Association regulations and local codes. Additionally, similar to security measures, 24-hour, third-party monitoring service is provided for both normal working hours and after hours. The building also includes fire extinguishers strategically located throughout the facility in accordance with National Fire Protection Association requirements and local fire codes. To confirm this compliance, the local fire department periodically conducts inspections of Building 945.

Building 1055

The second structure, located at 1055 Win Drive, Bethlehem, Pennsylvania (Building 1055), is currently used as a general storage warehouse (Figure S-8). The building measures 120×120 feet and is 24 feet high, providing a potential additional 14,400 square feet of floor space, with a total mercury storage capacity of approximately 3,000 MT (3,300 tons). Currently, Building 1055 is not included in the RCRA permit but could be added through a permit modification. The floor in Building 1055 has been sealed with a polymer coating to ensure that no waterborne contaminants can escape the facility. Building 1055 also includes 4-inch-high sealed concrete containment curbing around the interior perimeter. All expansion joints have been sealed to ensure complete containment of all materials accepted.

Figure S-8 Bethlehem Apparatus Building 1055

Although Building 1055 is an operational storage facility, as mentioned above, it is not a RCRA-permitted hazardous waste storage facility, and the staff does not work full time in the facility, nor do workers routinely inspect the contents and their condition. Certain operations activities would have to be implemented for the facility to be acceptable for long-term management and storage of elemental mercury. However, Building 1055 does include security features to prevent unauthorized entry. Specifically, the building is locked and alarmed after hours. Door keys and security codes are required for both normal and after-hour access. Entry sensors are installed in the building to further enhance the facility security. Finally, a third-party contractor provides 24-hour intrusion-monitoring services.

The fire-protection system in Building 1055 is a dry-pipe sprinkler system, which is compliant with all applicable National Fire Protection Association requirements and local codes for the service conditions.

S.2.2.4 Alternative 4: Perma-Fix Diversified Scientific Services Inc. Site

Perma-Fix DSSI operates a RCRA-permitted hazardous waste treatment facility in Roane County, Tennessee, that accepts and treats low-level radioactive and mixed (hazardous and radioactive) wastes from offsite government (e.g., DOE) and commercial generators that are mandated for regulated treatment and disposal with unique consideration of radiological properties. The Perma-Fix DSSI site is located approximately 4.5 miles east of Kingston and 10 miles southwest of Oak Ridge, Tennessee, and encompasses approximately 80 acres, of which about 12 acres have been developed (i.e., cleared of natural vegetation) and 7.2 acres have been fenced and permitted as a hazardous waste facility. Perma-Fix DSSI has constructed a new 8,400-square-foot container storage building (referred to as the Container Storage Building Unit [CSBU]) to support waste and material storage. This building could be used for the long-term management and storage of mercury. Independent of the Proposed Action, Perma-Fix DSSI is also planning to build an additional building (referred to as the CSBU expansion) immediately adjacent to the CSBU as part of their corporate planning. This CSBU expansion could also be used for the long-term management and storage of mercury.

Facility Characteristics and Storage

The Perma-Fix DSSI CSBU proposed for mercury storage is located on the north side of the site (Figure S-9). The CSBU is approximately 140×60 feet and 18.5 feet at peak height. Approximately 6,450 square feet of the building is storage area with secondary containment by perimeter curbing and epoxy sealant coating on the floor. The remaining 1,950 square feet of the building is laboratory space. On the southwest side, the roof extends about 14 feet beyond the wall to create a covered unloading bay (Figure S-10). On the northwest end of the building, the roof extends about 20 feet beyond the laboratory space to create a covered area. The storage area floor design allows up to triple stacking of 1-MT containers, configured as four containers on 4×4-foot steel pallets. Assuming 36-inch aisles, the storage area can accommodate up to 1,200 MT (1,323 tons) of elemental mercury.

Perma-Fix DSSI plans to construct the CSBU expansion immediately adjacent to the CSBU and the new building would be the same type of construction as the CSBU but with all 8,400 square feet of space available for mercury storage. The mercury storage capacity of the CSBU expansion would be approximately 1,800 MT, bringing the total Perma-Fix storage capacity to about 3,000 MT at the facility.

The proposed mercury storage area has a fire suppression system. The facility also has onsite fire hydrants supplied by utility service water. The Kingston Fire Department operates a fire station across the road from the Perma-Fix DSSI site. The ventilation system in the CSBU could require minor upgrades, such as replacing carbon filters with sulfur-impregnated filters and installing mercury vapor monitors.

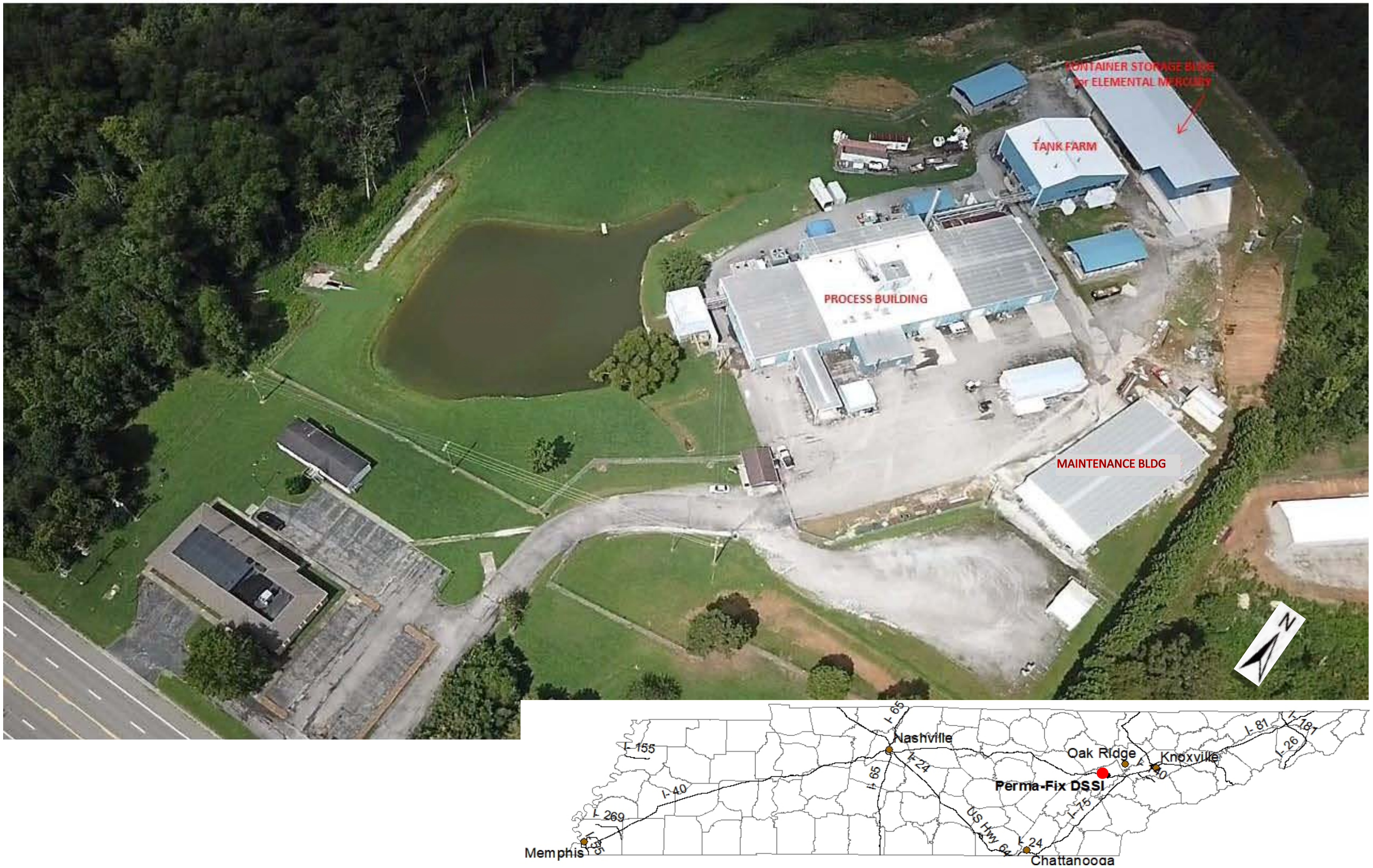


Figure S-9 Perma-Fix DSSI Facility in Kingston, Tennessee

Figure S-10 Perma-Fix DSSI CSBU

Security measures of the Perma-Fix DSSI site comply with requirements under 40 CFR 264.14 for controlling access to treatment, storage, and disposal facilities that handle hazardous waste. Primary access to the active operational area is controlled by a gate/guardhouse monitored by security personnel 24 hours a day. A 6-foot-high chain-link fence surrounds the RCRA-permitted area of the facility. All non-employees, contractors, and waste transporters must sign in and sign out to account for all personnel on site.

S.2.2.5 Alternative 5: Veolia Gum Springs Site

Veolia operates a waste treatment complex and Subtitle C hazardous waste landfill in Clark County in southwestern Arkansas near the community of Gum Springs (referred to as Veolia Gum Springs, [VGS]). The nearest population center is Arkadelphia, Arkansas, about five miles north of VGS. Veolia owns approximately 1,500 acres east of the Gum Springs community. The hazardous waste treatment facility occupies about 75 acres. A landfill occupies about 90 acres to the east of the treatment facilities. The remaining land owned by Veolia surrounds the operational facilities and is used for agriculture or is mixed pine-hardwood forest.

VGS operates two rotary kilns for thermal treatment and incineration of hazardous and nonhazardous liquids, sludge, solids, and debris. VGS also operates a large stabilization unit for the treatment of liquids, sludge, and solids requiring RCRA-regulated metals stabilization prior to being landfilled. The indoor process has dust suppression and dust collection and can handle high volumes of materials for metals stabilization.

Facility Characteristics and Storage

The hazardous waste treatment facility at VGS has approximately 10 acres under roof (Figure S-11). Buildings are concrete and steel construction with floors ranging in depth from 8 to 12 inches of high-strength concrete that previously supported aluminum smelting operations. VGS has identified three potential locations within the larger facility as potential mercury storage locations. The Rectifier Area is located on the west end of the facility and is approximately 368×47 feet; the Sand and Lime Area is about 378×67 feet; and the Second Cut Area is about 210×66 feet. Total potential storage space is 56,500 square feet. Building height is 45 feet. These spaces are part of the overall RCRA permit for the building but are not currently used for hazardous waste storage, and secondary containment curbing and appropriate floor sealant would need to be added to any areas designated for mercury storage. Estimated mercury storage capacity is 6,352–12,704 MT (7,002–14,004 tons) depending on whether containers are stacked.

Figure S-11 Veolia Gum Springs Facility in Clark County, Arkansas

Twenty-five fire hydrants are located throughout the facility. VGS maintains and follows a site security plan. The treatment facility and landfill are surrounded by a 6-foot-high chain-link fence topped with barbed wire. The main gate is only accessible to VGS employees with proper identification. The security system monitors and records all VGS personnel that enter and exit the facility. A high-definition camera system is used throughout the facility and is live monitored from the control room and security building.

S.2.2.6 Alternative 6: Clean Harbors

Clean Harbors has a total of three potential facilities at three different site locations that could be used for mercury storage (see Figure S-2). The Clean Harbors Grassy Mountain site is a RCRA-permitted hazardous waste treatment, storage, and disposal facility located in Tooele County, Utah, on the eastern edge of the northern Great Salt Lake Desert, seven miles north of Interstate 80 (I-80). Clean Harbors Grassy Mountain site is approximately 2,560 acres, of which 640 acres are fenced and permitted for waste management activities. Most of the permitted area sits on salt or saline clay flats.

The Clean Harbors Greenbrier site is a RCRA-permitted hazardous waste storage facility located on the north end of the community of Greenbrier, Tennessee, in Robertson County. The site encompasses 12 acres. The facilities include an office building, storage warehouse, supply warehouse, loading dock, trailer containment building, asphalt parking lot, and gravel work areas.

The Clean Harbors Pecatonica site is located in Winnebago County in north-central Illinois. The site is located in a rural agricultural area two miles north of the community of Pecatonica, Illinois, and four miles north of State Highway 20. Approximately 10 acres are enclosed within the security fence. The facility consists of four buildings, two of which are RCRA-permitted for the storage of hazardous waste and are currently permitted to store mercury.

Grassy Mountain Site – Facility Characteristics and Storage

Clean Harbors has identified the Drain and Flush Building Warehouse One (DFBWO) as a potential mercury storage building (Figure S-12). The enclosed portion of DFBWO (including the office and laboratory) that would be used for mercury storage activities is approximately 80×75 feet; the height is approximately 30 feet. The DFBWO contains five rooms, one of which is an office and laboratory. Three of the other four rooms (A1, A2, and A3) could be used for mercury storage and handling, and processing. Each of the rooms is equipped with one or more sumps. Room A3 has more precise temperature control through a heating, ventilation and air conditioning system. A covered outdoor area on the north side would be used for loading and unloading. The DFBWO would need to be upgraded to include secondary containment and epoxy floor sealant for expanded RCRA storage and consolidation of mercury. Clean Harbors is currently updating the building's RCRA permit (Class 2 permit modification) with the State of Utah to allow expanded storage for mercury. The estimated mercury storage capacity of the DFBWO is approximately 900 MT (992 tons).

The DFBWO has fire suppression equipment throughout the building for fire protection. The site is enclosed by a 6-foot-high chain-link fence topped with barbed wire. Secured gates are used to control access into and out of the facility. Gates are closed and locked when not being monitored. The proposed mercury storage building is located about one mile from the main access gate.

Figure S-12 The DFBWO at the Clean Harbors Grassy Mountain Site

Greenbrier Site – Facility Characteristics and Storage

Clean Harbors has identified the storage warehouse building at the Greenbrier site, adjacent to the office building (Figure S-13), for mercury storage. The active work area of the facility is fenced and encloses approximately 5.3 acres and contains all buildings except the office building and parking lot. The storage warehouse building is 60×100 feet and is divided into eight separately contained areas. The structure is a pre-engineered steel frame with insulated metal walls for container storage. Storage areas have concrete secondary containment curbs and epoxy-sealed floors. The building is RCRA-permitted for the storage of mercury. The total estimated storage space is about 2,430 square feet. The estimated mercury storage capacity is 1,875 MT (2,067 tons).

The building is equipped with heat and smoke detectors and fire suppression equipment. The building has a passive ventilation system. The active portion of the Greenbrier site is secured by a 6-foot-high chain-link fence topped with barbed wire. The storage warehouse building has an alarm system and is monitored around the clock by a security company. There are two overhead and two pedestrian doors in the warehouse that are locked when staff are not present.

Figure S-13 Storage Warehouse Building at the Clean Harbors Greenbrier Site

Pecatonica Site – Facility Characteristics and Storage

Clean Harbors has identified the two RCRA-permitted container storage buildings at the Pecatonica site for mercury storage: CSB-1 and CSB-2 (Figure S-14). The two buildings share a common wall. The CSBs are steel-framed structures with insulated metal walls and concrete slab floors. The smaller CSB-1 is 100 by 60 feet. The container storage area in CSB-1 is about three-fourths of the building, or approximately 4,360 square feet. The building height is 12 feet. CSB-2 is 274 by 168 feet. A portion of this space in CSB-2 is a fully covered truck unloading and dock area accessible through rollup doors on the west side of the building. The container storage portion of CSB-2 is approximately 174 by 168 feet. The height of CSB-2 ranges from approximately 17 to 20 feet. The storage area in CSB-2 is approximately 29,232 square feet. The estimated mercury storage capacity in CSB-1 is 2,465 MT (2,717 tons) and in CSB-2 is 12,330 MT (13,591 tons).

The floor has an integrated sump system and curbing for spill control and containment. The unloading and container storage areas have a fire suppression system. The buildings are naturally ventilated through doors. The site is surrounded by a 6-foot-high chain-link fence with barbed wire. Both access driveways are gated. The main gate has a roll-away gate.

Figure S-14 CSB-2 (foreground) and CSB-1 (rear left) at the Clean Harbors Pecatonica Site

S.2.3 Transportation and Handling

Transport of mercury is conducted almost exclusively by truck due to the relatively small quantities involved. Persons that desire to have their elemental mercury managed and stored at the DOE storage facility would be responsible for shipping the mercury to the DOE storage facility. In some instances (e.g., gold mining in Alaska), mercury could be transported to a U.S. port (i.e., Oakland, California) before being transported to the long-term management and storage facility. This Mercury Storage SEIS-II assumes that mercury being received from ore processors would be shipped to a RCRA-permitted treatment facility prior to receipt at the DOE storage facility. Transportation and handling of elemental mercury from generators or owners, or a U.S. port, is analyzed as an element of the Proposed Action.

Three-liter flasks would be transported in box pallets, each assumed to contain an array of up to 49 flasks, based on standard, commercially available pallet sizes for waste drums and typical forklift capacities for use in waste storage facilities (e.g., 48 inches by 48 inches and 5,000-pound capacity). The total weight of a fully loaded pallet would be approximately 4,400 pounds, or 2 MT (2.2 tons). A 1-MT container would be transported within a spill tray capable of containing the full volume of the mercury. The assembly of a full 1-MT container, spill tray, and pallet is assumed to weigh about 3,080 pounds.

Consistent with the analysis in the 2011 Mercury Storage EIS and 2013 Mercury Storage SEIS, the mercury currently at the Y-12 National Security Complex (Y-12) is stored (and would be shipped) in 3-L flasks. DOE anticipates that the majority of the mercury generated from mining would be shipped in one-MT containers.

The analysis in this Mercury Storage SEIS-II assumed that the capacity of a truck is 40,000 pounds. Therefore, one truck could ship either nine pallets (of up to 49, 3-L flasks) or 13, 1-MT containers. The number of pallets of 3-L flasks or the number of 1-MT containers that the truck could accommodate is limited by weight and would be determined during the actual loading.

Table S-5 summarizes the amounts of mercury that are assumed (for analytical purposes) to be transported from each of the locations listed in Table S-2 to the potential alternative site locations (with the corresponding total expected numbers of pallets and 1-MT containers transported over

40 years). The values in Table S-5 are representative values based on the accumulated amounts for each location and the estimated annual generation rates from Table S-2.

Table S-5 Transportation Characteristics Used for Analysis

Site	Years of Shipments[a]	Total Mass (MT)[b]	Number of Pallets	Number of 1-MT Containers	Number of Trucks[c]
Y-12 National Security Complex	1st – 2nd	1,200	713	0	80
Ore Processors (assumed to be shipped from Carlin, Nevada)[g]	1st – 40th	5,100	0	5,100	393
Other Ore Processors (via Port of Oakland)[g]	1st – 40th	300	0	300	24
Commercial Storage					
WM, Union Grove, Wisconsin	1st – 2nd	100	0	100	8
WM, Emelle, Alabama	1st – 2nd	300	1	298	23
Total Inventory Assumed for Analysis		**7,000**	**714**	**5,798**	**528**

MT=metric ton; WM=Waste Management Mercury Waste, Incorporated & Chemical Waste Management, Incorporated.

a For purposes of analysis, the 2011 Mercury Storage EIS assumed a 40-year operational period. A revised operational start date is not known at this time; however, the period of analysis remains 40 years for this Mercury Storage SEIS-II.

b Total mass transported would be approximately 7,000 MT. Average mass transported per year during the 40-year period of analysis is 175 MT. The individual entries of this column are conservatively high, include any estimated accumulation since 2018, and are used for analytical purposes only.

c Total number of trucks: 528. Average number of trucks per year during the 40-year period of analysis: approximately 13. This assumes trucks are full. If half or partially full, the estimated number of shipments could increase by up to a factor of two. The highest number of annual truck shipments could occur in the first two years.

Note: To convert metric tons to tons, multiply by 1.1023.

S.2.4 No-Action Alternative

As required by CEQ NEPA regulations (40 CFR Parts 1500–1508) and the DOE NEPA implementing procedures (10 CFR Part 1021), the Mercury Storage SEIS-II also analyzes a No-Action Alternative as a basis for comparison to the Proposed Action. Under the No-Action Alternative evaluated in the SEIS-II, DOE would not designate a facility (or facilities) for the long-term management and storage of mercury. Elemental mercury would continue to be generated from other sources, primarily the gold-mining industry and, to a lesser extent, waste reclamation and recycling facilities. As a result of the Chemical Safety Act of 2016, mercury generators have additional options that were not available when the 2011 Mercury Storage EIS and 2013 Mercury Storage SEIS were prepared.

The Chemical Safety Act of 2016 amended RCRA and TSCA and includes the following key elements that could have a bearing on the No-Action Alternative:

1. Ore processors that generate mercury may accumulate mercury onsite without storage prohibition (i.e., more than 90 days) if:

   a. DOE has not designated a facility,

   b. The generator certifies that it will ship the mercury once the facility is available, and

c. The generator certifies that the mercury would not be sold or otherwise placed back into commerce.

2. If DOE does not designate an elemental mercury storage facility by January 1, 2020, DOE will accept title to all elemental mercury accumulated at ore processor sites as of that date, and store (or pay the cost of storage for) this mercury in a RCRA-permitted facility until DOE designates a long-term storage facility.

3. Export of certain mercury compounds is prohibited, except for those exported to Organization of Economic Cooperation and Development (OECD) countries for environmentally sound disposal (e.g., Canada). Note that export of the identified mercury compounds to OECD countries for disposal, or other potential purposes, was already acceptable under MEBA prior to 2016.

Therefore, the current options available to a mercury generator under the No-Action Alternative currently include:

- **Accumulate On site** – Ore processors can accumulate elemental mercury on site in accordance with the Chemical Safety Act of 2016 until DOE designates a facility (which theoretically would not occur under the No-Action Alternative) or Congress passes new legislation.[13] The Act requires that generators comply with requirements in 40 CFR Part 262 for managing their hazardous waste.

- **Store at a Permitted Facility –** Existing storage facilities can continue to store elemental mercury at their RCRA-permitted facility, or generators can transport their mercury from onsite storage to a permitted, commercial storage facility. MEBA provides that storage of elemental mercury at a RCRA-permitted facility is not subject to time constraints.[14]

- **Transport for Treatment and Disposal in Canada –** Generators can opt to transport their mercury to a permitted treatment facility as a precursor to sending the mercury compound to Canada for disposal (e.g., Bethlehem Apparatus, Stablex).[15] Historically, ore processors have not used this option on a large scale.

[13] Under the Chemical Safety Act of 2016, ore processors may store mercury in non-permitted facilities with no time constraints and RCRA-permitted facilities beyond their normal 365-day limit.

[14] Section 5 of MEBA states that, "Elemental mercury may be stored at a facility with respect to which any permit has been issued under section 3005(c) of the Solid Waste Disposal Act (42 U.S.C. § 6925(c)), and shall not be subject to the storage prohibition of section 3004(j) of the Solid Waste Disposal Act (42 U.S.C. § 6924(j)) if— (i) the Secretary is unable to accept the mercury at a facility designated by the Secretary under subsection (a) for reasons beyond the control of the owner or operator of the permitted facility; (ii) the owner or operator of the permitted facility certifies in writing to the Secretary that it will ship the mercury to the designated facility when the Secretary is able to accept the mercury; and (iii) the owner or operator of the permitted facility certifies in writing to the Secretary that it will not sell, or otherwise place into commerce, the mercury."

[15] Bethlehem Apparatus is an example of a RCRA-permitted facility that currently treats mercury for eventual disposal in Canada. Stablex is a US Ecology company in Canada that accepts mercury compounds for land disposal. See Sections 2.1.1 and 2.6 of this SEIS-II for a discussion of treatment and land disposal in the United States.

The options that the generators could take under the No-Action Alternative are clear under the current laws and regulations; however, which option generators may choose and to what extent is still speculative and would be driven by the generators' case-by-case financial considerations.

Under the No-Action Alternative, the approximately 1,200 MT (1,330 tons) of DOE mercury currently stored at Y-12 would continue to be managed and stored in this location and no new construction would be required.

The No-Action Alternative would not comply with the MEBA legislative requirements.

S.2.5 Preferred Alternative

In the 2011 Mercury Storage EIS and the 2013 Mercury Storage SEIS, DOE identified the WCS alternative as the preferred alternative. Considering that the SEIS-II evaluates seven existing commercial sites and one federal site, DOE no longer has a specific preferred alternative as of the publication of the Draft SEIS-II. However, DOE does prefer one or more of the existing commercial facilities evaluated in the Draft SEIS-II because selection of one or more of these commercial facilities would facilitate schedule urgency established by MEBA. Prior to being able to receive mercury at HWAD, DOE would need to execute real estate actions in addition to lease agreements with the General Services Administration and Departments of the Army and Defense. Designation and modification of the available storehouses at HWAD would also require further consultation with the Nevada SHPO because the proposed facilities are eligible for listing on the National Register of Historic Places. Additionally, these buildings are not currently permitted as RCRA Hazardous Waste Storage facilities, which would also be required prior to receipt of elemental mercury. Overall, these activities, which would be more complex and time-consuming than those of the other alternatives, could add significant time (i.e., three years or more) to the schedule for meeting DOE's statutory obligation under MEBA. Such a delay would result in accumulation of additional quantities of elemental mercury at ore processing facilities.

In parallel with the ongoing NEPA process, DOE is executing a procurement process to identify potential vendors for long-term management and storage of elemental mercury. Based on analysis from the Draft SEIS-II, public comment on the Draft SEIS-II, and input gained from the procurement process, DOE will identify its Preferred Alternative in the Final SEIS-II, as required by 40 CFR 1502.14(d). DOE will then publish a ROD no sooner than 30 days after publication of the EPA Notice of Availability for the Final Mercury Storage SEIS-II in the *Federal Register*. The selection of any facility(ies) would be based on the 2011 Mercury Storage EIS, the 2013 Mercury Storage SEIS, this Mercury Storage SEIS-II, and other appropriate factors and would be described in a ROD published in the *Federal Register*.

S.3 ENVIRONMENTAL IMPACTS

Table S-4 presents a comparison of the key physical characteristics of the eight action alternative sites; focusing primarily on the proposed, permitted buildings and their capacity and capability for storage of elemental mercury. Table S-6 presents a comparison of key physical setting and location factors, i.e., those factors that provide some means of discerning the differences among action alternative sites regarding their surroundings, operational experience, or land use compatibility. These factors, among others, are discussed in more detail in Chapter 3 of the Mercury SEIS-II.

Because of the various sites and circumstances in which mercury could potentially be stored, transported, or treated for disposal outside of the United States under the No-Action Alternative, quantitative evaluation of the potential environmental consequences would be highly speculative. The SEIS-II qualitatively evaluates the potential environmental consequences of the various options that are available to entities under the No-Action Alternative (as discussed in Section S.2.4). Because the No-Action Alternative could involve expansion and/or modification of non-DOE storage capacities at multiple locations, it is possible that some land, or land with more- or less-sensitive resources than those analyzed under the action alternatives, could be affected. Environmental consequences to the land use and ownership, visual, geology, soils, ecological, and cultural and paleontological resource areas are dependent on the affected environment disturbed and amount of land disturbance that might occur. Potential environmental consequences to water resources would depend on the specific location and proximity to surface-water bodies and groundwater aquifers and the current use of these water resources. Therefore, the environmental consequences to water resources could be more or less than under the action alternatives. If mercury were transported to a RCRA-permitted storage facility or to a treatment facility, the potential transportation-related consequences would not be markedly different than those predicted for the action alternatives.

Impacts on infrastructure and waste management would depend on the specific infrastructure and waste management capabilities available to support the mercury storage facility(ies). Impacts on socioeconomics and environmental justice primarily would be related to the changes in employment due to changes in mercury storage and the minority and low-income composition of the communities near the mercury storage facility(ies). Because impacts on infrastructure, waste management, socioeconomics, and environmental justice are indeterminate for the No-Action Alternative, impacts could be more or less than under the action alternatives.

Under the No-Action Alternative, the management and storage of mercury may or may not be conducted in accordance with RCRA regulations. For example, long-term accumulation at ore processor sites would be of higher concern because these sites have not necessarily been permitted for long-term storage. As such, it would be reasonable to conclude that there could be a heightened risk associated with facility incidents or inconsistent management and storage of mercury containers. This could lead to potentially greater environmental consequences associated with air quality, occupational and public health and safety, and ecological resources. In contrast, if much of the excess mercury remained at the generating facilities and was not transferred to a DOE long-term storage facility, it is reasonable to expect that environmental consequences associated with transportation would be somewhat less than those predicted to occur under the action alternatives. Although, these transportation consequences would eventually be realized when the accumulated mercury was eventually shipped offsite for storage, treatment, or disposal. As stated in Section S.2.4, one of the options that generators could take would be to ship the mercury to a RCRA-permitted treatment facility and then on to Canada for land disposal. In this scenario, transportation impacts would be similar to those predicted under the action alternatives. There would be no environmental consequences under the No-Action Alternative at any of the candidate sites because a DOE mercury storage facility(ies) would not be operated. Conversely, under any of the action alternatives, there would be beneficial environmental consequences at the various locations where excess mercury is currently stored, including Y-12, because the mercury could be transferred to a DOE facility(ies) for long-term storage and no longer be available for potential release to the environment at the current storage site.

Table S-6 Comparison of Action Alternatives – Physical Setting and Location Factors

Site/Resource Factor	Hawthorne Army Depot	WCS Site	Bethlehem Apparatus	Perma-Fix DSSI	Veolia Gum Springs	Clean Harbors Grassy Mountain	Clean Harbors Greenbrier	Clean Harbors Pecatonica
Location	Hawthorne, NV	Andrews County, TX	Bethlehem, PA	Kingston, TN	Gum Springs, AR	Tooele, UT	Greenbrier, TN	Pecatonica, IL
Site Property Size	147,000 acres	13,500 acres	10 acres	80 acres	1,400 acres	640 acres	12 acres	10 acres
Developed Area Footprint	175 acres	1,338 acres	10 acres	12 acres	75 acres	0.4 acre	5.3 acres	4 acres
Existing RCRA permit[a]	Yes[b]	Yes	Yes[c]	Yes	Yes	Yes	Yes	Yes
Estimated mercury storage capacity (MT)	7,000	3,000	Bldg 945 3,000 Bldg 1055 3,000	CSBU 1,200 CSBU Expansion 1,800	6,352–7,000	900	1,875	CSB-1 2,465 CSB-2 7,000
Seismic risk; peak ground acceleration (*g*)	0.62	0.08	0.10	0.33	0.10	0.16	0.14	0.05
Nearest surface-water feature	Walker Lake (5 miles)	No natural perennial features within 10 miles	Lehigh River (0.45 mile)	Stormwater detention basin (0.1 mile)	Deceiper Creek (0.4 mile)	No natural perennial features within 10 miles	Several ponds within 1 mile	Small creek (0.25 mile) Pecatonica River (1 mile)
Site in 100-year floodplain	No	No	No	No	No	No	No	No
Distance to nearest public access	2.3 miles	0.62 mile	115 feet	820 feet	984 feet	6.6 miles	130 feet	417 feet
Distance to nearest business or residence	>2.3 miles	3.4 miles	120 feet (business) 354 feet (residence)	950 feet	0.53 mile	40 miles	460 feet	607 feet

Site/Resource Factor	Hawthorne Army Depot	WCS Site	Bethlehem Apparatus	Perma-Fix DSSI	Veolia Gum Springs	Clean Harbors Grassy Mountain	Clean Harbors Greenbrier	Clean Harbors Pecatonica
Consultation with State Historic Preservation Office required?	Yes	No	No	No	No	No	No	No
Approx. time to establish lease agreement	3–5 years	<6 months	<6 months	<6 months	<6 months	<6 months	<6 months	<6 months

a Any RCRA permit associated with the site designated by DOE for long-term management and storage of elemental mercury may be modified to add DOE as a co-permittee.
b HWAD is permitted for mercury storage; however, the specific modified building would need to be added to the permit.
c Building 945 is currently permitted. Building 1055 would need to be added to the permit.

The approximately 1,200 metric tons (1,300 tons) of DOE mercury currently stored in 35,000, 3-L flasks at Y-12 would continue to be managed and stored in this location. No new construction would be required at Y-12, nor would any incremental increase in impacts on resource areas occur because storage operations at Y-12 would not change. Continued storage at Y-12 would have potential operational impacts since these facilities would not be available for other, planned uses including storage of mission-related materials.

The following subsections summarize the potential impacts on resources under the Mercury Storage SEIS-II action alternatives. Detailed descriptions and in-depth discussions of impacts on resources are provided in Chapter 4 of the SEIS-II.

S.3.1 Land Use and Ownership, and Visual Resources

No impacts on land use or visual resources would be expected for any of the alternative sites because no new construction or substantial external modifications to the buildings would be required. The storage of mercury would be consistent with current land use and site operations at each site. If DOE were to designate a commercial facility for the Proposed Action, DOE would obtain an appropriate leasehold interest in that facility to comply with MEBA. DOE would ensure that any long-term lease agreement would afford DOE an appropriate level of responsibility and control over the facility.

There would be additional time constraints to completing the permitting, real estate actions, and lease agreements for the HWAD alternative. These additional activities would not be required for existing commercial facilities. DOE estimates the time required to complete the activities to allow receipt of mercury at HWAD for long-term storage and management would be between three and five years from the date that DOE selected HWAD in a ROD. DOE estimates that a lease agreement for an existing commercial facility could be completed within about six months.

S.3.2 Geology, Soils, and Geologic Hazards

Except for the HWAD site, no additional impacts to geology and soils are expected because no new construction or soil disturbance would be required. At HWAD, minimal external modifications would require trenching for installation of needed utilities and other systems and services, resulting in negligible-to-minor impacts to previously disturbed, surrounding soils. All alternative sites would adhere to standard best management practices for necessary maintenance and management of soils.

Geologic hazards from potential earthquakes at any of the alternative site locations would be minimized because storage and management of elemental mercury would occur in existing structures that were engineered and built to structural and/or seismic design standards for each site location. In addition, mercury storage locations within the facilities would include robust storage containers and spill containment features.

S.3.3 Water Resources

Storage of mercury at any of the alternative sites would increase water use for sanitary purposes by up to 16,000 gallons per year. The increased water use would directly correlate to the number of additional personnel required during operations. All alternative sites are permitted for hazardous waste storage and would have engineered barriers such as berms and sealed floors in storage building(s) to prevent releases of mercury from the storage area. No impacts to groundwater or surface water would be expected. None of the alternative sites is located within a designated 100-year regulated floodplain.

S.3.4 Air Quality and Noise

Mercury storage operations at any of the alternative sites would not involve any activity that would increase air emissions. Impacts to air quality at each site would be negligible. The transportation of mercury from existing storage sites and generators over a 40-year period would release relatively small quantities of air pollutants and greenhouse gases compared to existing emissions from truck transportation in the United States. An average of 13 truck trips per year would be required to transport the 7,000 MT of mercury to a storage location(s). Additionally, because none of the proposed facilities is in a floodplain and all are constructed to meet building code requirements, they are mostly resilient to potential increases in severe weather related to global climate change.

Noise created by mercury storage operations, including transportation, would be undiscernible from existing noise levels. Most mercury storage activity at each site would occur indoors and be inaudible to the public.

S.3.5 Ecological Resources

No impacts on terrestrial resources, aquatic resources, wetlands, and threatened or endangered and other protected species would be expected for any of the alternative sites because of the use of existing buildings, which would require minimal to no external modifications. Therefore, none of the alternative sites analyzed would be expected to adversely affect any ecological resource. Potential ecological risk associated with transportation accident scenarios is addressed in Section S.3.10.

S.3.6 Cultural and Paleontological Resources

Except for HWAD, there are no known prehistoric or historic cultural resources at any of the alternative site locations, and any potential unknown sites would not be impacted since mercury storage would occur within existing structures with no new construction or surface disturbance planned. At HWAD, the Group 110 design storehouses that are proposed for mercury storage are historic architectural properties that are part of a larger historic district like many of the structures at HWAD. None of the Group 110 structures would be impacted under the Proposed Action other than by proposed building modifications, which would be coordinated with the Nevada SHPO. If the HWAD became a preferred alternative for operation of a mercury storage facility, DOE would further consult with the SHPO on the proposed storage building modifications to determine the potential impacts on structures eligible for listing on the National Register of Historic Places and potential mitigation measures, as appropriate. The Section 106 consultation process would need to be completed prior to completion of a ROD selecting HWAD.[16] Therefore, the key activities that would need to be completed prior to a ROD would include: (1) detailed design of all

[16] The consultation process under Section 106 of the *National Historic Preservation Act* can be found at: https://www.ecfr.gov/current/title-36/chapter-VIII/part-800/subpart-B

modifications to specific HWAD buildings, (2) identification of HWAD as a preferred alternative, and (3) closure of the Section 106 consultation process with the Nevada SHPO.

Because the Proposed Action at facilities other than HWAD would occur within an existing building permitted for the storage of mercury, DOE has determined that this undertaking does not have the potential to cause effects on historic properties, and DOE is not required to enter into consultation under Section 106 of the *National Historic Preservation Act* (36 CFR § 800.3(a)(1)).

Since no new construction would be required, no impact on American Indian resources or traditional religious practices in the immediate areas surrounding any of the alternative sites would be expected.

There are no known paleontological resources at any of the alternative site locations; because no new construction would be required under the Proposed Action, there would be no impact to paleontological resources.

S.3.7 Site Infrastructure

The frequency of mercury shipments is projected to be small (13 per year) compared with baseline truck traffic; therefore, existing road systems would be adequate for supporting the transfer of mercury. All of the alternative sites have sufficient utility capacity to support mercury storage. Because most of the sites are existing operating facilities, the incremental increase in utility requirements would be small. At HWAD, additional utility services would have to be extended to the designated storage buildings as needed including electricity, heating, water, and communications even though the service capacity onsite is sufficient.

S.3.8 Waste Management

The operation of a mercury storage facility would be expected to generate hazardous waste that is commensurate with the amount of mercury stored at the facility. The estimate of hazardous waste generation was based on the analysis in the 2011 Mercury Storage EIS, which assumed some degree of repackaging of potential leaking containers. This is a conservative estimate and likely bounding for any of the alternative sites. For storage facilities that have the capacity to store the full 7,000 MT of mercury, up to 637, 55-gallon drums of hazardous waste could be generated over the 40-year analytical period (about 16, 55-gallon drums per year). The amount of waste that would be expected to be generated at the alternative sites ranges from 82 to 637, 55-gallon drums over the 40-year analytical period (or 2 to 16, 55-gallon drums per year). Approximately 16,000 gallons of sanitary wastewater would be expected to be generated per year from mercury storage operations.

S.3.9 Occupational and Public Health and Safety

This section summarizes the potential human health consequences and associated risks to workers and members of the public. The analyses in Chapter 4 of the SEIS-II evaluated four scenarios: (1) normal operations, (2) facility accidents, (3) transportation, and (4) intentional destructive acts. The respective sections of Chapter 4 discuss human health consequences and associated risk analysis in detail under each alternative, and Appendix B discusses the development of the analyses and the comparison of the analyses for the alternatives evaluated in this SEIS-II and those alternatives evaluated previously in the 2011 Mercury Storage EIS and 2013 Mercury Storage SEIS. This summary presents the most conservative (i.e., maximum) consequence, and thus risk, to a human receptor that could be expected to occur under each scenario. Consequences are presented in terms of severity levels (SLs), with SL-I representing negligible-to-very low consequences and SL-IV representing the most severe consequences. SLs are defined for various receptor scenarios in Appendix B, Section B.5. Overall risk is a function of the frequency at which an event might occur and the probable severity of the event.

Normal Operations

Normal operations would involve the receipt and storage of mercury for extended periods of time (assumed to be up to 40 years for purpose of analysis). Exposures could arise during normal operating conditions from small amounts of mercury vapor accumulating in the storage areas. This release scenario can best be described as a chronic, slow release of mercury vapor within the storage building resulting from an undetected leaking container or external contamination of a container. Under all alternatives, the consequences to involved workers, noninvolved workers, or members of the public are expected to be negligible (i.e., SL-I), with negligible associated risks.

Facility Accidents

Accidents could include mercury spills inside or outside the storage building. Of the various accident scenarios considered, those with the highest probability of occurring would be (1) a container or pallet drop during transfer from the transport vehicle to long-term storage (e.g., by forklift), (2) a collapse of storage racks, or (3) an earthquake event.

The consequences and associated risks to human health receptors would be nearly identical under all action alternatives evaluated and are summarized in Table S-7. In all cases, potential risks to human receptors would be negligible to low. The highest potential consequences would be associated with the beyond-design-basis earthquake that, theoretically, could cause a total building collapse. In this extremely unlikely event, members of the public around the Bethlehem Apparatus and Clean Harbors Greenbrier sites could be within 330 feet of the storage buildings and could be exposed to SL-IV concentrations. However, the probability of a strong earthquake in these areas is unlikely, as the peak ground acceleration (*g*) for Bethlehem, Pennsylvania, and Greenbrier, Tennessee, is only 0.10 and 0.14, respectively, indicating areas of relatively low seismic activity. Additionally, these members of the public likely would evacuate from the area immediately, resulting in a reduction to the potential severity level to the SL-II range.

Table S-7 Summary of Consequences and Risks from All Onsite Mercury Spill Scenarios

Scenario	Consequence (Risk)
Spills Inside Building	
Involved worker	SL-I to SL-II (Negligible to low)
Noninvolved worker[a]	SL-I (Negligible)
Member of the public	SL-I (Negligible)
Spills Outside Building	
Involved worker	SL-I to SL-II (Negligible to low)
Noninvolved worker[a]	SL-I to SL-II (Negligible to low)
Member of the public	SL-I to SL-II[b] (Negligible to low)

a A noninvolved worker is nearby (outside the building) but still on site.
b A noninvolved worker is assumed to evacuate the area after an extremely unlikely earthquake scenario with building collapse.
c Bethlehem Apparatus and Clean Harbors Greenbrier are the only locations where offsite human receptors could be within 100 meters during an extremely unlikely earthquake scenario with building collapse. The potential concentrations at these locations could fall in the SL-IV range. However, the seismicity of the region at these locations is low and if members of the public were to evacuate immediately following the earthquake event, consequence levels would likely be in the SL-II range.
SL=severity level

It should be noted that the proposed capacity of elemental mercury for each of the sites identified in this SEIS-II would be within the permitted capacity for hazardous materials established by the respective state during the permitting process. That is, DOE is not proposing to increase the capacity of hazardous materials beyond that which is permitted by the State.

Transportation

Transportation risks under all alternatives are a function of the number of miles driven and the nature of the accident (fire or no fire). Table S-8 summarizes the consequences and associated risk to human health receptors under transportation accident scenarios with mercury spills. These scenarios apply to all alternative sites.

Table S-8 Summary of Transportation Consequences and Risks to Human Receptors

Scenario	Consequence (Risk)
Spill onto ground	SL-I to SL-IV (Negligible)
Spill into water[a]	SL-I to SL-II (Negligible to low)
Spill with fire – inhalation	SL-III SL-II (Negligible) or (Low)
Spill with fire – dry deposition onto soil	SL-I (Negligible)
Spill with fire – wet deposition onto soil	SL-I (Negligible)
Consumption of methylmercury in fish – dry deposition onto water	Potentially above SL-I/SL-II (Negligible)
Consumption of methylmercury in fish – wet deposition onto water	Potentially above SL-I/SL-II (Negligible)

a. Due to a large range of uncertainty, estimating the consequences of this scenario is difficult.
SL=severity level

Intentional Destructive Acts

The scenario for an intentional destructive act is a deliberate crash of a gasoline tanker into a truck carrying mercury with a subsequent fire. Other scenarios involving an attack on a storage facility are judged to be less likely because of the distribution of mercury within the facility, security measures, and facility design features that would mitigate the impacts of mercury releases into the environment. Therefore, the intentional destructive act analysis applies to all the alternative sites and evaluated impacts from the atmospheric pathway, from inorganic mercury deposited on the ground, and from consumption of mercury-contaminated fish.

Human exposure pathways from an intentional destructive act include atmospheric inhalation and dry or wet deposition. The most severe case for atmospheric exposure pathways would be at the SL-III level and could occur between approximately 330 feet and 3.5 miles downwind of the intentional destructive act location. SL-IV consequence levels would only be reached within 0.55 mile under low wind speeds and stable atmospheric conditions (Class F). The deposition benchmark of 180 milligrams per kilogram in soil would not be exceeded anywhere.[17] However, sufficient mercury could be deposited on lakes such that, in the event of rain, methylmercury might accumulate to potentially hazardous levels in fish up to approximately six miles downwind for national average consumption rates, 12 miles for the average subsistence fisherman, and 25 miles for the 95th percentile subsistence fisherman.

S.3.10 Ecological Risk

Consequences and, hence, risks to ecological receptors would be negligible to all ecological receptors except if there is a fire. Without fire, the primary risk is inhalation of mercury vapor, which is an insignificant pathway for exposure to ecological receptors. The frequency of onsite

[17] For inorganic mercury deposited on the ground, the threshold between SL-I (negligible) and SL-II (low) is 180 milligrams per kilogram.

fires sufficient to cause a release of mercury at any of the storage sites is predicted to be negligible; consequently, the ecological risk also would be negligible. Ecological risk would be evident only in the event of a transportation accident with fire; thus, the ecological risk would be similar under all action alternatives. Under dry deposition with fire, three ecological receptors (sediment-dwelling biota, soil invertebrates, and plants) would have low risk, while all other receptors would have negligible risk. Under wet deposition, sediment-dwelling biota would have a moderate risk, and soil invertebrates, plants, American robin, and river otter would have a low ecological risk. The other receptors would all have negligible risk.

S.3.11 Socioeconomics

There would be negligible impacts on socioeconomic conditions, including overall employment population trends, available housing, and other community services in the regions of influence associated with all alternative sites. Any additions to staff would be minor and easily accommodated by the existing labor forces in each of the alternative site locations and surrounding counties.

S.3.12 Environmental Justice

While there may be individual minority or low-income families living relatively near each of the alternative site locations, the sites are (or would be) permitted by their respective state under RCRA for the storage and treatment of hazardous materials. The Proposed Action would not increase the human health risk beyond that approved as part of the RCRA permitting process. As discussed in Sections S.3.9 and S.3.10, implementing the Proposed Action would result in negligible offsite human health and ecological risks from mercury emissions during normal operations and most accidents. Potentially high mercury concentrations could occur in the event of an extremely unlikely beyond-design-basis earthquake for some sites (Bethlehem Apparatus and Clean Harbors Greenbrier), as described in Section S.3.9. Considering the probability of such an event, the potential risks associated with this extremely unlikely scenario are considered low. Therefore, there would be no disproportionately high and adverse effects on minority or low-income populations under the Proposed Action at any of the alternative site locations.

S.3.13 Reasonably Foreseeable Environmental Trends and Planned Actions

This SEIS-II evaluates reasonably foreseeable environmental trends and planned actions within the regions of influence for each of the alternative sites. Considering the negligible-to-low potential impacts of the Proposed Action, the potential contribution of the Proposed Action to the cumulative impacts to the region were shown to be negligible.