

Congress of the United States
House of Representatives

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MEMORANDUM

October 14, 2021

To: Members of the Subcommittee on Economic and Consumer Policy and the Subcommittee on Civil Rights and Civil Liberties

Fr: Subcommittee on Economic and Consumer Policy and Subcommittee on Civil Rights and Civil Liberties, Majority Staff

Re: Safety of Tear Gas Is Unregulated by the Federal Government; Health Effects from Exposure Are Concerning, but Full Extent Is Unknown

Tear gas is widely used by U.S. law enforcement agencies as a “riot control agent.” It was used in at least 100 U.S. cities in the first six months of 2020 alone.¹ Such widespread domestic use stands in stark contrast to the lack of U.S. use of tear gas against our enemies in war—tear gas is banned from use in war as a chemical weapon by international treaty.²

The Subcommittee on Economic and Consumer Policy and the Subcommittee on Civil Rights and Civil Liberties conducted an investigation into what federal agencies know about the human health effects of tear gas when it is used to control crowds, and how the federal government regulates its use against civilians.

Documents and information obtained from relevant federal agencies and three major tear gas manufacturers reveal that the federal government has never made a determination that tear gas is safe to use on humans.

Specifically, the Subcommittees’ investigation revealed:

¹ *Here Are the 100 U.S. Cities Where Protesters Were Tear Gassed*, New York Times (June 18, 2020) (online at www.nytimes.com/interactive/2020/06/16/us/george-floyd-protests-police-tear-gas.html).

² *Fact Check: It’s True Tear Gas Is a Chemical Weapon Banned in War*, USA Today (June 6, 2020) (online at www.usatoday.com/story/news/factcheck/2020/06/06/fact-check-its-true-tear-gas-chemical-weapon-banned-war/3156448001/).

- The U.S. government does not regulate the safety of tear gas used against people in the United States and has not conducted epidemiological research to determine whether it is safe to use.
- The limited studies that have been conducted on the health effects of tear gas show that risks from exposure include acute respiratory illness and gastrointestinal and menstrual effects.
- U.S. tear gas manufacturers acknowledge that tear gas is dangerous and that “injury and/or damage can be expected,” whenever it is used.
- U.S. tear gas manufacturers have earned significant revenue from selling tear gas products, despite the known serious risks tear gas poses to human health and safety.
- In the absence of federal guidance, manufacturers and law enforcement have free rein to self-regulate. Tear gas manufacturers defer to law enforcement, and some law enforcement associations eschew strict standards for tear gas use. For example, one manufacturer’s training document highlighted a law enforcement association claim that it does not need a “formula” to determine whether it is safe to use tear gas because “[w]e don’t need a formula to use other forms of force.”

I. U.S. GOVERNMENT’S FAILURE TO REGULATE SAFETY OF TEAR GAS

The United Nation’s Chemical Weapons Convention bans the use of tear gas in war.³ The Senate approved this convention in 1997.⁴ However, the convention allows countries to use tear gas domestically for “law enforcement,” including for “riot control.”⁵

In June 2021, Subcommittee on Economic and Consumer Policy Chairman Raja Krishnamoorthi opened this investigation after hearing from Congresswoman Cori Bush that women had suffered long-term health consequences after tear gas exposure. Chairman Krishnamoorthi, Subcommittee on Civil Rights and Civil Liberties Chairman Jamie Raskin, Congresswoman Cori Bush, and Congresswoman Alexandria Ocasio-Cortez asked the Department of Justice (DOJ), the Department of Health and Human Services (HHS), and the

³ *Fact Check: It’s True Tear Gas Is a Chemical Weapon Banned in War*, USA Today (June 6, 2020) (online at www.usatoday.com/story/news/factcheck/2020/06/06/fact-check-its-true-tear-gas-chemical-weapon-banned-war/3156448001/); Organisation for the Prohibition of Chemical Weapons, *Convention on the Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons and on Their Destruction* (online at www.opcw.org/sites/default/files/documents/CWC/CWC_en.pdf) (accessed Sept. 10, 2021).

⁴ United States Congress, Congressional Records of Senate Actions Regarding Chemical Weapons Convention (online at www.congress.gov/treaty-document/103rd-congress/21).

⁵ Organisation for the Prohibition of Chemical Weapons, *Convention on the Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons and on Their Destruction* (online at www.opcw.org/sites/default/files/documents/CWC/CWC_en.pdf) (accessed Sept. 10, 2021).

Environmental Protection Agency (EPA), which are responsible for the federal government's law enforcement and public health and safety, for briefings on their regulation of domestic use of tear gas in the United States. The Subcommittees requested information on (1) each agency's role in regulating tear gas products and determining if tear gas is safe for humans; (2) all research and data related to health risks for humans exposed to tear gas; and (3) the feasibility of establishing universal standards for tear gas products.⁶

DOJ responded by email that it “neither regulates tear gas products nor conducts research on its health effects.”⁷ DOJ later confirmed the same statement via letter and asserted that HHS and EPA were “better positioned to address the questions [the Subcommittees had] raised.”⁸

HHS also confirmed that it neither regulates nor studies tear gas, and could not provide any information about the feasibility of establishing standards for tear gas use:

The Department of Health and Human Services does not regulate tear gas. Further, the Department does not have any current or recently conducted scientific studies, nor been made aware of recently funded scientific studies regarding the health implications of such chemical compounds. As such, we are unable to provide additional information regarding the regulation, research, or feasibility of establishing universal standards for these products.⁹

EPA also confirmed that it does not regulate tear gas, stating that it is “not aware of any activities or actions regarding tear gas across the agency.”¹⁰

Currently, there is only tangential regulation related to tear gas, which is unrelated to tear gas safety when used as a riot-control agent. The Department of Transportation regulates shipment of tear gas, the Occupational Safety and Health Administration regulates worker safety requirements during manufacture of tear gas, and the Bureau of Alcohol, Tobacco, Firearms, and Explosives regulates the sale of tear gas products when they contain explosives.

⁶ Letter from Chairman Raja Krishnamoorthi, Subcommittee on Economic and Consumer Policy, et al. to Secretary Xavier Becerra, Department of Health and Human Services, Attorney General Merrick Garland, Department of Justice, and Administrator Michael S. Regan, Environmental Protection Agency (June 10, 2021) (online at <https://oversight.house.gov/sites/democrats.oversight.house.gov/files/2021-06-10.RK%20JR%20et%20al.%20to%20Becerra-HHS%20Garland-DOJ%20Regan-EPA%20re%20Tear%20Gas.pdf>).

⁷ Email from Staff, Department of Justice, to Staff, Subcommittee on Economic and Consumer Policy (Aug. 4, 2021) (online at <https://oversight.house.gov/sites/democrats.oversight.house.gov/files/Ex. B.pdf>).

⁸ Letter from Deputy Assistant Attorney General Joe Gaeta, Department of Justice, to Chairman Raja Krishnamoorthi, Subcommittee on Economic and Consumer Policy (Sept. 2, 2021) (online at <https://oversight.house.gov/sites/democrats.oversight.house.gov/files/Ex. I.pdf>).

⁹ Letter from Acting Assistant Secretary for Legislation Jeff Hild, Department of Health and Human Services, to Chairman Raja Krishnamoorthi, Subcommittee on Economic and Consumer Policy (Aug. 20, 2021) (online at <https://oversight.house.gov/sites/democrats.oversight.house.gov/files/Ex. C.pdf>).

¹⁰ Email from Staff, Environmental Protection Agency, to Staff, Subcommittee on Economic and Consumer Policy (Sept. 21, 2021) (online at <https://oversight.house.gov/sites/democrats.oversight.house.gov/files/Ex. J.pdf>).

II. INSUFFICIENT RESEARCH ON THE DANGERS OF TEAR GAS

Tear gas use is woefully understudied given recent increases in its use, as scientists have noted:

[T]he massive increase in tear gas deployments worldwide, accompanied by advances in formulations and deployment technologies and the often-observed absence or disregard of evidence-based deployment rules and operating procedures, is of great concern. Epidemiological research on tear gas health effects is clearly deficient and has received little public support.¹¹

Most safety studies on tear gas are from around 1950, and only included animals and healthy young men. The only recent U.S. study on civilian human health impacts found that many individuals exposed to tear gas during the 2020 protests in Portland, Oregon, experienced both immediate and delayed symptoms, including unexpected ones like gastrointestinal and menstrual effects.¹² In a 2014 study focused on U.S. Army recruits, scientists found that even young, healthy individuals developed a high risk of acute respiratory illness after exposure to tear gas.¹³ As a result, the Army immediately limited exposure concentrations and exposure times.¹⁴

A. Tear Gas Manufacturers Know Tear Gas Is Dangerous and That “Injury and/or Damage Can Be Expected” Whenever It Is Used

The Subcommittees requested documents from three companies that manufacture tear gas in the United States: Pacem Defense (Pacem), Combined Systems, and Safariland.¹⁵

¹¹ Craig Rothenberg et al., *Tear Gas: An Epidemiological and Mechanistic Reassessment*, Annals of the New York Academy of Sciences (July 8, 2016) (online at www.ncbi.nlm.nih.gov/pmc/articles/PMC5096012/).

¹² Britta N. Torgrimson-Ojerio et al., *Health Issues and Healthcare Utilization Among Adults Who Reported Exposure to Tear Gas During 2020 Portland (OR) Protests: A Cross-Sectional Survey*, BMC Public Health (Apr. 26, 2021) (online at www.ncbi.nlm.nih.gov/pmc/articles/PMC8074355/pdf/12889_2021_Article_10859.pdf).

¹³ Joseph J. Hout et al., *o-Chlorobenzylidene Malononitrile (CS Riot Control Agent) Associated Acute Respiratory Illnesses in a U.S. Army Basic Combat Training Cohort*, Military Medicine (July 1, 2014) (online at <https://academic.oup.com/milmed/article/179/7/793/4259353#101149356>).

¹⁴ Craig Rothenberg et al., *Tear Gas: An Epidemiological and Mechanistic Reassessment*, Annals of the New York Academy of Sciences (July 8, 2016) (online at www.ncbi.nlm.nih.gov/pmc/articles/PMC5096012/).

¹⁵ Letter from Chairman Raja Krishnamoorthi, Subcommittee on Economic and Consumer Policy, et al., to Mr. Andrew Knaggs, Chief Executive Officer, Pacem Defense LLC (June 10, 2021) (online at <https://oversight.house.gov/sites/democrats.oversight.house.gov/files/2021-06-10.RK%20JR%20et%20al.%20to%20Knaggs-Pacem%20Defense%20re%20Tear%20Gas.pdf>); Letter from Chairman Raja Krishnamoorthi, Subcommittee on Economic and Consumer Policy, et al., to Mr. Donald Smith, Chief Executive Officer, Combined Systems, Inc. (June 10, 2021) (online at <https://oversight.house.gov/sites/democrats.oversight.house.gov/files/2021-06-10.RK%20JR%20et%20al.%20to%20Smith-Combined%20Systems%20re%20Tear%20Gas.pdf>); Letter from Chairman Raja Krishnamoorthi, Subcommittee on Economic and Consumer Policy, et al., to Mr. Warren Kanders, Chief Executive Officer, Safariland (June 10, 2021) (online at

Training materials and site contamination warnings provided to the Subcommittees show that manufacturers know tear gas is dangerous.

For example, tear gas training materials obtained from Pacem explain that any time tear gas is used, “injury and/or damage can be expected.”¹⁶

Combined Systems recommends posting a warning notice wherever law enforcement officers use tear gas, so inhabitants can protect themselves from its effects. The warning notice recommends hiring “a professional cleaning/decontamination service to remove any chemical agents that may still be in the area.” The advice even states that tear gas can “penetrate many plastics, so wrapped food should also be discarded.”¹⁷

<https://oversight.house.gov/sites/democrats.oversight.house.gov/files/2021-06-10.RK%20JR%20et%20al.%20to%20Kanders-Safariland%20re%20Tear%20Gas.pdf>.

¹⁶ Pacem Defense LLC, 2019 CS & CN Human Health Risks Training (online at <https://oversight.house.gov/sites/democrats.oversight.house.gov/files/Ex. H.pdf>).

¹⁷ Combined Systems, Inc., Training Slides for Instructor Certification Course (online at <https://oversight.house.gov/sites/democrats.oversight.house.gov/files/Ex. D.pdf>).



WARNING

**During the course of law enforcement actions
this area has been exposed to the following chemical agents:**

- Oleoresin Capsicum (OC) Liquid
- Oleoresin Capsicum (OC) Powder
- Oleoresin Capsicum (OC) Gas
- Ortho-chlorobenzalmalononitrile (CS) Liquid
- Ortho-chlorobenzalmalononitrile (CS) Powder
- Ortho-chlorobenzalmalononitrile (CS) Gas
- Smoke

We have removed the spent munitions as they are the most heavily contaminated. We highly advise you to contact a professional cleaning/decontamination service to remove any chemical agents that may still be in the area. You can take the following steps which may help to decrease the adverse effects of the chemical agents:

- **Open all doors and windows. Ventilating the building will remove airborne particulate. Fans can be used to increase ventilation. Place the fans at one end of the building and blow the particulate out the other end.**
- **If CS or OC powder is used, a HEPA-filtered industrial vacuum cleaner may be used to collect the residual powder. A standard household vacuum will stir up the powder rather than trap it.**
- **Wet cleaning using a non-ionic, non-oil based detergent such as Tide or Ivory liquid is recommended for most clothes and fabrics.**
- **Dry cleaning is suggested for more delicate clothing and fabrics. Advise the cleaners of the contamination. More than one treatment may be necessary.**
- **Contaminated foods will absorb the agent and should be discarded. CS and OC penetrate many plastics, so wrapped food should also be discarded. Foods in cans may be usable after the outside of the can is thoroughly cleaned.**

These site contamination warnings demonstrate that manufacturers and law enforcement agencies know that tear gas can have serious effects on human health and that tear gas can remain in homes, on clothing, and even in food long after it is deployed.

III. TEAR GAS MANUFACTURERS HAVE TAKEN ADVANTAGE OF THE LEGAL VOID IN TEAR GAS REGULATION

A. Three U.S. Tear Gas Manufacturers Have Earned Significant Revenue from Selling Tear Gas Products Since 2018

Combined Systems, Pacem, and Safariland manufacture and sell tear gas to law enforcement agencies, corrections facilities, and distributors. These three companies generated over \$13 million in revenue from tear gas sales between January 1, 2018, and June 2021.

Safariland sold over \$8.2 million in tear gas products, Combined Systems sold over \$3.5 million, and Pacem sold over \$1.2 million.¹⁸

B. In the Absence of Any Federal Guidance Regarding Law Enforcement Use of Tear Gas, Tear Gas Manufacturers and Law Enforcement Are Left to Self-Regulate

Despite knowing the risks of tear gas, manufacturers defer to law enforcement “philosophies” on how to use tear gas.

For example, Combined Systems has a training arm called the CTS Training Institute (CTSTI) that conducts training courses for law enforcement officers. One of the courses presented through CTSTI is the “Instructor Certification Course” on “Chemical Munitions.” The Subcommittees obtained training materials for this course that discuss a guideline called “LCt50.”¹⁹ LCt50 is a way of measuring the lethality of tear gas; it is “the product of the concentration and exposure time that is lethal to 50 percent of a group of exposed, unprotected” individuals.²⁰ LCt50 values for tear gas products are determined by using these products in a “sealed, unventilated” room.²¹

Materials obtained by the Subcommittees show that although Combined Systems’ trainings present LCt50 to law enforcement, they also clearly state that law enforcement is free to ignore the guideline. Combined Systems’ training slides state that the company will “[c]ontinue to advise Agencies on LCT ... , however whether or not to use will be up to the agencies.”²²

The training materials also assert that the “concentration variable”—the potency of the tear gas used, a key factor in the equation to calculate LCt50— “should be based on SWAT chemical agent deployment philosophy,” rather than any independent standards.²³

Further, Combined Systems actively undercuts the LCt50 guideline in its trainings by presenting interest groups’ negative opinions of the guidelines. Its training slides state that two

¹⁸ Safariland, Revenue Data (online at <https://oversight.house.gov/sites/democrats.oversight.house.gov/files/Ex. G.pdf>); Combined Systems, Inc., Revenue Data (online at <https://oversight.house.gov/sites/democrats.oversight.house.gov/files/Ex. E.pdf>); Pacem Defense LLC, Revenue Data (online at <https://oversight.house.gov/sites/democrats.oversight.house.gov/files/Ex. F.pdf>).

¹⁹ Combined Systems, Inc., Training Slides for Instructor Certification Course (online at <https://oversight.house.gov/sites/democrats.oversight.house.gov/files/Ex. D.pdf>).

²⁰ T. E. McKone et al., *Strategies to Protect the Health of Deployed U.S. Forces: Detecting, Characterizing, and Documenting Exposures*, National Academies Press (2000) (online at www.ncbi.nlm.nih.gov/books/NBK225370/).

²¹ Combined Systems, Inc., Training Slides for Instructor Certification Course (online at <https://oversight.house.gov/sites/democrats.oversight.house.gov/files/Ex. D.pdf>).

²² *Id.*

²³ *Id.*

law enforcement associations have “declared” the LCt50 calculations for “CN and CS” tear gas to be “obsolete.”²⁴ Combined Systems quotes the dangerous philosophy of a group called the National Tactical Officers Association.²⁵ This group urges against the use of any formula to determine appropriate use of tear gas, stating, “We don’t need a formula to use other forms of force.”²⁶ Combined Systems’ choice to present these extreme views in a tear gas training undercuts any message that law enforcement should use protective guidelines.

²⁴ *Id.*

²⁵ National Tactical Officers Association, *About NTOA* (online at www.ntoa.org/about/) (accessed Aug. 20, 2021).

²⁶ Combined Systems, Inc., Training Slides for Instructor Certification Course (online at [https://oversight.house.gov/sites/democrats.oversight.house.gov/files/Ex. D.pdf](https://oversight.house.gov/sites/democrats.oversight.house.gov/files/Ex._D.pdf)).