

Regulatory Impact Analysis

Revisions to Standards for the Open Burning/Open Detonation of Waste Explosives Proposed Rule

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EXECUTIVE SUMMARY

This document presents the U.S. Environmental Protection Agency's (EPA's, the Agency's) analysis of the costs, benefits, and economic impacts of the Revisions to Standards for the Open Burning/Open Detonation (OB/OD) of Waste Explosives Rule. This rule amends certain existing regulations promulgated under the hazardous waste provisions of the Resource Conservation and Recovery Act (RCRA) regarding the OB/OD of hazardous waste in the United States.

ES.1 SUMMARY OF THE PROPOSED RULE

This rulemaking is proposing changes to the RCRA regulations to clarify existing requirements for owners or operators of OB/OD units, including how and when to apply and implement the existing requirements in the permitting process. This rulemaking proposes new provisions that would specify how and when facility owners and operators and permit authorities are to evaluate alternative treatment technologies for OB/OD, including specific information that would be required for facilities to demonstrate whether safe modes of treatment are available for specific waste streams. This rule also proposes additions to the regulations on timelines for implementing alternative technologies, permitting for alternative technologies, waste analysis/characterization, wastes prohibited/restricted from OB/OD, technical standards for OB/OD units, delay of closure applicability to OB/OD units, clarifications to emergency provisions at §§ 270.61 and 264.1(g)/270.1(c)(3), and procedures for permitting mobile treatment units (MTUs). For a detailed discussion of all the changes to OB/OD regulations that EPA is proposing, please refer to the Preamble to the proposed rule.

ES.2 UNIVERSE OF FACILITIES AFFECTED BY THE PROPOSED RULE AND BASELINE REQUIREMENTS FOR EVALUATION OF ALTERNATIVE TECHNOLOGIES

The proposed rule's requirements apply to all hazardous waste treatment storage and disposal facilities (TSDFs) conducting or seeking to conduct open burning or open detonation of waste explosives. The proposed regulations would also apply to RCRA cleanup, closure, and corrective action activities, including those performed at Corrective Action Management Units (CAMUs).

As of April 2023, the requirements would apply to 69 RCRA TSDF OB/OD facilities, two of which use OB/OD for corrective action only and may be affected by this proposed rule. As Exhibit ES-1 below shows, the U.S. Department of Defense own or operate approximately half of the operating OB/OD facilities. Privately held companies own or operate 23 facilities, non-military federal agencies own or operate seven facilities, and the Northern Mariana Islands Department of Fire and Emergency Management Services (U.S. Territory Agency) operates one facility.

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EXHIBIT ES-1. UNIVERSE OF AFFECTED ENTITIES

FACILITY OWNER	TOTAL NUMBER OF OB/OD FACILITIES
U.S. Air Force	7
U.S. Army	21
U.S. Marines	2
U.S. Navy	7
U.S. Space Force	1
-U.S. Department of Energy	6
National Aeronautics and Space Administration	1
U.S. Territory Agency	1
Private Company	23
Total	69
Source: EPA, Resource Conservation and Recovery Act Information (RCRAInfo), April 2023.	

In the absence of this the proposed regulation, OB/OD is already banned with one exception – treatment of waste explosives “which cannot safely be disposed of through other modes of treatment” (45 FR 33217, May 19, 1980; 40 CFR 265.382. In a June 2022, policy memorandum EPA clarified the regulations and policy guidance which includes evaluating (and reevaluating) whether safe alternatives to OB/OD are available.¹ When safe and available alternatives are identified in the alternative technology evaluations, regulated entities must implement them in place of OB/OD. The baseline is that in the absence of any new regulations, facility owners or operators would fully implement the existing regulations when their permit comes up for renewal. In the absence of this rule, owners/operators will continue to renew permits every ten years, with the permitting conditions guidance issued in the policy memorandum.

Facility owners or operators that perform OB/OD must first demonstrate that their waste explosives “cannot safely be disposed of through other modes of treatment” to qualify for the exception to use OB/OD. To do so, the facility owner or operator must successfully demonstrate, through an evaluation of alternative technologies, that no other technologies can safely treat each waste stream, or such

¹ EPA Open Burning and Open Detonation (OB/OD) of Waste Explosives Under the Resource Conservation and Recovery Act (RCRA) From: Carolyn Hoskinson;, Director, Office of Resource Conservation and Recovery to: Land, Chemicals, and Redevelopment Division Directors, Regions 1-10 posted at https://www.epa.gov/system/files/documents/2022-06/OBOD_Policy_Memo_signed_6.7.22_508.pdf

technologies are unavailable. As new technologies routinely become available, a facility owner/operator must periodically reevaluate, e.g., at permit issuance and renewal, whether this condition has been met to maintain compliance with this requirement. Periodic reevaluation is required even if the facility has previously made this evaluation to satisfy its interim status obligation under 40 CFR 265.382 or to satisfy a permit condition established under Subpart X.

In addition, whenever an OB/OD permit is issued, the permit must include the requirements at § 265.382, as well as the terms that specify the conditions requiring periodic reevaluation to determine whether other safe modes of treatment have been developed, so that these requirements remain enforceable during the life of the permit. This baseline scenario would include both the circumstance in which the permit is issued to an interim status facility and in response to an application to renew a permit for an OB/OD unit. Inclusion of such requirements is also consistent with the direction in RCRA Section 3005(c) to determine compliance with the RCRA Section 3004 requirements prior to issuing a permit, and to “consider improvements in the state of control and measurement technology” in reviewing an application for a permit renewal (42 U.S.C. 6925(c)(1), (3)).

ES.3 ASSESSMENT OF COSTS

To assess the costs of the proposed rule, this RIA estimates the costs of the revised standards for evaluating alternative technologies to OB/OD and of implementing new technical standards and monitoring requirements for OB/OD when there are no available, safe alternatives. Two of the proposed rule's requirements are expected to add incremental costs to OB/OD owners relative to the regulatory baseline:

- After an initial evaluation, OB/OD facility owners/operators will need to reevaluate alternative technologies at least as frequently as every five years thereafter (instead of every ten years with permit renewal in the baseline scenario). Over a 20-year period, facility owners would need to conduct five alternative technology evaluations after the rule's implementation instead of three in the regulatory baseline.
- OB/OD facility owners/operators will need to comply with new technical operating/performance standards and monitoring requirements for OB/OD units that their permits do not presently include. Under the proposed regulations, OB/OD permits must address: the removal of excess waste material (such as foils and casings) if it is possible to do so safely; a security plan and controls to ensure the OB/OD units and surrounding kickout area are protected from unauthorized access by the public; and a public notice and outreach plan to include notice to the surrounding community of planned OB/OD activities and events. In addition, under § 264.710, owners/operators of OB/OD units must implement air, groundwater, kickout, soil, stormwater, and surface water monitoring plans as appropriate to OB/OD unit operation and site-specific conditions to monitor for releases and contamination from the OB/OD units and the surrounding kickout areas that may cause an unacceptable risk to human health and the environment.

Other requirements, such as specifying when an initial alternative technology evaluation must be conducted and the time allowed for implementation of alternative technologies, are not expected to add incremental costs to facility owners/operators. Instead, these requirements will shift when the costs will be incurred. In addition, the new permitting framework, and procedures regarding Mobile Treatment

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Units (MTUs), outlined in Subpart K of the proposed rulemaking, and described qualitatively in this analysis, provide a lower-cost alternative technology option for OB/OD facility owners/operators.

This RIA presents the cost impacts of the rule in present value and annualized terms using discount rates of three and seven percent over a 20-year forecast period. To address uncertainties and differences across OB/OD facilities regarding costs, this RIA presents both low impact and high impact estimates of the costs associated with the proposed rule. The low impact cost estimates presented in this RIA reflect the low-end assumptions regarding any cost-related inputs for which a range of data inputs was available, such as the capital and operating costs of monitoring equipment or structures required for compliance activities. Similarly, the high impact cost estimates reflect the high-end estimates for these variables.

Exhibit ES-2 reports the total annualized cost per facility of the proposed rule by provision. These costs are reported under discount rates of both three percent and seven percent. Exhibit ES-3 reports total aggregate annualized costs of the rule across the regulated universe of OB/OD facilities. EPA is seeking public comment to refine cost estimates for several of the new operating and monitoring requirements.

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EXHIBIT ES-2. TOTAL COST PER FACILITY OF THE PROPOSED RULE BY REQUIREMENT (\$2022 ANNUALIZED OVER 20 YEARS)

REQUIREMENT	LOW IMPACT SCENARIO		HIGH IMPACT SCENARIO	
	ANNUALIZED COSTS (USING A 3% DISCOUNT RATE)	ANNUALIZED COSTS (USING A 7% DISCOUNT RATE)	ANNUALIZED COSTS (USING A 3% DISCOUNT RATE)	ANNUALIZED COSTS (USING A 7% DISCOUNT RATE)
Reevaluation of Alternative Technologies	\$2,945	\$2,846	\$9,818	\$9,487
Removal of Excess Material	\$2,768	\$2,768	\$5,537	\$5,537
Security Plan and Controls	\$1,588	\$2,147	\$5,861	\$7,923
Public Notice and Outreach Plan	\$5,073	\$5,073	\$10,146	\$10,146
Groundwater Monitoring Requirements	\$33,927	\$34,314	\$250,839	\$254,979
Stormwater Controls and Monitoring Requirements	\$18,984	\$23,560	\$36,150	\$42,777
Surface Water Monitoring Requirements	\$5,420	\$5,420	\$32,521	\$32,521
Soil Monitoring Requirements	\$4,026	\$4,026	\$24,157	\$24,157
Air Monitoring Requirements	\$12,138	\$12,296	\$17,162	\$17,565
Kickout Monitoring Requirements	\$118	\$118	\$5,505	\$5,505
Total	\$86,988	\$92,568	\$397,696	\$410,597

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EXHIBIT ES-3. TOTAL AGGREGATE COSTS OF THE PROPOSED RULE BY REQUIREMENT (\$2022 ANNUALIZED OVER 20 YEARS)

REQUIREMENT	LOW IMPACT SCENARIO		HIGH IMPACT SCENARIO	
	ANNUALIZED COSTS (USING A 3% DISCOUNT RATE)	ANNUALIZED COSTS (USING A 7% DISCOUNT RATE)	ANNUALIZED COSTS (USING A 3% DISCOUNT RATE)	ANNUALIZED COSTS (USING A 7% DISCOUNT RATE)
Reevaluation of Alternative Technologies	\$203,230	\$196,385	\$677,433	\$654,618
Removal of Excess Material	\$191,025	\$191,025	\$382,049	\$382,049
Security Plan and Controls	\$38,115	\$51,526	\$140,661	\$190,150
Public Notice and Outreach Plan	\$350,045	\$350,045	\$700,090	\$700,090
Groundwater Monitoring Requirements	\$2,340,997	\$2,367,638	\$17,307,909	\$17,593,571
Stormwater Controls and Monitoring Requirements	\$1,309,900	\$1,625,621	\$2,494,384	\$2,951,603
Surface Water Monitoring Requirements	\$373,989	\$373,989	\$2,243,936	\$2,243,936
Soil Monitoring Requirements	\$277,800	\$277,800	\$1,666,799	\$1,666,799
Air Monitoring Requirements	\$837,518	\$848,450	\$1,184,163	\$1,211,959
Kickout Monitoring Requirements	\$8,117	\$8,117	\$379,866	\$379,866
Total	\$5,930,736	\$6,290,595	\$27,177,290	\$27,974,642

ES.4 ASSESSMENT OF BENEFITS

This RIA discusses the proposed rule's benefits in qualitative terms. The main purpose of this proposed rule is to increase protection of human health and the environment through improved implementation of the existing requirements to evaluate and implement alternative technologies, and by establishing minimum technical standards for OB/OD units to ensure consistency across all permits. The proposed revisions would reduce the release of contaminants to the air, soil, surface water, and groundwater from the treatment of waste explosives.

Benefits may occur from each of the three major rule cost components resulting from the new requirements in this proposed rule to improve implementation of existing requirements established in 1980. First, the rule's requirements for facility owners to more frequently reevaluate alternative technologies to OB/OD relative to the baseline scenario. Second, from facility owners implementing EPA's proposed new technical performance standards and monitoring requirements when there are no safe or available alternative technologies to OB/OD. And finally, the cost savings to the regulated community from the increased adoption of MTUs to treat waste explosives.

OB/OD operations may present risks to human health and the environment. The proposed regulations may limit the overall use of OB/OD over time through increased adoption of alternative technology evaluations and limit emissions from OB/OD units through the technical monitoring requirements in the proposed rule. The proposed rulemaking requires OB/OD facility owners/operators to reevaluate alternative technologies every five years (instead of every ten years with permit renewal). Over a 20-year period, facility owners/operators would need to conduct five alternative technology evaluations after the rule's implementation instead of three in the regulatory baseline. More frequent reevaluations may accelerate the identification of alternative technologies, which in turn would accelerate the improvement in environmental and human health outcomes relative to actions in the regulatory baseline. Thus, these benefits would manifest themselves as a product of time, or present value, not as a matter of overall magnitude. Similarly, the proposed regulations simplify the permitting process for using MTUs to treat waste explosives; OB/OD facility owners/operators may adopt MTUs sooner than they would have in the regulatory baseline, thereby reducing the overall use of OB/OD and its potential to impact human health and the environment. Finally, if there are no safe alternative technologies to OB/OD available and MTUs are not a feasible alternative, the proposed rule's new technical operating and monitoring requirements are intended to promote early identification of OB/OD-related contamination and to ensure that Subpart Y permitted units are protective of human health and the environment.

ES.5 OTHER REQUIRED ANALYSES

As required by applicable statutes and executive orders, this RIA examines equity considerations and other regulatory concerns associated with the proposed rule. Specifically, this RIA considers the following (discussed further in Chapter 5):

- **Regulatory Planning and Review:** Pursuant to the terms of Executive Order 12866, as amended by Executive Order 13563 and the Executive Order of April 6, 2023 (Modernizing Regulatory Review), the Agency has determined that this rule is not an economically significant regulatory action.

- **Regulatory Flexibility:** EPA estimates that the proposed rule will not have significant economic impacts on a substantial number of small entities under the Regulatory Flexibility Act.
- **Employment Impacts:** Insufficient data are available to quantify the potential impact of the proposed rule on employment. The economics literature suggests, however, that the costs imposed on directly regulated sectors may raise production costs and put some specific jobs at risk, while at the same time environmental regulation may create jobs in the regulated sector or other sectors, such as the environmental protection sector. EPA is requesting public comment on the potential employment impacts of the proposed rule.
- **Unfunded Mandates:** Signed into law on March 22, 1995, the Unfunded Mandates Reform Act (UMRA) requires federal agencies, unless otherwise prohibited by law, to assess the effects of their regulatory actions on state, local, and tribal governments and on the private sector, to determine whether any final rulemaking may result in “any Federal mandate that may result in the expenditure by state, local, and tribal governments, in the aggregate, or by the private sector, of \$100 million or more in any one year.” Based on the magnitude of the proposed rule’s estimated cost impacts, the proposed rule is not estimated to result in annual expenditures exceeding \$100 million for either the private sector or state, local, and tribal governments in the aggregate.
- **Federalism:** EPA estimates that the proposed rule will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.
- **Tribal Governments:** EPA estimates that the proposed rule will not impose a substantial burden on tribal governments.
- **Environmental Justice:** The human health or environmental conditions that exist prior to this action result in or have the potential to result in disproportionate and adverse human health or environmental effects on people of color, low-income populations and/or indigenous peoples. This rule is likely to lead to actions that reduce these disproportionate or adverse impacts.
- **Children's Health Protection:** The proposed rule is not expected to result in disproportionate adverse health impacts on children.
- **Energy Impacts:** The proposed rule is not expected to have a significant adverse effect on energy supply, distribution, or use. In addition, no measurable adverse impacts are expected on energy prices or foreign supplies.

CHAPTER 1 | INTRODUCTION

1.1 BACKGROUND AND NEED FOR REGULATORY ACTION

OB/OD has historically been used to treat and destroy energetic hazardous wastes, such as military munitions, explosives and gun and rocket propellants, fireworks, and flares. OB/OD is an uncontrolled treatment technology; it is conducted in the open and the treatment byproducts are released directly into the environment. As discussed below, EPA has found OB/OD operations may present risks to human health and the environment and has taken previous action to address OB/OD. Waste explosives, when open burned or open detonated, have the potential to release to the environment heavy metals, perchlorate, particulate matter, per- and poly-fluoroalkyl substances (PFAS), PCBs, dioxins/furans, explosive compounds, and other toxic contaminants. Substances released during OB/OD have the potential to migrate into and contaminate the air, soil, surface water, groundwater, and subsurface physical structures. Exposure to contaminants released during OB/OD can cause adverse health effects in humans and animals.² A detailed description of potential environmental impacts and health effects from the contaminants that are released during OB/OD is included in the background document “*Background on Potential Environmental Impacts and Health Effects of Contaminants released during OB/OD*”, available in the docket.

Because of the potential hazards to human health and the environment, in 1980, EPA banned open burning, including open detonation, of hazardous waste during the interim status period with one exception – EPA allowed OB/OD for waste explosives “which cannot safely be disposed of through other

² EPA's “Background on Potential Environmental Impacts and Health Effects of Contaminants released during OB/OD”, available in the docket.

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modes of treatment” (45 FR 33217, May 19, 1980; 40 CFR 265.382).^{3,4} This exception, or “variance”, from the ban on OB/OD was not intended to be indefinite. At the time, EPA also committed to monitoring development of new technologies.⁵

Waste explosives, as defined in 40 CFR 265.382, “include waste which has the potential to detonate and bulk military propellants which cannot safely be disposed of through other modes of treatment.”

After establishing interim status standards for thermal treatment, EPA finalized permitting standards in 1987 for hazardous waste management units that were not already covered in the regulations, including OB/OD (40 CFR Part 264, Subpart X — Miscellaneous Units).⁶ Under Subpart X, a miscellaneous unit “must be located, designed, constructed, operated, maintained and closed in a manner that will ensure protection of human health and the environment” (40 CFR 264.601).

In the 1987 final rule, EPA used the 40 CFR 265.382 definition of waste explosives to explain what OB/OD operations could and could not be permitted under Subpart X. Specifically, EPA listed OB/OD of explosive waste as an example unit covered under Subpart X, referring to units “as defined in § 265.382.”⁷ EPA also concluded in the 1987 final rule that open burning of nonexplosive hazardous waste could not be conducted in a manner that was protective of human health and the environment, stating the Agency “made this finding in 1980 in promulgating the general ban on open burning of nonexplosive hazardous waste (40 CFR 265.382) and has no new information to suggest this conclusion should be revised. The Agency, therefore, intends to deny any permit applications it receives under Subpart X for such activities.”⁸

³ The 1980 final rule followed EPA's proposed rule, published in 1978, which proposed to prohibit open burning of hazardous waste unless the owner/operator “can demonstrate that alternative treatment and disposal methods...have been evaluated and determined to be technically or economically infeasible or that the transport, treatment, and disposal of such waste poses a greater risk to human health or the environment than open burning.” 43 FR 59000, December 18, 1978.

⁴ 45 FR 33217, May 19, 1980. “The Agency agrees that open burning and open detonation are currently the only alternatives for disposal of most munitions, and thus a modified and more detailed version of the proposed variance for waste explosives has been retained in the final rules.”

⁵ Final Background Document, 40 CFR part 265, subpart P Interim Status Standards for Hazardous Waste Facilities for Thermal Treatment Processes Other Than Incineration and for Open Burning. U.S. EPA, Office of Solid Waste, April 1980; p. 52. “The Agency will be monitoring the progress of the on-going development of safe alternatives and may propose additional regulations at a later time.”

⁶ 52 FR 46964, December 10, 1987.

⁷ 52 FR 46952, December 10, 1987.

⁸ 52 FR 46952-3, December 10, 1987.

The Subpart X regulations further direct that permits for such “miscellaneous units” must “contain such terms and provisions as are necessary to protect human health and the environment” (40 CFR 264.601), and permitting authorities generally incorporate applicable provisions from the existing EPA regulations. EPA stated in the preamble to the 1987 rule that “[w]hen upgrading existing units or permitting new units, the applicable portions of Part 265 Subpart P standards (e.g., minimum safe distances) will be incorporated during issuance of Subpart X permits”.^{9,10} Thus, EPA has long interpreted Subpart X as incorporating the provisions of 40 CFR 265.382 when applied to OB/OD activities.

RCRA Section 3005(c)(1) directs EPA to issue a permit “upon a determination by the Administrator (or a State, if applicable), of compliance by a facility...with the requirements of this section and section [3004].” This means that to obtain a RCRA hazardous waste (Part B) permit, an interim status facility would need to demonstrate compliance with 40 CFR 265.382 before issuance of the permit. Moreover, given the record concerning the risks associated with OB/OD, EPA considers that the incorporation of the qualified prohibition in 40 CFR 265.382 would be necessary to ensure that such units are “operated... in a manner that will ensure protection of human health and the environment” (40 CFR 264.601). RCRA Section 3005(c) also directs the Administrator (or State), prior to issuing a permit, to “consider improvements in the state of control and measurement technology” in reviewing an application for a permit renewal. (42 U.S.C. 6925(c)(1), (3)). Accordingly, EPA expects that Subpart X permits would only be issued for OB/OD units treating waste explosives as defined in 40 CFR 265.382, and that such permits would incorporate the prohibition on OB/OD except for waste explosives “which cannot safely be disposed of through other modes of treatment” in light of the most recent information on available alternative technologies in two recent 2019 reports published by EPA and the National Academies of Sciences, Engineering, and Medicine (NASEM).¹¹ Both reports indicated there are potentially safe available alternatives technologies for certain waste streams that are currently being open burned and open detonated.

⁹ 52 FR 46952, December 10, 1987.

¹⁰ In addition, shortly after publication of the Subpart X final permitting standards, EPA confirmed that “[a]ll thermal treatment is subject to Part 265, Subpart P; if this was not the case, the standards would not be the same....” Memorandum from Marcia E. Williams, Director of Office of Solid Waste to Robert F. Greaves, EPA Region 3 Acting Chief Waste Management Branch, December 15, 1987, RO 11310.

¹¹ EPA's Alternative Treatment Technologies to Open Burning and Open Detonation of Energetic Hazardous Wastes posted at https://www.epa.gov/sites/default/files/2019-12/documents/final_obod_altechreport_for_publication_dec2019_508_v2.pdf and NASEM's *Alternatives for the Demilitarization of Conventional Munitions* (2019) posted at <https://nap.nationalacademies.org/catalog/25140/alternatives-for-the-demilitarization-of-conventional-munitions>, respectively.

Also relevant are the provisions in the statute and regulations which provide authority for agency-initiated permit modifications. Under these provisions, Regional, state, and territorial RCRA programs could consider whether cause exists to initiate a modification of existing permits not currently up for renewal to incorporate the terms and conditions listed below. RCRA Section 3005(c)(3) stipulates the Administrator (or authorized state) can review and modify a permit at any time during its term. In accordance with this direction, 40 CFR 270.41(a)(2) authorizes Regional, state, and territorial permitting authorities to modify or revoke and reissue a permit based on “information [that] was not available at the time of permit issuance ...and would have justified the application of different permit conditions at the time of issuance” such as the information contained in the two 2019 reports (discussed in Chapter 2). Under 40 CFR 271.19, EPA Regions can indicate in a comment during review of state permits, that issuance of a permit without the requirements in 40 CFR 265.382 would be inconsistent with the approved state program provisions implementing Subpart X. EPA would then have authority to take enforcement action against a permittee that does not comply with the permit condition identified as necessary, whether that condition was included in the final permit.

This proposed rule is intended to address three main needs: (1) to add regulatory requirements for the treatment of waste explosives; (2) to specify the required content for and frequency of the evaluation of alternative treatment technologies to OB/OD; and (3) to introduce a new permitting framework for MTUs and new technical standards applicable to all OB/OD units for consistency in permitting. For detailed discussion of the proposed rulemaking, see Section II.A “Introduction to Open Burning and Open Detonation of Waste Explosives and this Rulemaking” of the rule for more information.

1.2 SUMMARY OF THE PROPOSED RULE

This rulemaking is proposing changes to the RCRA regulations to clarify existing requirements for owners/operators of OB/OD units, including how and when to apply and implement the existing requirements in the permitting process. This rulemaking proposes new provisions that would specify how and when owners and operators and permit authorities are to evaluate alternative treatment technologies for OB/OD, including specific information that would be required for facilities to demonstrate whether safe modes of treatment are available for specific waste streams. This rule also proposes additions to the regulations on timelines for implementing alternative technologies, permitting for alternative technologies, waste analysis/characterization, wastes prohibited/restricted from OB/OD, technical standards for OB/OD units, delay of closure applicability to OB/OD units, clarifications to address certain time-sensitive emergencies involving OB/OD emergency provisions at §§ 270.61 and 264.1(g)/270.1(c)(3), and procedures for permitting mobile treatment units (MTUs).

1.3 SCOPE OF ANALYSIS

This analysis examines quantifiable and qualitative impacts for this proposed rulemaking and estimates compliance costs associated with OB/OD requirements. Primarily, this analysis estimates costs associated with requirements that increase the frequency of conducting evaluations of alternative technologies to OB/OD. This analysis also considers the costs resulting from new permitting standards for MTUs and new technical standards and monitoring requirements applicable to all OB/OD units. Chapter 4 discusses the proposed rule's expected benefits in qualitative terms. Chapter 5 considers the impacts of the

proposed rule related to certain Executive Orders, including environmental justice implications and impacts on Tribal Governments and Federalism.

1.4 ORGANIZATION OF THE REPORT

To support development of the rule, this RIA examines the rule's costs, benefits, and other economic impacts. The data, methods, and results of this analysis are presented in the following chapters:

- **Chapter 2: Potentially Affected Entities.** This chapter provides an overview of the U.S. entities that are likely to be affected by EPA's Revisions to Standards for the Open Burning/Open Detonation of Waste Explosives Rule and characterizes the regulatory baseline.
- **Chapter 3: Assessment of Costs.** Chapter 3 presents the estimated costs associated with the proposed rulemaking and describes the methodology used to develop these cost estimates.
- **Chapter 4: Assessment of Benefits.** After presenting the rule's cost impacts, the focus shifts to EPA's assessment of the rule's benefits in Chapter 4.
- **Chapter 5: Other Required Analyses.** This chapter assesses distributional and other impacts of the rule, including impacts to small entities, environmental justice implications, children's health, impacts to Tribal Governments, energy use and distribution effects resulting from the rule, and joint impacts with other rules.

CHAPTER 2 | POTENTIALLY AFFECTED ENTITIES

This chapter provides a description of the universe of entities that may be affected by the proposed rulemaking and characterizes the baseline regulatory costs for the universe.

2.1 UNIVERSE OF ENTITIES AFFECTED BY THE RULE

The rule's requirements apply to all RCRA hazardous waste treatment storage and disposal facilities (TSDFs) conducting or seeking to conduct open burning or open detonation of waste explosives. The proposed regulations may also apply to RCRA cleanup, closure/post-closure, and corrective action activities, including those performed at Corrective Action Management Units (CAMUs) and under Remedial Action Plans (RAPs).

As of April 2023, the requirements would apply to 69 RCRA TSDF OB/OD facilities, two of which use OB/OD for corrective action only and may be affected by this proposed rule. Permit agencies have issued permits to 65 of these facilities as RCRA hazardous waste treatment units. Four facilities are still awaiting initial permit decisions and continue to operate in interim status. Appendix A provides the full list of existing OB/OD facilities that may be subject to this rule's requirements.

As Exhibit 2-1 below shows, the Department of Defense owns or operates the approximately half of the operating OB/OD facilities. Privately held companies own or operate 23 facilities, federal agencies own or operate seven facilities, and the Northern Mariana Islands Department of Fire and Emergency Management Services owns/operates one facility. Overall, facility owners/operators have conducted 24 alternative technology evaluations as required under existing EPA requirements. 13 of these evaluations have identified an appropriate alternative technology that can treat waste explosives at the facility, while 11 concluded there are no safe alternatives available.

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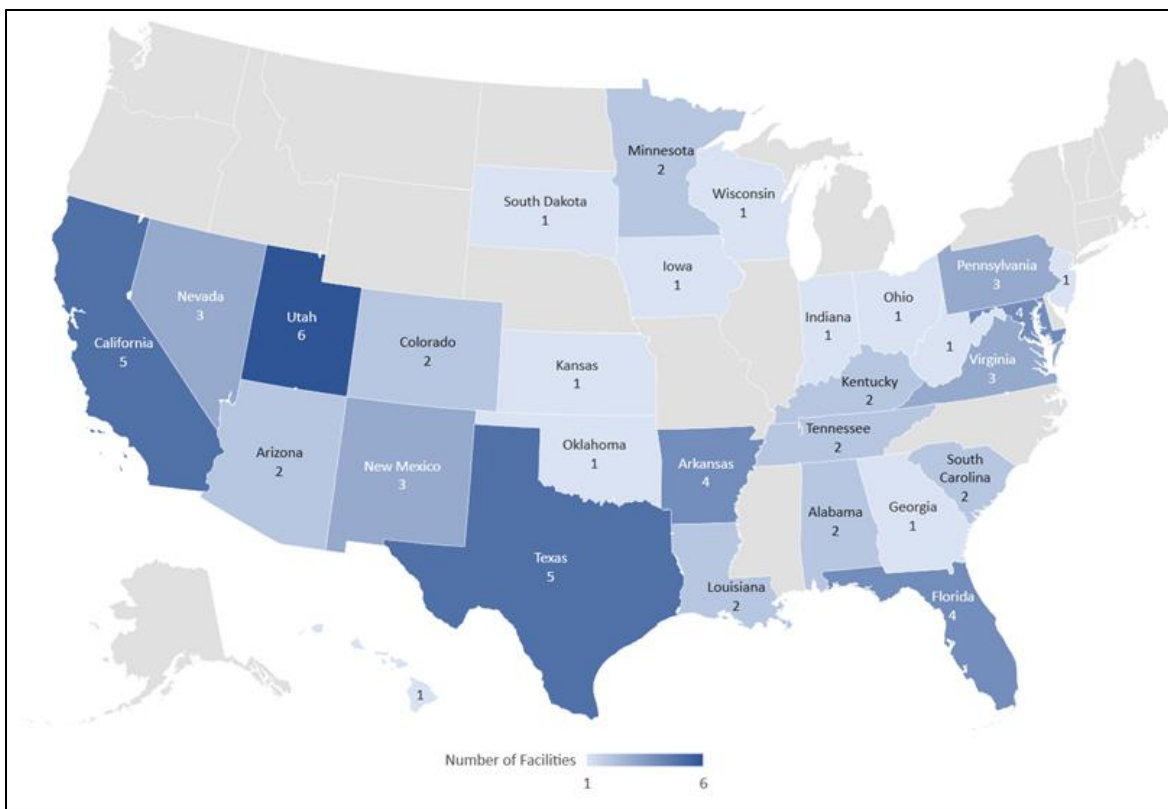
**EXHIBIT 2-1. UNIVERSE OF AFFECTED ENTITIES AND STATUS OF EVALUATING ALTERNATIVE
TECHNOLOGIES TO OB/OD**

FACILITY OWNER	TOTAL NUMBER OF OB/OD FACILITIES	COMPLETED EVALUATION OF ALTERNATIVE TECHNOLOGIES TO OB/OD	IDENTIFIED ALTERNATIVE TECHNOLOGIES TO OB/OD
U.S. Air Force	7	1	0
U.S. Army	21	7	6
U.S. Marines	2	0	0
U.S. Navy	7	4	1
U.S. Space Force	1	0	0
U.S. Department of Energy	6	2	2
National Aeronautics and Space Administration	1	1	0
U.S. Territory Agency	1	0	0
Private Company	23	9	4
Total	69	24	13
Source: EPA, Resource Conservation and Recovery Act Information (RCRAInfo) system, April 2023.			

Exhibit 2-2 shows where operating OB/OD facilities are located across the country. The states with the largest number of OB/OD facilities are Arizona, California, Florida, Maryland, Nevada, Pennsylvania, Texas, Utah, and Virginia. Two OB/OD facilities in Guam and the Northern Mariana Islands are not pictured in Exhibit 2-2.

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EXHIBIT 2-2. U.S. OPERATING OB/OD FACILITIES BY STATE



Source: EPA, Resource Conservation and Recovery Act Information (RCRAInfo) system, April 2023.

Note: Two OB/OD facilities in Guam and the Northern Mariana Islands are not pictured.

According to EPA's RCRAInfo system,¹² 18 private companies own or operate 23 of the OB/OD facilities in the regulated universe.¹³ This RIA relies on information from Dun & Bradstreet (D&B), a leading private source of commercial information, to help identify the number of small entities in the regulated universe. D&B data provide the primary North American Industry Classification System

¹² <https://enviro.epa.gov/facts/rcrainfo/search.html>.

¹³ Alliant Techsystems Operations, LLC owns three facilities, ATK Launch Systems Inc. owns and/or operates two facilities, and Austin Powder Company owns and/or operates two facilities.

(NAICS) code and estimates of annual revenues and the number of employees for each company.¹⁴ This RIA also relies upon the Small Business Administration's (SBA's) Small Business Size Standards.¹⁵ Standards are specified for individual 6-digit NAICS codes and defined by either annual revenues or number of employees, depending on the industry. Comparing these size standards against the company financial and employment data from D&B indicates that 8 of the 18 private entities may currently qualify as small businesses.¹⁶ Chapter 5 provides additional analysis about the proposed rule's economic impacts on small businesses.

2.2 BASELINE REQUIREMENTS FOR EVALUATION OF ALTERNATIVE TECHNOLOGIES

In the absence of this the proposed regulation, entities conducting OB/OD would continue to be subject to 40 CFR 265.382, which includes evaluating (and reevaluating) whether safe alternatives to OB/OD are available. When safe and available alternatives are identified in the alternative technology evaluations, regulated entities must implement them in place of OB/OD.

Recently, in support of the existing regulations at 40 CFR 265.382, EPA released two informative documents regarding OB/OD. The 2019 EPA report, "Alternative Technologies to Open Burning and Open Detonation of Energetic Hazardous Wastes" documents safe alternatives are available for managing waste explosives currently being treated by OB/OD.¹⁷ In June 2022, EPA issued a policy memorandum, "Open Burning and Open Detonation (OB/OD) of Waste Explosives Under the Resource Conservation and Recovery Act (RCRA)" to communicate the existing regulations, implementation of OB/OD ban and alternative technology evaluation requirements, and provide guidance for specific permitting conditions to OB/OD units.¹⁸ Depending on an individual facility's permit renewal cycle, permit writers and regulated

¹⁴ For more information, see <https://www.dnb.com/>.

¹⁵ These reflect SBA's small business size standards as of December 19, 2022. Accessed at: <https://www.sba.gov/document/support-table-size-standards>.

¹⁶ The Northern Mariana Islands does not qualify as a "small governmental jurisdiction" according to the Regulatory Flexibility Act, which defines "small governmental jurisdiction" as the government of a city, county, town, township, village, school district, or special district with a population of less than 50,000 (5 U.S.C. section 601(5)). The population of the Northern Mariana Islands was approximately 51,475 as of 2022. <https://www.cia.gov/the-world-factbook/countries/northern-mariana-islands/#people-and-society>.

¹⁷ EPA's Alternative Treatment Technologies to Open Burning and Open Detonation of Energetic Hazardous Wastes posted at https://www.epa.gov/sites/default/files/2019-12/documents/final_obod_alttechreport_for_publication_dec2019_508_v2.pdf

¹⁸ Open Burning and Open Detonation (OB/OD) of Waste Explosives Under the Resource Conservation and Recovery Act (RCRA) From: Carolyn Hoskinson, Director, Office of Resource Conservation and Recovery to: Land, Chemicals, and Redevelopment Division Directors, Regions 1-10 posted at https://www.epa.gov/system/files/documents/2022-06/OBOD_Policy_Memo_signed_6.7.22_508.pdf

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facilities have not had time to act on the information newly available and to fully implement the policy memo interpretation of the existing regulations. In the absence of any new regulations, facility owners/operators would fully implement the existing regulations, as clarified in the 2022 policy memorandum guidance, when their permit comes up for renewal. In the absence of this rule, facility owners/operators will continue to renew permits every ten years, with the permitting condition guidance issued in the 2022 policy memorandum. Facility owners or operators that perform OB/OD must first demonstrate that their waste explosives “cannot safely be disposed of through other modes of treatment” to qualify for the exception to use OB/OD. To do so, the facility owner or operator must successfully demonstrate, through an evaluation of alternative technologies, that no other technologies can safely treat each waste stream or technologies are unavailable. As new technologies become available, a facility owner or operator must periodically reevaluate, e.g., at permit issuance and renewal, whether this condition has been met to maintain compliance with this requirement. Periodic reevaluation is required even if the facility has previously made this evaluation to satisfy its interim status obligation under 40 CFR 265.382 or to satisfy a permit condition established under Subpart X.

In addition, whenever an OB/OD permit is issued, the permit must include the requirements at § 265.382, as well as the terms that specify the conditions requiring periodic reevaluation to determine whether other safe modes of treatment have been developed, so that these requirements remain enforceable during the life of the permit. This baseline scenario would include both the circumstance in which the permit is issued to an interim status facility and in response to an application to renew a permit for an OB/OD unit. Inclusion of such requirements is also consistent with the direction in RCRA Section 3005(c) to determine compliance with the RCRA Section 3004 requirements prior to issuing a permit, and to “consider improvements in the state of control and measurement technology” in reviewing an application for a permit renewal (42 U.S.C. 6925(c)(1), (3)).

CHAPTER 3 | ASSESSMENT OF COSTS

This chapter estimates the costs of the revised standards for evaluating alternative technologies to OB/OD and of implementing new technical standards and monitoring requirements for OB/OD when there are no available, safe alternatives. Based on the language of the proposed rule, two requirements are expected to add incremental costs to OB/OD owners or operators relative to the regulatory baseline and are quantified in this analysis:

- After an initial evaluation, OB/OD facility owners/operators will need to reevaluate alternative technologies at least as frequently as every five years thereafter (instead of every ten years with permit renewal in the baseline scenario).
- OB/OD facility owners/operators will need to comply with new technical operating/performance standards and monitoring requirements for OB/OD units that their permits do not presently include.

Other requirements, such as specifying when an initial alternative technology evaluation must be conducted and the time allowed for implementation of alternative technologies, are not expected to add incremental costs to facility owners/operators. Instead, these requirements will shift when the costs will be incurred. Not quantified in this analysis are the costs to EPA or states for the review of more frequent alternative technology evaluations. Because the current regulations already require alternative technology evaluation review, EPA assumes because this is an update to a RCRA permitting structure the regulators already have staff expertise and would likely not need to hire additional staff. The evaluations are also infrequent (proposed rule will require reviews every five years instead of the current ten years) and EPA expects the costs to EPA and states to be minimal. EPA is requesting public comment on annual labor hours resources necessary to comply with the increased frequency.

Costs for Mobile Treatment Units (MTUs) are not quantified in this analysis, since MTUs are not required under this proposal. Rather MTUs are an existing potential compliance option which, by the changes to MTU permitting in the proposal, EPA intends to make more widely available through this rulemaking. In addition, the new permitting framework and procedures regarding MTUs, outlined in Subpart K of the proposed rulemaking, are expected to represent a net cost savings to OB/OD facility owners or operators for two primary reasons. First, the rule's two-step permitting process is simpler and less expensive than complying with existing requirements to obtain RCRA permits to use MTUs to treat waste explosives. Second, where MTUs are used by facility owners/operators, MTUs are assumed to be a less expensive option than other alternative technology treatment options (e.g., a permanent on-site alternative treatment unit). EPA is requesting public comment on the costs of employing MTUs. Not quantified in this analysis are the costs to EPA for the new MTU permitting framework, as this process is yet to be finalized.

To address uncertainties and differences across OB/OD facilities regarding costs, this RIA presents both low impact and high impact estimates of the costs associated with the proposed rule. The low impact cost estimates presented in this chapter reflect the low-end assumptions regarding any cost-related inputs for which a range of data inputs was available, such as capital and operating costs of monitoring equipment or structures required for compliance activities. Similarly, the high impact cost estimates developed in this chapter reflect the high-end estimates for these variables.

3.1 REQUIREMENTS WITH INCREMENTAL COSTS

3.1.1 GENERAL ASSUMPTIONS

Description of Alternative Technology Evaluations

At present, facility owners/operators that conduct OB/OD of waste explosives are required to demonstrate and periodically redemonstrate that no safe alternatives exist. Prior alternative technology evaluations have varied in depth, organization, and content. In this rulemaking, EPA proposes to standardize the alternative technology review process by requiring that certain information be included in the alternative technology evaluation, including: 1) description of facility operations, 2) characterization of waste explosives, 3) initial screening of potentially available alternative treatment technologies and, as applicable 4) identification of alternative technologies according to individual waste streams to include off-site treatment options, 5) identification of selected alternative treatment technologies, and 6) identification of individual waste streams still requiring OB/OD. .

The cost of an alternative technology evaluation is dependent upon, among other factors, the provider conducting the evaluation and the complexity of the OB/OD facility (e.g., the number of different waste streams present). EPA conducted outreach to OB/OD facility owners/operators to collect information about the methodologies and costs associated with conducting (or commissioning) alternative technology evaluations. Based on these conversations, OB/OD facility owners/operators report a range of alternative technology evaluation costs that are site specific. Alternative technology evaluations vary due to complexity (such as timeframe for completion, facility size, waste streams, owner of facility) with the largest and most complex cases costing up to \$2,000,000. For the purposes of the RIA, to characterize a range of alternative technology evaluations that would be reasonable to apply to the entire universe, EPA estimates that the costs of an alternative technology evaluation are between approximately \$30,000 and

\$100,000 (\$2022).¹⁹ These values account for all costs associated with the rule's updated waste characterization and analysis requirements discussed above and outlined in Subpart Y of § 264.706 and § 264.707 of the proposed rule. EPA is aware that certain facility owners/operators may incur additional costs if they identify specific alternative technologies to OB/OD that require further evaluation and analysis. That is, facility-specific factors could prolong, and increase the costs of, the evaluation of alternative technologies. EPA requests comment on alternative technology reevaluation costs.

Discount Rates

This RIA presents the cost impacts of the rule in present value and annualized terms using discount rates of three and seven percent over a 20-year forecast period.²⁰ The present value represents the value of a payment or stream of payments in common dollar terms. That is, it is the sum of a series of future cash flows expressed in today's dollars. Translation of future costs to present value terms requires the following: (a) projected future costs; and (b) the specific years in which these impacts are expected to be incurred. With these data, the present value of the future stream of impacts (PVC) from year t_1 to T is measured in 2022 dollars according to the following standard formula:²¹

$$PV_c = \sum_{t_1}^T \frac{C_t}{(1+r)^{t-t_1}}$$

where C_t is the cost of each alternative technology evaluation and r is the discount rate.

As indicated above, this RIA also expresses cost impacts of evaluating alternative technologies as annualized values. Annualized values are calculated to provide a comparison of impacts across activities

¹⁹ For use in the RIA estimates, \$30,000-\$100,000 is an approximate range for the cost of a single evaluation of alternative technologies to OB/OD that satisfies the proposed rule's requirements, according to EPA's communications with OB/OD facility owners or operators with a range of facility sizes. Costs may vary by facility.

²⁰ To discount and annualize costs, guidance provided by the OMB specifies the use of a real rate of seven percent. In addition, OMB recommends sensitivity analysis using other discount rates such as three percent, which some economists believe more appropriately reflects the social rate of time preference. U.S. Office of Management and Budget, Circular A-4, September 17, 2003 and U.S. Office of Management and Budget, "Draft 2003 Report to Congress on the Costs and Benefits of Federal Regulations; Notice," 68 Federal Register 5492, February 3, 2003.

²¹ To derive the present value of future impacts, t_1 is the first year and T is the final year of the forecast. Based on EPA Guidance for Preparing Economic Analyses, this RIA uses a 20-year forecast period, which allows for both the full expected costs to OB/OD facility owners/operators and the physical effects that drive the rule's benefits to materialize. See page 5-4 of U.S. EPA Office of the Administrator, Guidance for Preparing Economic Analyses, December 2010, accessed at <https://www.epa.gov/sites/default/files/2017-09/documents/ee-0568-05.pdf>.

with varying time components and forecast periods.²² Annualized future impacts (APV_c) are calculated according to the following standard formula:

$$APV_c = PV_c \left[\frac{r \times (1 + r)^{(N-1)}}{(1 + r)^N - 1} \right]$$

where N is the number of years in the forecast period.

3.1.2 INCREASED FREQUENCY OF REEVALUATIONS OF ALTERNATIVE TECHNOLOGIES TO OB/OD

Regarding reevaluations for owners or operators conducting OB/OD, EPA is proposing at § 264.707(d) to require the facility owner or operator, after conducting an initial evaluation of alternative technologies, to conduct reevaluations at least as frequently as every five years thereafter (instead of every ten years with permit renewal in the baseline scenario). After an initial alternative technology evaluation, over the next 20 years a facility owner/operator will need to reevaluate alternative technologies four times after the rule's implementation, rather than twice in the baseline, meaning the facility owner's evaluation costs will double (in nominal terms).

Exhibit 3-1 reports the total and annualized costs per OB/OD facility of the rule's reevaluation of alternative technologies requirements over 20 years. Costs in columns B, D, and E are reported in present value terms using a seven percent discount rate. Costs are then annualized (reported in the final row) using the above formula for annualized future impacts (AVP_c) at a seven percent discount rate.

Exhibit 3-2 reports results based on a discount rate of three percent. For a constant stream of payments, as in this analysis, the annualized costs are not sensitive to changes in the discount rate and the results are essentially the same as in Exhibit 3-1.

²² When comparing annualized costs using different discount rates, the values may vary depending on the timing of costs over the analytical time horizon. *A priori*, there is no rule stating whether a lower or higher discount rate should yield a higher annualized cost, as this depends on the timing of costs during the analytic time horizon. As described above, the annualization method involves two steps, which have countervailing influences on the magnitude of the annualized cost: the present value calculation and the standard annualization formula. In general, if the majority of costs are experienced in the upfront years, the annualized cost would be higher using a higher discount rate. However, if the majority of costs are experienced in the years further out, the annualized costs would be higher using a lower discount rate. For a constant stream of payments, the annualized costs are not sensitive to the discount rate and will be equivalent.

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EXHIBIT 3-1. COSTS PER FACILITY OF THE RULE'S REEVALUATION OF ALTERNATIVE TECHNOLOGIES REQUIREMENTS (\$2022 ANNUALIZED OVER 20 YEARS, USING A 7% DISCOUNT RATE)

YEARS AFTER EVALUATION	LOW IMPACT ESTIMATE				
	REGULATORY BASELINE		AFTER RULE TAKES EFFECT		COST DIFFERENCE [E =D-B]
	REQUIRED ALT. TECH EVALUATIONS [A]	PRESENT VALUE COST OF ALT. TECH EVALUATION [B]	REQUIRED ALT. TECH EVALUATIONS [C]	PRESENT VALUE COST OF ALT. TECH EVALUTATION [D]	
0	1	\$30,000	1	\$30,000	-
5	0	\$0	1	\$21,390	\$21,390
10	1	\$15,250	1	\$15,250	-
15	0	\$0	1	\$10,873	\$10,873
20	1	\$7,753	1	\$7,753	-
Total	3	\$53,003	5	\$85,266	\$32,263
Total Annualized Costs (AVP_c)					\$2,846
YEARS AFTER EVALUATION	HIGH IMPACT ESTIMATE				
	REGULATORY BASELINE		AFTER RULE TAKES EFFECT		COST DIFFERENCE [E =D-B]
	REQUIRED ALT. TECH EVALUATIONS [A]	PRESENT VALUE COST OF ALT. TECH EVALUATION [B]	REQUIRED ALT. TECH EVALUATIONS [C]	PRESENT VALUE COST OF ALT. TECH EVALUTATION [D]	
0	1	\$100,000	1	\$100,000	-
5	0	\$0	1	\$71,299	\$71,299
10	1	\$50,835	1	\$50,835	-
15	0	\$0	1	\$36,245	\$36,245
20	1	\$25,842	1	\$25,842	-
Total	3	\$176,677	5	\$284,220	\$107,543
Total Annualized Costs (AVP_c)					\$9,487
Notes: <ol style="list-style-type: none"> \$30,000-\$100,000 is an approximate range for the cost of a single evaluation of alternative technologies to OB/OD that satisfies the proposed rule's requirements, according to EPA's communications with OB/OD facility owners or operators with a range of facility sizes. Costs may vary by facility. Year 0 represents either an initial alternative technology evaluation or the most recent reevaluation for the facility. Costs in columns B, D, and E are reported in present value terms using a discount rate of seven percent. Total Annualized Costs are also reported in present value terms using the same discount rate of seven percent to amortize the total present value costs over 20 years. 					

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EXHIBIT 3-2. COSTS PER FACILITY OF THE RULE'S REEVALUATION OF ALTERNATIVE TECHNOLOGIES REQUIREMENTS (\$2022 ANNUALIZED OVER 20 YEARS, USING A 3% DISCOUNT RATE)

YEARS AFTER EVALUATION	LOW IMPACT ESTIMATE				
	REGULATORY BASELINE		AFTER RULE TAKES EFFECT		COST DIFFERENCE [E =D-B]
	REQUIRED ALT. TECH EVALUATIONS [A]	PRESENT VALUE COST OF ALT. TECH EVALUATION [B]	REQUIRED ALT. TECH EVALUATIONS [C]	PRESENT VALUE COST OF ALT. TECH EVALUTATION [D]	
0	1	\$30,000	1	\$30,000	-
5	0	\$0	1	\$25,878	\$25,878
10	1	\$22,323	1	\$22,323	-
15	0	\$0	1	\$19,256	\$19,256
20	1	\$16,610	1	\$16,610	-
Total	3	\$68,933	5	\$114,067	\$45,134
Total Annualized Costs (AVPc)					\$2,945
YEARS AFTER EVALUATION	HIGH IMPACT ESTIMATE				
	REGULATORY BASELINE		AFTER RULE TAKES EFFECT		COST DIFFERENCE [E =D-B]
	REQUIRED ALT. TECH EVALUATIONS [A]	PRESENT VALUE COST OF ALT. TECH EVALUATION [B]	REQUIRED ALT. TECH EVALUATIONS [C]	PRESENT VALUE COST OF ALT. TECH EVALUTATION [D]	
0	1	\$100,000	1	\$100,000	-
5	0	\$0	1	\$86,261	\$86,261
10	1	\$74,409	1	\$74,409	-
15	0	\$0	1	\$64,186	\$64,186
20	1	\$55,368	1	\$55,368	-
Total	3	\$229,777	5	\$380,224	\$150,447
Total Annualized Costs (AVPc)					\$9,818
Notes:					
1. \$30,000-\$100,000 is an approximate range for the cost of a single evaluation of alternative technologies to OB/OD that satisfies the proposed rule's requirements, according to EPA's communications with OB/OD facility owners or operators with a range of facility sizes. Costs may vary by facility.					
2. Year 0 represents either an initial alternative technology evaluation or the most recent reevaluation for the facility.					
3. Costs in columns B, D, and E are reported in present value terms using a discount rate of three percent.					
4. Total Annualized Costs are also reported in present value terms using the same discount rate of three percent to amortize the total present value costs over 20 years.					

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Exhibit 3-3 reports the total annualized costs of the proposed rule's reevaluation of alternative technologies requirements for the 69 operating OB/OD facilities in the regulated universe, using three and seven percent discount rates. The total annualized cost of this component is between approximately \$196,385 and \$677,433, depending on the discount rate and the cost (low impact or high impact estimate) of the alternative technology evaluation. Costs to facility owners or operators will vary depending on factors such as the number and complexity of the waste streams at the facility, the pricing and availability of firms capable of conducting alternative technology evaluations, and potentially the discovery of new technologies that would complicate or simplify the evaluation process.²³

EXHIBIT 3-3. TOTAL ANNUALIZED COSTS OF OF THE RULE'S REEVALUATION OF ALTERNATIVE TECHNOLOGIES REQUIREMENTS (\$2022 ANNUALIZED OVER 20 YEARS, USING 3% AND 7% DISCOUNT RATES)

DISCOUNT RATE [A]	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY LOW IMPACT ESTIMATE [C]	TOTAL ANNUALIZED COSTS LOW IMPACT ESTIMATE [D=B×C]	ANNUALIZED COST PER FACILITY HIGH IMPACT ESTIMATE [E]	TOTAL ANNUALIZED COSTS HIGH IMPACT ESTIMATE [F=B×E]
3%	69	\$2,945	\$203,230	\$9,818	\$677,433
7%	69	\$2,846	\$196,385	\$9,487	\$654,618
Notes: 1. For a constant stream of payments, as in this analysis, the annualized costs are not sensitive to changes in the discount rate.					

3.1.3 NEW OPERATING AND MONITORING REQUIREMENTS FOR OB/OD UNITS

Before OB/OD facility owners or operators are eligible to open burn or open detonate waste explosives, they must submit documentation of waste analysis required under § 264.606 and an alternative technology evaluation required under § 264.707(a) to the regulatory authority, and the regulatory

²³ Note that more frequent reevaluations may accelerate the identification and implementation of alternative technologies, leading to related costs being incurred earlier relative to the baseline. Insufficient information exists to estimate the cost in present value terms of any accelerated time frame, but the effect is likely to be limited.

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authority must approve the evaluation. If the owner or operator is eligible to open burn or open detonate any waste explosives, they must be conducted in accordance with §§ 264.709 and 264.710 and in a manner that does not pose a threat to human health or the environment.

This proposed rulemaking updates the technical standards and permit conditions with which OB/OD users must comply. This analysis of the proposed rule's costs focuses on new permit requirements that EPA expects impose incremental costs on OB/OD facility owners or operators. EPA identified these new operating and monitoring requirements by examining what requirements are typically included in existing permits. Exhibit 3-4 summarizes the conditions that OB/OD permits must address once the regulations take effect and indicates if a permit condition is an existing requirement (i.e., the requirement is explicitly stated in OB/OD permits that EPA reviewed) or a new requirement under this rulemaking.

EXHIBIT 3-4. EXISTING VS. NEW OB/OD PERMIT CONDITIONS

PERMIT CONDITION	EXISTING OR NEW REQUIREMENT
Public Notice and Outreach Plan	New
Securing OB/OD Facility	New
Waste Characterization	Existing
Atmospheric Limitations	
Air Temperature	Existing
Wind Restrictions	Existing
Precipitation Restrictions	Existing
Cloud Conditions	Existing
Processing Limits	
Time of Day	Existing
Events per Day	Existing
Maximum Net Explosive Weight Limits	Existing
Excess Material Removal	New
Construction Specifications	
Burn Pad/Pan Specifications	Existing
Secondary Containment	Existing
Soil Cover Requirements	Existing
Monitoring Requirements	
Groundwater Monitoring	New
Kickout Monitoring	New
Soil Monitoring	New
Air Monitoring	New
Stormwater Controls and Monitoring	New
Surface Water Monitoring	New
Notes:	
1. EPA classified requirements as "new" if they are not required under current regulations and are expected to impose costs on OB/OD facility owners or operators as a result of the proposed rule. Certain requirements are clarified under this rulemaking that may be partially addressed in existing permits.	

The new operating requirements proposed under this rulemaking are the following: OB/OD permits must address the removal of excess waste material (such as foils and casings) if it is possible to do so safely; permits must include a security plan and controls to ensure that the OB/OD units and surrounding kickout area are secure and protected from unauthorized access by the public; and permits must include a public notice and outreach plan to include notice to the surrounding community of planned OB/OD activities and events. In addition, under § 264.710, owners/operators of OB/OD units must implement plans for groundwater, soil and residues, air, kickout, storm water, and if present, surface water and sediments as appropriate to monitor for releases and contamination from the OB/OD units and the surrounding kickout areas. Estimated incremental costs resulting from new requirements are outlined below. EPA is seeking public comment to refine cost estimates for several of the new operating and monitoring requirements. Hourly Labor Costs

Some of the unit costs presented in this chapter reflect the time required to comply with operating and monitoring requirements and are estimated as a function of the hourly labor costs associated with various professional positions. Exhibit 3-5 reports the fully loaded labor costs on a per-hour basis for environmental engineers, environmental science technicians, public relations specialists and public relations managers who will likely implement the removal of excess material, public notice and outreach plan, and kickout monitoring requirements associated with the rule. The hourly costs presented in the exhibit reflect unloaded hourly wages reported by the U.S. Bureau of Labor Statistics (BLS) based on a full-time employee working 40 hours a week multiplied by a loaded wage rate factor of 1.63. The loaded wage rate factor represents the sum of two cost adjustments: (1) a fringe benefits (e.g., insurance, disability income protection, retirement benefits, sick leave, vacation, etc.) rate of 0.2949 and (2) an overhead rate of 0.336.²⁴

²⁴ The fringe benefit cost factor and overhead cost factors were obtained from the Supporting Statement for OMB NO. 2050-0149: "RCRA Expanded Public Participation", accessed at <https://omb.report/icr/202203-2050-006/doc/119811400>.

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EXHIBIT 3-5. HOURLY LABOR COSTS (\$2022)

BLS OCCUPATION CATEGORY	MEAN LOADED HOURLY LABOR COST
Environmental Engineers	\$88.63
Environmental Science and Protection Technicians	\$47.05
Public Relations Managers	\$130.79
Public Relations Specialists	\$68.47
<p>Notes:</p> <ol style="list-style-type: none"> 1. U.S. Bureau of Labor Statistics, National Occupational Employment and Wage Estimates, May 2022, accessed at https://www.bls.gov/oes/. 2. Inflation factor based on U.S. Bureau of Labor Statistics, “Table 5. Employment Cost Index for total compensation, for private industry workers, by occupation and industry, continuous occupational and industry series (not seasonally adjusted);” Employment Cost Index, Historical Listing - Volume V, Continuous Occupational and Industry Series, March 1979-March 2022 (December 2005=100). Private Industry Workers, All Workers, March 2022=150.2 and March 2021=143.3. Accessed at https://www.bls.gov/web/eci/eci-continuous-dollar.pdf. 3. Loaded wage rates calculated using (1) fringe benefits from U.S. Bureau of Labor Statistics, “Table 4. Employer Costs for Employee Compensation for private industry workers by occupational and industry group;” All Workers, Total Compensation March 2022=39.61 and Total Benefits March 2022=11.68, accessed at https://www.bls.gov/news.release/ecec.nr0.htm ; and (2) the overhead cost factor from EPA Information Collection Request Number 1688.10, OMB Control No. 2050-0149, “RCRA Expanded Public Participation (Renewal).” 	

Removal of Excess Material

This proposed rulemaking specifies the permit conditions and terms for managing OB/OD units. Permits must include requirements for OB/OD facility owners or operators to remove excess material, such as foils and casings, if it is possible to do so safely. Environmental technicians, under the guidance of environmental engineers, are expected to remove excess material as part of the routine cleanup process following an OB/OD event. Exhibit 3-6 reports the annualized unit and aggregate costs of the proposed rulemaking’s removal of excess material requirements, based on the fully loaded labor costs on a per-hour basis for environmental engineers and environmental technicians who will likely perform this function and EPA’s estimates of the number of hours per year that will be sufficient to comply with these operating requirements. EPA is requesting public comment on the potential annual labor hours necessary to comply with this operating requirement.

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**EXHIBIT 3-6. ANNUALIZED UNIT AND AGGREGATE COSTS OF THE RULE'S REMOVAL OF EXCESS
MATERIAL REQUIREMENTS (\$2022 ANNUALIZED OVER 20 YEARS, USING 3% AND 7%
DISCOUNT RATES)**

DISCOUNT RATE [A]	LOW IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C]	RECURRING COSTS [D] ¹	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	69	\$0	\$2,768	\$2,768	\$0	\$191,025	\$191,025
7%	69	\$0	\$2,768	\$2,768	\$0	\$191,025	\$191,025
DISCOUNT RATE [A]	HIGH IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C]	RECURRING COSTS [D] ²	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	69	\$0	\$5,537	\$5,537	\$0	\$382,049	\$382,049
7%	69	\$0	\$5,537	\$5,537	\$0	\$382,049	\$382,049
Notes:							
1. This represents the low impact annualized cost of removing excess material, reflecting average loaded hourly labor costs and hours worked for environmental engineers (\$88.63, 10 hours per year) and environmental technicians (\$47.05, 40 hours per year).							
2. This represents the high impact annualized cost of removing excess material, reflecting average loaded hourly labor costs and hours worked for environmental engineers (\$88.63, 20 hours per year) and environmental technicians (\$47.05, 80 hours per year).							

Security Plan and Controls

Permit conditions must address a security plan for OB/OD facility owners/operators such that OB/OD units and the surrounding kickout area are protected from unauthorized access by the public. EPA has verified that the 45 facilities in the regulated universe that are owned or operated by the federal government (including the Department of Defense) are already secure and finds no facilities that do not comply with general RCRA facility access standards. For the remaining 24 facilities in the current regulated universe, this RIA assumes that OB/OD facility owners or operators will construct chain link fencing around OB/OD unit perimeters to comply with this operating requirement. According to EPA's Unit Cost Compendium, the average unit cost of constructing security fencing is \$61 per linear foot

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(\$2022).²⁵ EPA also reviewed OB/OD unit boundaries that are reported in existing permits for facilities that are owned/operated by private entities and estimated a range of perimeter sizes that facility owners/operators will be responsible for securing after the regulations take effect. EPA chose the 25th and 75th percentiles of the perimeter sample (in feet) as the lower and upper bounds for this analysis. Thus, as a low impact estimate, this RIA assumes OB/OD facility owners/operators will construct 400 feet of fencing to secure OB/OD units. As a high impact estimate, this RIA assumes 1,476 feet of fencing is required to secure OB/OD units.

Exhibit 3-7 reports the annualized unit and aggregate costs of the proposed rulemaking's security plan and controls requirements. EPA is requesting public comment on the size of OB/OD units and surrounding kickout area, as well as other potential resources necessary to comply with this operating requirement.

²⁵ EPA, Office of Resource Conservation and Recovery, Unit Cost Compendium, September 2011. Costs are adjusted for inflation to 2022 dollars.

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**EXHIBIT 3-7. ANNUALIZED UNIT AND AGGREGATE COSTS OF THE RULE'S SECURITY PLAN AND
CONTROLS REQUIREMENTS (\$2022 ANNUALIZED OVER 20 YEARS, USING 3% AND
7% DISCOUNT RATES)**

DISCOUNT RATE [A]	LOW IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C] ¹	RECURRING COSTS [D]	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	24	\$1,588	\$0	\$1,588	\$38,115	\$0	\$38,115
7%	24	\$2,147	\$0	\$2,147	\$51,526	\$0	\$51,526
DISCOUNT RATE [A]	HIGH IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C] ²	RECURRING COSTS [D]	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	24	\$5,861	\$0	\$5,861	\$140,661	\$0	\$140,661
7%	24	\$7,923	\$0	\$7,923	\$190,150	\$0	\$190,150
Notes:							
1. This represents the low impact annualized cost of constructing 400 feet of fencing to secure OB/OD units.							
2. This represents the high impact annualized cost of constructing 1,476 feet of fencing to secure OB/OD units							

Public Notice and Outreach Plan

Under the proposed rule, OB/OD facility owners or operators must prepare a public notice and outreach plan to include notice to the surrounding community of planned OB/OD activities and events. The plan must include the method of notice distribution, required content, and timeframe for notifications. The plan's required content includes information regarding contaminants emitted or released from OB/OD operations, environmental monitoring data/results, and locations of off-site contamination including kickout and groundwater contamination.

Exhibit 3-8 reports the annualized unit and aggregate costs of the proposed rulemaking's public notice and outreach plan requirement, based on the fully loaded labor costs on a per-hour basis for environmental engineers, public relations managers, and public relations specialists who will likely perform this function and EPA's estimates of the number of hours per year that will be sufficient to

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comply with this operating requirement. EPA is requesting public comment on the potential annual labor hours necessary to comply with this operating requirement.

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**EXHIBIT 3-8. ANNUALIZED UNIT AND AGGREGATE COSTS OF THE RULE'S PUBLIC NOTICE AND
OUTREACH PLAN REQUIREMENTS (\$2022 ANNUALIZED OVER 20 YEARS, USING 3%
AND 7% DISCOUNT RATES)**

DISCOUNT RATE [A]	LOW IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C]	RECURRING COSTS [D] ¹	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	69	\$0	\$5,073	\$5,073	\$0	\$350,045	\$350,045
7%	69	\$0	\$5,073	\$5,073	\$0	\$350,045	\$350,045
DISCOUNT RATE [A]	HIGH IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C]	RECURRING COSTS [D] ²	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	69	\$0	\$10,146	\$10,146	\$0	\$679,797	\$700,090
7%	69	\$0	\$10,146	\$10,146	\$0	\$679,797	\$700,090
Notes:							
1. This represents the low impact annualized cost of the public notice and outreach plan, reflecting average loaded hourly labor costs and hours worked for public relations specialists (\$68.47, 10 hours per year), environmental engineers (\$88.63, 20 hours per year), and public relations managers (\$130.79, 20 hours per year).							
2. This represents the high impact annualized cost of the public notice and outreach plan, reflecting average loaded hourly labor costs and hours worked for public relations specialists (\$68.47, 20 hours per year), environmental engineers (\$88.63, 40 hours per year), and public relations managers (\$130.79, 40 hours per year).							

Groundwater Monitoring Requirements

As appropriate, groundwater monitoring is required under the proposed rulemaking to detect potential releases from OB/OD units. Groundwater monitoring must include at least one upgradient background well in addition to downgradient wells. sampling and testing must be conducted regularly in accordance with an approved RCRA groundwater monitoring plan at least until the unit completes RCRA closure (soils and groundwater) and is under a post-closure permit as applicable. Exhibit 3-9 reports the annualized unit and aggregate costs of the proposed rulemaking's groundwater monitoring requirements, based on steel-cased groundwater well installation costs and groundwater sampling and testing costs from EPA's Unit Cost Compendium.²⁶ EPA uses a groundwater-specific sampling unit cost but relies on the costs of testing for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals in surface water, since the Unit Cost Compendium does not provide comparable cost estimates for testing for these substances in groundwater. As a high impact estimate of the cost of this requirement, this RIA assumes facility owners or operators will install five groundwater monitoring wells and will conduct groundwater sampling and testing monthly at each well. As a low impact estimate, this RIA assumes facility owners or operators will install three groundwater monitoring wells and will conduct groundwater sampling and testing semi-annually at each well. EPA is requesting public comment on the number of monitoring wells required to comply with this monitoring requirement and on the frequency of events at permitted OB/OD units used to estimate this cost component.

²⁶ EPA, Office of Resource Conservation and Recovery, Unit Cost Compendium, September 2011. Costs are adjusted for inflation to 2022 dollars.

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EXHIBIT 3-9. ANNUALIZED UNIT AND AGGREGATE COSTS OF THE RULE'S GROUNDWATER MONITORING REQUIREMENTS (\$2022 ANNUALIZED OVER 20 YEARS, USING 3% AND 7% DISCOUNT RATES)

DISCOUNT RATE [A]	LOW IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C] ¹	RECURRING COSTS [D] ²	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	69	\$1,097	\$32,830	\$33,927	\$75,719	\$2,265,279	\$2,340,997
7%	69	\$1,483	\$32,830	\$34,314	\$102,359	\$2,265,279	\$2,367,638
DISCOUNT RATE [A]	HIGH IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C] ³	RECURRING COSTS [D] ⁴	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	69	\$11,767	\$239,072	\$250,839	\$811,932	\$16,495,976	\$17,307,909
7%	69	\$15,907	\$239,072	\$254,979	\$1,097,595	\$16,495,976	\$17,593,571
Notes: The sampled materials and associated testing unit costs (\$2022) included in this analysis are VOCs (\$390), SVOCs (\$865), and metals (\$499). Sampling costs are \$11,154 per sampling event. <ol style="list-style-type: none"> 1. This represents a first-year cost of \$16,816 per facility (\$1,097 and \$1,483 on an annualized basis using a discount rate of 3% and 7%, respectively) for installing three steel-cased groundwater monitoring wells (total depth 15 feet). 2. This represents the low-impact annualized cost of groundwater monitoring, assuming OB/OD facility owners will conduct semi-annual sampling and testing at three groundwater monitoring wells. 3. This represents a first-year cost of \$180,317 per facility (\$11,767 and \$15,907 on an annualized basis using a discount rate of 3% and 7%, respectively) for installing five steel-cased groundwater monitoring wells (total depth 110 feet). 4. This represents the high-impact annualized cost of groundwater monitoring, assuming OB/OD facility owners will conduct monthly sampling and testing at five groundwater monitoring wells. 							

Stormwater Controls and Monitoring Requirements

This rulemaking proposes adding stormwater to the list in § 264.601(b). Stormwater monitoring may be required at and around OB/OD units to detect any potential releases. As appropriate, stormwater monitoring must be conducted in accordance with an approved RCRA stormwater monitoring plan according to proposed § 264.710, until the unit achieves RCRA clean closure. To comply with the proposed regulations, OB/OD facility owners may need to install stormwater controls to prevent

stormwater run-on and run-off. EPA believes that retention basins and earth/soil berms are sufficient structures to meet these requirements.

According to a previous EPA study, the base capital construction cost of a retention basin is approximately \$170,959, with annual maintenance and monitoring costs of three to six percent of the base construction cost.²⁷ The unit cost of constructing an earth/soil berm is approximately \$48 per linear foot;²⁸ the total construction cost varies depending on the size of the OB/OD units and kickout areas at each facility. Similar to the analysis in the removal of excess material operating requirement section, for this requirement EPA calculated the 25th and 75th percentiles of OB/OD unit perimeter sizes for a larger subset of permits that includes permits for facilities that are owned and operated by the Department of Defense. The 25th and 75th percentiles are used in this analysis are 590 to 2,450 linear feet, respectively. Earth/soil berm costs also include annual maintenance costs of three to six percent of the base construction cost.²⁹ EPA is requesting comment on the size of OB/OD units and the surrounding kickout areas. EPA is also requesting comment on the accuracy of the Agency's expectation that constructing/maintaining both retention basins and earth/soil berms are necessary and sufficient to comply with this operating requirement.

Exhibit 3-10 reports the annualized unit and aggregate costs of the proposed rulemaking's stormwater controls and monitoring requirements, based on the assumption that facility owners or operators must construct and maintain a retention basin and an earth/soil berm. The estimated cost per facility to comply with these requirements ranges from \$18,984 to \$36,150 using a three percent discount rate and from \$23,560 to \$42,777 using a seven percent discount rate.

²⁷ EPA, Office of Water, Preliminary Data Summary of Urban Storm Water Best Management Practices, *Chapter 6*, August 1999. Costs are adjusted for inflation to 2022 dollars.

²⁸ Minnesota Pollution Control Agency, "Unit costs related to stabilized earth/soil berms", available at: https://stormwater.pca.state.mn.us/index.php?title=Sediment_control_practices_-_Stabilized_earth/soil_berm. Unit costs represent average bid prices for award projects for the Minnesota Department of Transportation and are inclusive of salaries and benefits.

²⁹ EPA, Office of Water, Preliminary Data Summary of Urban Storm Water Best Management Practices, *Chapter 6*, August 1999. Costs are adjusted for inflation to 2022 dollars.

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**EXHIBIT 3-10. ANNUALIZED UNIT AND AGGREGATE COSTS OF THE RULE'S STORMWATER
CONTROLS AND MONITORING REQUIREMENTS (\$2022 ANNUALIZED OVER 20 YEARS,
USING 3% AND 7% DISCOUNT RATES)**

DISCOUNT RATE [A]	LOW IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C] ¹	RECURRING COSTS [D] ²	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	69	\$13,005	\$5,979	\$18,984	\$897,368	\$412,533	\$1,309,900
7%	69	\$17,581	\$5,979	\$23,560	\$1,213,089	\$412,533	\$1,625,621
DISCOUNT RATE [A]	HIGH IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C] ³	RECURRING COSTS [D] ⁴	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	69	\$18,834	\$17,316	\$36,150	\$1,299,545	\$1,194,838	\$2,494,384
7%	69	\$25,460	\$17,316	\$42,777	\$1,756,765	\$1,194,838	\$2,951,603
Notes: 1. This represents a first-year cost of \$199,291 per facility (\$13,005 and \$17,581 on an annualized basis using a discount rate of 3% and 7%, respectively) for constructing a retention basin and an earth/soil berm. 2. This represents the low impact annualized cost of maintaining the retention basin and berm and conducting stormwater monitoring (3% of base construction costs). 3. This represents a first-year cost of \$288,608 per facility (\$18,834 and \$25,460 on an annualized basis using a discount rate of 3% and 7%, respectively) for constructing a retention basin and an earth/soil berm. 4. This represents the high impact annualized cost of maintaining the retention basin and berm and conducting stormwater monitoring (6% of base construction costs).							

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Surface Water Monitoring Requirements

As appropriate, surface water monitoring of nearby water bodies is required under the proposed rulemaking to detect potential releases from OB/OD units that may cause unacceptable risk to human health and the environment. Surface water monitoring must be conducted regularly in accordance with an approved RCRA surface water monitoring plan until the unit achieves RCRA clean closure. Sediments in the surface water must be monitored according to the sediments sampling plan. EPA relies on the Agency's Unit Cost Compendium for the costs of sampling for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals.³⁰ As a high impact estimate of the cost of this requirement, this RIA assumes facility owners or operators will conduct surface water monitoring for the above substances monthly. As a low impact estimate, this RIA assumes facility owners or operators will conduct surface water monitoring semi-annually.

Exhibit 3-11 reports the annualized unit and aggregate costs of the proposed rulemaking's surface water monitoring requirements. The estimated cost per facility to comply with these requirements ranges from \$5,420 to \$32,521.

³⁰ EPA, Office of Resource Conservation and Recovery, Unit Cost Compendium, September 2011. Costs are adjusted for inflation to 2022 dollars.

**EXHIBIT 3-11. ANNUALIZED UNIT AND AGGREGATE COSTS OF THE RULE'S SURFACE WATER
MONITORING REQUIREMENTS (\$2022 ANNUALIZED OVER 20 YEARS, USING 3% AND
7% DISCOUNT RATES)**

DISCOUNT RATE [A]	LOW IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C]	RECURRING COSTS [D] ¹	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	69	\$0	\$5,420	\$5,420	\$0	\$373,989	\$373,989
7%	69	\$0	\$5,420	\$5,420	\$0	\$373,989	\$373,989
DISCOUNT RATE [A]	HIGH IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C]	RECURRING COSTS [D] ²	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	69	\$0	\$32,521	\$32,521	\$0	\$2,243,936	\$2,243,936
7%	69	\$0	\$32,521	\$32,521	\$0	\$2,243,936	\$2,243,936
Notes: The sampled materials and associated sampling and testing unit costs (\$2022) included in this analysis are VOCs (\$709), SVOCs (\$1,184), and metals (\$817). 1. This represents the low-impact annualized cost of surface water monitoring, assuming OB/OD facility owners or operators conduct semi-annual sampling and testing. 2. This represents the high-impact annualized cost of surface water monitoring, assuming OB/OD facility owners or operators conduct monthly sampling and testing.							

Soil Monitoring Requirements

As appropriate, soil must be monitored monthly around the unit (e.g., burn pans, cages, piles, and detonation sites). Exhibit 3-12 reports the annualized unit and aggregate costs of the proposed rulemaking's soil monitoring requirements. EPA relies on the Agency's Unit Cost Compendium for the costs of sampling and testing for EP toxicity metals, volatile organic compounds, and polycyclic aromatic

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hydrocarbons (PAHs) in soil.³¹ As a high impact estimate of the cost of this requirement, this RIA assumes facility owners or operators will conduct soil monitoring at four sites around the OB/OD unit monthly. As a low impact estimate, this RIA assumes facility owners or operators conduct soil monitoring at four sites around the OB/OD unit semi-annually. EPA is requesting public comment on cost estimates for this monitoring requirement.

³¹ EPA, Office of Resource Conservation and Recovery, Unit Cost Compendium, September 2011. Costs are adjusted for inflation to 2022 dollars.

EXHIBIT 3-12. ANNUALIZED UNIT AND AGGREGATE COSTS OF THE RULE'S SOIL MONITORING REQUIREMENTS (\$2022 ANNUALIZED OVER 20 YEARS, USING 3% AND 7% DISCOUNT RATES)

DISCOUNT RATE [A]	LOW IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C]	RECURRING COSTS [D] ¹	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	69	\$0	\$4,026	\$4,026	\$0	\$277,800	\$277,800
7%	69	\$0	\$4,026	\$4,026	\$0	\$277,800	\$277,800
DISCOUNT RATE [A]	HIGH IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C]	RECURRING COSTS [D] ²	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	69	\$0	\$24,157	\$24,157	\$0	\$1,666,799	\$1,666,799
7%	69	\$0	\$24,157	\$24,157	\$0	\$1,666,799	\$1,666,799
Notes: The sampled materials and associated testing unit costs (\$2022) included in this analysis are EP toxicity metals (\$176), volatile organics (\$123), and PAHs (\$140). Sampling costs are \$257 per sampling event. <ol style="list-style-type: none"> This represents the low-impact annualized cost of soil monitoring, assuming OB/OD facility owners or operators conduct semi-annual sampling and testing. This represents the high-impact annualized cost of soil monitoring, assuming OB/OD facility owners or operators conduct monthly sampling and testing. 							

Air Monitoring Requirements

As appropriate, air monitoring is required to detect potential releases from OB/OD units. Air monitoring may be required downwind of the OB/OD unit boundary and at or near the facility boundary. Air monitoring of OB/OD plumes must be conducted during an OB/OD event, in accordance with an approved air monitoring plan. Air monitoring may be conducted upwind of the facility to establish background or ambient concentrations, where they would not be impacted by facility operations including any other open burning or open detonation (e.g., OB/OD conducted related to product testing or training). In addition, the direction, duration, extent, and opacity of air smoke plumes must be visually monitored and recorded (e.g., in a log) during each OB/OD event. This RIA assumes OB/OD facility owners will

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incur one-time capital costs in the first year and annually recurring operating costs over 20 years to comply with the rulemaking's air monitoring requirements. EPA derived cost estimates based on the costs of fence line passive diffusive tube monitoring equipment and maintenance.³² This RIA assumes that each OB/OD facility will have two monitoring sites for the low-impact estimate and three monitoring sites for the high-impact estimate.

Exhibit 3-13 reports the annualized unit and aggregate costs of the proposed rulemaking's air monitoring requirements. The estimated cost per facility to comply with these requirements ranges from \$12,138 to \$17,162 using a three percent discount rate and from \$12,296 to \$17,565 using a seven percent discount rate.

³² Colorado Department of Public Health and Environmental, Cost-Benefit Analysis of Regulation Number 7: Control of Ozone via Ozone Precursors and Control of Hydrocarbons via Oil and Gas Emissions, September 2020. Costs are adjusted for inflation to 2022 dollars.

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**EXHIBIT 3-13. ANNUALIZED UNIT AND AGGREGATE COSTS OF THE RULE'S AIR MONITORING
REQUIREMENTS (\$2022 ANNUALIZED OVER 20 YEARS, USING 3% AND 7% DISCOUNT
RATES)**

DISCOUNT RATE [A]	LOW IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C] ¹	RECURRING COSTS [D] ²	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	69	\$450	\$11,688	\$12,138	\$31,073	\$806,445	\$837,518
7%	69	\$609	\$11,688	\$12,296	\$42,005	\$806,445	\$848,450
DISCOUNT RATE [A]	HIGH IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C] ³	RECURRING COSTS [D] ⁴	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	69	\$1,145	\$16,017	\$17,162	\$79,004	\$1,105,159	\$1,184,163
7%	69	\$1,548	\$16,017	\$17,565	\$106,800	\$1,105,159	\$1,211,959
Notes: <ol style="list-style-type: none"> 1. This represents a low impact first-year cost of \$3,450 per facility (\$450 and \$609 on an annualized basis using a discount rate of 3% and 7%, respectively) for installing monitoring equipment. 2. This represents the low impact annualized operating costs for two air monitoring stations, including expenditures for equipment maintenance/insurance, sampling collection, sampling analysis, recordkeeping, and reporting. 3. This represents a high impact first-year cost of \$17,546 per facility (\$1,145 and \$1,548 on an annualized basis using a discount rate of 3% and 7%, respectively) for installing monitoring equipment. 4. This represents the high impact annualized operating costs for three air monitoring stations, including expenditures for equipment maintenance/insurance, sampling collection, sampling analysis, recordkeeping, and reporting. 							

Kickout Monitoring Requirements

Kickout must be visually monitored and recorded after each OB/OD event conducted at the OB/OD unit. The operator/operator must monitor and record the following information: the extent (distance from OB/OD unit), description, and location of all kickout that goes off facility. Kickout monitoring requirements differ for open burning and open detonation, but this analysis assumes that OB/OD facility owners/operators will conduct both treatment methods. To calculate a range of costs, EPA assumes that kickout monitoring at open burning units is conducted twice per year and daily (five days per week), respectively, in the low impact and high impact scenarios, while monitoring at open detonation units is conducted twice per year and weekly, respectively, in the low impact and high impact scenarios. In all scenarios, each OB unit requires 15 minutes to inspect, and each OD unit requires one hour to inspect.

Exhibit 3-14 reports the annualized unit and aggregate costs of the proposed rulemaking's kickout monitoring requirement, based on the fully loaded labor costs on a per-hour basis for environmental technicians who will likely perform this function and EPA's estimates of the number of hours per year that will be sufficient to comply with this requirement. EPA is requesting public comment on the potential annual labor hours necessary to comply with this monitoring requirement.

EXHIBIT 3-14. ANNUALIZED UNIT AND AGGREGATE COSTS OF THE RULE'S KICKOUT MONITORING REQUIREMENTS (\$2022 ANNUALIZED OVER 20 YEARS, USING 3% AND 7% DISCOUNT RATES)

DISCOUNT RATE [A]	LOW IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C]	RECURRING COSTS [D] ¹	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	69	\$0	\$118	\$118	\$0	\$8,117	\$8,117
7%	69	\$0	\$118	\$118	\$0	\$8,117	\$8,117
DISCOUNT RATE [A]	HIGH IMPACT ESTIMATE						
	NUMBER OF AFFECTED FACILITIES LIKELY TO INCUR COSTS [B]	ANNUALIZED COST PER FACILITY			AGGREGATE ANNUALIZED COST		
		ONE-TIME COSTS [C]	RECURRING COSTS [D] ²	TOTAL COST PER FACILITY [E = C+D]	ONE-TIME COSTS [F=B×C]	RECURRING COSTS [G=B×D]	TOTAL AGGREGATE ANNUALIZED COSTS [H=F+G]
3%	69	\$0	\$5,505	\$5,505	\$0	\$379,866	\$379,866
7%	69	\$0	\$5,505	\$5,505	\$0	\$379,866	\$379,866
Notes:							
1. This represents the low impact annualized cost of kickout monitoring plans, reflecting the average loaded hourly labor cost for environmental technicians of \$47.05 and 30 minutes worked per year monitoring OB units and 2 hours worked per year monitoring OD units.							
2. This represents the high impact annualized cost of kickout monitoring plans, reflecting the average loaded hourly labor cost for environmental technicians of \$47.05 and 65 hours worked per year monitoring OB units and 52 hours worked per year monitoring OD units.							

3.2 RESULTS

Exhibit 3-15 reports the total annualized cost per facility of the proposed rule by provision. These costs are reported under discount rates of both three percent and seven percent. This RIA reports large ranges of costs for the rule's monitoring requirements between low and high impact estimates, which reflects the potential wide variability across facilities in terms of their expected monitoring frequency requirements contained in permits. The range of costs is also large for the proposed rule's requirements whose costs vary depending on the size of the OB/OD facility (security plan and stormwater controls). Exhibit 3-16 reports total aggregate annualized costs of the rule across the regulated universe of OB/OD facilities.

Regulatory Impact Analysis (RIA) for EPA's Revisions to Standards for the Open Burning/Open
Detonation of Waste Explosives Rule

Cost impacts may be lower for facilities than estimated in this analysis. The Director (40 CFR 124.2(a) "Director") has discretion to determine if some permitting and monitoring conditions are needed or the required frequency. Examples include groundwater and stormwater monitoring, the most expensive monitoring requirements, may not be required for a specific site. The Director also has discretion to determine the appropriate monitoring frequency of the other permit conditions. Because of the Director's discretion, facilities may not incur groundwater or stormwater monitoring costs, or may incur lower costs for the other monitoring requirements due to decreased frequency of monitoring approved by the Director.

Regulatory Impact Analysis (RIA) for EPA's Revisions to Standards for the Open Burning/Open
Detonation of Waste Explosives Rule

EXHIBIT 3-15. TOTAL COST PER FACILITY OF THE PROPOSED RULE BY REQUIREMENT (\$2022 ANNUALIZED OVER 20 YEARS)

REQUIREMENT	LOW IMPACT SCENARIO		HIGH IMPACT SCENARIO	
	ANNUALIZED COSTS (USING A 3% DISCOUNT RATE)	ANNUALIZED COSTS (USING A 7% DISCOUNT RATE)	ANNUALIZED COSTS (USING A 3% DISCOUNT RATE)	ANNUALIZED COSTS (USING A 7% DISCOUNT RATE)
Reevaluation of Alternative Technologies	\$2,945	\$2,846	\$9,818	\$9,487
Removal of Excess Material	\$2,768	\$2,768	\$5,537	\$5,537
Security Plan and Controls	\$1,588	\$2,147	\$5,861	\$7,923
Public Notice and Outreach Plan	\$5,073	\$5,073	\$10,146	\$10,146
Groundwater Monitoring Requirements	\$33,927	\$34,314	\$250,839	\$254,979
Stormwater Controls and Monitoring Requirements	\$18,984	\$23,560	\$36,150	\$42,777
Surface Water Monitoring Requirements	\$5,420	\$5,420	\$32,521	\$32,521
Soil Monitoring Requirements	\$4,026	\$4,026	\$24,157	\$24,157
Air Monitoring Requirements	\$12,138	\$12,296	\$17,162	\$17,565
Kickout Monitoring Requirements	\$118	\$118	\$5,505	\$5,505
Total	\$86,988	\$92,568	\$397,696	\$410,597

Regulatory Impact Analysis (RIA) for EPA's Revisions to Standards for the Open Burning/Open
Detonation of Waste Explosives Rule

EXHIBIT 3-16. TOTAL AGGREGATE COSTS OF THE PROPOSED RULE BY REQUIREMENT (\$2022 ANNUALIZED OVER 20 YEARS)

REQUIREMENT	LOW IMPACT SCENARIO		HIGH IMPACT SCENARIO	
	ANNUALIZED COSTS (USING A 3% DISCOUNT RATE)	ANNUALIZED COSTS (USING A 7% DISCOUNT RATE)	ANNUALIZED COSTS (USING A 3% DISCOUNT RATE)	ANNUALIZED COSTS (USING A 7% DISCOUNT RATE)
Reevaluation of Alternative Technologies	\$203,230	\$196,385	\$677,433	\$654,618
Removal of Excess Material	\$191,025	\$191,025	\$382,049	\$382,049
Security Plan and Controls	\$38,115	\$51,526	\$140,661	\$190,150
Public Notice and Outreach Plan	\$350,045	\$350,045	\$700,090	\$700,090
Groundwater Monitoring Requirements	\$2,340,997	\$2,367,638	\$17,307,909	\$17,593,571
Stormwater Controls and Monitoring Requirements	\$1,309,900	\$1,625,621	\$2,494,384	\$2,951,603
Surface Water Monitoring Requirements	\$373,989	\$373,989	\$2,243,936	\$2,243,936
Soil Monitoring Requirements	\$277,800	\$277,800	\$1,666,799	\$1,666,799
Air Monitoring Requirements	\$837,518	\$848,450	\$1,184,163	\$1,211,959
Kickout Monitoring Requirements	\$8,117	\$8,117	\$379,866	\$379,866
Total	\$5,930,736	\$6,290,595	\$27,177,290	\$27,974,642

3.3 REQUIREMENTS WITHOUT INCREMENTAL COSTS

3.3.1 TIMING OF INITIAL ALTERNATIVE TECHNOLOGY EVALUATIONS

For permitted facilities, EPA is proposing new regulations at §§ 264.607(c) that specify when OB/OD facility owners or operators must prepare and submit initial alternative technology evaluations.

Owners/operators must submit the initial alternative technology evaluation as part of the next permit application supporting any of the following permit actions.

- Application for a new OB/OD unit;
- Renewal application of an existing OB/OD unit;
- Permit application for an interim status OB/OD unit; or
- Class 3 permit modifications.

For interim status facilities, EPA is proposing requirements at § 265.607(c)(2) that the OB/OD facility owner/operator conduct an alternative technology evaluation in association with permit renewals. An owner or operator that conducted an alternative technology evaluation within three years prior to the effective date of the regulations may use that evaluation in lieu of conducting another alternative technology evaluation provided that the alternative technology evaluation assessed all the facility's waste streams and meets the standards at § 264.607(b).

3.3.2 IMPLEMENTATION OF ALTERNATIVE TECHNOLOGIES SCHEDULES

Similarly, EPA is proposing a requirement at § 265.607(f) that owners and operators of facilities managing waste explosives that identify safe alternatives to OB/OD prepare and submit an implementation schedule. The implementation schedule would be due within 180 days of the completion of an alternative technology evaluation which determined that a safe alternative technology is available. The implementation schedule would need to be approved by the permitting authority and include the significant interim milestones, including vendor procurement, submittal of a permit application to add the alternative technology unit, construction start and completion dates (if applicable), testing of the alternative technology, and operation of the alternative technology. The proposal allows flexibility in the timing for implementation of the alternative technology by not establishing a nationwide regulatory compliance date. At the same time, the proposal would provide an avenue to establish implementation schedules on a technology and facility-specific basis and thus provide clarity and certainty as to the compliance deadlines for implementing an alternative technology.

3.3.3 MOBILE TREATMENT UNITS

At present, the RCRA regulations require that owners or operators of MTUs obtain a RCRA permit for treatment from the authorized permit agency at each site where it will operate. Furthermore, every time the unit moves across state lines, a new permit with potentially unique state-specific requirements would need to be issued. The RCRA permit process is time and resource intensive and thus, not very conducive to meeting the needs of facilities that require a short-term and cost-effective treatment option. EPA

previously proposed regulatory amendments to create a framework to enable streamlined permitting of MTUs to facilitate their use in the RCRA program.³³ However, that proposal was never finalized.

EPA is proposing a framework for MTUs solely to treat waste explosives, rather than all hazardous wastes as the previous 1987 proposal. Within this framework EPA issues permits for MTUs in a two-stage process that enables OB/OD facility owners and operators to treat waste explosives. Under the proposed regulations, an owner or operator of an MTU, or group of identical MTUs, seeking to treat waste explosives must first apply for and obtain a nationwide conditional approval in accordance with §§ 270.332 through 270.334. Upon receiving a nationwide conditional approval, the owner or operator is eligible to apply for and seek a RCRA MTU permit in accordance with §§ 270.335 through 270.337 for each location at which the unit, or group of identical units, will treat waste explosives (location-specific permit). EPA believes the proposed rule's two-step permitting process would be simpler, by way of providing a standardized permit process specific to MTUs, than complying with existing requirements to obtain RCRA permits to use MTUs to treat waste explosives. For a detailed discussion of all the changes to the permitting of MTUs that EPA is proposing, please refer to Section L of the proposed rule.

EPA believes MTUs offer a cost-effective solution to some of the challenges associated with the management and treatment of waste explosives. First, use of MTUs by facilities to treat hazardous waste explosives would provide a more cost-efficient compliance option. MTUs would be able to provide services at more than one site, lowering the average cost of alternative technology in treating waste explosives as the unit's infrastructure and construction costs would be spread over multiple customers and for a greater operating time. MTUs could obviate the need for these facilities to build, maintain and operate alternative technologies in instances where a mobile alternative tech is available. Finally, MTUs could be operated by specialized personnel trained in the operation of the MTU, thereby increasing the safety of these units and reducing training needs of facilities that would otherwise need to construct and maintain their own technologies. Because of these opportunities, along with the simplified permitting process, this RIA assumes that the rule's new regulations and framework for MTUs are at least cost neutral to facility operation and may represent a cost savings to OB/OD facility owners/operators if they adopt MTUs in lieu of other more expensive alternative technologies or sooner than they would have in the baseline scenario.

³³ 52 FR 20914, June 3, 1987.

3.3.4 DE MINIMIS EXEMPTION

EPA is proposing to establish a conditional exemption that would allow a facility to treat waste explosives by OB/OD without conducting a comprehensive alternative technology evaluation or implementing an available alternative technology, based on a showing that the treatment would result in negligible (or *de minimis*) contamination and potential for exposure. The requirements of the *de minimis* exemption and demonstration are discussed in Section II.B Scope of Applicability of the proposed rulemaking. EPA has proposed 15,000 lbs NEW as the annual maximum of waste explosives that could potentially qualify under a *de minimis* exemption. EPA is proposing that the *de minimis* demonstrations would need to be made on the same schedule as the owner operator would have submitted alternative technology evaluations for the subject wastes under § 264.707(c) and (d) for permitted facilities or § 265.707(c) and (d) for interim status facilities. (For permitted facilities the initial demonstration would be submitted upon permit renewal, class 2 or 3 modification or permit issuance and at least as frequently as every five years thereafter. For interim status facilities the demonstration would be due within one year of the effective date of the rule and every five years thereafter).

EPA does not have sufficient data to estimate how many OB/OD facilities may apply for and potentially qualify for the *de minimis* exemption (because it is a new proposal). In addition, since no facility owners/operators have applied for the exemption, EPA does not have a basis to quantify the costs of the demonstration process at this time. This RIA assumes that the *de minimis* exemption demonstrations will not increase costs on facility owners/operators beyond those estimated in the Chapter 3 Section 3.1.2 Increased Frequency of Reevaluations of Alternative Technologies to OB/OD. Rather, it is likely that the total cost estimate would be decreased if one or more facilities applied for and obtained the *de minimis* exemption because of the expectation that a *de minimis* demonstration would involve less effort and costs than performing an alternative technology evaluation) because the *de minimis* demonstration is not required to evaluate and consider implementation of on-site alternative technologies. The benefits to human health and the environment as discussed in Chapter 4 due to this rulemaking, would be expected to be reduced if a *de minimis* exemption is finalized and OB/OD is used for treatment instead of alternative technologies. The magnitude and significance of this reduction is not clear. EPA is requesting public comment on the potential costs of preparing the five demonstrations to qualify for the *de minimis* exemption.

CHAPTER 4 | ASSESSMENT OF BENEFITS

This chapter provides a qualitative assessment of the benefits that may result from the proposed rulemaking. The main purpose of this proposed rule is to increase protection of human health and the environment through improved implementation of the existing requirements to evaluate and implement alternative technologies, and by establishing minimum technical standards for OB/OD units to ensure consistency across all permits. The proposed revisions would reduce the release of contaminants to the air, soil, surface water, and groundwater from the treatment of waste explosives.

Benefits may occur from each of the three major rule components. First, the rule's requirements for facility owners to more frequently reevaluate alternative technologies to OB/OD relative to the baseline scenario. Second, from facility owners implementing EPA's proposed new technical performance standards and monitoring requirements when there are no safe or available alternative technologies to OB/OD. And finally, the cost savings to the regulated community from the increased adoption of MTUs to treat waste explosives.

OB/OD operations may present risks to human health and the environment. Substances released during OB/OD have the potential to migrate into and contaminate the air, soil, surface water, groundwater, and subsurface physical structures. This contamination may damage water supplies, drinking water, and zones of food chain crops, vegetation, domestic animals, and wildlife, ³⁴putting at risk the individuals who live and rely on water sources near OB/OD facilities.

Contaminants released during OB/OD such as perchlorate, TNT, RDX, HMX, DNT, VOCs/SVOCs and PAHs have all been linked to deleterious health outcomes; further, EPA has documented in closure report case studies that these hazardous constituents exceeded action levels in environmental media at closed

³⁴ A description of potential environmental impacts and health effects from the contaminants that are released during OB/OD is included in the background document "Background on Potential Environmental Impacts and Health Effects of Contaminants released during OB/OD", available in the docket.

OB/OD units.^{35,36} For example, above certain exposure levels in drinking water, perchlorate can interfere with the normal functioning of the thyroid gland.³⁷ TNT is a possible human carcinogen to which humans can be exposed through drinking contaminated water, skin contact with contaminated soil or drinking water, and inhalation.³⁸ RDX is a suggestive human carcinogen based on toxicological reviews of the compound's effects in mice and rats.³⁹ DNT is a probable human carcinogen. According to EPA, releases to water, as are possible during OB/OD events, are sources of human exposure and remain an environmental concern.⁴⁰

Furthermore, as documented in the 2019 NASEM Report, use of safe alternative technologies to OB/OD in general represents a greater level of control and more complete treatment than does OB/OD, and therefore provides better protection of human health and the environment.⁴¹ Appendix D of this report also summarizes EPA's and the public's concerns about OB/OD that NASEM collected as part of the study. These include concerns about the potential for contamination of surface water/groundwater, soil, and air resulting from treatment activities and the inability to accurately monitor and characterize emissions from OB/OD. Addressing this perceived inability is important to assure the public that health risks to the communities near OB/OD facilities are fully identified and evaluated.⁴²

4.1 INCREASED FREQUENCY OF REEVALUATIONS OF ALTERNATIVE TECHNOLOGIES TO OB/OD

The proposed rulemaking requires OB/OD facility owners to reevaluate alternative technologies every five years (instead of every ten years with permit renewal in the baseline scenario). As discussed in Chapter 3, over a 20-year period, facility owners would need to conduct five alternative technology evaluations after the rule's implementation instead of three in the regulatory baseline. More frequent reevaluations may accelerate the identification of alternative technologies, which in turn would accelerate

³⁵ See page 30 of the Alternatives for the Demilitarization of Conventional Munitions, NASEM, January 2019 <https://www.nap.edu/catalog/25140/alternatives-for-the-demilitarization-of-conventional-munitions>.

³⁶ OB/OD Closure Case Studies Report, EPA, 2023, available in the docket for this proposed rule. Information about specific chemicals, including information on health and environmental impacts, can be found on EPA's CompTox Chemicals Dashboard <https://comptox.epa.gov/dashboard/>.

³⁷ <https://www.epa.gov/sdwa/perchlorate-drinking-water-frequent-questions>.

³⁸ https://www.epa.gov/sites/default/files/2017-10/documents/ffirofactsheet_contaminants_tnt_9-15-17_508.pdf.

³⁹ https://iris.epa.gov/ChemicalLanding/&substance_nmbr=313.

⁴⁰ https://www.epa.gov/system/files/documents/2021-08/technical-fact-sheet-dinitrotoluene-dnt_0.pdf.

⁴¹ See Chapter 8 and finding 8-1 (page 90) of the Alternatives for the Demilitarization of Conventional Munitions, NASEM, January 2019.

⁴² Alternatives for the Demilitarization of Conventional Munitions, NASEM, January 2019. Appendix D.

the improvement in environmental and human health outcomes relative to actions in the regulatory baseline. In other words, though existing reevaluation requirements promote environmental and health benefits, this proposed rulemaking may bring these same benefits forward in time.

For OB/OD facilities that qualify for the *de minimis* exemption, owners or operators may save costs relative to the requirements of the proposed rule which include submitting evaluations of alternative technologies that include on-site technologies analyses. This RIA does not quantify the costs of implementing alternative technologies since their implementation is required (if feasible) under existing regulations, but if a facility meets the criteria for a *de minimis* exemption, a facility could continue to OB/OD, and not be required to construct an on-site alternative technology. As discussed in Section 3.3.4 *de minimis* Exemption, EPA does not have sufficient data to estimate how many OB/OD facilities may apply for and potentially qualify for the *de minimis* exemption and EPA has requested comment for consideration in the final rule.

4.2 NEW OPERATING AND MONITORING REQUIREMENTS FOR OB/OD UNITS

Similarly, if no safe alternative technologies to OB/OD are available at the time of an alternative technology evaluation, facility owners or operators must comply with the proposed rule's new operating and monitoring requirements that will be incorporated into OB/OD permits once the regulations take effect. The proposed regulations concerning monitoring plans are intended to ensure that Subpart Y permitted units are protective of human health and the environment.⁴³ As EPA described in the 1987 Subpart X final rule, "[i]n most cases, air emissions from open burning/open detonation cannot be controlled since it is impossible to operate these units under totally enclosed conditions" (2 FR 46957, December 10, 1987). The lack of air emission controls can be mitigated by permit conditions that monitor the impact to the surrounding environment. Specifically, monitoring of environmental media is intended to ensure hazardous constituents are not migrating beyond the unit boundary, to provide for early detection of releases, and to allow timely cleanup or corrective action to occur.⁴⁴ As described in Chapter 3, this RIA identifies, and accounts for the incremental costs of, new requirements that are not explicitly included in existing OB/OD permits. Specifically, the analysis of costs assumes that facility owners or

⁴³ EPA has consistently maintained that "In lieu of safe alternative technologies for treating explosive waste, RCRA permits have served as an important mechanism for establishing conditions to minimize exposure during OB/OD operations and ensure cleanup of contaminants upon closure." See page 10 of Alternative Treatment Technologies to Open Burning and Open Detonation of Energetic Hazardous Wastes, US EPA, December 2019 https://www.epa.gov/sites/production/files/2019-12/documents/final_obod_alttechreport_for_publication_dec2019_508_v2.pdf.

⁴⁴ See page 69 of the Alternatives for the Demilitarization of Conventional Munitions, NASEM, January 2019. <https://www.nap.edu/catalog/25140/alternatives-for-the-demilitarization-of-conventional-munitions>.

operators are currently not conducting air, groundwater, kickout, soil stormwater, and surface water monitoring (according to standards outlined in § 264.710(a) of the proposed rule) in the regulatory baseline. EPA expanded monitoring requirements because of the potential for harmful concentrations of OB/OD contaminants to migrate to communities near facilities through air, stormwater, and surface water pathways (discussed below). Therefore, as owners and operators comply with the proposed rule's more expansive monitoring requirements, they may identify OB/OD-related contamination in new environmental media and several years earlier relative to the baseline scenario. Earlier identification of such contamination would, in turn, allow facility owners/operators and regulators to prevent OB/OD-related impacts to human health and the environment sooner than they would have been able to absent the proposed rule's new requirements.

Once the regulations take effect, owners/operators would design and propose soil, groundwater, stormwater and surface water monitoring plans, as appropriate, to detect any potential releases from OB/OD units; all monitoring would be conducted regularly by an approved monitoring plan until units complete RCRA clean closure. This proposed rule includes these requirements out of concern that contaminants released during OB/OD can migrate between soil, stormwater runoff, groundwater, and surface water. According to the U.S. Department of Health and Human Services' Toxicology Report for RDX, RDX has been detected in surface water and groundwater at U.S. Army ammunition plants, including sites which use OB/OD.⁴⁵ An EPA Administrative Order for Response Action documented groundwater contamination of RDX and TNT near OB/OD operations at the Massachusetts Military Reservation that was in excess of EPA's health advisories for both substances.⁴⁶ Research published in the *Journal of Environmental Quality* documented the prevalence of RDX in surface water and groundwater near North American military detonation ranges and described how RDX may be discharged from stormwater runoff and groundwater into surface water systems.⁴⁷ DNT is an additional harmful compound released during OB/OD that is transported in groundwater and surface water because of its moderate solubility and relatively low volatility.⁴⁸

⁴⁵ Toxicological Profile for RDX, US Department of Health and Human Services, 2012, <https://www.atsdr.cdc.gov/toxprofiles/tp78.pdf>. See pages 116-118.

⁴⁶ <https://semspub.epa.gov/work/01/448138.pdf>. Page 10.

⁴⁷ Lapointe et al., A Conceptual Model of Fate and Transport Processes for RDX Deposited to Surface Soils of North American Active Demolition Sites, *Journal of Environmental Quality*, 2017, Volume 46-6, <https://cswab.org/wp-content/uploads/2018/01/RDX-Fate-and-Transport-Processes-Scientific-Paper-2017.pdf>. See pages 5 and 8.

⁴⁸ https://www.epa.gov/system/files/documents/2021-08/technical-fact-sheet-dinitrotoluene-dnt_0.pdf.

Similarly, constructing structures for stormwater controls, i.e., retention basins and berms, are important to mitigate the impact of contaminants migrating from storm runoff into soil and groundwater and surface water bodies.

As appropriate, air monitoring plans will include testing to determine if harmful pollutants migrate beyond the OB/OD facility's boundaries, potentially harming nearby communities.⁴⁹ Air monitoring is also important to detect concentrations of harmful compounds such as TNT, to which humans can be exposed through breathing TNT-contaminated air or TNT-contaminated soil particles stirred up by wind or construction activities.⁵⁰ As described above, plumes released during OB/OD are by nature dynamic. The environmental and health impacts from airborne contaminants released during OB/OD may be uncertain, given baseline monitoring requirements. Enhanced permit conditions for monitoring air emissions would provide facility owners/operators and regulators with more accurate information concerning the impacts of OB/OD. The available evidence suggests air monitoring can be effective in detecting contaminants that are harmful to human health and the environment. Gullet et al. (2016) open burned and open detonated explosives at an army depot in Canada and documented the release of particulate matter, carbon dioxide, carbon monoxide, methane, volatile organic compounds, and particulate-based metals during OB/OD activities.⁵¹ Particulate matter contains microscopic solids or liquid droplets that, when inhaled, are linked to human health problems such as aggravated asthma, irregular heartbeat, and decreased lung function; in addition, once released into the atmosphere particulate matter can make lakes and streams more acidic, deplete nutrients in soil, and damage sensitive forests and crops.⁵² Carbon dioxide and methane are greenhouse gases with well-documented negative impacts on climate change and its associated consequences for the environment and human health.^{53,54}

The proposed operating requirements are intended to improve OB/OD facility owners'/operators' accountability to nearby communities (through a notice public outreach plan) and to better protect

⁴⁹ See page 69 of the Alternatives for the Demilitarization of Conventional Munitions, NASEM, January 2019
<https://www.nap.edu/catalog/25140/alternatives-for-the-demilitarization-of-conventional-munitions>.

⁵⁰ Handbook on the Management of Munitions Response Actions. EPA, 2005, <https://nepis.epa.gov/Exe/ZyPDF.cgi/P100304J.PDF?Dockey=P100304J.pdf>.
Page 3-31.

⁵¹ Gullett, B., J. Aurell, AND R. Williams. Characterization of Air Emissions from Open Burning and Open Detonation of Gun Propellants and Ammunition. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-16/289, 2016.
https://cfpub.epa.gov/si_public_record_report.cfm?Lab=NRMRL&dirEntryId=337030.

⁵² <https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm>.

⁵³ <https://www.epa.gov/climate-indicators/greenhouse-gases>.

⁵⁴ https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_LongerReport.pdf. Pages 7-17.

individuals during and after OB/OD operations (through securing the units and kickout area with fencing and removing excess materials after OB/OD events).).

4.3 MOBILE TREATMENT UNITS

The increased use of MTUs is also expected to improve environmental and human health outcomes. As OB/OD facility owners or operators evaluate potential remedies and treatment technologies as part of the site cleanup process, the availability of these units for some waste streams could reduce the near term and overall use of OB/OD.⁵⁵ In addition, some waste explosives for which safe alternatives exist may not be safe for long-distance transportation or may not be able to receive a Department of Transportation (DOT) shipping classification for transportation for offsite treatment using alternative technologies or another technology, such as incineration. MTUs could bring alternative technology to these locations thereby mitigating the transportation safety concern.

4.4 SUMMARY OF EXPECTED BENEFITS

The main benefit of this proposed rule is to increase protection of human health and the environment through improved implementation of the existing requirements to evaluate and implement alternative technologies, and by establishing minimum technical standards for OB/OD units to ensure consistency across all permits. As noted, the primary public health and environmental benefits should result in instances where identification of an alternative technology occurs several years earlier relative to the baseline. Thus, these benefits would manifest themselves as a product of time, or present value, not as a matter of overall magnitude. Relative to the baseline, the likeliest benefit concerns the potential for quicker identification of alternative technologies to the OB/OD of waste explosives. Similarly, the proposed regulations simplify the permitting process for using MTUs to treat waste explosives; OB/OD facility owners/operators may adopt MTUs sooner than they would have in the regulatory baseline scenario, thereby reducing the overall use of OB/OD and its associated harmful impacts on human health and the environment. Finally, if there are no safe alternative technologies to OB/OD available and MTUs are not a feasible alternative, the proposed rule's new technical operating and monitoring requirements are intended to promote early identification of OB/OD-related contamination and to ensure that Subpart Y permitted units are protective of human health and the environment.

⁵⁵ <https://data.unsafeguard.org/iatg/en/IATG-10.10-Demilitarization-destruction-logistic-disposal-IATG-V.3.pdf>. See pages 10, 13, and 23-24.

CHAPTER 5 | OTHER REQUIRED ANALYSES

As required by applicable statutes and executive orders, this chapter summarizes EPA's analysis of equity considerations and other regulatory concerns associated with the proposed rule. This chapter assesses potential impacts with respect to the following issues:

- **Regulatory Planning and Review:** requires examination and quantification of costs and benefits of regulating with and without the proposed rule;
- **Regulatory Flexibility:** focuses on the potential effects of the proposed rule on small entities;
- **Employment Impacts:** assesses the potential impact of the proposed rule on employment;
- **Unfunded Mandates:** examines the implications of the proposed rule with respect to unfunded mandates;
- **Federalism:** considers potential issues related to state sovereignty;
- **Tribal Governments:** extends the discussion of federal unfunded mandates to include impacts on Native American tribal governments and their communities;
- **Environmental Justice:** considers potential issues for minority and low-income populations;
- **Children's Health Protection:** examines the potential impact of the proposed rule on the health of children; and
- **Energy Impacts:** examines the impacts of the proposed rule on energy use, supply, and distribution.

5.1 REGULATORY PLANNING AND REVIEW

Under Executive Order 12866 [58 FR 51735 (October 4, 1993)], as amended by Executive Order 13563, the Agency, in conjunction with the Office of Management and Budget's (OMB's) Office of Information and Regulatory Affairs (OIRA), must determine whether a regulatory action is "significant" and therefore subject to OMB review and the full requirements of the Executive Order. Executive Order 12866 defines "significant regulatory action" as one that is likely to result in a rule that may:

- a) Have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
- b) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

- c) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- d) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

As described in Chapter 3, the upper-bound annualized cost to the regulated universe of the proposed rule is \$28.0 million. As a result, this RIA concludes that the proposed rule is not an economically significant regulatory action.

5.2 REGULATORY FLEXIBILITY

The Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), 5 USC 601 et seq., generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute. This analysis must be completed unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions. Based on EPA's RFA/SBREFA analytic guidance, a rule is not expected to result in a significant economic impact for a substantial number of small entities if the costs of the regulation per entity are less than one percent of annual revenues.⁵⁶

This RIA identifies the specific small entities affected by the proposed rule and assesses impacts for these entities. As described in Chapter 2, 18 private companies own or operate 23 of the OB/OD facilities in the regulated universe.⁵⁷ This RIA relies on information from D&B to identify the number of small entities in the regulated universe based on company-specific estimates of annual revenues and the number of employees. The steps in this process are as follows:

1. ***Identify affected entities and industries.*** As described in Chapter 2, EPA's RCRAInfo system provides facility-level information, including the owner and/or operator of the facility. As of April 2023, there are 69 OB/OD facilities. The Federal government, which owns or operates 45 of these facilities, is not subject to this analysis under RFA/SBREFA. The Commonwealth of

⁵⁶ U.S. EPA, Final Guidance for EPA Rulewriters: Regulatory Flexibility Act as amended by the Small Business Regulatory Enforcement Fairness Act, November 2006.

⁵⁷ Alliant Techsystems Operations, LLC owns three facilities, ATK Launch Systems Inc. owns and/or operates two facilities, and Austin Powder Company owns and/or operates two facilities.

Northern Mariana Islands does not qualify as a "small governmental jurisdiction" according to the RFA, which defines a "small governmental jurisdiction" as the government of a city, county, town, township, village, school district, or special district with a population of less than 50,000 (5 U.S.C. section 601(5)). The population of the Northern Mariana Islands was approximately 51,475 as of 2022.⁵⁸ Thus, this analysis evaluates the 18 private companies that own or operate 23 of the OB/OD facilities in the regulated universe.

2. ***Estimate number of entities that are small.*** To identify the number of small entities in the affected universe, this RIA relies upon the SBA's Small Business Size Standards.⁵⁹ These standards "represent the largest size that a business (including its subsidiaries and affiliates) may be to remain classified as a small business concern." Small Business Size Standards are specified for individual 6-digit NAICS codes and defined by either annual revenues or number of employees depending on the industry. These size standards were compared against D&B's company revenue or employment data (described in Chapter 2) to identify small businesses. Exhibit 5-1 reports the small business size standard for each NAICS code, the percentage of facilities that are considered to be small, and the average annual revenues per small facility.
3. ***Estimate annual revenues of affected small entities.*** This RIA relies on financial data from D&B to estimate the annual revenues of private entities. EPA is requesting public comment on private entities' revenue streams and how they would be impacted by the proposed rule's requirements.
4. ***Estimate regulatory costs per small entity.*** The average costs per affected entity of the rule are presented in Chapter 3. The low impact and high impact costs per facility are \$92,568 and \$410,597, respectively, using a seven percent discount rate. The high impact costs represent potential burdens for larger, more complex facilities owned/operated by the Federal government (including the Department of Defense). At the same time, the high impact costs likely overstate the potential cost impacts for privately-owned/operated facilities (e.g., because these facilities have smaller (or less) OB/OD units to secure or to monitor than larger facilities and treat a small number of waste streams that owners/operators must analyze in an alternative technology evaluation). EPA uses the low impact cost of \$92,568 as the benchmark in this RFA/SBREFA

⁵⁸ <https://www.cia.gov/the-world-factbook/countries/northern-mariana-islands/#people-and-society>. Further, the Northern Mariana Islands collected over \$146 million in tax revenues in fiscal year 2021. As discussed below, the cost of the rule is at most \$410,597 per entity, which does not exceed one percent of the Commonwealth's annual revenue. See <https://www.dof.gov.mp/division-forms/sof/reports/2021-dof-annual-report.pdf>

⁵⁹ These reflect SBA's small business size standards as of December 19, 2022. Accessed at: <https://www.sba.gov/document/support-table-size-standards> and <https://www.sba.gov/partners/contracting-officials/small-business-procurement/small-business-size-standards>.

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analysis, as the RIA's low impact estimates are representative of compliance costs for private companies, which are the only regulated entities evaluated in this section.

As Exhibit 5-1 shows, the average annual revenues of the 8 small entities in the affected universe range from approximately \$13.2 million (for marketing research) to \$374.7 million (for search, detection, navigation, guidance, aeronautical, and nautical system and instrument manufacturing). As described in Step 4 above, the lower-bound average annualized cost of the rule is \$92,568 on a per facility basis (using a 7 percent discount rate). At most, the costs of the proposed rule represent between 0.02 and 0.7 percent of annual revenues of affected small, private entities.⁶⁰ Therefore, this proposed rulemaking is not expected to impose a significant economic impact for a substantial number of small entities.

⁶⁰ Using the high impact per facility cost (\$410,597), the costs of the proposed rule represent between 0.11 and 3.11 percent of annual revenues of small entities.

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EXHIBIT 5-1. DETERMINATION OF SMALL BUSINESSES AFFECTED BY THE RULE

NAICS CODE	NAICS DEFINITION	SMALL BUSINESS SIZE STANDARD ¹		OWNERS OR OPERATORS THAT ARE SMALL ²	PERCENTAGE OF OWNERS OR OPERATORS THAT ARE SMALL ²	AVERAGE REVENUE PER SMALL OWNER OR OPERATOR ² (\$2021, MILLIONS)
		REVENUE (\$ MILLIONS)	NUMBER OF EMPLOYEES			
325180	Other Basic Inorganic Chemical Manufacturing	--	1,000	1	100%	\$114.0
325199	All Other Basic Organic Chemical Manufacturing	--	1,250	1	100%	\$90.4
325920	Explosives Manufacturing	--	750	1	50%	\$22.8
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	--	500	2	67%	\$18.0
332992	Small Arms Ammunition Manufacturing	--	1,250	0	0%	n/a
332993	Ammunition (except Small Arms) Manufacturing	--	1,500	1	100%	\$158.0
332994	Small Arms, Ordnance, and Ordnance Accessories Manufacturing	--	1,000	0	0%	n/a
334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	--	1,250	1	50%	\$374.7
334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals	--	750	0	0%	n/a
336390	Other Motor Vehicle Parts Manufacturing	--	1,000	0	0%	n/a
541330	Engineering Services	\$22.5	--	0	0%	n/a
541910	Marketing Research and Public Opinion Polling	\$20.0	--	1	50%	\$13.2

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NAICS CODE	NAICS DEFINITION	SMALL BUSINESS SIZE STANDARD ¹		OWNERS OR OPERATORS THAT ARE SMALL ²	PERCENTAGE OF OWNERS OR OPERATORS THAT ARE SMALL ²	AVERAGE REVENUE PER SMALL OWNER OR OPERATOR ² (\$2021, MILLIONS)
		REVENUE (\$ MILLIONS)	NUMBER OF EMPLOYEES			
562211	Hazardous Waste Treatment and Disposal	\$41.5	--	0	0%	n/a
Total				8		
Notes: 1. U. S. Small Business Administration, Table of Small Business Size Standards Matched to North American Industry Classification System Codes, effective December 19, 2022. Accessed at: https://www.sba.gov/document/support-table-size-standards 2. Based on analysis of data compiled from Dun & Bradstreet. Accessed at https://www.dnb.com/						

5.3 EMPLOYMENT IMPACT ANALYSIS

Executive Order 13563 “Improving Regulation and Regulatory Review” (76 FR 3821; January 18, 2011) requires Federal agencies to consider the employment impacts of regulatory policy. Specifically, Executive Order 13563 states, “Our regulatory system must protect public health, welfare, safety, and our environment while promoting economic growth, innovation, competitiveness, and job creation.” Consistent with the requirements of the Executive Order, this RIA considers the employment impacts of the rule. Ideally, this RIA would include a quantitative assessment of these impacts, but insufficient data are available to quantify changes in employment associated with the rule. This RIA, therefore, presents a qualitative assessment of the rule’s potential employment impacts.

In general, an environmental regulation can be understood as an increase in demand for a particular output: environmental quality. Meeting this new demand can result in increased demand for the various factors of production (including labor) available to the economy. However, the regulated sector generally relies on revenues generated by their other market outputs to cover the costs of supplying increased environmental quality. This can lead to reduced demand for labor and other factors of production used to produce the market output. Thus, as described in Morgenstern, Pizer, and Shih (2002), in general, the net effect of an environmental regulation on employment in regulated sectors and the overall economy is indeterminate.⁶¹ The costs imposed on directly regulated sectors may raise production costs and put some specific jobs at risk, while at the same time environmental regulation may create jobs in the regulated sector or other sectors, such as the environmental protection sector. See Berman and Bui (2001) for a theoretical model of employment effects of environmental regulation.⁶²

Because the costs of this rule are relatively low and because the number of effected entities is relatively low, EPA believes it is unlikely that the proposed rulemaking would result in significant employment impacts. Further, EPA expects that OB/OD facility owners/operators can comply with the new reevaluation of alternative technology requirements and operating/monitoring requirements (which, from a technical perspective, are closely related to existing requirements) using existing staff and without expending significant additional resources on outside labor and expertise. EPA is requesting public comment on the proposed rule’s potential employment impacts.

⁶¹ Source: Richard D. Morgenstern, William A. Pizer, and Jhih-Shyang Shih. (2002) “Jobs Versus the Environment: An Industry-Level Perspective.” *Journal of Environmental Economics and Management*, Vol. 43, no. 3, pp. 412-436.

⁶² E. Berman and L.T.M. Bui. (2001). Environmental regulation and labor demand: evidence from the South Coast Air Basin. *Journal of Public Economics* 79: 265-295.

5.4 UNFUNDED MANDATES ANALYSIS

Among its other purposes and federal agency rulemaking requirements, the Unfunded Mandates Reform Act (UMRA) requires federal agencies, unless otherwise prohibited by law, to assess the effects of their regulatory actions on state, local, and tribal governments and on the private sector, to determine whether any rulemaking may result in “any Federal mandate that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$100 million or more in any one year.”

Section 202 of UMRA requires federal agencies that propose rules that are likely to exceed this expenditure threshold to prepare a “Written Statement” containing the following five components, supply the statement to OMB, and summarize it in the Federal Register:

1. Identification of the applicable authorizing federal law;
2. Qualitative and quantitative assessment of the anticipated costs and benefits of the rule including the costs and benefits to state, local, and tribal governments or the private sector, and an analysis of whether federal resources may be available to pay these costs;
3. Estimates of future compliance costs and any disproportionate budgetary effects;
4. Estimates of effects on the national economy such as productivity, economic growth, employment, job creation, international competitiveness; and
5. Description and summary of agency’s prior consultation with elected representatives of the affected state, local, and tribal governments.

Based on the magnitude of the rule’s estimated cost impacts, the estimated annualized upper-bound cost of the rule (\$28.0 million) would not result in annual expenditures exceeding \$100 million for the private sector or state, local, and tribal governments, separately or in aggregate.

5.5 FEDERALISM ANALYSIS

The 1999 Federalism Executive Order 13132 furthers the policies of UMRA by establishing federalism principles, federalism policymaking criteria, and a state and local government consultation process for the development of federal regulations with implications for federalism. These include regulations and other federal policies and actions that have substantial direct effects on states, on the relationship between the federal government and the states, or on the distribution of power and responsibilities among the various levels of government.

Pursuant to the consultation process of Executive Order 13132, this section evaluates whether the rule may “impose substantial direct compliance costs” on state and local governments. EPA’s 2008 guidance

for compliance with Executive Order 13132 describes two numerical methods for evaluating whether an EPA rule may have federalism implications with respect to “substantial direct compliance costs”.⁶³

1. ***The \$25 million test.*** Annualized direct compliance cost expenditures to state and local governments in aggregate of \$25 million or more.
2. ***The one percent test.*** Annualized direct compliance costs faced by state and local governments are likely to equal or exceed one percent of their annual revenues.

States and local governments do not currently own/operate OB/OD facilities in the regulated universe and are thus not subject to direct compliance costs associated with the proposed rule. Thus, the rule would not result in substantial direct compliance costs, as defined in the EPA guidance, for state and local governments.

EPA does not estimate that the rule would affect the relationship between the federal government and the states or affect the distribution of power and responsibilities among the various levels of government.

5.6 TRIBAL GOVERNMENTS ANALYSIS

Executive Order 13175, entitled “Consultation and Coordination with Indian Tribal Governments” (65 FR 67249, November 9, 2000), requires EPA to develop an accountable process to ensure “meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.” As indicated in the UMRA discussion above, EPA does not estimate any costs of the rule for state and local governments. Based on these results, the rule is not expected to impose a substantial burden on tribal governments.

5.7 ENVIRONMENTAL JUSTICE ANALYSIS

Executive Order 12898 (59 FR 7629, February 16, 1994) directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations (people of color and/or indigenous peoples) and low-income populations.⁶⁴ EPA defines environmental justice as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to

⁶³ The two methods are from “EPA’s Action Development Process -- Guidance on Executive Order 13132: Federalism,” OPEI Regulatory Development Series, Nov 2008, at <http://intranet.epa.gov/adplibrary/documents/federalismguide11-00-08.pdf>.

⁶⁴ <https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice>.

the development, implementation, and enforcement of environmental laws, regulations, and policies.⁶⁵ Executive Order 14008 (86 FR 7619; January 27, 2021), *Tackling the Climate Crisis at Home and Abroad*, also calls on Agencies to make achieving environmental justice part of their missions “by developing programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related and other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts.”⁶⁶

Executive Order 14096 (88 FR 25251, April 26, 2023) directs the Federal Government to build upon and strengthen its commitment to deliver environmental justice to all communities across America through an approach that is informed by scientific research, high-quality data, and meaningful Federal engagement with communities with environmental justice concerns.

This RIA includes aggregate and facility-level analyses of the demographic and sociological characteristics of the populations in proximity to OB/OD sites in the universe and considers the possible impact of the proposed rule on populations and locations relevant to Executive Orders 12898, 14008, and 14096. To examine whether baseline conditions of the regulated universe impose disproportionate burdens on minority and low-income populations, EPA conducted a spatial analysis of the communities and populations that fall within one, three, or six miles of sites currently using open burning or open detonation to treat waste explosives. EPA evaluated a six-mile radius to capture both the wider dispersion of air pollution and particles resulting from open burning methods and also the noise, shock, and vibration impacts of open detonation on local communities. When available, EPA conducted the analysis based on the coordinates of the OB/OD unit(s) at the facility; EPA received these coordinates for 38 facilities owned/operated by the Department of Defense and NASA. EPA used the address of the OB/OD facility per the RCRAInfo system for the remaining OB/OD sites. The analysis relies on population data from the U.S. Census and EPA's Environmental Justice Screening and Mapping Tool (EJScreen). The U.S. Census Bureau data counts military personnel living on installations and are included in this analysis as

⁶⁵ Fair treatment occurs when “no group of people should bear a disproportionate burden of environmental harms and risks, including those resulting from the negative environmental consequences of industrial, governmental, and commercial operations or programs and policies” (U.S. EPA, 2011). Meaningful involvement occurs when “1) potentially affected populations have an appropriate opportunity to participate in decisions about a proposed activity [i.e., rulemaking] that will affect their environment and/or health; 2) the population's contribution can influence [the EPA's] rulemaking decisions; 3) the concerns of all participants involved will be considered in the decision-making process; and 4) [the EPA will] seek out and facilitate the involvement of population's potentially affected by EPA's rulemaking process” (U.S. EPA, 2015). A potential EJ concern is defined as “actual or potential lack of fair treatment or meaningful involvement of minority populations, low-income populations, tribes, and indigenous peoples in the development, implementation and enforcement of environmental laws, regulations and policies” (U.S. EPA, 2015). See also <https://www.epa.gov/environmentaljustice>.

⁶⁶ <https://www.federalregister.gov/documents/2021/02/01/2021-02177/tackling-the-climate-crisis-at-home-and-abroad>.

the general population. The demographic screening analysis relies on Census-block level data from the American Community Survey (ACSA). A limitation of the data is that Census blocks vary in size, in remote areas they can be much larger (and therefore less precise for this analysis) due to lower populations.

Exhibit 5-2 summarizes several key sociodemographic categories of the populations near the universe of OB/OD sites subject to the proposed rulemaking and compares these demographics to U.S. national averages.⁶⁷ The five key sociodemographic categories examined are minority (reflecting an examination of both race and ethnicity; minority is defined as populations excluding non-Hispanic White), poverty level, linguistic isolation, education, and age (specifically the population less than five years old).

This assessment suggests that the Native American, Hispanic, other non-white, and minority/people of color populations, in addition to children under 5 years of age will be more highly represented within one-, three-, and six-mile radiuses of OB/OD facilities than U.S. national averages. The percent of linguistically isolated households and individuals with education levels less than a high school education have representation near OB/OD facilities that were below national averages in each analysis. The remaining demographic and socioeconomic indicators varied depending on the chosen radius around OB/OD facilities.

The following demographic indicators were more highly represented within one mile of OB/OD facilities than U.S. national averages:

- Black or African American.
- Households below the poverty level.

The following demographic indicators were more highly represented within three miles of OB/OD facilities than U.S. national averages:

- Asian.
- Hawaiian/Pacific Islander.

The following demographic indicators were more highly represented within six miles of OB/OD facilities than U.S. national averages:

- Asian.

⁶⁷ Two OB/OD facilities in Guam and the Northern Mariana Islands are not included in this analysis because block-level American Community Survey data are not available for these territories.

- Hawaiian/Pacific Islander.

The EPA believes that the human health or environmental conditions that exist prior to this action result in or have the potential to result in disproportionate and adverse human health or environmental effects on people of color, low-income populations and/or indigenous peoples. Due to their proximity to OB/OD sites, the communities discussed above may be disproportionately impacted by the harmful environmental and health impacts associated with the OB/OD of waste explosives. In addition to these EJ concerns identified using aggregated data, EPA analyzed disaggregated facility-level demographics relative to national averages. Exhibit 5-3 below reports the number of OB/OD sites that represent potential EJ concerns; these sites are flagged if nearby, potentially vulnerable communities are currently more highly represented than U.S. national averages for the chosen radius. Though certain communities may be underrepresented relative to the U.S. population in aggregate across all OB/OD sites (the information reported in Exhibit 5-2), these same communities may be more highly represented at many sites in the regulated universe. For example, the percentage of households below the poverty level exceeds the national average at 25 and 28 sites for three-mile and six-mile radiuses, respectively. This indicator was below national averages in the same spatial analyses at the aggregate level. OB/OD sites in relatively population-dense areas also influence aggregate results; between 10 and 14 sites (out of 70 total) exceed the national average with respect to the percent of the population that is Hispanic, but the Hispanic indicator exceeded the national average overall in each spatial analysis in Exhibit 5-2.

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EXHIBIT 5-2. SUMMARY DEMOGRAPHIC ANALYSIS OF THE OB/OD FACILITIES UNIVERSE

PROPORTIONS OF KEY DEMOGRAPHICS NEAR OB/OD SITES AND THE TOTAL U.S. POPULATION				
DEMOGRAPHIC CATEGORY	POPULATION WITHIN 1 MILE OF OB/OD SITES	POPULATION WITHIN 3 MILES OF OB/OD SITES	POPULATION WITHIN 6 MILES OF OB/OD SITES	U.S. POPULATION
RACE				
Asian	3.14%	6.34%	8.64%	5.64%
Black or African American	13.66%	10.40%	8.68%	12.53%
Hawaiian/Pacific Islander	0.16%	0.85%	1.28%	0.18%
Native American	1.79%	1.25%	1.06%	0.82%
Other non-white race	14.34%	14.54%	14.44%	12.82%
ETHNICITY				
Hispanic (any race)	22.40%	20.22%	19.31%	19.24%
MINORITY/PEOPLE OF COLOR				
Minority/People of Color	44.34%	43.06%	43.09%	40.50%
POVERTY LEVEL				
Households below the poverty level	15.40%	12.51%	11.18%	12.71%
OTHER DEMOGRAPHICS				
Linguistically isolated households	3.25%	2.91%	3.24%	4.84%
Less than a High School Education	9.39%	9.20%	9.13%	11.24%
Under 5 years of age	7.95%	6.85%	6.44%	5.87%
Source: U.S. Census, 2017-2021 5-Year American Community Survey (ACS) estimates.				
Notes:				
1. Two OB/OD facilities in Guam and the Northern Mariana Islands are not included in this analysis because block-level ACS data are not available for these territories.				
2. Percentages highlighted in orange exceed the U.S. average.				

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**EXHIBIT 5-3. NUMBER OF SITES (% OF REGULATED UNIVERSE) THAT EXCEED THE U.S.
POPULATION AVERAGE**

NUMBER OF OB/OD SITES (% OF REGULATED UNIVERSE) THAT EXCEED THE U.S. POPULATION AVERAGE				
DEMOGRAPHIC CATEGORY	POPULATION WITHIN 1 MILE OF OB/OD SITES	POPULATION WITHIN 3 MILES OF OB/OD SITES	POPULATION WITHIN 6 MILES OF OB/OD SITES	U.S. POPULATION
RACE				
Asian	8 (11%)	5 (7%)	8 (11%)	5.64%
Black or African American	17 (24%)	21 (30%)	24 (34%)	12.53%
Hawaiian/Pacific Islander	7 (10%)	14 (20%)	15 (21%)	0.18%
Native American	14 (20%)	14 (20%)	20 (29%)	0.82%
Other non-white race	13 (19%)	15 (21%)	17 (24%)	12.82%
ETHNICITY				
Hispanic (any race)	10 (14%)	10 (14%)	14 (20%)	19.24%
MINORITY/PEOPLE OF COLOR				
Minority/People of Color	16 (23%)	19 (27%)	26 (37%)	40.50%
POVERTY LEVEL				
Households below the poverty level	18 (26%)	25 (36%)	28 (40%)	12.71%
OTHER DEMOGRAPHICS				
Linguistically isolated households	4 (6%)	4 (6%)	9 (13%)	4.84%
Less than a High School Education	9 (13%)	9 (13%)	10 (14%)	11.24%
Under 5 years of age	27 (39%)	31 (44%)	36 (51%)	5.87%
Source: U.S. Census, 2017-2021 5-Year American Community Survey (ACS) estimates.				
Notes:				
1. Two OB/OD facilities in Guam and the Northern Mariana Islands are not included in this analysis because block-level ACS data are not available for these territories.				
2. Percentages based on 70 OB/OD sites (individual units when available).				

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EPA additionally identified and addressed environmental justice concerns by conducting informational webinars. EPA recognizes that communities are concerned about emissions of contaminants from OB/OD. The treatment of waste explosives conducted in the open can expose communities to hazardous substances through air emissions and deposition onto the ground that can contaminate the soil, surface water, sediments, and groundwater. Leading up to, and during development of this proposed rulemaking, EPA has taken actions to involve communities. During several separate webinars, communities were invited to provide their input on proposed changes to the existing OB/OD regulations that would help strengthen the existing regulations, as well as clarify when facilities are eligible to conduct OB/OD.

First, EPA held an informational webinar on February 23, 2022, for tribes located near OB/OD facilities, in support of EPA's consultation and coordination regarding the proposed rulemaking. EPA identified four OB/OD facilities located in close proximity to or on tribal lands and presented information about the proposed rule to assist tribes in determining whether they would like to formally consult with EPA. One tribe subsequently requested formal consultation with EPA, which occurred on March 28, 2022. During this consultation, the Choctaw Nation of Oklahoma raised several concerns ranging from air emissions, contaminants spread through "kickout" of unreacted waste explosives, ground vibration causing structural damage to residences, and impairment of local water bodies. EPA provided responses to the Choctaw Nation of Oklahoma during the consultation meeting and committed to coordination with other program areas in EPA, as well as the state permitting agency, to address their concerns. In addition, EPA has considered ways in which the OB/OD regulations could be improved via this proposed rulemaking and has included new provisions and clarifications of existing requirements to strengthen the regulations.

Second, EPA held an informational webinar on March 10, 2022, for interested communities and environmental groups. This early engagement sought input for EPA to consider prior to development of the proposed rulemaking. Representatives from a variety of community and environmental groups and one tribe were in attendance:

- Louisiana Environmental Action Network
- Center for Progressive Reform
- Tulane Law School
- Public citizens
- Earthjustice
- Citizens for Safe Water Around Badger
- Prutehi Litekyan/Save Ritidian
- California Communities Against Toxics
- Central Louisiana Coalition for a Clean and Healthy Environment
- Vidas Viequenses Valen
- Concerned Citizens for Nuclear Safety
- San Ildefonso Pueblo

Topics addresses included:

- Alternative treatment technologies and adding an explicit regulatory requirement to evaluate available alternative treatment technologies and to implement identified alternatives in place of OB/OD.
- Scope of applicability for who the rule should include/exclude.
- Timing for rule compliance to determine how soon the new/revised requirements should go into effect.
- New technical standards for OB/OD units to better control emissions and contamination.

As a result of this webinar, EPA heard accounts of how communities located near OB/OD facilities are negatively impacted by air emissions and noise and vibration impacts from the treatment events. In addition, some community and environmental members indicated environmental justice concerns for certain locations.

Last, EPA held an informational public webinar on December 5, 2022, which was open to all groups, to provide opportunity for public input during the drafting phase of the proposed rule. This webinar presented the same topics as the March 10, 2022, webinar, with more specific approaches under consideration by EPA. Community and environmental members, and several tribes provided additional input related to their concerns. Input provided to EPA included establishing in the rule: prohibition OB/OD of certain wastes, provisions for air monitoring in communities, and requirements for better communication between the OB/OD facilities and the communities.

Through the webinars, EPA gained valuable insight and information from community and environmental groups that led to the incorporation of additional proposed requirements to further strengthen OB/OD regulatory requirements.

5.8 CHILDREN'S HEALTH PROTECTION ANALYSIS

Executive Order 13045, entitled "Protection of Children from Environmental Health Risks and Safety Risks" (62 FR. 19885, April 23, 1997) applies to any rule that: (1) is determined to be "economically significant" as defined under Executive Order 12866, or (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

EPA does not anticipate that the rule would lead to a disproportionate negative impact on children. As described in Chapter 4 and the Environmental Justice analysis, the proposed rule includes several provisions that will reduce risks for populations near OB/OD facilities. These reductions in risk represent a benefit for all segments of the population, including children.

5.9 ENERGY IMPACT ANALYSIS

Executive Order 13211, "Actions Concerning Regulations that Affect Energy Supply, Distribution, or Use" (May 18, 2001), addresses the need for regulators to more fully consider the potential energy impacts of regulatory action. Under this Executive Order, agencies are required to prepare a Statement of Energy Effects when a regulatory action may have significant adverse effects on energy supply,

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distribution, or use, including impacts on price and foreign supplies. Additionally, the requirements obligate agencies to consider reasonable alternatives to regulatory actions with adverse effects and the impacts that such alternatives might have on energy supply, distribution, or use.

The proposed rule will not directly regulate energy production or consumption. In addition, with annualized aggregate costs of approximately \$28.0 million, this rule is not considered an economically significant action under EO 12866.

The requirements of the rule will have minimal impact on energy consumption; therefore, the rule is not expected to have a significant adverse effect on energy supply, distribution, or use. In addition, no measurable adverse impacts are expected on energy prices or foreign supplies.

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APENDIX A. UNIVERSE OF AFFECTED ENTITIES AS OF APRIL 2023

OB/OD FACILITY ID	FACILITY NAME	STATE	EPA REGION	MAILING ADDRESS	OPERATING STATUS	PERMIT EXPIRATION DATE
AL3210020027	ANNISTON ARMY DEPOT	AL	4	7 Frankford Ave, Anniston, AL 36201	Operating	9/21/2031
AL7210020742	U.S. ARMY REDSTONE ARSENAL	AL	4	4488 Martin Rd, Redstone Arsenal, AL 35898-5000	Operating	7/18/2031
AR0213820707	PINE BLUFF ARSENAL	AR	6	10020 Kabrich Circle, Pine Bluff, AR 71602	Operating	6/11/2025
ARD091688283	AEROJET ROCKETDYNE, INC.	AR	6	14160 West Arkansas Highway 274, East Camden, AR 71701	Operating	6/25/2025
ARD093417525	AUSTIN POWDER COMPANY	AR	6	7-Lc-10 Blandy Road, East Camden, AR 71701	Operating	6/10/2025
ARD980867873	ARMTEC COUNTERMEASURES CO.	AR	6	Highway 203 East Highland Ind, East Camden, AR 71701	Operating	3/20/2028
AZ5213820991	US ARMY GARRISON YUMA PROVING GROUND	AZ	9	301 C St, Yuma, AZ 85365	Operating	7/11/2027
AZR000037382	BARRY GOLDWATER WEST RANGE - MCAS YUMA	AZ	9	East/West Dividing Line of Ranges is Mohawk - Yuma - 85356	Operating	8/4/2025
CA1570024504	EDWARDS AIR FORCE BASE	CA	9	446 N. Rosamond Blvd Bldg 4916, Edwards, CA 93524-1130	Operating	9/20/2031

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OB/OD FACILITY ID	FACILITY NAME	STATE	EPA REGION	MAILING ADDRESS	OPERATING STATUS	PERMIT EXPIRATION DATE
CA2170023152	NAVAL AIR WEAPONS STATION CHINA LAKE	CA	9	429 East Bowen Road, China Lake, CA 93555-6104	Operating	7/12/2028
CA2890090002	LAWRENCE LIVERMORE NATIONAL LABORATORY -SITE 300	CA	9	15999 Corral Hollow Rd, Tracy, CA 95377	Operating	8/7/2027
CA9570025149	DEPT OF AIR FORCE VANDENBERG AFB	CA	9	1028 Iceland Avenue, Vandenberg Afb, CA 93436-0000	Operating	10/7/2030
CAD009220898	PACIFIC SCIENTIFIC ENERGETIC MATERIALS CO	CA	9	3601 Union Road, Hollister, CA 95023-0000	Operating	8/9/2031
CO2210020150	US ARMY - FORT CARSON	CO	8	1626 Evans St Bldg 1219, Fort Carson, CO 80913	Operating	9/28/2027
CO8213820725	PUEBLO CHEMICAL DEPOT	NM	8	45825 Hwy 96 E, Pueblo CO 81006	Cleanup under Corrective Action	N/A
FL2800016121	CAPE CANAVERAL AFS/SFS	FL	4	1224 Jupiter St, Patrick Afb, FL 32925-3343	Operating	3/3/2025
FL8570024366	EGLIN AIR FORCE BASE	FL	4	501 Deleon St Suite 101, Eglin Afb, FL 32542-5105	Operating	9/1/2025
FLD047096524	ST MARKS POWDER INC	FL	4	7121 Coastal Highway, Crawfordville, FL 32327-0000	Operating	10/1/2026
FLD047966593	NAMMO PERRY INC.	FL	4	10625 Puckett Rd, Perry, FL 32348-8505	Operating	3/12/2026

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OB/OD FACILITY ID	FACILITY NAME	STATE	EPA REGION	MAILING ADDRESS	OPERATING STATUS	PERMIT EXPIRATION DATE
GA4170090001	NAVAL SUBMARINE BASE - KINGS BAY	GA	4	1063 Uss Tennessee Avenue, Kings Bay, GA 31547	Operating	9/28/2022
GU6571999519	U.S.A.F. ANDERSEN AIR FORCE BASE - JOINT REGION MARIANAS	GU	9	Bldg 19017 Arc Light Blvd, Yigo, GU 96543	Operating	5/31/2020
HIR000001115	NAVY REGION HAWAII - WAIPIO PENINSULA	HI	9	Waipio Point Access Road, Waipahu, HI 96797	Operating under RAP	1/29/2029
IA7213820445	IOWA ARMY AMMUNITION PLANT	IA	7	17571 Dmc Hwy 79, Middletown, IA 52638	Operating	9/28/2028
IN5170023498	US NAVAL SUPPORT ACTIVITY CRANE DIVISION	IN	5	300 Sr 361, Crane, IN 47522- 5001	Operating	7/10/2024
KSR000511964	DAY & ZIMMERMANN KANSAS LLC	KS	7	21017 Scott Road, Parsons, KS 67357	Operating	1/18/2026
KY8213820105	BLUE GRASS ARMY DEPOT	KY	4	431 Battlefield Memorial Highway, Richmond, KY 40475	Operating	4/18/2026
KYR000034207	DAICEL SAFETY SYSTEMS AMERICA INC	KY	4	720 Old Liberty Church Road, Beaver Dam, KY 42320	Operating	12/28/2016
LA0214022725	US ARMY, FORT POLK	LA	6	1647 23 Rd Street, Fort Polk, LA 71459	Operating	10/31/2020
LAD981055791	CLEAN HARBORS OF COLFAX LLC	LA	6	3763 Highway 471, Colfax, LA 71417	Operating	10/26/2017

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OB/OD FACILITY ID	FACILITY NAME	STATE	EPA REGION	MAILING ADDRESS	OPERATING STATUS	PERMIT EXPIRATION DATE
MD3210021355	U.S. ARMY GARRISON, ABERDEEN PROVING GROUND	MD	3	6504 Rodman Rd - 3rd Floor, Aberdeen Proving Ground, MD 21005	Operating	2/15/2020
MD4170024109	NAVAL SUPPORT FACILITY INDIAN HEAD	MD	3	3838 Strauss Avenue, Indian Head, MD 20640	Operating under Interim Status (No OBOD Permit)	N/A
MD4170090001	NAVAL SUPPORT FACILITY INDIAN HEAD, STUMP NECK ANNEX	MD	3	2008 Stump Neck Road, Indian Head, MD 20640	Operating under Interim Status (No OBOD Permit)	N/A
MDD003067121	ALLIANT TECHSYSTEMS OPERATIONS LLC - ELKTON	MD	3	55 Thiokol Road, Elkton, MD 21921	Operating	8/23/2015
MND006156590	FEDERAL CARTRIDGE CO	MN	5	900 Bob Ehlen Drive, Anoka, MN 55303-1778	Operating	9/7/2024
MND081138604	ALLIANT TECHSYSTEMS OPERATIONS LLC	MN	5	23100 Sugarbush Rd Nw, Saint Francis, MN 55070	Operating	9/28/2022
MPR000128710	DEPARTMENT OF FIRE AND EMERGENCY MANAGEMENT SERVICES (DFEMS)	MP	9	1 Mi N Of Marpi Landfill Lat15, Saipan, MP 96950	Operating under RAP	7/13/2028
NJ3210020704	US ARMY-PICATINNY ARSENAL	NJ	2	Bldg 3100, Picatinny, NJ 07806	Operating under Interim Status (No OBOD Permit)	N/A
NM0890010515	LOS ALAMOS NATIONAL LABORATORY	NM	6	Bikini Atoll Road, Sm-30, Los Alamos, NM 87545	Operating under Interim Status (No OBOD Permit)	11/30/2020
NM5890110518	SANDIA NATIONAL LABORATORIES	NM	6	1515 Eubank Blvd Se, Albuquerque, NM 87123	Operating	1/27/2025

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OB/OD FACILITY ID	FACILITY NAME	STATE	EPA REGION	MAILING ADDRESS	OPERATING STATUS	PERMIT EXPIRATION DATE
NM6213820974	FORT WINGATE DEPOT ACTIVITY	CO	6	7 Miles East of Gallup on Route 66, Fort Wingate, NM 87316	Cleanup under Corrective Action	N/A
NV1210090006	HAWTHORNE ARMY DEPOT	NV	9	1 South Maine Ave, Hawthorne, NV 89415	Operating	5/21/2030
NV3890090001	U. S. DOE, NNSA/NFO	NV	9	Nevada National Security Site, Mercury, NV 89023	Operating	12/1/2020
NV5210090010	NEW BOMB FACILITY (HAWTHORNE ARMY DEPOT)	NV	9	State Route 359 South, Hawthorne, NV 89415	Operating	6/12/2029
OHD004293775	AUSTIN POWDER CO - RED DIAMOND PLANT	OH	5	430 Powder Plant Rd, Mcarthur, OH 45651	Operating	12/30/2021
OK6213822798	MCALISTER ARMY AMMUNITION PLANT	OK	6	1 C Tree Road, Mcalester, OK 74501-9002	Operating	6/27/2023
PA6213820503	LETTERKENNY ARMY DEPOT	PA	3	1 Overcash Ave, Chambersburg, PA 17201	Operating	2018
PAR000030874	COPPERHEAD CHEMICAL CO INC	PA	3	120 River Rd, Tamaqua, PA 18252	Operating	11/14/2021
PAR000522326	ZAMBELLI FIREWORKS MFG CO	PA	3	782 Garner Rd, Edinburg, PA 16116	Operating (Not Currently Treating Waste Explosives)	9/27/2021
SC1750216169	US MARINE CORPS AIR STATION	SC	4	Hwy 21 Bldg 601, Beaufort, SC 29904	Operating	1/29/2025

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OB/OD FACILITY ID	FACILITY NAME	STATE	EPA REGION	MAILING ADDRESS	OPERATING STATUS	PERMIT EXPIRATION DATE
SC8170022620	JOINT BASE CHARLESTON WEAPONS	SC	4	2316 Red Bank Rd Ste 100, Goose Creek, SC 29445	Operating	9/22/2021
SDD981549983	TECH ORD, A DIVISION OF AMTEC CORPORATION	SD	8	47600 180th Street, Clear Lake, SD 57226	Operating	5/18/2031
TN5210020421	HOLSTON ARMY AMMUNITION PLANT	TN	4	4509 West Stone Drive, Kingsport, TN 37660	Operating	3/31/2021
TND981026594	KILGORE FLARES COMPANY LLC	TN	4	155 Keller Rd, Toone, TN 38381	Operating	9/10/2029
TX4210020133	JOINT BASE SAN ANTONIO CAMP BULLIS	TX	6	5050 Wilkerson Rd Bldg 5000, San Antonio, TX 78257-9716	Operating	5/23/2029
TX4890110527	US DEPARTMENT OF ENERGY PANTEX PLANT	TX	6	955 Fm 2373, Panhandle, TX 79068	Operating	5/30/2024
TXD987988318	SCHLUMBERGER TECHNOLOGY CORPORATION COYANOSA	TX	6	1129 North FM 1776, Fort Stockton, TX 79735	Operating	4/3/2023
TXR000080174	DAY & ZIMMERMANN LONE STAR FACILITY	TX	6	Highway 82 West, Texarkana, TX 75501	Operating	5/22/2027
TXR000084774	LONE STAR ARMY AMMUNITION PLANT	TX	6	Highway 82 W Approximately 12, Hooks, TX 75501	Operating	1/16/2031
UT0570090001	UTAH TEST AND TRAINING RANGE	UT	8	18 Miles North Of Exit 62 I-80, Hill Air Force Base, UT 00000	Operating	9/27/2023

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UT3170027277	ATK LAUNCH SYSTEMS INC. - NIROP	UT	8	5000 South 8400 West, West Valley City, UT 84120	Operating	9/30/2030
UT3213820894	TOOELE ARMY DEPOT - NORTH	UT	8	1 Tooele Army Depot, Tooele, UT 84074	Operating	2/2/2027
UT3750211259	US ARMY DUGWAY PROVING GROUND	UT	8	6672 Stark Road, Dugway, UT 84022	Operating	9/22/2027
UT5210090002	TOOELE ARMY DEPOT - SOUTH	UT	8	State Highway 36, Tooele, UT 84074	Operating	8/18/2025
UTD009081357	ATK LAUNCH SYSTEMS INC. - PROMONTORY	UT	8	9160 North Highway 83, Brigham City, UT 84302	Operating	9/26/2029
VA1210020730	RADFORD ARMY AMMUNITION PLANT	VA	3	4050 Peppers Ferry Road, Radford, VA 24141	Operating	9/17/2031
VA7170024684	US NAVY DAHLGREN	VA	3	6509 Sampson Road, Dahlgren, VA 22448	Operating	4/28/2031
VA7800020888	NASA GSFC WALLOPS FLIGHT FACILITY	VA	3	34200 Fulton Street, Wallops Island, VA 23337	Operating	4/13/2028
WID020488011	STRESAU LABORATORY INC	WI	5	N8265 Medley Rd, Spooner, WI 54801-7819	Operating	8/2/2018
WV0170023691	ALLIANT TECHSYSTEMS OPERATIONS LLC, ABL OPERATIONS	WV	3	210 State Route 956, Rocket Center, WV	Operating	3/30/2025
Source: EPA, RCRAInfo system, April 2023.						

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