

**U.S. Chemical Safety and  
Hazard Investigation Board**

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**Catherine J.K. Sandoval**  
Board Member



May 14, 2024

EPA Docket Center  
WJC West Building, Room 3334  
1301 Constitution Avenue NW  
Washington, DC 20004  
(Via Federal eRulemaking Portal://www.regulations.gov/)

Docket Number: EPA-HQ-OLEM-2021-0397

Dear Sir or Madam:

Enclosed are the U.S. Chemical Safety and Hazard Investigation Board's (CSB) comments in response to the Environmental Protection Agency's (EPA) proposed rule titled, *Revisions to Standards for the Open Burning/Open Detonation of Waste Explosives*, published in the Federal Register on March 20, 2024. The CSB supports the EPA's goal of reducing air emissions through requirements for evaluating and using safe and available alternative technologies for the disposal of waste explosives. The CSB has identified gaps in the proposed rule and urges that the proposed rule be improved to meet the objectives of CSB Recommendation No. 2011-06-I-HI-R9 issued to the EPA in connection with the agency's investigation of the 2011 explosion and fire at the Donaldson Enterprises, Inc. fireworks storage facility near Honolulu, Hawaii, that killed five employees.

We thank you for this opportunity to provide comments. If you have any questions or need further information regarding these comments, please contact Mr. Charles B. Barbee, Director of Recommendations at: (202) 261-7621, or via email: [CSBRecommendations@csb.gov](mailto:CSBRecommendations@csb.gov).

Sincerely,

Steve Owens  
Chairperson

Sylvia E. Johnson, Ph.D.  
Board Member

Catherine J.K. Sandoval  
Board Member

Enclosure

cc: Stephen J. Klejst, Executive Director - Investigations & Recommendations, CSB

**Introduction:**

The U.S. Chemical Safety and Hazard Investigation Board (CSB) is an independent federal agency charged with investigating, determining, and reporting to the public in writing the facts, conditions, circumstances and cause or probable cause of any accidental chemical release resulting in a fatality, serious injury, or substantial property damage. The CSB issues safety recommendations based on data and analyses from investigations and safety studies and advocates for these changes to prevent the likelihood of recurrence. CSB safety recommendations also aim to minimize the consequences of accidental chemical releases.

The CSB submits the following information in response to the Environmental Protection Agency's (EPA) proposed rule titled, *Revisions to Standards for the Open Burning/Open Detonation of Waste Explosives*, published in the Federal Register on March 20, 2024. The CSB has identified gaps in the proposed rule and urges that the proposed rule be improved to meet the objectives of **CSB Recommendation No. 2011-06-I-HI-R9** issued to the EPA in connection with the CSB's investigation of the 2011 explosion and fire at the Donaldson Enterprises, Inc. fireworks storage facility near Honolulu, Hawaii, that killed five employees.

**Background:**

The EPA prohibited open burning and detonation (OB/OD) of hazardous waste in 1980 under the Resource Conservation and Recovery Act (RCRA). Due to feasibility concerns, an exception for waste explosives "which cannot safely be disposed of through other modes of treatment" was included in the rule. This exception was not meant to be indefinite, however, and the EPA committed to monitoring development of new technologies for the purpose of proposing additional regulations at a later time.

Since 1987, the requirements for OB/OD hazardous waste management units have been addressed by 40 CFR Part 264, Subpart X – *Miscellaneous Units* (Subpart X). Subpart X requires that units "must be located, designed, constructed, operated, maintained and closed in a manner that will ensure protection of human health and the environment." Subpart X also directs that permits for miscellaneous units must "contain such terms and provisions as are necessary to protect human health and the environment." Additionally, as stated in an EPA memorandum dated June 7, 2022<sup>1</sup>, "permitting authorities generally incorporate applicable provisions from the existing EPA regulations" into permits that are issued.

Despite the enforcement framework that the EPA has established through Subpart X, it is recognized that OB/OD causes contamination of air, soil, and water through the release and deposition of hazardous residuals, explosive kickout, and contaminants. Several groups have raised concerns related to plumes of smoke from OB/OD facilities migrating to communities, and soil contaminants leaching into ground water or adversely affecting plant life. Excessive noise and ground vibration from these facilities have also been reported.

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<sup>1</sup> [EPA memo dated June 7, 2022 \(as of 5/6/2024\) from the Office of Resource Conservation and Recovery to the Division Directors of Land, Chemicals, and Redevelopment in Regions 1-10](#)

The EPA and the National Academies of Sciences, Engineering, and Medicine (NASEM) recently published separate reports describing alternative technologies available to safely treat explosive waste. There are now safer available alternative technologies for most, if not all, waste streams being openly burned and/or openly detonated. Use of these alternative technologies results in more complete treatment and a greater level of contaminant control, and therefore provides greater protection for human health and the environment.

The goal of the EPA's proposed rule is commendable, but the rule needs stronger requirements to mitigate the acute risk from explosion. The EPA acknowledges in their NPRM that alternative technologies may increase the handling of explosive waste. The agency intends for acute risk from explosion due to increased handling and storage to be evaluated by an "explosives safety expert" as part of a "safe" technology determination, but no minimum requirements for what is safe and how to arrive at that conclusion are established in the text of the proposed rule.

Safety is an important aspect of hazardous waste disposal, and RCRA is intended to address not only the environmental implications of hazardous waste treatment and disposal, but also health and safety concerns. The EPA states in the NPRM that "the potential for injury or loss of life or loss of equipment is always present when handling, storing, transporting, and treating waste explosives." The incidents described below underscore the importance of this concern.

**Incident Title: ICI Explosives Environmental Company**

On August 26, 1998, an explosion at the ICI Explosives Company facility in Joplin, MO killed one worker and injured two others. The details of this incident are provided in several open-source media reports gathered by the EPA in a document titled *Report on Emergency Incidents at Hazardous Waste Combustion Facilities and Other Treatment, Storage, and Disposal Facilities (TSDFs)*<sup>2</sup>. According to these reports, the workers were in the facility's feed-handling room breaking apart packages of detonators and placing them on a conveyor belt intended to carry them to the rotary kiln incinerator when the explosion occurred. The facility had suffered an explosion two years earlier, but no details of this incident are provided. A reference is also made to a similar incident that occurred in 1971 at the McAlester Army Ammunition Plant killing three people.

**Incident Title: 716 E. 27<sup>th</sup> Street Explosion<sup>3</sup>**

On June 30, 2021, the Los Angeles Police Department (LAPD) received an anonymous tip concerning the illegal storage of fireworks in a residential neighborhood. The bomb squad was deployed to dispose of the large quantity of fireworks discovered. Due to the condition of some of the fireworks discovered, onsite disposal was chosen.

The onsite disposal was prepared in a total containment vessel (TCV) designed to contain the heat, pressure, and shock from an explosion, within certain limits, and release those products in a

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<sup>2</sup> [On EPA's National Service Center for Environmental Publications \(NSCEP\) webpage \(as of 5/1/2024\) - Report on Emergency Incidents at Hazardous Waste Combustion Facilities and Other Treatment, Storage, and Disposal Facilities \(TSDFs\)](#)

<sup>3</sup> [From ATF.gov webpage \(as of 5/1/2024\): ATF Report of Investigation - 716 E. 27th Street Explosion](#)

controlled manner. When the disposal shot was initiated, however, the TCV failed to contain the explosion resulting in injury to 18 civilians, eight LAPD officers, and one ATF employee. In addition to the injuries caused by the failure of the containment vessel, 26 residential structures and 32 vehicles were also damaged by the blast.

The U.S. Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) investigated this incident and determined that it was the result of overloading the TCV. According to the ATF's investigation report the TCV was designed with a rated capacity of 19.20 lbs TNT equivalent for repeated detonations or for a one-time containment of a detonation of 33.28 lbs TNT equivalent. The ATF calculated the Net Explosives Weight of the materials detonated in the TCV, including the counter charge, as 39.85 lbs TNT equivalent which is more than the TCV's rated capacity. A metallurgical examination supported the conclusion that the TCV failure was a onetime overload event. The ATF classified the explosion as accidental.



*Surveillance Footage of the LAPD bomb disposal truck at the time of detonation.  
Photo Credit: NBC 4 Los Angeles*

**Incident Title: Donaldson Enterprises, Inc. Fatal Fireworks Disassembly Explosion and Fire<sup>4</sup>**

On April 8, 2011, an explosion and fire occurred at a fireworks storage magazine at the Waikele Self Storage in Waipahu, HI, near Honolulu. The explosion resulted in the deaths of five workers and one worker was injured. The storage magazine was leased by Donaldson Enterprises, Inc. (DEI). DEI was under contract to dispose of three shipments of contraband fireworks that were seized by federal government authorities. The fireworks were labelled as consumer fireworks, but upon inspection, were found to be more physically consistent with commercial grade display fireworks.

DEI was an unexploded ordinance (UXO) remediation company based on the island of Oahu. DEI was chosen as the disposal contractor in part because they were already storing the contraband fireworks and they submitted the lowest cost and most time efficient bid. Prior to this contract DEI had no experience disposing of fireworks. DEI was issued a 90-day emergency hazardous waste permit by the Hawaii Department of Health authorizing "thermal treatment" of the fireworks at a local shooting range. DEI began the work shortly thereafter.

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<sup>4</sup> [From CSB.gov webpage \(as of 5/1/2024: CSB Investigation - Donaldson Enterprises, Inc. Fatal Fireworks Disassembly Explosion and Fire](#)

Though not addressed in DEI's permit, DEI attempted to desensitize the fireworks by soaking them in diesel prior to burning them either in open drums or a portable incinerator. Despite this effort, minor explosions were occurring when certain types of fireworks were burned. In response, DEI employees began disassembling individual firework tubes and storing explosive powder from the tubes in plastic containers and cutting slits in the aerial shells to improve desensitization efforts. The first shipment was destroyed in the Fall of 2010 without incident.

DEI began working on the second shipment in December 2010. During the processing of this shipment, they also disassembled the fireworks and separated the contents into cardboard boxes. This was done with the intent of expediting the processing of the third shipment. There was reportedly no plan for what would be done with the black powder during this process, resulting in significant accumulations of these materials within the magazine which was also storing the third seized shipment.

On the morning of the explosion six workers, four of whom were UXO Level I Technicians arrived at the facility and began disassembling fireworks in an area on the loading dock just outside of the magazine. They were able to process six or seven boxes before it began to rain heavily. The team stopped work and moved the black powder, aerial shells, and partially disassembled tubes just inside the magazine entrance. They also brought their other equipment inside. Once everything was inside the magazine, the explosion occurred.



*The image on the left is a computer-generated rendering of the explosion prepared by the CSB.  
The photo on the right was taken after the explosion.*

As a result of the CSB's investigation into this incident, the following recommendation was issued to the EPA:

**CSB Recommendation No. 2011-06-I-HI-R9**

*Revise the Resource Conservation and Recovery Act (RCRA) Subtitle C regulations to require a permitting process with rigorous safety reviews to replace the use of emergency permits under 40 CFR §270.61 for the disposal of explosive hazardous materials, including fireworks. At a minimum, the new process should require the use of best available technology, safe disposal methodologies, as well as safety*

*management practices, such as those required by OSHA's Process Safety Management Standard (PSM), 29 CFR §1910.119 (e.g., hazard analysis and control, management of change).*

In 2013, the EPA responded that regulatory changes were unnecessary and expressed a belief that the problem in the DEI incident was implementation of the existing regulation and other regulations such as those enforced by OSHA and ATF. EPA did disseminate information on the safe management of explosive waste under RCRA, but this guidance did not address the safety management practices listed in the recommendation. As of the date of this submission, the status of this recommendation is **“Closed – Unacceptable Action/No Response Received.”**

RCRA was enacted in part to provide “for the safe disposal of discarded materials...” Congress also noted that “disposal of solid waste and hazardous waste in or on the land without careful planning and management can present a danger to human health and the environment.” In light of the significant risk experienced by those who operate these processes and the communities in which they are conducted, more specific requirements about what constitutes “safe” must be included in the final rule, as discussed below.

**Issue 1. There is no definition or description of qualifications for “explosives or munitions specialist” as referenced in 40 CFR 264.707(b)(1)(i) and 40 CFR 265.707(b)(1)(i).**

The provisions referenced above place the responsibility for determining whether an alternative technology is safe on the “explosives or munitions specialist.” The proposed rule also places the responsibility for evaluating acute risks from explosion due to increased handling and storage associated with alternate technologies upon “explosive safety experts” as a part of the “safe” technology determination. To prevent confusion and ensure the outcome sought by the proposed rule the EPA should define these terms and/or specify a minimum level of qualifications for these individuals. Relying on the determinations of a less than qualified individual could prove disastrous. “Explosives or Munitions Emergency Response Specialist” is defined at 40 CFR 260.10. A similar definition should be included in the proposed rule.

**Issue 2. There are no minimum standards for the “explosives or munitions specialists” to rely upon in establishing that an alternate technology is safe with regards to acute risk from explosion.**

40 CFR 264.707 and 40 CFR 265.708 appear to address the operating requirements for protecting human health and the environment from the chronic effects of these disposal processes that a specialist must take into account when making a determination of whether an alternate technology is “safe.” There is no equivalent information referenced in the proposed rule, however, for what must be addressed to make a determination of “safe” for acute risk from explosion. To prevent confusion and ensure that the outcome sought by the proposed rule is achieved, minimum criteria should be specified as to what constitutes “safe” with regards to acute risk from explosion. An evaluation process should also be mandated.

For example, the requirements of 40 CFR 265 Subpart EE Hazardous Waste Munitions and Explosives Storage could provide a basis of reference for specialists when making alternative



technology determinations as they relate to storage areas. The criteria could be included in the operating requirements specified by the proposed rule. Alternatively, requiring compliance with these requirements could be part of the permitting process. This would be consistent with the current practice of permitting authorities to include existing EPA requirements into permits as discussed above.

Other practices addressing the operation of these facilities and equipment should also be included in the proposed rule. The EPA's July 6, 2017, memorandum titled "The Safe Handling, Storage, and Treatment of Waste Fireworks" provides an excellent list of requirements and resources that could be referenced by specialists in making "safe" determinations at facilities handling waste fireworks. The National Fire Protection Association's (NFPA) new Recommended Practice for the Prevention of Fires and Uncontrolled Chemical Reactions Associated with the Handling of Hazardous Waste (NFPA 401) should also be referenced. The EPA's Military Munitions Rule could also be a source of reference. These conditions could be imposed upon facilities as previously described.

The evaluation process should be modeled after 40 CFR 68.67 Process Hazard Analysis or other existing guidance on job safety/hazard analysis. Consistency in evaluating these processes for hazards is paramount to preventing incidents such as the ones described above.

**Issue 3. "Safe" determinations are static with regards to acute risk from explosion.**

Under the proposed rule there is no mechanism to cause the owner/operator of a facility to consult with specialists after their process has been determined to be "safe" as long as the owner/operator does not change the conditions of the facility affecting human health and the environment from chronic risk from disposal of these materials. Although these conditions are addressed at 40 CFR 264.707 and 40 CFR 265.708, they are not geared towards acute risk from explosion. Even a small change to the way that these materials are processed could result in a catastrophe. To prevent confusion and ensure the outcome sought by the proposed rule, owners/operators should be required to consult with specialists prior to making *any* changes to their processes and equipment to ensure that they continue to operate in a "safe" manner. The existing Management of Change regulation, 40 CFR 68.75, could serve as a model for establishing these requirements.

Addressing the three issues detailed above will help mitigate the acute risks from explosions and other adverse consequences that are inherent in the treatment, storage, and/or disposal of explosive waste. Effectively addressing these three issues should also address the causal factors that were identified in the CSB's Donaldson Enterprises, Inc. Fatal Fireworks Disassembly Explosion and Fire investigation.